

Restructuring and Reform: Business Development Opportunities in Military Industry Conversion to Civilian Markets



**The United Nations Department of Economic
and Social Affairs (UN/DESA), New York**

The United Nations Development Programme (UNDP), China

**in cooperation with
The China Association for Peaceful Use of Military Industrial Technology (CAPUMIT)**

1998

Note:

Symbols of United Nations documents are composed of capital letters combined with figures. Mention of such a symbol indicates a reference to a United Nations document.

The designations employed and the presentation of the material in this report do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries. Where the designation “country or area” appears in the headings or tables it covers countries, territories, cities or areas.

Acknowledgement

This publication results from three years of continuous and effective cooperation between the United Nations and the China Association for Peaceful Use of Military Industrial Technology (CAPUMIT) with the backing of the former Commission on Science, Technology and Industry for National Defence (COSTIND). The tireless efforts by the senior staff of CAPUMIT, the former COSTIND, the COSTIND organizations in Sichuan, Hubei, Yunan, Guizhou and Jianxi, and the Beijing Institute of Aeronautical Materials have made these meetings and training programmes efficient and pleasant exercises.

Contents

Introduction1

Part I. Main Issues of Military Industry Restructuring And Public Sector Reform with Special Reference to China3

Main Issues and Suggestions for Further Military Industry Restructuring and Public Sector Reform in China

*Sergio C. Trindade*5

Facing the 21st Century: Strengthening International Cooperation for Military Industry Restructuring

*Xie Mingbao*25

The Second-Time Development and Re-Allocation of Defence Resources: A New Approach from Military to Civilian Conversion

*Jin Zhude and An Weimin*29

Conversion of Military Industries to Civilian Production in China: Prospects, Problems, Policies

*Saadet Deger and Jean-Claude Berthelemy*40

Building Endogenous Capacity to Meet the Challenges of the World

*Zhang Shouliang*57

Promote Development and Commercialization of Advanced Materials by Strengthening International Cooperation

*Wu Xueren*59

Ford Motor Company in China

*Robert Dockstader*66

German-Chinese Joint Ventures: A Story of Success?

*Jörn Brömmelhörster*71

Present Status and Development of the Defence Conversion in Sichuan Province

Wu Anren⁸⁴

**Strengthening International Cooperation to Promote
Military Industry Restructuring in Hubei Province**
Shu Zhongyan⁸⁹

**Part II. International Experiences in Military Industry
Restructuring and Public Sector Reform**⁹⁷

**The “Peace Dividend” in Argentina and Chile:
An Evaluation of Opportunities for Defence
Conversion**
Thomas Scheetz⁹⁹

**Reconstruction and Development Following Armed
Conflict: The Case of Eritrea**
Naigzy Gebremedhin¹¹⁴

Military Industry Restructuring in Belarus
Jack Baranson¹¹⁶

**Military Industry Restructuring in Russia and
International Cooperation in the Field of Conversion**
Leonid V. Efimov¹²⁴

**Successful Defence Industry Recovery Projects
in Both Eastern Europe and the United States**
Wallace B. Bishop, Jr.¹⁶¹

**Technology Transfer: Applying Military Research to
Commercial Industry with Examples of Joint
Ventures in Saint Louis, Missouri, USA**
Mary Ann McGivern¹⁸⁴

**The CALSTART Experience with Programs Designed
to Re-utilize in Civilian Applications Technologies,
Facilities
and Personnel Originally Utilized in Defence/Military
Applications in California, USA**
James D. Boyd¹⁹²

**International Cooperation in European Countries:
Successes, Failures and Future Options**
Bernard Reverdy¹⁹⁹

**Conversion of Military Establishments in the
United Kingdom**
*Duncan Hall*202

**From the Nation's Flattop to the Motor of Conversion
in Germany**
Werner Rech 210

**Part III. Building Blocks for Effective International
Cooperation**213

**Coaching Seminars on Business Strategy and Business
Planning for Military Industry Restructuring and
Public Sector Reform**
*Leshan, Sichuan Province and Kunming, Yunnan
Province;*
*Guiyang, Guizhou Province and Nanchang, Jiangxi
Province*215

**Workshops on New Business Opportunities in China:
Restructuring the Military Industry**
*Chongqing, Sichuan Province and Wuhan, Hubei
Province*227

Direct and Indirect Financial Aspects of Conversion
*Daniel Pierre Blais*229

**International Management and Asset Valuation of
Intellectual Property Rights**
*Heinz Goddar*253

Joint Ventures
*Christian Osterrieth*275

Market Communications Outlines
*David Buxbaum*284

**Advice to Chinese Enterprises Involved in Preparing
Proposals to Major Transnational Corporations**
*Ben R. Carroll*290

**Enterprise Support System for Conversion:
Introduction
of Strategies for Innovation (SFI) Applied to Market-
Oriented Transition of Military Enterprises in China**

Joseph Bitran and William B Carpenter305

Opening Statements by Representatives of the United Nations and UNDP at the Round-table on International Cooperation for Military Industry Restructuring

Mr. Abdel-Hamid Bouab and Ms. Chingboon Lee320

Epilogue327

Glossary331

Foreword

This publication is unique, in the sense that it presents and discusses the military industry restructuring and public sector reform experience in a wide range of situations in Argentina, Belarus, Chile, China, Eritrea, European Union, France, Germany, Russia, Ukraine, the United Kingdom and the United States. This is probably the first time that an array of such diverse experiences is presented in one volume, for the benefit of public officials and private individuals and organizations in the world at large.

Military industry restructuring and public sector reform are becoming ever more important endeavors, as countries continue to decrease their military budgets and reexamine the role of the state in the economy. Despite the unfortunate continuation of some regional and local conflicts, the end of the Cold War and strengthened disarmament initiatives have contributed significantly to this trend. The challenge posed to the world is to redeploy the human, financial and physical resources from military objectives to promote the sustainable development of all nations, while reforming the public sector.

Twenty-six authors contributed to this publication. Their experiences provide precious analyses of the successes and failures of conversion from military industry to civilian markets and of public sector reform, the role of international cooperation and the necessary building blocks for effective cooperation. Despite the diversity of situations and national settings, there is a certain convergence of expert opinion regarding the need for international cooperation and the elements of success in military industry restructuring and public sector reform. The latter include the participatory role of the communities housing concentrations of military industry; the need to promote an enabling environment with access to information on markets, technology and finance;

management training, including business strategy and planning; the importance of dealing quickly with the social overheads previously the responsibility of military industry in some countries; the respect for and implementation of the law on property of tangible and intangible assets, including intellectual property; attention to environmental issues, including environmental liabilities from previous military-industrial activities; the importance of corporatizing converted enterprises to make clear the property of assets and the responsibility for liabilities; the clustering of resources to support efforts by groups of enterprises to make it in the civilian markets; openness to international trade, investment and technology flows; etc.

In this context, it is crucial to fully document and disseminate successes and failures in military industry restructuring and public sector reform, via all media of communication available to make such information accessible to a growing number of stakeholders. Hopefully this publication will contribute toward this end.

The United Nations Department for Economic and Social Affairs (UNDESA) and its predecessors, the United Nations Department for Development Support and Management Services (UNDDSMS) and the United Nations Center for Science and Technology for Development (CSTD) have worked with interested Member States and organizations within and outside the UN system, in the conversion from the military to the civilian economy and public sector reform. UNDESA has conducted meetings, workshops, seminars and training programmes and has sponsored investment promotion initiatives in connection with military industry restructuring and public sector reform throughout the world.

One such programme is project CPR/94/319 jointly sponsored by the United Nations Development Programme (UNDP) and the China Association for Peaceful Uses of Military Industrial Technology (CAPUMIT), and executed by the Division for Public Economics and Public Administration of UNDESA. This project focused on the structural adjustment of military manufacturing and marketing capacities, and the process of public sector reform in China and elsewhere in the

world. This broad programme of work started in 1995 and ended in June 1998. It involved :

- Workshops on new business opportunities in China;
- Mobilization of international resources for conversion in China;
- Business strategy and planning for reformed public sector enterprises via coaching seminars; and
- An international round-table for dissemination of experiences.

This volume hopes to disseminate the important findings of project CPR/94/319. It is organized to offer the reader, at first, ten articles on the main issues of military industry restructuring and public sector reform, with special reference to China. This ought to give the reader a good introduction to another set of ten articles on these issues in the developing countries, countries with economies in transition and the developed countries. These twenty articles constitute the backbone of this publication.

A segment on building blocks for effective international cooperation in conversion from military industry to civilian markets and public sector reform follows, with six articles on financing and accounting; intellectual property; joint ventures; advertising and trade marks; and business strategy and planning, with frequent reference to the requirements of reform in China.

Finally, it is hoped that this publication will encourage the readers to reflect on the important issues presented and to promote, with all means available, the ideals of the United Nations of peace, stability and equitable prosperity for all peoples.

Guido Bertucci

Director

Division for Public Economics and Public Administration

Department of Economic and Social Affairs

Introduction

This publication represents the culmination of project CPR/94/319. The programme of work comprised three phases:

I. Workshops on new business opportunities in China

The workshops held in Chongqing, Sichuan Province and Wuhan, Hubei Province in late October and early November of 1995, yielded Chinese proposals for sino-foreign partnerships engaged in military industry restructuring. The prospects of these and of other project proposals submitted by CAPUMIT at later dates, were considered throughout the programme.

II. Mobilization of resources and coaching seminars on business strategy and planning for military industry restructuring and public sector reform

The business opportunities workshops and other analyses confirmed the interest of Chinese defence industries to adopt the share-holding corporate structure, in setting up joint ventures with international partners. The Chinese side in general seeks financing, sometimes technologies and access to international markets. The workshops also confirmed the urgent need for management training of Chinese defence industry managers in business strategy and business planning and in business communication skills. In response to these demands, an effort, in the form of a virtual China Conversion Facility, to mobilize international interest in partnering with the Chinese defence industry aimed at civilian markets was undertaken. Also a set of coaching seminars in business strategy and planning for defence

industry managers was held in Leshan, Sichuan Province and Kunming, Yunnan Province in November 1996, and Guiyang, Guizhou Province and Nanchang, Jiangxi Province, in June 1998. The latter exercise emphasized the public sector reform process accelerated by the directives of the National People's Congress meeting of March 1998, which promotes the corporatization of SOEs via the shareholding system.

III. International round-table for dissemination of experiences

In order to share the project findings with the international community and to learn from the experience of China and other countries, a round-table on international cooperation in military industry restructuring and enterprise reform aiming at civilian markets, was held on 13-14 October 1997 in Beijing. Finally, this publication is being issued bringing together the major findings of project CPR/94/319, for further worldwide dissemination of issues and options and stimulation of processes of military industry restructuring and public sector reform.

Part I:

Main Issues of Military Industry Restructuring and Public Sector Reform with Special Reference to China

This segment constitutes the core of this publication and draws its material primarily from the Beijing International Round-Table on International Cooperation for Military Industry Restructuring, held on 13-14 October 1997. The last three articles, however, come from the International Workshops on New Business Opportunities in China, held in Chongqing, Sichuan Province and Wuhan, Hubei Province, in October/ November 1995.

It opens with the article by Sergio C. Trindade entitled “Main Issues and Suggestions for Further Military Industry Restructuring and Public Sector Reform in China” presented at the Beijing Round-Table. Although it addresses the case of China, its analysis and findings are of interest to military industry restructuring and public sector reform processes all over the world.

It continues with a paper by Xie Mingbao, President of CAPUMIT, on “Facing the 21st Century: Strengthen International Cooperation for Military Industry Restructuring.” This is followed by a paper by Jin Zhude, Vice-Chairman of CAPUMIT, on “Prospects for a Second Wave of Conversion.” Subsequently, comes Saadet Deger’s article on “Conversion of Military Industries to Civilian Production in China: Prospects, Problems, Policies.” Then there is the summary of a paper by Zhang

Shouliang of Beijing Changkong Machinery Corporation, a subsidiary of the Aviation Industries of China, on “Building Endogenous Capacity to Meet the Challenges of the World.” Next is an exposé by Wu Xueren, of the Beijing Institute of Aeronautical Materials (BIAM), on “Strengthening International Cooperation for R&D Commercialization of New Materials.” The section also contains papers, by Robert G. Dockstader, Director, New Vehicle Programs, Ford Motor (China) Ltd., on Ford’s activities in China, under the title “Non-Defence Sector: An Example of Conversion”; and by Jörn Brömmelhörster on “German-Chinese Joint Ventures: A Story of Success?” The section ends with two papers: “Present Status and Development of the Defence Conversion in Sichuan Province” by Wu Anren, Deputy Director, Sichuan Office of Science, Technology and Industry for National Defence; and “Strengthening International Cooperation to Promote Military Industry Restructuring in Hubei” by Shu Zhongyan, Director, Hubei Office for Science, Technology and Industry for National Defence.

Main Issues and Suggestions for Further Military Industry Restructuring and Public Sector Reform in China

Sergio C. Trindade
President
SE²T International, Ltd.

Summary

The main issues of military industry restructuring and public sector reform in China can be grouped into macro-economic and micro-economic categories.

The macro-economic issues include the fact that the converted enterprises remain State Owned Enterprises (SOEs), with all the problems inherent to the SOEs, and that military industry restructuring in China was stimulated by the change in military procurement from simpler items of ordinance and military supplies to more sophisticated command and control equipment, technology and systems with the corresponding redundancy of traditional military-industrial assets and labor which had to find other uses, lest unemployment would rise to intolerably high levels in communities over dependent on the military-industrial complex for their livelihoods.

Foreign investment has been the engine of growth in China's recent economic development and to a large measure has come from expatriate Chinese from East and South East Asia and throughout the world. For atavic reasons, the 12 coastal provinces have gotten the bulk of

this investment flow (more than 90%). These provinces also enjoy a measure of autonomy in relation to the central government and have become a manufacturing platform for world markets, particularly the USA market. Notwithstanding the success made so far, according to the World Bank, there is a need for foreign investment in telecommunications, banking, insurance, accounting and auditing, legal services and computer processing, critical areas for building a modern, reformed economy.

Conversion is no exception to the high transaction cost of doing business in China, which is stimulating public sector reform. Higher costs, bad debts, bureaucratic interference, transport problems, the low quality of local inputs and raw materials, and difficulties of access to yuan RMB loans for working capital, opaques decision-making processes leading to abrupt changes in taxes and import duties policies which create an atmosphere of volatility and confusion, confounding prudent business planning, etc., all add to the cost of doing business in China. A further factor which increases the transaction costs of conversion is the coexistence of many conversion processes: from military to civilian markets; from remote locations to locations near markets; from centrally planned system to market economy; from present business approach and management style toward a competitive market economy; and from state-owned enterprises to other forms of ownership.

Another macro-economic issue is enterprise reform, which got a boost from the recent 15th Congress of the Communist Party of China, as well as from the meeting of the National People's Congress of March 1998, which provide for the reorganization, association, merger, joint stock partnership, leasing, contract operation and sell-off of SOEs. This represents a major impulse to the public sector reform process in China.

The micro-economic issues include the possibility that the restructured enterprises could operate as truly commercial corporate entities, the equivalent of private firms, with clear ownership of assets and responsibility for liabilities. The setting up of joint ventures offers an opportunity to introduce such market-oriented management behavior and to open up export markets, besides bringing in foreign

investment and technology. But, to get there the Chinese side must be prepared, in terms of public sector reform, investment promotion, strategic thinking, business planning, management training, information and business communication skills, and the regions of China hoping to host them must improve infrastructures, physical and otherwise.

Other micro-economic issues include entrepreneurship, business communication, investment financing and social overheads. The general answer to these issues is to corporatize the enterprises and institutionalize the social services so far provided by the military industries themselves, all of which are part of the process of public sector reform.

Main issues in military industry restructuring in China

The issues affecting the success or failure of conversion in China by and large fall into two general categories: macroeconomic and microeconomic. The macroeconomic issues relate to: (i) the converted SOEs and the changes in military procurement; (ii) foreign investment and China's economic growth; (iii) the high transaction cost of conversion; (iv) enterprise reform and the structure and ownership of SOEs, town and village enterprises (TVEs) and private firms in China. The microeconomic issues relate to: (i) restructured enterprises as truly commercial corporate entities; (ii) entrepreneurship, business communication, investment financing and the impact of social overheads.

The large military-industrial establishment of China evolved historically under a centrally planned regime, with a major security concern over the former Soviet Union, with which China shares a very long border. Being relatively isolated from the world at the time, China built its military-industrial complex in a self-contained way, and with many establishments located, for security reasons, in the interior provinces, in the so-called "third front." But, over the years, China and the world around it changed dramatically. The Chinese economy has been moving at a fast pace toward the market system, the public sector is

being reformed, the security concerns have refocused elsewhere, and the qualities and quantities involved in defence procurement are being reoriented accordingly. The size of the armed forces has decreased in the number of men and women in uniform, and the demand for the pivotal technologies of electronic command and control capabilities and more accurate and sophisticated equipment, especially for air and naval defence, has increased substantially. According to James Harding (Financial Times, 14 July 1997), “the Chinese market for electronic technology and equipment is expected to reach US\$ 121 billion by the year 2000, with the bulk of the demand coming from modernizing military services.”

Converted SOEs and the changes in military procurement

Thus, the remarkable degree of conversion that has occurred was stimulated by the decrease in traditional defence procurement and the concern over keeping employment in military factories. But, coming as they did from a state-owned industrial complex, the converted enterprises have remained by and large SOEs, at a time when the overall industrial output from the SOEs is decreasing in relative importance compared with the new players, the TVEs, the joint ventures and the purely private enterprises, domestic and foreign. It should also be noted that there is a limit to the extent those defence industries can be converted, and that a substantial portion of the military-industrial complex has already switched to civilian markets.

Nevertheless, there are still opportunities for conversion, especially in new higher value-added products and services, which could benefit from civilian applications of military research and development and from the push of public sector reform. It is also possible that in the purely military side of the industry there might be room for mergers and restructuring of defence industries, as is happening in the United States and to a lesser degree in Europe.

According to Tony Walker (Financial Times, 18 July 1997), "China's state sector includes 118,000 industrial enterprises, 7,000 controlled directly by the central government. They account for about one-third of the production, but profits have fallen from 6 percent to less than 1 percent of gross domestic product since the early 1980s. In 1996, 50 percent of state-owned industrial companies incurred net losses, up from one-third two years ago, amounting to 1.3 percent of GDP." Since the converted enterprises remain SOEs, the bulks of them are probably losing money as well, hence the relevance of public sector reform.

Foreign investment and China's economic growth

Forty percent of total foreign direct investment flowing to developing countries is being invested in China in recent years. Thus it is no surprise that foreign investment has played a key role in China's recent economic growth. However, it is peculiar of China that the largest share of foreign investment in China comes from Chinese expatriates, from Hong Kong (no longer expatriates since 1st. July 1997), Macau, Taiwan, Singapore, Thailand, Malaysia, Indonesia and from elsewhere in the world. There may also be an atavic tendency for Chinese expatriates to invest in the ancestral home areas, where their families originated from in China, with which cultural and linguistic links are strong. To a large extent, these areas coincide with the coastal provinces, including the five Special Economic Zones. According to a 1997 World Bank report on distribution of foreign direct investment in China, the twelve coastal provinces have attracted more than 90 percent of foreign direct investment since 1989, most of it going to Guandong Province.

A possible additional explanation for this concentration of foreign investment is that coastal areas have a higher level of autonomy when it comes to investment, production and other economic policies. Furthermore, China has become a manufacturing platform for transnational

corporations seeking low cost bases to serve world markets, especially the United States. The eventual entry of China into the World Trade Organization (WTO) will further expand Chinese foreign trade. But, the World Bank is concerned that private capital flows into China have been concentrated “in industries such as the real estate sector, especially hotels and other tourism-related projects. Telecommunications, banking and insurance, accounting and auditing, legal services and computer processing—critical areas for building a modern industrial economy—have attracted far lower levels of foreign direct investment.” Public sector reform could help improve these service economies by allowing private sector participation in these markets.

According to Tony Walker and John Ridding (Financial Times, 10 May 1996) “foreign business in China has experienced a roller coaster existence since Beijing tentatively opened its doors in 1978. The past five years have seen a flood of new investment, but investors are now facing a less welcoming response from the authorities....Main concerns were over costs, bad debts, bureaucratic interference, transport problems, the low quality of local inputs and raw materials, and difficulties of access to yuan RMB loans for working capital....Despite the somewhat less-encouraging business environment, recent surveys indicate no slackening in interest in China among foreign investors....A poll last year of 47 mainly western multinationals by the Economist Intelligence Unit and Andersen Consulting found 60 percent of ventures in China were operating profitably. Most had become profitable in two years. But the EIU-Andersen survey also reported tighter margins in China than in other developing countries—confirming anecdotal evidence that China is a tough market and getting tougher.”

The high transaction costs of conversion

Conversion in general, and particularly conversion in the interior provinces of China, is hampered by the high transaction costs involved in attempting to implement

joint ventures or any venture, which ought to be stimulating public sector reform. This is due to many factors, including as previously mentioned, higher “costs, bad debts, bureaucratic interference, transport problems, the low quality of local inputs and raw materials, and difficulties of access to yuan RMB loans for working capital”...and opaque decision-making processes leading to abrupt changes in taxes and import duties policies that could “further create an atmosphere of volatility and confusion which confounds prudent business planning.” Uncertainty about rules and procedures and their changes certainly add to the transaction cost of doing business.

A further factor which increases transaction costs is the coexistence of many conversion processes at the same time. Indeed, conversion in China is complicated by the several conversion processes taking place simultaneously: from military to civilian markets; from remote locations to locations near markets; from a centrally planned system to a market economy; from its present business approach and management style toward a competitive market economy; and perhaps from state-owned-enterprises to other forms of ownership. These various conversions are at the root of the difficulties with conversion in China. They are systemic in nature. The military enterprises interested in restructuring are embroiled in the transition the country is going through, toward a market economy, while remaining essentially state-owned enterprise. Progress in public sector reform should help streamline these processes.

SOEs, TVEs and private enterprise in China

Speaking before the National Peoples’ Congress, according to Tony Walker (Financial Times, 5 March 1997), then Prime Minister Li Peng pledged to “quicken the pace of reform” of smaller enterprises, and spoke approvingly of the revitalization of such enterprises through “reorganization, association, merger, joint stock partnership, leasing, contract operation, and sell-off.” He left no doubt that 240,000 smaller SOEs across China could be put up for sale. More recently, as Zhu Rongji

replaced Li Peng as Prime Minister at the National Peoples' Congress of March 1998, the impetus toward public sector reform and enterprise reform is likely to accelerate.

The Handan Iron and Steel Works is an SOE which has changed course from loss-making to profitability. According to Tony Walker (Financial Times, 3 May 1996), the introduction of cost "accounting standards which valued the real cost of producing a ton of steel and the setting of production targets based on market prices," compounded with a bonus system that rewards workers for achieving cost control and production targets, and moving products to market against contracts and payments, turned the company around. On the other hand, only about 10,000 of Handan's 28,000 employees are involved with steel making and the rest is engaged in ancillary and social services including schools and hospitals. "We can't just tell people to go. They have to have rice to eat," says Liu Hanzhang, the factory chief.

Zhuhai Giant Advanced Technology Group is a TVE, which started in 1989 as a software venture with a staff of two and became an enterprise with interests ranging from biotechnology to retailing, with an annual turnover of more than US\$120 million and over 3,000 employees. Shi Yuzhu, the 35-year-old mathematics graduate entrepreneur behind these accomplishments, is very much a believer in markets' forces. He said "we want to become a business that serves the family... only when you become part of the daily life of people can you grow really big." According to Tony Walker (Financial Times, 18 December 1995), following a tenfold growth in staff numbers in 1994, Giant was for the first time coming up against personnel problems such as how to weed out nonperformers. "We rarely fired our people before. But now we are starting to do it." Shi said. "We are expanding so rapidly that we are finding people are not up to standards. We tell them this is not a state-owned enterprise."

"Regulations were put in place ten years ago to enable people to own their own businesses, but state-approved entrepreneurs have been a rarity," according to James

Harding (Financial Times, 26-27 July 1997). “In the last few years, though, the number of individually owned enterprises has soared, accounting for nearly 13 percent of gross industrial output in 1995 compared with 5 percent in 1990. There were 819,000 privately owned businesses registered in China last year, up 25.2 percent. More significantly, given China’s declining state owned industries. Private businesses boasted income of US\$ 27 billion in 1996, up 51.9 percent. Chen Rongsheng, head of the Xiamen Dayang group, one of the top ten individually owned enterprises in China is part of that trend...he started a joint venture exporting fragrant mushrooms to Japan...and finally established his own business in 1992 with a modest loan from the local Xiamen bank....

“Xiamen Dayang quickly expanded from mushrooms into eel exports to Japan and from there into property development and industrial production. Last year the 4-year-old company recorded sales of US\$ 120 million, contributed US\$ 2.4 million in taxes and boasted a workforce of more than 500 people....The freedom of being an individually owned enterprise has enabled such rapid growth, says Mr. Chen. “What you do not have at state owned enterprises are individual decision-making power, but here that is our most important advantage—an effective management mechanism....Mr. Chen still complains about the reluctance of banks to lend to Chinese entrepreneurs and about the occasional obstreperous official.”

Converted enterprises as truly commercial corporate entities

Transferring authority and control over defence industries interested in conversion, from the central government to provincial and municipal governments, as suggested in a 1995 OECD study, certainly helps, but the essential issue behind the success of conversion is the ability of converted enterprises to operate as the truly equivalent of private firms, with clearly established responsibility for strategy, assets, liabilities, profits and losses, irrespective of the

question of ownership. That requires deepening the public sector and the enterprise reform process.

The setting up of joint ventures with international partners offers an opportunity to introduce such market-oriented management behavior and to open up export markets, besides bringing in foreign investment and technology. But to get there, the Chinese conversion effort needs further public sector and enterprise reform, and support in investment promotion, management training, information, and business communications skills, and the regions of China expecting to host them must improve infrastructures, physical and otherwise.

Entrepreneurship, business communication, investment financing and social overheads

Specific issues concerning the defence industries interested in converting to civilian markets, which emanate from the previous considerations and from the experience gathered in Project CPR/94/319 can be centered around enterprise reform and entrepreneurship, effective business communication, investment financing and social overheads. As SOEs operating in a monopsonic market, the defence enterprises have not excelled in entrepreneurship, which is sorely needed in order to survive in the civilian markets in the long run. They also lag in access to business information and business communication skills, have difficulties organizing investment financing and have to cope with large costs derived from social services, such as health, housing, education, leisure, etc. The latter social overheads are an issue affecting all SOEs, the solution to which depends on the larger and slow moving social welfare reform process, an important component of the public sector reform process.

Corporatizing the enterprises and institutionalizing the social services are necessary conditions for conversion joint ventures with foreign parties to take place. The difficulty in obtaining investment financing in China for conversion ventures results partly from the fact that

Chinese banks are only gradually becoming more than mere cashiers at the service of the central plan. Public sector reform will help there as well. As a result of this difficulty, most defence companies which are interested in conversion via foreign joint ventures, seek primarily investment equity from the foreign parties, without much concern for management skills, product selection, technology choice, adaptation to customer requirements, export market competition and risk analysis.

Soames Hines, former managing director of J. Walter Thompson in Shanghai, the largest advertising agency in China, quoted by James Harding (Financial Times, 14 July 1997) has been “consistently amazed” at how companies fail to spend time and money to understand the market before launching appropriate products, and he was referring to foreign companies trying to sell consumer products in China! He also commented that “most international companies in China are pushing packaged goods when their first concern should be getting a decent distribution system in place. . . . Companies must also tailor their products to Chinese tastes.”

Building up entrepreneurship among Chinese defence industry managers to pursue further conversion or to rescue previous attempts at restructuring, requires management training with varying emphasis on finance, strategy, technology, planning, negotiation, marketing, etc. as required by specific situations at hand. Specific issues may be of special relevance, such as valuation of assets, valuation of intellectual property, good will; choice of products, technologies and markets; enterprise organizational structures for effective management; advertising; legal structure of converted businesses, etc. Although the defence enterprise managers are generally familiar with feasibility studies, they apparently are not conversant in the language of business plans, and are particularly weak in evaluating risks from market competition, technology obsolescence, and financial uncertainties.

Suggestions for further military industry restructuring and public sector reform in China

The insights provided so far by the implementation of Project CPR/94/319 helped to deepen the understanding of the core issues of military industry restructuring and public sector reform in China. With this encouragement and in a positive spirit, a few practical suggestions are offered below for the consideration of CAPUMIT and all responsible parties, to further pursue conversion in China. The final round-table on international cooperation for military industry restructuring, and this publication, help bring in a broader array of views to further the understanding and the promotion of military industry restructuring in China and elsewhere.

Macroeconomic considerations

The first category of problems hampering military industry restructuring in China relates to national policies and macroeconomic issues which affect all economic activity in China and can only be addressed at the national level, via reforms such as public sector reform. They include policies on national defence and procurement; state enterprise reform; corporate and intellectual property law; science and technology; labor law and social security reform; foreign investment; banking reform; taxes and regulations; etc., all of which set the enabling environment for conversion and foreign joint ventures to thrive. Since there are different kinds of businesses and economic sectors, some simple, some sophisticated, involved in military industry restructuring, the impact of these national policies will not be uniform on all conversion initiatives. At any rate, the defence enterprises, and their foreign partners interested in conversion, have limited influence on these broader policy issues of public sector reform, which nevertheless contribute to the transaction costs of doing business in China.

Microeconomic initiatives

On the other hand, the transaction costs can be somewhat diminished by initiatives at the level of the micro-economy of the enterprises. These initiatives include making converted enterprises behave as close as possible to truly commercial corporate entities; promoting and developing entrepreneurship and business communication and analytical skills; and finding creative approaches to overcoming barriers posed by investment financing and social overheads. Although each individual enterprise will have to face and resolve their specific issues, there is much to be gained from pooling together resources and solutions based on common issues and interests.

To some extent, CAPUMIT has been playing part of this role in China, regarding the defence industry interested in conversion. In many countries, specially in transition situations, there are initiatives in the manner of associations, consortia and other forms of organization, to lower initial costs and to prepare for the launching of new or renovated enterprises. In these groupings, companies can enjoy common services to support research and development; product development; investment promotion and financing; export market development; management training; information and communication; advertising; etc.

An example in the USA is DARPA, the Defence Advanced Research Projects Agency, “the guardian of the future of the Department of Defence. DARPA invented the Internet and keeps providing the early lead, to keep the edge in military capabilities and to carve out other areas of commercial leadership in the global market.” DARPA is involved with several consortia working on advanced transportation systems, such as CALSTART, a California “statewide, nonprofit consortium dedicated to creating an advanced transportation technology industry in California that will create high-quality jobs, clean the state’s air, and improve economic competitiveness. CALSTART accomplishes its goals by tapping the skills and experience of California’s world-leading defence, aerospace and high-tech industries and teaming them with the entrepreneurial spirit for which the state is famous.”

In Europe, the European Union has been taking similar initiatives with programmes such as Konver, which provides partial funding for, among others, the European Defence Observatory and DECIDE. In Germany, the Bonn International Conversion Center provides useful information and analysis on conversion processes throughout the world.

China Conversion Clusters (CCCs or C³s)

With respect to promoting military industry restructuring in China, one could think of consortia of enterprises, organized as China Conversion Clusters (CCCs or C³s), which would play such roles in specific industry market segments. The CCCs would incorporate the functions of the proposed China Conversion Facility and add more features, to expand the prospects of conversion in China, by lowering transaction costs. Essentially, the CCCs, would organize consortia of interested stakeholders, Chinese and non-Chinese, to promote product development and investment in certain focused industry segments, such as automotive and mechanical engineering industries; environmental related equipment; pharmaceuticals and health products; etc. The CCCs would probably be composed of small and medium enterprises (SMEs), Chinese and foreign, which do not have the critical mass to provide itself with the kinds of services the CCCs would offer.

The CCCs would focus on specific industry segments, such as auto-parts, and could set up of one or more investment funds, including venture capital, which would finance a portion of the requirement of the conversion projects, fitting the needs and eligibility criteria jointly agreed between the participants (governments, defence industries, venture capital companies, development banks, etc.). Special consideration should be given to promoting high-value added SMEs, including the services and information industries. The environmental services area in China could be of particular interest for the highly qualified staff of the defence industry complex. The CCCs provide an environment for strategic alliances, mergers

and investment in China in areas with appropriate infrastructures, while a new infrastructure is built in other areas of China.

To be truly effective, the CCCs should focus on specific industry segments, and gather the most relevant stakeholders, irrespective of their location in China or elsewhere. Should a defence company have a winning product for domestic and export markets, it should not be deterred from implementing because of the deficiencies of the immediate local infrastructure. It should set up manufacturing elsewhere in China, while the infrastructure of its place of origin gradually improves. The CCCs would also provide an environment for strategic alliances between enterprises, Chinese and non-Chinese, or even full mergers. For a given industry sector, a CCC would provide members with the functions (e.g., investment promotion, training, information, etc.) they need the most, as decided by them.

Military industry restructuring covers a broad array of industries, some simple, some more sophisticated. Thus, the needs of specific CCCs would vary. Some would need more investment promotion; others may require more management training; or R&D; or technology choice and product development; or market knowledge; others still would need all these services with the same intensity. Probably all must work on information and communication, about themselves, and the industry segment they are involved within China, and with the world.

Irrespective of the investment funds they may wish to establish, the CCCs would be funded from member contributions, venture capital funds, government funds, both Chinese national, provincial and local, and bilateral and multilateral. The CCCs could in a time phase out of existence after accomplishing the missions set out to achieve originally. The CCCs should also be able to earn income from the sales of services to members and nonmember. Currently, the international business world is keenly interested in China and is probably willing to pay for well prepared, reliable and relevant information.

As a new concept in China, the implementation of CCCs should be phased in, to improve the chances of success, beginning with a single pilot experiment for a specific promising industry segment.

Typical CCC functions can be categorized as described below:

1. Investment promotion for restructuring military enterprises and public sector reform

The experience of the Chongqing and Wuhan workshops and the efforts in mobilizing international resources for conversion in Project CPR/94/319, confirmed that extra preparatory work is necessary to expand the investment promotion activities, to other parts of China and even to revisit areas where workshops had taken place previously.

This means carefully planned and executed preparations, visiting with as many prospective Chinese joint venture partners as possible; meeting with the trade attachés of interested member states in Beijing; visiting with trade associations and chambers of commerce in interested countries; meeting with specific interested investors; visiting with private investment banks and multilateral financial organizations; reviewing business plans prior to the investment promotion activities; providing feedback to all concerned, etc.

The investment promotion activities would include engaging media and advertisement; promoting investment workshops, conversion exhibitions and trade fairs, investment tours to China and abroad.

According to a proposal by Trindade in 1993, should a particular CCC wish, it could decide to organize an investment fund to finance conversion “projects fitting requirements and eligibility criteria jointly agreed by the participating stakeholders. The funds could help finance the Chinese component of joint venture projects with foreign partners. Such joint ventures, international or domestic, could be vehicles for absorption of technology; commercialization or perhaps privatization of converted

enterprises; adding besides investment and working capital, management skills, market access and other ingredients required for success.”

Other than foreign joint ventures, the investment fund could consider financing “spinoff and start-ups, ventures which would benefit from the scientific and technological competence of defence personnel engaged in research, development and manufacture, in association with management and marketing skills to be obtained elsewhere. In this context, there could be a special emphasis in promoting high-value added SMEs, including the services and information industries. The environmental services area in China could be of particular interest for the highly qualified staff of the defence industry complex. The fund management for the CCC would have to maintain and disseminate information for business decision making, both for Chinese and foreign investors.”

In situations where it is appropriate, consideration should be given to setting up environmental protection and remediation funds. “The demobilization of defence installations can result in negative environmental impacts, which must be prevented. If environmental damage has been caused by previous defence manufacturing and research and development activities, remediation must be undertaken as an integral part of the conversion project. These funds would finance these protection and remediation activities. As they do not relate directly to conversion projects, they should be set up separately from other investment funds. They should also be financed from alternative sources and the terms and conditions should likewise be distinct from those of the investment funds.”

The issue of the social overheads faced by the converted enterprises which remain SOEs must be addressed, to improve their chances of success. Although the public sector reform process in general, and the social welfare reform process at the national level in particular, ought to provide the ultimate answer, the defence industry could consider taking initiatives in this area, especially in the

context of specific CCCs. Concept development by the CCC and negotiations with government and affected workers could lead to spinning off costs and responsibilities for the provision of health, education, housing, leisure, etc. Some of these services could be absorbed by government entities, other could be spun off as new businesses, providing services to be paid for by the consumers of such services, companies and individuals.

2. Getting military enterprises ready for international joint ventures

The essential nature of any joint effort is the establishment of a common ground of shared interests, costs and benefits in a given market. Therefore, effective communication between the Chinese side and international partner is a critical factor in promoting conversion joint ventures. The Chinese side must understand the international perspective and conversely, the international partner must understand the Chinese perspective. The objective is to bridge gaps, cultural and otherwise, between foreign investors and Chinese military enterprise managers in information, communication, understanding, etc. Patience and accommodation are essential ingredients in this process. Knowledge and access by the Chinese side to information on markets, capital, both equity and debt, and technologies are crucial to this communication process.

The Chinese side, however, must take responsibility for preparing the project proposals they want to promote, in a way that communicates effectively with the international side. This requires the utilization of international standards of business communication. Effective communication may require many channels. However, the most commonly used communication tool to promote investment is the business plan. It contains all the essential information to support the initial decisions of prospective investors.

Although the Chinese managers who participated in the workshops and the coaching seminars of Project CPR/94/319 appeared to have experience in preparing

feasibility studies for new projects, the limited documentation on project proposals made available was lacking as an effective communications tool to attract international interest. A major drawback is the total absence of risk analysis.

To get the Chinese military enterprises ready to engage into meaningful discussions with interested international partners, a host of activities must be designed, taking into account the specific requirements of military restructuring in China. Special attention should be given to the development of skills in project preparation and implementation, such as effective business plans, financial statements and valuation and protection of intellectual property rights, etc.

CCCs could tap on existing management education and training resources already existing in China and future initiatives in this area which are likely to evolve, to improve the management capabilities of their member companies.

According to James Harding (Financial Times, 27 January 1997), foreign managers in China “can often be heard venting their frustrations about local Chinese staff. The lack of initiative, experience or flexibility is a common complaint.” In response to this situation, business management schools are appearing in China, on the initiative of international business, such as the China-Britain Business School in Beijing and the China-Europe International Business School (CEIBS) in Shanghai. CEIBS was established as a partnership between Shanghai Jiatong University and the European Foundation for Management Development. These schools offer courses in accountancy, marketing, financial management and the law, to employees of foreign companies as well as SOEs. BOC Gases, which owns three companies in China and has a further 17 joint ventures there, offers another example. According to Della Bradshaw (Financial Times, 15 January 1996), BOC’s concern was neither the handful of expatriate employees, nor the dozen or so highflying Chinese staff. The issue was how to train the 150 general managers who worked on a day-to-day basis with BOC’s

3,000 Chinese employees. The company “decided to set up its own school, the BOC College, in conjunction with the university in Fushun, in northeast China, where one of the BOC’s joint ventures is sited. Then the company designed its own management programme modeled on a traditional business school MBA. BOC brought in training modules where available and developed others where required. The first 11 students graduated from the first 10-month, full-time course at the end of 1995.” To stamp its image on the programme, the marketing of industrial chemicals is taught exclusively by BOC staff. One third of the Fushun course is English language learning. “With human resources such a big issue, BOC decided to buy a HR module from the Nanyang Technological University in Singapore, which was taught by a lecturer from Singapore, unlike most of the other course material which was taught by lecturers at the Fushun University.”

Shorter programmes are being offered for foreigners to understand China better. CEIBS offers a one-week familiarization programme for senior executives entitled “China from the inside” in Beijing, Shanghai and Suzhou. The Institute for International Research of Hong Kong offers 1-2 day programmes on human resource management in China and compensation and remuneration in China, in Hong Kong and Singapore. McCann-Erickson, the international advertising corporation, offers a 1-day programme on “Exploring the China connection: how successful businesses cope,” in New York and San Francisco. Another example is Farleigh Dickinson University’s Prof. Hsu O’Keefe 2-3 day programme on “Doing business in China.”

According to consultant Geneviève Barré, vocational training for joint ventures and foreign private companies in China has also received international attention. Among the countries of the European Union, Germany is a leading player, in both public and private sectors, followed by France, Italy and the UK. Ongoing training programmes or programmes about to be launched cover the fields of electricity, automobiles, metallurgy, telecommunications, aeronautics as well as international

trade management. Most of them are located in the cities of Beijing, Guangzhou, Shanghai and in the provinces of Zhejiang, Anhui, Jiangsu, Liaoning, Hubei and Shanxi. Other projects are developed by the World Bank, International Labor Organization (ILO) with UNDP support, and the Asian Development Bank, generally with Chinese partners such as the State Education Commission, the Ministry of Labor, Ministry of Foreign Technical and Economic Cooperation (MOFTEC).

3. Building effective information services for business development

Knowledge and access by both the Chinese and the international sides to information on markets, capital and technologies are crucial to the communication process between them. Thus, the development and maintenance of an effective information data base on military enterprises in China would be an ongoing activity of any particular CCC, with information on the current physical plant of participating enterprises and local infrastructures, technology, production, financial status, social overheads, management and manpower, and proposals for the future. Furthermore, the information possibilities offered by the Internet and the multimedia cyberspace of today, make it affordable to provide both the Chinese and international partners with a broad range of relevant data.

Basic data processing and telecommunications equipment and Internet connections will be required to set up this function. Acquisition of proprietary software and access to relevant national and international databases will be necessary, as well as the training of a limited number of professionals to build up and maintain the required information function.

There are presently in China information providers and networks which should be tapped by specific CCCs to quickly build up a relevant information base. One such provider— UPSA—is itself a converted enterprise. Another is the Institute of Science and Technology Information of China (ISTIC), which has developed a subsidiary— INFOMART—which is in the business of commercial

information services for Chinese and foreign companies. A network of some 50 Engineering Research Centers (ERCs), which are actually technology transfer corporations, sponsored by the State Planning Commission (SPC) and financed in part by the World Bank, operate in a broad range of industry segments, some of which might be relevant to specific CCCs.

CALSTART is one of many examples of how a consortium can develop and provide information to participants. They maintain a major Internet World Wide Web site; find and publish focused industry news stories, daily in the web, weekly in print; produce an industry newsletter, monthly on the web and in print; and weekly industry features and analysis. "CALSTART provides a number of venues and mechanisms to assist participants in developing markets for their products and services. Through public forums, technology exhibits, and informational briefings, CALSTART raises the profile of its participants and provides marketing contacts. By linking them with potential end-users, CALSTART helps create and expand the commercial market for their member's products."

The future of military industry restructuring in China and elsewhere

Military industry restructuring is still fraught with many difficulties. But, there is potential for larger initiatives on conversion in China and elsewhere. In other parts of the world, demobilization of defence personnel and military bases, and the decreases in military procurement are emerging problems, which must be approached in a positive way via public sector reform and military industry restructuring. The experience of project CPR/94/319, from conception to implementation has definitely contributed to better understanding of conversion in China and could be helpful to military industry restructuring processes in the future, in China and elsewhere in the world. There is a role for the United

Nations system and other parties to play in achieving these goals.

Note on the author:

Sergio C. Trindade (President, SE²T International, Ltd., Consultants on the Management of Change) is a former United Nations Assistant Secretary-General for Science and Technology (1986-1991). Prior to and after that assignment, he has been consulting worldwide on the management of change in energy, environment and technology.

Facing the 21st Century: Strengthening International Cooperation for Military Industry Restructuring

Xie Mingbao
President
CAPUMIT

In March 1995, CAPUMIT and UNDP reached a project cooperation agreement of Military Industry Restructuring in China to be executed by UNDDSMS. The objective of this cooperation project is to help the Chinese military industry to restructure to produce civilian projects and enter the international market through training and enterprise analysis. It is divided into three phases. The first step on cooperation information exchange happened in Chongqing and Wuhan in November 1996. The second stage was a training seminar carried out in Leshan and Kunming in October 1996. The third stage is the international conference to summarize and introduce the experience. The Beijing International Round-Table of October 1997 was the third stage. The focus of the Round-Table was to discuss the concluding report of the cooperation project, exchange experiences and problems of international cooperation of military industry restructuring of various countries and look ahead to the development the prospects of international cooperation on military industry restructuring in the 21st century. Within three years, CAPUMIT, together with UNDP and UNDESA, the successor to UNDDSMS, worked together to carry out the cooperation project and achieved good results. First, the project is not restricted to information exchange. It also provides for cooperation opportunities. For example, the workshops on “New Business Opportunities in China,” held in Chongqing and Wuhan,

attracted over 100 foreign and domestic experts, entrepreneurs and officials. The exchanges between domestic and foreign participants helped to foster mutual understanding and identified more than ten military restructuring projects for further development.

The second is to help partly converted military enterprises to learn to promote and advertise their enterprises and package their project proposals to make them attractive to foreign investors. For example, the seminar on Business Strategy and Business Planning, held in Leshan and Kunming, attracted 65 factory leaders, general managers, chief economists and chief accountants from 42 defence enterprises. The experts invited by the United Nations gave overall and systematic lectures on compiling a strategic “business plan,” which helped to broaden the listeners’ minds to strengthen the market risk concept and get to know the method and experience of market survey and analysis. Third, our foreign friends made further understanding about China’s military industrial restructuring and laid a base for future cooperation. After some experts visited the Kunming Shipbuilding Equipment Group of the China State Shipbuilding Corporation, they were impressed by the hard work and successful development of whole set of cigarette-making machinery production line equipment. In all, the execution of this cooperation project greatly promotes the development of military industry restructuring in China. The 15th National People’s Congress of the Chinese Communist Party came to a successful end. The Congress mobilizes people of all nationalities of the country, to hold high the great banner of the Deng Xiaoping Theory, for an all-round advancement of the cause of building socialism with Chinese characteristics into the 21st century. The policy of “military and civilian combination” of China’s Commission for Science, Technology and Industry for National Defence (COSTIND) set by the Chinese Government is an important component of the Deng Xiaoping Theory of national defence. At this moment of crossing the century, with the guidance of the soul of the 15th Congress, COSTIND will carry out the policy of “military and civilian combination” and deepen and widen the military industry restructuring, as well as improve

international exchanges and cooperation. I wish the experts, entrepreneurs and financial experts from the United Nations departments and countries from all over the world pay more attention and support China's military industry restructuring. With multi-level and various forms of exchange and cooperation, we may achieve greater results.

The Second-Time Development and Re-Allocation of Defence Resources: A New Approach from Military to Civilian Conversion

Jin Zhude

*China Defence Science & Technology Information
Centre*

and

An Weimin

former Vice President

CAPUMIT

“Military-to-civilian conversion,” as an activity in the economy area, has long been carried out in China and other countries in the world. But, as an economic concept, it was only formed in China at the end of the seventies and generally accepted by the Chinese people in the mid-eighties. Its prevalence worldwide only started at the end of the eighties and the beginning of the nineties. Comprehension of such a concept has then been gradually developed and deepened.

At the very beginning, “military-to-civilian conversion” only referred to the utilization of the military production capacity in surplus for civilian production, which meant a change in the use of production capacity. Starting from the eighties, the market in China began to extend into the technology sector, thus giving “conversion” a new meaning, i.e., the utilization of military-industrial technology for civilian purposes, or a change in the use of

technology. This included the use of industrial technology of weapons for peace and the shift of relevant manpower to civilian industries. Then it was further extended into the training of military staff for both military and civilian work and their re-employment in society after demobilization. Until the early nineties, “conversion,” though, can be interpreted in different ways, maintaining the previous connotation, while stressing different facets from one time to another.

In July 1993, “The Hong Kong Declaration on Conversion from Military to Civilian Industry” signed by 92 participants from 18 Member States of the United Nations and regions at the 1993 Hong Kong Conference on International Cooperation to Promote Conversion from Military to Civilian Industry, explicitly defined the concept as follows: “Military-to-civilian conversion is a complex process which involves the military, political, economic, technological and social aspects of a country.” “It involves conversion of military research and manufacturing capabilities to civilian use; peaceful use of military technology; conversion of military equipment and facilities for civilian uses or the dual use of the same; and mobilization of displaced military and non-military personnel in the affected communities.”

The second quotation can be regarded as the most authoritative definition of such *conversion*. However, when examined closely, it still seems not to be accurate and satisfactory enough, because it is only the epitome of economic phenomena or practical experience of certain countries, in a certain historical period. Thus, it can hardly sublime into a conceptual level of universal significance. The reason, that *conversion*, though having been carried on for many years, has not yet attracted enough attention from economic research, at home and abroad, really lies in such a corner.

To give a more exact interpretation of “military-to-civilian conversion” from an economist’s point of view might result like this: “A second time development of military resources for civilian use and a re-allocation of such resources in the national economy for the same purpose.”

And the following factors might be included in the meaning:

- It defines clearly and accurately the word “military” as “military resources”;
- The word “to” in “military-to-civilian” is spelled out as “a second-time development,” upgrading from a simple transfer between two applications to a sophisticated development from one phase to another; “second-time” is chosen as a term relative to its first development for military use;
- “For the purpose of civilian use” indicates the final destiny of such kind of “conversion”;
- Adding on “re-allocation of military resources in the national economy” to “second-time development” stresses that “military-to-civilian conversion” has a broader sense of tapping national resources, finding a place for the “conversion” in macroeconomic theory.

Based on these factors, “conversion” can be further understood as follows:

1. There is more to conversion than reallocating assets

Things to be converted from military to civilian are all the resources of national defence, not only the production capacity and technology, equipment and manpower of the defence sector.

It is necessary to point out although we say “all,” but in a certain definite period of history, only those in surplus are usually converted. For example, some weapons may still be needed in service but some may be out-of-date and need to be converted to civilian use. So the word “all” is used from the theoretical, extensive and a distant point of view, that is to say, we cannot convert all defence resources to civilian use in a certain period of time, but looking far into the future, any part of such resources can become necessary for such kind of conversion.

Another point to clarify is that the so-called resource of national defence only refers to those of the defence sector, which include two portions: first the armed forces and then the research and production capabilities. The latter portion is different from country to country to the extent that some countries even have no distinct boundary line between military and civilian in terms of administration. There are no state organs specially administering the scientific research and production of the defence sector and seldom any capabilities are specially established for

the development and production of weapons, the majority of which are produced in common plants and factories and the administration of which is usually put less than one roof in the civilian sector. However, though very different in administrative structure, clear demarcation lines between military and civilian in the allocation of resources, as well as the use of capital, development of technology and control of the market still exist.

Nowadays, “military-to-civilian conversion” has become well known by all and an almost common understanding has been reached for its origin in history. Everybody knows that at the end of the cold war, peace and development has become an irresistible trend, keeping all countries in the world busy with reforming their defence strategy, reducing their armed forces and cutting down the scale of their defence industries. Evidently, these all led to “military-to-civilian conversion.” However, such an understanding is somewhat surfaced on external influence. According to the definition given in the former paragraph, the “conversion” concept really originated from the natural law of the development of national defence, and all external influences are of minor importance. If a nation has her own national defence, she will need to develop it and allocate resources to her defence build up incessantly. The reasons are that the routine consumption has to be replenished and the existing equipment and facilities have to be updated and renovated. Being very much different from other resources, the displaced resources in the defence sector are never trash and garbage, but treasures for civilian production, like construction machinery, electronics, carriers, and premises, all can be utilized, especially some production and testing equipment, disclosed military technologies are really hard to find for civilian production.

We can come to a summary as follows: any nation, if she has her own national defence, will have the problem of “military-to-civilian conversion.” People often ask us: “When does *military-to-civilian conversion* begin and when does it end?” “Which country needs to do that?” If our answers are based on the former understanding, the concept of “conversion” will be limited to a certain period

of history for a certain country. Therefore, many countries and some international communities all will consider it irrelevant to themselves and turn a deaf ear to the answers. Now it is time to correct the misunderstandings based on such limited considerations. We want to tell everybody that “military-to-civilian conversion” is universal for all countries that have their own national defence and coexists with their national defence.

In reality, after the first and second world wars, many countries already had encountered and handled such *conversion* problems. The Japanese said that they mainly relied on military-to-civilian conversion to overcome their economic difficulties after the second world war. In China, Comrade Mao Zedong said early in the fifties that defence industries should learn to have two capabilities, one for military, the other for civilian purposes. Such policy is condensed in words as “Combine military with civilian” and integrates peace with a war.

However, up to the middle of this century, the cold war raged on, which sent the arms race between the United States and the former Soviet Union in full swing. World peace was threatened by local wars and terrorism. Under such circumstances, most of the countries considered how to strengthen their national defence and had no time to think about the “military-to-civilian conversion.” So, when China upheld “military-to-civilian conversion” at the turning of the seventies to the eighties, nobody paid attention to it.

The United Nations asked for some information from China in 1985 and that was all. Only up until 1990 had the UN convened the first forum on the conversion of military-to-civilian in Moscow, but some experts and scholars still considered the Chinese report on “military-to-civilian conversion” doubtful or even objected to it after discussed over and over again the necessity and urgency of “conversion.”

In October of 1991, the China Association for Peaceful Use of Military Industrial Technology and the UN Centre for Science and Technology for Development co-sponsored the International Conference on International Cooperation in Peaceful Use of Military Industrial

Technology in Beijing. The military industries of China presented comprehensive reports on the achievements made on “military-to-civilian conversion” systematically. From then on, China has aroused the attention from other countries in the world and received a favorable comment like this: “China is the country that had carried out ‘military-to-civilian conversion’ the earliest and had achieved the best of all.”

We think that by setting the time limit at the latter half of the 20th century, China really deserves such a compliment, but from the historical point of view, we dare not consider it accurate enough. Up until now, we have not yet heard of any opinions in this aspect that can be deemed systematic and authoritative.

2. The three obstacles to conversion

A vital point lies on the word “conversion.” There are three obstacles to be removed; if not, “conversion” will not be easy.

It has been mentioned that things to be converted from military to civilian are the resources of national defence, and the goal of “conversion,” of course, is to utilize defence resources for civilian purposes. The term “conversion” really has two meanings: one is to transform or develop military resources into those that can be used for civilian purposes; the other is to transfer the already developed resources in civilian applications. Practical experience tells us that the former means technical development, which needs funds; lack of funds will create an obstacle.

The latter are more complicated; on its way, obstacles are often met from the organization side, that is, the administration, structure and mechanism, of course, also entangled with monetary problems. Most important is the change in ideology, which is needed for laying the foundation for the above-mentioned “transform” and “transfer,” without such change, an ideological obstacle will be in our way. It is the continuous removal of the three obstacles that has constantly pushed forward the “military-to-civilian conversion” ahead in China.

People from other countries are correct to say that China has made significant achievements in the “military-to-

civilian conversion.” Frankly speaking, although we have been busy with such work for nearly 20 years, the defence resources already developed and transferred to civilian use only constitute a small portion of those that can be developed and transferred. The efficiency of “conversion” is also quite low. There is still a large gap between the achievements and expectations. Especially in recent years, progress has been slackened obviously, because facing the three obstacles (ideological, structural and monetary), we feel rather powerless to break through, difficult to step forward, no room for retreating and no way for circumventing.

Therefore, if we want to move forward, the only way is to try best for a frontal breakthrough. Among the three big obstacles, the ideological one is the most important. In the beginning, the ideological bound took the form of indulging in vain hopes of military orders, then it shifted over to the wishful thinking of help from the planning economy. At present, it appears to be lagging behind in both theory and practice, that is, lacking in understanding on the theory of “military-to-civilian conversion” and having a low competitive spirit in the new environment of market economy created by the policy of reform and opening in China.

To solve this ideological problem, the only way is to make deeper understandings of the logic of “military-to-civilian conversion” and try best to acquire a new knowledge of the theory, then publicize the theory extensively. As for the structural problem, one cannot wish a success by designing a model structure and letting everybody just follow it, but only can encourage the defence industries and research centers to make trials on reforms of structure and mechanism and brave failures, if there are any. To solve the problem of funds, one must not rely upon either government support or foreign investment, but can find a more feasible way, that is, to enliven the reserves of assets and convert them into currency to enter the capital market and learn to make money with capital.

3. Removing the ideological obstacle

To remove the ideological obstacle, we must clear up two misunderstandings.

From the macroscopic point of view, nobody ever denied that “military-to-civilian conversion” is a great deed for benefiting all nations and mankind, but when it comes to practical work, one often forgets such an important judgment. So, when planning civilian production for a military plant and developing the market for the civilian product, even now, tough resistance is often encountered. Reasons for this include the protectionism from local governments and individual industries. More important are the misunderstandings on “military-to-civilian conversion” that always hinders the progress. For example, firstly, “conversion” is mistaken as a transfer of assets to civilian production units; secondly, in the civilian production sector, there still prevails the prejudice against production of common civilian products by military production units and the belief in only the development of hi-tech and sophisticated products and undertakings of large projects by military production units, because of their hi-tech capabilities and large production capabilities. If common civilian products are produced by the military production facilities, they will compete with those made by civilian production facilities and take away relevant market shares. Such people do not understand that the conversion of military resources to civilian use needs all kinds of market shares; for instance, among the defence resources, there are material and nonmaterial, hardware and software, manpower and technology, as well as all kinds of invisible assets, which need different ways and means to be converted to civilian use, in which proper and normal market competition will be necessary and inevitable.

It is necessary to say that China is very much different from the capitalist countries, where military production often coexists with civilian production in one factory. When military orders decrease, employees can be dismissed or even the plant can close down, if necessary. The burden of unemployment will be shifted to the society and never be borne by the plant. Under the planned economy in China, military production plants are only engaged in military production and employees cannot be simply discharged and plants can never close down, even when military orders are totally stopped. Therefore,

problems created by “military-to-civilian production” are different in China and other countries; in the capitalist world, problems to be solved lies in the increase of unemployment, but in China, it lies in not only the unemployment but also the survival of a large number of manufacturing plants. This is why the capitalist countries did not care much about “military-to-civilian conversion,” but China did attach utmost importance to it by starting “conversion” early in the latter part of the seventies.

One can see that to strive for their survival, the defence industries in China must produce, especially in the beginning state, those common products for civilian use of large market demands that are highly profitable and with quick returns. Of course, it is also necessary to control them not to act like hunger-stricken beggars not choosy for food, but to abide by the industrial policy, attach great importance to the economic effect and environmental protection, etc. Also, their rich human resources and technical superiority must be fully utilized for the development of high and new technologies. Enterprises that can play the key role in the growth of the national economy must be further developed, like those converted into the industries like energy, transportation, information, etc. Only in such a way can our defence industries secure a foothold amidst competition in all markets.

4. Conversion needs strategic thinking and sound theoretical ground

Promotion of military-to-civilian conversion needs strategic and theoretical backup.

The defence resources are allocated in accordance with the need for ways of conversion and have gathered valuable experience through practice. Many units have solved their problems of survival and growth and added valuable contributions to the economy and community of the district there they are located.

Among the many ways and modes of conversion of military capabilities to civilian use, the most important one is “hir-tech plus share-holding” (development of high and new technology and adoption of the shareholding system). The most valuable defence resource is, of course,

technology, which includes the technical staff and their achievements. And as confirmed at the 15th Congress of the Communist Party of China, the share-holding system has paved the high road to be taken by the enterprises for adapting themselves to the market economy. Without an efficient mechanism, high and new technologies can hardly be successfully developed and without high and new technologies, it will be difficult to get any orders from big buyers, hence difficult to survive and grow amidst tough competition in the market. That is why only combining hi-tech with shareholding can lead the military-industrial facilities toward success.

The above-mentioned tells the experience we gathered from practical work. In the mid-eighties, the Department we worked with was responsible for handling the scientific and technological achievements of military-industrial enterprises. Registration, evaluation and public disclosure of the achievements, as well as giving out awards for the achievements can all be done smoothly, but the promotion of applying the achievements to production was always difficult. Although the opening of the technology market in China has created an environment for technology transfer, the military production system, or the mechanism, still hampered the initiative of promotion and application. To find a way out, in 1993, a company of limited liability was inaugurated in Hainan Province with a military production unit as the major shareholder. However, because of the lack of orders from suitable projects and other problems, the company was not successful.

In the mid-nineties, by combining hi-tech with shareholding, three companies were formed: the Peace Bay Power Source Group in Tianjin, with the nickel-hydrogen cell as its major product, the Universal Satellite Peace Application Ltd. in Beijing with satellite information as its main business and the Fan Neng Technology Development Center and Fan Neng Industrial Base with micro energy technology as their major backup. These three enterprises are growing up with full vigor and might, giving a reason for believing "hi-tech plus share-holding" is a broad way for conversion of military-industrial capabilities to civilian use.

Last of all, one more point to be added is that formerly, our studies made on “military-to-civilian conversion” had only lingered over the plateau of experience analysis and never ascended to a theoretical height. Therefore, the conversion of military-industrial capabilities to civilian use had no place in macroeconomic theory, and remained without explicit theoretical instructions, extensive public support, and powerful organization and coordination from the State level. The result is that some issues of basic importance cannot be listed in the agenda of strategic meetings and many problems cannot be solved for years. The purpose of writing this paper is to break through the binding of a pure experience summation for further probing into the concept of such conversion and subliming to the theoretical height step by step, so as to produce a bit of an effect on the promotion of converting military-industrial capabilities to civilian use.

Conversion of Military Industries to Civilian Production in China: Prospects, Problems, Policies

Saadet Deger and Jean-Claude Berthelemy
OECD Development Center

Introduction

Conversion of military industries towards civilian production in China is important for at least three reasons. First, it typifies the link between security and development which is vital for developing countries. An independent military industry is important for security. However, its output should be available for national development. By transforming its defence industrial sector towards civilian development, China has managed to utilize advanced technology towards economic growth. Secondly, conversion allows the peace dividend to be realized adequately. When external security threats are reduced and human and physical capital of the military sector transformed towards civilian use, then the peace dividend can be gained by society at large. Third, lessons from the conversion process, particularly the commercialization and market orientation that needs to be performed to increase productivity, are useful for State Owned Enterprises (SOEs) in general. With the rise in the scale and scope of the private sector in developing countries, and the consequent rapid growth that commercialization produces, it is important that SOEs become more market-friendly and privatize when necessary. The experience of conversion is valuable in understanding the relation between state and private

industries in the large-scale manufacturing sectors of the economy.

The OECD Development Center has been studying and analyzing Chinese conversion for the last three years and has made a major international contribution towards its progress. The main purpose of the OECD research has been to analyze the process of conversion and is strongly focused towards suggesting implementable policies. However, it is based on a framework which is rooted in economic theory. Essentially, conversion in China has two economic dimensions—macroeconomic and microeconomic. The macroeconomic dimension stresses that the converted sector has positive external effects on the growth rate of the rest of the economy. In particular, at the regional and provincial level where the relative size of this sector is large, there can be important growth stimulating effects on the civilian economy through conversion.

In addition, the R&D resource of the former defence industrial sector can be usefully utilized by the rest of the economy. At the microeconomic level, conversion implies industrial restructuring. Such restructuring involves four steps (although not necessarily sequential). The first is technical adjustment: using the same labor force, human capital and management, but possibly different capital stock (if the old are obsolete), to produce new goods. The second is commercialization: making products that are saleable in competitive markets and the ability to make reasonable profits without major subsidies. The third is unbundling: changing management functions, organizational structures and getting rid of unprofitable production lines or activities. The fourth is changing ownership. The OECD Development Center's research uses these theoretical concepts to discuss the actual prospects of Chinese conversion and also the policies required for successful implementation.

Chinese conversion has passed through three major phases and is now poised to enter its fourth and last phase. The first phase of "ad-hoc conversion," from 1978 to 1982, saw an encouragement and exhortation to the defence industries to convert without any specific planning by the government. The second phase may be

called “technological conversion” or supply side conversion. The main emphasis is on technology and the ability to utilize existing resources of capital and skilled labor to produce new types of goods under government planning. The third phase of conversion is “economic conversion,” or demand side conversion, where sales and profitability are the main criteria for success. Conversion in China has been eminently successful in the first two phases. Over 80 per cent of former defence industries now have civilian output with shares ranging from 50 to 100 per cent.

On the other aspect of profitability, conversion has been far less successful. Of the converted enterprises, only 50 per cent make regular profits while the remaining 50 per cent are struggling. The objective of policy is essentially to increase profitability and make economic conversion as successful as technological conversion. The fourth phase, called “hi-tech conversion,” is characterized by sophisticated product development and producing hi-tech products with considerable value added. R&D resources of the defence sector could be a valuable input; so also would be international technology transfers.

Our research consists of five principal features. Instead of describing the features sequentially we want to use our paper to highlight some of the major issues which permeate the whole analysis. First, it is important to note the historical background to conversion and how it has historically evolved. Second, we discuss the organizational structure of the converted industries and enterprises within the macro economy. We then look at one aspect which is emphasized in most transitional economies, i.e., the subject of ownership and possible privatization. We argue that ownership changes are not vital for the success of conversion. In effect, State Owned Enterprises (SOEs) in converted sectors can operate efficiently and make profits provided certain economic criteria are met. Third, cost of structural change through conversion has been high and these are discussed. Fourth, an important aspect of conversion is its regional dimension and the fact that much of the DIC has been concentrated in interior regions and provinces.

Such a regionalization, due to historical reasons, has sometimes had a negative impact. Fifth, the international dimensions of conversion, through finance, exports and technology transfer, are crucial to the ultimate success of conversion. These core issues are discussed in Section II of the paper emphasizing the problems encountered by conversion and the prospects for its success. We argue that Chinese conversion has been successful in most of its stated objectives but need to increase profitability so that the successful transition becomes permanent and sustainable.

The last part of the paper (Section III) concentrates on policies and discusses these policies under nine headings. These are: information gathering and data collection; management; organizational structure of the DIC; ownership; product development and technology; social and welfare aspects; financing conversion; international dimensions and cooperation; and political will. Section IV concludes briefly.

Core issues

The Chinese military sector in general, and the defence industrial complex (DIC) in particular, has traditionally occupied a high proportion of the modern part of the economy, absorbing large amounts of resources and producing high volume of armaments and associated products. Since 1979 however, there has been a concerted effort to reduce the size of the sector and concomitantly, to transfer resources from defence to civilian use. The scale of this transformation is large and has affected certain industries and regions quite significantly. This process of conversion has been very broad affecting many aspects of the relationship between the military and civilian sectors of the economy. This paper will be predominantly concerned with industrial conversion whereby enterprises and corporations downsize their defence-related production and then try to produce and sell civilian products. Henceforth, conversion will imply such industrial restructuring and the problems and prospects that it faces.

From around 1980, military expenditure has been reduced substantially and continuously for a decade. Procurement

budgets have been slashed. The defence industrial complex has been forced to transfer resources into civilian production simply to survive. The authorities have strongly encouraged the DIC to convert. Before 1978-79, a large part of China's industrial output went towards meeting the requirements of the military. Dramatic changes during the 1980s, both in the macro economy as well as the military sector, imply that pure defence production share in industrial output is now low. Rather, the *civilian output* produced currently by the defence industrial sector is estimated to be over 5 per cent of total industrial output and a much higher proportion of manufacturing. In some interior regions this share is around 25 per cent. In 1979 less than 10 per cent of the total output of the defence industry was being produced for civilian markets. By 1990 this share has risen to over 65 per cent. In some industrial sub-sectors, such as electronics, the overwhelming amount of production of the DIC is now destined for the civilian markets.

In spite of these major structural changes in terms of product mix, sales outlet and marketing strategy, many of the enterprises have remained within the DIC in terms of organization. This is particularly true of firms which require Research and Development (R&D) expertise and technological assistance in innovating new products. The military sector is the largest reservoir of R&D and individual enterprises and groups realize that they can benefit from the non-rival nature of R&D provided they maintain their relationship with the defence sector.

Total conversion, in the sense of complete withdrawal from military activities, reallocation of production inputs and full specialization in civilian products, is still exceptional—particularly for enterprises in the interior of the country. Ownership entitlement, rights over assets and legal obligations, all exhibit an element of duality. The enterprises across the country are often grouped under organizations which are akin to holding companies (such as China North Industries Corporation) which deal with sales, marketing, exports, collaborative ventures, and so forth.

On the other hand, these firms are also State Owned Enterprises (SOEs) which belong sometimes to the relevant local Province, not depending on central government, but coming under the administrative authority of local government. Business management decisions, including which civilian product to produce and invest in, are relatively autonomous—particularly if the enterprise does not need any assistance. However, strong dependency exists with the (local) government due to financial assistance (high subsidies), technical help (organizing collective technical consultancies) as well as guidance within the Plan (what civilian products to produce when subsidized assistance is required).

In many other countries, in Eastern Europe for example, ownership of such industries has been an impediment to successful transition. SOEs have simply remained inefficient due to public ownership and privatization has often become a necessary condition (although not a sufficient condition) for proper conversion. However, the case seems to be different in China. Management style, proximity to dynamic markets, assistance provided by the government and joint ventures with overseas companies seem to have been the catalysts to success rather than ownership issues.

Looking at the issue of ownership from the supply side, the problems of the converted enterprises are not radically different from that of SOEs in general. Evidence showed that if management is allowed to run the firms independently and given sufficient rewards and autonomy, then profitability rises. The issue is not necessarily privatization, but commercialization. If commercial and profit motives are allowed to operate then heavy industries and those in the defence sector can function effectively. When conversion occurs for these industries, it is essential that they be made fully commercial enterprises with responsibility for profits and losses as well as effective employment contracts. If managements are given incentives, and the micro budget constraint is hardened (no government bail-out), even converted ex-defence industries owned by the state could be profitable in producing relevant civilian products.

Conversion usually needs high sunk costs but this could be met by a once and for all subsidy. There is a major difficulty, however, on the demand side. Traditionally, defence-related industries work on the basis of monopsony. There is one predominant buyer (domestic government military procurement budget) and even exports to foreign countries of defence products will have to be made through the government. Thus companies and enterprises are geared to working on tight technological specifications but with little understanding of markets, pricing and cost. When the enterprise is converted, its civilian goods will have to compete effectively in an almost perfectly competitive market.

The difficulty of exporting to countries outside Hong Kong, South-East Asia and Japan, that enterprises in the DIC have faced, shows that at least some SOEs may not be able to compete. However, many enterprises have done very well in terms of competing within China and internationally as well as making reasonable profits in spite of heavy sunk costs in changing capital stock from defence to civilian production. Once again, as mentioned earlier, management style, proximity to dynamic markets, assistance provided by the government and joint ventures with overseas companies have been the reasons for success rather than ownership issues.

The transition has been costly. Part of the reason lies in the total insulation of the defence industries from existing markets in the civilian sectors as happened in the past. This was a problem even before the opening up of the country and has been exacerbated by the rapid transformation in the macro economy. The hermetically sealed military sector, with little idea of resource costs and market signals, has faced more problems than other state owned enterprises. It is interesting that those enterprises who were closely proximate to the most dynamic regions of the country (in terms of geographical location and access to markets) have performed far better than the more isolated ones. Enterprises in Nanjing, Shanghai or in Guangzhou seem to be far more successful on average than those in Shaanxi, Guizhou or Yunnan in the interior of the country.

The Chinese government (both central and local/provincial) has granted over RMB 20 billion for projects of conversion within the framework of the State Plan; RMB 11 billion has come from the Central Government and the remainder from various local authorities. Enterprises which have gone for conversion outside the plan have had to borrow quite heavily from the financial markets (predominantly from the banks). These enterprise debts are quite substantial and often match the reported costs of conversion. Although employment losses have been modest, this is possibly due to protecting redundant workers rather than forcing compulsory redundancies.

In addition, all enterprises have a substantial number of some nonindustrial workforces (sometimes amounting to 20 per cent of total employees)—manning schools, nurseries, kitchens, housing maintenance etc.—and in the absence of more profound restructuring which will close down these ancillary activities these workers will have to remain. In the long run, labor shedding in nonindustrial activities is essential even though initially it will add to social costs. However, conversion overall is similar to an investment programme with initial sunk costs when net benefits are negative or modest; after the break-even point, there could be increasing returns to resource input thus raising productivity rapidly. We feel that, subject to appropriate policies, Chinese conversion may be approaching the state where high and increasing net benefits are possible in the near future for the successful enterprises in aggregate.

There is an important regional dimension to the defence industrial sector which has affected the productivity of the conversion effort. These industries and enterprises are spread over the country. But the provinces where the sector represents an important part of provincial industrial output are Hunan, Hubei, Gansu, Sichuan, Shaanxi and Yunnan. These provinces are also characterized by the following features: a high share of primary industry to regional GDP (usually over 30 per cent in 1992); and, low per capita income (ranging from 1,100 to 1,500 Yuan in 1992 as compared to 2,800 in Guangdong for example).

A relatively small, regional, “domestic” based market implies that it is difficult to experiment with new products; local authorities are unwilling to subsidize and invest in new or altered production lines both because of a weak state of public finances and also because industrial output outside of the DIC is already high. The regional concentration of the defence industry is a product of historical factors related to dispersal to the interior areas (the so-called “Third Front of Capital Construction”) of military industries in the 1960s but the adverse impact is now being felt by the current managers and workers. Where a thriving local economy exists, particularly in the coastal areas or near Hong Kong, conversion has been very successful even in traditional industries.

The international dimensions of conversion, both in terms of exports as well as attracting foreign direct investment and technology, are important. By the end of 1992, around 180 joint ventures with overseas companies had been established and this number is currently approaching 200. The total amount of foreign direct investment (FDI) has been in excess of US\$1 billion. However, in the context of overall FDI in the economy of China this amount invested in the converted industries is still quite small and most of it is concentrated in the coastal areas rather than in the interior provinces where the need is the maximum.

Export performance is also patchy and highly concentrated in the neighboring countries of the Asia-Pacific as well as the United States. Even when individual enterprises have the full backing of holding companies with international marketing outlets, have factories and sales office in the coastal area, and have managed to attract limited foreign capital and technology, export performance is not commensurate with the effort put in. Most exported products are labor intensive and therefore price competitiveness must be an essential precondition for success in exports. Although labor costs are still low, in the absence of subsidies the enterprises have found it difficult to cut costs sufficiently to boost exports significantly. Occasionally, joint ventures and adoption of foreign technology increases price in international markets

without the equivalent improvement in the technical quality of these products.

The main comparative advantage of the DIC in China seems to be skilled labor, and Science & Technology (S&T) personnel. Thus, export promotion, if it is to be successful, must emphasize this aspect of product development. Leaving out some spectacular cases, such as space technology, large scale ship construction or nuclear energy, most converted industries are still trying to export low value-added products. Even within the domestic industry they do not have sufficient price competitiveness given relatively high wages (by local standards) and also the growth of the non-state sector, which operates at much higher levels of profitability. Export promotion henceforth should concentrate on more sophisticated technology.

Policies

Let us now turn to policy. The main strategic attention of policy for further structural reforms must concentrate on two core areas: increase profitability and make the phase of economic conversion more successful; as well as, increase technology transfer to the DIC enterprises from within the country (through using military sector S&T resources) and from abroad. A major constraint, repeatedly pointed out by enterprise management, was that of financing. Hence, a third strategic area for policy reform is how to increase the flow of funds to the defence complex.

This paper suggests a number of implementable policies within the broad framework of the three areas mentioned above. These policies are classified into nine groups and treated separately for analytical tractability. However, they are by nature somewhat interrelated.

The nine sets of policies which should produce structural reforms are in the following fields:

- Information gathering and data collection;
- Management;
- Organizational structure of the DIC;
- Ownership;
- Product development and technology;
- Social and welfare aspects;
- Financing conversion;
- International dimensions;
- Political will.

All of these nine points have strong implications for either/or the three strategic issues of profitability, technology transfers and funding of conversion. In various publications of the OECD Development Center, we have given general and specific policies in each field and related them to the strategic needs of profit-making, technology and financing. We have also pointed out the enormous successes of Chinese conversion and how good policies have aided the conversion process. In this paper we concentrate on the *problems* of conversion that adequate policies must face. However, it must be emphasized that overall, Chinese conversion has been genuinely successful and our stress on weaknesses in this paper is simply a method of highlighting policy effects.

- (i) There is an urgent need to gather and disseminate *economic information and data*—both at the macroeconomic level and at the enterprise level. It is difficult to get aggregate data on various indicators related to the progress of conversion—profit rates, turnover, sales, assets and so forth. Nor was there such data at the regional or provincial level. Economic data that were available were sometimes inconsistent with each other.

Transparency is important in the civilian sectors because it increases accountability and therefore efficiency. Also, foreign investors, who are evaluating opportunities and risks of investing in the DIC, will need to know about these facts and figures. No major evaluation and appraisal can be done unless such economic data is widely available. There is a huge amount of technical data that is available. However, we feel strongly that economic information is inadequate for the converted sectors.

- (ii) Managements, in the converted sectors, are technologically very competent and perform a wide range of managerial and social functions. However, there is scope for improvement in terms of purely financial, economic and marketing functions of management. In other words,

Chinese firms need to improve their *financial management and marketing techniques* in order to develop their civilian activities. We believe that some of the management in the loss making enterprises are scientifically excellent but are not clear about finance, costs and how they would market the products that they are planning to produce.

- (iii) Organizational structures in the DIC are vertically integrated and top-heavy. It may be useful to *decentralize* this structure increasingly towards the provinces as has already happened at Yunnan. It seems that there is little horizontal integration between the different industries and groups. Each industry, in the converted sector, is communicating vertically with its higher structures, up to Beijing, rather than at its horizontal level with similar enterprises at the regional or provincial level.

If ultimate control of the organization of the DIC enterprises is passed on to local governments (at the province or region) then there are a number of advantages. First, monitoring is better. Second, responsibility for social and welfare payments of the enterprises can be taken up by the provincial authorities. This will allow the enterprise management to concentrate on their real functions, i.e., increasing the productivity of the enterprises. Third, if a factory is shut down then local authority takes over the social and welfare provisions of the unemployed. This may reduce social tensions. Fourth, if provincial authorities have financial problems then they can deal directly with the central government. It is unfair on the enterprises to bear the cost of administering such expenses and then ask for subsidies for these costs which lower pure commercial profitability. Fifth, foreign investment and funding will be easier to get if international investors know that the enterprise is a commercial and production

enterprise alone rather than having all these other functions which are costly.

- (iv) There has been a lot of discussion about *state ownership* in the context of conversion. Our overall conclusion is that patterns of ownership are not essential towards efficiency in converted industries. It is however essential that commercial motives are made paramount. Entrepreneurial attitudes can be changed if there are sufficient incentive and sanctions. If the enterprise is allowed to retain a high proportion of profits, is allowed to make excess workers redundant, is not given cheap credit from the state banking sector, and is rewarded for risk, then entrepreneurial attitudes can develop even within the converted SOE. The main weakness of converted industries has been choosing the right product mix which can be sold in competitive markets. Even in the private sector they will have to learn how to choose the right civilian products, after having worked in sheltered markets for so long. The central point therefore is to run converted industries as commercial ones.

The Report makes it clear that privatization is neither necessary nor sufficient for success. However, commercialization is essential. Management must respond to the special features of the market within which they operate. Incentives and sanctions are therefore important.

- (v) The main source of *new technology in the converted sector* will probably have to come from the internal S&T resources of the DIC. Just as there has been significant conversion of production activities, there must now be major conversion of scientists and engineers. We have no direct evidence on any research institutes. However, most enterprises have claimed that there was significant transfer of technology from the military S&T base of the country. This is to be encouraged.
- (vi) In addition to its purely economic dimension, the burden of conversion must also be understood

from a *social and welfare* point of view. The enterprises have high employment related to non-production activities (schools, hospitals), and support or ancillary staff (nurses, cleaners and cooks). This is a heavy burden. The enterprises want them to be separated from the responsibility of the factory. But this cannot be done because of social reasons. Also because the consensus behind conversion will disappear, it will become politically unacceptable. However, it is becoming necessary for enterprises to divest themselves of non production units.

As China's social security system develops and is restructure then this problem will be shifted from the enterprises and taken over by the state directly. It is better to have unemployment benefits, pensions and other amenities (schools, hospitals) be paid by the government rather than the enterprises.

- (vii) *Financing* of conversion remains a major problem. We would suggest a number of measures to help fund-starved enterprises. First, the government should seriously consider writing off or canceling some of the enterprise debts. There is a possibility that a serious debt overhang is present and this usually implies low investment. Clearly there are problems with this approach and we will deal with them later. Second, the government should authorize matching loans at a subsidized rate even if the enterprise wishes to produce a product which is not determined by the plan. There could be a matching fund principle whereby every Yuan raised internally through profits would be matched by a Yuan from the banking system at low rates of interest. Third, exportable products should automatically receive special loans. Thus, the firms will have an incentive to invest when they are confident that they have developed a product which can be exported. The basic principle in all this is that there should be rewards and incentives for enterprises which are seen to be making a large

scale effort. These special financing measures for the DIC must be *monitored* very carefully. Otherwise, the new money could be wasted.

The opposite side of financial incentives (for good projects) is punishment for failures (for bad projects). SOEs have traditionally not had hard budget constraints. If they have substantial deficits than a bail-out is made since the government cannot politically accept unemployment. However, some form of hard budget constraint is inevitable. If an enterprise gets a special grant, and fails to successfully market the product through its own fault, then the government should call in the loan by selling assets that the enterprise has or by stipulating that bonus payments to workers will be reduced although the basic wage must be paid. Such a threat will reduce the problems of moral hazard and adverse selection.

- (viii) The international dimensions begin with *exports*, which are essential for the success of conversion. What is the comparative advantage of the DIC? We believe that its greatest asset is its human capital. Instead of going for relatively cheap labor intensive goods, these enterprises could concentrate on human capital intensive output backed by domestic technology transfer from the military S&T sector. There are some obvious examples of large scale projects where success is possible with this strategy. Supply of nuclear energy, space technology or special types of ships can be exported by the DIC in cost effective fashion. However, there are other relatively unexplored areas. Computer software or new materials may be types of output where there could be comparative advantage. In the absence of detailed information, we cannot give more specific recommendation on the product mix likely to achieve export competitiveness. But we emphasize the general principle that use of human capital to produce exportables should be encouraged.

The difficulty in attracting *foreign investors* is a critical question. Joint-ventures and other cooperation projects with foreign companies are actively sought by the Chinese authorities and the enterprises. A foreign fund preferred by enterprises is in the form of joint venture capital and FDI. But this will come only to the successful ones who already have a track record. For the unsuccessful enterprises, recording losses, it is difficult to get FDI. Yet, they are the ones who need them most. The only way that most of the enterprises, except the very successful ones, can get international capital is through special incentives and tax relief.

It is important to tap the world financial markets for equity financing. Mutual funds or unit trusts tend to have large amounts of relatively mobile capital some of which can be used for medium-term investment in the DIC. We would suggest setting up a Mutual Funds for Chinese Conversion, possibly in Hong Kong or New York, which can use equity capital to buy shares generally or directly invest in specific enterprises. Some of the enterprises have very good prospective projects but which could be somewhat risky. These would benefit from Mutual Funds for Conversion,

It is also necessary to try to get foreign aid for conversion projects. Here, the international community has a special responsibility. Conversion is an important way of reducing international threats and enhancing security by economic means. Those international organizations which are involved in security and development are therefore natural partners in trying to finance conversion. The United Nations clearly has a role to play. One useful suggestion for the United Nations is to try to set up an International Conversion Fund (ICF). Such a fund could begin with working capital contributions by member states. After some time it could start borrowing from international money markets

similar to what other multilateral financial institutions do. Its primary function would be to give low interest loans to governments specifically earmarked for conversion activities. By lending to the government it will avoid the risk of default. However, the receiving government must have a viable project related to specific enterprises rather than borrowing on the basis of a general and vague criterion. The enterprises will receive loans but the interest rate will be lower than domestically available. The ICF will not simply be a foreign aid agency but essentially a financing and lending mechanism to allow conversion investment to take place.

- (ix) *Political will* is vital and must be sustained now. The last phase of conversion will need as much political support as the earlier years of conversion.

Concluding remarks

Overall, Chinese conversion has been far more successful than any other country in the world. The rapidity with which the country has grown in aggregate during the last one and half decade (coinciding roughly with the process of conversion which began around 1979 and accelerated around 1984) has helped considerably the conversion process. The spin off from expanding markets, increase in the variety of inputs and outputs used and produced by the industrial sector overall, the use of defence sector R&D, have all helped the converted industries.

In spite of major remaining problems, the paper is optimistic about the success of the conversion process provided that sound policies are implemented. The international community needs to be fully supportive since conversion will contribute to both development and security. Hence we call for an active role for the OECD countries and multilateral agencies such as the United Nations.

Building Endogenous Capacity to Meet the Challenges of the World

Zhang Shouliang

*Beijing Changkong Machinery Corporation,
Subsidiary of the Aviation Industries of China*

Summary

Zhang Shouliang's paper describes how Beijing Changkong Machinery Corporation, originally a manufacturer of fuel accessories for helicopter engines, converted partially to gas station equipment, sand blasting units, radial riveting machines, co-extruded plastic sheets and plates, file cabinets, etc., and engaged in technical, economic and trade cooperation with manufacturers in the United Kingdom, France, Canada, etc., and launched six joint ventures with partners in the USA, Japan, Hong Kong and Taiwan. The gasoline filling equipment venture was launched in cooperation with a partner from the USA. It has achieved 40 percent market penetrations in China. Other products include a dry washing machine, food packaging equipment, etc.

Zhang's article emphasizes research and development and technical capacities as the valuable assets of the military industry, and concludes that these are preconditions for developing products for the civilian markets and for engaging in international cooperation. In addition, in the case of Changkong, there are also a strong technical equipment base and a strong technical team, and they have been certified in ISO 9001. Furthermore, Zhang pointed out that Changkong had the capability of delivering on contracts, with its technical personnel literate in English and able to provide valuable technical inputs to the joint ventures they are engaged on. On the other hand, it can be said that the Chinese side is weak in

market, marketing, risk assessment and management capabilities. For instance, in the case of the dry laundry machines, 90 percent of the output is purchased by the joint venture counterpart. Changkong has no direct access to the outside market and consequently does not enjoy the full profit potential of the venture. As with many other Chinese industries, Changkong provides its partners essentially with a manufacturing platform for exports.

Promote Development and Commercialization of Advanced Materials by Strengthening International Cooperation

Wu Xueren
Chief Engineer
Beijing Institute of Aeronautical Materials

Introduction

Beijing Institute of Aeronautical Materials (BIAM) was founded in 1956 as one of the major construction projects of China's First Five Year Plan. Being the only research institute of materials for the Chinese aviation industry, BIAM's main mission has been to develop advanced aeronautical materials for the country's airframe and aero-engine applications. After over four decades of development, BIAM has become one of the largest materials R&D centers in China, with the most comprehensive programme combining metallic and nonmetallic materials studies with extensive synthesis/processing and testing/evaluation. During the past four decades, BIAM has made a great contribution to China's aircraft industry, as evidenced by the numerous ministry/state achievement awards. At the same time, the institute has scored great success in the large-scale production and commercialization of its R&D achievements on the international as well as domestic market.

The institute has some 20 laboratories for its research activities. A distinct feature of BIAM is its manufacturing capability of advanced materials and their related products

on small/medium scale, and for some product types, mass production capability has been built up in recent years.

Fast development

BIAM's fast development is a result of Deng Xiaoping's "Reform and Opening" policy. As many of China's research institutions, while keeping its prime focus on R&D programmes, BIAM has been making great efforts in the technology transformation and commercialization of its scientific and technical achievements to various civilian industry sectors. In particular, great success has been achieved in its internationalization.

With its extensive expertise accumulated over the past research programmes, and intelligent researchers and highly qualified work force, BIAM has built up a solid foundation for its civilian products development. Since the mid-80s, a large number of civilian product development projects have been carried, resulting in a fast growth in the hi-tech products and market expansion. At present, BIAM has four production lines with annual output exceeding RMB20 million, and two of them are over 100 million. BIAM's total revenue has been growing at a rate of well over 40 per cent per year in the past five years, from RMB120 million in 1993 to 400 million in 1996, approaching 500 million in 1997.

Export-oriented products

A remarkable feature of BIAM's fast growth is its export-oriented products. BIAM was authorized by the State Council with export/import rights of its own products in 1993, among the country's first 100 research institutions to be granted such privilege. Since then, BIAM's product export has been on fast and steady growth: US\$2.1 million in 1994, 10 million in 1995, 21 million in 1996, and approaching 30 million in 1997. BIAM has been one of the top exporters in the list of the country's authorized 100 institutions since 1995.

The fast growth of economical strength has led BIAM into a very favorable position. Infrastructures, including research and manufacturing facilities, buildings, etc. have been significantly improved with also more earnings for its

employees. And these have laid a solid foundation for steady growth in the future.

Build up market-driven large-scale production capabilities

Market economy requires certain scale to make the product economically profitable. Among the large variety of product types, BIAM has concentrated on a few for its commercialization. The present eight items are: Titanium investment casting, aluminum casting, super-alloys and master alloys, aircraft brake disks, protective coatings, artificial joints and polymeric composites. In the past three years, the focus has been on titanium casting and permanent magnet alloys for mass production and export.

1. Titanium investment cast golf club heads

Sport equipment represents one of the fast growing fields where hi-tech finds its applications. The titanium golf club heads became a new fashion in recent years. Seizing this opportunity, BIAM made a strategic decision by separating the production line from its parent research group. A great effort was made in transferring its investment casting know-how to mass production, facility expansion, international market development and quality improvement. A total amount of RMB35 million was invested for the titanium casting facilities. Thus, led to a 100-fold increase of its production capacity from 1993 to 1996, some 60,000 pieces per month, making BIAM one of the world's leading titanium golf club heads producers. Our titanium golf club heads are all for export, with the main international customers being Japan, Taiwan and the USA.

A new development for the golf products in BIAM is to combine Ti-casting with its capability in composite technology. A production line of carbon fiber reinforced polymeric composite golf shafts has recently been constructed enabling BIAM to make the complete golf sets.

2. Permanent magnet alloys

After the expansion of the titanium casting capabilities, the second big investment was for the permanent magnet

alloys. Thanks to the market opportunity and BIAM's expertise in metallurgy, BIAM was able, in a very short time period, to pass the certification and produce a large quantity of permanent magnet alloy for MQ, a subsidiary of General Motors, meeting the demanding specifications. In the first year, 1996, BIAM made a big investment of RMB40 million for the purchase of two VIM-800 vacuum melting furnaces, and the rare-earth permanent magnet alloy with a value of US\$5.6 million was exported to the USA. Continuous expansion of its capacity is underway. The goal for 1997 is US\$10 million exports.

3. Passenger aircraft brake disks and systems

Passenger aircraft brake disk is one of the most critical elements for commercial transport safety. BIAM's technical know-how acquired in our past research of powder metallurgy paved the way for the manufacturing of sintered iron-based powder metallurgy disks. BIAM's aircraft brake disks have passed the CAAC air worthiness certification, making BIAM the CAAC-approved manufacturer of commercial passenger aircraft products. The products have been used by most of the Chinese airlines on their fleet, including Boeing, McDonnell-Douglas, the Soviet Tu-, An- and IL-airplanes, and the BAE-146, etc. The production of the brake disks is organized into three parts: manufacturing, engineering and quality control, and is BIAM's first example adopting the enterprise management system. The present revenue amounts to RMB28 million, with the domestic market share of 80 per cent. At the same time, BIAM's aircraft brake disks have been exported to Eastern Europe and former Soviet countries.

4. Protective coatings

Protective coatings are other examples where BIAM has achieved significant success. Such coatings serve various purposes, for instance, corrosion prevention, fire retarding and brew/liquor processing. At present, the research and production of the coatings are still in the same laboratory, but with separate management. Sales representatives have been established all over the country at multiple regional centers. Thus, a sales network is formed. The total sale has

been steadily increasing, RMB45 million for 1996. One particularly successful example is the T-541 coating used for large size carbon steel beer barrels. It is now a well-known quality and healthy coating for the brew/liquor-making industry in China. Efforts are also being made for international sales.

Strong international marketing effort

In order to promote the research institutions to enter the international market, the Ministry of Foreign Economics and Trade authorized part of the country's large research institutes and universities to conduct their products export/import. BIAM was among the first 100 institutions receiving this authorization in 1993. In the past three years, BIAM made significant strides in the international economical cooperation with some 20 countries and regions. A series of BIAM's products, e.g., titanium castings, magnet alloys and passenger aircraft brake disks, have been exported to Asia, Europe and America.

BIAM's foreign trade team members are highly competent and dynamic. The requirement for such personnel is strict; they must have a good knowledge in international trade and in certain technical fields, good mastery of foreign language, be able to drive, and good public relations. The team has increased its size to the present 20 members.

To further expand our overseas market, BIAM often sends its people to various international exhibitions to make its name known to the international business community. We have established our overseas representative offices, e.g., in Los Angeles to facilitate our contact with the customers. Advertisements in widely distributed international journals are made a high cost. For commercial transport aircraft products, because of the requirement of air worthiness, we cooperate with foreign airlines: the products are manufactured by BIAM while the test flight and certification are done by our foreign partners. In this way, BIAM's aircraft brake disks for Tu-154, An-24, IL-64 have been certified by Romania, Kazakhstan and the Ukraine. Progress is also being made in cooperation with a U.S. company in this area.

International cooperation in R&D programmes

BIAM's international cooperation began in the late 1970s, among the first group of research institutes open to the outside world. Since 1980, BIAM has sent its researchers to many countries according to the bilateral cooperative agreement, e.g., Germany, Sweden, France, USA, Russia, Korea and India, etc., for short/long term stay in their laboratories. A good example of the long term cooperation is with the German DLR institute of materials to which BIAM has sent its scientists for a one-year stay in the past 17 years. A governmental cooperative research programme with NASA-Langley was successfully conducted in the late 1980s.

Cooperation with the Russian institutes began in the early 1990s. Regular visits by both parties and seminars have been arranged in the past six years. Exchange of scientific research and the purchase of facilities have improved BIAM's research capabilities.

A new development in cooperative R&D in recent years has been with the western multinational companies. One particular example is with United Technologies Corporation (UTC), USA. Three CRADAs (Cooperative Research and Development Agreement) are currently being carried out at BIAM facilities: low cost single crystal alloy for commercial engine application, structural integrity assessment and prediction for high strength aluminum alloys, and fatigue testing for Carrier's storage tank plastic material. Discussions are underway for more CRADAs, including eutectic materials for UTC/Carrier's refrigeration equipment, and failure analysis service for UTC/Otis elevators. With General Electric, USA, a programme on an innovative metal process technology, spray forming of super-alloys, is underway with the aim of significant manufacturing cost reduction of critical engine parts. All the programmes have been very successful, and both parties are very pleased with what has been achieved so far.

Future development

For the future, BIAM will continue its policy: “Research Being the Backbone and Civilian Products Being the Mainstay.” The institute will further strengthen its research capabilities and plan an aggressive programme both to underpin the materials in use on a current airframe and engines, and to develop new advanced materials and processes for China’s future aerospace systems. Ambitious goals have been set by BIAM by the year 2000, with the following main points:

- There is a broad international recognition in materials’ R&D with a reduced, but high level research staff.
- Strengthen the key research laboratories, especially the expansion of the existing National Key Lab of Advanced Composites, and the construction of a new National Key Lab of High Temperature Structural Materials. Accelerate the modernization of other facilities. These will be funded jointly by the government and BIAM.
- Make even stronger efforts on the commercialization of R&D achievements, increase the overall hi-tech civilian products by an average of over 20 per cent per year, with a total institute annual output value exceeding US\$100 million, of which 60-80 million for export; and corresponding increases of average staff income of US\$5,000 per year.

In the country’s general climate “Reform and Opening.” BIAM is ready to meet the challenge of the 21st century.

Ford Motor Company in China

Robert Dockstader

Director

New Vehicle Programs, Ford Motor (China) Ltd.

Background

As background, I would like to start with a brief review of Ford in China and close with a few comments on military restructuring.

Ford activities in China dated back to 1913 when Model T vehicles were imported. In 1924, the founder of our company, Mr. Henry Ford, received a letter from Dr. Sun Yat-sen inviting Ford to come to China to develop the Automotive Industry.

In recent years, Ford has made a substantial, sincere commitment to assist in developing the Chinese domestic auto industry through several key initiatives.

The first initiative began by Henry Ford II and Deng Xiaoping in 1978-79, was a focus on the further development of research, technology and education in China. Today, Ford, together with our Chinese partners, supports an extensive array of technical and educational programs, including our visiting scientist and engineer program which began in 1982. This program was expanded this year to include the annual training of ten Chinese scientists and engineers for one-half year at Ford World Headquarters in the U.S. The Chinese participants work hand-in-hand with Ford technical and managerial personnel to learn the latest skills and automotive procedures.

The second initiative in answer to China's automotive plan which called for the development of China's component sector was the formulation of Ford's five component Joint Ventures (JVs). The first, Shanghai

Fuhua Glass Company, was formed in July 1994, and was soon followed by an additional four JVs including:

- Shanghai Yanfeng Plastics—a JV with SAIC
- Shanghai Fudian Electronics
- Nanchang Fuchang Climate Control
- Changchun UARCO Automotive Radiator Company

We are pleased with the progress in our JVs and believe that they demonstrate China capability. Fuhua glass, as an example, will launch a major export programme to provide automotive glass to Australia in 1998.

In addition to the JVs presently in operation, Ford will continue to seek additional component joint ventures, concurrent with vehicle ventures. We also believe it is important that key Ford suppliers develop operations which support the growth of the China auto industry and bring important technologies to the industry. We have been working closely with our suppliers to encourage their participation in China's growing automotive industry.

A third initiative, built-up vehicle import and sale, services and parts infrastructure development, is also underway. While the sale of built-up import vehicles is severely constrained by the import duty structure and resultant pricing of the vehicle, Ford believes it represents another element of commitment to China. To provide adequate service to our customers, Ford must develop a sales, service and parts system. Presently we have 11 dealers, 44 service centers, 2 nationwide parts distributors and 1 technical training center. This infrastructure helps to provide good jobs to Chinese nationals as well as technical training consistent with Ford international standards.

Finally, a fourth initiative, local production of vehicles will soon be underway. In 1995, Ford purchased a 20% equity in Jiangling Motor Company of Nanchang, in Jiangxi province. During the last 2 years, Ford and Jiangling have jointly developed a light commercial vehicle which will be launched in December 1997.

This vehicle is based on Ford's European Transit van, bus and truck technology and Jiangling's diesel engine and axle technology. A team involving Ford and Jiangling engineers has worked closely in Europe and in China to

execute this programme. We are now beginning to see these vehicles on China roads.

In addition to this particular vehicle relationship, Ford is working closely with the Chinese Government and other Chinese companies to develop ventures consistent with China automotive policy. Many of the possibilities being studied include opportunities in vehicle and component production as well as potential for joint development, technology sharing and, in some instances, exports.

Ford is also very active in industry shows, presentations and seminars and is working hard with talented Chinese engineers to further understand China operating conditions. There is much we must learn about China and we seek every opportunity to do so. As an example, during 1996, we conducted a joint data acquisition programme with the China Automotive Technology and Research Center (CATARC).

In this effort, three specially instrumented vehicles, Transit, Taurus and Fiesta were operated on local roads and proving grounds throughout China to gain knowledge on operating conditions and driving styles. Data acquired in this process is being correlated to other worldwide markets and Ford standards. Modifications will be made where necessary to meet China requirements.

Ford and the defence industry

Now, let me move to the topic of restructuring to civilian uses of China's military industries.

Let me again start with a little background on Ford's participation in the defence industry.

As you probably know, Ford was a major player in the efforts of the World War II period. Post World War II, Ford was challenged to rapidly restructure production from war materials to vehicle production maintaining only a small portion of total production in the defence industry.

Of course, this was not an easy or smooth transition as it took many years for the US economy and major industries to adequately adjust. The loss of major government cash infusions and the poor economic conditions resulted in near catastrophe for local economies, the workforce and Ford.

Since that time, Ford has converted to essentially a civilian-use product manufacturer. We sold our last defence production subsidiary, Ford Aerospace, approximately 5 years ago. Ford technologies are now all focused on civilian uses and it is our intent to support only civilian uses.

Ford and military industry restructuring in China

To date, our involvement in the military restructuring process in China has been limited and it is unclear what our participation might be in the future. With the knowledge we have gained in this area from our work in China we can offer the following observations:

First, technology transfer. Ford supports the concept of technology transfer to enhance the development and growth of the Chinese automobile industry. We will transfer our technology to a civilian enterprise for use by that venture in civilian applications.

Second, remote locations. We would expect that many defence factories being converted to civilian use products are located in remote areas. To successfully launch world class products in these locations, we would want to develop as part of any venture, a clear approach to supporting relocation of foreign and Chinese employees to the site. This would include such issues as developing supporting infrastructure for venture and supplier employees.

Third, business incentives. To ensure the financial viability of the venture, we would hope to be provided with all incentives included in major Economic Development Areas in China. In addition, we believe the venture will need special incentives likely related to infrastructure and remote location to ensure viability.

Fourth, skilled personnel. We would expect to find that many people in the military industry have skills and talents readily convertible to civilian production. We have learned through experience that ongoing availability of talented personnel is critical and that we must be able to attract the best people to the venture. In remote locations this will be a challenge.

Fifth, management and financial accounting. Establishing a management structure for a venture which is not associated with the defence side of the business is critical. We believe the best approach is a high degree of autonomy from the parent to assure there is no financial or strategic connection to the military.

Sixth, environmental and safety. Insuring that members of the venture, their families and Chinese and worldwide populace is safe from past, present and future effects of military and civilian goods production at the venture site is also critical. Understanding the condition of the site and surrounding areas will be important to developing a successful business relationship.

In closing, we fundamentally agree with the concept of converting the military industry to civilian uses provided we can demonstrate to our peers and public around the world that our joint ventures are undeniable efforts to the expansion of world peace and economic development.

About the author:

Robert Dockstader, age 46, is a 22-year employee of Ford. He holds a Bachelor's degree in Mechanical Engineering and a Masters in Business Administration and presently lives and works in Beijing. He is responsible for Product Development and New Vehicle Program Studies for Ford Motor (China) Ltd. Prior to working in China, he held a variety of positions in Ford Product Development including service in Japan.

German-Chinese Joint Ventures: A Story of Success?

Jörn Brömmelhörster

Bonn International Center for Conversion (BICC)

Development of foreign investment in China

East Asia has exhibited remarkable development in recent decades exemplified by the outstanding success of Japan, one of the top industrial nations in the world and a leading producer of ships, automobiles, television receivers, synthetic fibers, paper, cement, pianos, synthetic resins, and steel. The so-called Little Tigers have outgrown the label “little” by successfully approaching markets used in the past and today by Japan for its own prosperity. After the year 2000, East Asia will likely remain one of the world’s driving forces in terms of economic growth, with China as one of the primary engines. China has already demonstrated an increasingly strong economy in the last decade, with growth rates consistently around 10 percent. With this rising economic power, foreign investment in China has ballooned. This article presents an overview of the development of the most significant forms of direct foreign investment in China. All three major forms of direct foreign investment—equity joint ventures, cooperative joint ventures and wholly foreign-owned enterprises (WFOEs)—show phenomenal growth rates in terms of approved projects as well as of both agreed and realized volumes of investment. Equity joint ventures are by far the most important investment vehicles. In cooperative joint ventures, growth occurred in absolute terms but by less than in other configurations. While in the period 1979 to 1990 the growth reached 32 percent by measuring the projects, it dropped down to slightly more

than 12 percent by 1993. Also, notable is the number of new WFOEs and the overall volume of investment. In addition, huge differences exist between approved and realized direct investments, due to time factors, overestimation of market position, and approval practices by the relevant institutions.

The relative share of German direct investment in China is important. Germany's status as the world's second biggest export nation (1994) is a relatively minor factor. Compared with other European countries, however, Germany is China's most important trading partner. According to some statistics, Germany constitutes about 5 percent of China's overall trading volume, but only 0.25 percent of institutionalized foreign investment (i.e., joint ventures and WFOEs). When realized investment is taken into consideration, this share is slightly higher (1.4 percent). At the same time, the average volume of German investment is much higher than in most other countries. Most of these investments are "real," with high multipliers compared to other forms of investments such as speculation-driven ones in the real estate business.

Compared with Taiwan, Hong Kong and Macao, the level of German direct investment designated for China has changed substantially. In 1980, only 1.3 percent of all direct investment to that area went to China. With the exception of an interruption due to the Tiananmen crackdown, this share increased steadily to almost 22 percent in 1992. (See Schuller, 1995, p.583).

The allocations of German direct investment from 1987 to 1993 focused on the machinery industry (31 percent), textiles (21 percent), chemicals and pharmaceuticals (12 percent) and electronics (11 percent). Considering the Chinese industrial structure and its needs, both countries might be called perfect cooperation partners.

Advantages and disadvantages of joint ventures

Despite the differences between joint ventures—varying shares of responsibility and capital input—some overall criteria of pros and cons for both China and the foreign investor may be outlined.

1. Advantages for the Chinese partner

Joint ventures ease the lack of capital and therefore accelerate growth through foreign investments. Most Chinese companies have a severe capital deficit and rely on loans for investments. Only a few, carefully selected, state owned enterprises (SOEs) receive considerable organizational and financial aid to cover their investments. The investment as well as the production activities may positively affect other Chinese companies' inputs.

Joint ventures contribute to diversifying the production structure and enhancing competitiveness. They enable the use of previously unaffordable technologies.

Despite reforms which aim at an equalization of state-owned enterprises in China, joint ventures still receive such privileges as the tariff-free import of investment products during the founding period and tax-free or tax-reduced incentives.

Other advantages include better salaries for management, the possibility of traveling to foreign countries and the provision of a company car, which should not be underestimated.

Market creation. Competition has been increased through recent "opening-up" policies and the implementation of a new Chinese economic model; even the term daobi (bankrupt) is no longer a foreign word to the Chinese understanding of a socialist market economy. The formation of a joint venture may therefore help not only to establish a good position inside the market but also to form the market itself. (Geissbauer, 1994, p.67)

2. Advantages for the foreign partner

Entry into the Chinese market—with one-fifth of world's population and a huge reserve of surplus demand—would take full advantage of existing distribution channels. Utilizing the Chinese partner rather than an indirect approach through trading companies would broaden knowledge of the market and bridge gaps in mentality. Joint ventures have the added benefit of price differences for labor, land and other resources. They heighten the accessibility to projects which were formerly not available

to foreign companies, or which were contracted to foreign bidders but required excessive initial outlays.

They may include penetration into third markets like Pakistan, countries in which the Chinese are the main economic class, or countries in which German involvement is shrinking due to cost differences.

Joint ventures may avoid legislation in the home country (i.e., tax disadvantages, limitations on hours worked per week, incidental wage costs, complex environment acts).

The formation of some joint venture guarantees a relatively high level of legal security and is a well-established model of cooperation. Thus, long lasting collaboration may be guaranteed by a contract that covers the legal framework, share of risks and distribution of profits. Joint ventures provide cover against political risks through guarantees for foreign investors. They generally safeguard the supply of raw materials and other inputs.

3. Disadvantages

Domestic suppliers may be displaced. This effect may not necessarily be negative if the foreign partner is the best competitor and cooperation fosters competition. It is entirely negative, however, when cooperation leads to a quasi-monopoly position with total control of the market and market entry. Welfare and/or income transfers may be lost to foreign investors, due to excessive state-guaranteed incentives (for instance, provision of an infrastructure without payments, protection rent to eliminate market access with import taxes or subsidized loans). Cost-intensive coordination problems may also exist between East and West.

In sum, the advantages for German-Chinese joint ventures by far outweigh the disadvantages, which are more or less common problems of the overall economy.

Addressing these deficiencies should not become overwhelming when clear, overarching policies are formulated. Consideration of each potential advantage should allow an optimum performance from cooperation. Choosing the appropriate partner will therefore be the major criterion for a mutual maximization of benefits.

Forms of foreign involvement in the Chinese market

The respective laws show three distinctive forms of direct investment:

- (i) Cooperative joint ventures
- (ii) Equity joint ventures
- (iii) Wholly foreign-owned enterprises (WFOEs)

Cooperative joint ventures may be further divided by type of contract—those without or with a distinct legal personality. The former may be compared with a working group and is suited for projects limited in time, e.g., building projects executed jointly with a Chinese partner. The second kind, i.e., joint ventures with their own legal personality, is quite similar to equity joint ventures as far as capital shares and capital contribution are concerned. The decisive difference, however, is that the total profits available for distribution may be paid to the foreign partner until his investment has amortized; the whole property must then be ceded to the Chinese partner. This kind of joint venture is therefore best suited for projects in which the foreign company's investment, which bought the plant, is repaid with product deliveries. The joint venture concludes as soon as the deliveries have covered the acquisition cost and the interest; the property is then transferred to the Chinese partner.

Both joint ventures or wholly foreign-owned enterprises are suited for long-term cooperation. From the legal and fiscal point of view, both investment forms have been placed on the same footing in most respects. The WFOEs, however, must comply with certain conditions, such as the export share must be over 50 percent and only high-tech products are allowed to be manufactured. Nevertheless, the authorities have ample leeway to decide whether or not the criteria have been observed.

What are the advantages and drawbacks of each arrangement when long-term cooperation is envisaged? From the perspective of the foreign investor, the following factors favor WFOEs (Janus, 1995, pp.19-21):

- Less negotiation;
- More flexibility in choosing the location;
- No evaluation problems, as there is no Chinese capital contribution;
- More independence.

However, the following elements must also be taken into account:

- Usually much higher capital requirements;
- Expanded management requirement for establishment of a new company;
- no indigenous partner giving access to the local market.

The establishment of an equity joint venture has the following advantages:

- Potential to realize smaller projects, as a substantial share of the investment may be carried by the partner;
- Access to the Chinese market through the distribution network of the partner;
- Immediate presence on the market when cooperating with a partner experienced in his branch;
- Settlement of all formalities by the partner.

There are also some drawbacks:

- Difficult negotiations, as coordination with the partner is required.
- Evaluation problems concerning the Chinese partner's contribution of existing assets and resources (real estate, staff, etc.);
- Inclusion of partners' weak points, which might be impossible to avoid (insufficient buildings, over-staffing, etc.);
- Need to harmonize business interests.

WFOEs are especially suited to export-oriented projects. They cover more than 75 percent of all investment types in the "economic and technological development zones." This form of cooperation is especially used by Hong Kong and Taiwanese companies to obtain low salaries and other location advantages, which ultimately contribute to reduced costs. If opening of the Chinese market is emphasized, however, joint ventures have decisive advantages, as the cooperation of a suitable Chinese partner can hasten market penetration. This is especially recommended for companies dealing with China for the first time.

It should also be noted that there are now other, often complementary arrangements in China. It is possible, for example, to organize existing or potential joint ventures as public limited companies. Umbrella companies are also possible. However, a sufficient number of holding companies—which must be largely production-oriented—and a capitalization of at least US\$10 million is required for these kinds of companies.

What steps will optimize the chances of success?

Literature research as well as discussions with company representatives and consultants reveal that all joint ventures are different. In particular, examples of joint ventures conducted by large German groups with various Chinese partners demonstrate not only that all contracts are different, but also that copying the initial contract in its entirety would have ruptured the impending partnership. The branches and products with their respective market conditions are too disparate, and the perspectives and fields of action often differ. Moreover, the partners vary in terms of their strength, and regional particularities presuppose diverging actions.

1. No more pioneer work

One of the most significant findings concerns the “possibility of joining,” which has changed considerably. Pioneer work, formerly the only option and which frequently implied significant costs, is no longer necessary; rather, prospective participants can rely on the prior experiences of their predecessors. Nevertheless, using the wealth of joint venture experiences in an optimum way remains a problem.

2. Legal security and its enforcement as a prerequisite for investment

From the German perspective, the basic prerequisites for a successful joint venture are always political stability and other related conditions, such as legal security on the one hand and enforcement of law on the other. The history of law in both countries is quite different: the original Chinese character “fa” stood for law, but only applied to criminal law and not to the civil law involved here. Even if rapprochements in the understanding of law were to be achieved, strategies aiming at solving conflicts would remain distinct. Whereas Western partners would tend to go to court in the case where some prescribed contractual basic prerequisites were not fulfilled, the Chinese might continue to seek a “harmonious” way to solve even the most tricky of situations. The significant discrepancies

between Asian-Chinese and non-Asian-Chinese joint ventures may likely be attributed to varying interpretations of law and its enforcement.

In general, however, much progress has been made since the first joint venture law (1979). The investment protection treaty, signed by China and more than fifty other countries (including the Federal Republic of Germany) and aimed at protecting investors against nationalization and expropriation, was also a crucial step toward better cooperation. China's agreements to international law, especially the United Nations Convention on Contracts for the International Sale of Goods (1985), the Madrid Trade Marks Agreement (1989), the Universal Copyright Convention (1992) and the Patent Cooperation Treaty (1994), were further milestones. Furthermore, some Chinese laws share characteristics of German ones. For example, the Unfair Competition Act (1993) has many dispositions in common with Western laws. These agreements and others not listed here are essential investment prerequisites, especially for Western investors.

3. Choice of a suitable partner

Discussions with representatives of companies that have successfully entered into joint ventures with Chinese partners may indicate that the partners knew each other previously, not necessarily in terms of a personal meeting between company representatives, but rather in the sense that knowledge of Chinese competitors has clearly increased in the West. Market knowledge varies greatly in terms of clarity and transparency. For instance, markets for knowledge-intensive plant equipment such as escalators and lifts are easier to grasp than consumer goods branches dealing with the manufacture of sweets.

If there were no contacts at all, as is often the case for the Chinese side, it is not very useful to organize symposiums on business with China in general, in which participants examine joint venture possibilities with many representatives of a given sector. These symposiums are generally ineffective with regard to chances for success, that is, the "discovery" of suitable partners. It is also

extremely doubtful whether such partners will even attend, due to the proliferation of events of this kind. Representation on trade fairs dealing with a specific range of products and activities is easier to grasp and more likely to be fortuitous. Presenting the entire scope of *danwei* activities on the Chinese side is as irrelevant as the various activities of the Daimler Holding. Rather, the more specialized the fair, the greater the chances of encountering adequate partners.

4. Indication of clear, unequivocal and practical key figures

After the right partners have been found, it is crucial for objectives to be formulated clearly. Partners' knowledge of each other also plays an important role. In addition to the actual goal of the cooperation, other elements are significant for the foreign partner:

- Notoriety of the partner in China and his position on the market "Rating" in China, if rather modern or backward;
- Quantity and quality of distribution channels;
- Ability to adapt to technologies requiring a high production standard;
- Financial situation and earning capacity;
- Cost situations (taxes, wage costs, bonuses, rents and buildings);
- Quality and stability of the provisioning of raw materials and supplies;
- Ability to overcome institutional and bureaucratic barriers.

5. Prospects

Beyond his knowledge of the Chinese partner, it is of great importance for the Western counterpart for the prospective location to be reasonable, with respect to the infrastructure level (traffic infrastructure, communication, institutional infrastructures) and to its suitability for international management (international schools, swimming pools, cultural life, etc.). If the latter are not provided, it will be more difficult and therefore more expensive to find European specialists willing to work in China.

6. Contracts

Contracts should be as clear as possible. They should include the possibility for partners to oversee each other,

in order to verify whether both are able to meet their liabilities.

Contract drafting has become easier due to the number of existing joint ventures. Europeans have also learned that the Chinese and Westerners do not negotiate the same way. The Chinese generally have difficulties understanding why Germans suddenly stubbornly insist on a previous proposal and refuse any modification. On the other hand, the Chinese often add something after negotiations are supposedly concluded; this may be perceived by Germans as subsequent negotiations. Although the differing methods can be a test of patience, the Chinese practice of constantly negotiating has its advantages, as it implies a greater flexibility that may be vital when drafting special contract clauses.

7. Feasibility studies

Feasibility studies administered according to a given scheme are an element of contracts and a prerequisite to joint ventures. Nonetheless, frequently the given criteria are not sufficient for the Western partner. In particular, the calculation of success criteria is often difficult to understand as calculation methods vary greatly. It has also become apparent that dynamic aspects are not sufficiently taken into account. These formal differences in the calculation of success criteria highlight another major difference between China and Germany. Chinese tend to think in project-related terms: once the goal is reached or the project concluded, negotiations begin again from scratch. For Germans, this process is generally too time-consuming; the German partner would rather avoid it and prefer stage-by-stage plans that build on each other and include long-term objectives.

Joint ventures and military industry restructuring

One component of the four modernizations implemented in the late 1970s and early 1980s is the restructuring of the defence sector. As officially mentioned, the output value of civilian products accounted for three-quarters of the defence industry's total in 1994. Further, two-thirds of

military enterprises have converted completely to production of purely civilian products. Nevertheless, the conversion of parts of the defence sector is not without problems—according to the same article, profit-making enterprises account for some 20 percent of the total. In the above-mentioned article, it was not clearly indicated if the 20 percent belonged to one particular province (Guizhou) or to China overall. Even if it refers to the province, however, the overall problem remains obvious.

In the construction of a joint venture, it is virtually imperative to establish a complete and traceable separation between the civilian and the defence-related portions of the company. It must specifically be assured that technologies and capital are retained within the civilian sector and that a flow into the defence sector does not occur. On the one hand, a full separation is an important prerequisite due to the sensitivity of these undertakings, which can easily be prohibited by the foreign country. On the other hand, history has demonstrated that a pure product conversion is extremely difficult and seldom brings the anticipated success. To overcome both obstacles, outsourcing or the foundation of a new and independent company is probably a better solution.

There are a few examples of joint ventures with Chinese companies that are somehow related to the defence sector (for instance China Aero-Space Civil Products Corp. with McDonnell Douglas Corp.). To expose these particular markets to foreign direct investors, it is absolutely necessary to establish an environment concerned with transparency and controllability.

Conclusion

The direct investment form of joint ventures, with its variety of establishment criteria, has demonstrated that both partners can take full advantage of the opportunities. The impressive data on the growth of direct German investment in China speaks for itself. It is, after all, a success story.

Nevertheless, given Germany's overall economic capacity, the percentage of German investment in comparison to

other states is still too low. In the future, considering China's quickly developing economy and needs, as well as Germany's leading presence in certain sectors of the economy (machinery, chemicals, electronics, etc.), there remains a wide scope for expansion.

Regarding the choice of suitable partners, it is essential to find more aim-oriented approach. In Germany, some institutions and consultants are specialized in this area (contacts may be obtained through the German embassy or the Deutscher Industrie und Handelstag, for example) and would be helpful in reducing the shortcomings. It also must be mentioned that the insights on China and Chinese business practices are now more extensive, and pioneer work with its discouraging costs is no longer required. The more accurate and clear joint venture intentions and purposes are formulated and the better the resulting advantages are negotiated, the earlier companies—specifically small and medium-sized enterprises, the motor of the German economy—will be willing to undertake the consequential step of investing directly in China.

References

Bohnet, Arnim, Zhong Hong, Frank Muller, Stefanie Schmitt, Jochen Steinbuch, and Bing Yue. "Kooperationsmöglichkeiten deutscher Unternehmen in der VR China." *Berichte zur Wirtschafts- und Gesellschaftspolitik China*. No. 20, April 1995. GieRen.

Casal, Christian, Oliver Pabst. "Successful Joint Ventures in China." Thesis. February 1995.

China Daily, 14 April 1995, p. 1

Geissbauer, Reinhard. "WirtschaftspartnerChina." Bonn: CommerzbankAG

Janus, Helmut. "Investieren in China-Praktischer Leitfaden für mittelstandische Unternehmen." Köln: Deutsche Investitions und Entwicklungsgesellschaft mbH, May 1995.

Meng, Fan-Chen. "Der steinige Weg zum Gemeinschaftsunternehmen in China." *Frankfurter Allgemeine Zeitung*, 29 March 1994.

Schuller, Margot. "China-Boom in Deutschland: Entwicklung und Perspektiven der deutsch-chinesischen Wirtschaftskooperation." In: *China Aktuell*. June 1994, pp. 580-588.

Stucken, Bernd-Uwe. "Überleben in China Bürokratie—ein strategischer Leitfaden für Geschäftsleute." *Bundesstelle für Außenhandelsinformation*, January 1993.

Present Status and Development of the Defence Conversion in Sichuan Province

Wu Anren

Deputy Director

Sichuan Office of Science, and Technology and Industry for National Defence

The province of Sichuan lies in the Southwest China, with an area of 570,000 km² and a population of 110 million, which gives it a first place among the provinces in China, and also one of its largest developing markets. Sichuan is one of the centers of National Defence Industry, and it has got most investment in the so-called "Third Front" construction. There are about 200 large and medium sized enterprises including nuclear, aviation, space, ordnance, shipbuilding and electronics industry. There are more than 80,000 scientific and technical personnel. The famous Xichang Satellite Launching Center is in Sichuan.

After ten years' hard work, the province has accomplished outstanding achievements. The output value of this sector has increased to 24.6 billion yuan RMB 1994 up from RMB0.3 billion in 1980. The output value of civilian products represents more than 90% of the total output value. The profit and tax revenue handed over to the State in 1994 is up to RMB1.54 billion, the equivalent to 160 times of that in 1980. Profits make up RMB780 million.

With the development of the civilian products, the province has substantially contributed to the increase of national fiscal revenue and to the income of workers and staff in military enterprises. Equipment and installations have been modernized.

During the past 15 years, the Sichuan national defence industry has developed 1,300 kinds of civilian products subordinated to 27 large types. Among them 14 large types have begun profitable large scale production.

1. Automotive industry

There are many kinds of automobile production in Sichuan, including mini-vehicle, heavy trucks, agricultural vehicles and special purpose vehicles. Total production numbered 100,000 units in 1994. Among them, the leading output and sale volumes belongs to mini-vehicles which hold a safe lead in China. Trends are favorable to heavy trucks, some 400 of which were exported in 1994.

2. Driving trains and engines for land vehicles and ships

Small-sized engines are being produced at the annual production rate of 100,000 units. The production line with annual production of 10,000 units of the heavy engine "STERY" just started operations. And another production line with annual output of 60,000 light engines is under construction.

3. Motorcycle vehicles and parts

The output and sales volume of a motorcycle will reach two million units in 1995 in Jialing Industrial Co. Ltd. The company Jianshe Industrial Co. Sichuan is the largest production base of motorcycle parts in China and the products sell well in all regions of the country.

4. Non-ferrous metals

Aluminum ingot annual production of 15,000 tons has been implemented. A new aluminum ingot plant with annual production of 30,000 tons is under construction. The aluminum foil plant with annual production of 12,000 tons is scheduled to begin operations in 1995. Lithium metal and calcium metal are also processed in the province. Sichuan has the largest lithium cell industry production base in the country.

5. Chemicals and pharmaceuticals

The large chemical fertilizer plant of State Plant No. 816, with annual production of 300,000 tons of ammonia and 520,000 tons of urea has been put in operation. There are plans for the annual production of 20,000 tons for acetate and 12,000 tons for dialysis fibre bundles with investment of US\$110 million in cooperation with foreign countries. Other plans for medical drugs productions at Plant No. 215 have been approved by the State Planning Commission, with an investment of RMB150 million, will start operations by 1997. Besides, there are many fine chemicals being produced.

6. Civil aviation equipment and parts

Some 20 noses for the MD-82 aircraft produced under contract with McDonnell Douglas of the USA have been produced in 1995. From September 1995 manufacture of noses of the MD90-30 aircraft has begun. And a 25-year contract with USA Union Technology Co. for the design, production and sales of Gas Turbine FT-8.

8. Optical products

There is a plant in the province with capacity for producing 3,000 tons optical materials and Hi-Pink complex glasses without alkali per year. More than a million of various series of binocular and telescope products are produced annually.

9. Textile machinery

There are different kinds of advanced textile machinery production lines in 1990s as typical of middle-frequency cup-rotary airflow spinning with annual output of 30 units.

10. Railway locomotive

The province is a host to factories which can produce 3,000 open-wagons and jug-wagons per year.

11. Civilian boats

Different kinds of cruise ships, fishing-vessels and tugboat can be manufactured in the province.

12. Electronic products

Three million color TV sets, 200,000 fax machines and all kinds of communication equipment can be manufactured per year.

13. Refrigeration equipment

Currently the province has the capacity to produce 500,000 refrigeration units for domestic use and for industrial use, such as in fishing vessels.

14. Fuel assemblies for nuclear power

Presently, the province can supply fuel assemblies, for the 300 MW Qinshan Nuclear Power Station as well as for the 900 MW Daya Bay Nuclear Power Plant, built in cooperation with the French SOFRATOME.

With the support of the government and the help of all the companies, the civilian products of Sichuan national defence industry have made strides in the marketplace.

Of course, at the same time, civilian market conversion has benefited from a wide-range of international cooperation. Sichuan national defence industry has built up 77 joint ventures with foreign countries and regions such as USA, UK, Japan, Italy, New Zealand, Thailand, Malaysia, Hong Kong, Taiwan, with foreign direct investment of US\$ 220 million out of a total investment US\$ 690 million.

We can see that more and more foreign corporations and financial groups have been attracted to the broad

marketplace of Sichuan and the technical base of its military plants. The Sichuan national defence industry has not only attracted large funds, domestic and foreign, but also transferred technology and management experiences to the military industry firms which has led to improved quality of products in the military-civilian transition. In the same period, the economies of scale have been achieved and promoted our military-industrial firms rapid steps toward the road of the socialist market economy.

The conversion from military to civilian industry in Sichuan is one the most important items in the Ninth Five-year Plan. In Sichuan foreign investors share the legal protection and preferential policy emanating from the Regulations of Encouragement to Investment for Foreign Traders in Sichuan, approved by the Sichuan People's Congress.

Strengthening International Cooperation to Promote Military Industry Restructuring in Hubei Province

*Shu Zhongyan
Director
Hubei Office of Science, Technology and
Industry
for National Defence*

This paper is divided into three parts covering the military industry restructuring in Hubei and the situation of international cooperation.

The current situation of military industry restructuring in Hubei

In the past 16 years, under the policy guidance of the conversion process founded on the strength of advanced military-industrial technology, the Hubei Commission on Science, Technology and Industry for National Defence has evolved from a small endeavor in research and development where only military products are developed and produced, toward the battle field of the national economy and marketplace. According to the market economy, Hubei advanced the enterprise reform process, reorganized management, adjusted products specifications, exploited products for civilian use, and developed hir-tech industry.

As a result, Hubei achieved a measure of success in the conversion process. In accordance with preliminary statistics, by the end of 1994, out of some 800 kinds of products, there are more than 400 that have been moved into mass production, of which more than 100 products have become successful, and more than 200 products have been awarded achievement prizes by Hubei Province, relevant ministries or the central government. The output of civilian-use products went up from RMB164 million in 1980 to RMB2.36 billion in 1994. An annual average increases of 21%. Some 72% of the output of industries under military control sells in the civilian sector in Hubei.

After careful screening, the focus of future development is on seven main sectors: automobiles and auto-parts, mechanical engineering equipment, shipbuilding, electronic, photoelectricity, fine chemicals, medical equipment, instruments and medicinal drugs. Some of these products such as light-duty trucks, various types of refitted trucks, boats or ships for civilian use, water pretreatment equipment, cigarette making machinery, oil pumps, oil field recovery equipment, welding rods, optical glass and lenses, radio station equipment, nitrotoluene, butadiene rubber caps, vitamin B1, gun targeting for civilian use, etc., have been produced in large amounts and succeeded in the marketplace.

Beginning with the first wave of new civilian products from military-industrial facilities, Hubei, now is in the third way of development, energetically endeavoring to create a batch of new highly profitable, hi-tech products. For instance, deluxe light buses, agricultural aeroplanes, new construction materials for walls, etc., automobile seats and adjusting system, computer disk drivers, mobile communication transmitter-receiver, polyurethane products, thick-wall steel pipes for power plants, etc.

An export drive was present in the program since the early stages. Exports have been growing fast since 1986. In 1994, exports reached RMB320 million. More than twenty

civilian products compose the export portfolio. Markets abroad include the United States, Europe, Hong Kong, South East Asia, etc. There are five factories which are allowed to export-import by themselves, another five factories which are allowed to expand their export.

Thus, Hubei's military industries are steadily earning foreign exchange. Foreign capital is also being attracted. Sino-foreign joint ventures are becoming an important driving force in the conversion process in Hubei. By June 1995, there were more than 30 Sino-foreign joint ventures in Hubei engaging military industries' civilian market projects. The total investment involved is US \$207 million. Currently some US\$56 million has already been invested. Many new products have been or will be manufactured in large scale, such as the "TRAFFIC" car manufactured by the Sino-French joint venture Sanjiang RENAULT Co. Ltd., whose total investment amounts to US\$98 million; mobile communication equipment by the Sino-Japanese joint venture NEC Central China Mobile Communication Co. Ltd.; computerized high density measuring tapes by the Sino-American joint venture Wuhan Advanced Medium Co. Ltd., etc.

As a result of more than 40 years' hard work, Hubei military industry has built a solid foundation in equipment and technology. Hubei offers the three main advantages, as follows:

- 1) Sound human resource and research base, in a variety of specialties. The military side of Hubei military industry covers the following six areas: nuclear, aviation, spaceflight, weapons, ship design and electronics. Among them, there are research and development capabilities in more than 30 fields such as high polymer chemistry, nuclear power engineering, ocean engineering, ship design, computer, automatic control, superconductor, micro light, laser, aviation and spaceflight, all of which are outstanding in China.***

- 2) ***Strong technical human resource base. There are 18 thousand technicians, which constitute 14% of the labor force. Some 83% of technicians have earned vocational or university degrees of various kinds.***
- 3) ***Large fixed asset base. The technical equipment of military enterprises reaches RMB18 thousand per person, which is one third more than that of typical mechanical industries in China. In nearly 30 thousand scientific and technical instruments, there are more than one thousand “large, superior, uncommon” instruments. Many experimental set ups, testing and measuring instruments are of world class.***

After ten years of efforts, military industry restructuring in Hubei can be considered successful. Nevertheless, there is still a long way to go to meet the needs of the development of the socialist market economy in China, to realize the military-civilian integration at a higher level and to work out the advantages and potentialities of the military industry for civilian purposes. Hubei should explore these problems further so that the military conversion to civilian markets can be pushed forward.

Strengthening international cooperation as an important way to realize the restructuring of military industry in Hubei

Peace and development are increasingly desired by all peoples in the world. As in the past, the Hubei Office of Science, Technology and Industry for National Defence will stick to the principle of making peaceful use of military technology to benefit the mankind. It will also firmly develop the cause of conversion from military industry to civilian markets to contribute to the modernization of China. Hubei’s COSTIND 1996 to 2010 development program offers broad

prospects for Hubei's conversion process. The development target is as follows: by the end of this century, the annual output of civilian-use products will amount to RMB18 billion, profits and tax to RMB1.78 billion; in 2010, the annual output of civilian-use products will amount to RMB39.2 billion, profits and tax to RMB5.3 billion.

To realize this development target, firstly, Hubei should be self-reliant. Focusing on enterprise reform, Hubei should deepen the reform, strengthen the management, transfer technology and improve the economy. Hubei should take advantage of the twelve large research institutes, strengthen scientific research and development, accelerate the transformation of scientific achievement into marketable products and give a free rein to science and technology—the first productive force. We should carry out “name brand” strategy, develop a batch of high-quality name-brand civilian products with the strength of Hubei's military industry characteristics, expand the tertiary industry so as to balance the portfolio of products emanating from converted military enterprises, strengthen the vitality and competitiveness of enterprises. Meanwhile, we should further broaden the opening to the outside world, explore and extend international economic exchanges and cooperations.

Therefore, under the guidance of “equality and mutual benefit, cooperation and common development,” Hubei military industry actively participates and develops external exchange and cooperation with various partners, levels and forms so as to import advanced foreign technology and speed up the renewal of products and upgrade of product structure; to attract foreign funds, increase the investment and attain economic impacts on an extensive scale; to introduce advanced foreign management and administrative approaches; reform and enhance management and administration in accordance with international

practices; to expand market space and participate in the ever enlarging global markets.

At present, Hubei hopes that the strengthening of international economic and technical exchange and cooperation should be focused on offering a batch of good projects, attracting foreign investors, to obtain foreign direct investment to initiate joint ventures, cooperative enterprises and transform outmoded enterprises. All of this is done to achieve the aim of “mutual complementary of advantages, mutual benefit and common development.” The main projects are as follows:

1) Machinery (automobile and auto-parts): electrically operated motor car being explored with the broadest market prospects; motor gearboxes with an annual output of 230 thousand; angle modulator and automobile seat for five thousand to one million vehicles; automobiles internal ornaments and middle or small sized punch in part which provide necessary accessories for 150 thousand Renault light cars annually. Besides, there other projects such as motor disk breaks, hydraulic head stock gear, automatic staircase and ships for civilian use, etc. these projects have already been authorized by the State. Some of them have production lines of a certain scale and reliable markets.

2) Electronic industry: optical disk driver, computer software driver, TV program interference increasing and decreasing device, mobile communication radio station and “gold” projects such as gold bridge, gold car, gold pass, etc. Among them, there are:

An optical disk driver: It is one of the fastest developing devices in the computer external storage equipment. The market will be expanded quickly in next several years. With annual output of 200 thousand, the total

investment of this project is about RMB180 million, and the annual output value is estimated to reach RMB1.25 billion, profits and tax RMB350 million. Presently, the driver is being produced in small-scale.

A TV program interference increasing and decreasing device: A great deal of work can be done in this field because China is quickening the tempo to build its information highway. Institute No. 722 has built a production line with an annual output of 50 thousand. It has managed to import advanced foreign technology and to attract foreign funds.

- 3) *Chemical industry: wholly-sealed maintenance-free lead acid storage battery, high polymer compound film, polyurethane furniture, biodegradable regenerated cellulose agricultural earth film etc. Among them, there are:*

Biodegradable regenerated cellulose agricultural earth film. This kind of earth film can be biodegraded by microorganisms present in the soil. Therefore, it can accelerate the growth of crops and save precious resource as well. Some experts predict that this kind of earth film probably can make a revolutionary breakthrough in removing the “white pollution” caused by traditional earth film and thus has a wide application prospect. With the total investment of RMB29.8 million, this project has been listed in the national “production, study and research” engineering plan.

Wholly-sealed maintenance free leads acid storage battery. Institute No. 712, which represents the highest level of lead acid storage battery technique in China, provided the technology for this project. At present, the institute owns a small-scale battery factory whose annual output value amounts

to RMB10 million. The products which have gained a great fame, can hardly meet the demand of markets. Foreign funds are now in great need to enlarge the production scale of this project.

- 4) Medicine and medical equipment: vitamin B, butadiene rubber cork, solid oxygen generators, laser treating instruments, medical high-pressure oxygen cabins for children etc. Among them, there are:**

Vitamin B1: Hashing Pharmaceutical Factory produces 500 tons of vitamin B1 each year. More the 90% of the products are exported overseas, with sales of about US\$10 million last year. The product has a promising market prospect. Foreign funds are required to increase the annual output to 1,000 tons and to make the factory the largest producer and exporter in China.

Butadiene rubber cork: According to the program of National Medicine Administration Bureau, natural rubber will gradually be replaced by butadiene rubber. More than 12 billion corks are needed on the national market but the current production only reach 11 billion even after the first and second term reform projects of the factory. The third-term reform project is planned to increase the output to 6.1 billion by the end of the ninth five-year-plan and to build the largest medical rubber cork factory in China.

- 5) Environmental protection instruments: water purification instruments, hypochlorous acid sodium electrolysis generating devices; hypochlorous acid; system for measurements and tests of large-scale sewage treatment plant.**

The environment and policy of strengthening international

cooperation of the Hubei military industry restructuring program

After the adjustment of the seventh and eighth five-year-plan, the Hubei Office for Science, Technology and Industry for National Defence is now mainly distributed in several large and medium-sized cities such as Wuhan, Xiangfan, Yichang, Xiaogan, Jimen and their suburban areas. The transportation and information infrastructure conditions have been greatly improved. At present there is a golden opportunity to strengthen international cooperation in support of the Hubei military industry restructuring program.

This is provided by projects, such as the development of the Changjiang economic zone; the construction Three Gorges hydropower scheme; the quick rise of Hubei automobile industry corridor; the open cities authorized by the State Council such as Wuhan, Huangshi, Yichang; the Wuhan port with open docks to the world's oceans and the Tianhe International Airport connecting to all destinations worldwide.

In order to create a favorable external environment for the international exchange and cooperation with the Hubei military industry, the Hubei government established policies and measures encouraging and fostering conversion from military to civilian markets. These policies include making the military industry an organic part of the national economy in Hubei, and bringing the products for civilian-use explored by army industry enterprises in line with the State or province developing plan and relevant sectoral plans. The Hubei government actively helps the military industry enterprises choose and adjust the key products for civilian use, develop new products and investment in their development.

In considering priorities, products and formulating plans, the military industry enterprises should be "treated as equal to civilian enterprises, given the

priority in the same occasion and taken into consideration from time to time.” For the project funds brought into line with a State conversion plan, relevant provincial ministries will cooperate to allocate loans to targeted projects; for the military industry restructuring projects authorized by the local government, Hubei Province will provide all the necessary support.

The Hubei Office for Science, Technology and Industry for National Defence wishes to strengthen the exchange and cooperation with other countries, to advance the great cause of world peace and development.

Part II:

International Experiences in Military Industry Restructuring and Public Sector Reform

There are ten papers in this segment. The first paper is Thomas Scheetz's on "the 'Peace Dividend' in Argentina and Chile: An Evaluation of Opportunities for Defence Conversion." This is followed by the article, entitled "Reconstruction and Development Following Armed Conflict: The Case of Eritrea," whose summary is presented, is authored by Naigzy Gebremedhin.

Next come a group of papers on Central and Eastern Europe which begins with a paper by Jack Baranson on "Military Industry Restructuring in Belarus." This is followed by an article by Leonid Efimov on "Military Industry Restructuring in Russia and International Cooperation in the Field of Conversion." Then comes the paper by Wallace B. Bishop, Jr. on "Successful Defence Industry Recovery Projects in Both Eastern Europe and the United States."

Two papers on the USA experience come next. The first is by Mary Ann McGivern, on "Technology Transfer: Applying Military Research to Commercial Industry with Examples of Joint Ventures in Saint Louis, Missouri, USA." The second is by James D. Boyd on "The CALSTART Experience with Programmes Designed to Re-utilize in Civilian Applications, Technologies, Facilities and Personnel Originally Utilized in Defence/Military Applications in California, USA." The experience of the

USA is also covered in the article by Wallace B. Bishop, Jr. referred to above.

Another set of papers registers the experience of Western Europe, beginning with Bernard Reverdy's "International Cooperation in European Countries—Successes, Failures and Future Options," whose summary is presented. Next comes the paper of Duncan Hall on "Conversion of Military Establishments in the United Kingdom." At the end comes the summary of an article by Werner Rech on "From the Nation's Flattop to the Motor of Conversion in Germany."

The “Peace Dividend” in Argentina and Chile: An Evaluation of Opportunities for Defence Conversion^{*}

Thomas Scheetz
Professor of Economics
National University of Quilmes

Abstract

Although similarities and relationships between what is occurring in Europe and the United States certainly do exist, arguments for military “conversion” that are applicable in the North are less so for countries in South America. The concept “conversion” itself implies a rational orienting of the defence sector towards a lower level of “equilibrium.” And this ordered change is just what is lacking in the region and in the two countries directly studied, most especially in Argentina. This is made evident both politically, militarily and economically. In both countries (as in the region) though for different reasons, an overarching integrated government defence policy is absent.

The South American context

In the 20th century South America has experienced repeated military intervention in politics but comparatively few wars. At the same time the continent is a checkerboard of low-level tensions (at times exploding into wars, as in the case of Peru/ Ecuador in 1995) which

^{*} Reprinted from N.P. Gleditsch, et.al., *The Peace Dividend*, 1996, pages 403-423, with permission from Elsevier Science.

remains a heritage of the early 19th century emancipatory period. The result is that most countries' historical enemies are their neighbors on all sides with whom they maintain latent border disputes.

While the *de facto* principal role of the South American armed forces has been the maintenance of internal security, under the leadership of elites who managed to exercise control over the state without sufficient political legitimacy (see Ayoob, 1994 for a good description of this use of the military for rent-seeking), this internal role did not provide sufficient justification for the existence of a (relatively) modern military apparatus. This justification was historically provided by the checkerboard nature of regional relationships and (between 1945 and 1989) by the "communist threat." Latin armies viewed themselves as genuine military (that is, not police) forces whose basic role was the external defence of the nation against these two threats. Thus they adopted offensive military doctrines which also suited their corporate and bureaucratic interests, while increasing their budget.

Using 1980 and 1990 as reference years, Table A (next page) shows Chile leading the rest of South America in military burden, with Argentina a distant second or third. But in real dollar outlays Argentina leads Brazil (the situation was reversed in 1990) with Chile a distant third or fourth in the two reference years. In any case, both Argentina and Chile are traditionally among the most significant military spenders in South America. And both are traditional arms race competitors.

The advantage of the current study is that the database is much better than that of SIPRI or any other international source. Our own military expenditures—milesx—(and other) series were constructed locally from the government accounting agencies in charge of reviewing public sector budget outlays.

Table A: Relative Military Expenditures in South America

	<u>Percent of GDP</u>		<u>US\$</u>	
	<u>millions at 1988 prices</u>			
	<u>1980</u>	<u>1990</u>	<u>1980</u>	<u>1990</u>
Chile	6,700	5,000	1,276	1,183
Guyana	6,500	1,900	47	12
Argentina	6,400	3,300	5,414	2,000
Peru	5,300	2,100	422	421
Bolivia	4,000	3,200	170	181
Uruguay	2,900	2,100	223	169
Venezuela	2,700	2,000	1,485	1,151
Colombia	1,800	2,700	499	1,164
Ecuador	1,800	1,500	147	160
Paraguay	1,400	1,000	57	84
Brazil	1,300	1,700	4,609	4,900
Average	3,700	2,400		

Source: SIPRI 1990, 1992.

Notes: SIPRI discontinued its series on South America after 1990.

The data for Argentina 1990 is really for 1989.

The average expenditure for 1981 was 4.1 percent of GDP.

This paper concentrates on Argentina and Chile, two countries whose military policies are symptomatic of the rest of the continent, and who have been traditional hypotheses of conflict each for the other. Chile spends a high percentage of her GDP on defence, in part because she is surrounded on three sides by historically inimical neighbors (Bolivia, Peru and Argentina) as a result of the War of the Pacific in the late 19th century when she took territory from both Peru and Bolivia. In addition, Chile suffers from a lack of strategic depth (at times only 90 km wide with a length of over 4,000 km). To a large extent, these two factors explain her heavy military burden. Since 1987 Chile has also been the principal arms importer of South America. If and when the Argentine economy improves, this could rekindle the arms race in the Southern Cone.

Both countries are currently paradigmatic for the rest of South America. Both are under democratic regimes (as is all of South America), but civilian control of the armed forces is strongest in Argentina and weakest in Chile. Both are deeply committed to privatization of formerly state-held assets. Argentina has recently taken a very pro-American stance in security and political matters in the region (having recently been granted special ally status by the Clinton administration), while Chile represents a more independent opinion vis à vis Washington in both security and international relations.

In general, South America's importance lies in the immense resources available for the future. It holds one of the world's premier grain belts (the Argentine pampa), the virgin forests of the Amazon basin, fishing banks, minerals, oil (currently the central issue in the conflict over the Malvinas/Falklands), and closeness to Antarctica. In the 21st century shortages in all of the above will increase the importance of South America, and most especially Brazil and the Southern Cone. Defence should be seen in this light.

It is here that doubts arise. Political corruption and social inequalities do not bode well for regime stability in countries like Argentina. Moreover, the Latin armies find themselves without well-defined missions, with increasingly insufficient funding to support their offensive forces. Their growing bureaucratization will tend to make them more corrupt (along the lines of the Paraguayan military). And "collective security," the mission pushed by Washington and Argentina, does not convince the officers, who see that Brazil (confronting the possibility of receiving a permanent seat on the UN Security Council) will probably come to dominate the region.

Reductions in military expenditures

For Argentina military expenditure (miles) reached a real Austral expenditure high in 1981, prior to the onset of the debt crisis and Malvinas War of 1982. The subsequent decline continued with the transition to democracy (December 1983) through 1986, when the Alfonsín Government, never sure of its footing with the military establishment, began to reverse the downward tendency of

the defence budget. In 1988 with the reappearance of serious economic and fiscal problems the downward trend was reinitiated and continued through the initial years of the incoming Menem administration (1989), being reversed only in 1994 in the midst of a notable national economic recovery. But overall there has been a significant decline since 1981 (in both real Austral and budget shares we witness a decline of two-thirds), triggered by a declining economy, *not primarily by the changing international security situation* of the post Cold War era.

This cyclical and downward trend of milex is related to three factors. First, it is directly tied to the economic ebbs and flows of the Argentine economy, being especially constrained after 1982 and 1988 for these reasons. Second, the military corporation was politically susceptible to these reductions due to the defeat suffered in the Malvinas War and especially their conduct of the “dirty war.” Their capacity to influence the budgeting process, though still formidable, was greatly reduced. And third, this lobby capacity was further diminished as a result of external political factors. The demise of the East-West struggle deprived Latin-American military establishments of their fundamental mission, anti-communism. Today they are still searching for a role, and civilian authorities have provided no orientation in the matter. Simply put, Argentina lacks a military policy. This hurts both military morale, defence sector planning and budget lobbying.

Chile’s milex reached a real peso expenditure high in 1987 (when the Pinochet dictatorship faced a probable loss in a plebiscite to determine its continuance in power) and in 1989 after losing the elections and before handing power over to the civilian administration of Patricio Aylwin in March 1990. Straight jacketed by budgetary and political stipulations enacted before the military regime left power, Chile has reacted even more feebly than Argentina to changes in international security realities in the post Cold War era. Chile actually increased its arms acquisitions through the 1990s (data for 1992-1995 are lacking, but informed sources on recent acquisitions indicate large outlays). Indeed, it was (and is) probably the country that spent most on arms since the mid 1980s.

In both countries millex's share in GDP has declined notably over the past decade, due to the spectacular growth of the denominator (GDP), and a significant decline in the numerator in the case of Argentina. This economic growth has been sustained over a longer period in Chile than in Argentina.

Shifts within military expenditures

The reallocation of expenditures deals with percentage (of total expenditure) shifts within millex. In the case of Argentina arms purchases were reduced to zero in the late 1980s and early 1990s. In 1994 they began to grow, although still representing insignificant sums. On the other hand, one notes a growing concentration of millex expenditure in labor costs (retirement and salaries). Personnel costs have displaced other aspects of defence expenditure to such an extent that in the Army budget for 1994 and 1995 over 80% is spent on personnel costs. This implies that the force(s) has very little operating capacity, the budget being spent basically on pay. Consequently, morale is dangerously low among the armed forces.

The other notable growth is registered in shares of millex spent on military retirement. Furthermore, the military, both active and retired, consider themselves badly paid, though their pay scales exceed those of the public education and health sectors, and defence is (until the recent addition of the national civilian retirement system to the National Administration budget in 1994) the largest single government function in Argentina. The doubling of shares dedicated to military personnel and retirement (from 32% of total millex in 1983 to 70% in 1992) carries with the implication that, *rather than a process of "conversion," we are witnessing an institutional collapse.* Or perhaps one could define it as conversion to "unemployment benefits" distributed to the military establishment, because their operating capacity has been reduced to near zero.

This shift in percentage allocation has occurred because the executive and legislative branches of government either have not cared, or were unwilling to face up to the military establishment over what would be a bloody political fight concerning the very necessary military reform required to

convert the armed forces into a useful tool in the actual regional security context. The official policy has been to make no policy, as though “out of sight” were “out of mind.” The result is a military corporation that is very resentful, where those soldiers with alternative economic possibilities open to them abandon the service, and those who remain are found among bands involved in criminal activity with alarming frequency.

In the case of Chile the arms acquisition portion of milex is handled off-budget via a fund which extracts a percentage of public sector copper exports. Astutely the Chilean armed forces have taken loans against future copper earnings, to such an extent that their claim on copper exports has been spent far into the 21st century, thus tying civilian politicians’ hands with regard to the copper fund and with regard to future arms acquisitions (since it would be politically unacceptable to deny the military the tools of their profession during, for example, the 20 years required to pay off the debt against future copper earnings).

Other noteworthy sub-aggregates of Chilean milex are the increasing weight of the military pension system (privatized in 1995), and the declining portion of a defence outlay spent on salaries, the latter are basically the result of the increasing concentration of milex in arms acquisitions.

Shifts from military expenditures to other government functions

The tradeoff of milex towards other functional areas of outlays is also examined for Argentina and Chile. We define a tradeoff between defence and another sector as a situation in which the “budgetary share” of defence moves in the opposite direction to social expenditures (Education, Health, and Other Social Expenditures) or to some other function of government. Our interest is primarily in defence’s displacement of social expenditures (or vice versa), which is to say, a situation in which the military share increases while social expenditures decline. It is left to the reader to note the size of this displacement. If a peace dividend exists, it should be seen here.

In Argentina out of 13 years analyzed a defence-social expenditure tradeoff occurs in 1981, 1982, 1984, 1985,

1989, and 1993. But of those six years, only in 1981 (under the military dictatorship) did defence displace social expenditures. In the late 1980s and early 1990s the beneficiary functions were education and health. But the most favored governmental function from 1984 onwards was debt interest payment.

In the case of Chile, out of 11 years analyzed, a defence-social expenditure tradeoff exists only in 1983, 1989 and 1991. Only in 1989 (the year before General Pinochet left the presidency) does defence grow at the expense of social outlays. If Civilian Social Security outlays are added to the displacement list, we would have to include 1982, 1984, 1985, and 1989. So one must conclude that during the last decade defence grows more at the expense of Social Security payments, a function which alternates with defence as the most important in the government budget. We should remind the reader that in 1980 the Chilean government initiated the privatization of the formerly public retirement system, this transition implied the assumption by the government of the retirees (debits) of the previous system, with only general revenues to cover this function. What might be seen as surprising is the maintenance of social expenditure (Education, Health, and Other Social Expenditures) share at a relatively constant level. The issue of whether defence trades-off with debt repayment cannot be completely analyzed within the Chilean budgetary context because most of the internal and the external debt payments are off-budget in Central Reserve Bank accounts. However, from 1988 onwards, the treasury debt interest outlays increase notably. We should also draw attention to the gains made in our residual grouping of government functions ("Rest of Public Sector"), which expands significantly after 1986. What seems fairly clear in both countries is that in the last thirteen years defence was incapable of crowding out social expenditures. Displacement had occurred very significantly during the 1970s (Scheetz, 1991). In both Argentina and Chile the declining political capital of the military lobby was due more to internal factors than to the change in the international security situation, but the end of the Cold War did have a political impact (though not as significant a budgetary impact in Chile) in both countries.

In both Argentina and Chile there were present countervailing forces (which we will term a “Malthusian effect,” described below) which should have driven miles upwards, if it had been politically possible to do so.

Fiscal economics of base closures and privatization

In the early 1990s the Argentine military lobbied successfully for a position in which the monies gathered from the privatization of military properties or industries would be used by the three service branches for restructuring, instead of passing the monies to the general Treasury fund as it might be logically expected. To date several properties have been sold and practically all civilian products or dual use industries have been privatized. The estimated income from the privatization effort was originally projected at US\$700 million versus a book value of those industries at US\$5,600 million (admittedly, this may be overly generous) (see Ministerio de Defensa, 1991). The funds were to be employed in the restructuring of the Armed Forces. But to date this restructuring has not occurred.

The information on the few base closures is rather anecdotal. The Navy claims that every time it unilaterally took the initiative to close an establishment, in order to consolidate it with another, the Treasury eliminated the base closed from its programme budget, thus denying the Navy the use of those funds. According to Navy sources, after suffering the effect of this tactic a couple of times, it was decided to close no further bases. Thus, Naval reform was partially frustrated by fiscal regulations.

Chile's defence industry was officially denied Treasury support from 1986 onwards. However, we discovered fiscal transfers in every budget year examined. Nonetheless, it is quite clear that a serious (and largely successful) attempt at making the public sector defence industry self-supporting was begun long before the change in the international situation. Perhaps the navy facilities (ASMAR) have been the most successful because of their ability to provide repair services to merchant ships along with construction and repair of navy vessels.

Financial support for industrial conversion and dual-use projects

The World Bank lent funds for stimulating voluntary personnel retirement in both civilian and military privatized Argentine industries (Luzuriaga, 1992). This created a political climate in which privatization became acceptable in Argentina.

The Argentine government's most famous case of conversion has been the Condor II medium range missile project. It was dismantled and destroyed at the insistence of the United States, UK and Israeli governments in the early 1990s. The plant itself was supposed to be converted into a civilian-use space platform technology producer. Government monies to do so have not been significant, and to date the project is more a dream than reality, with the added cost that the human capital reserve built up by the missile programme has largely been dispersed and lost. CONAE (Comisión Nacional de Actividades Espaciales-founded in mid-1991, with much fanfare by both the Argentine and US governments) as the successor to the Condor II programme has had very few practical results. In 1996 its total budget was US\$23.8 million, of which 25.4% was labor cost. Obviously very little R&D is carried on. Moreover, the long-promised NASA launch of the scientific satellite SAC-B was finally and faultily put into a low orbit in November 1996. More positively, Argentina used the acquiescence to Condor II's destruction to gain admittance to the MTCR (Missile Technology Control Regime) club.

Argentina has also converted most of its naval sector to civilian or dual-use. The most significant case (for its failure) was the submarine plant (Astillero Manuel Domecq García), built in the late 1970s with the help of the German firm Thyssen Nordseewerke GMBH. The original agreement was to build two TR 1,700 submarines in the Thyssen plant in Emden, Germany with the following four to be built in Argentina. With fiscal budgetary problems in the 1980s, the Argentine assemblage was suspended. But with the return of growth in the local economy the project was to have been reinitiated. Local Argentine private firms (with Navy

backing) tried to keep the project alive in Argentina, at far lower cost than the German alternative, with the addition of civilian boiler products interspersed with submarine construction and repair. But the attempt failed to generate sufficient political support in the climate of privatization of almost all state productive assets. Domecq Garcia was totally liquidated in 1995. Limited submarine repairs will be handled at the privatized AFNE drydocks.

Another significant privatization effort is taking place in the Fábrica Militar de Aviones. In recent years the production line was capable of turning out just one IA-63 Pampa per month. This German technology (Dornier) plane was presented to the US military as a competitor in the JPATS trainers' competition. It was eliminated in mid-1994 because it was considered too advanced to serve as a trainer. This caused consternation between Argentine politicians and in the Air Force. The local plant was planning on partial inputs into what would have been an "American" plane manufactured in Texas. The bad news was quickly followed by another negative item. The Fábrica Militar de Aviones has been taken over by Lockheed in conjunction with the purchase of 40 A-4 Skyhawks, some of which Lockheed will recondition in Argentina. With the fiscal cutbacks coming on the heels of the Mexican financial crash of December 1994, the Argentine Air Force experienced difficulty in finding funds to pay for the planes.

Efforts at military reform

In Argentina there are three *de facto* defence policies, two supported by civilian politicians and a third by the military (Scheetz, 1995). First, many supposedly progressive politicians (and intellectuals) *implicitly* support the total elimination of the armed forces, based on the feeling that they are no longer needed in the current world situation. Second, the official government position (described previously) is characterized by "indefiniteness" or vagueness concerning roles and missions, such that no joint planning can occur, nor can deployment, size of forces or arms acquisitions be determined. A good example of its effect is the above-mentioned acquisition of 40 A-4 Skyhawks from the United States. The purchase was made in order to

break the arms embargo placed on Argentina during the “dirty war” (1976-1983) and ratified after the invasion of the Malvinas in 1982. The Air Force took no part in the decision. No concern was expressed on the role of these planes. Indeed, at the very moment the A-4s were negotiated, because of inadequate budgetary allocations for operations, the Air Force could not fly or repair its very limited current fleet of planes.

The third implicit defence policy could be termed “chaotic militarism,” that is to say, each of the three service branches separately defines its own missions just as it wishes. This implies maximum deployment and maximum budgetary demands. Thus, for instance, the Navy, until just recently, resisted abandoning its fixation with refitting the aircraft carrier “25 de mayo,” although it was manifestly unable to defend or even maintain it. Neither do we witness any Air Force questioning of the need for a naval air arm. This chaotic restructuring is the direct result of the lack of explicit executive control over the armed forces.

It is in this context that we stated that, rather than rational planning and “conversion”, what we are really witnessing in Argentina is “collapse”. This collapse is not just the result of economic difficulties confronting Argentina (and Chile to a lesser degree) in the 1980s. Its deeper cause is what we refer to as a “Malthusian effect” in defence, whereby a rapid increase in milex (mostly in weapons cost and retirement benefits) confronts less rapid increase in Treasury income.

Developing countries can react to these cost increases in one of three ways. First, they can try to maintain a relatively “modern” force by purchasing second or third generation arms technology. This only lags the effects of technology price increase impacts, and in the end leads to crowd-out of other government functions. The military bureaucracy naturally tends to choose this option.

Second, a policy option of shifting defence expenditures from hardware to labor-intensive tends to over bureaucratize the armed forces, making them incapable of competing with a modern enemy, and in the long run leads to heavy retirement costs. This option also leads either to a praetorian army, or to extreme professional

frustration between the officers' corps and corruption in the Ministry and high command (as is currently the case in Argentina).

The third policy option is to consciously reform the military, limiting missions to those which can be accomplished, restructuring deployment, personnel and arms acquisitions to a more defensive mode. In many countries this would best be done by adopting some form of non-offensive defence (Cáceres & Scheetz, 1995).

Historically Chile has opted very intelligently for older technology, well maintained and well managed by a relatively efficient military. Nonetheless, the Malthusian effect will sooner or later confront the Chilean military and civilian policy makers with difficult options. On the one hand, the soldiers have attempted to guarantee a high level of arms acquisitions by, first, continuously increasing the tax on copper exports, and second, by borrowing increasingly against future (necessarily declining) exports. On the other hand, before handing over power to the civilians, the military passed laws tying the civilian government's hands both in budget and in the area of political control.

The Chilean navy has been attempting to redefine and expand its mission to include the enormous geographical triangle running between the two tips of Chile and Easter Island. Coverage of such a large ocean area would require a much larger fleet. In terms of budget, it would seem obvious that this is beyond Chilean capacity. But given certain service autonomy in the situation of imperfect democratic transition, such inconsistencies are thinkable. The army, under General Pinochet, (Pinochet, 1993) has also publicly defined its own strategic policy, when one would have expected that to be a prerogative of the Executive. The Chilean situation has been less organizationally chaotic than that of Argentina, but the degree of civilian control over the military has been far less.

Chile is currently in a stage where military reform would be considered by the Frei government. However, given the constitutionally supported veto strength of the military (still lead by General Augusto Pinochet), it is doubtful that much significant change can occur in the immediate future, until constitutional change becomes possible with

the evolution over time in voting strengths in the Senate, where constitutional amendments must originate.

Overall for Argentina, though a few ideas have emerged on rapid deployment forces and fewer divisions, no explicit statement of the role of the armed forces exists, with the consequent morale, deployment and training problems. This is the fault of civilian leaders. In Chile, on the other hand, the civilian government is not even permitted to concern itself with these issues, its hands having been legally tied by the outgoing dictatorship. Consequently “conversion” in both countries is far from a rational process leading to a lower level of military equilibrium.

About the author:

Thomas Scheetz (EURAL and the Universidad Nacional de Quilmes) is an American economist, a resident of Peru and then Argentina since 1968. He has written extensively defence aspects of the Southern Cone of Latin America.

References

Ambito Financiero, various issues.

Ayoob, Mohammed, “Security in the Third World: Searching for the Core Variable,” in Norman A. Graham (ed), *Seeking Security and Development: The Impact of Military Spending and Arms Transfers*, Lynne Rienner, Boulder, Colorado, 1994, pp.15-28.

Argentina, Ministerio de Defensa, 1991. “Privatizaciones..”

Cáceres, Gustavo & Thomas Scheetz, eds, 1995. *Defensa No Provocativa: Una Propuesta de Reforma Militar para la Argentina* [Non-Provocative Defence: A Military Reform Proposal for Argentina], Editora Buenos Aires, Buenos Aires.

Clarín, various issues.

Docampo, Cesar, 1995. “El Ambito Aéreo y Espacial en el Campo de la Seguridad” [Air and Space in the Security Field], pp.299-324 in Cáceres, Gustavo & Thomas Scheetz eds, 1995.

Defensa No Provocativa: Una Propuesta de Reforma Militar para la Argentina [Non-Provocative Defence: A Military Reform Proposal for Argentina], Editora Buenos Aires, Buenos Aires.

Luzuriaga, Alfredo, 1992. “The Conversion of the Military-Industrial Complex in Progress in Argentina,” Paper given at Dortmund, Germany, February 25, mimeo.

Pinochet, Augusto, 1993. “Ejército de Chile: Posibles Elementos a Considerar en su Proyección Futura” [The Chilean

Army: Possible Elements to be Considered Regarding its Future Projection], *Fuerzas Armadas y Sociedad*, Santiago, vol. 8, no. 4, pp.19-33.

Pugh, Philip, 1986. *The Cost of Seapower*, Conway Maritime Press, London.

Scheetz, Thomas, 1991. "The Evolution of Public Sector Expenditures: Changing Political Priorities in Argentina, Chile, Paraguay and Peru," *Journal of Peace Research*, vol. 29, no. 2, pp.175-90.

Scheetz, Thomas, 1995. "Opportunities for Non-Offensive Defence in the Southern Cone of South America," Paper given at Copenhagen, February, mimeo.

Stockholm International Peace Research Institute. *SIPRI Yearbook*. Oxford: Oxford University Press, various years.

Reconstruction and Development Following Armed Conflict: The Case of Eritrea

Naigzy Gebremedhin

Summary

This paper describes the struggle of the Eritrean people to assert their statehood, in a prolonged war of liberation which left deep scars in the social economic tissue of society. According to Gebremedhin, “the first challenge which independent Eritrea faces is the successful reintegration of disciplined and politically sophisticated women ex-fighters into a conservative traditional civil society. In this regard, the Association of Women Ex-Fighters and the larger Union of Eritrean Women face a major challenge. On the whole, the extent to which both former men and women combatants are reintegrated into civil society will determine whether peace can be sustained in Eritrea. The sacrifice ex-combatants, men and women, are making to nudge Eritrea along the path of reconstruction and development cannot be expected to continue indefinitely, without a commensurate reward to those making that sacrifice. Here lies the first of the major challenges for Eritrea. The second challenge relates to rebuilding Eritrea’s infrastructure. The formidable struggle for economically and environmentally sustainable development must be won, a struggle that must recognize the long-term needs both of society and of nature. Here lies the second major challenge for Eritrea.”

The third challenge relates to psychological rebuilding. Eritrean society has been torn apart by war and pestilence. The agony of the Eritrean people is not, in the final analysis, so much in the destruction of the economic

infrastructure, in the loss of farm or factory. These can be rebuilt, indeed are being rebuilt, albeit slowly.

One interesting feature in Eritrean society, which will help the process of healing, reconstruction and conversion, is the national passion for consensus building which is “deeply engraved in the national ethos. The village councils (“baitos”) are used for building consensus. A vision that emerged after exhaustive national debate is that through individual and corporate effort Eritreans could build up their country again. There is a national consensus on this vision.” The “baitos” are a form of stakeholders fora and emphasize community involvement and consensus which have been found to be crucial in achieving conversion, as exemplified in McGivern’s presentation, among others.

Military Industry Restructuring in Belarus

Jack Baranson

Abstract

Following the breakup of the Soviet Union, restructuring of military plants was a leading government objective of the Belarus Government. The demand for defence-related products dwindled to less than 10 percent of previous output levels. In order to maintain employment in the state enterprises, a major effort was made to convert output to civilian production. There were widespread requirements to redesign products for civilian markets and modernize plants to a competitive level. The gaps in product design and production efficiency were very large to overcome. To a limited degree, Belarus enterprises attempted to enter into industrial partnerships with foreign companies to assist in their defence conversion efforts. The success or failure of entering into and sustaining business partnerships with foreign companies depended upon a diversity of factors.

Manufacture of cryogenic tanks

Byelocrio (BC), a joint venture established in 1994, began manufacture of cryogenic tanks (pressure containers for liquefied gases). The product introduced by the foreign enterprise group was well beyond the market outreach and production know-how of the Belarus partner working on its own. The partners were an American company, Byelocorp Scientific (BS), an Italian enterprise group, Supco (SU), and the Belarus Design Department of Experimental Production (BDDEP). The plant facility was part of the Institute for Belarus Energy of the Belarus National Academy of Sciences (BNAS), which was

responsible for the design and development of nuclear pressure vessels for the Soviet military. The BDDEP facility had freestanding buildings needed for manufacturing operations, and the required labor-force skills for shaping and welding metal that met Western European technical standards. BC's president was an American scientist specializing in the design of pressure vessels. He had been associated with BNAS scientists and with the SU group in Italy for several years prior to entering into the joint venture and was instrumental in linking up with the involved parties. SU had a small plant in northern Italy that manufactured the line of cryogenic tanks that were to be transferred to the Belarus Facility. Rising labor cost in Italy was pricing SU out of the European market, and they decided to relocate their manufacturing operation to Belarus.

The BC joint venture was up and running within five months and eventually became a highly successful operation. The entire output is for export to the Western European market. A key element in the success of the Belarus venture was the decision to limit procurement and production ("local content") to what was available in Belarus. BC imports the sheet metal used in manufacturing the outer shell of the tanks, the inner stainless steel container, tubing and valves, and electronic controls. These are all components that are not now available in Belarus in terms of quality, price and reliability of on-time delivery to an ongoing operation. Metal-shaping and welding equipment were transferred from the Italian plant. Key Belarus factory personnel were trained at the Italian facility. Supco also set up its own transport company in order to maintain adequate control over the import of required materials and the shipment of expensive and fragile final products.

Success factors in the joint venture

- The foreign partners realistic appraisal of the limitations in Belarus production and procurement capabilities, and the materials and parts that they had to continue to import from abroad.
- The pre-established export market for the factory's output assured demand and provided the foreign exchange earnings to pay for the large import content of the manufacturing operations.
- Operational rapport between Western and Belarusian partners, based on the working experience of the Italian company in the Belarus

market and American partner's connections with the Belarus scientific community.

Motor vehicle assembly

The Ford Motor Company (FMC) signed a joint-venture agreement in May 1996 to assemble two models of FMC vehicles (Escort and Transit). The Belarus partners in the joint venture were LADA OMC (LO), Ford's distributor in Belarus, and the Belarus Ministry of State Property (BMSPP). FMC retained a 51% share in the venture. MSP contributed the use of land and the factory site just outside the city of Minsk.

FMC invested \$20 million to recondition plant buildings and install mostly imported equipment for a relatively small assembly operation (6,000 vehicles annually of which 80% were for export to Russia). Complete semi-knocked-down (SKD) kits are to be imported from FMC plants in Western Europe. The joint venture was exempted from all import and export duties. Ford anticipated investing an additional \$250-300 million for the local manufacture of components and parts, if market demand increased and local conditions warranted.

Success Factors in negotiating the joint venture

- The Belarus Government was anxious to attract high-profile foreign investment in order to demonstrate its efforts to revive production activity and salvage employment opportunities and was willing to grant the tax benefits and import protection that balanced investment with projected returns.
- FMC was anxious to establish an entry base into the Russian market and after considering an alternative investment in Russia, decided that the Belarus site was more favorable.

Co-production of printing equipment

Thermoscan (TS), a Belarus spinoff group of one of the large state enterprises, signed a collaborative agreement (strategic alliance) in November 1995 with Cirrus (CR), a small firm located in New England, to jointly develop and market advanced computer-to-plate printing equipment. TS had been part of Spectrum, a state enterprise group that specialized in laser technologies for defence equipment. TS had branched off to the development of equipment for transferring computer images to a printing plate. TS's laser technology permitted savings in printing

time and cost by eliminating photographic film to produce a printing plate and was cost-effective for low-volume printing jobs to produce high quality copy. TS succeeded in selling a small number of their units to customers in Belarus and Russia, but eventually recognized the necessity to join with a Western partner in order to develop an internationally acceptable product and a competitive production and marketing system.

The alliance with CR provided TS with an American partner experienced in the production and global marketing of comparable equipment. Prior to signing the strategic alliance with TS, CP's CEO spent time in Belarus at the TS facility reviewing in-place equipment and technology; discussing alternative ways to structure and organize working arrangements; mapping out the programme to combine physical and human resources and capabilities; developing a business plan on product development, procurement of materials and components, manufacturing and global marketing logistics; and taking on the responsibility for raising the capital needed to initiate the co-production programme in Belarus.

The U.S. International Executive Service Corps (IESC) had an important matchmaking role in arranging the transnational partnership. Through its offices in the U.S. and in Belarus, the IESC (1) surveyed Belarus industry for candidate companies; (2) surveyed American firms for complimentary interests and capabilities; (3) visited, briefed and selected candidate American firms on the investment opportunity in Belarus; (4) arranged for visits by American companies to the Belarus factory; and (5) acted as intermediary in negotiating a mutually acceptable joint-venture agreement.

Success factors in negotiating the joint venture

- There was a good match between the American and Belarus partners. Thermoscan was anxious to become successful in a competitive environment. Cirrus, with limited financial resources, was looking for a suitable partner to expand its sales into Eastern Europe and the former Soviet republics.
- The IESC made a substantial effort to find an American company willing to consider a business partnership in Belarus and then to assist the two companies in structuring a collaborative arrangement.

Manufacture of glass fiber textiles for export

Steklovolokno (SV) was a leading producer of glass fiber textiles and insulating materials and reinforced plastics for the Russian military aircraft and space industries. The factory was equipped with modern yarn-processing equipment and textile looms imported from Western Europe in the 1980's. After the break up of the Soviet Union, production dropped to 30 percent of installed capacity.

In 1993, an American company, Glass Fibre Enterprises (GFE), entered into an exclusive marketing agreement with SV to adapt output to civilian export markets. GFE succeeded in expanding sales of textiles and yarns to Asian and Western European markets (including export to Japan of glass fiber sleeves for installation on exhaust pipes of Toyota vehicles). GFE provided technical assistance to adapt textiles and adjust looms to new customer requirements. GFE had invested over \$1 million in technical support and market expansion activities.

In 1994, GFE began negotiations to form a joint venture with SV for the modernization and adjustment of the facility to serve expanded export markets. They planned an equity investment and agreed to take responsibility for obtaining the necessary additional financing from international sources. One of the indispensable conditions for obtaining foreign financing was a privatized entity. After nearly a year of negotiations, it became clear that the enterprise would not be privatized. In addition, SV began selling directly to the newly acquired Asian and Western European customers through GFE's marketing expenditures. These activities were in violation of GFE's exclusive marketing agreement. The involved parties eventually fell into mutual recriminations of bad faith and false promises, and negotiations for the joint venture were terminated.

Lessons learned from the failed relationship

- Belarus management undervalued the foreign partner's contribution to the penetration of foreign markets and to the technical support they provided to adjust products and production processes to customer requirements.

- Loss of confidence and trust between the partners over marketing arrangements and the privatization issue.

Local manufacture of medical syringes

Belcare (BC) is an example of the persistent effort of a Western businessman over a four-year period to start a production operation in Belarus. The individual came from Denmark, where he had worked for several years in marketing hospital equipment and supplies. The Danish entrepreneur began in Belarus by marketing imported syringes and other hospital supplies from Denmark.

BC subsequently entered into a joint venture for the manufacture of syringes with a Belarus state enterprise, Elektronika (ET). The Belarus partner provided factory facilities and labor. BC later branched out into the manufacture of diagnostic strips for self-testing by diabetics of their glucose levels. They also were negotiating for the local assembly and sale of heart pacers and hearing aids.

Success factors in the joint venture

- Personality of the Danish entrepreneur, country residence over a prolonged period, and his links with Danish technology and financing sources.
- Trade in imported items provided cash earnings in support of follow-on manufacturing operations.

Production and export of silicon wafers

Kamsil (KC) was a registered joint venture between an American company, Silicon Materials (SM), and the Belarus state enterprise, Kamerton (KM). KC manufactures a range of electronic products, including silicon wafers for microchips production. KM finishes and packs for export to the U.S. 4-inch diameter wafers. Most world demand has shifted to larger-diameter sizes, but there is still a residual world market for the smaller wafers. SM came to Belarus looking for a low-cost procurement source, but was not in a financial position to invest in production facilities. KM had in-place equipment and trained factory skills to produce a world-class product. SM's involvement was needed as a marketing agent and

for the procurement of the high-quality polysilicon material used in the manufacture of the ingots from which the wafers are sliced. Polysilicon material was no longer available from Soviet sources and difficult to obtain in the global market.

Mutual advantages in the joint venture

- The American partner was looking for least-cost procurement, and Belarus had low labor costs and idle capacity.
- Belarus enterprise lacked outreach to the export market and needed an agent to package and sell its product.

Insights from the Belarus experience

- The decision to invest capital and managerial resources is based on projected earnings versus the risks of a failing venture and financial losses.
- The conversion of production from military to civilian markets adds an additional set of uncertainties and risks for a foreign investor.
- Foreign investment and production operations in a state- enterprise economy present other risks and uncertainties, compared to functioning in a market economy.
- Substantial differences between Belarus and Western enterprise cultures and management practices posed special problems in negotiating agreements and in establishing working relationships and an acceptable level of mutual confidence and trust.

Implications for Chinese military conversion programmes

- A marketing and technical support agreement with a Western partner can be a useful stepping stone toward a more permanent joint venture. (See GFE Glass Fiber Textiles). Alternative forms of strategic alliances are other possibilities. (Thermoscan/Cirrus Computer-to-Plate Printing).
- It is worthwhile discussing the business objectives of a proposed Western partner and based on this knowledge negotiate the terms of a joint venture that is of mutual advantage. (See Ford Motor Vehicle Assembly, and Thermoscan/Cirrus Computer-to-Plate Printing).
- A western partner with knowledge and experience in China or a related environment can be an added advantage toward a harmonious relationship (Byelocrio Cryogenic Tanks and Belcare Medical).
- Serious consideration should be give to arrange for a matchmaking mechanism to find and interest prospective Western partners for various forms of business partnerships to assist in conversion programmes. (See Thermoscan/Cirrus Computer-to-Plate Printing).

About the author:

Jack Baranson spent two years (1994-96) as Program Director of Industrial Defence Conversion in Belarus with the International Executive Service Corp. He has participated in industrial missions to China and visited a number of Chinese industrial plants. He was previously a staff economist with the World Bank and International Marketing Manager with the General Dynamics Corporation.

Military Industry Restructuring in Russia and International Co-operation in the Field of Conversion

Leonid V. Efimov
Corresponding Member
International Informatization Academy

Introduction

The conversion of military capacity for civilian use and sustainable development is a new and complex endeavor in the contemporary world. Challenging the accepted path of socio-economic development, military conversion raises conceptual and programmatic issues which require innovative approaches, new forms of expertise and holistic responses.

It has become obvious that military conversion will not yield a much heralded peace dividend overnight. The process has protracted and painful implications for communities now dependent on the military-industrial complex for their livelihoods. Although Russia has the high technologies, well-educated personnel, low labor costs and world-class R&D and manufacturing capacity, the structural obstacles to conversion are more severe than in western countries.

The application of military R&D, know-how, equipment and production facilities for civilian purposes require a substantial change in the economic paradigm of the former military-industrial complex (MIC). In practically all countries, government contracting systems are cost-ineffective. Therefore, the introduction of a corporate management culture and private capital investment in

conversion projects are essential for the establishment of market-oriented cost/quality standards in the sector.

Although managers of the Russian MIC are competent in production planning, manufacturing technologies and industrial engineering, they lack experience in product distribution, advertising, legal affairs, public relations, taxation, union negotiations, accounting, insurance, shareholder relations, environment controls and other skills necessary to compete in a free market.

A radical change in management and corporate culture is needed to overcome these fundamental obstacles. International aid to Russia's conversion process and that of other interested countries, should therefore focus on human and institutional resources development.

Military restructuring in Russia: the current situation

The scale and complexity of the conversion problems that Russia faces have no parallel world experience, in either the scale of the defence complex to be converted, or the impact.

For many years, building up military was one of the key objectives of this country's economic development. As a result, an overblown military-industrial complex absorbed huge scientific and technological potential (up to 900 research and project design organizations), production potential (about 2,000 companies) and a workforce of about five million people.

The collapse of the USSR necessitated the restructuring of the whole management mechanism of the military-industrial complex in Russia. A new approach to the development of this complex was formulated for the transition to a market economy. It combined state planning and administrative regulation with expanding market relations within the military-industrial complex and with other industries of the Russian economy.

The Committee on Defence Industries of Russia was set up in October 1992 and later renamed as the State Committee for the Defence Industries (Goskomoboronprom), with executive powers extended to cover nine ministries and state departments overseeing the production of armaments, military equipment and

conversion issues. In May 1996, the Goscomoboronprom became the Ministry of Defence Industries, but in March 1997, it was downgraded to departmental status within the RF Ministry of Economy.

A number of committees have been set up in the State Duma, including a special sub-committee to deal with problems related to the development of the military-industrial complex.

Several federal non-governmental institutions to promote the development of the military-industrial complex and work on its conversion were set up in 1992. One of these institutions was called the League of Defence Industry Enterprises, renamed in 1994 as the League for Promoting Defence Industries. It comprises more than 700 plants and factories, R&D institutions and design bureaus. There was also the Russian Center for the Conversion of the Aerospace Complex (Rosconversaerocosmos), Uralconversiya.

A number of international organizations were also set up in the beginning of 90s. They include the non-governmental Center for Conversion attached to the CIS Foreign Policy Association and the intergovernmental International Scientific and Technical Center. Russia, the European Union, the United States, Japan, Finland, Sweden, Georgia, Armenia and Belarus are represented at the latter center by international agreement. These bodies deal with specific issues such as marketing of conversion products and training of managers from former military enterprises.

In December 1994, the State Committee of the Russian Federation for Military and Technological Policy was established by Presidential Decree No. 2251 to coordinate the activities of governmental and non-governmental departments and organizations, and of federal and regional authorities; to increase the efficiency of interdepartmental and interregional cooperation in implementing state armaments programmes, conversion of defence industries, and the salvage of armaments and military equipment; and to protect state interests in the area of military and technological cooperation with foreign countries.

The most general problems involved in the management of the Russian military-industrial complex and its relations with other sectors of the Russian economy are handled by the Defence Council and Security Council presided over by the President of the Russian Federation.

A number of legislative and normative acts have been passed to regulate reform of the Russian armed forces and the defence complex as a whole. They include: the Law on Security, the Key Provisions of the Military Doctrine in Russia, the Law on Defence and Conversion, the Law on Defence, the Law on State Defence Orders and others. Fourteen Federal and dozens of regional conversion programmes have been approved.

As an example, the Law on Conversion defines the legal basis for the work of defence-oriented plants and factories, as well as enterprises and organizations connected with them. It also defines relations between the government bodies managing the military-industrial complex and guarantees state protection for the entire workforce during the transition to a market economy. Further, it identifies ways of solving problems that arise out of conversion.

Military conversion in Russia has passed through three phases to date. The first, “declarative conversion”, relates to the period 1988-1990, when the appeals of the former Soviet leadership for conversion were accompanied by purposeful or comprehensible actions. The second period, 1991-1992, referred to as “anarchic conversion” was associated with drastic cuts in Government production orders. The uncontrolled character of this process badly affected all sectors of MIC and brought a great number of defence enterprises to the brink of collapse. Extreme cutbacks in procurement, inadequate financing of the industry and low wages caused major socio-economic dislocation. Millions of skilled workers left plants and design bureaus. Many enterprises elaborated new policies and plans, even though their findings did not always correspond with those of the Government.

During the first stage of conversion (1989-1990), state orders for military equipment and armaments were reduced—a process that paralleled conversion efforts elsewhere in the world. In 1991, more than 460 enterprises and about 200 research and development

institutes and design bureaus were already under conversion and by 1995, the numbers had risen dramatically to more than 930 and 600 respectively. This period also saw the beginning of a decline in the “science-consuming” industries. The slump in industrial output was also evident elsewhere due to a general state of economic crisis. Between 1989 and 1995, civil industrial output fell by 26 per cent. In the aviation industry it had fallen by 48 percent in 1991-1994, and by 56 percent in 1995.

Between 1991 and 1993, defence output fell by 48%. At the same time, commercial output in the MIC fell by 13%. Military production declined by 44% between 1993 and 1994, and commercial production in the MIC, by 41%. (In 1998, military production is projected to be only 6% of the 1991 level). Since 1995, the production output of defence companies has fallen by 21%. In December 1995, the volume of production in the defence industries fell by 39% compared with the previous year. The most severe production declines occurred in four industrial sectors, e.g., shipbuilding, 81.6%; communications, 34.4%; weapons, 34.5%; ammunition, 29.9%. The commercial output of defence companies fell by 43.8% between December 1994 and December 1995, and by 23.2% from the beginning of 1996.

Rates of decline in the output of military and civilian products in the defence complex tend to converge. In 1994, they were 40% and 37% respectively, and in 1995, 21.1% and 23.2%. In previous years, given a sharp decline in military production, the commercial production output of the MIC companies was maintained at a more stable level than in the industry as a whole.

The decline of commercial output is, to a large extent, explained by inadequate financing for conversion programmes and projects. Previously, it was assumed that the conversion of defence companies would take 7-10 years and cost no less than US\$150 billion. But in 1992-1993 allocations amounted to only 117 billion rubles (in 1992 prices). It was planned to assign 4,307 billion rubles for conversion purposes in 1993-1995 (in 1993 prices). According to some estimates, this would create additional capacity for commercial production worth 7,671 billion

rubles. However, inadequate and delayed financing for conversion programmes upset production schedules. In 1993, financing was only 67% of the planned level. By the third quarter of 1994, it was only 50% and the fourth quarter was not financed at all. In 1994, less than one trillion of the planned 5.86 trillion rubles were allocated for conversion. In 1995, financing amounted to just 58 billion Rubles of the planned 1.4 trillion.

In the third and current phase of conversion, regional and local economic restructuring, accompanied by government efforts to introduce task-oriented federal programmes, legal incentives, financial reforms and further privatization, could lead to more balanced and controlled conversion process. However, inconsistent implementations of these macro-level measures, as well as fluctuations in the political and socio-economic priorities of the Government, seriously complicate military conversion objectives.

Privatization has been growing wider in defence industries. By the beginning of 1994, 642 companies, that is, more than 30% of the total, had received permission to privatize. This process has been especially active in aviation, shipbuilding, electronics as well as in arms production. By the end of 1995, 28-30% of the companies and organizations were state-owned and 60-65% had mixed forms of ownership.

As a result of the privatization campaign, companies with mixed forms of ownership produce almost equal volumes of industrial products: 36% is produced by state-owned companies, 34%, by joint stock companies with a state share, and 30%, by joint stock companies without the state's participation.

The scientific potential of the MIC witnesses a different situation. About 70% of its companies belong to the state, 14-15% are joint stock companies, and the rest are private businesses and organizations.

These numbers show that defence companies did not miss the privatization process. At the same time, the military and industrial complex, unlike other sectors of the economy, needs strict control during the process. With this in mind, in April 1996 the President of the Russian Federation issued a decree "On Measures to Ensure State

Control over the Privatization of Defence Companies and Organizations.” It prescribes setting up the Federal Committee at the Government to ensure control over the privatization of defence objects, companies and organizations. The Government would approve lists of the functioning defence companies and organizations forbidden for privatization, and lists of joint stock companies whose controlling interests would remain as state property.

Some 500 plants and factories have been listed as working for defence purposes only and will remain state-owned, at least for the foreseeable future.

A second group of enterprises, also numbering about 500, comprises subcontractors for the first group which also manufacture dual-use products for the civilian sector. They will be about half state and half privately owned, with the State having the larger stake in them.

A third group of about 1,000 enterprises of no special security importance, can be converted and privatized without restrictions.

Under current conditions, the export of manufactured products is an important source of financing for conversion programmes. In 1994, exports of civilian products manufactured by the defence industries were worth US\$460 million, and in 1995, US\$630 million. In 1996, with the strict exchange rate corridor and a 2-3 fold increase in domestic prices (2.5-3 times) the value of exports reached US\$730 million. The growing export market for civilian products of the Russian defence industry demonstrates that they can replace imports and be quite competitive on the world market. But uncertainty as to the development of the industry makes it impossible to change production lines and plan exports from a long-term perspective.

For this reason space services appear more predictable and promising. After the successful commercial launch of the “Proton” rocket in the spring of 1996, (Khrunichev State Space Center), carrying the Astra-1F European telecommunication satellite into orbit, Russia expected to capture 17% of the world space services market by the end of 1996. The transportation of satellites into orbit costs from US\$60 to US\$120 million and can help finance

further development of the Russian aerospace industry and its conversion programmes.

The Khrunichev State Space Center and the Motorola company had a contract to launch rockets, each of which will transport several satellites to the orbit. The first launch was planned for 1997. Realization of this project will also enable Russia to create a global system of mobile satellite communication called Iridium, to be integrated in the world information system. Presently, this Center has several contracts with different companies. President Yeltsin visited the Center in August 1997. Special financial support for the conversion programmes is envisaged in the 1998 RF budget in accordance with his decision.

Another example of Russia's successful conversion export activities is the success of the NPO Energomash (Khimki, Moscow Region) in January 1996 in winning the tender for the first stage engine (RD-180) to be installed in the new American Atlas 2AR rocket. The market for first stage engines is valued at US\$2 billion, and the estimated price of one RD-180 is US\$30 to US\$40 million. The export of aerospace services in 1995 (launch of satellites, transportation of international space crews, devices and equipment to the MIR Station) through the Russian Space Agency earned Russia US\$350 million.

Problems related to investment in the conversion of Russia's defence industry were discussed with President Yeltsin in Energomash and concrete proposals for financial and material support for conversion were formulated. They include:

- Full settlement of state debt to the defence complex, including compensation payments;
- The policy of state protectionism of competitive products both on the home and foreign markets;
- Support of scientific and technological modernization to ensure the competitiveness of domestic products and state security;
- Adherence to the schedule and volume of financing for science-intensive production under the state order;
- State guarantees for loans and international contracts for the hi-tech products of companies under conversion;
- Preferential customs and tax treatment for products exported by defence companies;
- The lifting of customs and export duties for the products of international cooperation in space products.

Arms exports might help the Russian defence-related companies to solve difficult social, labor and economic problems, to find funds for financing conversion programmes and producing civil goods. A number of financial structures have formed financial-industrial groups. For example, the Mig production unit acquired the controlling interest in the Aviabank. At the end of 1995 its share in the bank's capital stock increased to 5.95 million rubles or 29.7%. Now the bank finances 73 defence-related companies. At the beginning of 1996, Aviabank invested more than 186 billion rubles in conversion.

Such mergers in the Russian MIC are likely to go on. It is quite possible for some financial and industrial groups to grow into transnational corporations. Four foreign states have expressed their interest in joining the newly created MAPO State Unified Military and Industrial Complex.

Since 1992, the State Committee for the Defence Industries and other relevant departments and ministries have worked on special purpose conversion programmes. By 1993, "The State Programme of Defence Industries Conversion for 1992-1995" had been approved. It included 14 special purposes Federal programmes of conversion in various industries. The decree of the RF Government dated 26 December 1995, No. 1274 approved the "Federal Programme for the Conversion of the Defence Industry in 1995-1997" (now referred to as the Programme).

The Programme is designed to achieve the following objectives:

a) to change the range of products and modernize facilities for the development and commercial production of hi-tech competitive products for civilian purposes. This includes the full-scale revamping of key national industries to remove the dependence on imports in the following areas:

- Civil aviation;
- Civilian shipbuilding;
- Equipping of the fuel and power complex;
- Science-intensive medical equipment;

- b) To complete the restructuring of the defence industry by creating viable production units and groups of researchers;
- c) To maintain and effectively utilize the scientific potential in aircraft and shipbuilding, and electronics industry for the development of modern materials and production in machine building and instrument-building;
- d) To provide social guarantees to workers formerly employed for military production. This is to be achieved by creating new jobs in civilian production;
- e) To develop export markets for machinery-building products and designs;
- f) To raise private investment for these purposes.

The Programme includes nine sub-programmes, including:

- Civil aviation development (1995-2000);
- The revival of the Russian Navy (1995-2000);
- The development of the fuel and power complex (1995-2000);
- The production of new medical equipment and means of rehabilitating disabled persons (1995-1997);
- Electronics (1995-1997);
- Telecommunications (1995-1997);
- The development of new materials, components and advanced technology for manufacturing hi-tech household appliances (1995-1997);
- The conversion of nuclear power companies (1995-1997);
- The development of equipment for the agro-industrial complex, construction, chemical and light industries, instruments and devices for ecological purposes.

Achievement of these objectives will make it possible to accelerate conversion, to obtain the broad cooperation of the major participants of the Programme, to create conditions for stable commercial output in 1997, to increase production of certain products and to ensure the social security of the former employees.

The Programme envisaged an allocation of 18.6 trillion rubles for 1996-1997, including 7.33 trillion from the Federal budget; a 6.3 trillion loans; and 5 trillion from non-budgetary sources.

It is projected that implementation of the Programme can stabilize commercial production in the defence industries in 1997 and lead to 3-5% growth in the same year. Estimates project growth in aircraft-technology between

1995 and 1996, including the growth in aircraft construction (1.3 times); equipment for the fuel and power complex (1.2 times); shipbuilding (1.4 times). Experts estimate that in 1997 the share of civil products in total production volume will rise to 87%, compared to 78.3% in 1994.

Implementation of the Programme should make it possible to maintain and develop the scientific and technological potential of defence industries and make them competitive internationally.

The decline of military production in Russia has led to the reduction of international tension and the threat of military confrontation and global war. It has also made it necessary for different countries to join efforts in liquidating and utilizing Russia's huge arsenal of nuclear, chemical, and rocket weapons. This task is beyond Russia's present economic and technological capacity. In return, the international community is gaining access to Russian space equipment and technology in such areas as telecommunications, global environmental monitoring, and aerospace prospecting for natural resources.

International participation in Russia's defence industry conversion can help minimize the risk of and uncontrolled and unintended spread of nuclear, chemical, bacteriological and other weapons, to areas of regional conflict or international terrorists.

For these and other reasons, the conversion of Russian defence industries has become an area of broad international cooperation, carried out at multilateral and bilateral levels, through national and international organizations (including NGOs).

Conversion in Russia: international aspects

Conversion in Russia and the world community

The end of the Cold War, the reduced role of ideology in political and economic relations among nations, the removal of opposition between military blocs, progress with nuclear disarmament, the reduction of armed forces and stocks of conventional weapons have resulted in reduced military expenditure globally. The world military

spending peaked in 1987 at US\$995 billion, before dropping to US\$767 billion in 1994 (at 1991 prices and exchange rates), yielding a “peace dividend” of more than US\$200 billion. From 1987 to 1993, the ratio of military expenditure to the Gross National Product (GNP) declined from 5.4% to 3.4% in industrialized countries, and from 4.7% to 3.1 % in developing countries.

Between 1990 and 1995 NATO member states halved their military expenditure, while the reduction in the USA was 2.5 times. At the same time Russia decreased its defence expenditure 33 times. In 1995, the federal budget for national defence amounted to only 6.2% of analogous budget expenses in the USA that same year. The level of military expenditure of the leading Western countries and Russia is shown in the following table:

Table 1
Military expenditure (in US\$ billion) in Russia
and the leading Western states in 1995

Country	GNP	State Budget	Military Budget	Military Expenditures % of GNP	Military Expenditures % of State Budgets	Military Expenditures per capita US\$
Russia	446	91.0	16.7	3.7	18.3	113
USA	7140	1612.0	268.0	3.9	18.0	1054
Germany	2140	300.0	36.0	1.8	12.2	430
France	1400	268.0	43.0	3.2	16.7	739
UK	1133	374.0	34.0	3.2	9.4	575
Italy	1100	406.9	21.0	1.9	5.0	351

The Russian military budget is smaller than that of all the above countries, and especially much smaller than the USA's, in both absolute and per capita terms.

Russia faces the greatest difficulties in the global process of demilitarization. Far from becoming a driving force for economic reform, reductions in military expenditure and production in 1992-1995 placed additional barriers in the way of economic stability and growth. There are several reasons for that. Among them: a high degree of militarization of the economy inherited from the former USSR; an abrupt reduction in Government weapons purchases; an internal economic crisis; the collapse of the Soviet Union, the Council for Mutual Economic Assistance (CMEA) and the Warsaw Pact Organization; a delay in the development of the country's post Cold War military doctrine; a sharp decrease in the world market for weapons and military equipment (from US\$50 billion in 1990 to US\$2 billion in 1995), and the loss of important foreign arms markets. Russia's share of global arms exports shrank in two years (1993-1994) from 21% to 7%, while Western Europe increased its share from 20% to 30.8%, and the

USA, from 49% to 57%. But in 1996, Russia rebounded to the second place, after the USA, as exporter of weapons and military equipment. Between 1990 and 1995, the number of people employed in military production fell globally from 16 million to less than 11.5 million. The impact was especially acute in the Russian Federation, which accounted for 60% of all jobs lost.

Demilitarization of the world's economy and reduced military production resulted from the relaxation of international tensions, and released huge material, financial and human resources for productive socio-economic purposes, locally and globally. However, practical implementation of that goal in Russia is complicated and is taking a long time.

There are two conceptual approaches to conversion globally and they are dictated by the role and place of the state in the process and the ways in which the resources released as a result of demilitarization are reallocated and used.

The first approach is termed "economic conversion" and requires the development of a special mechanism for state regulation of the process. This includes the setting up of federal and local organs for implementation; mandatory planning at company level; the creation of conversion trust funds; and increased state orders for civilian products. This approach is also known as "direct" or "physical" conversion.

The second approach is known as "economic adaptation" and does not require active state regulation. This approach views conversion in the broader context of a new market economy in which the industries concerned do not owe their existence to military contracts alone. Military conversion is seen as a structural shift in production, typical of the economy as a whole with the loss of contracts, the decline of some industries, or losses due to foreign competition. Special mechanisms are not necessary to overcome the side effects.

In the absence of a universal script for conversion in Russia, there is a dynamic combination of both approaches, with "physical conversion" prevailing. This was especially the case in the early stages of demilitarization launched in the final period of "perestroika" in the late 1980s. The approach however is gradually shifting to "economic adaptation" as the market economy of Russia develops. Lack of a clear vision of conversion stems from the absence of a well-developed concept and strategy to manage the process of socio-economic transformation, and the vagueness of its theoretical and methodological basis. Conversion is being implemented on an empirical and pragmatic basis, with due regard to the internal and external political situation and

prevailing socio-economic conditions. Financial and material opportunities are exploited on an “ad-hoc” basis.

Considering its unprecedented scale, nature of development, political, social, and economic consequences, the conversion of the defence sector of the Russian economy has overgrown national borders. Its global significance is due to a number of internal and external factors, some of which pose a real danger to international security.

First, as a result of arms reduction in Central and Eastern Europe, the withdrawal of Soviet troops from this region, the downsizing of the military forces in the former Soviet Union and, particularly, in Russia itself, stockpiles of military equipment have accumulated at depots all over the Russian territory. Because of poorly kept records, inadequate control, inefficient security, and corruption of army bureaucrats, this equipment may find its way to criminal elements, the “hot spots” and areas of tension both inside and outside Russia. The problem is compounded by the large amounts of arms that are kept in warehouses at Russian military enterprises and remain unclaimed because of the lack of financing. Owing to non-payments for finished products on the part of customers and consumers, chronic arrears on wages, etc., the enterprises of the military-industrial complex were forced to look for buyers themselves, while the government lacked an efficient system of supervision and control.

Even now, in the midst of conversion, when proper controls are being established over the sale and export of armaments, there are numerous reports of stolen arms and military hardware. In 1992, in the port of Novorossiisk, authorities detained a train carrying 12 tanks that the notorious ANT concern tried to deliver to a neighboring country. More recently, in January 1996, channels were exposed through which Russian small arms were smuggled via Estonia to Chechnya and Ireland (for the IRA). There are some other examples. Of course, the accessibility of these arms seriously harms both national and international security.

Even more serious consequences result from the illicit production, sale, and proliferation of radioactive materials and components suitable for the manufacture of nuclear arms. Forty-two illegal attempts to take radioactive materials from Russia have been recorded since 1992.

Second, an equality if not more dangerous phenomenon for both internal and international security is the “brain drain” from the Russian military-industrial complex caused by its landslide reduction and hasty restructuring. The world community is particularly concerned with the exodus of scientists and experts, specializing in the development and production of chemical, bacteriological, and nuclear weapons, from the former Soviet republics. It is known that ten specialists have signed

contracts with Algeria, four have offered their services to India, and 50 are working in Iraq. Fourteen nuclear engineers left to work in Iran in 1992. In 1994, they were joined by another 50 engineers and 200 technicians who were offered monthly salaries of US\$5,000 each. Libya has contracted several researchers from the Kurchatov Institute of Nuclear Energy in Moscow to work on a nuclear project in the Gulf of Sidra, promising to pay them US\$100,000 a year. Over 60 former Soviet nuclear specialists (scientists and engineers) are now working in the Israeli nuclear industry.

Russia's nuclear brain drain is directed not only to the Middle East, but also to the Asian-Pacific region. Even in Taiwan, there are 30 specialists who formerly worked in the Russian military-industrial complex.

According to W. Porter, Director of the Center of Russian Studies at the Institute of International Problems (California, United States), about eight thousand Russian specialists in the fields of nuclear technology and material fissions are potentially ready to emigrate because of difficult conditions at home (i.e., unemployment, lack of demand for their professional knowledge and experience, inability to provide a decent standard of living for their families, etc.). The concern felt by the international community over the "brain drain" from the Russian military-industrial complex, particularly, from its nuclear sector, stems primarily from the fact that nuclear technology and other technologies for the manufacture of weapons of mass-destruction may find their way to "hot spots" seats of ethnic and regional conflict, and terrorists. To stop undesirable emigration, it is necessary to guarantee and create more jobs for nuclear scientists and engineers, both in Russia and within the framework of various bilateral and multilateral projects for international cooperation, to secure broad international support for Russian conversion programmes.

Lastly, the concern of the world community is caused by social and labor problems. The collapse of the industrial, scientific, and technological potential of the defence complex have resulted in the falling production of civilian and military goods, layoffs, the disintegration of the social infrastructure, high unemployment, and undesirable migration. Russian society faces inequities between demand for and supply of labor, and the labor and housing markets are deformed. All this, in turn, leads to the rise of social tension and political instability in the country, which is already aggravated by economic problems. Such a state of affairs contradicts Russia's policy of stable economic development and may negatively affect the situation in the country and international stability in general.

Of course, curtailment of military production in Russia helps lower the threat of military confrontation and global wars. However, one has to take into account that, by assisting Russia in conversion of the defence complex, the international community gains access to a huge backlog of up-to-date technologies developed by Russian specialists, including aerospace technologies, that can be used for, among other things, telecommunications, global ecological monitoring, and geological exploration (with the help of aerospace photography). Moreover, the purely economic considerations of a competitive struggle on a crowded world arms market and the desire to restrict Russia's competitive possibilities on this market induce foreign countries to work for more extensive and rapid conversion of the Russian military-industrial complex to civilian production. For these and other reasons, conversion of the defence complex in Russia is a two-way street.

Main areas of cooperation in the field of conversion

The following main areas, related to conversion of the Russian military-industrial complex, can be singled out as areas for international cooperation:

- Control over the sale and proliferation of conventional arms, radioactive materials, and chemical agents that can be used for military purposes;
- Reprocessing and/or destruction of missiles, nuclear weapons, and chemical arms;
- Preservation of the scientific and technological potential of the Russian military-industrial complex for peaceful purposes, including the prevention or maximum possible reduction of undesirable "brain drains";
- Development of the social sphere and solutions for social and labor problems within the framework of Russian conversion programmes and projects;
- Transfer of military industry to civilian production, and joint use of the scientific, technological, and industrial potential of the defence complex for peaceful purposes.

Control over the proliferation of conventional and chemical arms and radioactive materials are carried out on the basis of multilateral agreements, by authoritative international organizations (the United Nations and OSCE, for example), and through bilateral contacts via ministries of foreign affairs, defence, and external trade. The Chemical Weapons Convention, signed in 1993 by Russia and 155 other states in Paris, is an example of this type of cooperation (incidentally, the United States rendered US\$60 million worth of assistance to Russia for the development of a safe and effective technology for the elimination of chemical weapons). It cannot be said that this process is without obstacles. Opposition by the United States to the sale of Russian missile technology to India, the export of Russian nuclear components to Iran, and the construction of a chemical plant in Libya, is widely known.

Under the SALT-1 treaty, the United States and the former Soviet republics possessing missiles and nuclear weapons must destroy the excess number of missiles and missile launchers by the year 2000. In the United States and Russia, this process has already begun. Some specialists believe that it would be more effective economically to convert missiles and launchers to civilian use by employing them to launch commercial satellites under joint international control. In this way, conversion might yield a mutually advantageous “peaceful” effect.

The cooperation directed towards preserving the scientific and technological potential of the Russian military-industrial complex and preventing undesirable “brain drains” has assumed dramatic proportions. An example of the scale of this cooperation is the International Scientific and Technical Center which was opened in Moscow on March 2, 1994. This center finances scientific and technical projects carried out by Russian scientists and specialists, who formerly worked in defence industry, together with their foreign colleagues. An agreement for the establishment of the center was signed by the European Union, the Russian Federation, the United States, and Japan. Later, Sweden and Finland joined these founders as two more financing parties. The center renders financial support to 12,500 scientists and specialists. As of May 1996, the funds allocated for all of the organization’s projects totaled US\$400 thousand.

Other programmes for the preservation of the Russian military-industrial complex’s scientific potential concentrate on providing jobs for Russian specialists at home, on one hand, and arrangements for their training and temporary work abroad on the other. Financial assistance from various foundations (Soros, MacArthur, Fulbright, Mitterand and others), granted for the support of Russian science, mainly under the auspices of conversion projects, has now totaled about US\$700 million. Positive experience has been accumulated in the joint solution of social problems and improvement of the social infrastructure by serving people, who retired either because of the armed forces’ mass reduction or because they formerly worked in the Russian military-industrial complex and are now out of jobs, as a result of conversion in the defence industry. For instance, the German government has allocated DM7.8 billion for the construction of residential housing for the families of servicemen who returned to Russia when their units were withdrawn from Central and Eastern Europe. Twenty-seven settlements (about thirty thousand apartments) have already been built and another six will be completed by the end of this year. The construction was carried out by German, Bulgarian, Turkish, Austrian, Finnish, and Korean firms; 30% of the work was done by Russian companies.

The widest scale as well as a great diversity of forms and methods are characteristic of international cooperation in the transfer of military industry to civilian production and joint use of the scientific, technological, and industrial potential of the Russian military-industrial complex for peaceful purposes. Such cooperation is exemplified particularly well in the aerospace field. In March 1996, Boeing, a well-known US aircraft manufacturing company, signed ten agreements for scientific and technological cooperation with its Russian counterparts. Boeing and the Ilyushin aircraft complex are jointly working on a programme to ensure flight safety; in cooperation with the Russian Institute of Aviation Technologies, Boeing is developing new technologies for building more reliable and economical airliners. Cooperation between Boeing and the Central Aero-hydrodynamics Institute, located in the town of Zhukovskii, is based on eight joint programmes dealing with the problems of an aerodynamics, strength of materials, and acoustics.

In addition to this, Boeing maintains extensive links with Russian aircraft manufacturers. Aircraft factories in Voronezh and Samara supply Boeing with high-quality tools, appliances, and various equipment. Boeing displays interest in Russian know-how in the field of aviation technologies. Three years ago, a scientific-technological center was established in Moscow where Russian scientists work under the direction of managers from the United States. A joint programme has been drafted for co-production of the TU-144LL plane. At their meeting in July 1994, the then Russian Prime Minister Victor Chernomyrdin and US Vice-President Al Gore agreed on the joint development of the SPS-2 aircraft—a plane of the next generation.

In May 1996, at the ILA-96 international aerospace salon in Berlin, two giant aircraft manufacturers—the Russian Aviaprom and the West European consortium Airbus—signed an agreement for joint development and co-production of the A-3XX super-liner, which can accommodate 500 passengers and has a range of 13,500km. The super-liner will be assembled at the Aviastar enterprise in Ul'yanovsk from parts and structural elements manufactured by Airbus.

The sphere of aerospace services is highly promising. Here, the aerospace sector of the Russian military-industrial complex can realize its scientific, technological, and industrial potential most fully and efficiently. This was mentioned earlier on the commercial activities of Khrunitchev State Space Center and NPO "Energomach".

A large part of financing for the conversion of the Russian military-industrial complex comes from the export of arms and military hardware it manufactures. Favorable conditions are now being created for the pro-

export orientation of defence enterprises. Defence enterprises are granted licenses for independent, foreign economic activity. These enterprises are now allowed both to export military equipment which is still in the process of being adopted by the Russian army and work directly on the orders from foreign customers, NATO countries included. If, for some reason, the Russian Army is not interested in a given type of weapon, orders for the weapon may be placed by a foreign military agency. Enterprises may accept orders for the modernization of Russian-made arms and their adaptation to the standards of other armies. However, this approach is permissible only when funds which were earned in this way help Russia remain in the forefront of world military science and develop even more promising types of armaments. With a certain degree of cautious optimism, one can say that the arms export policy has begun to yield positive results. Whereas from 1992 to 1994 the exports of Russian arms remained between US\$1.5 and 2 billion, already in 1995, they had risen to US\$2.8 billion. In 1996, the Russian military-industrial complex expected to earn between US\$3.5 and 3.6 billion and by the end of this century, up to US\$10 billion per year. The Soviet Union annual weapons' exports are of the order of US\$14 billion. These sales peaked in 1987 at US\$20 billion. At present, Russia sells arms to 51 countries, and its major customers are India, China, Syria, and Malaysia.

In 1993, the state-owned company Rosvooruzhenie was established to increase commercial efficiency and ensure more reliable controls in the exports of arms. This company not only helps manufacturers search for buyers, but also assists them in attracting investment. In August 1997 it was restructured in accordance with the Decree of the President of the Russian Federation.

A number of priority measures must be taken to solve the problems of investment support for conversion of the Russian military-industrial complex, participation of foreign capital in this conversion, and creation of a favorable investment climate. These measures include: provision of state guarantees to secure loans and international contracts for the hi-tech products of enterprises undergoing conversion; customs and tax concessions for the export of hi-tech, science-intensive products of defence enterprises; exemption of the products of international space cooperation from customs and export duties.

A mechanism of existing international cooperation in the field of conversion

The breakup of the Soviet Union has brought about the collapse of a highly efficient system of inter-republican labor in the defence complex

and specialization and cooperation in science, technology, and production. As a result, the Russian military-industrial complex has become structurally deformed; this deformation has been rather substantial and, in some cases, even irreversible. Therefore, great efforts are now being made to restore the single scientific and production system, comprising the military-industrial complexes of Russian and other CIS countries, and establish cooperation in the development and conversion of their defence industries.

Russia's relations with defence companies of the CIS are now regulated by 42 agreements (25 intergovernmental and 17 interdepartmental). This legal foundation enables all companies and organizations participating in the development and production of weapons and military technology to work under coordinated programmes (including conversion) without customs duties, taxes and other charges which make cooperation in conversion extremely expensive. Today, the companies which affiliate to the Department of Defence Industries of the RF Ministry of Economy cooperate with 1,033 design bureaux, research institutes and plants of the CIS. In 1996, 440 companies of the Russian MIC received from the CIS countries more than 13,000 kinds of products, including those produced under programmes of cooperation in conversion.

Cooperation with foreign countries outside the CIS, both on a multilateral and bilateral basis, also contributes to the realization of Russia's conversion programmes. It includes large loans from the IBRD, the IMF and the EBRD for programmes of nuclear waste disposal, and the destruction of chemical and rocket weapons. The project "Conversion for Sustainable Development" was implemented in the framework of the UNDP Country Programme for the Russian Federation and executed by the former UNDDSMS, now UNDESA. Financing is also provided for programmes within the framework of TACIS, and employment programmes for Russian scientists and specialists made redundant in the conversion process. This includes housing for retired military personnel.

In bilateral cooperation with the USA, US\$250 million are allocated annually under the Nunn-Lugar programme. In 1995, US\$500 million were allocated for these purposes by the American Overseas Private Investment Corporation (OPIC). The American Fund of Support for Large Companies in Russia under the USAID programme allocates US\$100 million annually to major defence companies for conversion. The total amount of annual foreign aid for Russian conversion in recent years is valued at about US\$1 billion. The challenge is to use this money effectively, to create appropriate organizational, legal and economic

conditions to attract foreign investments in the Russian economy, and in the conversion of the defence sector in particular.

Under bilateral cooperation between Russia and the United States in the area of Russian defence conversion, a definite organizational and legal infrastructure has been formed on the basis of the aforementioned Nunn-Lugar Programme approved by the US Congress in November 1991. Under this programme, large appropriations will be made from the budget of the US Defence Department to promote the conversion of the Russian military-industrial complex. The legal basis of the bilateral cooperation is complemented by the joint Russian-US declaration on defence conversion signed by the Presidents of the United States and Russian in June 1992. Current questions are dealt with by the Permanent Bilateral Commission on Economic and Technical Cooperation (the Gore-Chernomyrdin Commission) formed in 1994. In the organizational structure of cooperation in the field of conversion, the United States is represented by such well-known organizations as the Trade Development Agency, Export-Import Bank, the Business Information Service for CIS Countries (BUSINIS), Special American Business Internship Training Programme (SABIT), etc.

Similar organizational and legal structures are being built to promote bilateral cooperation in the fields of conversion and military technology between Russian and other countries (Germany, France, China, Israel, Hungary, Poland, and Slovakia).

In sum, conversion of the defence sector in the Russian economy does not only have far-reaching internal political, social, and economic consequences for structural transformation and economic reform as a whole, it also markedly affects current processes in the world economy, and the nature and scale of international cooperation. Its dynamics will largely depend on the further progress of Russian society along the road of preservation and strengthening of democratic traditions.

Some institutional, managerial and financial proposals for cooperation in the field of conversion

Financial-industrial groups

International cooperation in the conversion of the Russian military-industrial complex has introduced a number of new economic mechanisms that aid in this process. Foreign investors are increasingly interested in the activity of Russian Financial-Industrial Groups (FIGs), which are formed by the association of industrial enterprises with banking and other financial structures.

The RF Ministry of Economy encourages the organization of joint stock companies and financial-industrial groups. The industry is planning to set up 400-500 large corporations or FIGs in the form of diversified structures, including research and production institutions, sales organizations, banks and insurance companies.

In accordance with the presidential decree signed on December 5, 1993, financial-industrial groups can be created in three basic ways:

Voluntarily, by means of formation of an open type joint stock company, transfer of blocks of shares in trust to one of the participants in the group, or acquisition of blocks of shares by one participant in the other participants. In this case, the group is formed predominantly of enterprises and financial institutions which are privately owned.

Another approach is to set a FIG by decision of the RF government, in which case the participants in the group are federal state enterprises or institutions and organizations financed out of the federal budget.

FIGs can also be set up on the basis of intergovernmental agreements. FIGs may include all kinds of industrial enterprises, with the exception of social and religious organizations. They are composed of state-owned enterprises, joint stock companies, private and semi-private enterprises using dual (military and civilian) technologies. But state-owned enterprises can be members of FIGs only on condition that they belong to a single FIG. FIGs can include industrial companies from Russia as well as other members of CIS. In the latter case, FIGs will be called transnational and intergovernmental. They may also include industrial companies from abroad. In this case, FIGs will be registered as an international group and will be subject to intergovernmental agreements. According to the law on "Financial and Industrial Groups" signed by the President of the RF on November 30, 1995, a FIG is required to form a "leading firm" which is perceived as a legal institution created upon mutual consent by all participants. The basic agreement regarding the formation of a FIG must detail its duties, responsibilities, financial proceedings, directions, field of activities, etc. An FIG's general stock will have no lower or upper limit. As to the legal form of a FIG, it is a joint stock company and performs according to joint stock company rules. That is, such an FIG has a board of directors, executive and technical directors, and the leading company. This leading company should implement the strategic policy of the FIG, which is a general guideline for development, concentration of financial resources and attraction of investments as well as creation of a united marketing service.

To summarize, FIGs may have the following structure: a leading firm, several additional industrial enterprises, design bureaus, banking

institutions (including investment companies and insurance companies), marketing department and export company. At present, we may speak about various FIG structures, since they are still looking for an individual style.

The main thrust for the formation of FIGs in the Russian Federation has been determined by the Federal FIGs Programme for 1995-1997. This programme, which embraces four special-purpose areas, was developed by the State Committee for Industrial Policy, with the assistance of various experts, in the second half of 1995 and was submitted for approval to the government and the President. It encompasses: the fuel and energy sector, the gas and oil complex, the aerospace industry (civil and military aviation), and the agricultural complex including development, manufacture and sale of light industry products. The prime purpose of this programme is to set up FIGs which would manufacture and sell their products on the Russian and CIS markets, later on other foreign ones. Although the federal FIG programme embraces these four priority orientations, it does not exclude formation of FIGs in other areas.

FIGs have to be formed on the basis of two conditions. A FIG is formed as a group of industrial and investment structures closely interconnected on the financial level. Yet, new industrial structures must also belong to a single group.

To enable FIGs to operate on a commercial basis, the government transfers part of its shares in each group to the holding company, or its leading firm. The RF Ministry of Economy will, however, retain a "golden share" which gives it a veto right over changes in the capital structure or strategy of the FIG for a period of three years. The aim is to create a structure with the flexibility, financial resources and organizational independence of a typical Western Corporation, yet ensure that it continues to be effectively controlled by the state.

Nevertheless, FIGs have their problems. First, cooperation between industrial enterprises within a FIG does not seem to be proceeding smoothly as a result of the privatization process which subsequently broke down links between enterprises. Leaders of several FIGs were expected to receive government financial support but were denied it, which led to disappointment and frustration. At present we are observing a different trend—consolidation of financial capital within the frame of the united technological chain. But this is a long and painstaking process. This problem is connected with Russia's unstable economic situation and severe budget deficit. Besides, Russia has an imperfect taxation system which, on the one hand, thwarts enterprises by imposing high taxes while, on the other hand, Russia is unable to collect

them for the federal budget. Should the new Taxation Code, proposed by the government, be approved by State Duma, this situation may change.

The process of FIG formation on the basis of Russian defence companies is held back by lack of investment. Though a number of banks such as Promstroybank, Promradtechbank, Incombank, UNEXIM Bank, Aviabank, MENATEP are actively participating in project financing, "the banking world" on the whole is very reluctant to "enter into contracts" with manufacturers on long term projects.

The currently functioning ones are: the "Vympel" international joint stock corporation, the "NPO Energy" Russian holding company, the "Leninetz" holding company, the "Antei" joint stock industrial company, the "Urals Plants" financial-industrial group and others. It is estimated that their number now amount up to 100. That shows the growth of the private sector real participation is in a production sphere. The majority of the structures being formed at present are often transitional in character and will have to undergo significant further evolution before they become stable formations.

The formation of transnational/intergovernmental FIGs is carried out primarily within the framework of the CIS. The tendency as such is explicit and will undoubtedly be realized. Furthermore, the formation of FIGs takes into consideration involvement of foreign industrial firms. In the future, some FIGs may be transformed into transnational corporations (TNCs), especially in the Russian aerospace industry, which has a number of FIGs in the defence complex and is steadily expanding scientific, production, and cooperative commercial links with foreign partners. One of many such potential TNCs may grow out of the organized State Unitary Military-Industrial Complex (MAPO MIG) in aviation industry. Companies of four foreign countries have already expressed their desire to join this organization.

Creation of large and competitive companies on the basis of financial and industrial groups will be one of the directions of industrial policies and defence companies restructuring. They are designed to activate industrial production, to retain companies' production lines and to restore the disrupted ties between business entities.

Packaging companies

Attracting foreign investments into the former MIC under conversion, Russian has met with some problems. And it is understandable, because these enterprises have 2-10% of military orders and no one foreign investor will finance an enterprise which has military state orders of another country.

So it is of great importance and necessity to create such independent institutional structures that can meet interests of Russian enterprises and foreign companies. Unlike FIGs, whose creation runs into certain difficulties because of the time it takes and requirement for large investments, “packaging companies” is a more flexible corporate form which is oriented towards specific production, does not require drastic technological and organizational changes and, consequently, needs much less investment. Moreover, a packaging company has a guaranteed market for its products and this reduces the economic risks and raises the economic attractiveness of the enterprise for foreign partners. Production costs in such a company are much lower due to the high production and technological level of the Russian partner, high qualification of its personnel—researchers, engineers, technicians, and workers—and cheaper labor.

The developed innovative idea of a “packaging company” as a joint venture would meet the interests of former military enterprises and foreign investors. Suggested as an effective means for easing difficulties in the transition from military to commercial production for gas turbine technology, this approach would become a model for other businesses in Russia and other countries.

We can say that those “packaging companies” are one of the keys to the creation of civil production on the basis of military enterprises, and attraction of investments to this sector. The idea of the “packaging company” is not new in industry, but it is new for conversion programmes of the defence industry. The establishment of joint (Russian-foreign) ventures of the packaging company type holds great promise as a means of giving a “fresh start” to enterprises burdened by welfare and other baggage of the past.

A “packaging company”(PC) will be an absolutely newly established company from a legal point of view. The main idea of the “packaging company” is that the final product will be assembled (“packaged”) from several relatively big units. The PC will order these units from the former military enterprises and then “package” them.

Packaging of modular-combined heat and power (CHP) turbines of 10-12 MW is a very good example:

A “packaging company” could be set up to assemble ready-to-use, module-type gas-turbine plants of varying capacity for sale in domestic and foreign markets. It could be a joint venture with any percent of the stock in the foreign partner’s hands, and the balance in the hands of the Russian partner or partners, private companies, financial institutions, individuals or the government.

The Russian partner would deliver to the “packaging company” the required number of gas-turbine units of a given type and the foreign partner would assemble the final product, drawing on such components as instrumentation etc. to suit the client’s requirements. The output would then be delivered to the client, “ready to use”. The “packaging company” would take care of the marketing, delivery and after sales servicing. It would pay the Russian supplier of gas-turbines for its share in the completed station. Given the interest of the packaging company in the development of Russian gas-turbine units, it might also offer loans or other forms of financing to support their production, or look for foreign investors to cooperate with the Russian producer. Cooperation between Russian and foreign partners in a packaging company might begin early in the production cycle with the design of the station and conclude with sales and after sales servicing and training of the clients’ maintenance personnel.

Unlike a big industrial plant with a complete technological cycle, which requires considerable investment and a long time to overcome institutional difficulties, “packaging companies” are a more agile form of cooperation, which target concrete production lines, do not require radical technological and institutional adjustments and therefore require a significantly smaller investment. With a stable, guaranteed market, they also pose fewer economic risks for the foreign partner.

Leasing

Another promising ways of attracting investment in the Russian military-industrial complex and its conversion involves the leasing of equipment, production lines, machine tools, electronics research apparatus and instrumentation, communications and transportation facilities, construction machines, etc., through banking institutions. Leasing implies a one-off loan for the entire cost of the equipment supplied, so that the producer does not have to go looking for considerable start-up capital. Equipment is more readily obtained through leasing than through the borrowing of credits to buy it. Problems related to collateral are also easier to solve because leased equipment can be withdrawn if a contract is violated.

In this context, a bank itself might invest funds to acquire the necessary machinery and technologies to start new production lines or to revamp existing ones. Leasing gives converted enterprises access to the latest equipment, including foreign hi-tech imports. The enterprises are responsible for commissioning the equipment, servicing it, and training maintenance personnel. The manufacture of high-quality, a state-of-the-art competitive product enables an enterprise to win new markets or

consolidate its position in established markets. When a leasing contract expires, the equipment can be bought at salvage or residual value or even received gratis.

With leasing, companies have greater financial freedom to implement conversion programmes. The problem of depreciation is eliminated completely, as it becomes the lessor's responsibility. The terms of settling the lessee's obligations are also advantageous for the producer, who can make the settlement in money or in kind, at a fixed or floating interest rate, and within a time frame that suits him best. The equipment, including foreign equipment, may be paid for after it has been commissioned or, in some cases, from the sale of the goods produced.

Unlike an ordinary banking loan with their rigid restrictions on the time and size of payments, sanctions for delays and non-payment, leasing is very flexible and determined only by the specifics of the given enterprise and production needs.

The amounts and deadlines for payment are defined when the contract is signed and do not depend on exchange rate or interest rate fluctuations. The value of the equipment is assessed in current prices which remain fixed during the term of the lease. As the leased equipment is on the lessor's books, the enterprise can substantially increase its production capacity without violating the stipulated proportion of its own and borrowed capital. Payments for the leased equipment are included in the production costs, which reduces taxes. There is no property tax on leased equipment because it belongs to the lessor.

There were several legal acts concerning financial leasing in the Russian Federation. The first document was the Decree of the President of Russia No. 1929 dated 17 September 1994 "About Development of Financial Leasing in Investment Activity."

The Resolution of the Government of the Russian Federation No.633 dated June 29, 1995, on the Development of Leasing in Investment Activity formulated the programme of the government on creation of legal and financial secure of leasing business and approved "Temporary Regulation on Leasing."

The Civil Code of the RF which went into effect on March 1, 1996 envisaged the "Agreement on Financial Leasing" and explained regulations. That was the next step in development of legislation in this sphere. More than 100 leasing companies have been registered since then. On the whole, the level of leasing operations by two thousand is estimated by the RF Ministry of Economy at 10-15% of the total investment capital in Russia.

Technology innovation centers

Social problems related to conversion are even more acute at regional level and in some industries in particular. Consider the problems faced now by the so-called “science towns” closed settlements serving defence enterprises and mostly belonging to the Ministry for Defence Industries and Ministry for Nuclear Power and the Academy of Sciences of the former USSR. In these towns, the entire population was closely involved in a specific industry located in the area. There are about 100 science towns in Russia, built between the 1930s and 1960s primarily to deal with specific defence problems. However, they have outlived their usefulness, and existing conversion programmes ignore them.

The impact of cuts in financing for science towns has been dramatic. Scientific schools and centers that take decades to evolve are disintegrating. Expensive equipment is falling apart, the towns’ public utilities and the supply and servicing of infrastructures have been disrupted, and the best cadres of workers are leaving.

There is also a need for conversion of the intellectual potential concentrated in the military-industrial complex. To achieve this, the results of scientific research and design must be handed over to civilian industries. The intellectual potential of the military-industrial complex must be saved and directed toward the development of technologies and products that can compete on the world market.

One of the most promising directions of keeping of scientific, technologic and human potential is to establish the Network of Technological Innovation Centers (TIC) in science towns and at big industrial enterprises which have their own design bureaus and R&D branches.

Recent trends in the global innovation process show that it is moving from industrial estates, science and technological parks, business centers, etc. in the 1970s, towards technological and business incubators in the 1980's-early 1990's, and to technology innovation centers in the late 1990s.

The experience of creation in Russian during the last few years of pure business incubators were not successful. More appropriate to the Russian situation, scientific environment and mentality could be the establishment of TICs.

TIC will represent a number (10-20) of technology incubators (TI)-tenant enterprises (small and medium-size enterprises (SME) and a business incubator (BI).

The TICs will accumulate innovative ideas that were developed in scientific centers. The existing economic environment forced SME to be

more flexible, mobile and aggressive than large corporations. SMEs spent relatively more money for R&D, they produce relatively more inventions, more rapidly introduce them to practice and bring to the market.

The BI provides integrated packages of focused management marketing and technical assistance to tenants, from helping them develop the strategy for the business, through the development of the business plan, and the implementation of that strategy by securing investment and working capital.

The combination of a technology and business incubator is a useful instrument in promoting both the start-up of new enterprises and their survival during first years of existence.

TIC is a cost-effective instrument in the creation of new enterprises and in the development of jobs. There is plenty of experience with TICs in industrialized and industrializing countries. More than 50 were established and are in operation now in China and, of course, the positive and negative results achieved should be taken into account when creating such a network in the Russian Federation.

General recommendations

Institutional development of business oriented capacity building and close cooperation with interested investors/partners, are major conditions for the success of any conversion endeavor.

To achieve this end, the following is proposed to:

a) Policy makers:

- Improvement of Russia's investment legislation, which must secure the achievement of priority targets of conversion;
- Improvement of financial legislation and development of a system of tax exemptions for high priority branches of the economy, including military conversion;
- Promotion of Russian cooperation with potential partners and customers via existing intergovernmental channels;
- The utilization of a considerable part of the aid funds and other sources to provide insurance and reduce risks to Western investors;
- Boosting domestic economic growth and employment, through developing favorable conditions for the financing of small and medium enterprises to prevent the outflow of capital from the country, which will have a positive impact on domestic and direct foreign investments alike;
- Creation of a federal institution for training of trainers for conducting feasibility studies and for developing business plans according to international standards and to arrange a network of its regional branches across the country;

b) Regional authorities:

- Setting up of regional and interregional information and business centers and data bases on research, manufacturing and commercial potential projects, products, companies, etc. as well as world markets, international contacts, relevant legislation, intellectual property rights, forms of all kinds;

- Setting up of Networks of Technology Innovation Centers and “business incubators” for promoting market methods of the operation of new companies and ensuring their survival;
 - Setting up of regional and interregional management schools for training manager of MIC with due regard to the necessity of transition from command and administrative techniques to market-driven management of conversion and production development;
- c) **Russian enterprises undergoing conversion:**
- Creation of competitive financial-industrial groups;
 - Creation of innovative SME including in the framework of TIC;
 - Production diversification while maintaining experienced workforce and using available equipment at maximum capacity;
 - Creation of strong marketing divisions at enterprises and working out marketing and advertising strategies;
 - Creation of “packaging” companies as form of attracting foreign capital;
 - Reliance on leasing as a form of attracting financing for conversion projects;
 - Promotion of business enterprise at factories under conversion through providing favorable conditions for commercial application of spinoff technologies;
 - Application of technologies manufacturing products that can replace imported ones; retraining of personnel in management and marketing;
- d) **International governmental and non-governmental organizations:**
- Assisting relevant institutions, including the private sector, in establishing working contacts, and promoting close cooperation;
 - Setting up of goal-oriented funding for projects aimed at the reallocation of human, financial and material resources in the military sector for sustainable human development;
 - Retraining of executives from defence-related companies, with a focus on marketing and business;
 - Creation of a national institution of experts in feasibility studies and business planning; organization of national centers, global networks and databases on military conversion;
 - Providing credits to enterprises under conversion specifically aimed at enabling them to adopt a “corporate culture” and organize the manufacture of civilian production in hi-tech priority industries;
 - Promotion of further privatization, entrepreneurship, and small and medium businesses in the countries concerned as significant elements in restructuring;
 - Provision of collateral and risk-minimizing measures to capital investors for the joint ventures;
 - Organization of conferences and workshops on selected issues of military conversion for sustainable human development;
- e) **Potential foreign investors:**
- Exploration of innovative forms of business collaboration, capital structuring and risk reduction including the structuring finance system at chosen enterprises;
 - Examination of new types of national and foreign participation in utilizing R&D and production facilities;
 - Calling on national and international organizations to provide insurance and other risk-reduction measures for work in military conversion.

About the author:

Leonid Efimov was Senior Adviser to the Russian Federation Parliament [State Duma] on military conversion matters and industrial restructuring (1997-1998). He was a United Nations Projects Manager from 1995-1997 and an Investment Projects Manager for the Moscow International Energy Club from 1995-1998. Mr. Efimov's professional experience includes the development, implementation and monitoring of international, national and regional programmes and projects in industrial development (aerospace, machine-building communication, power, metallurgy industries) and military conversion.

Successful Defence Industry Recovery Projects in Both Eastern Europe and the United States

Wallace B. Bishop, Jr.

W. B. Bishop & Associates, Inc.

Defence industry was for many communities around the world the center of their employment base. In 1989 they received a severe jolt with the end of the Cold War and dissolution of the Warsaw Treaty Organization, and the breakup of the Former Soviet Union (FSU) in 1991. When the FSU ceased to be a major military threat, the demand for military weapons and stronger military forces became nonexistent. This turned into a global situation, not one relegated to just the United States and Russia. The manufacturers of the weapons and technology of war gave way to the products of peace.

The giant aerospace defence plants in the major metropolitan city of St. Louis, Missouri and in the closed city of Zhukovsky, just outside of Moscow, now have greatly reduced production and employment levels since the end of the cold war. But all is not lost, for new job opportunities are being created by the same firms, or by new companies that have been established in their place, and they are developing new products for new buyers. Even in my home community of Pinellas County, Florida, a former US Department of Energy facility of 92 acres, 800,000 square feet under a roof were purchased for redevelopment by the county for \$2.6 million. The Science Technology and Research Center, an industrial park/incubator, is being developed and marketed to attract business and industry to replace the loss of 2,000 workers. The results of these global efforts have produced results, not only in terms of the job replacement, but in the fact that former defence related facilities are now becoming part of the fabric of the industrial community. Today, there is a more diversified economic base than when the single defence presence was all that there was in the community.

This article covers a number of Federal to Federal international partnership programmes, especially between the governments of the

United States and Russia. It will address a conversion project in the city of Reutov where there was a major focus of the Military Departments and the governments of the United States and Russia. The successful SABIT Programme of the U.S. Department of Commerce (DOC) is discussed. This programme provides for executives and scientists from the Former Soviet Union (FSU) countries to visit and learn from the experiences of business and industry in the United States.

A most successful State to State partnership programme between the German State of Rhineland-Palatinate and the U.S. State of South Carolina began with a focus of community adjustment to military base closure and defence conversion. An overview will be provided on the results of a successful industrial incubator that was funded by the Canadian government in the Russian closed city of Zelenograd just outside of Moscow. And the results of several very successful defence industry projects in the United States will be briefly presented, since the results of those projects are readily transferable to other countries through the implementation of the Economic Adjustment Process that was employed.

Military industry restructuring in Russia

The differences between the Russian “command economy” and the Western countries “free market economy” are so significant that it has made it very difficult to undertake large numbers of successful cooperative and joint ventures with industry. The speed with which the disintegration of the FSU took place, and the urgent requirement to reorient both supplier and purchasing networks greatly complicated the recovery of Russian defence industry. There was a host of problem areas that were factors that hindered efficient movement toward conversion and all played a role during this period. These factors include, but are not limited to the following:

- The sudden and deep drop in state defence orders and loss of export sales;
- The lack of worker mobility of Soviet workers compounded regional problems;
- The attempts to both convert and privatize defence industry at the same time;
- The lack of central government guidance as to future defence production;
- The limited levels of resources for conversion efforts;
- The existence of serious inflation;
- The inability of company managers to accept Western management practices;
- The burden of municipal infrastructures placed on defence companies.

The period right after the collapse of the FSU was a difficult one. Western views were that the Soviet defence industry should disappear quickly and there should be orderly conversion to civilian production. The Russian perspective that was held by many boards of directors and

enterprise managers was two fold: to maintain a strong defence industry capable of both mobilization and security requirements, and to maintain viable military arms export potential. Some company managers were just waiting for the state to again resume production orders. It would take several years until the Western countries, i.e., the United States, Canada and others would develop meaningful programmes to respond to the tremendous needs of the individual countries in the FSU. While there were great needs there were also positive aspects found in Russian industry, such as:

- Large numbers of highly skilled production workers, engineers and scientists existed within the defence industry;
- Significant production capabilities were found in heavy industry;
- Large research labs and technical institutes had significant technical capacity;
- Large defence industrial enterprises could spin off potentially viable small firms;
- Russian workers took great pride in their technological work field.

The State was the manufacturer and the purchaser of weapons, and was responsible for material purchases, shipping, site purchasing, financing, and building. What this meant was that the system was never designed to work in a market economy. The Military-Industrial Complex in the Soviet Union was different from many other industrialized countries due to the heavy emphasis and concentration of defence industries. An interesting aspect of Soviet industry was that a majority of consumer-oriented goods, stoves to shoes, were also produced by these defence enterprises. And while the concept for conversion from military goods to civilian products was in place, the quick disintegration of the FSU and disruption of the entire economy did not allow it to happen.

Cooperation between the USA and the FSU on military industry restructuring

The ongoing relationships between the U.S. Department of Defence (DOD) and the Russian Ministry of Defence (MOD) have spawned many new initiatives over the years since the end of the Cold War. The degree of success that has been experienced to date in facilitating cooperation and assistance in conversion is the result of the US/Russian Defence Conversion Committee (DCC). The US level of participation, which was almost nothing in 1993, was at the level of US\$650 million in 1995. About one half of that went to Russia. It was estimated that in 1995 upwards of US\$600 to US\$800 million worth of existing and potential private investment either was in place or being negotiated. Within the DOD, the initiatives funded by the Nunn-Lugar Programme to dismantle strategic offensive arms, and provide seed funding to help US firms to form commercial joint ventures with selected Newly

Independent States (NIS) enterprises. In addition to the DOD, other agencies engaged in supporting defence conversion programmes were:

- The Department of Commerce published defence business directories to facilitate private investment in Russia, and established the successful SABIT Programme providing for the exchange of industry executives and scientists;
- The Overseas Private Investment Conversion (OPIC) supported finance and insurance assistance for NIS defence conversion efforts;
- The Arms Control and Disarmament Agency (ACDA) supported workshops on the conversion of personnel and technologies from nuclear weapons R&D;
- The Department of Energy through the Industrial Partnering Programme involved Russian weapon scientists and engineers in peaceful activities;
- The Export-Import Bank extended insurance and guarantees and direct loans in support of defence conversion projects;
- The US Trade Development Agency assisted American firms pursuing overseas business by providing funding for feasibility studies to determine technical, and financial viability of NIS projects;
- The US Agency for International Development supported a wide variety of projects in defence industry conversion, in workshops, training programmes and assistance in innovative projects.

The US Office of Economic Adjustment (OEA), located within the Office of the Assistant Secretary of Defence, has played a significant role in the conversion of both base closures and defence industry projects. Upon special request OEA has performed studies and evaluations in both Europe and selected countries of the former FSU. OEA has since 1961 helped over 500 American communities overcome the effects from actions such as the closing of a military base or the termination of a major Defence contract. OEA operates an economic adjustment programme providing technical expertise and financial resources to community organizations. It also serves as a focal point for conversion information on other relevant Federal programme assistance to be applied in a coordinated manner to plan and implement adjustment strategies.

An example of cooperation can be seen when the DOD and the Ukrainian MOD agreed to have an US team of OEA base reuse planning and military experts visit an Army Rocket missile launcher and maintenance facility in the area of Khmelnytsky to conduct a base reuse plan. This effort was unprecedented until that time. A significant defence industry partnership came about through the Gore-Chernomyrdin Commission meeting in 1994. It was proposed that a concerted level of assistance, paralleling what has been accomplished by OEA in the United States, would be pursued in the impacted community of Reutov in Russia. This effort will be presented to show that committed leadership can develop a plan for economic recovery and implementation that can set the stage for economic recovery.

Reutov, one of many closed defence industrial cities, located about 20 miles to the east of Moscow, was selected for assistance to address the challenges of industry and municipal infrastructures associated with defence conversion. In 1955, the State firm NPO Mashinostroenia, the Scientific Production Association of Machine Building (NPO Mash), was established in Reutov.

NPO Mash, the firm that designed and developed rockets, as well as reconnaissance satellite systems, cruise missiles and intercontinental ballistic missiles, is the major employer in Reutov. As far back as the 1980's the firm was required by the State to produce civilian goods. The company produced consumer products like sauce pans, food processing equipment and solar equipment, among many other items. After 1989 when almost 100% of its output was space technology production, the firm started to search out more consumer markets. They looked at the leather industry and opportunities for export sales in equipment to serve that industry.

In 1992, a contract was signed with an Italian firm for technology and equipment for leather treatment for factories. In 1994, the company became a candidate for a DOD joint venture project with Double Cola of the US. The US\$five million project was to renovate a building and establish a soft drink production operation. After three years of effort the project was terminated by mutual agreement, but NPO Mash received considerable insight in doing business in a market economy. Now the firm is considering military sales at 20% of its production, and is looking to increase civilian production for the balance. They are currently pursuing development of fiberglass sailboat construction. Currently the company is working with Hewlett-Packard and Siemens on new projects, and with Lockheed on auto engines.

Due to the drop in state orders for military goods, employment at NPO MASH declined from 20,000 to 5,000 jobs, a 70% loss in employment. Significant losses like this were seen throughout the Soviet block countries, and especially in Russia. It created a domino effect in terms of problems that were created in closed cities across the landscape. Towns like Reutov were also responsible for workers' housing, municipal services, health, education, and all of the usual municipal functions. When the resources dried up from the lack of state military orders, there were also no resources to care for community needs.

Following a series of discussions in Reutov between community leaders, business and MOD officials, a pre-meeting was held to determine how to go about addressing the recovery. It was decided that a highly structured seminar would be held in Reutov, and a list was developed of expected results that included the following:

- Commit to action at all levels of government;
- Determine the role of government ;
- Involve local people in the impact recovery;
- Demonstrate that a market economy can work.

OEA was responsible for putting together the seminar that was held in September of 1996, “The Company Under Conversion and the Community: A Concept of Mutually Advantageous Development.” Participation by upwards of 70 people came from municipal leaders of Reutov, NPO Mash representatives, the MOD, the Oblast, some small businesses, universities and interested citizens. Even the press was in attendance. Each of the major groups made presentations covering the problems they faced as well as identifying their assets. The participants, in both large discussion sessions and small groups started the process of self analysis for developing an economic strategy. An analysis was initiated that looked at the local strength, weaknesses, opportunities and threats (SWOT) to the recovery. A SWOT analysis is a useful tool in defining potential issues, problems, and areas of opportunity. It also focuses on current events in the community and potential hindrances to economic growth from outside and within.

A series of workshops focused on three breakout topics that addressed large scale business development, town development and small business development. All who participated in the sessions came away from the seminar with the feeling that they had accomplished a major first step in the rebuilding process. The following action items and objectives were developed during the workshops:

- Establish an Economic Action Committee to implement the specific recommendations coming from the workshop;
- Develop a Community Plan and Economic Strategy that would develop a community profile and analyze strengths and weaknesses;
- Determine economic and development capacities and an implementation plan;
- Create a Small Business Development Center to help existing small businesses, women-owned businesses, and define needs in terms of business and service providers;
- Establish with an US City a Sister-City relationship with Reutov for an exchange of business development, cultural and educational assets.

In April 1997, there was an exchange of individuals from Reutov to the US to see first hand the work in conversion that had been accomplished. A total of eight people, four from the community and four from NPO MASH made the trip. After a briefing in Washington by OEA personnel, and other government organizations, the group made three site visits to conversion projects. The sites visited were the St. Louis Economic Adjustment and Diversification Committee in St. Louis, Missouri, the Business assistance Center in Fort Worth, Texas, and the

Long Island Defence Diversification Initiative in New York. The group came away from the trip actually experiencing the kind of situation they needed to put in place in Reutov. They were especially impressed with the Business Development Center in Fort Worth, and the municipal developments that had taken place. This kind of exchange is almost always necessary to impress upon people the kinds of actions and programmes that need to be implemented.

The DOC has a program that has been a significant player in the defence industry conversion program. The Special America Business Internship Training (SABIT) Programme, an US Government-Private Sector Partnership, was established to develop long term US and NIS business contacts as a means of facilitating the conversion of defence enterprises. The programme was a setup and funded to help facilitate the exchange of hundreds of NIS defence enterprise experts from Belarus, Kazakhstan, Russia and Ukraine. The focus of the programme included the target industries of: electronics, avionics and aerospace, telecommunications, chemicals/pharmaceuticals, oil and gas, medical devices and equipment, infrastructure equipment manufacturing and environmental technologies.

Individuals selected for the Defence Conversion Training Programme from the NIS Countries included experts from defence enterprises interested in converting from military to civilian productions. The candidates are selected competitively and matched with host US firms in regions that have demonstrated significant diversification from defence production and have complementary conversion objectives with their NIS counterpart. The programme provides comprehensive business management training in Washington, with follow-up on-site training with diversifying conversion companies located throughout the US. It is the dialogue on conversion experiences between the NIS candidate and the American host company that produces a mutually beneficial relationship regarding defence adjustment.

The regular SABIT programme covers the costs for round trip air travel, per diem for food and incidentals. The American host company covers the cost of interpreters, housing, health and accident medical coverage. The host will provide management, production and scientific training for the candidates. On their return home, the individuals should be in a position to encourage contacts between their own, and other NIS businesses, and the US firm generating a climate for future export operations. Within its various SABIT programmes there has been a total of over 1,200 interns visit and work with US firms.

To date over 335 NIS individual candidates have gone through the SABIT Defence Conversion Training Programme, and from the reports

of the companies that have had interns, the responses have been most favorable. For example, a Milwaukee firm, Astronautics Corporation of America, trained four Russian scientists in their method of developing and manufacturing navigation systems in 1994. Since then, the firm has had two additional groups of three interns each. The interns were integrated into the work force just as if they were their own employees. A company representative said that from a personal and business perspective the firm gained significantly from the SABIT programme, in that it improved cooperation with Russian organizations, as well as Astronautics prospects for the future. It has meant the signing of several teaming agreements and technical cooperation with another Russian firm.

Philip Lynch, the Chairman of the Northern Technologies International, Incorporated (NTI) of Minnesota (also Ohio) visited Frank Vargo, U.S. Deputy Assistant Secretary for Market Access and Compliance (MAC), to thank the U.S. Department of Commerce for helping NTI become "the 20th most profitable company on the American Stock Exchange." Lynch has used MAC's SABIT programme to bring Russian scientists to intern with NTI, followed this up with agreements to purchase Russian scientific know-how, and then converted Russian science into marketable products he is selling globally. His sales have mushroomed as a result (since the time of this first SABIT intern, his sales have tripled to US\$21 million), creating profits and jobs in the United States while simultaneously generating valuable hard currency earnings for Russian scientific organizations. Lynch calls SABIT "the best thing Commerce has ever done for small business," and as a member of the board of the American Stock Exchange has offered to have the AMEX publicize and recommend the SABIT programme to all companies listed on the exchange.

A former intern of the SABIT Programme, who returned to his home in Azerbaijan, expressed great pride in being able to establish a branch operation of his host American company as a way to have his own country developed. Another positive result from this programme has been the establishment of Alumni Network Chapters of SABIT in the various former FSU countries in March of 1994. The Ukrainian Chapter was formed in October of 1994 with the commitment to continue ties with returning SABIT candidates and to provide a forum for interns to meet with each other.

Caterpillar Corporation, one of many firms that has entered the Russian market, is working with several former defence enterprises, to form both joint ventures and contract relationships. They found that it was not easy working in Russia, and that it required a considerable amount of

training. But they found great interest in the Russian firms in wanting to work together, and were impressed with the large machine tool capability in Russian companies. They considered using the SABIT programme, but decided to use their own resources to train people at their US facilities.

Cooperation between States in the USA and in Germany on military industry conversion

Just as Federal to Federal partnerships have worked, so also have International State to State relationships. The relationship between the State of South Carolina in the United States and that of the State Rhineland-Palatinate in Germany is similar in nature to the International Sister City Programme. The two states were brought together by the Atlantic Council of the United States for a Transatlantic dialogue to establish productive interaction between two bodies of people. The Atlantic Council, located in Washington, D.C., is a non-profit public policy center that addresses the advancement of US global interest between Atlantic and Pacific communities. It identifies challenges and opportunities and fosters informed public debate through seminars and round tables by bringing together national leaders in different countries to work together on problems of mutual concern. It was at the invitation of the Council that South Carolina, Rhineland-Palatinate, and the State of Thuringen from the former German Democratic Republic (GDR), got together in March 1994 for the first of a series of meetings that would take place on a rotating basis in each of the States. Rhineland-Palatinate and the former GDR State of Brandenburg already had a sister-state relationship and were made a part of the conference series. The theme for the initial workshop partnership was "Swords into Plowshares-Adapting Defence Industry and Military Facilities into the Post Cold War World." The focus of the first series of meetings was on community adjustment to the closing of military bases. All three states had experienced serious impacts from the reduction on major military installations. For example, each of the states had the following impacts:

1. South Carolina

- 1993 Closure of Myrtle Beach Air Force Base;
- 1995 Charleston Naval Base;
- 1989-1996 Significant Defence Industry Reductions.

2. Rhineland-Palatinate

1991-1995 Withdrawal of forces from four major US Air Force Bases;

1991-1996 Withdrawal of significant levels of US Army troops from over 400 sites;

1993-1996 Withdrawal of most French troops.

3. Thuringen

1995 Withdrawal of all Soviet Troops. Due to the fall of the GDR and German Reunification the GDR military forces were demobilized.

During the conference, approximately 15 members representing each state, including those from the Federal level, participated in presentations regarding their approach to recovery, reduction of surplus defence property, response to human resource needs, and personnel training. During the conferences in each country, there were site visits to former military bases. These visits provided an opportunity to hear from local, state and regional officials about their recovery plans.

The conference series that started off with the subject of defence conversion moved onto vocational training and education in 1995. The following year the role of the states in international relations was the topic. The subjects of utility services and economic development will be the focus of the conference which took place in South Carolina in October 1997. This unique partnership among the three states has provided the opportunity for highlighting a variety of topics where there has been a mutual interest. The Atlantic Council was able to set the stage so that people from different countries and states could come together for fruitful discussion in areas where they could learn and grow from their interactive dialogue.

An example of this working relationship can be seen in the efforts of officials of the Hahn Airport in Germany and the Myrtle Beach International Airport in South Carolina to create an air link between their two locations that would include charter and air cargo flights. Since Myrtle Beach is already a tourist recreation location, and given the fact that one hundred German firms have already located in the State, gives impetus to such an undertaking

Overall the visits during the past three and a half years have been serious, direct and focused exchanges of both views and experiences among the participants. One of the tangible results from the defence issue started in 1994 has been the establishment of the Global Aviation Network (GAN). The membership of GAN is made up of former military bases banded together in a cooperative relationship in the areas of marketing, advertising and representation at air show exhibitions, to

provide more efficient means of transporting goods and services, and to further the growth and development of the economies of the individual members and the group as a whole.

Cooperation between Canada and the FSU on military industry restructuring

FSU defence industry conversion programmes were available not only from the United States, but Canada also. The Canadian government had a programme providing technical assistance and industry matching with industry in the FSU. Part of that programme, still in place today and called the Renaissance Eastern Europe (REE), was developed to help Canadian firms prepare themselves to enter the Eastern European and former FSU market. REE was able to support Canadian/Russian joint ventures, training and bilateral agreements. There have been numerous projects in Russia, with many of them having led to successful joint ventures.

The Role of business incubators in military industry restructuring

One of the proven and successful methods for starting small businesses is the small business industrial incubator. There are many examples of incubators in the United States as well as in Europe, of hi-tech, universities related, office incubators and the industrial type. A most successful incubator was funded by Canada in Russia. The Canadian International Development Agency was an active player in such efforts and did fund the successful Sozidaniye Small Business Industrial Incubator Project in the closed city of Zelenograd, located about 25 miles outside of Moscow.

The Mennonite Economic Development Associates (MEDA) organization developed and ran the Zelenograd project. MEDA, which has had a long commitment to support micro enterprise development especially in Europe and in the Soviet block countries, developed and ran the project. It all started when a Christian Business Convention was held in Kiev, Ukraine in 1990 to explore the development of small business support to individuals and small firms after the collapse of the Soviet Union. The response to the conference was very positive and individuals in Russia asked MEDA to help them in setting up small businesses.

Numerous visits were made by Christian Business men, the Association of Christians in Business, to establish training programmes to conduct training sessions for small groups in auto mechanics, tourism and financial services. Training of this type did not exist in Russia since the

start-up of private business was prohibited. It was during this period that individuals from Russia requested that a center be located in their community, and that the concept to establish an incubator in Zelenograd was developed. The Canadian Government, in support of creating long range economic stability, financed the MEDA enterprise Incubator Project with a grant of C\$3.8 million. The project was funded from November 1994 till December 1997.

Zelenograd is a city, with a population of 250,000, which is located in what was the Soviet Silicon Valley, dominated by large computers, electronics and other hi-tech industries. The Sozidanize incubator was opened in 1995, and located in a 18,000 square foot ELMA building where strategic defence components, such as semiconductors and chips were produced. The space for start-up businesses was subdivided for both office and production operations. As it is typical with incubators, shared centralized support functions were provided, such as: fax, photocopying, office machines, conference rooms, mail and clerical services, computers, parking, and security.

An important element of success was having a resident manager to assist tenants, as well as basic business training in how to start, maintain, and operate a business. Each company that located in the Sozidanize incubator could grow to 2,000 square feet, and after that, if they required more space, would have to relocate outside the facility. Today there are over 460 employees working in the project, and it is estimated that 25% of the employees working in the incubator came from defence work. While the project was not started in response to defence conversion, many former defence industry workers were the recipients of jobs through the programme. And the incubator was located in a former defence industry structure.

Production space for start-up businesses in Russia, and the entire Former Soviet Union (FSU) for that matter, is practically impossible to find, especially at a reasonable price. The entire space in the Sozidanize incubator is now full, and a waiting list exists. There are 17 tenants including a bakery which is a hi-tech firm designing computer chips for both analog to digital conversions, a maker of custom draperies, medical equipment design and manufacture, a producer of mayonnaise, a private dental office and a retail clothing store. Approximately two-thirds of the tenants are retail, and service related and one-third is in production operations, which usually provide more employment.

Two significant ingredients to the success of the MEDA project were that Christian values were a part of the training and tenants' relationships, and that the supportive credit programme was available to tenant and non-tenant businesses. Many of the aspects of doing business

in the FSU came come under scrutiny when Christian values were applied to the following: fighting competition, running a business with integrity, dealing with employees, satisfying customers and operating under very restrictive government regulation. Regarding the credit programme, tenants have the opportunity for loans up to US\$9,000 for working capital. A total of US\$235,000 was lent to tenants, with all loans not to exceed 12 months. This allows the small business reasonable limits in terms of time to repay the loan, not like local Russian banks where collateral requirements are high, and loans are only for periods of three to six months. One of the difficult problems in doing business in Russia is the Mafia. Few firms can realistically expect to stay in business today without having to budget several hundred dollars monthly for protection, even though it is not desirable.

There is an association in the US that supports industrial incubation, both in this country and overseas. The National Business Incubation Association in Athens, Ohio (phone number: 614/593-4331) is the known source of information on all aspects of incubators. It has an estimated membership of 630 US members, and 130 members worldwide.

The success of small business incubators can be seen in the recent report of funded projects by the DOC, Economic Development Administration, *Profiles of Fourteen Small Business Incubators*. The common aspect of the success of these projects is that through a Federal grant and local government support, they have avoided high debt service. The majority of the buildings used (10 of 14 projects) were renovated structures rather than new buildings. This does make it easier to raise funds, while not always being cost effective. A third trait was that all were associated with another organization, such as a city, development organization, or a college or university. The establishment of a small business incubator should not be looked at as a profit making endeavor, but more as a break-even operation with the desired end result being to create new businesses and new employment opportunities. An incubator can assist in supporting a wide array of small businesses that may never succeed without it.

Transferable experience of military industry restructuring in the USA

As it was shown in the Reutov conversion project, the same economic adjustment process that worked so successfully in the US may be very applicable overseas. Conversion experiences in the US may not necessarily overlay them on the problems in Russia or in the Ukraine.

They are presented here in the hope that some ideas may be transferable. The OEA adjustment process concept is viable but must be applied with an awareness of the culture and the setting in which it is being presented. The key elements of the process are organization, planning and implementation.

In implementing a successful adjustment programme it is important to move quickly into a planning and conversion mode. This is so that the many workers in a community associated with a company doing defence work will be: one, not without assistance in finding a job, and two, not moving to other locations offering jobs. It is important to establish small business development centers and to move former employees quickly into retraining programmes, and to establish small business industrial incubators to assist new businesses.

The importance of community participation will be seen in the local economic adjustment process in the conversion effort. Emphasis will be placed on the fact that National and State governments can and should provide the initial start-up funding to get the local planning process off the ground. In addition, it is most important to fully involve the private sector in every aspect of the local recovery effort. In addition, agreements between a company, community and the state can bring about significant cooperation and financial assistance. There have been a number of defence industry conversion projects in the US that have been very successful, and the following are four such projects. All four have used the economic adjustment process of organization, planning and implementation.

The St. Louis, Missouri area saw the loss of 16,000 jobs since 1990 with the phase-back of defence contracts by McDonnell Douglas. This impact resulted from both the losses at the parent company, as well as with the many sub-contractors who supplied the aerospace firm. In response, the St. Louis Economic Adjustment and Diversification Committee (EADC) was established to respond to the impact by addressing the areas' dependence on defence industry. The emphasis was to develop strategies to assist displaced defence workers. A "One Stop" Defence Adjustment Office was set up to assist both workers and impacted small companies in the area. A wide variety of programmes were put in place in St. Louis county which included the following:

- Critical Technologies Partnership;
- Management Assistance & Technology Transfer Programme;
- Metropolitan Revolving Loan Fund;
- Procurement Assistance Center;
- Business Development Partnership;
- Manufacturing Technology Education Center;

- Workforce Initiative Partnership;
- World Trade Center for St. Louis;
- Incubator Center for developing small business opportunities.

The small business industrial incubator that was established to respond to the impact was placed in a vacant 15,000 square foot building owned by McDonnell Douglas. It has been instrumental in the start-up of numerous successful small businesses in the region by mostly former company employees.

A study of the industrial base of the City of Fort Worth revealed that, since 1990, it had lost nearly 44,000 jobs. The Fort Worth Office of Economic Adjustment, now known as Strategy 2000, was established and funded by OEA in 1994. A strategy 2000's goal is to create a healthy, diverse and less defence dependent economy supported by business development, emerging technologies, international trade and a world class workforce. In order to carry the goals of Strategy 2000, the following actions have been carried out:

- The Fort Worth Business Assistance Center, a one-stop business assistance center, was opened in January 1995. It provides small businesses with information and assistance from over 115 different service providers in one location. The Center is designed to help existing firms diversify and new businesses get started.
- After studying the future of BioMedical Industry Cluster concentrations, Fort Worth found it had a significant number of biomedical companies that could take advantage of defence technologies employed in Fort Worth. These firms could potentially prosper by being more directly linked. The BioMedical Industry Cluster which sponsors monthly breakfast meetings among interested companies developed a strategic plan for growing this sector of Forts Worth's economy, and considered developing a biomedical incubator.
- With emphasis on manufacturing clustering in the Forth Worth area, the Advanced Robotics & Research Institute (ARRI) promoted technology transfer and worked with firms to promote new technologies and more efficient business practices.
- Upon learning there was a shortage of trained machinists in Fort Worth, Bell Helicopter sponsored a machinist training programme for individuals to receive classroom and hands-on instruction on drill presses, lathes and other machines. Each student was guaranteed a job upon completing the programme.
- The local elected leadership fully supported the economic diversification programme and was very instrumental in energizing the public and private sectors in this initiative. Leadership proved to be one of the key elements of this programme's success.

The Long Island Defence Diversification Initiative (LIDDI), initially a pilot programme for nine defence firms, expanded to serve dozens of defence-dependent companies on Long Island. The diversification methodology, explained in a publication by the LIDDI had relevance for a wide range of defence-dependent and single-sector companies. In addition to the specific methodology for individual firms, the adjustment process implemented and identified significant experiences and valuable lessons learned in the operation of a programme to diversify defence firms.

In the State of Arizona, the Arizona Council for Economic Conversion (ACEC) was established to help defence industries improve administrative and manufacturing operations, and develop strategies for firms diversifying into commercial markets. ACEC conducted operational assessments for small defence firms, including strategic marketing perspectives to allow companies to identify markets, products, competition and resources necessary for product diversification. Some examples of company diversification include:

- A company that manufactured quiet valves for submarines now manufactures bearings for commercial helicopters.
- A company that manufactured breather valves for missile containers now manufactures wheelchair lifts.
- Microwave Cable Assembly is a new production line for a defence company that manufactured wire harnesses for tanks.
- Straps used to tie-down or secure items are now being used by beekeepers in the agricultural sector.

One of the most innovative products to come from the ACEC was the publication of a “self help manual” for small defence firms. Managers of small firms are very reluctant to work with outsiders, or to give information about their business. By using this manual, an owner, or production manager, can see very clearly the various aspects of running a business, and be able to compare defence procedures with those in the commercial world.

A final word on Russia’s military industry restructuring

The process of conversion in Russia of state enterprises from the production of military weapons to non-military goods is taking place. While it is difficult to calculate the overall number of the increases, the fact that unemployment has not matched the decline in production, indicates that the economy is absorbing more displaced workers.

Secretary of Defence William Perry commented on the success of one company in Russia at a national conference of the Industrial College of the Armed Forces in Washington, D.C. in April 1995. He said, “I also saw defence conversion working in Russia when I toured the production facility of a new US-Russian joint venture called Istok. It used to be a major producer of Russian electronic warfare technology. Then we facilitated the formation of a joint venture between an US firm and Hearing Aids International. Now, this joint venture is called Istok Audio International and is making hearing aids. It is geared to producing 2,000 hearing aids a year.”

Given positive growth in the economy of the Former Soviet Union, many companies will find the consumer market an opportunity for

growth. As improved business and economic conditions become more conducive to expansion and are put in place by government, additional stories like this will be told of foreign investors who became interested in new markets in these countries.

About the author:

The consulting firm of W. B. Bishop & Associates, Inc. was established by Mr. Bishop in July 1995 after he retired from the Department of Defence's Office of Economic Adjustment with 22 years of government service. During that time he assisted cities across the United States in organizing, planning, and developing a response to impacts caused by military base closure and realignment. From 1991 to 1995 he participated in numerous site visits and studies in the Former Soviet Union (FSU). Since forming his own company, he has done considerable military base recovery work in Germany.

References

"Building Industrial Partnerships in the Former Soviet Union," address by Dr. William J. Perry, Secretary of Defence, proceedings of a National Conference by the Industrial College of the Armed Forces, Washington, DC, Apr. 19, 1995, pg. 23.

Canadian Department of Foreign Affairs and International Trade, conversation with Ben Gailor, on the Renaissance Eastern European Programme and conversion topics, Aug. 1997.

Caterpillar Corporation, Peoria, Il, conversation with David Wright on joint ventures with Russian firms, Aug. 1997.

"Converting Defence Industry in Nizhniy Novgorod: A Preliminary Analysis," Clair K. Blong & James R Lecky, Industrial College of the Armed Forces, Washington, DC, Nov 1993, pg 8.

"Conversion of Defence Industry in Russia and Eastern Europe," Report 3, Proceedings of BICC/CISAC Workshop on Conversion, 10-13 August 1994, Bonn International Center for Conversion, Bonn, Germany, Apr 1995.

"Cooperative Business Ventures Between U.S. Companies and Russian Defence Enterprises," Center for International Security & Arms Control, David Bernstein, Stanford University, CA, Apr. 1997.

"Cooperative Threat Reduction 'Fast Four' Defence Conversion Projects in the Russian Federation," Center for International Security & Arms Control, David Bernstein, Stanford University, CA, Jan. 1997.

"Defence Industry Restructuring in Russia: Case Studies and Analysis," Center for International Security & Arms Control, David Bernstein, Stanford University, CA, Dec. 1994.

Department of Commerce, Special American Business Internship Training Programme (SABIT), Washington, DC, published materials and conversation with Cherie Whitney, Aug. 1997.

Marketplace Newsletter, March/April 1997 Mennonite Economic Development Associates, Winnipeg, MB, Canada, and conversation with Christopher Shore in Moscow & Bucharest, 1997.

Office of Economic Adjustment, Department of Defence, Washington, DC, published materials, notes and conversations on Reutov workshops and follow-up actions with Virginia Mayer, 1997.

“Profiles of Fourteen Small Business Incubators,” Report by the U.S. Economic Development Administration, Ry John Zinder, Economic Development Representative, Denver, CO, Sept. 1995.

Technology Transfer: Applying Military Research to Commercial Industry with Examples of Joint Ventures in Saint Louis, Missouri, USA

Mary Ann McGivern

Introduction

Technology transfer is the recognition of a bit of applied knowledge that can be lifted from military production and placed in a commercial product. It is difficult. At best, one out of three carefully researched and intelligently placed technologies will succeed. In this paper I want to describe some technology transfers, describe the internal corporate structures that support them, and give some examples of joint ventures that use technology transfer.

The problem is that military firms make fighter planes, tanks, bombs, ships, and ammunition. That is what they make, and that is how company management thinks about the product: the product is weapons. So the chief difficulty is to think differently.

One company, ESCO, makes windshield wipers for F-16s and F-18s. They had to learn that they didn't make windshield wipers. They made small motors that operate reliably under high-stress conditions. It is not easy to teach management to think that their product isn't a part of a weapon but a motor. But once they learned, they could look for new markets to place their product.

Another company, NAS, saw that its tank ammunition was the same size as paper cups. They could use the tooling to make paper cups. It wasn't glamorous, but it was another product. Once they started thinking differently, they realized the tooling could also make a bit for oil-well drilling. So now they had two new products.

Essex Industries produces fighter plane instrumentation and pressure suits for fighter pilots. The company learned to name their products precision controls and high-pressure valves. As a result they sold a joystick to a racing car manufacturer and developed an emergency oxygen delivery system for air ambulance service.

Another firm, Precision Castings, has expanded from specialty aerospace to fine art. Kemco has entered the commercial prototype market. Production Products, a composite material producer, purchased new technology to enter the high quality sporting goods sector.

These are small and medium sized companies in St. Louis, the city where I live. St. Louis is on the Mississippi River. Mark Twain lived there. And McDonnell Douglas Corporation headquarters is there. McDonnell Douglas was bought by Boeing, but for the past twenty years it has been the biggest for-profit weapon's corporation in the world. Most McDonnell Douglas aerospace weapons are made in St. Louis. It is almost impossible for management at McDonnell Douglas to think about their product differently. I'll talk more about McDonnell Douglas later.

Thirty small and medium-sized firms in St. Louis joined a U.S. government-funded programme to develop conversion plans and identify new products and new markets. We didn't call it technology transfer, but that's what they were doing. All the firms did an internal evaluation, using sometimes ISO 9000 or another programme they had already begun with, but most used "Achieving Manufacturing Excellence" out of Ann Arbor, Michigan because it is the most demanding self-evaluation. These companies wanted to prepare themselves to do joint ventures as well as place their own technologies and they understood the need for careful assessment.

We trained a core group of employees in the assessment process. The employees then returned to the company, trained additional team members, and conducted the assessment. In most companies, virtually all of the employees participated in the assessment because management assured them they would not lose their jobs because of negative findings. The result was a detailed profile of strengths and weaknesses with a set of recommendations for improvement that formed the core of a conversion plan. Many then chose an area to begin improvements and started to work, usually with consultants. Nine firms selected a specific project central to conversion, such as introduction of a new commercial product line or development of a strategic marketing plan. Other companies worked on total quality

management which means that there are zero errors. A few companies did on-the-job training for employees or met special needs.

Then most of the companies used Workforce Activity-based Management, designed by Dr. Peter Turney. Here too, success depended on the commitment of the workforce. Employees were trained on how to take apart every activity in each division and assign cost, quality, and amount of time to each one of these activities. The activity could be processing invoices, programming a numerically-controlled tool, training a new worker, even preparing cafeteria meals for the workers, etc. so there are hundreds or thousands of steps. They are taught how to figure out the cost of each step. Then they have to determine what the things are associated with those costs that are wasteful, negative root cause cost drivers.

This detailed exercise opened the eyes of management not only to waste but to where weapons' products carried the extra costs of doing business with the Pentagon. It's the sort of continuous improvement process that we've been talking about for years, and it allows the companies to figure out what changes they want to make first. By the end of the second day of implementation with Dr. Turney, all of the companies were talking about growth.

Training and implementation took about two weeks. As a result, one company reduced its commercial direct labor rate from US\$55 per hour to US\$37 per hour. Because they are not applying military burdens to these rates, they are able to maintain their profit margin. Another small firm, that considered themselves already lean, found US\$60,000 in waste in their operations.

And in a third case, employees documented US\$8,000/year in wasted time spent looking for shop drawings. This was not only wasteful; it was extremely annoying to the workers. They had complained about this problem for several years, but without proof of the actual cost of the problem, management considered the complaints as general griping. Presented with documentation, the owners promptly bought an US\$89 file cabinet and ordered that this work group have their own file copies of their shop drawings.

Finally, and this was the most important part of the retraining process, engineers and management began to see the process and product differently.

For example, ESCO, the one that makes the windshield wipers, was a spinoff of the military division of Emerson Electric. The Chief Executive Officer, Charles Knight, said the military market demanded too much management time and yielded too small a profit. ESCO has gone from 100% military in 1991 to about 68% military today. They

have purchased new technologies, sold some of their technologies, developed new products, found commercial applications for some of their military technologies, and developed commercial markets. In 1991 they were afraid their shareholders would sell if they announced a commitment to conversion, but today they proudly proclaim every commercial percentage increase.

A sadder story concerns a combat boot manufacturer who was asked by a discount retail company to submit a mold for civilian boots. The shoe manufacturer submitted a first mold, and when that was not quite right, designed and submitted a second mold. The retailer took these molds to a firm on the Pacific Rim, ordered production, and never paid the combat boot company a dime.

The case of McDonnell Douglas

The big companies, like McDonnell Douglas, are the saddest of all. McDonnell Douglas has gone from 43,000 workers in St. Louis to 20,000—all making weapons. But the Company holds hundreds of undeveloped technologies that may have commercial applications. They include painting an airplane safely so that toxic fumes are contained; laser research; software application to health care. As far back as 1967, McDonnell Douglas made efforts to diversify by purchasing Douglas Aircraft and to develop conversion plans. Diversification protects the Company, but conversion utilizes the existing site, tools, and workforce. Conversion protects jobs and the economic health of the local community. McDonnell Douglas had investigated conversion to mass transit but decided that in the 70s no community had \$2 billion to invest in subways or light rail. MDC looked at prefab housing, but decided those zoning requirements across the country were so varied it wasn't a field for a multinational. James McDonnell, the founder, was proud of the Company's success in the civilian (albeit government-funded) space programme in the '70s. Later profitable projects focused on missile guidance systems and star wars. And Mr. McDonnell was very proud of McAuto, the commercial computer technology services division that began in 1962. By 1978 it was the Company's fastest growing division, with 500 hospitals as customers. McDonnell had great hopes that McAuto would convert the military technology to civilian purposes. Because the machine tools are driven by computers, McDonnell Douglas can make anything, from carts for crippled children that won't tip over and can climb stairs, to kidney dialysis machines and deep sea mining equipment. But instead of health care products, the Company developed health-care diagnostic software, test analyses,

billing tools, and hospital management programmes. It offered its package of computer time and software to hospitals, nursing homes, medical practices, insurance companies, and pharmaceuticals. Somewhere around 1980, the health care/information system division, now named Vitech, got special impetus when a family member of one of the company's engineers was in a bad accident and needed reconstructive plastic surgery. The engineer recognized that he had better tools available to design F-18 fighters, using three-dimensional computer imaging than the plastic surgeon had to design a face. MDC began marketing its 3-D imaging to the health care industry. Over the next seven years, the Company purchased close to a billion dollars worth of technology, intellectual property rights, and small firms specializing in information systems to expand Vitech. Unfortunately, in its feasibility studies, MDC underestimated both the impact of PCS and the intense software competition. MDC never lost money, but by 1987 the Company concluded that medical information systems would not be profitable enough (especially in comparison with weapons) and began selling off the parts of Vitech. The total income from these sales amounted to more than a billion dollars. In other words, MDC's short-lived conversion effort was profitable, making between a quarter and a half a billion dollars! But now McDonnell Douglas has been purchased by Boeing for its weapons divisions and there are no plans to transfer its military technology to commercial sectors.

I've described technology transfer. But I haven't talked about how to finance it, ownership issues, workforce development, industrial sector development, factors besides worker and management commitment that are internal to the companies, and whether local community attitudes about military production and job creation impact these other issues by shaping public policy.

Local attitudes

I do want to say something about local attitudes. Urban production sites make all kinds of weapons and weapon systems and the technologies they utilize range from primitive to sophisticated. One St. Louis machine shop, John Ramming, has a computer that measures products with an electric eye—but it also has a four-meter square granite table on its own foundation. Every five years a man polishes this table with diamond dust and certifies it as level. Old ways still produce hi-tech products but often government doesn't believe this. As Chinese industry privatizes, international partners will

care about the quality of the product, not how new the machine tools are.

Also, military manufacture creates jobs and brings in cash, but at the same time it drains the local economy of its skilled workforce, its capital (machine tools and money), and its hi-tech process and product. That creates a poor climate for technology transfers and joint ventures. A city needs an industrial base. Then companies within that city are in a better position to engage in international joint ventures.

Joint ventures

Finally, I would like to talk about joint ventures. What happens in the tech-transfer joint venture is that once company places its technology within another company or partners with another company in order to gain access to its technology it is involved in technology transfer. What I have tried to do is describe the internal work a company must do to prepare for joint ventures.

The most interesting kind of joint venture is the flexible manufacturing network. Flexible manufacturing networks (FMNs), developed in Italy after World War II, demonstrate that smaller is more profitable, more satisfying, and better quality. FMN solves common problems and bids jointly within the consortium for jobs that are too big for any company. Manufacturers often have several joint ventures in operation, all at different stages. When a job is completed, the participating firms separate. Everybody learns new methods of production, marketing, accounting, and management. The cross-fertilization stimulates productivity and quality and sales go up. The consortium develops loan packages for its members, seeks new markets, and may house research and development efforts on their behalf. The FMNs themselves can be subsidized by government research grants and other supports. FMN is in a better position than a single company to engage in international joint ventures.

Small manufacturers are finding niches where flexibility, timeliness, quality, and innovation are demanded, characteristics the big firms like McDonnell Douglas just don't have. Instead of supplying discrete parts to the multinationals who dictate terms, FMNs cooperatively manufacture complete components and proprietary products. Their strong horizontal linkages with other job shops balance their vertical subcontracting connections to giant corporations and give them parity in negotiations. Decentralized production utilizes and fosters the skills and initiative of entrepreneurs.

The CALSTART Experience with Programmes Designed to Re-utilize in Civilian Applications Technologies, Facilities and Personnel Originally Utilized in Defence/Military Applications in California, USA

James D. Boyd
Managing Director, International Consulting
CALSTART

Background: an overview of CALSTART

CALSTART is a unique nonprofit consortium of nearly 200 companies and organizations formed to develop an advanced transportation technology industry and markets. It does this by providing key industry services that bring together people, technologies and resources to bridge the gap between technology development and the marketplace. CALSTART's diverse worldwide participants represent a unique and valuable linked network of skills and resources. That network includes hi-tech electronic and defence firms, entrepreneurial development companies, electric and natural gas utilities, vehicle makers, transit districts, universities and public and private research laboratories.

CALSTART is a strategic broker for an industry, its companies and its technologies. It provides a core level of services to participants and augments that with additional custom offerings to help companies bring their products to market. CALSTART is able to tap a strong industry expertise base leveraged from years at the forefront of innovative technology development. CALSTART helps to create strategic partnerships, find applications of technology solutions,

design vehicle implementation programmes, organize and manage focused technology development programmes and provide key industry and market information and assistance. CALSTART operates two business incubators for qualifying small and start-up companies.

CALSTART was created to address the need for solutions to burgeoning transportation and air pollution problems in California by utilizing new advanced technology transportation solutions. This was seen as a way to both create new jobs to offset those being lost due to the downsizing of defence industries and to re-utilize the hi-tech facilities being closed down. To this end, CALSTART and its participants have created and operated more than 100 interrelated technology and infrastructure development and demonstration programmes, worth more than US\$110 million. All programmes focus on technologies with near-term commercialization potential and work to advance components and vehicles in the electric, hybrid-electric, natural gas and Intelligent Transportation Systems (ITS) arenas. All new programmes are designed to incorporate and leverage the base of knowledge built in previous ongoing programmes thereby contributing to the rapid pace of innovation. Information sharing is a key to success.

CALSTART works with governmental agencies as partners but it itself is a private organization. Its budget comes from the services it provides, the programmes it helps create and manage.

Transportation infrastructure as a model: a problem needing a solution and an area that are amenable to use of technologies, facilities and personnel that have been dedicated to defence applications

Mobility is not only a highly treasured individual privilege but is an absolute necessity of commerce and economic development in today's world. Because of increasingly large national populations and a growing trend of people relocating from rural settings to urban centers in pursuit of jobs and economic prosperity, "mega-cities"—cities with huge populations are emerging at an unprecedented rate. The resultant traffic congestion and air pollution have become major problems.

More nations, both developed and developing nations, are struggling to provide the necessary infrastructure to meet the growing transportation needs of individuals and to provide for the efficient

movement of goods. An adequate transportation infrastructure is crucial to sustaining economic growth. Traditional technologies and approaches will not keep pace with these transportation and growth demands. Historically, increases in capacity have been negated by latent travel demand. What is required are solutions that leap over conventional technology. Decision-makers must not only consider whether new technologies are needed to address both the transportation and environmental problems, but which technologies would best address these problems.

Efforts to find solutions to these problems generally carry a high priority in most countries. However, generally there are significant overarching questions and policy debates on the ways and means of being able to provide sufficient national resources to address these issues.

As it has occurred in the United States, China too may be in a unique position to take advantage of the opportunity and the need to address transportation and air pollution problems while also addressing the pressing question of how to facilitate the conversion of military/defence resources including manpower, facilities and equipment to civilian/domestic purposes. In the State of California, and eventually in all parts of the United States, these issues and questions challenge government officials and decision-makers. California moved aggressively to demand that pollution from cars, trucks and buses be reduced significantly and called for the use of electric vehicles as well as cleaner burning fuels in motor vehicles to address its air pollution problems. But California and the U.S. as a whole still face the issue of needing to improve and modernize the approaches being taken to facilitate the mass movement of people. Historically, most efforts were too small, under funded and did little to advance technology or make use of means other than the private automobile.

This activity, calling for cleaner cars trucks and busses, was coincident with the beginning decline of the U.S. defence industry and the downsizing of the U.S. military. There was a recognition that something would have to be done to provide new jobs to offset the decline of jobs in defence and aerospace. California was particularly hard hit. Transportation was targeted as an area for technological improvement and for business growth.

In 1992, major California business leaders from aerospace, defence, electric and natural gas utilities, joined with transit agencies, state and local government and environmental leaders to form the private, non-profit CALSTART consortium. The objective was to advance

transportation technologies in an effort to create jobs, stimulate and revitalize state and local economies, clean the air and solve transportation problems, e.g., congestion. Subsequent to this action the U.S. Government created programmes through several federal transportation programme agencies and military defence related agencies to aid and facilitate these efforts. Eventually six similar advanced transportation technology consortia were formed in other regions of the U.S.

Of particular significance to this round-table gathering was the creation of programmes with funding to provide for partnerships between these consortia and the federal government specifically for the purpose of finding applications for military/defence technologies for transportation needs in the civilian sector. The U.S. Defence Advanced Research Projects Agency has become a major supporter of projects aimed at converting aerospace and military technology to practical transportation applications for civilian use. CALSTART has managed, and continues to manage, a wide number of projects carried out by major American companies as well as small “hatchery” companies all oriented toward developments for transportation uses. The following listing provides examples of some of the types of technologies that CALSTART and its partners have taken from military/defence applications and applied to meet transportation technology needs in the civilian economy.

Examples of Military to Civilian Technology Conversions by CALSTART

<u>Technology</u>	<u>Military Use</u>	<u>Civilian Use</u>
High pressure vessel	Missile propulsion chambers	NGV tanks
Fuel Cells	Spacecraft power source	EV power source
Turbogenerator	Combat Vehicle APU	Hybrid EV power
Composite materials trailer	Transport modules	Lightweight cargo
Flywheel power	Aircraft Military vehicle power	EV chassis, bodies Heavy duty EV
power	Field power source Gyroscopic guidance	EV rapid charger Mechanical EV
Magnetic induction system	Power transfer	EV charging
Power control electronics system	EV drive controller	Aircraft radar

Extruded aluminum frames chassis		Aircraft frames EV
Real-time computer analysis simulation	Vehicle safety analysis	War games
Low cost radar	Surveillance	Collision avoidance
Lithium ion capacitor battery	Communications	High power EV

Re-utilization of defence/military facilities for transportation programme activities: an opportunity to utilize existing facilities and equipment for economic development applications

CALSTART has established its headquarters office, shop and assembly facilities in a Southern California factory building that once housed the headquarters of a major U.S. Aerospace contractor. The space is provided at very low cost. In Northern California, CALSTART has offices and work space in facilities on the grounds of a former U.S. Navy air station. In each case the use of these facilities was part of a CALSTART partnership with the U.S. defence industry and the U.S. government. Each of these facilities houses an advanced transportation “business incubator.” Known as “Project Hatchery Burbank” and “Project Hatchery Alameda”, these facilities house a cluster of advanced transportation businesses and in the process facilitate the re-use of once important defence industry and military installations. By providing low cost space, shared equipment and machinery and a business support services network, CALSTART fosters the growth of small businesses in its incubators. CALSTART’s goal is for the companies to graduate as rapidly as possible from the incubator and to become thriving, self-sustaining companies– giving rise to the name Project Hatchery.

Each facility houses a number of differing types of business (roughly 50 in total) engaged in the research, development and manufacture of products used in the advanced transportation industry. Activities include an “agile manufacturing” line for the production of sophisticated electric vehicle components, the conversion of gasoline powered postal service vehicles to electric power, research and development work on a hybrid-electric heavy duty truck tractor, the manufacture of electric bicycles, conversion of conventional petroleum vehicles to natural gas, the development and assembly of

motor controllers for electric vehicles, and a variety of similar activities. Office space is utilized by firms engaged in the design and development of products utilized in transportation activities, ultra capacitors, brushless DC motors and so forth.

The re-use of military/defence facilities offers numerous advantages including access to high quality machinery and equipment, the available of a highly skilled labor pool, existing industrial infrastructure and low facility cost. Unused runways and taxiways of the former Navy base have provided a test track and testing areas for advanced technology vehicles and equipment.

Opportunities for international cooperation: a unique chance to share experiences and facilitate opportunities for commerce

Clearly, addressing solutions to a country's needs for transportation systems and facilities offers an ideal means of utilizing investments made in defence/military research and development projects, facilities and resources. If China were to see clear opportunities for the development and implementation of advanced transportation technologies and for the use of clean burning fuels such as natural gas, liquefied petroleum gas (LPG) or electricity to meet some or all of their domestic transportation needs as well as to address some environmental concerns, there is a body of knowledge and experience available for them to call upon to aid their efforts. Furthermore opportunities exist to engage in joint ventures with firms outside of China that have had experience with advanced technologies and are willing and able to export their technologies for use by others. For instance, vehicle fabrication and assembly could occur in China utilizing some components developed in China in combination with others obtained from suppliers in other countries.

All of these possibilities are predicated on the development of a host of partnerships with interested and affected businesses and government agencies, including the military. Furthermore, the active and positive support of government, business, community and worker organization leaders is necessary for the successful transition of activities and facilities to civilian operations.

Perhaps one of the most important issues to deal with is the "cultural change" necessary to have a successful transition. The "culture" in question is the one that governs military/defence policy in regard to both the operation of programmes and facilities and to the utilization and supervision of the work force. The necessary "change" is to an

operating policy more typical of civilian or domestic business operations. Difficult but necessary for success is an operating culture that recognizes the diversity of needs and provides for the programme and operational flexibility that are inherent parts of successful domestic or civilian business enterprises. Education and training of all parties affected may well be required to successfully make the transition desired. The appeal of benefits such as economic development, solutions to pressing domestic problems, especially growing transportation needs and the overall greater good for the people and the society of the country may well have to carry the effort through some difficult transition issues.

International Cooperation in European Countries: Successes, Failures and Future Options

Bernard Reverdy

Summary

Reverdy's paper focuses on industrial cooperation for conversion in Europe, with reference to the European Union Programme KONVER and other local networking activities. World military expenditures have been decreasing from a high level of US\$1 trillion in 1987 down to an estimated US\$500 billion by the year 2000, according to the Bonn International Conversion Center. Investment represents roughly 40 percent of these values and is decreasing accordingly. In Europe about half of the jobs in the military-industrial complex were lost in recent years! This happened in an environment of already high levels of unemployment (compared to the USA and Japan) in the civilian sector, related to restructuring and re-engineering of companies. But, the "peace dividend" appears to be as elusive in Europe as elsewhere, as governments use military budget cutbacks to reduce public debt and fiscal imbalances, which may benefit the economy and employment only in the medium to long run.

The response of the defence industry to the lack of scale accentuated by the lower level of military procurement was to concentrate via mergers, acquisitions and alliances, to strengthen the larger companies, such as British Aerospace and GEC in Britain, Thomson and Aerospatiale Dassault in France and MBB and Daimler Benz in Germany. Within a given country, regional subsystems of defence industry suppliers have tended to disintegrate threatening the survival of a large number of small to medium sized companies. To respond to this situation the regional authorities have found funding and support from the European Commission's KONVER Community initiative.

The KONVER programme begun in 1993 and resulted from a request of the European Parliament. KONVER promotes conversion and economic diversification of vulnerable regions. The eligible regions are selected according to criteria which emphasize job loss. Ten areas were

initially selected, in decreasing level of vulnerability: Cumbria, UK; Essex, UK; Bremen, Germany; Brittany and Aquitaine, France; Lancashire, UK; Liguria, Italy; Provence-Alpes-Côte d'Azur, Center and Île-de-France, France.

KONVER is expected to mobilize some US\$2.4 billion for conversion and diversification in about four years to 1997. KONVER's contribution consists of a financial grant, overmatched by other public and private outlays. Germany (44%), the United Kingdom (19%) and France (14%) are the major beneficiaries of the programme. Two types of conversion are considered: (i) industrial conversion and diversification; (ii) redevelopment of physical facilities and land and retraining and R&D, to provide a new economic development environment.

A survey in South East France revealed the difficulties of SMEs to convert from the defence market driven by technology and state specifications to a market driven regime where flexibility and price are paramount. Many SMEs tend to shrink and get involved in merger/acquisition, but refuse to abandon the defence market. Three examples follow:

A precision mechanic firm with an US\$10 million turnover has seen employment and sales cut by half. The firm has no product of its own and over half its sales are to the defence sector. It decided to resist the trend and be the last subcontractor in their field. Without an alternative strategy for survival, the firm folded within two years.

A software developer which used to respond to military aeronautic research demands has successfully diversified into other demands as part of a r&d network for other contractors in jet propulsion and energy applications.

Another success story is that of a supplier of frames for mechanical elements, especially made out of carbon fiber, to clients such as the Eurocopter project, whose defence turnovers were 60% of total sales. The company diversified into the supply of carbon fiber bicycles, with the help of a consulting engineer and an academic research laboratory. Defence turnover is now 18% of total sale.

Reverdy's paper likened the process of conversion to the process of innovation and presented information and knowledge diagrams to that effect.

The European programmes did not contain specific measures to promote international cooperation. Nevertheless, examples can be found in the initiatives of cities, universities, trade unions and non-governmental organizations, such as: (i) the conference of the port cities of the periphery gathering Brest, Cadix, Constanza, Den Helder, Dum Laoghaire, Kiel, Plymouth, O Porto and Tarento, which have seen

decline in their defence related industry and have responded by promoting international cooperation in maritime transport, science and technology, information technology, coastal tourism, etc.; (ii) CREDIT, an academic network established in 1991 to carry out in the wider European context, conversion policy studies, etc.; it includes PREST of Manchester, GRIP of Brussels, TU of Denmark, École Polytechnique of Paris and Espace Europe of Grenoble; (iii) trade union's network of the defence industries in Europe which are focused on the analysis of conversion and diversification of their industries; (iv) an international bulletin "Conversion" which acts as a forum for the exchange of experiences and information on conversion. It is issued by the "School for Peace in Grenoble."

Conversion of Military Establishments in the United Kingdom

Duncan Hall
Executive Director
Duncan Hall Associates

Introduction

Large scale facilities exclusively for military use are either closing or reducing severely in size, inevitably leading in immediate terms to substantial unemployment and social distress for communities long reliant upon the military establishment for their economic well-being. There is therefore an urgent need to convert the establishments to alternative and sustained uses. In simple terms there is the need to achieve the economic diversification of the facilities.

Implications of Closure

There are five (5) implications arising from the closure of military bases which apply to all forms of major closure, such as military bases, steel works, coal mines or shipyards.

1. Political

Initiatives are implemented at local, regional, national and indeed international levels such as the United Nations in turn leading to the requirement to determine four basic but very essential issues, vis-a-vis:

a) Organization of a redevelopment agency

Whether it is the action of local or regional government or the establishment of an independent agency there is an immediate need to establish a single focal point for the regeneration of the closure area.

b) Financial assistance

There is a need to establish at an early date the level and manner of public financial support to assist with the conversion of the area.

In particular there is a clear need to determine the level of support or additional support for the single purpose agency, the assistance to

private sector investors, e.g., new business starts ups either through direct financial assistance and/or tax allowances and to inward investors. Whilst land contamination or other environmental issues will need to be addressed and receive financial support.

c) Planning matters

There is a need for a clear and strategic statement of the future acceptable range of development which will be attracted to or supported on the former military base.

d) Training and retraining

An early skill's audit is required to identify current skills which could be available for the conversion process whilst a retraining programme will be needed to ensure that the forthcoming unemployed personnel can meet the challenge of new industries and developments.

2. Legal framework

There is the absolute need to ensure a smooth transition from a military to a nonmilitary framework with particular reference to land and title and the need to achieve flexibility in dealing with future development and investment requirements.

3. Land and buildings

There is a fundamental requirement to ensure that the single purpose agency or organization has control over the land and buildings of the former military establishment.

It is important to note that it is control and not necessarily ownership which is the essential issue whether it is the future of the airstrip, existing housing and recreational facilities, parkland etc.

4. Environmental Issues

There is the need to determine from the outset the ground conditions of the site particularly regarding the levels of any contamination or pollution, areas of environmental preservation and also the level of quality of public utilities, e.g., gas, water, electricity etc.

5. Private investment

There is a clear requirement to establish the strategy for the future attraction of private investment ranging from startup businesses to the use of existing buildings and facilities to inward investment.

Time scales

Whilst the implications of both closure and conversion become apparent, the timing and time scale of the decision-making process is crucial.

Upon the announcement of a military base closure there is an immediate political will for action and assistance whilst at the same time the confidence of the community in its future is very uncertain. There is therefore the need to grasp the opportunity which has arisen and ensure that time scales are met to sustain the confidence of the community and maximize the economic opportunities.

Practical examples on closure: Teesside

1. Tees Offshore Base

Following the closure of the shipyard it became the supply center for the gas and oil industry of the North Sea.

2. Haverton Hill Shipyard

Upon the closure of the largest shipyard it became the center for the attraction of new foreign investment utilizing existing buildings and facilities as well as stimulating new development.

3. Middlesbrough Dock

The dockyard is the focal point of a mixed development combining industry with recreation, tourism, retail and commercial development.

4. Tees Barrage

A completely new environment was established in this former shipyard area by the construction of Tees Barrage which led to the development of the major commercial and educational center for the region.

5. Hartlepool

Following closure of the shipyard and decline of the docks the redevelopment was based upon establishing the area as a major tourist center following an assessment that the area and surrounding population were of itself insufficient to sustain a major redevelopment programme.

Common features for conversion

1. Strategy

It can often be seen that a great deal of time is spent on creating a master plan which in time may be seen as a “wish list” or which does not fully allow for the demands of private investors. Accordingly whilst an overall strategy is required, it should be an assessment of opportunities rather than of over detailed planning requirements.

2. Marketing

It is surprising how often the need for a coordinated marketing campaign is overlooked or more usually under-funded. It is essential that an overall campaign is established not only to attract new investment at local, regional (the most likely), national and even international level whilst ensuring that at the same time the community directly affected by the closure is kept fully informed of the progress being made in the conversion process.

3. Land

The key element is to ensure that there is control over the land affected by the closure. It is not necessarily about ownership. Control can take many forms such as joint ventures, share holdings, equity arrangements with the key element being the certainty that can be provided in negotiations for redevelopment or new investment.

4. Organization

There must be a clear decision-making process through a single point agency—in the examples cited, central government established a single agency, funded through government, with wide ranging powers to redevelop the area—it should be noted that new private sector investment has now exceeded £1.5 billion.

5. Investment

There should be a clear understanding that any necessary remedial works to the site(s) should not commence until the certainty of new investment and development has been established.

Contrast between conversion in China and in the West

Hall's presentation at the Beijing Round-table was based on an analysis of the paper by Jin Zhude. Hall has compared conversion in the West with what appeared to be conversion in China, as described by Jin Zhude. He noted that conversion in the West leads to large-scale unemployment, and that the unemployment becomes a problem for society to take care. Hall remarked that in Jin's presentation a reference is made to ideological obstacles to conversion in China. He further pointed out that the Chinese approach to conversion is therefore different from that of the West. Plants are not closed down and thus do not generate immediate unemployment. The future of the plant must be seen in the national context. He mentioned that (i) conversion in China must have laws to abide by; (ii) the conversion strategy must fit within the national economic strategy; and (iii) conversion must be incorporated into national state plans.

Hall's presentation proceeded to answer whether there is common ground between conversion in China and elsewhere. The conclusion is affirmative. Conversion must follow a step wise approach and must bring value to the economy and to the community. At the outset, the reduction in military procurement and other defence activities, there are political reactions at the local, provincial and national levels. The issue is how to translate the political outcry into practical action. Jin's reference to shareholders, which could be interpreted as stakeholders, is very relevant as a means to finding out what to do in response to the opportunity of conversion. The notion of a redevelopment agency is useful as a point of contact for the stakeholders concerned. As a such agency would be controlled by the state, it would provide the guidance of national policies and initiatives to the conversion effort.

Secondly, on financing of conversion, the state would determine the level of assistance to be provided in the local, provincial and national contexts, including incentives, environmental remediation, etc. Thirdly, a clear strategy regarding an acceptable future economic development is another common ground, including skills development via training and retraining; clear legal relationships between the military and the civilian sides of the split in assets and liabilities; a neat distinction between ownership and control of real estate property, between the military and the civilian sides; the handling by the state of the environmental pollution and decontamination of land and buildings formerly used by the military.

Hall's presentation emphasized the catalytic role of the conversion agency, not providing directly capital and technology, but rather stimulating private investment into the affected areas. He also emphasized the controlled use of the former military assets for civilian purposes within the national context and exemplified with a former UK naval shipyard which was converted to an offshore base for supplies and services in connection with the North Sea oil production. Another shipyard became a supplier of parts to Samsung, a Korean chaebol with operations in the UK. The closure of a third shipyard led to a step-by-step redevelopment where each element had its own logic. All these developments in the UK had in common with China the reference to the economy and the community in the context of the state guidance.

In conclusion, Hall emphasized the following: (i) the need for a clear strategy, not a "wish list"; in the case of China, this has to be a Chinese strategy, which must show overseas investors what is there to offer. In this context marketing efforts are paramount; (ii) the distinction between control versus ownership is key to get things moving, not trapped in

ideological discussions; (iii) the need for a facilitating organization to bridge the gap between the military and the civilian industrial worlds.

Conclusions

1. Whilst any major closure will have immediate and distressing consequences for the surrounding community particularly in respect of future uncertainty it offers the opportunity to provide future development which is not dependent upon one industry.
2. Whatever organization or agency is involved it must be in control of the land and possess the ability and decision-making process to attract and stimulate new private sector investment as well as utilizing appropriate existing facilities for the benefit of the local community.
3. The time scale for all necessary action must be clearly established to ensure (a) confidence is sustained in the community, (b) the immediate political will to achieve conversion of the former military establishment is matched; and (c) the opportunities for new private sector investment strategically identified.

About the Author:

Duncan Hall has spent a career in urban regeneration and conversion projects. Whilst providing advice in most parts of the world, he was responsible for eight years for the regeneration of Corby in England following the closure of the largest integrated steelworks in Europe, which resulted in the highest ever recorded fall in unemployment from over 30% to less than 5% with investment exceeding £1 billion.

On Tees-side leading the largest Urban Development Corporation in the UK, he achieved more than £1.3 billion of new investment and the creation or protection of over 26,000 jobs.

Duncan Hall Associates is a company specializing in both advising and delivering regeneration projects.

From the Nation's Flattop to the Motor of Conversion in Germany

Werner Rech
Atlantic Academy of Rheinland-Pfalz

Summary

Rech's paper is divided into two segments, namely (i) development of conversion projects in Rhineland-Palatinate, and (ii) development of European interregional cooperation projects. The first segment addressed the defence dependency in Rhine-Palatinate; the "flagship projects" of site conversion (A Kaiserslautern business park, formerly French barracks; Zweibrücken, formerly an US air base; and Hahn Airport, formerly an US air base); the successful smaller projects; and the diversification and restructuring of defence industries. The second segment dealt with the Network Demilitarized project; the DEMCON project; and other interregional and international cooperation projects. Rhineland-Palatinate has been and still is highly dependent on defence, for well known historical reasons. The attempts of Rhineland-Palatinate to restructure its economy away from defence-dependency revealed that: (i) defence conversion can be likened to the long term heavy industry restructuring of the sort Europe has been exposed in the past, such as steel, coal and shipbuilding; (ii) market proximity helps with conversion; (iii) diversification is key; (iv) sites under restructuring compete with each other; (v) financing is key, as provided by governments and private investors; (vi) conversion, the reuse of former military sites can be higher than green field investments; (vii) separate clearly ownership from control of real estate, facilities, equipment, etc. There is a clear need for a coordinating and conversion promoting agency to facilitate and expedite the process.

Flagship projects in Rhineland-Palatinate included the Kaiserslautern Business Park developed on the site of former French barracks. It now houses the largest furniture market in the state, and housing units. The site was purchased and redeveloped by a private entity and has pledged

to invest further in the years ahead. At the former US air base near Zweibrücken, the use of runways and taxiways for car racing is under consideration. The former Hahn US air base was successfully converted into a civilian airport as part of the Global Airport Network, working in close cooperation with the former Myrtle Beach base in South Carolina, USA. This partnership has originated state-to-state partnership between South Carolina and 15 German-American sister cities.

Smaller conversion projects have been successful, such as former US military depots in Dahn and Fischbach which have been made into commercial areas; the Kreuzberg barracks near Zweibrücken and the Birkenfeld military hospital which became institutions of higher learning. Other sites have been or are being restored to their natural state. The creation of the Atlantic Academy in Rhine-Palatinate in early 1996 was an additional step to reinforce the links of the state with the USA.

Further conversion and diversification initiatives in industry are required in the state as the level of employment has not recovered to desirable levels and many former military facilities and skills have not been utilized. The state and the private Network for Innovation Technologies and Industries are helping. Both successes and failures have occurred. Many successes were associated with keeping global markets in mind when devising strategies for the converted enterprises. There is definitely a key role for international cooperation for the promotion of conversion. Rhineland Palatinate has held several international gatherings to that effect, including the one co-organized by the Atlantic Academy and the UNDESA, in October 1996. In the European context, the Network DEMILITARIZED was set up in 1992 by the European Commission as an interregional pilot project of 16 defence-dependent regions and municipalities in five European countries (Germany, Greece, The Netherlands, Spain and the United Kingdom). The Network developed transferable strategies to counteract the negative social and economic effects of diminished military expenditures. The programme is now seeking additional funding from the European Commission for its continuation. The DECOM project, also financed by the European Commission, involves cooperation with Central European countries. The objective of DECOM is to establish Conversion Centers and to transfer all available expertise and know how to these Centers in support of conversion, especially investment promotion of conversion projects. Both DECOM and Network DEMILITARIZED are very vulnerable initiatives, as they depend on the European Commission for funding.

Many of the points made by Rech converge with other exposés during the Round Table. For instance, the need for the functions performed by a Conversion Center to coordinate and harmonize efforts and promote investment in conversion projects resembles ideas presented by Trindade (Conversion Clusters), McGivern (Flexible Manufacturing Network), Boyd (consortia), Baranson (matchmaking), Efimov (“packaging firms” and FIGs), Hall (Agency), etc.

Part III:

Building Blocks for Effective International Cooperation

Coaching seminars on business strategy and planning for military industry restructuring were held in late 1996, in Leshan, Sichuan and Kunming, Yunnan, engaging Chinese military managers and providing opportunities for them to present and discuss case experiences, which are summarized below. An additional set of coaching seminars was held in early June 1998 in Nanchang, Jiangxi Province and Guiyang, Guizhou Province. Besides the coaching on business strategy and planning, this latter session emphasized the importance of public sector reform and the corporatization via the shareholding corporation format of new business ventures resulting from restructuring of military industries.

The workshops in Chongqing and Wuhan, held in late 1995, attempted to stimulate joint ventures between Chinese military owned enterprises interested in conversion and foreign partners, while providing instruction on important elements of business communication with the West, such as finance, intellectual property, advertising, valuation of assets, joint venturing, business strategy and planning. The material discussed on the occasion is presented below as edited papers covering finance (Blais), intellectual property/valuation of assets (Goddard), joint ventures (Osterrieth), trademarks (Buxbaum) and business planning and strategy (Carroll and Bitran).

Coaching Seminars on Business Strategy and Business Planning for Military Industry Restructuring and Public Sector Reform

*Leshan, Sichuan Province, and Kunming, Yunnan Province
20-28 November 1996*

*Guiyang, Guizhou Province and Nanchang, Jiangxi Province
1-12 June 1998*

Introduction

Two Coaching Seminars on Business Plan Formulation for Military Converted Enterprises in China took place in the latter part of November 1996. Session I of the Coaching Seminar took place in Leshan, Sichuan province, during the period 20-22 November 1996, for 40 managers of military owned enterprises, from the cities and towns of Chengdu, Leshan, Mianyang, Qing Shen and Yaan, Sichuan Province. The Nuclear Power Institute of China—NPIC was the host of Session I. A visit to the High Flux Engineering Test Reactor of NPIC took place on 22 November 1996.

Session II of the Coaching Seminar took place in Kunming, Yunnan province, hosted by the Yunnan Office of the National Commission of Science, Technology and Industry for National Defence, during the period 25-27 November 1996, for 36 managers of defence related enterprises, from the provinces of Yunnan, Guizhou, Tianjin, Hubei and Beijing. A visit to the Kunming Shipbuilding Equipment Co., a manufacturer of cigarette making machinery, subsidiary of China State Shipbuilding Corp., was undertaken on 27 November 1996.

Background

Phase I of the China Military Conversion project, implemented by UNDDSMS, was primarily focused on two workshops on new business opportunities in China: restructuring the military industry. The workshops were organized jointly with CAPUMIT, and were funded by UNDP. They were held in October/ November 1995, in Chongqing and Wuhan, respectively. The workshops converged on a set of issues which must be addressed to effectively implement conversion initiatives, particularly those involving an international partner.

The essential nature of a joint effort, in the form of joint ventures or other forms of cooperation, is the establishment of a common ground of shared interests, costs and benefits, in a given market. Thus, effective communication between the Chinese side and the international partner

is a critical factor in promoting conversion joint ventures. The Chinese side must understand the international perspective and conversely, the international partner must understand the Chinese perspective. Patience, understanding and accommodation are essential ingredients in this process. Knowledge and access by the Chinese side to information on markets, capital, both equity and debt, and technologies are crucial to this communication process.

The Chinese side, however, must take responsibility for preparing the information about the projects they want to promote and for initiating the communication with potentially interested parties. Effective communication may require many channels. However there was a clear consensus among the participants of the workshops that the most commonly used communications tool is the business plan. The typical business plan contains all the essential information to support the initial decisions by prospective investors.

Although the Chinese managers participating in the workshops appeared to have experience in preparing feasibility studies for new projects, the limited documentation on project proposals, made available at the time, was lacking as an effective communications tool to attract international interest. A major drawback is the total absence of risk analysis. Thus, it was decided to emphasize in phase II of the China Military Conversion project, the coaching of Chinese military managers in business strategy and business planning, with a focus on business plan preparation, including risk analysis and risk minimization. This training effort of phase II is paralleled by the promotion of the projects submitted by Chinese military enterprises to the 1995 workshops, with investors in Asia, Europe and North America. It is expected that the coaching on business plan formulation will help the Chinese side to prepare better project proposals structured as business plans understandable to international investors.

Opening session

There are many conversion processes to consider—conversion from war to peace, from attack to defence and from military to civilian. But, all the time there is conversion from old industry to new industry, and increasingly, from material-intensive to knowledge-intensive industry. The latter is an important consideration for China, a country with extensive resources, but with a large population, and therefore low resources per capita, whose development cannot be sustainable over the long run on the basis of increased utilization of materials and energy. In addition, with regard to China, there are other conversions taking place. They are conversions from centrally planned to market economy,

conversions from military to civilian, and conversion from remote locations to placements closer to developed infrastructures. Nevertheless, in the end, the conversion that matters, implicit in all the above conversions, is the conversion of the mind and the change in attitude and way of thinking that it implies.

The coaching seminars cover market analysis, marketing strategy, manufacturing, management and personnel, products and services, and project financing analysis. Each of these domains corresponds to full year courses in management schools. Thus, the objective of the coaching seminars was not to make the participants into experts in these various disciplines, but rather to alert them to the importance of understanding business strategy and to organize their thoughts regarding project proposals in business plans which can articulate in an intelligible way the essence of their projects to potential international investors. Developing a business plan helps the proponents of projects to think them through in a disciplined systematic way and to explore all possibilities of reducing the risk any investment entails. In short, there is a great need to considerably increase the business communication skills of former military managers in China, with banks and/or potential partners.

In both Leshan and Kunming, the participants were asked about their familiarity with the business plan concept, whether they have had any contacts with potential foreign partners, and whether they have had any conversion experience.

In Kunming, the participants were invited to share their experience with conversion projects, both positive and negative. The participants were asked to report their experiences in terms of markets, products, partners and time schedule.

Nine experiences were summarily presented which elicited an animated discussion between participants and the coaching team. The cases were as follows:

- A fruit preserve project for the US market which has been in existence for two years, in partnership with the American subsidiary of the French company Elf.
- A joint venture with the government of Laos, to produce military uniform fixtures for the Laotian army, is currently at the stage of negotiations.
- A powdered lemon concentrate production for the Japanese market has been established some 10 years ago.
- A citric acid (possibly) venture for the American market is presently under discussion with the French firm Rhone Poulenc.
- The manufacture of binoculars for export to the USA and other countries, in partnership with Hong Kong and Japanese interests has been going on for 8-10 years.
- A mini-car for the Chinese market has been under negotiation for the last two years with Fuji Heavy Industries of Japan.
- Spare auto parts for the Chinese market have been manufactured in joint cooperation with a company in Hong Kong for some eight years.

- A project to manufacture industrial chains for the Chinese market, which had been under discussion for two years, failed to yield any concrete results.
- A project to manufacture bicycles for the Chinese market in a joint venture with an American company failed after negotiations since 1995.

Participants questions, comments and discussion— Leshan, Sichuan Province

One participant mentioned that his experience with Hong Kong business people suggests that they are more interested in trade than in investment, and to take advantage of loopholes in Chinese policies. Thus, the Hong Kong experience would not be relevant to the business plan coaching, which appears more appropriate to Western companies. Another participant was interested to know why China was considered a high risk market and how did Western companies cope with that. The coaching team responded that the high risk is associated with the lack of knowledge about the market, the confidence on the rule of contract law, different perspectives of the joint venture partners (can sell versus can produce). To cope with risk, the foreign partner may try to minimize capital investment and to secure ownership of productive assets and land, and to achieve management control, particularly of the financial function.

A participant, producing magnetic materials for export, has been advised by consultants from Hong Kong and Taiwan, but is uncertain of the value of the information obtained. It has begun to surf the world wide web, found addresses but got no responses so far. The coaching team responded that personal contacts are invaluable and that in order to reap benefits, one must invest in information and analysis.

A participant from the host organization, NPIC, is preparing a business plan for contacts with foreign investors on an isotope for medicinal use in the treatment of arthritis. As for the market, he has considered all hospitals in China, including the network of military hospitals. Regarding the competition, their product appears to cause less side effect. Questioned about why he was interested in a foreign partner, the participant indicated that, since they believed to have the necessary technology, they would seek capital from the prospective foreign partner. Questioned about whether local capital sources were sought, since the project appeared to be profitable, the participant responded that both domestic and foreign capital sources were being sought. Asked again about the market, who would pay for the medical isotopes, who are the customers, the participant replied that the marketing effort will focus on twelve provinces of medium size. The product has obtained a positive response so far in trial tests by pharmaceutical companies and hospitals.

The treatment cycle is estimated at RMB 1,200, some US\$150. Nevertheless, much uncertainty remained in the actual implementation. The coaching team recommended work on removing uncertainties.

A participant from COSTIND Sichuan was interested to learn about the utilization of consulting firms, especially how to discern the reputable firms from the rest. Given the high cost of consulting firms, the participant was interested in finding out whether there would be any way of legally protecting the Chinese side from failure on the basis of advice provided by the foreign consulting firm. In other words, would there be any way of assuring success once a foreign consulting firm is engaged by a Chinese concern. The coaching team indicated that no reputable consulting firm would sign a legally binding contract with a success guarantee. However, a careful choice and success fee could increase the chances of success. Overall, the Chinese side should ponder the costs and benefits of engaging consulting firms in the implementation of conversion projects.

A participant was interested to know whether research and development for new products would be a hedge to changing markets. The coaching team suggested that it might be useful for an ongoing operation. Also, the need for R&D would depend on the business and the markets. For instance, the pharmaceutical markets usually require a level of R&D which is 10-20 percent of sale. On the other hand R&D for mature industries should be kept at much smaller levels.

Another participant was interested in pricing strategies. The coaching team digressed on the topic to suggest that the entry price should be sufficiently competitive to gain a market share for the new product. Also, even during the life cycle of a product or service, sometimes price wars are waged to secure or increase a market share, after which a profitable level of pricing is set. Cost is but one consideration for pricing. The rate of obsolescence of technologies is another consideration of pricing. Here patent protection plays an important role, as exemplified by the pharmaceutical industry. Also, when the product or service has special characteristics which make it valuable, it could be priced accordingly.

One member of the coaching team presented his own early experience in setting up sorbitol manufacturing in Brazil, to illustrate many of the points discussed regarding business strategy and business planning.

A participant, currently negotiating with a Hong Kong company, wanted to know how to value its trademark, and after a joint venture is established, who gets the increased value of the trademark. The coaching team suggested that comparison with similar situations would provide a useful reference; reference to publications, such as one issued in Germany, could help define the value of the trademark, according to the

type of business and market of interest. A discount cash flow analysis of the alternative of buying technology or trademark, would provide a present value, which could be a proxy for the value of the intangible considered. Regarding the increased value of the intangible after the joint venture is established, it should be apportioned to the partners in proportion to their equity in the business.

With respect to management and personnel, the coaching team made a brief presentation on management structures, social overheads, compensation, number of staff. It also presented hierarchical and cluster management approaches, indicating that as information and telecommunications technologies develop, the need for middle management layers, the traditional processors of information in the corporate structure, decreases, and management structures evolve towards the cluster management approach.

A report of feasibility for a multifunction refrigerating compressor was presented by one of the participants to the coaching team. The document confirmed the need for training in business strategy and business planning, as it lacked the basic features of a business communication piece.

Participants' questions, comments and discussion— Kunming, Yunnan Province

A participant from Guizhou expressed the need for the Chinese side to get consultants' advice regarding the many foreign groups contacting them. The Chinese side often is naïve and unaware of the reputation of such foreign firms. The coaching team responded that brokers and intermediaries can cost a lot. On the other hand the China Association for Peaceful Uses of Military Industrial Technology (CAPUMIT) should consider equipping itself to respond to the challenge and help discern the quality of the foreign firms approaching the Chinese side.

A participant from Kunming Shipbuilding, formerly producing weapons for ships, now diversified into cigarette making machinery, described the evolution of the conversion process. Their first move was to check with cigarette manufacturing companies, which are very profitable in China. The incremental cigarette market in China is apparently the largest in the world as personal income increases. They learned that price of machinery was not relevant as long as the machinery would be of quality. After visiting many international cigarette machinery manufacturers in the world, they opted for German technology, which they licensed. On the basis of the licensed technology, they built the only integrated cigarette making machinery in China. The equipment package is worth some RMB 20 million (US\$2.5 million), of which they are capable of

manufacturing 20 units per year. This was the plant visited during the stay in Kunming.

Another participant from Kunming showed interest in diversifying into environmental equipment, specially waste water treatment, for which a growing market is expected in China. The major issue is the potential competitiveness of Chinese manufacturers vis-a-vis the foreign competition.

A participant from a chemical industry, originally engaged in explosives for military purposes, is considering entering the civilian market with feed rations based on calcium bi-phosphate. They believe they have followed the same approach as presented in the coaching seminars. The factory is now under construction, with a Chinese partner. The coaching team advised them to monitor price trends and cost structure to check for risk of a profit squeeze.

The participant from Yunnan Southwest Instrument Factory (YSWIF), which had failed joint ventures' attempts, expressed that it was difficult to deal with foreign partners. Their Italian counterpart already had a joint venture in Yunnan, not involving YSWIF, to manufacture bicycle chains (US\$3.6 million). The Italians also manufactured bicycle chains in Shanghai. An attempt by YSWIF to manufacture industrial chains in a joint venture with the same Italians (requiring an investment of US\$30 million) did not work out.

The difficulties involved problems of communication and the complicated Chinese system, which the foreigners have difficulty understanding. The coaching team reacted by pointing out to a Wall Street article, on about 15 November, which reported on the difficulties of doing business in China. It must be realized that even between more similar countries such as the USA and Canada there are gaps in understanding. Evidently the gap is larger between China and the rest of the world. This gap involves culture, commercial habits, contract law, enforcement capabilities, etc. Countries like Brazil, in the 60s had similar gaps with its main commercial partners. Over time, foreign companies learned how to do business within a framework which in their view was very limited. Attitudes evolved, as the benefits of foreign investment began to show up.

In China, foreign companies will become more familiar with doing business there. On the other hand, China will evolve its business habits, contract law and enforcement capabilities. The coaching team suggested that the Chinese side should try and find partners with the maximum comfort level with Chinese commercial practices. Again, there is a need for a system to assist the Chinese side in finding the right partner. Also, the business plan must be drafted with the reality of China in mind,

showing clearly how to live with risk, until the environment becomes more familiar to the way the foreign firm does business at home.

Another participant, on the topic of advertising, mentioned they converted from explosive manufacturing to the manufacture of a medicinal product, similar the throat drug known as Halls in the USA. To promote this recent product, which sells through 40 distributors throughout China to pharmacies, hospitals, etc., in the Chinese market, they hired an ad agency to advertise the product via television, through Central TV. The ad agency proposed alternatives: national coverage via Central TV costing, off prime time, US\$20,000/min and local TV at much less expense.

A representative from CAPUMIT commented on the advertising of foreign products in China, such as water beds and fish oil, and expressed concern about reliability of foreign products advertised. For instance, the “Tupperware” advertising approach using housewives to organize gatherings in their homes was suspended by the Government. The coaching team commented that it is important to estimate how much money will be made. How much will it cost? The foreign side would like to know how does the Chinese side plan to get there, in much detail. The Chinese question on whether advertising is meant to persuade customers to buy something they don’t need. Is it deceptive? The answer is yes. Advertising explores fantasies and anxieties.

In many countries, there are laws and regulations curtailing advertising which might be harmful and habit forming. Still on the topic of advertising, one participant asked when would be the right time to begin announcing the new product or service. The coaching team suggested that it would depend on the industry and the markets. Means include journals, exhibitions, TV, radio. The best approach would be to check with the ad agency of choice.

A participant from a converted enterprise which developed a chemical product ($C_5H_6O_4$) placed advertisements in the Yunnan Daily and in the People’s Daily International, and received many calls asking for quotes. Therefore, an image had been developed that the product had a large market. After that, a commercial scale plant was built, and a letter of intent with an US client (without binding clauses) was signed. In the end, the client opted not to buy, and the Yunnan factory, already built, found itself without clients. They had quoted a price of RMB 38,000, whereas the international price is RMB 28,000. So now the Chinese producer is offering the product at US\$25,000 and still have no buyers? The coaching team suggested that the market may be glutted. Also, even if the price and quality were fine, concern about delivery in time might have shied away potential customers, concerned that the location of the

plant in the back lands of Yunnan would make it uncertain for a product to get into a market.

Another participant wanted to see the business plans of famous companies, such as Kodak, Coca-Cola. The coaching team indicated that the business plans of famous companies are often confidential documents, and thus, hard to get. What really counts is the methodology, not the company name.

A participant was concerned with the valuation of assets (equipment, technology, etc.) offered by foreign suppliers, which turn out not to be the best. The coaching team brought up the phrase "Caveat Emptor", that is, "buyers be aware". The coaching team further suggested that it would be worth to pay for information, to pay to consultants to evaluate assets. The Engineering Research Centers' (ERC) programme initiated by the State Planning Committee, with a loan from the World Bank, could help assess technologies and other assets.

Another participant asked whether the case study contained in the manual was not too perfect. Can business plans be deceptive? The coaching team explained the concept of dual diligence, which makes sure that the information contained in the business plan is accurate. Services such as Dunn & Bradstreet provide information about the situation of companies, regarding their finances and markets.

Need for a support system for conversion

Since the workshops in Chongqing and Wuhan in 1995, it became apparent that there is an urgent need to provide the military enterprises interested in conversion with efficient and effective means of getting information and analysis about markets, technologies and investors. These considerations led to the proposal of a Business Service Center. The concept is to organize a service-oriented organization to promote conversion in China, which would gather, process and disseminate useful information for potential investors and Chinese military enterprises interested in conversion. This organization could also provide consulting and training services to companies in China and abroad.

The training would emphasize building capacity in preparing business plans to improve the quality of joint venture proposals. The accent would be on small and medium enterprises, bringing together township and village enterprises (TVEs, potential sources of capital) and military-owned enterprises (potential sources of technology). It would have to be funded initially, but it should become self-sufficient from fee income from the client's system over the years.

The coaching seminars held in Guiyang and Nanchang in June 1998 confirmed the urgent need to provide such a clearinghouse service to

military enterprises considering conversion. Learning how to prepare business plans is but a small step in building up capacity to convert conversion project ideas into reality. A business plan that cannot be drafted for lack of data is useless. Establishing the proposed system of information is an urgent need which CAPUMIT must address seriously as soon as possible.

Workshops on New Business Opportunities in China: Restructuring the Military Industry

*Chongqing, Sichuan Province and Wuhan, Hubei Province
31 October-2 November and 7-9 November 1995*

Summary

A number of Chinese military enterprises were involved in back-to-back training and investment promotion workshops, in Chongqing and Wuhan, in late October and early November of 1995. These workshops are the first phase of an UNDP-funded project, jointly sponsored by the China Association for Peaceful Use of Military Industrial Technology (CAPUMIT), and executed by UNDDSMS, to promote new business opportunities, resulting from the workshops, for sino-foreign partnerships, engaged in conversion towards civilian markets. The second phase will concentrate on promoting specific joint ventures based on conversion plans negotiated between Chinese and international partners. The third phase will focus on disseminating the results worldwide.

Some 40 joint venture proposals emerged from the workshops, focused on automotive industry in Sichuan, pharmaceuticals in Hubei and environmental industries in Yunnan. The workshops brought to China an international team of experts and practicing business people, perhaps with a bias towards licensing related people. Furthermore, these workshops benefited from the accumulated experience of UNDP, UNDDSMS and others, in the field of conversion for more than five years.

Civilian goods accounted for 80 percent of the output of China's defence industry in 1994, compared with only 8 percent in 1979. Today the defence industry enterprises produce over 15,000 products for civilian use and account for a large share of national output of certain products. For instance, 9 percent of China's car production, 60 percent of its motorcycles, 26 percent of its freight trains and 24 percent of its

mechanized coal cutting equipment are produced by military- owned industries.

Nevertheless, there are still many barriers to overcome to further expand conversion in China. Interested military enterprises seek primarily capital and technology from joint venture partners, but lack adequate information and have communication difficulties with them. They could benefit from assistance in preparing business plans, financial analysis and statements, technology sources, valuation of assets and organizing joint business ventures. Access to information, the utilization of many tools, such as training and a conversion business service center, and of action networks could help.

Conversion is still fraught with many difficulties. But there is still potential for larger initiatives on conversion in China and elsewhere. Elsewhere in the world, demobilization of military personnel and decrease in military procurement are emerging problems, which must be approached in a positive way via conversion.

The papers presented at the back-to-back seminars are summarized below.

Direct and Indirect Financial Aspects of Conversion

Daniel Pierre Blais
Audit Adviser
UNDP, Slovak Republic

Introduction

Demilitarization presents challenges and opportunities, political and otherwise. This article focuses on the challenge and the opportunity of converting vast accumulated industrial knowledge and associated capital investment into peaceful and profitable enterprises. The first step towards conversion of an industrial facility from purely military to purely civilian use will often be cooperation between the two branches of industry in research and development, exchanges of personnel and technology and joint development of technology and equipment having application in both the military and civilian spheres.

There are several stakeholders interested in any conversion project including governments as owners of military infrastructure and technology; manufacturers with idle capacity and potential markets and workers anxious to preserve their employment and improve their standards of living. Conversion is seldom a task capable of being performed alone by any one of the interested stakeholders either because the costs or risks are too high or because individually they lack all the necessary ingredients for success. Through one form or another of joint venture, the necessary elements can be combined.

State support

The Chinese government (both central and local/provincial) has granted over RMB20 billion for projects of conversion within the framework of the State Plan. RMB11 billion has come from the Central Government and the remainder from various local authorities. Enterprises which have gone for conversion outside the plan have had to borrow quite heavily from the financial markets (predominantly from the banks). These enterprise debts are quite substantial and often match the reported costs of conversion. Although employment losses have been modest, this is possibly due to protecting redundant workers rather than forcing compulsory redundancies.

In addition, all enterprises have a substantial number of nonindustrial workforce (sometimes amounting to 20% of total employees)—manning schools, nurseries, kitchens, housing maintenance, etc.—and in the absence of more profound restructuring which will close down these ancillary activities, these workers will have to remain. In the long run, labor shedding in non-industrial activities is essential even though initially it will add to social costs. However, conversion overall is similar to an investment programme with initial sunk costs when net benefits are negative or modest. After the break-even point, there could be increasing returns to resource input thus raising productivity rapidly.

The international dimensions of conversion, both in terms of exports as well as attracting foreign direct investment and technology, are important. By the end of 1992, around 180 joint ventures with overseas companies had been established and this number is currently approaching 200. The total amount of foreign direct investment (FDI) has been in excess of US\$1 billion.

However, in the context of overall FDI in the economy of China, this amount invested in the converted industries is still quite small and most of it is concentrated in the coastal areas rather than in the interior provinces where the need is the maximum. Export performance is also patchy and highly concentrated in the neighboring countries of the Asia-Pacific as well as the United States. Even when individual enterprises have the full backing of holding companies with international marketing outlets, have factories and sales offices in the coastal areas and have managed to attract limited foreign capital and technology, export performance is not commensurate with the effort put in.

Most exported products are labor intensive and therefore price competitiveness must be an essential precondition for success in exports. Although labor costs are still low, in the absence of subsidies, the enterprises have found it difficult to cut costs sufficiently to boost exports significantly. Occasionally, joint ventures and adoption of

foreign technology increase prices in international markets without the equivalent improvement in the technical quality of these products.

The main strategic attention of policy and structural reform must concentrate on two core areas: increase profitability and make the phase of economic conversion more successful; as well as, increase technology transfer to the Defence Industrial Complex (DIC) enterprises from within the country (through using military sector S&T resources) and from abroad. A major constraint, repeatedly pointed out by enterprise management, was that of financing. Hence, a third strategic area for policy reform is how to increase the flow of funds to the defence complex.

Overall, Chinese conversion has been far more successful than any other country in the world. The rapidity with which the country has grown in aggregate during the last one and a half decade (coinciding roughly with the process of conversion which began around 1979 and accelerated around 1984) has helped considerably the conversion process. The spinoff from expanding markets, increase in the variety of inputs and outputs used and produced by the industrial sector overall, the use of noncompeting R&D, have all helped the converted industries.

Types of foreign partnerships

1. Processing and assembly agreements

The simplest form of arrangement is a processing and assembly agreement whereby the foreign company concerned supplies raw materials or parts on a consignment basis to a local entity in PRC for processing. A processing fee is paid to the PRC entity for its work and the processed goods are returned to the foreign company.

In almost all cases, the foreign company will have to supply the necessary production equipment and supervision. A large proportion of Hong Kong business interests in Southern China operate under such agreements. The principal advantage to the foreign company is the comparatively low processing costs in PRC compared with other processing centers in South-East Asia and elsewhere.

One characteristic of such form of arrangement is the restriction on the domestic sale of products. In general, the foreign investor is not allowed to sell any of his production in the domestic market.

2. Compensation trade agreements

The compensation trade formula enables the foreign company to provide a local entity in PRC with the entire plant, technology, equipment and training required for successful operation. Orders are placed on the PRC entity by the foreign company and the PRC entity is

responsible for production. Finished products are shipped to the foreign company on normal commercial terms except that an amount is deducted from the payment for each shipment to compensate the foreign company for its investment in plant, technology, equipment and training costs.

3. Wholly foreign-owned enterprises

Similar to equity joint ventures, wholly foreign-owned enterprises are limited liability companies. The foreign investors provide the entire capital investment and technical expertise.

Approval to establish a wholly foreign-owned enterprise is strictly controlled by the authorities and normally the enterprise must satisfy at least one of the following two conditions;

- Adopt advanced technology and equipment in the development of new products, economize on the use of energy and raw materials, achieve product upgrading and replace or produce import substitutes;
- Have annual exports of at least 50% of the value of its total product output and achieve a foreign exchange balance or surplus.

The most attractive advantage of a wholly owned enterprise is that the foreign investor will be able to enjoy full autonomy in the management of the company. In some cases, a wholly owned structure is preferred by a foreign investor for the sake of better protection of trade secrets.

4. PRC holding companies

In recent years, foreign investors have been allowed to establish holding companies in PRC upon approval of the Ministry of Foreign Trade and Economic Cooperation (MOFTEC). The PRC holding company may be in the form of a joint venture or a wholly foreign-owned enterprise.

At present, there are no clear published rules and regulations regarding the establishment of a PRC holding company. Applications submitted to MOFTEC for approval are determined on a case by case basis with reference to internal guidelines. A PRC holding company can provide its group companies with support and centralized management services. However, any “trading” and “production” activities in the PRC holding company’s scope of business will require prior approval from MOFTEC. The PRC holding company and its subsidiaries are taxed as separate entities and do not file a consolidated tax return.

5. Joint ventures

In the global economy, a well-developed ability to create and sustain fruitful collaboration gives companies a significant competitive leg up. Joint venture or cooperative arrangements between companies range along a continuum from weak and distant to strong and close. A joint venture, generally speaking, is a means of pooling resources, sharing costs, and distributing both risks and benefits.

The technical difference between the joint venture and the strategic alliance is whether or not a new, independent business entity is formed. At one extreme, in mutual service consortia, similar companies in similar industries pool their resources to gain a benefit too expensive to acquire alone—access to an advanced technology, for example, at mid-range, in joint ventures, companies pursue an opportunity that needs a capability from each of them—the technology of one and the market access of the other, for example. The joint venture might operate independently, or it might link the partners' operations.

The strongest and closest collaborations are value-chain partnerships, such as supplier-customer relationships. Companies in different industries with different but complementary skills link their capabilities to create value for ultimate users. Commitments in those relationships tend to be high, the partners tend to develop joint activities in many functions, operations often overlap, and the relationships thus create substantial change within each partner's organization.

a) Financial joint ventures: access to international capital markets; pooling of financial resources and risks: transmission of financial resources

Financial public joint ventures, such as regional development banks, provide an expanded and more flexible means of access to international capital markets. They provide a means of pooling financial resources and thereby reducing risks. These joint ventures can often be used as mechanisms to transmit financial resources.

b) Communication and transportation: development of regional links; scale savings

Public joint ventures aimed at national and regional infrastructure development can be used to achieve economies of scale necessary for profitable operations or to achieve technologically dictated economies of scale.

- c) Industrial and extractive: pooling markets for economy of scale; exploration of resources; securing supplies; complementarity of resources; and securing markets.**

In the industrial sector, public joint ventures are used to develop nationally and regionally industrial potential either by expanding access to raw materials, creating or expanding new production capabilities in industries of common interest, or by combining markets and achieving the necessary economies of scale. Public joint ventures can be designed to gain access to technology or products suited to the region's needs.

- d) Trade: economy of scale; oligopoly formation; and developing new markets**

Trade public joint ventures may be designed to specifically reduce barriers to trade on the bilateral, regional, or international level or to establish a mutually beneficial oligopolistic market situation, or to simply develop the scale necessary for a major trade organization.

Because of their greater ability to finance large projects, market their products regionally and derive benefits beyond the confines of the host country, public joint ventures are in a better position than other enterprises to take advantage of economies of scale and scope. Public joint ventures have the ability to balance the interests of the technological adaptor and developer with the potential user of the technology. Profit-sharing not only provides the assurance that the technology transferred is appropriate but also that the transfer proceeds smoothly and efficiently. In many cases, moreover, since contributions to capital could take the form of know-how and technical expertise, a technological transfer could well serve as an important vehicle for creating joint ventures in the face of limitations to the mobility of capital and resources.

Another consideration regarding the growth of public joint ventures was the need for risk-sharing and allocating efficiency of investment in a world full of risks and uncertainty, and in which virtually all economic stakeholders (from individuals, to companies and even Governments) are risk-averse. Public joint ventures could presumably afford to be less risk-averse and therefore might be expected to accept more risk and earn a higher rate of return than the private or public enterprises of a single owner would. Even in the absence of other specific advantages, one would therefore expect public joint ventures to earn higher rates of return than other fewer widely held enterprises.

6. Equity joint ventures

Equity joint ventures are limited liability companies with a joint PRC and foreign ownership set up for specific purposes, usually the establishment of a new manufacturing plant or a new service organization, such as a hotel or shopping complex. The foreign company is typically required to provide the entire capital investment, technical expertise and management skills and to arrange for technology transfer. The PRC entity typically arranges for land and buildings and facilitates the smooth operation of the joint venture.

The equity contributions of the two parties to the joint venture determine their share of the results of the joint venture. The advantage of the arrangements to both parties is primarily exploitation of new business opportunities for their mutual benefit.

7. Contractual Joint ventures

Contractual joint ventures are similar in concept to equity joint ventures. However, their form is different in that the obligations of each party are spelled out in the form of a contract. These contracts typically specify the minimum registered capital and capital contributions of each party at various levels of investment and their respective share of the results of the enterprise. Contractual joint ventures can be formed as limited liability companies.

As with equity joint ventures, the foreign company is typically required to provide the entire capital investment, technical expertise and management skills and to arrange for technology transfer while the PRC entity typically arranges for land and buildings and facilitates the smooth operation of the joint venture.

Information needs

1. Valuation and pricing the sale

The valuation process is an important aspect in the divestiture of state-owned enterprises. Among the most important issues to take into consideration are the following:

- Valuation should be seen as part of a “continuum” and not in isolation; i.e., recognizing its interrelationship with the preparation of SOEs for sale, as well as with the promotion and marketing phase;
- Given the sensitivities that exist in a process of this nature, it is recommended that valuations be conducted by independent appraisers recognized for their professional standards;
- It is essential that valuations provide a realistic view of what investors would be willing to pay for a given SOE or assets in the open market; historic costs or book values do not normally reflect this reality;
- One of the best approaches to appraise SOEs is the income approach and, as part of it, the discounted cash flow (DCF) method. The DCF method is a flexible and versatile

technique, but it has to be applied with care and responsibility in order to avoid misrepresentation of value.

Finally, it is important to remember that a conversion transaction needs to be analyzed from various perspectives and that base prices are a significant factor (though not the sole factor) that needs to be considered. A number of SOE privatization transactions in the least developed countries (LDCs) have demonstrated that the long-term benefits (for example, increased capacity utilization, paid taxes, hard currency generation, etc.) are by far more important than the “ideal” final sale price (i.e., the maximization of the return on the transaction itself).

In theory, those investors willing to pay the highest prices should also be the ones who can make the best possible use of the SOE or assets in question. Nevertheless, in the case of state-owned enterprises, there may be a number of variables which distort the perception of prudent businessmen, such as price controls, import limitations, special tariffs, etc. which should be dealt with early on as part of the public sector reform programme, in order to make privatization possible. Therefore, even though it is highly desirable to obtain the best possible price for SOEs or assets sold, there is a *range of value* within which governments and investors should negotiate, until both sides are satisfied with the merits of the transaction; the real benefits to the economy will come from a more efficient and competitive operation over the years and, in the case of conversion in China, to have converted military enterprises to commercial uses.

2. Responsible authorities

It is necessary also to set up a central independent regulatory authority linking the enterprises and the owners, i.e., the provincial government. This is particularly necessary for foreign financing. Both foreign direct investment FDI (such as through joint ventures) and equity financing (such as through share options or mutual fund investment) will mean that foreign investors will want to know who is legally responsible for profits repatriation, loans guarantees, liability for interest and principal payments, insolvency and bankruptcy leading to asset redistribution between debtors and owners. If they know that an independent regulatory authority is looking after their interest (and not those of the managers and the government only) then they will be more confident in their investment. Absence of clarity in this area might cause some confusion to a potential joint venture partner.

3. Business plan for conversion

For those enterprises soon to be converted, a well-prepared business plan to be distributed to potential foreign joint venture partners should be drawn up. This business plan seeks to inform what conversion seeks to achieve. Such information prepared by the Chinese authorities would help in attracting potential foreign investors. A business plan is usually found in a “Prospectus”, which is a document giving complete details of a public offering to raise equity or borrowing capital. Some of the key aspects to be covered in a business plan are as follows: a) introduction; b) business strategy; c) the industry in general; d) products; e) markets; f) production facilities; g) capital expenditure programmes; h) work force reduction; i) marketing initiatives; j) potential for a future capacity increase; k) raw materials and energy; l) plan of arrangement; m) environmental; n) employee capacity; o) trade; and p) legal proceedings.

PRC requirements for foreign investment enterprises

1. Statutory requirements

a) Books and records

Foreign investment enterprises (FIEs) are required to keep accounting records in Chinese that properly reflect the transactions and financial position of the company. However, a foreign language may be used in addition to Chinese. As a rule, companies should use RMB as the accounting currency. In the case of joint venture companies, if both the Chinese and foreign participants have reached an agreement, a foreign currency may also be used as the monetary unit for keeping accounts, but the financial statements should be accompanied by a copy denominated in RMB.

All accounting books and records must be kept for at least 15 years. Important contracts, agreements, articles of association, annual financial statements, audit reports and minutes of board of directors’ meetings must be kept permanently.

b) Method of accounting

Companies use the accrual basis method of accounting. Income and expenses are recognized in the period earned or incurred, regardless of whether the amount has actually been received or paid. Income received but not earned and expenditure paid but not incurred in the current period are deferred or accrued to a future period and are not recognized as current period income or expense.

2. Sources of accounting principles

In 1985, China promulgated Accounting Regulations of the PRC for joint ventures Using Chinese and Foreign Investment, which apply only to equity joint ventures. In 1992, a new set of accounting regulations Accounting Regulations of the PRC for Enterprises with Foreign Investment, was promulgated to replace the 1985 regulations. The new regulations, effective 1 July 1992, apply to all FIEs. In addition, in 1992 the Ministry of Finance also promulgated Accounting Standards for Business Enterprises, which took effect 1 July 1993.

Together with the Income Tax Law of PRC for Enterprises with Foreign Investment, these laws form the legal framework for the accounting system for FIEs in China. But, the legal and regulatory system in China is continually evolving, as the country develops further into the future.

3. Accounting principles and practices

a) Accounting principles

The accounting principles adopted for FIEs are similar to internationally accepted accounting principles. They include the principles described in the following paragraphs.

Matching of income and expenses

All income must be matched with related expenses. When revenue is recorded in the accounts related costs and expenses must be entered into accounts in the same period.

Consistency

To ensure uniformity of accounting data, the accounting policies, methods and practices must be applied consistently in subsequent periods. Any changes must be agreed to by the board of directors, approved by the relevant authority and explained in the financial statements.

Legitimacy

All economic activities and financial transactions of FIEs must comply with relevant stipulations of Chinese laws and regulations. Accounting departments must check the legitimacy of FIEs' economic operations, transactions and related vouchers and should refuse to execute or handle those that are found to be illegitimate.

Truth, correctness, completeness and timeliness

All vouchers, accounting books, accounting statements and other accounting records of FIEs must be prepared and recorded to reflect the actual economic transactions that have taken place. It is important to

ensure that necessary procedures are followed and that the information provided is complete, accurate and timely.

b) Accounting practices

The primary difference between the accounting standards adopted in China and the International Accounting Standards is that the prudence concept, or principle of conservation, has been adopted in China only on a limited basis. In other words, anticipated or unrealised losses are not provided for. The following are the examples:

- The lower-of-cost-or market inventory valuation method is not allowed.
- Bad debts, if any, are written off when they are verified and approved. A provision for bad debts is allowed, up to a limit of 3% of the total outstanding receivables.
- A provision for permanent diminution in the valuation of long-term investments is not allowed.

The following paragraphs describe accounting practices in China.

Capital revenue expenditure

FIEs must distinguish between capital and revenue expenditure. Expenditure used to increase fixed or intangible assets are capital expenditure; expenditure used for the purpose of deriving revenue is revenue expenditure.

Capital contributions

Participants of a FIE are required to pay for all subscribed capital according to the time limit stipulated in the capital subscription contract. Any delay is subject to payment of interest in arrears or compensation for loss arising from such delay. FIEs should account for capital investments in accordance with actual contributions made by the respective parties.

Cash investments should be deposited in a bank, and the date and amount of the deposit is the date and amount of the investment received by the FIE. Plant, machinery, equipment, construction in progress, materials, supplies and other similar items invested in the FIE should be recorded in the accounts at the assessed value agreed on the subscription agreement or contract. The right to the use of site or land, proprietary technology, patent rights, royalty rights and other intangible assets transferred to the FIE as investment should be recorded in the accounts at the amounts and dates agreed on in the agreement or contract.

Capital invested in the FIE by investors should be examined and verified by a CPA registered in China, and a capital verification report is required.

Valuation at historical cost

Inventories, fixed assets and intangible assets must be recorded at original cost or at the amount paid. In general, book value should not be adjusted for fluctuations in market value.

Inventory valuation

FIEs should account for inventories at historical cost, which can be determined using the first-in, first-out (FIFO) or specific cost methods. If the net realizable value of inventory is below cost because of defects or obsolescence, the difference between net realizable value and cost may be charged to the selling expenses of the year if approval is obtained from the relevant authorities. Unlike provisions for doubtful debts, no limit exists on the provisions for inventory obsolescence.

Provision for bad debts

Under the old accounting regulations, no provision for doubtful debts was allowed. If a debt turned bad and needed to be written off, the enterprise had to obtain approval from both the board of directors and the local finance bureau. The current accounting regulations allow for the provision of doubtful debts. An enterprise may provide up to a maximum of 3% of the total year-end receivables balance, and the provision for doubtful debts must be shown.

Capitalization of interest

Interest on bank loans borrowed by FIEs for the construction of fixed assets should be capitalized during the construction period and expense after the construction is completed. Interest on bank loans borrowed by a FIE before the FIE begins operations is capitalized as organization cost.

Depreciation

Under the Accounting Regulations, Income Tax Law and Detailed Regulations for Enterprises with Foreign Investment, the straight-line method is generally used in calculating the depreciation of fixed assets. The production or service-output method may also be used if the straight-line method is not appropriate. A FIE is required to determine the useful life and rate of depreciation of its fixed assets according to relevant provisions of the income tax law. The minimum periods of depreciation for the following types of fixed assets are: (i) 20 years for buildings and structures; (ii) 10 years for trains, ships, machinery and equipment, and other production equipment; and (iii) five years for electronics equipment, tools, furniture and transport facilities other than trains and ships.

The income tax law also provides that the estimated residual value of a fixed asset should not be less than 10% of its original cost.

Profit or loss on the disposal of fixed assets is treated in the profit-and-loss account as non-operating profit or loss. Depreciation is calculated on a monthly basis. No depreciation is taken in the month of disposition.

Amortization

Amortization of intangible assets such as proprietary technology, patent rights and rights to the use of a site, whether obtained by a FIE through capital contribution or purchase, should be computed monthly over the useful life of the asset as stipulated in the contract or agreement. If no useful life has been stipulated, amortization should be made over a period of not less than 10 years. In all cases, the amortization period should not exceed the venture period of the FIE.

Expenses incurred during a FIE's startup period, excluding expenditure used to purchase fixed and intangible assets and interest incurred during construction (which is part of the cost of construction of the underlying assets), are considered preparing expenses for accounting purposes according to the terms of the contract. These expenses may be amortized at an annual rate of not more than 20% when the FIE begins operations.

Long-term investment

Long-term investments consist of capital injected into other enterprises for a period of more than one year, including cash in-hand, tangible and intangible assets, and shares and debentures not expected to be realized within one year from the balance-sheet date. The equity method must be used if an enterprise's long-term investment exceeds 25% of the total capital or total share capital of the invested enterprise and if the investor can exercise significant influence over the management of the invested enterprise. Enterprises that use the equity method of accounting for long-term investments are treated as investment gains or losses and are accounted for as non-operating income or expenses. Enterprises that use the equity method of accounting for long-term investments must treat changes in the book value of long-term investments resulting from changes in their ownership interest in an invested enterprise as investment gains or losses.

Accounting for profits and profit distribution

A FIE prepares a profit-and-loss account monthly. If it is not feasible to prepare monthly accounts, quarterly or annual accounts may be prepared if approval is obtained from either the relevant public finance bureau or supervisory authorities under the State Council.

The total profits of a FIE include selling profits, profits from other operations and non-operating income net of expenses. According to relevant government regulations, distributable profits of a FIE are the total profits after deducting income tax payable and allocations to the reserve fund, the staff bonus and welfare fund, and the expansion fund. Distribution of profits, which are decided by the board of directors, should be made in proportion to the capital contributions of the FIE's participants.

Reserve funds

The reserve fund is a contingency fund established to meet unexpected and future losses or increases in capital. The expansion fund is a reserve set up for future expansion and capital requirements. These funds may be used to increase the capital of a FIE with the consent of an approval authority. The bonus and welfare fund provides welfare facilities to the staff and workers of the FIE.

The proportions of allocations to the reserve fund, staff bonus and welfare fund, and an expansion fund, should be specified in the FIE contracts. If no proportions for allocation are specified, the board of directors should decide the proportions after discussion.

The reserve and expansion fund is shown in the balance sheet as part of equity capital, whereas the staff bonus and welfare fund is shown as part of current liabilities. The reserve, expansion, and staff bonus and welfare funds are treated as appropriations against profit after taxation.

Foreign currency transactions

Separate accounts should be kept for bank deposits, bank loans, and accounts receivable and accounts payable in foreign currencies, and these accounts should be recorded in both RMB and foreign currencies. The exchange rate used for conversion is the daily rate published by the State Administration of Foreign Exchange or the rate on the first day of the month in which the transaction occurs.

Foreign exchange gains or losses should be calculated and included in the current month's profit and loss when realized. If the rate at the end of the month differs from the book rate, differences on revaluation may be charged or credited to the profit-and-loss account.

If foreign currency is sold for RMB through the Foreign Exchange Adjustment Center, differences between the book rate and the Adjustment Center rate should be charged to the profit-and-loss account. If foreign currency is purchased through the Foreign Exchange Adjustment Center, the asset should be recorded at the Adjustment Center rate. For debt settlements, the differences between the book rate

and the Adjustment Center rate may be charged to the profit-and-loss account.

Exchange losses incurred during start-up periods may be amortized over a period of not less than five years from the date the FIE commences operation. Exchange gains incurred during the start-up period may be: (i) amortized in equal instalments over five years after commencement of operations; (ii) offset against operating losses in future years after the FIE starts its operations; or (iii) retained until the FIE liquidates.

5. Financial reporting

A company's fiscal year is the calendar year. For a company formed during the year, the first fiscal year is the period from the date of formation to the end of the calendar year.

FIEs are required to prepare quarterly and annual financial statements. The quarterly financial statements are due 15 days after the end of the quarter, and the annual financial statements, with the auditors' report, are due four months after year-end. Both sets of financial statements must be sent to the venture's Chinese and foreign participants, the local tax authorities, the administrative government department in charge and the relevant department of public finance. A copy of the annual financial statements also must be sent to the government authority in charge of approving the joint venture project.

The format and contents of financial statements are specified in the Chart of Accounts and Form of Accounting Statements for Enterprises with Foreign Investment. Financial statements normally include a balance sheet, an income statement, a statement of changes in financial position and supporting schedules. No fixed disclosure requirements exist, but statements tend to disclose as much detail as possible.

6. Audit requirements

A FIE is required by law to engage Certified Public Accountants (CPAs) registered with the government of China to audit the annual financial statements and books of accounts. The appointment of Chinese auditors is normally the duty of the board of directors.

A foreign firm of CPAs may be engaged to perform a joint audit with the Chinese accountants. The Chinese accountants must, however, report independently.

For consolidation and equity accounting or management control purposes, some foreign partners of FIEs may appoint foreign CPAs to perform joint audit, accounting or review work. The scope of their task may include evaluation of the internal control system, a limited review

or audit of the financial statements issued by the Chinese accountants, a specific review of certain financial figures or a full-scope audit.

If foreign partners appoint foreign CPAs to examine the books of a joint venture, prior approval of the board of directors must be obtained. Unless approved by the relevant tax bureau, the audit fee payable to foreign CPAs is normally a nondeductible expense. Consequently, the foreign partners usually bear this expense.

In China, the auditor's primary objective is to certify the annual financial statements for reporting and tax compliance purposes. All FIEs operating in China must be audited by a Chinese-registered CPA. In addition, joint ventures and other foreign operations may seek a foreign-registered CPA to perform an audit and to render an auditor's opinion. This is often the case when a foreign-based parent company requests the services of a foreign-registered CPA to report on the operating results of one of its subsidiaries or joint venture companies.

The capital contributed by parties to a joint venture may be in the form of cash, fixed assets (such as land, buildings, machinery and equipment) or both, as well as in intangible assets. The value of all capital contributed must be validated by a CPA registered with the Chinese government. After completing an examination, the Chinese CPA will render a certificate of capital verification.

7. Accounting profession

Under the provisions of Regulations of the People's Republic of China on Certified Public Accountants, effective 1 January 1994, certified public accountants are persons approved by the State to practice accounting, auditing, accounting consultancy or other accounting services. According to the Ministry of Finance, approximately 10,000 CPAs were registered in China at the end of 1993.

The Chinese Institute of Certified Public Accountants (CICPA) is the only national organization of certified accountants and is under the jurisdiction of the Ministry of Finance.

Until recently, only Chinese citizens could register as CPAs. Under recent changes in the law, foreign CPAs also may sit for the national examination under the principle of reciprocity. Applicants must meet minimum educational requirements to sit for the national examination. Examination and evaluation of CPAs are administered by the CICPA. By law, a CPA must be a member of a public accounting firm before accepting an engagement to render services. At the national level, the regulatory authority for CPAs and public accounting firms is the Ministry of Finance. At the local level, the regulatory authority is the department or bureau of public finance of a province, an autonomous

region or a municipality directly under the central government. The establishment of branch offices of foreign accounting firms or joint venture accounting firms must be reported to and approved by the relevant regulatory authority.

Examples

1. Military Base Closures

An Air Force and Navy base were closed. Total facilities had absorbed \$2.2 billion. Both military employees (5,000) and civilian were laid off (14,000). Liabilities included are:

A.	Severance pay	\$53 M
	Sick and annual leave	\$15 M
	Other remunerations	<u>\$ 3 M</u>
		\$ 71M
B.	Removable property	\$1.4 billion
	Buildings and structures	<u>\$ 763 M</u>
		\$2.163 billion

C. Environmental cleanup and restoration: N.A.

Besides the pulling out, many times a commercial purpose can be given with the required capital outlays. In several cases military bases were converted into tax free manufacturing or retailing zones. In many cases the government simply turned over conditionally certain assets after having invested substantial amounts in conversion costs. However, the government does not take a partnership interest in the new venture. It turns over outright the converted facilities (e.g., the August 1995 announcement to privatize NASA—a prestigious US governmental institution).

2. Navy shipyard downsizing and conversion

The process consists of the following: (i) determining the existing ship repair industrial base in terms of physical plants, locations and staff sizes; (ii) identifying distribution and type of past Navy repair work; (iii) evaluating potential in private shipyard works; (iv) assessing potential in private shipyard works; (v) assessment of public facilities having a commercial vocation; (vi) preparation of action plans for conversion; (vii) acceptance of an action plan; (viii) carrying out of necessary work; and (ix) handover of facilities.

Conclusion

Restructuring and implementing investment in the former military complexes is more difficult than in companies producing for the civilian sector, largely because there is no competitive position on which to build. In many cases, the only advantages of military enterprises are in manufacturing and technical expertise. Often there is no familiarity with the consumer market, sales, service and distribution networks or advertising. Furthermore, accounting methods by which to assess full costs and to set competitive prices are often absent.

For many military enterprises, the inherited industrial structure is a major obstacle to quick conversion. In a market economy, the goal of banks and other financial intermediaries when lending is to “pick winners” which will repay their interest and principal. This means the restructuring and preparation of investment in military companies must be performed thoroughly before sources of potential investment are approached. Experience shows that the problem is not the amount or source of investment, but rather the lack of quality investment projects within suitable corporate structures in which Western managers have sufficient confidence.

Difficulties arise at all levels of structuring, implementing and planning an investment according to market principles. Some useful practical information is provided by international financial institutions such as the International Financial Corporation (IFC), a subsidiary of the World Bank dealing with the private sector, and the European Bank for Reconstruction and Development (EBRD) in the case of CIS countries of the former Soviet Union. Some commercial banks also support the process. For a worthwhile individual project having the attributes of a profitable venture, financing is available in one form or another. The main problem lies in selecting the enterprise/industry.

For example, the Russian Industrial Fund has adopted the following guidelines to select enterprises:

- Identifying and reviewing enterprises seeking assistance in attracting investment;
- Reviewing and selecting potentially successful candidates;
- Planning a transaction which includes drawing up schedules and advising enterprises on how to proceed and present their information in an attractive manner;
- Conducting site visits to prepare information for investors;
- Holding discussions to verify the information;
- Finalizing an investment memo on selecting projects;
- Preparing lists of potential partners and investors;
- Negotiating with contacts to get their opinions of products and their investment requirements;
- Holding site visits with investors;
- Giving advice on market studies for proposed products;

- Preparing requests with indications of requirements which are given to potential investors;
- Judging submitted proposals;
- Suggesting investment phases; and
- Developing a capital structure prior to the signature of cooperation agreements and the setting up of a joint stock company.

References

Restructuring the Military Industry, China Association for Peaceful Use of Military Industrial Technology (CAPUMIT) and United Nations Department for Development Support and Management Services (UNDDSMS), 1994.

Financing of Public Enterprises in Developing Countries: Coordination Forms and Sources, United Nations Department of International Economic and Social Affairs (DIESA), 1976.

Public Joint Ventures in Developing Countries: Organization, Management and Cultural Issues, United Nations Department of Technical Cooperation for Development (DTCD), 1989.

Audit of Major Development Programmes, United Nations Department of Technical Cooperation for Development (DTCD), 1987.

Government Accounting and Financial Reporting in Developing Countries, United Nations Department of Technical Cooperation for Development (DTCD), 1988.

The Conversion of Military Industries in China, Organization for Economic Cooperation and Development, Development Center, 1995.

Documents on Base Closures and Technology Transfers, United States General Accounting Office, 1989-1995.

New Issue and Secondary Stock Offerings, Scotia-McLeod, Inc. (Canada).

Audit of Management, Buyouts in the Public Sector, National Audit Office of the United Kingdom, 1991.

Doing Business in China, Ernst and Young International, 1994.

Methods and Practices of Privatization, United Nations Department for Development Support and Management Services (UNDDSMS), 1993.

Investment in the People's Republic of China, KPMG-Peat Marwick, 1995.

International Debt Restructuring: Substantive Issues and Techniques, United Nations Center on Transnational Corporations (UNCTC), 1989.

Project China Walden Investments, International Finance Corporation (IFC).

Industrial Restructuring and Defence Conversion in Russia, Rowez and OECD-CEC-TACI Delegation in Moscow.

Multilateral and Bilateral Economic Promotion Programmes for the CIS.

International Management and Asset Valuation of Intellectual Property Rights

Heinz Goddar
German and European Patent Attorney
Boehmert & Boehmert

Exploitation of technology and intellectual property rights (IPRs)

When technology is to be used in cooperation with a third party, whether in the form of a license to be granted, or by merger or by taking capital investment of a third party into the company owning the technology, it is of tremendous value to secure the exclusivity of the technology. In many instances, said IPRs, understood in a broader sense, do already exist by the mere creation of the technology, but in other instances an appropriate protection by registered IPRs is necessary, or at least advisable.

The purpose of this paper is to give a well-founded baseline to the subjects of the Workshops. The original paper was more detailed than the present shortened version.

1. Licensing and IPRs

Licensing out of technology usually means that a first party, the licensor, grants the permit to use intellectual property rights (IPRs) to a second party, the licensee. Obviously, the licensee will only be prepared to pay certain remuneration, the royalty, for such permits, the license, to the licensor if without a respective license agreement, the licensee would not be able to use the respective IPR. Typically, in the case of secret know-how the licensee without an appropriate agreement would not be able to use the technology, whilst in cases of registered and non-registered exclusive rights the licensor because of its IPRs could prevent the second party to use the IPR in question. Accordingly, it is of great value, if not necessity, for a party wishing to license out technology that as many elements as possible of the technology in the area the potential licensee is interested in are

protected by IPRs. In one case, a party would own a patent for a certain technology originating in a certain country, like China, and the potential licensee would be a party residing in Europe. Without having patent protection also in Europe, the licensor and owner of the Chinese patent would hardly be able to convince the European party, the potential licensee, to pay royalties under a license agreement for use of the technology, since without a parallel patent in Europe the licensee could simply go ahead and use, in an absolutely lawful manner, the technology in question after publication of the patent in China. Similar aspects apply, of course, to other kinds of IPR's, like trademarks and designs.

From these considerations one will immediately see that, before a potential licensor offers its technology, trademarks, design, etc. to a potential licensee, the licensor should obtain broad IPRs for the technology and general subject matter involved in the area the licensee is interested. Unfortunately, this means that a Chinese licensor, even before having been able to enter into negotiations with the licensee, usually will have to spend a lot of money, particularly foreign exchange, to obtain the protection of the IPR in the area which is interesting for the licensee. The main purpose of this paper is to explain—using Europe as an example—in which manner a potential licensor can achieve the goal of protecting its IPRs in the territory of interest for a potential licensee at as low costs as possible.

2. Merger/acquisition/joint venture and IPRs

The valuing of intellectual property becomes important if technology-oriented enterprises are bought or sold, or if investment capital is brought into such a technology-oriented enterprise investment capital. A technology-oriented enterprise will generally have IPRs of some type and in many cases, as will be subsequently shown, their value may far exceed the value of the fixed assets of the enterprise. Therefore when selling a technology-oriented enterprise, the seller and buyer will assess the value of the intellectual property of the enterprise, independently of whether the IPRs in question are to be sold individually or as a package, separate from the remaining enterprise, which may occasionally be advantageous for taxation reasons, or whether the value of the IPRs is to be calculated into the total enterprise value and therefore makes a significant contribution to the appropriate purchase price.

Kinds of IPRs

It is common that, when valuing technology-oriented enterprises, the determination of the value initially does not take into account the intellectual property belonging to the enterprise. It may appear like a bad joke, but it is frequently the case that at the last moment the tax consultant, lawyer or auditor dealing with the purchase of the company, will raise the question of whether the value of the enterprise might not be influenced by patents and the like belonging to it. Frequently the sale takes place without taking account of IPRs due to the fact that the patent attorney dealing with the enterprise has not been involved in its sale, so that important items of value, which can influence the purchase price remains ignored.

In order to illustrate to the Chinese participants the types of intellectual property which exist and may increase the value of the enterprise, reference will be made to the different types of IPRs in the widest possible sense. The sale of an enterprise should definitely consider whether any intellectual property may increase the enterprise value.

1. Registered IPRs

A typical intellectual property case is constituted by IPRs in the narrower sense, meaning registered IPRs. The economically usable intellectual property, which is able to influence the value of the enterprise, is in no way restricted to registered IPRs, but these are the easiest to trace for someone wishing to value an enterprise, by checking the public registers, if the actual enterprise, as is frequently the case with small economic units, has no internal records. Assessing the registered IPRs can also be of interest to the purchaser in a one-sided manner, if the seller has negligently ignored his rights when valuing the enterprise.

1.1. Patents

Patents and patent applications are preeminent IPRs. When valuing these it must be borne in mind that a patent application already represents an economic value, although it still fails to provide any exclusive rights.

Naturally, in the case of a patent application there is a risk of it not converting into a patent, because its invention is not considered patentable. And the risk of patent destruction also exists as a result of opposition or invalidation proceedings. In the practice of valuing intellectual property in technology-oriented enterprises, seldom is there a significant risk factor in the case of patent applications compared with already granted patents.

1.2. Protection certificates

The so-called protection certificates occupy a special position among registered IPRs. At present such protection certificates can only be obtained for medicines. For instance, in the Federal Republic of Germany such protection certificates, which provide supplementary protection term extending the life of the patent, can be obtained for those patent-protected medicines, whose initial acceptance as medicines took place after January 1, 1988. When valuing IPRs of medicine-manufacturing enterprises, which have patent applications or patents for not yet or only just authorized medicines, it is necessary to carefully check whether it is possible to obtain a protection certificate and a corresponding increase in the enterprise value.

1.3. Utility models

For the purpose of the present paper utility models can be looked upon as "petty patents". Fundamentally they are exclusive rights substantiating claims to cease and desist and for damages. Since the right of the utility model owner insofar is no different from those of the patentee, they lead to the corresponding consequences for valuation.

1.4. Designs

Unlike patents and utility models, designs do not protect technical inventions, but instead creations having esthetic uniqueness. The uniqueness of a particular design derives from a generally known shape fund, no matter whether it is attractive or not. The protection of the design, unlike that of a patent or utility model, is not "absolute" protection, but instead only covers the copying of the protected design.

Subcases of design protection are the protection of typographic characters and the topographies of microelectronic semiconductor products. If the enterprise to be acquired is of such a nature, it will be necessary to check such rights.

1.5. Variety protective rights

In special cases it will also be necessary to check whether in the case of a corresponding character of the enterprise, there are variety protective rights, particularly concerning seed, in accordance with the variety Protection Act.

1.6. Marks

Trademarks, or more currently Marks, constitute a key type of IPRs, influencing the value of an enterprise^{2,3}. Marks, which are namely

words and picture marks, but also sound or three-dimensional structures, can assume considerable values. For instance, in 1991 seven marks for alcoholic drinks which used to obtain annual turnover of about US\$235 million, were sold by the Canadian Seagram for more than US\$370 million to American Brands, yielding an average mark value of more than US\$50 million.

In contrast with patents, utility models and designs, the protection of trademarks is unlimited. Marks range in value over time from zero to infinity. Consider Coca Cola, whose mark value exceeds many times the total value of the remaining assets of the enterprise.

2. Unregistered exclusive rights

The valuation of IPRs of an enterprise should not forget the value of unregistered exclusive rights, which provide a given enterprise a competitive advantage and therefore represent an economically usable value.

2.1. Trade secret know-how ("unprotected invention")

Unprotected inventions can take the form of trade secret know-how. The latter covers information, particularly information of a technical nature, unknown to the public or not easily accessible to the public. Typically any technical invention fulfilling the requirements for patentability (novel and inventive compared with the prior art), not made accessible to the public and not applied for as a patent, constitutes secret know-how. An unprotected invention gives its owner an economically competitive advantage, as the particular know-how cannot be used by competitors because they are unaware of it. Therefore the disposal of such know-how represents an asset, which can have an influence on the value of the enterprise.

2.2. Copyrights

Copyrights, can also constitute an important part of the value of the enterprise, as they represent not only the duplication rights for books or musical works, but also software rights, which in many countries cannot be patented and are instead subject to copyright protection. Thus, copyrights are important in valuing publishing houses as well as in technology-oriented enterprises, such as software companies and the like.

2.3. Getup rights

Getup features, such as word or picture marks, packing, etc., which are protected by registered marks, represent an economically usable value of an enterprise. There is value also for relatively unprotected

markings, but which are known in business and are understood to be of high quality. These are important considerations in the franchising sector, such as restaurant chains and the like, where such getup rights influence the value of the enterprise.

2.4. Name and business name rights

The goodwill associated with the name of the enterprise must not be underestimated. For instance, if Microsoft had to be valued, then the name MICROSOFT as a business name right, would still have a considerable economic value even if no parallel trademark or mark protection existed.

3. Rights of use

When valuing the intellectual property of an enterprise account, it must be considered that, in addition to the IPRs proper, the rights of use of such IPRs also add to the value. Such rights of use, generally licenses, but also author agreements, etc., offer the purchaser of the enterprise improved competitiveness, even exclusivity, consequently as a function of the form, period of notice, etc. which must be valued in the same way as the particular IPRs to which they refer. Thus, in the case of exclusive patent licenses the value is no lower than the actual protective rights from which they are derived.

A special case of rights of use is the prior use right, which are relevant to the free use of patents and utility models of third parties. For an enterprise, it represents a considerable improvement in competitiveness if, compared with competitors, it is able to freely and exclusively use the patent of a third party due to a “private prior use right”.

Available protection for IPRs—Europe as an example

Before explaining the various possibilities to get IPRs protected in Europe, it must be remembered that similar observations, of course, also apply to other regions in the world. Europe is a good example because of the coexistence of different national and international possibilities to obtain IPRs there.

1. Patent protection

1.1. National patent laws

For the foreseeable future the various national patent laws as they are enforced and practiced today will remain valid in the countries of the European Union (EU). So, a first possibility of protecting technology

in EU is achieved by making use of the national patent laws in the various member countries, or at least in some of those countries, taking into account the duration of patents of twenty years, reaching far into the next century.

1.2. European Patent Convention (EPC)

The European Patent Convention (EPC) which is in force since 1978 introduced a common filing, search, examination and granting procedure for 17 European member states, namely Austria, Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Monaco, Netherlands, Portugal, Spain, Sweden, Switzerland/Liechtenstein, and United Kingdom.

The EPC had a strong effect on the harmonization of the national Patent Laws of the member states. They harmonized their national Patent Laws in formal and substantial aspects.

In reality though, a European Patent does not exist because the patent grant means that the owner holds a bundle of national patents, which are handled separately under the respective national laws as they still exist in national Patent Offices. Also in case of infringement and revocation the national authorities have to become active and the revocation in one member state does not affect the patent in another member state.

1.3. Community Patent Convention (CPC) and Green Paper

The most important change of the presently existing patent system in Europe would have to be expected, as far as patents are concerned, if the Community Patent Convention (CPC) ever would come into force. It would bring about just one central European patent, in the following designated Community or CPC patent, to which EU regulations are to be applied centrally as regards annuity payments, invalidation and enforcement. To this end, as to be explained in more detail in the following, a Community Patent Court (COPAC) would be formed, probably at Luxembourg, which will be in charge of appeal procedures in both invalidation and infringement proceedings.

Whilst for several years the overall feeling in Europe was that CPC probably would come into force, recently, because of the Green Paper of the commission of 1997, it seems that certain changes in the EP system will take place in a not too distant future, but the CPC probably will never be realized. Several elements of it, however, will probably come into force, so that in the following the consequences of CPC will be discussed in some detail, though because of the Green Paper, a number of modifications will take place.

1.4. European patent applications via Patent Cooperation Treaty (PCT)

It should be noted that patent protection in Europe, both in case of national patents, EPC and forthcoming CPC, also can be obtained on the basis of international applications filed in accordance with PCT. This treaty, which was signed in 1970 and entered into force in 1978, established a worldwide union open to all Member States of the Paris Convention.

By agreement with the World Intellectual Property Organization (WIPO), inter alia, the U.S. as well as the European patent offices are authorized to act as an International Searching and Preliminary Examining Authority.

2. Trademark protection

2.1. National trademarks

The transfer of technology often is accompanied by transferring the goodwill already connected with certain trademarks related to the technology in question. Also in the future national trademarks which can be obtained now by national trademark applications in any and all of the member countries of EU will be of importance. It should be noted that the trademarks applied for nationally nowadays will remain valid also in future in the various countries.

2.2. International registration (Madrid Union)

It is possible to obtain trademark protection in many member countries of the EU simultaneously, by making use of the provisions of the Madrid Convention. However, only applicants having residence or a place of business in one of the member countries of the Madrid Convention can enjoy the very favorable provisions of the international registration. China, of course, is a member of the Madrid Convention.

2.3. Community Trademark

The location of the Community Trademark Office is at Alicante, Spain. Since January 1, 1996, Community Trademark applications may be filed, the earliest effective application date having been April 1, 1996. The Community Trademark, as the Community Patent already discussed earlier, will be a single mark covering the whole EU, having the same legal effect in all countries.

Nowadays, parties interested in the future Common Market should try to secure trademark protection for a trademark related to their technology at least in one of the member countries of EU. The reason

is that the owner thereof may oppose an identical or similar trademark applied for by any third party in the whole EU, with the factual effect that only the owner of the prior registration is able later on to obtain a Community Trademark covering the whole EU.

3. Design protection

3.1. National design registrations

The import of technology will increasingly take into consideration copyright provisions and specific legal provisions concerning the protection of computer software and the like. The EU situation is fragmented in this field. The situation is different, however, regarding design protection, often connected with technology imports. It is possible to obtain design protection for articles of interest in all of the member countries of EU by national design registrations, and designs applied for and registered now will have effect in the foreseeable future.

3.2. International deposition (Convention of The Hague)

It is possible to protect design for at least some of the member countries of the EU, through a single international deposition at WIPO making use of the Convention of the Hague. The member countries of EU which are covered by such international registration, as of 1995, are Belgium, France, Germany, Italy, Luxembourg, Netherlands and Spain. The problem is that, similar to International Trademark Registration, only persons with residence or place of business in one of the member countries can enjoy the Hague Convention benefits.

3.3. Community Design

In 1995, the EU was preparing the draft of a convention creating a design registration covering the whole EU. The forthcoming Community Design will have the same legal effect in all EU countries, like the Community Patent and the Community Trademark discussed above.

Management of IPRs and cost optimizing aspects

The various possibilities to obtain IPRs in Europe create the chance that a potential licensor wishing to protect its technology etc. in Europe makes use of various systems in a particularly smart form. Cost minimization, at the same time guaranteeing the full legal effect of IPR protection in Europe, can be achieved.

Recommendations

Making reasonable, wise use of the various possibilities international IPR protection systems present, tremendous cost savings in protection can be achieved. One aspect always to be taken into due consideration by a potential applicant is that the date at which foreign exchange expenditures will be incurred to obtain patent protection. Europe can be postponed, in many instances, to a time when already the negotiations with a potential licensee have been finalized. The other aspect is that in spite of a difficulty or impossibility to make use of international conventions directly, one should consider using an intermediate holding enterprise or the like, at low costs and under standardized arrangements, to enjoy the respective registration possibilities.

Methods of asset evaluation relating to IPRs

After making clear the principle that when determining the value of a technology-oriented enterprise, it is also necessary to value the IPRs, the question then arises as to how to carry out such an evaluation. The literature^{1, 2, 3} discusses numerous theoretical possibilities, the most important of which will be subsequently discussed.

1. Asset evaluation on the basis of the production costs

The simplest method for determining the value of an IPR is to sum the production costs. If it is a protective right, which has not been purchased from a third party, then, as an initial approximation the production costs can be equated to the prime or capital costs. In the case of a patent, the total sum of the introduction costs consists of the pro rata research and development costs which had to be expended in order to bring about the particular, still unprotected invention, the costs for making the invention ready for marketing, and the obtaining, maintaining and defending costs for the patent in question.

Regularly this type of asset evaluation leads to a relatively low value, which is so far remote from actual practice, that it has only acquired significance in connection with "blocking-off patents" or "stock patents". These are cases where no actual economic use of the patent has taken place by the evaluating enterprise, apart from the fact that competitors have been prevented from using the invention, and it is also not possible to foresee whether or when the purchaser will carry out a corresponding use. Such an evaluation of IPRs on the basis of production costs, even under the narrow view point of balance sheet

fiscal aspects, would only appear appropriate in those cases where there is no use.

2. Comparison price method

A further possibility closer to actual practice for correctly determining the value of an IPR consists of attempting to establish, possibly by questioning specialist industrial associations, chambers of commerce, etc., which purchase prices have been recently paid for comparable IPRs. A disadvantage of this method is that it is very difficult with technical inventions to find really comparable situations, but there may well be criteria which permit an orientation of the evaluation of an IPR by comparable sales in identical or similar industrial fields.

3. Business use

The “most just” evaluation of an IPR is certainly obtained if it is possible to quantitatively determine the business use, which the enterprise has as a result of the invention in question. In the narrower sense, such a use can be that certain production sequences have been cheapened by using a patented invention in a calculable manner. Averaged over an average expected use period, this leads to a combined overall use, which must naturally also be capitalized or discounted, as will be discussed in detail hereinafter.

4. Yield value determination

Savings can be made by use of a specific invention, not only in the case of the narrower business use, but also when using the invention a contribution is otherwise made to the profit of the enterprise. The latter represent a wider meaning of use, which is generally referred to as the “yield value”. For example the value of a protected, patented invention can be determined on the basis of considering which fees (royalties) would be received by the enterprise if it gave to a third party the right of using the particular patent. The reverse consideration consists of posing the question of what royalties the enterprise would have to pay to a third party, if it was necessary to acquire a license on the same patent.

Also in the case of works protected by copyright, the capital value of a composition is established, which leads to considerable earnings through the exploitation companies (e.g., GEMA in Germany). To heirs or purchasers of a music publisher, the composition as such naturally has no “market price”. This also applies for a novel or concert recordings which have become famous and cannot be repeated. This also applies to movie “classics”, which are constantly

being shown such as “Dinner for One”, “High Noon”, “Arsenic and Old Lace” etc.

Assistance is obtained in such cases by the annual average proceeds being looked upon, as a type of interested payment, so that on this basis in much the same way as capital which pays interest, conclusions can be drawn on the “capital value” of the work in question.

From the estate duty fiscal standpoint it is official to proceed in this way. Halaczinsky states in his article “The fiscal evaluation of copyrights and sound carriers,” the so-called “Dresden Guidelines” of 1942, that the basis is to be the net proceeds from the exploitation of the work over the five years preceding the inheritance or sale and that said annual average is then to be multiplied by 2.5.

The relatively low factor is explained by the fact that taxation assets, which cannot be readily transformed into cash, are always favored (the standard values of real estate for tax purposes are always lower than their market value).

5. Evaluating patents

Particularly when evaluating patents, the yield value determination has been accepted according to license analogy. There is a broad experience spectrum concerning the determination of the value of patented and unpatented value in the field of German service invention law. Invention value determinations are standard practice, particularly for the patent departments of large industrial enterprises, as well as corresponding legal advisers. Reference is made to the comprehensive information given in standard works.

5.1. Employees’ Invention Act (EIA) and invention value

One of the basic ideas, if not the fundamental idea, of the Employees’ Invention Act (EIA), whose provisions, to the extent that they relate to service inventions of employees up to their notification to the employer, represent unavoidable, imperative law, consists of the employees’ inventor receiving special compensation as a reward for making the invention in question. This special compensation is based on the consideration that the employees’ inventor, who was admittedly employed in the expectation of his making inventions, but not contractually bound to make creative “inventions”, should appropriately participate with a certain proportion in his special service, namely the invention, which improves the monopoly position of his employer in competition.

The compensation or remuneration guidelines, particularly in their present version, as the pillar for determining compensation, highlight

the determination of the value of the invention, which is the decisive quantity also for influencing the value of an enterprise. As soon as the invention value is determined as a quantity, which an independent third party would have paid to a "free inventor" for the purchase of the invention, then a specific personal participation of the inventor on the one hand and the enterprise on the other in bringing about the invention is applied. In simplified form, this proportion fact is very small, being 0.1 or less, when it is expected of the inventor that he will make inventions, i.e., in the case of the head of a research and development department, whereas it is very large, namely close to one, if it was not to be expected that the particular inventor would make inventions.

It is also pointed out that the central quantity for determining an appropriate remuneration of an inventor is according to the EIA in its practical application, the invention value decided by the arbitration committee for service inventions at the German Patent Office and the appropriate courts.

5.2. Partial value determination by license analogy

What does this mean for the practice of determining total compensation according to the EIA which (to the extent that the determination of the value of the invention involves the so-called partial value) can serve as a model for evaluating an invention in the case of an enterprise being purchased? The tentative answers follow:

Royalty base

As discussed in detail in connection with service invention law practice, it is necessary to establish the royalty base to which an appropriate license rate or royalty can be applied. The royalty base decisively determines the level of the license rate to be applied. If in the case of a television receiver the complete receiver is taken as the royalty base, then the royalty rate for an invention only relating to a tuning capacitor would have to be very low. However, if the tuning capacitor is used as the royalty base, a relatively high royalty rate must be assumed. The decisive standpoint is that as the royalty base such a part of a negotiable overall apparatus is used as it is influenced by the invention. A particular "influenced" part can extend beyond the protective scope of the patent in question. If the part influenced by the invention, which could naturally be the complete apparatus, is established, in the case that it is in reality only part of the overall apparatus, it is possible to determine the royalty of the part from the ratio of the production costs of the particular part to the overall production costs. It is a factor which is applied for some standard

royalty rates appropriate for the overall apparatus or the net sale price of the overall apparatus.

License rate

Some details have already been given on the level of an appropriate license rate or royalty. A particular consideration, when determining the value of an invention is whether besides the royalties for the part, it would be possible to add a yield-independent minimum royalty, counting towards the combined piece royalties, and/or an all-in payment are agreed. Optionally the corresponding amounts can be averaged by an estimate over the assumed total use period of the invention in question.

Use period

In connection with the use period it has been stated hereinbefore that a 12-year total use period is to be assumed. The average residual use period of six years, which does not as yet appear in the remuneration guidelines, still forms the basis for the Federal German Finance Court (GFC) judgement III R 82/67 decisive for yield value determinations and whose principles can be generalized to different periods by referring to corresponding tables.

Capitalization

First, the comparison standard, license rate and use period are established, either as is prescribed by the taxation law applications of the above GFC judgement, which is based on determining according to the conditions of the assessment time the future expected average annual proceeds from the calculated average of the proceeds of the last three years before the assessment time (average annual royalty for the last three years), or as agreed by the parties by forecasting the assumed use period, when evaluating a protected invention on enterprise sale. Then corresponding capitalization takes place in such a way that either the average annual proceeds are multiplied according to the principles of the above GFC judgement, with a use period corresponding multiplier, which according to the judgement for an assumed use period of eight years is 4.86, or the expected future license yields (or saved royalties) are capitalized according to the pension formula, assuming subsequent pension payment, to the cash value at the time of determination.

Writing off

Without considering taxation questions, reference is made to an interesting standpoint, namely King/Labrum/Franck in the article "Valuing Intellectual Property" in connection with the determination

of the value of the invention according to the yield value method (license analogy). The issue is whether account should not already be taken of taxation standpoints when determining the value of the invention based on license analogy, in the same way as for the total compensation determination according to the EIA (of which the above authors were clearly not aware when drafting their article, when they refer to a new evaluation method). It must firstly be borne in mind that royalty payments, which must be paid in future by the particular enterprise to a third party, can be immediately tax deducted as working expenses, and on the other it must also be considered that the value of the invention can be written off over the expected use period, after it has been capitalized and activated. Therefore the overall calculation should be made "after tax", as will be shown in an example.

6. Special standpoints

For various protective right types special considerations must be taken into account, and certain of these are explained below.

6.1. Know-how

The literature repeatedly states that in the case of "unprotected inventions," particularly from taxation standpoints, an average use period of only three years is used as a basis. This may well be of interest from the taxation standpoint, but is not in accordance with practice. Generally only those technical inventions are unprotected, i. e., not applied for as a patent, where there is a realistic chance of keeping the corresponding invention secret.

These are typically inventions which are not detectable on the finished, marketed product. An example is a chemical production process, which may make decisive internal savings possible, or may bring about a considerable improvement to the product, but whose features cannot be detected on the finished product. Therefore, the enterprise in question does not publicize the invention, so as to admittedly obtain a time-limited monopoly advance compared with the competition, but would still run the risk or certainty of the competition imitating the process, which could take place legitimately at the latest when the patent in question expired or also in countries with no patent protection, and instead handles the invention as a company secret.

This is based on the idea of also being able to utilize the invention in a monopoly, a time-unlimited manner. If the advance of technology does not lead to the know-how becoming obsolete, or if third parties

do not, in turn, make the invention in question or protect the same, or use the invention in a company secret manner, or the secret is betrayed, there is no apparent reason for the particular know-how being used for shorter period than in the case of a patented invention, in fact the opposite can be assumed.

Therefore also in the case of evaluating know-how it would appear appropriate to use as an average a period of at least 12 years.

Corresponding capitalization factors or multipliers are to be used, as is naturally the case with all the remaining examples, quite independently of shorter residual use periods being used in the above calculations.

6.2. Copyrights

The normal capitalization factor in the publishing sector (much the same as with sound carrier manufacturer stocks and occasionally also film stocks) is between 2 and 10, the upper and lower limits rarely being encountered. In general, the negotiations for an agreement are based on four to eight times an average annual result over the past five years and other than in the case of taxation evaluation general costs are ignored and any directly associated special costs for a particular exploitation of the specific work are deducted from the outset when determining the annual result (for instance, a commission paid to an intermediary for arranging a license agreement for the translation into a foreign language, with a foreign publisher).

The individually used capitalization factor is determined as to whether the previous average proceeds can or cannot be expected in the longer term. The novel of a well-known author who has just died may only make a large turnover after his death. However, it may be forgotten after a few years. If Simmel (a popular German novelist) writes no further novels, then his earlier works will soon be jobbed off. In the music publishing branch this is particularly clearly felt.

Many composers only have good GEMA incomes, because they not only compose, but also conduct an orchestra, where they particularly frequently play their own works (examples: Ernst Mosch, James Last). When they pass away, their works soon die with them. Libretto authors, who live from writing German texts for foreign hits, which have a relatively short life, scarcely leave anything except that when their inheritance, as an exception, includes an evergreen. Catalogues containing such short-life works and/or have not been well cared for, because the existing stocks in the time prior to the inheritance or sale had not been subject to sufficient advertising, are given a lower factor, whereas stocks including evergreens are given in a higher factor.

6.3. Marks

When determining the value of a mark it will be assumed, if the license analogy basis is to be used, that royalties of up to 10 are usual. The author has found that frequently trademark royalties, based on corresponding net turnovers, of approximately 2 to 4 are paid. However, such license rates will only be applied if they are particularly well known or famous marks and in this case the comparison price method may appear more appropriate. However, in the case of license analogy an average use period of at least 20 years would be appropriate.

6.4. Use in practice

The practical application of these evaluation principles for intellectual property, both registered and unregistered IPRs, should be based whenever possible the proven method of value determination on the basis of yield value considerations, generally known as license analogy. Only if this method fails, then in the sense of the application of service inventor determinations, should the use be made of determinable business use, particularly corresponding saving, whilst taking account of similar capitalization methods, as explained on the basis of license analogy. If all this fails, all that remains is the possibility of the free estimate, preferably taking account of the comparison price method.

Conclusions

Enterprises owning secret know-how (such as technology not yet publicly known), like certain know-how in the field of manufacturing military components, which usually is not yet publicly known, should, in their effort to enter into civilian business, particularly in cooperation with foreign investors and licensees, start by collecting specifications of all know-how available in the enterprise, which is considered not being of belonging to the state of the art.

Thereafter, using national or international search facilities, such as the excellent documentation of the Chinese Patent Office, what part of the respective technology can still be patented should be determined. Such a particular specification, explaining both the procedures of the state of the art, the disadvantages thereof, and the specific advantages of the particular procedures etc. developed by the respective company, are a good basis for filing a national patent application at the Chinese Patent Office.

Such an application should be made before talks with foreign enterprises are sought for, in order not to bring patentability of

subject matter involved into jeopardy of becoming unprotectable by unconfidential disclosure. In cases where patent protection appears as not possible or not advisable, secrecy understandings should be signed before talks of the aforementioned kind start.

After filing of the national patent application, the twelve months priority term of the Paris Convention and the thirty months' term of phase II of the Patent Cooperation Treaty (PCT) are available for the necessary negotiations, so that investments in foreign countries in the form of patent filing costs can be postponed, until essential agreement in relation to the distribution and bearing of such costs is achieved with the foreign investor.

The assets of a company which owns valuable technology to a great extent are determined by IPRs, and such IPRs should be duly evaluated, in terms of asset evaluation, before mergers, joint ventures etc. are realized.

References

- Mohr, *Taxing Inventors and Inventions*, Munich, 1985.
- Rohnke, *Valuing Trademarks when Purchasing Enterprises*, DB, 1992.
- Repenn, *Determining the Market Value of Marks*, Mitt., 1994.
- King/Labrum/Franck, *Valuing Intellectual Property*, Les Nouvelles, 1991.
- Halaczinsky, *The Taxation Evaluation of Publishing Rights and Sound Carriers*, GRUR, 1984.
- Reimer/Schade/Schippel, *The Law of Service Inventions*, Berlin, 1993.
- Bartenbach/Volz, *Employees' Invention Act*, Cologne, 1990.
- Bartenbach/Volz, *Service Invention Remuneration*, Cologne, 1995.
- Michael Gross, Betriebsberater, *Present Royalties in Patent License, Know-How and Computer Program License Agreements*, No. 18, May 4, 1995.
- Patent, Design and Trademark Journal*, 1989.
- Federal German Taxation Gazette*, 1970, part II.

Joint Ventures

Christian Osterrieth
Attorney at Law
Punder, Volhard, Weber & Axten

What is Technology?

The significance of technology transfer

Without technological development the possibility of economic development is inconceivable. The economy of the currently industrialized countries grew based in the main part on the technological advances which they have experienced in the process of their development.

Technological development is a running accumulation of technical knowledge which can be used in industry, commerce, agriculture and services. This accumulation can originate in two different ways: it can come from your own research and development work but it can also come through the acquisition of technology from a third party which has already undertaken to carry out research and development work. Your own development work and the acquisition of technological knowledge are of equal importance, standing side by side and neither can be dispensed with. There can be no doubt that your own research and development work is essential for the optimal utilization of technology acquired from a third party. For it is only he that has adequate basic technological principles at his disposal that is in a position to suit the acquired technology to his own requirements. Therefore, the transfer of technology is of paramount significance for technological development and cooperation.

Furthermore it leads to the spreading of existing technology and gives the owner the possibility and the chance to exploit and utilize this technology intensively. Therefore more and more holders of complex and significant technology are tending to optimize the utilization of their technology by cooperating with a suitable partner and are introducing it in various forms of industrial cooperation.

Especially in international transactions a range of methods and contract types concerning technology transfer have been developed. In the following I will deal with one special method of technology transfer, namely the joint venture.

The meaning of technology

However, before we get involved in the methods of technology transfer we should first establish what we understand by technology. UNCTAD, while working out the Draft International Code of Transfer and Technology defined the term technology as “Systematic knowledge for the manufacture of a product, for the application of a process or for the rendering of a service, including managerial and marketing technologies.”

This definition is very open and does not only see technology as technical knowledge but also incorporates “managerial” and “marketing” abilities. I should nevertheless not like to lose sight of this definition because it is especially suited to joint ventures. These are a good example of extensive cooperation and for an exchange of “technical” technology as well as “managerial” and “marketing” technologies.

Technology seen as a legal object

Technology transfer takes place within the framework of international contracts between the partners. Technological knowledge is hereby the object of a contract. Before abstract technological knowledge can become the object of a contract, it has to be defined in a legally binding way. Technological knowledge has first of all to become a legally identifiable object.

This can come about in many ways. One particularly important method of converting technological knowledge into a legal object is the subject of the preceding article by Heinz Goddar. The article covers the preconditions and explains how inventions from as many countries as possible throughout the world gain commercial protection in the form of patents, utility models, registered design, etc. If technological knowledge is not patented, it is, in the case of secret technology, generally characterized as know-how and because of this comes under specific legal protection in many countries. In some cases it is difficult to decide and careful consideration is required to determine how a certain technology can be protected most efficiently. It is assumed here that this first step has already been taken, i.e., that a certain technology, in either the form of commercial protection (patent) or know-how, can be or is protected.

The various forms of technology transfer

Variety of forms

The form of technology transfer depends first of all on the content and manifestation of the technology to be transferred and secondly on the kind of cooperation both parties intend to have. There are many possibilities in this field, which are also often combined.

Buy/sell

The easiest instance of technology transfer is the simple buying or selling of a patent or know-how against payment of an agreed price. In this case the holder of the technology usually provides the buyer with a number of documents in which the technology in question is fully described and instructs the buyer on the technology. The contracts are usually drawn up in a short time.

Joint venture

The opposite of the previous case is a joint venture, where both partners found a company together. This binds two (or more) parties to a contract usually for a longer period of time. There is not only an exchange of technological knowledge but also an exchange of personnel and financial resources. A joint venture is, as a rule, a long-term finance intensive cooperation which in the event of failure can lead to large losses for both partners in the joint venture.

Licensing contracts

Between buying and joint venture there are many other methods of technology transfer. A frequently and commonly used form of international technology transfer is the licensing contract. A licensing contract differs from a purchase in that there is a long term cooperation between the licensor and licensee. The parties to the contract usually commit themselves to place further developments and results of their own research and development work at the other parties' disposal.

R&D contract

Research and development contracts are special cases because they refer primarily to the joint creation of technological knowledge and not its industrial utilization.

Other forms

Management contracts and contracts concerning technical assistance affect not only technical but also commercial knowledge in the form of surrender of commercial or technical advisers. In practice, these separate contracts only play a subordinate role and in most cases are part of comprehensive cooperation.

The joint venture as a means of international technology transfer

What is a joint venture?

The term 'joint venture' is controversial. There have been many different attempts at defining the term which try to capture the many nuances of meaning as fully as possible.

One can define a joint venture in very simple terms as follows: a joint venture is the project of two or more legally, organizationally and economically independent partners, to found a new company—the joint venture company—which is directed as a long term basis towards the production and sale of various goods and services.

Because of its organizational independence, the joint venture company has committees and organs at its disposal, which represent the company in legal matters. The partners are involved in the running of the company and play a part in the decision-making. It is also characteristic of a joint venture that the partners are usually of different nationalities.

Some dissociations are ensured from this definition: one must differentiate between a joint venture and a 100% (pure) foreign subsidiary or a dependent office of an individual company. It must also be differentiated from dependent forms of cooperation of various partners and from pure financial participation, such as portfolio investments.

Strategies and "driving market forces" for joint ventures

There are numerous reasons which speak for the founding of a joint venture when practicing international technology transfer.

a) Necessary joint ventures

There are areas in which the emergence of new products is just not possible without the existence of a joint venture because virtually none of the partners would be in a position to provide the necessary means for the development and production of the product. The AIRBUS Consortium is a prominent example of such a joint venture, made up of a series of European partners for the development of civilian aircraft to compete with Boeing in the international market. The necessities for cooperative forms of technological transfer, for example through a joint venture, also arise in other areas such as information technology. In this area, the linking-up of various systems, a problem which is growing in importance, calls for cooperation.

In many cases, a partner's financial participation, which is associated with a joint venture, is a compelling prerequisite that the other partner is actually prepared to make a certain technology available. This can be seen in the following case: Within the framework of a licencing contract the licensor usually reveals the technology directly after the contract has been completed. He hereby fulfils his obligation resulting from the licencing contract from the moment the contract comes into being. In return, the licensee pays his licencing fees at a later date and over a long period of time.

In the case of partners whose cooperation is based on trust, this doesn't usually cause a problem. However, it is just possible that the licensee is not willing or is not in a position to pay the licensor his licencing fees on a long-term basis as stated in the contract and that his primary interest lies in gaining possession of the new technology as quickly as possibly to use it for his own benefit. In such a case, the licensor has every right to claim damages or take proceedings against the licensee for breach of a contract. In many instances, he will be successful if there is effective legal protection in the country concerned and the breach of a contract can be proved.

In the case of a joint venture where the licensee himself has a financial input in the joint venture company, this sort of risk can hardly arise due to the different corporate structure. Because of the financial participation of the licensor in the joint venture—legally the joint venture company is the licensee—the licensor can exert influence on the joint venture company through company law and, on the other hand, the partner, through his financial participation in the joint venture company, vouches for its success.

Therefore in the case of a transfer of particularly high quality and valuable technology, it can be observed that the holder of the technology would prefer to pass on the technology to a joint venture company in which they share control, than sell the rights to a licensee over which they have no control.

In practice, there are numerous other cases in which a joint venture is imperative. This is especially the case in host countries where the legal requirements call for the incorporation of a local partner. In the legislation of many countries the incorporation of a local partner is a prerequisite for sanctioning, as pure foreign subsidiaries are not allowed.

In many countries it is not the legal, but rather the actual conditions which call for the incorporation of a local partner. This particularly affects the access to sources of raw materials, contact with authorities, the procuring of public orders, etc.

b) Joint ventures as a gateway to new markets

One further reason which, from a strategic point of view, can speak for a joint venture is the necessity to be present in these countries where the target markets are located. Somebody wishing to develop a market for a particular product or wishing to enter into an existing market could, of course, also try to achieve this by exporting these products into these markets. This often proves to be difficult because insider information concerning knowledge of the market, market channels, connection to the business community and experience in dealing with local authorities and government are lacking. A company which has a joint venture partner in such a situation, who is familiar with the particularities of the target market, often has a structure at its disposal which must be seen to be more favorable than a sales system with connections to a distributor.

c) Joint venture as a finance model

Apart from the technological necessity of cooperation and the necessity of cooperation to open new markets, the capital investment of both partners plays a decisive role. There are instances in which the financing possibility for a joint venture is a decisive reason for choosing this type of cooperation.

d) Summary of the advantages of a joint venture

The most important motives for founding a joint venture can be summarized as follows:

- The development, production and sale of a new product or service require the technological, “managerial” and “marketing” input of a partner.
- There is a possibility of co-financing.
- The existence of a domestic, legal, independent company often makes the development of contacts to customers, suppliers, personnel and state authorities easier.
- The joint venture, being a legal independent unit, is in a position to take on its own economic risk. This means, on the one hand, that the legal responsibility of the parent company resulting from the cooperation can always be limited to the resources invested in the joint venture company. It also means that the joint venture company is in a position to finance itself by borrowing on the money market.
- Usually the use of profit in joint venture companies follows through distribution of dividends or profit retention. For tax reasons, this kind of profit distribution can be more favorable than the intake of licencing fees or payment of management.
- As a legal, independent unit, the joint venture company is immediately the owner of commercial patent rights and know-how which is to be developed through its activities. This lends the joint venture company, which is now the independent owner of technological knowledge, more importance on the market.
- The partners of a joint venture company often hive off certain parts that were established parts of their own company up to then and incorporate them into the joint venture. This applies in part to R&D institutes and also for certain applications of a technology, the industrial utilization of which up to this time was economically unattractive for a single

company. The hiving off of an activity from the partner's own company and its incorporation into the joint venture often lead to a strengthening of the structure of the partner's own company.

- Because of its activity on the domestic market the joint venture company often has easier access to the local work force, and in particular, to local raw materials because the domestic partner often has better connections to the raw material sources. He can then introduce these materials into the joint venture company.

e) Disadvantages and risks in a joint venture

These advantages do, however, to some extent have their counterpart disadvantages and dangers. The transfer of technology through a joint venture has the following disadvantages compared to the standard licence award:

- The joint venture leads to a considerable capital tie-up and therefore to an increased liability risk with regard to the general company risks and product risks.
- Compared to a licencing contract a joint venture requires a lot of looking after and management responsibility.
- It requires that the partner also controls the company by playing a part in the organs of the company.
- It requires partnership and trusting cooperation as well as a lot of consideration.
- In the case of failure, it can only be ended under relatively difficult conditions.

Even compared to direct investment of a 100% (pure) subsidiary, a joint venture can, under certain circumstances, prove to be disadvantageous. Owing to the necessary cooperation the joint venture requires a solution to possible goal conflicts among fellow partners or at least a vote among the fellow partners, a transfer of technology which up to then was exclusively used by their own company. Furthermore they only share control in the joint venture company and a limited control at that, as well as having to share the return on capital.

It seems that the list of advantages and disadvantages of opting for a joint venture structure can be extended at will. The large number of arguments for and against a joint venture must in each case be carefully thought over. Especially when you consider the fact that a joint venture has to run over a long period and that in the case of failure large settlement problems need to be dealt with, then it becomes clear that the decision whether or not to go through with a joint venture must be very carefully examined.

Market Communications Outlines

David Buxbaum

Attorney at Law

Amberger, Kim, Buxbaum & Choy

Of all the aspects of marketing, none is more important than developing name identification for a product or a service.

Brand and corporate trade names

Anything that you have purchased during the past week, the clothes that you are wearing, the cologne that you use, the car that you drive, the computer that you work on, the watch that you wear, the soup that you eat, even the decision to purchase a book were all influenced by the name of that product. The influence which the name of a product has on a consumer even applies to the company that you work for and the street that you live on.

A good name means high satisfaction for the end-user, and power for the business that carries it.

Product names have one main purpose: to enter the mind of the consumer when the consumer is making a purchasing decision. Otherwise, there would be no reason to name a product in the first place. You could simply use a number and call your product number 829.

If you haven't already experienced it, sooner or later you will have to name a product or service for your company. This is a critical decision that business people face all over the world every day. In fact, a new product name is registered somewhere in the world several times a minute, 24 hours a day.

To evoke the intended response, a product name must be one to which the customer can relate. One indication of the auto industry's failure to adhere to this principle is the plethora of alphanumeric names currently found on cars, such as the Mercedes 560, SEL, the BMW740IL, and so on.

This unfortunate trend of giving cars meaningless names can be traced back to the success that the Datsun 240Z experienced in the early 1970s. Today, the successor to the 240Z—the Nissan 300ZX—also supports a virtually meaningless name. While the "Z" refers to a 3-litre engine, the

“Z” and “X” are merely meant to sound sporty and convey no information to the consumer.

While a handful of serious car enthusiasts may be able to relate to such names, the vast majority of consumers cannot make head or tails out of the difference among NS-X, RX-7, and XR4Ti, 24KOSX, MX-6, or SHD. Although some German consumers might be thrilled to discover that the Mercury XR4Ti name is based on German; the “X” means “sporty”; the “R” means rear-wheel drive; the “4” refers to its number of cylinders; its “T” stands for a turbo charged, and the lower-case “i” means fuel-injected. Few other consumers are likely to care.

In spite of all the eye-catching alphanumeric names for today’s car, car makers have still failed to solve the all-important international identity problem.

To develop a good trade name Javed Naseem has suggested four steps:

The first step

Name development is the most creative step. However, there must be input that includes linguistic knowledge, historic naming references, and an update on current naming trends.

The second step

This one is analytical. One should judge the suitability of a name to the desired positioning in the marketplace. The process must include consideration of the appropriateness of the task at hand; measurement of the advantages of the offering and competitive disadvantages of the name; testing its use and applications; and its potential longevity.

The third step

Here, one investigates the name’s availability. This step requires adherence to a strict checklist, making sure jurisdictions are not overlooked; that conflicts and similarities are noted; and, as a result of extensive and detailed searches, detailed search reports are prepared for the company’s legal department.

The fourth step

There must be confidence that the name has been put through an exhaustive process, so that it can be properly registered, and protected, through review of the legal department’s plan of action. This requires an audit of all search results, and analysis of conflicts; assessment of the proprietary of component of each name; and the documentation of a registration and protection strategy which ensures complete and final approval of a name’s launch.

Once a brand name has achieved international recognition it can be utilized to market a variety of other products. One famous example of this was Coca Cola's ability to refresh the clothing industry with its own line of apparel. In 1987 alone, Murjani International sold \$200-million worth of clothes emblazoned with the Coca Cola logo. The power of Coca Cola's logo was indeed the Real Thing.

Protection of tradenames and trademarks

In order to protect a tradename or trademark, it is desirable to register them at the local trademark office. However famous marks can be protected even where they are not registered.

Because famous trademarks are widely recognized by consumers, they are likely victims of several types of actionable harm, including confusion, dilution and other injuries based on damage to "brand equity". Unlike owners of not-well-known marks, who may only be able to prevent uses of similar marks on similar goods, owners of famous trademarks have a variety of legal theories available to oppose objection third-party uses.

In evaluating a mark's strength, courts focus on two dimensions: (1) inherent distinctiveness; and (2) the extent of recognition or awareness by the relevant consumers' class. "The term 'strength' as applied to trademarks refers to the distinctiveness of the mark, or more precisely, its tendency to identify the goods sold under the marks emanating from a particular, although possibly anonymous, source."

Franchising

One means to market your product after it is named is by franchising. Franchising is generally understood to be a mode of commercial operation in which a franchisor licenses a franchisee a package of rights, often including trademark, trade name, patented technology, trade secrets, etc., and in return, the franchisee pays the franchisor a fee and operates and manages the business, in some cases under direction from the franchisor.

Franchising, as a means of creating and operating a large number of commercial operations, has developed rapidly in China in recent years. According to the Legal Daily of April 14, 1995, there are more than one hundred and fifty chain stores, with more than two thousand participant enterprises and companies in China. Some big name western fast food companies, including Kentucky Fried Chicken ("KFC"), McDonald's and Pizza Hut, entered the Chinese market through franchising. KFC has approximately twenty chain stores in China's major cities, including Beijing, Shanghai and Guangzhou. McDonald's also has many franchise locations in China's major cities.

Some well-known Chinese operations, including Quanjude Fried Duck based in Beijing and Goubuli Buns based in Tianjin, have also employed franchising to enter new markets. So far, Goubuli Buns has sixty-one outlets in eighteen provinces in China and another three overseas stores. In 1993, it collected franchising fees totaling to RMB800,000 which doubled the profits of the company.

Trademark licensing is a common part of franchise agreements in China and the rest of the world.

Under Articles 20 and 25 of the Trademark Law in China, once a trademark is registered, the holder may transfer or assign all or a portion of his rights to the trademark. The assignment of all of one's rights to a trademark requires an application to the trademark bureau and a guarantee by the transferee that any goods manufactured will meet minimum quality standards.

The Trademark Law in China also contemplates the transfer of rights by means of a license. Such a transaction normally requires that a written contract granting the license be filed with the Trademark Bureau (Art. 28). The Trademark Law requires the licensor to supervise the quality of the products manufactured by the licensee. The Trademark Law also requires the licensee to indicate its name and address on the products which it manufactures. The law imposes no other mandatory requirements on trademark licensing transactions. Therefore, unlike those contracts entered into under the Technology Rules, the licensor and licensee have a great deal of autonomy in conducting a trademark licensing transaction. They may agree on whatever terms they wish. If a trademark is licensed by foreign owners to Chinese business entities, normally the Foreign Economic Contract Law (discussed above), will apply. The terms and conditions of the licensing contract must comply with this Law. These rules are quite similar to those that were already discussed.

Market analysis

To understand a market for any product certain analysis must be done, e.g., :

- Define the market and opportunities;
- Market sizing;
- Market segmentation;
- Understanding consumer attitudes and buying patterns;
- Assessing the purchasing power of the middle class;
- Understanding regional differences.

References

Javed Naseem, *Naming for Power*, at 117th Annual Meeting of the International Trademark Association, Orlando, 1995.

Alexander J. Miles, "International Protection of Famous Trademarks in the United States," *Course Book*, 117th International Trademark Association Annual Meeting, Orlando, 1995.

Chan Siew Hoong, Nielsen SRG China, "The Chinese Retail Market," China Franchising Symposium, Shanghai, China, 1995.

Advice to Chinese Enterprises Involved in Preparing Proposals to Major Transnational Corporations

Ben R. Carroll

The basic issue addressed in this article is the establishment of relationships; in particular, how would a Chinese enterprise go about establishing a business relationship with a major foreign corporation? We will assume that a joint venture is the contractual vehicle of choice. After initial conversations, coordination meetings, and governmental considerations, the essential documentation will take the form of a proposal. Accordingly, my remarks will be arranged into four elements:

- A brief description of the conditions necessary in setting up a joint venture;
- The basis for a relationship with a major U.S. corporation;
- The expected type of proposal data package;
- Some baselines for use in comparing competitive positions.

Necessary conditions

There is a need for an overall framework for establishing a Conversion Joint Venture. The time taken to move from one activity to the next will vary widely and will reflect the urgency, importance and visibility of the situation. The steps, from initial contact to programme startup, are discussed in sequence, the basic questions (when, where, who) must be addressed and the key actions (follow up, assessment, etc.) must be identified in terms of the output required (coordination, analysis, etc.). Policy, economic, legal and contractual considerations impact the ongoing efforts. There is a degree of involvement and confirmation required of the government. Nothing final will happen until the proposal documentation is submitted.

In order to expedite business contacts and to assist Chongqing/ Wuhan enterprises, setting up a Business Development Centre would be a huge advantage.

As China moves forward in the process of shifting toward a market economy, many major obstacles will impede progress in establishing joint ventures with foreign firms because, by Western standards:

- The essential legal, contractual and regulatory base has not been established or reduced to practice.
- Management principles are not understood and the training of managers is inadequate.
- Professional cadres which are crucial to the support of the market (lawyers, bankers, accountants, etc.) are not available in sufficient numbers.
- Sichuan/Wuhan entrepreneurs do not have access to the expertise which is required for market-driven technology development.
- There are not enough entrepreneurs to provide the grassroots generators of new employment and growing economic development.

When western businessmen arrive in Chongqing/Wuhan full of goodwill and high expectations, *they will not know* where to find key services, how to complete essential documents, or from which office to obtain necessary permission to operate and:

- How to set up an office;
- Where to look for prospective clients;
- Who to turn to for advice on hiring staff;
- How to find a place to live;
- Which institutions and agencies to contact.
- Who are the decision-makers in their area of business interest?

Some of these matters are addressed in two books: *Doing Business in China* and *A Guide to Investment and Taxation in China*, both by Chinese authorities and both printed by 1987.

After receiving the start-up help provided by the sponsoring entities—the Centre would be expected to operate as a profit center—and would serve as a source of advice, information and instruction in helping Chongqing/Wuhan enterprises establish a relationship with a major foreign company.

Basis for relationship

The first matter to be agreed upon is who is selling and who is buying? There are many questions to which a major U.S. corporation would want to have answers. Most of the immediate issues would arise over whether the transaction would involve buying or licensing:

- What is the form of the technical data package? Exclusive rights?
- Who owns the technology? Patented?
- Are intellectual property rights involved?
- What are the legal requirements?
- How will the contract be written?
- Where will the contract be negotiated and enforced?
- How will physical transfer be effected?

- Which entity receives payment?
- What are the permanent arrangements made for follow-up activities?

To a USA aerospace company, a set of technologies could be of significant and immediate interest such as: welding, image processing, composites, software, and more exotic applications such as diamond film; and wind tunnels always seem to attract interest. But where do we start? How do we know that we have the basis for “a deal”?

Questions that remain include:

- What are the applications?
- Product lines?
- Divisions?
- Potential benefits in the short, middle and long-term?
- Where in China is the technology?
- Do we need an expediter in Chongqing/Wuhan?

There is a common set of problems to be faced by a producer of consumer products. This is exemplified by, for instance, when a given enterprise can produce a small calculator, but is not immediately prepared to answer fundamental, practical questions such as these:

- What did it cost you?
- Who wants to buy it?
- What will buyer pay for it?
- How will buyers know it?
- How many can you sell?
- How many should you make?
- What rate of production?
- Where are the buyers?
- How fast will he buy it?
- How will you deliver it?
- Where will you service it?
- What will service/repairs cost?
- What if the buyer wants changes?
- How will you know what to change?
- What will it cost you in three years?

When faced with the realities of converting an entity from a producer primarily of military hardware to a maker of consumer products, it is best to look at the facts of the situation, to address the reality of whom you really are and what paradigm you want to follow. There are some fundamental’s issues, illustrated below. To get down to basics, you will need to focus on answering– for *your* enterprise–issues such as these:

- Accept essential fact: conversion is necessary;
- Dismiss the obvious: technology is the easy part;

- Define critical evaluation criteria: What is a company? Who is a customer?
- Provide mechanisms for specific progress;
- Drill on the process: customer surrogates;
- Focus on practical basis for "a deal".

As you seek examples of what to use as a guide, bear in mind (1) that institutions underlie a market economy and (2) that you have to do a lot of preparation work to be able to write a winning proposal.

To be useful to the Chinese in 1995 and for the years beyond, they may want to take a close look at the appropriate paradigm they will want to follow in developing your strategies and, of course, they would expect the Center in Chongqing/Wuhan to have carefully examined the matter of what example to use in advising your enterprise. In the USA, guarantors of success (big, rigid, independent), which worked so well from WWII until 1965, have been seriously challenged by Japanese features of success (small, flexible, interdependent) beginning in 1975 and lasting into the present.

U.S.A.	JAPAN
WWII -1965	1975 - Present
Big, rigid, independent	Small, flexible, interdependent
Huge resource base	Sub-value added for resources
Demanding home market	Set up offshore operations
Best technology base	Pay off in quality/productivity
Monopoly on raw materials	Reduced cost of raw material
Finest infrastructure	Kieretsu networks
Standard consumer appetites	Quick response to tastes
High transport costs	Geography no barrier

There is another very critical aspect of competing in the broader industrial community: global commercial trends are taking on borderless characteristics. Most of the advantage is obtained from and by the commercial companies making parts and components: they have many more opportunities, they produce far more volume, and they are much more profitable. As we move up the product side to bigger and more complex systems (culminating, perhaps, in a stealth bomber or a nuclear submarine) and as we move across the bottom to defence-unique companies, we end up with few opportunities, little quantities, and small profits. So, borderless companies *who make use of borderless knowledge* are driving the great commercial technology revolution of our time.

There are many differences between military and civilian (or commercial) projects. There are many elements making up these differences. For the moment here, we want to focus on the fact that a key test of the differences comes down to the term "Value Added". Non-value added activities are what we want to eliminate and, on the US Department of

Defence contracts, at a *minimum* about 20 to 25 percent of the tasks are non-value added, unnecessary tasks.

We want to move on now to more specific considerations which a Chinese enterprise would need to address when planning to deal with a major USA corporation. It is assumed that Sichuan/ Hubei alone does not comprise a sufficient “market” and that the foreign corporation wants to sell across China—and perhaps to a global market. The first two matters that need to be provided by the enterprise or made available through the proposed Centre at Chongqing/Wuhan are:

- Provide a digest and interpretation of relevant laws, including legislation in process, which effect the formation, status, and operation of an enterprise in which there is a foreign participant.
- Provide a digest and interpretation of relevant trade regulations, including contemplated regulatory actions, which describe or restrict the market environment and relationships across China.

The biggest task to be undertaken by the Chinese enterprise is the preparation of information (which information might have to be verified in an on-site audit) about how the enterprise works, how it is organized, what is the scope of its technical and production capability, what is the basis of its financial position, and who are the managers and what is their level of competence. The following is a list of the criteria which a western corporation would want to use in evaluating the Chinese enterprise:

1. R&D: Have experiences (via demonstrated performance) in the origination and development of a consumer-oriented product.
2. Technology: Have capabilities in high or mid-technology application by a qualified staff.
3. Detail engineering design: Have the capacity & the willingness to accept a “design package” (drawings, specifications, and other technical data) as the basis for undertaking to complete a detailed design of a consumer product.
4. Production: Have the trained workforce, basic tools, and manufacturing processes required for the output of high/mid technology production of a significant quantity of units.
5. Distribution: Have experience or current activities in China- wide distribution of a product (particularly a consumer- oriented product); transportation, storage, and outlets and service centers should be characteristic of this operation.
6. Marketing/sales: Have an understanding of, or practice in marketing/sales activities.
7. Cost accounting: Have an understanding of or practice in the application of basic cost accounting principles:
 - Estimating and pricing;

- Budgeting and work authorization;
 - Indexing of costs to tasks;
 - Cost pickup and analysis;
 - Cost reporting methodology.
8. **Consumer orientation:** Have a strategy of product development that is oriented toward responding to customer requirements in terms of:
- Quality;
 - Warranties;
 - Service and follow-up improvements;
 - Pricing;
 - Quantities.
9. **Targeted market:** Have acceptance of the necessity to confine sales to China areas until competitive position warrant attempts to penetrate “Western” markets.

Certainly I realize that some of this terminology is not completely understood by a lot of the people in China, but these are largely *fundamental assumptions* that would be firmly fixed in the mind of most Western executives. If the Chinese enterprise can meet most of the above criteria then the Chinese side is ready to work on a proposal.

Proposal

The joint venture proposal document should include the five parts (the U.S. company you are dealing with may require that the five parts be bound separately and likely would require the language to be English). The synopsis of relevant laws would be seen as an “official” statement of relevant statutes and might be made a part of contract terms and conditions. The typical, four- volume proposal document would have these contents and represent an *ideal data package*:

- 1. Synopses of laws which apply to the establishment of the proposed enterprise**
 - Summary of relevant sections of the law
 - Details, interpretations and documentation (appendix)
- 2. Summary of the nature and scope of the proposal being made to potential foreign investors/partners**
 - Executive level
 - Reference to proposal content
- 3. Technical features and operational performance details of the product or service offered by the proposing enterprise**
 - Features
 - Performance: effectiveness, reliability, maintenance, etc.

4. Planning and projections

- Cost of progressive phases in enterprise formation
- Phase I: Investigative steps
- Phase II: Contract definition
- Phase III:
 - Financial projection for proposed enterprise
 - Risk assessment (tulip curve)
 - Profitability projections
 - A break-even point
 - Comparative/historical cost data by product line

5. Management approach to organizing and operating the proposed enterprise and in producing the product or providing the service

- Organizational structure and recruitment of key personnel
- Principal management control processes
- Review of status and control centers
- Operating procedures and standards
- Schedule of the major events and activities which must be accomplished to bring the proposed enterprise into being
- Cost accounting techniques
- Estimating data base (historical? indexed?)
- Negotiating procedures & contract features
- Budgeting and authorizing work (task breakouts)
- Cost collection, report submission, data files
- Auditing requirements

It is difficult to generalize about the contents of a proposal because three factors have a large impact on the proposal submittal:

- The business environment
- The structure of the organization
- The nature of the product line

The business environment causes a wide variation in the instructions provided in the Request for Proposal (RFP). The contract conditions can be gathered into six categories:

- Legal
- Contractual
- Management and technical
- International
- Capitalization
- Customer

The nature of the business and its ownership will cause varying responses to the stipulations in the contract conditions. Any one of the many contract conditions might be the subject of a long discussion, but the first two, equality of legal position and settlement of disputes, are matters of significance to government-owned organizations and to any organization doing business with the government.

If the contractor cannot assume a position of equality, then the very fundamental of equity in the contract world has been abrogated (done away with). How would Boeing, General Electric and American Airlines decide who was responsible for an accident if one of the three was not only a participant, but the judge as well? Settlement of disputes by arbitration, by negotiation, by government intervention, by the national court system, at International Court in The Hague becomes a crucial consideration.

The type of product considered will substantially dictate the contents of the enterprise/organization response. If the enterprise concerned produces huge, complex, highly technical, networked system-of-systems (a satellite telephone system, for example), then the enterprise response will be considerably different from that of a component part-maker who runs a machine shop. It is clear that *what* the enterprise makes will determine *how* their reply to an RFP.

The proposal document, particularly the Executive Summary Volume, is looked upon by military contractors and by Government-owned companies differently than commercial organizations view the document. In one case, the Pan-USSR Consumer Products Company, it is shown how a western software and systems company sells *benefits* and *results* as compared to spending time describing technical features.

Baseline comparison

Base lining/bench marking has assumed a major role in assessing what it will take to compete in the global marketplace. If you assume that your enterprise/company is working in aerospace, that you have about 5,700 workers, and that your annual sales are \$750 million, what positions are you in to compete worldwide? Here is the challenge.

If your company seeks to maintain existing company practices, then to meet international *aerospace* competitive levels, you will have to reduce manpower, say 25% reduction and increase the sales budget by 100%, but to meet international *commercial* competitive levels, it may take:

- 67% reduction in manpower; and

- 300% increase in the sales budget.

In order for direct comparisons to be made, the best way will be for your enterprise to allocate your total manpower into common core business systems which are in the process of being defined for worldwide use. Then you will be able to compare your operating results to those of other highly competitive organizations. Also, a comparison can be made on the basis of a number of categories (from “number of employees” down to “Profitability”). A separate discussion of this approach and a further explanation of the bench marking technique would require a much longer article.

An appendix: Business Development Centre Chongqing/ Wuhan

The Sichuan/Hubei government could investigate the creation of a Centre in Chongqing/Wuhan to serve as a forum where a broad range of interested Chinese and foreigners could meet to establish business relationships and work together toward the common achievement of objectives, such as:

- Help Sichuan/Hubei entrepreneurs set up new business;
- Guide Sichuan/Hubei enterprises to become “marketized”, “corporatized” or “privatized”;
- Assist foreign partners who want to invest in new ventures in Sichuan/Hubei;
- Advise Sichuan/Hubei national, regional, and city governments about the most appropriate legislation and regulations needed to make a market economy operate.

A. Criteria for creating a Centre

In response to this rationale, the Centre should serve as a clearing house and central forum where everybody interested in participating in the development of the Sichuan/Hubei market economy can find help in support of:

- Business opportunities
- Joint ventures
- Cooperative agreements
- Technology choices
- Transfer of technology
- Other forms of cooperation
- Practical questions such as:
 - Defining legal structures
 - Arranging financing
 - Setting accounting standards
 - Conducting marketing efforts

- Providing customer follow-up services
- Interpreting laws and regulations
- Training for Sichuan/Hubei and foreign business leaders, technology assessors, technicians, enterprise staff, and others

B. Questions to be addressed in relation to the Centre

- Who will sponsor/promote the start-up of the Centre?
- Where will initial resources come from?
- What organizational structure would oversee the efforts of the Centre?
- How can the Centre operate on a self-funding basis, after, perhaps, one year of underwriting by initial sponsors?
- Who will contribute funding, how much, and for what services?
- How will the managing directorate function and what will be the authority base?
- What will be the interface with the Sichuan/ Hubei governments and how will an access be assured?
- What would be the charge to foreign businessmen and what services would be offered?
- Which providers of professional services could use the Centre and what would be their relationship? For instance, how would they be charged?
- What physical facilities would the Centre need in order to operate successfully?
 - A building for reception, offices, conference rooms, etc.
 - Miscellaneous services: transportation, interpreters, food, etc.
 - International telecommunication connectors
 - Support services such as bilingual staff, reproduction equipment, presentation materials, etc.
 - Office space available to foreigners for hard currency
 - Apartments and other suitable living quarters available for rent to foreigners for hard currency
- What would be the principal source of Centre revenue as a self-supporting, profit-making entity?
 - Rental of offices and apartments
 - Membership fees and annual dues
 - Fees for services provided by the Centre staff to Sichuan/Hubei or foreign clients
 - Income from various commercial activities of the Centre, such as loans, venture participation, emergency advances, referral fees, etc.
 - Donations to the Centre from public or private sector sources and
 - “Success fees” at the conclusion of a mutually beneficial business arrangement between Sichuan/Hubei enterprises and entrepreneurs and foreign parties

About the author:

Ben Carroll is recognized as a national and international expert in defence acquisition, national defence policies and aerospace business strategy. During his 30-year career at Lockheed Martin, Ben made contributions to virtually every major competitive award—from the F-111 fighter/bomber to the joint strike fighter programme. Ben, who retired in 1994 as Manager of Programme Acquisition, served as a key adviser to five company presidents at Fort Worth.

Enterprise Support System for Conversion: Introduction of Strategies for Innovation (SFI) Applied to Market-Oriented Transition of Military Enterprises in China

Joseph Bitran and William B. Carpenter

Introduction

This article reviews our experiences in “Enterprise Support Projects” aimed at helping enterprises to develop market-oriented products and services, and enable them to successfully transition from defence to civilian markets. We discuss the processes which were introduced to help in planning and managing the transition, and demonstrate through a specific case study from Rolls Royce how a successful transition was achieved.

The first process, called “Strategies for Innovation” (SFI), focuses on enterprise design and strategic product planning. The second, closely related process, called “Design for Success” (DFS), focuses on design of successful new product concepts. Both processes address Market, Product and Technology issues for each existing product or a new product concept. Implementation of SFI and DFS requires the participation of internal “stakeholders” which represent all the key functions in the enterprise, such as Research & Development, Engineering, Production, Marketing & Sales, and Product Support. Both SFI and DFS processes are software based, and when implemented, they form an “Enterprise Support System”. They are implemented via “enterprise support projects” which consist of Workshops, Coaching Sessions, and proprietary software in which the SFI and DFS processes are embedded.

SFI and DFS were researched, designed and developed by Dr. William B Rouse and his team, at TEAM Technology International, Ltd.

SFI and DFS were implemented in more than 100 enterprises from different industry sectors, including aerospace, automotive, banking, defence, electronics, health care, and non-profit and non-governmental organizations. This article contains outline appendixes which describe the processes and several implementation stories.

The focus here is on how an enterprise support system consisting of the “Strategies for Innovation” process has enabled defence enterprises, such as Rolls Royce International Research & Development, to transition successfully from defence-related products into products that address civilian market needs. Specially developed software drives both the “Strategies for Innovation” (SFI) and the “Design for Success” (DFS) processes.

Further on, we outline problems of all enterprises in transition (and, one can argue, that each and every enterprise, these days, is undergoing, or should be undergoing transition and adaptation). Next we outline problems which, in our experience, defence enterprises in transition are facing, and the challenges that they must meet to become market driven and plan unique products that provide significant benefits to customers. The SFI software helps develop a strategic product plan and the necessary implementation and marketing plans, and all the related financial statements.

Innovation from within

Common experiences have demonstrated that the combined SFI and DFS process encouraged innovation from within, by stimulating the participants to draw on their enterprise’s experiences, know-how, and competencies, while at the same time addressing potential new markets. The process then enabled participants to generate ideas for enhancing or adapting existing products, as well as help to generate ideas for “market innovation” via new product concepts relating to new markets.

In practice, the process enables a quick and thorough development of a “strategic product plan” for each “product” (which may be a product, a service, a project or a programme). It starts by asking a series of a market related questions, and continues with product functionalities and technology issues. The process then provides feedback on the success potential of each plan for an enhanced or a new product.

Product plans that do not score well on the “Success Potential Matrix” (which is based on 16 market and technology attributes) are then enhanced by the process, which offers appropriate enhancement strategies and helps to pinpoint the product’s critical success factors. Obviously, at this point in the process the participants determine which

products to focus on and which to “relegate” to a lower priority, or remove entirely from the enterprise’s strategic plan.

In all cases, however, for a product plan to be ranked as potentially successful, it must, first of all, offer significant benefits to customers. These benefits are then translated into product functionalities, and all the necessary implementation, support, and marketing plans are then developed.

Objectives of a typical defence enterprise in transition

A typical state owned defence enterprise undergoing privatization and a transition from defence to civilian markets has used the combined SFI-DFS process to achieve effective transition and provide the necessary training in the process to all the participating “stakeholders”.

The enterprise defined a support project which would assist it in achieving the following objectives:

- Support the efficient and cost-effective transition of defence technologies and know-how into marketable products and services, targeting commercial market opportunities as well as the shrinking defence markets;
- Review high priority or high visibility programmes, and evaluate and enhance their success potential;
- Develop innovative strategic plans for products and services which efficiently address new market opportunities;
- Provide an efficient system for ongoing review, evaluation and enhancement of existing products and new product concepts, to ensure that they provide significant added value to clients;
- Stimulate all Company stakeholders (from R&D, Engineering, Business Development, Marketing and Product Support) to participate in and contribute to a common, SFI-based, “Product Development & Enhancement System”.

Problems the enterprise was facing

The problems that were facing the enterprise were a combination of problems facing all enterprises in transition, and, in addition, specific problems facing defence enterprises in transition.

The following general problems common to all enterprises were identified by the enterprise’s management team and the consultant on enterprise support systems.

Typical problems facing all enterprises in transition

- A serious gap between strategic planning and product planning;
- Shorter product life cycles;
- Increasing competitive pressure;
- Increasing development costs;
- Faster technological change;
- Dynamic organizational change.

Typical problem facing defence enterprises in transition

- Excessive product and technology orientation;
- Weak market orientation;
- Excessive reliance on external consultants;
- Neglect of own, internal, human resources and intellectual potential;
- Lack of effective processes for generating market innovation.

How the SFI process was implemented and used

The SFI process was then used to identify and agree the critical success factors and challenges that were facing defence enterprises in transition: how to deliver significant value and benefits to customers, through innovative products and product functionalities, at a price that customers are willing to pay, while relying, as much as possible, on in-company knowledge and competencies, and on appropriate internal and external technologies.

Participants then utilized the SFI process to develop:

- A strategic plan for transition strategic product plans for civilian markets;
- Marketing plans for civilian markets;
- Plans for transition of R&D and support functions.

By the end of a six-month long project, the defence enterprise has implemented a process that enabled an ongoing review and enhancement of success potential of each existing product or new product.

A strategy for transition

It should be stressed that the route that the defence enterprise followed in the transition of some of its capabilities into products for civilian markets was a low risk effort that first attempted to review the success potential of the enterprise's existing defence related products.

Only when the enterprise's strengths were established, in terms of the defence related products with the highest success potential, did the stakeholders' attempt to develop new product concepts that meet civilian market needs. In fact, all those new potential civilian product plans have evolved from the enterprise's strengths in terms of competencies and know-how. The route that they then followed was to compare the market potential of both existing defence-related products and the new, civilian, product concepts:

- Develop strategic plans for all existing defence related products and services;
- Develop strategic plans for new, unique and innovative, product concepts;
- Review the success potential of all existing and new product plans;
- Enhance the success potential of new products;

- Validate all existing product plans and new product concepts, including functionalities, and “export” the results into the strategic planning system;
- Consolidate existing and new product plans with highest success potential into a “Strategic Plan for Transition”;
- Review the financial consequences for the entire enterprise and individual divisions or business units.

Consequences and benefits for the defence enterprise

Following the implementation of the SFI, the participating stakeholders and the management team have achieved only partial conversion from defence to civilian products, which, in reality, was all they could hope to achieve given their ongoing commitments to their military clients. However, more importantly in their opinion, they have achieved ownership of a common process, or system, for ongoing transition, in which all the stakeholders were trained and which all of them endorsed and used.

The following consequences and benefits were listed by the various stakeholders and endorsed by the management team:

Structured planning and review processes

The existing “structure” was open to wide interpretation by individuals.

Commonality of approach

Everyone uses the same SFI process regardless of position within the company.

Credibility

The SFI process, when fully utilized, allocates resources to those plans with the greatest success potential. Product managers thus fully understand the criteria for obtaining approval and budgets for their product plans.

SFI’s Enterprise-Specific-Advice function enables top management to provide *timely guidelines on critical market, domain and company-specific issues* which influence products.

Knowledge base

The system became a depository for relevant information and new ideas, and is used at both management reviews and product planning design meetings.

Objective vs. subjective assessments

The system encourages multi-criteria, objective, assessment of potential success.

Dynamic planning process

At the end of each financial year, plans can be produced at a “click of a button”; previously, 3-5 person-weeks were spent on producing each individual product plan at the end of the financial year.

Selection of unique products

The process enabled a systematic selection of unique and innovative products which represented the enterprise’s strengths and, at the same time, provided significant benefits to customers.

Enhanced valuation of the entire enterprise

The process stimulated the development of innovative product functionalities which provide added value and enhance competitiveness. These, combined with an overall higher success potential score for the enterprises repositioned existing products and new potential products for civilian markets, have contributed significantly to enhancing the entire enterprise’s valuation during negotiations in connection with privatization and the formation of potential joint ventures.

Improved market communication

The strategic product plans which resulted from the SFI product planning and enhancement process became the ongoing common source for the development of all marketing communications, advertisements and public relations information. By drawing from the same strategic product plan, marketing and public relations stakeholders were able to communicate consistently and efficiently with the market and potential clients. High quality market communications, at both the enterprise and the product levels was the direct result, as exemplified in Appendix A below.

The SFI system encouraged and made possible cross-functional planning teams.

The SFI system encouraged a more effective and efficient sharing of resources across divisions and the entire enterprise.

Case study: transition of defence-related R&D into innovative, market-oriented products and services

Rolls Royce International Research & Development was set up in 1962 in Newcastle-upon-Tyne, UK. At that time it was not part of the Rolls-Royce group. It was set up to carry out technical work and R&D programmes for the major power engineering companies in Newcastle, for government owned utilities, for the British Ministry of Defence and its suppliers.

The RR/IRD enterprise was expert in a wide range of technologies: (i) materials development; (ii) materials testing; (iii) coatings; (iv) welding technology; (v) welding systems; (vi) electro-mechanical systems; (vii) electronic & computing systems. For example, for many years in the 1970's, RR/IRD was the leading organization in the UK for super-conducting electrical systems.

The 110 contracts won during the 1970's and 1980's, from the customers listed earlier, were nearly all "cost-plus", and up to an agreed limit payment was guaranteed. Contracts were based on high cost rates and work was carried out on readily extended timescales.

By the end of the 1980's, RR/IRD was a company of around 225-250 people with a turnover of about US\$10 M per year, but producing very little profit.

In the early 1990s, three major changes affected IRD and completely altered the business situation:

- In the UK's defence business there were two major effects. Firstly, the political changes in Eastern Europe and the end of the "Cold War" between the Western countries and the Eastern bloc soon meant that spending on defence was reduced. Secondly, all contracts were the subject of more competition and were increasingly on a fixed price basis.
- All the major utilities in the UK were privatized, sold to private shareholders and very soon began to reduce costs in all areas, especially in R&D.
- Rolls-Royce took over the ownership and management of the major power engineering groups that IRD was part of by this time. The main effect of this was to bring the culture of a leading-edge, multinational company to IRD's business.

What challenges faced RR/IRD as a result of all the changes described? The "marketplace" for R&D work was crowded and competitive. Customers were no longer mostly government run. Contracts were now fixed price and available only through competition. RR/IRD's costs were much too high. Project Management was poor. Products and services were diverse. RR/IRD's culture was internally focused, not on the customer, and not concerned with excellence.

RR/IRD's response to all those challenges was simple and similar to that of many other companies in the UK in most respects:

- They decided to concentrate on a few things they would do well.
- They found many ways to improve their performance on contracts. They reduced numbers of staff. They changed their culture in many ways, especially by focusing on the needs of their customers.

In all of this, the enterprise support system they used had a key role. However, they needed, most of all, to decide which products and services to concentrate on and to get everyone to focus on the customer.

The enterprise support system they used met these requirements and they insisted that it was used by every business area. Every business area was required to produce business plans for each of its products and services using the enterprise support system.

This produced several improvements very quickly:

- The plans addressed the benefits sought by the potential customers and how those benefits could be delivered by the product or service. The plans did not start with the assumption that the product or service was highly desirable.
- The plans addressed the competition and why competitors would let the business succeed. They did not assume success.
- The plans considered several “horizons”, beginning with what is possible now and eventually considering products or services that would delight the customer.
- The plans required each business area to establish the cost of developing each product or service.

All this made it possible for RR/IRD to compare the prospects for each product plan in each area and to decide between them in a way that had never been possible before.

Rolls-Royce & Associates

Rolls-Royce & Associates (RRA) was formed in 1959 to take on the naval nuclear reactor technology from the USA. For over 20 years RRA’s main business was the design, development, procurement and support in service of nuclear steam-raising plant for British Royal Navy submarines.

In the mid 1980s, RRA first sought business from non-naval customers in the areas of technology developed for the naval programme. This was done with the full knowledge and support of the UK’s Ministry of Defence.

The biggest and best example of success from this time was the winning of a contract from the CEGB (then a government owned utility) for the inspection of the Reactor Pressure Vessel for the Sizewell Pressurized Water Reactor at Sizewell in the UK. Inspection of this RPV was “state of the art” technology in the Western nuclear industry. This contract was won in 1987 and completed in 1994.

Since 1987 RRA has found other nonmilitary applications of the technologies originally developed in the naval nuclear programme. However, the most difficult step in such a change is always the development of the business case for the product or service.

During 1993 attempts were made to transfer the successful experience of enterprise support systems at RR/IRD to the RRA situation. That transfer was not successful for several reasons, principally:

- The products and services under consideration were a minor part of RRA’s business, so not everyone was familiar with the language or methodology of the enterprise support system.
- There was not a champion at a sufficiently high level in RRA like there was at RR/IRD.

In 1995, they are again planning to use the enterprise support system to assist with decision making on the deployment of R&D resources within the organization. This time RRA will have the benefits of: (i) the

experience from the last attempts; (ii) RR/IRD's ongoing experience; (iii) improvements to the enterprise support system.

Appendix A: Improved Market Communications

In any enterprise which implemented the SFI process for product planning and enhancement and, in particular, in defence enterprises where marketing and market communications are generally neglected or little understood, the strategic product plans which resulted from this process became the source for all marketing communications, advertisements and public relations information.

With SFI, each strategic product plan must address market, product, and technology issues relevant to the product under planning or enhancement.

The process prompts participants to answer a series of a critical market related questions before proceeding to "design" the product's functionalities or address specific technology or know-how issues. There are questions such as:

- What benefits will the product provide (as distinct from features)?
- Who wants these benefits?
- How much will people be willing to pay (as opposed to how much we want to sell the product for, thus practicing Peter Drucker's "market-driven pricing" not "cost-plus pricing")?
- Why will the competition let us succeed?
- What revenue can we expect?

Specific advice for each question then prompts participants to search for, or conduct focused market research, and provide the answers. Similarly, product and technology questions are answered, in order to focus on the product's functionalities and link them to the benefits to be provided. ("How will these functionalities provide the desired benefits?") The result of this product planning process is a "strategic product plan" that contains all market, product and technology information in one common plan. Once the implementation of the strategic product plan is agreed by the stakeholders, it is communicated to all functional managers, such as marketing and sales, engineering, R&D, production, product support, etc.

For those who are responsible for marketing and sales, the strategic product plan thus becomes a common source for all market communications, including brochures, advertisements, press releases, product announcements, and even sales proposals. At the same time, the very same strategic product plan provides consistent information for those who are responsible for the other functional managers.

By drawing from the same strategic product plan, all stakeholders are able to communicate consistently and efficiently with the market and with potential clients. High quality market communication that focuses on the products' benefits to customers, together with effective and competitive proposals, was the direct result of implementing the SFI process.

Appendix B: Strategies for Innovation (SFI)

The SFI Business Planning Advisor software helps managers and staff, at all levels and disciplines, to develop innovative strategic product plans. The SFI process enables all stakeholders to efficiently interact with and contribute to plans, and to assess and enhance their success potential, prior to implementation. SFI also provides enterprise specific advice and an on-line, "just-in-time", training and support.

The SFI system is used in the USA, UK, Israel and South Africa, where it stimulates planning, development and enhancement of innovative products and services. It is used by a variety of enterprises, such as British Aerospace Defence, Motorola, Rolls Royce, Rover, Stratus Computer and Barclays Bank.

Appendix C: Design for Success (DFS)

The DFS Product Planning Advisor software helps managers and staff, at all levels and disciplines, to develop detailed pre Computer Aided Design (CAD) product design plans. The DFS process enables all stakeholders to efficiently interact with and contribute to plans, and to identify critical success factors.

The DFS system is used in the USA, UK, Israel and South Africa for the following applications:

Pre-CAD Design & Development of New Product Concepts
Market & Product Modeling, including identification of Critical Success Factors
Market Assessment of Alternative Product Concepts
Competitor Comparison & Analysis
Improving Competitive Advantage;

DFS is one of the systems in the Enterprise Support Systems family. The others are Strategies for Innovation (strategic business and product planning), Catalysts for Change (understanding and enabling change) and Enterprises in Transition (strategic situation assessment).

Appendix D: Enterprise Support Systems Selected Applications

Planning and implementing change

Enterprise Support Systems have been applied in a wide variety of projects associated with substantial, and often massive, changes in enterprises in both the private and public sectors. In the process of implementing our planning systems, we have also provided assistance in training people to use the component methods and tools, formulate their planning problems, prepare detailed plans, and implement these plans. The following selection of applications is representative of the types of efforts with which we have been involved:

Aircraft, vehicle and weapons' industries

A large aircraft manufacturer was seeking to broaden the market for its aircraft beyond the domestic defence market. We worked with the marketing and sales function within this company to implement our strategic planning system, train people in its use, and prepare the function's first comprehensive plan.

A major manufacturer of aircraft avionics was attempting to diversify beyond its traditional, cyclical markets. We worked with the engineering function in this company to implement our strategic planning system, train people in its use, and prepare initial plans for two new market thrusts.

A major airline was planning a transition from a mainframe- based passenger reservation system to a distributed computing environment. Working with the information technology and reservation functions within this company, we helped them to develop an evolutionary plan, including the metrics whereby the business impact of this effort could be assessed.

The R&D function within a major aircraft manufacturer was seeking to be more responsive to the needs of its operating units. Working with top management within this function, we helped them to implement our strategic planning system, train people in its use, and prepare a plan for developing and introducing new cockpit technology.

A leading vehicle manufacturer wanted to improve its processes for planning new vehicles and systems. We worked with their engineering & marketing departments to integrate our strategic planning and product planning systems into their processes and train people in their use.

A weapon's manufacturer was looking to improve its processes for strategic business and product planning and gradually transition into civilian markets. Working with the engineering function in this company, we helped them implement our strategic product planning system and train people in its use.

Opening Statements by Representatives of the United Nations and UNDP at the Round-table on International Cooperation for Military Industry Restructuring

Abdel Hamid Bouab
Officer-in-Charge
PFBDB/DPEPA/DESA

It is a great honour to share this round-table with such a distinguished group of representatives from public and private sectors, government and academia. Moreover, I am very pleased to be here with you today to launch this international round-table in the true spirit which prevailed at the founding of the United Nations.

Let me at the outset convey my very warm appreciation to the Chinese authorities from COSTIND, CAPUMIT and the Beijing research institute of aeronautical materials for the arrangements made for this important round-table and for their generous hospitality. We also would like to express our thanks to UNDP for their long-standing support to the project of which this round-table is the epilogue.

China has played a very significant role in promoting conversion from military to civilian sector and international cooperation in this field, jointly with the United Nations and other partners. The meeting we are launching here today testifies to the commitment of the people of China to peace, sustainable development and international cooperation. The United Nations has welcomed its association with the Chinese authorities in various conversion initiatives, and it is therefore our desire that this on-going conversion partnership between Chinese and the United Nations, will continue to thrive in the years ahead.

Conversion from military activities towards civilian endeavours embodies the very ideals of peace, stability and equitable prosperity upon

which the United Nations was established in 1945. In this context, the Secretary-General of the United Nations, Mr. Kofi Annan, has continued the United Nations tradition of emphasizing the strong relationship between peace and development, entailing the close linkages between peace-making, peace-building and sustainable development.

The process of structural adjustment for the transition to disarmament, including the conversion of military capacities to civilian use, is both a complex and dynamic evolution. Structural adjustments in the civilian sector take place all the time, in response to changing economic conditions and the challenge of sustainable development. What naturally occurs in these cases is the shifting of resources, that is, the transfer of capital, labor and technologies to other activities and/or locations, usually guided by market forces.

What makes military conversion different is the relative difficulty in redeploying resources to other development-oriented endeavours. Market forces alone are not sufficient for military conversion. Consequently, conversion requires a close interaction and partnership between the private and public sectors.

This round-table provides a unique opportunity for fruitful interaction among key stakeholders in the conversion of defence industries, military facilities and personnel. Full advantage should be taken of this opportunity to take stock of international cooperation initiatives for conversion and to have a candid exchange of views on these complex issues.

The project that is coming to completion at this round-table was initiated in 1995. It was aimed at promoting international cooperation, such as joint ventures, in support of conversion in China. This round-table is part of the concluding episode of a three-phase programme sponsored by UNDP, and jointly implemented by CAPUMIT and former DDSMS, now DESA.

The first phase of the project consisted of back-to-back Workshops on New Business Opportunities in China—Restructuring the Military Industry, held in Chongqing and Wuhan in October/November 1995. The second phase comprised back-to-back Coaching Seminars on Business Strategy and Planning, held in Leshang and Kunming in November 1996. All the time, since the project inception, efforts were made to promote Chinese conversion projects in a variety of countries, in Asia, Europe, and the Americas.

Finally, this round-table will take stock of the accomplishments of the project, while still seeking to promote international cooperation for conversion in China. At the conclusion of the project, a publication will be issued to disseminate its main results, including an evaluation whose

summary will be presented and discussed here at the onset of the round-table.

As the programme indicates, after this opening session, we will start by discussing the Chinese experience with conversion and the role of international cooperation in achieving it. The topic will be reviewed by Chinese and non-Chinese experts and practitioners. Next, the vast experience of the United States will be discussed by a host of specialists, who will cover approaches emphasizing the role of the private sector. Then comes the European experience, with its traditional mix of government and private sector approaches. The presentations and discussions of the experience of the rest of the world will complete the canvas. In listening and participating you may refer to the need to provide an enabling environment at both local and national levels, the promotion of a consensus among stakeholders on conversion priorities, as well as the mobilization of private and public resources to implement conversion initiatives.

The round-table will end with a summary and an overall discussion. You will also have an opportunity to discuss international cooperation and local partnerships in this field. It would be most useful if you would explore a variety of cooperation and partnership possibilities both at the international and local levels. The models that you will share with us will be useful reference for those countries considering conversion programmes.

The concluding session should be far more than a summary of the round-table. We expect it to be a lively debate on the direction to pursue in the future, from many different perspectives, truly reflecting the thinking of the round-table, both for China and other countries concerned.

Today and tomorrow you will be engaged in an important deliberation, which the generosity of our Chinese hosts have made possible. I keenly hope that with your support and the support of all Member States of the United Nations, we will be able to continue on-going programmes and launch new initiatives to realize, on the broadest possible scale, the ideals of the United Nations, which we all share.

I thank you and would like to convey my best wishes for a most successful and productive round-table.

***Ms. Chingboon Lee,
Deputy Resident Representative
UNDP Office in Beijing, China***

On behalf of the United Nations Development Programme, I would like to extend a warm welcome to all of you at this international round-table on cooperation for military industry restructuring, an initiative sponsored by China Association for Peaceful Use of Military Industrial Technology (CAPUMIT), UNDESA and UNDP.

Military industry restructuring is one of the most challenging tasks being undertaken by China during the country's economic reform and opening up process. Challenging because it is closely related to reforms in other areas such as public administration, state asset management, and most importantly, the state-owned enterprise sector.

The reform of state-owned enterprises is the highest priority among China's policy-makers and it is regarded as an essential task for China's economic growth and stability. This consensus is clearly reflected in President Jiang Zemin's recent report to the 15th National Congress of the Communist Party of China.

The project under which this round-table is funded is one of many technical assistance projects UNDP China has in its economic reform portfolio. This initiative, entitled "Military Industry Conversion in China" aims to assist China in its efforts to find creative market solutions for converting military enterprises into enterprises providing goods for civilian markets. The project consisted of three-phases of training activities.

The first phase was composed of two back-to-back workshops on new business opportunities in China held in Chongqing and Wuhan in October/November 1995.

The second phase organized two back-to-back coaching seminars on business strategy and planning held in Leshan and Kunming in November 1996. From the activities in the last two phases, some 40 joint venture proposals were produced and contacts with potential foreign partners have been established. They also helped managers of the military industry to develop an appreciation for the importance of business planning and strategy.

The last and concluding phase of this project includes this international round-table and two additional back-to-back training seminars on business strategy and planning in Beijing and Xiamen as well as publication to disseminate the project results.

These activities are aimed at helping the Chinese military industry identify civilian manufacturing opportunities based on military technologies, mobilize resources, both private and public from domestic and international sources, to develop market-oriented management skills of enterprise managers such as incentive-based personnel management, marketing strategy development, and fund raising techniques for new investment, and to retrain military personnel for civilian employment. However, the issues raised above represent merely the tip of the iceberg of challenging tasks for the military industry conversion in not only in China but also in many other countries. Therefore, it would be useful to learn from the considerable knowledge and experience of other countries, which is one of the main purposes of this round-table. We believe that the experiences and case studies presented at this round-table will improve the understanding of the conversion process under different social, economic and political conditions through the analysis of successes and failures of past and on-going experiments of international cooperation in China and other countries.

We hope that during this round-table a candid exchange of views will take place and wish that the lessons learned from these exchanges will become a valuable input to the future implementation of China's efforts to institutionalize the modern enterprise system as well as to the dissemination of the project results.

Finally, on behalf of UNDP, I would like to wish you all success in your presentations and discussions over the next two days.

Epilogue

The articles in this publication converge on the relevance of timing, structure and strategy regarding the future of international cooperation in support of military industry restructuring and public sector reform. A gradual, step-wise approach, at the opportune time, as the public sector is being reformed, with a market orientation and based on careful preparations, supported by a sound strategy, with consensual backing by the relevant stakeholders, and public and private financial inputs, was found to be crucial to the success of military industry restructuring and public sector reform.

A structure of collaborative partnerships or consortia, assuming a variety of forms in different countries and regions, but having in common a core sets of activities for supporting the relevant stakeholders involved, in the form of investment promotion, information, management coaching and training, project preparation and matchmaking, business communication, technology acquisition and R&D, etc., is essential for effective military industry restructuring.

Other important features of the structure for promoting military industry restructuring and public sector reform include the involvement of the relevant stakeholders concerned, especially the local communities, as members of the collaborative partnerships or consortia, in the decision making process for the selection of priorities and the broad strategy to be followed. Better results are to be expected if these consortia are able to concentrate efforts on focused markets, with clear objectives in mind, and a full awareness of risks, while guided by the strategic direction provided by the stakeholders' consensus. The consortia should also show flexibility and resilience as circumstances change in the marketplace.

International cooperation in all forms must be promoted via bilateral initiatives, in both public and private sectors, and via multilateral channels, particularly through the United Nations system. There could be many entry points into the complex arena of military industry restructuring, but there would always be room for mutually reinforcing contributions from a number of United Nations system bodies, especially if they are provided in a context of coordinated efforts.

Member States committed to conversion initiatives should strengthen the mandate of the international organizations with which they are

affiliated, to allow them to devote the necessary resources to public sector reform and military industry restructuring processes. In the end, it must not be forgotten that the power of the United Nations lies largely in the power of ideas and their capacity to mobilize the political will and the resources to address demanding causes such as military industry restructuring and public sector reform.

As the above conclusions unfold, it is important to keep in mind those international efforts to ease tensions at the global, regional and national levels must continue to maintain an environment of mutual trust among nations, which would discourage renewed arms buildup and proliferation. An international frame of reference, which promotes military industry restructuring, should be established to expand military industry restructuring initiatives and prevent reconversion processes from taking place in the future.

Multilateral efforts to promote the global economy on a sustainable basis should be intensified, particularly through the United Nations, the World Trade Organization, the World Bank, the regional development banks, and others, to promote free trade, investment, technology transfer and open economic systems for the benefit of all countries and the military industry restructuring process.

In this context, it is crucial to fully document and disseminate public sector reform and military industry restructuring successes and failures, via expanded networks where information is accessible to a growing number of stakeholders. Conversion provides global opportunities for investment, particularly by institutional investors who might be inclined to support military industry restructuring and public sector reform in line with the specific interests of their informed membership. Thus, documentation and information are paramount to boost conversion investment.

Military industry restructuring and public sector reform still have many difficulties to overcome. But there is an immense potential for much larger initiatives in China and elsewhere. All over the world, demobilization of military personnel and decrease in military procurement are posing a set of problems and opportunities, which must be approached in a positive way via public sector reform and military industry restructuring. International cooperation, including United Nations initiatives, has an important role to play in this endeavor.

Glossary

ACDA	Arms Control and Disarmament Agency, USA
ACEC	Arizona Council for Economic Conversion
BI	Business incubator
BIAM	Beijing Institute of Aeronautical Materials
BDDEP	Belarus Design Department of Experimental Production
BMSP	Belarus Ministry of State Property
BNAS	Belarus National Academy of Sciences
BUSINIS	Business Information Service for CIS Countries
CAPUMIT	China Association of Peaceful Uses of Military Industrial Technologies
CATARC	China Automotive Technology and Research Center
CHP	Combined heat and power generation
CICPA	Chinese Institute of Certified Public Accountants
CIS	Community of Independent States of the former Soviet Union
CMA	Council for Mutual Economic Assistance
CONAE	Comisión Nacional de Actividades Espaciales of Argentina
COPAC	Community Patent Court
COSTIND	Comission on Science, Technology and Industry for National Defence, China
CPA	Certified Public Accountant
CPC	Community Patent Convention
CPR	China, People's Republic
CRADAs	Cooperative Research and Development Agreement
CREDIT	Academic network established in 1991 to carry out conversion policy studies, in the wider European context, etc.
CSTD	United Nations Centre for Science and Technology for Development
DARPA	Defence Advanced Research Projects Agency, USA
DCF	Discounted cash flow method of financial analysis
DIC	Defence Industrial Complex
DOC	U.S. Department of Commerce
DOD	U.S. Department of Defence

DSTI	Defence science, technology and industry, in China
EADC	Economic Adjustment and Diversification Committee, Saint Louis, USA
EBRD	European Bank for Reconstruction and Development
ERC	Engineering Research Centers, China
EIA	Employees' Invention Act
EPC	European Patent Convention
EU	European Union
FDI	Foreign direct investment
FIE	Foreign-investment enterprises
FIFO	First in, first out method of inventory accounting
FIGs	Russian Financial-Industrial Groups
FMC	Ford Motor Company
FMN	Flexible Manufacturing Networks
FSU	Former Soviet Union
GDP	Gross Domestic Product
GFC	German Finance Court
IBRD	International Bank for Reconstruction and Development
IESC	U.S. International Executive Service Corps
IFC	International Finance Corporation, World Bank subsidiary
IPR	Intellectual Property Rights
ITS	Intelligent Transportation Systems
KONVER	European Union Programme for Conversion
LIDDI	Long Island Defence Diversification Initiative
MIC	Military Industry Complex
MILEX	Military Expenditures
MOD	Russian Ministry of Defence
MOFTEC	Ministry of Foreign Trade and Economic Cooperation of China
MTCR	Missile Technology Control Regime
NASA	National Aeronautics and Space Administration of the USA
NATO	North Atlantic Treaty Organisation
NGO	Non-governmental organization
NIS	Newly Independent States of FSU
NPIC	Nuclear Power Institute of China
OEA	US Office of Economic Adjustment
OECD	Organisation of Economic Cooperation and Development
OPIC	Overseas Private Investment Corporation, USA
PC	Packaging company

PCT	Patent Cooperation Treaty
R&D	Research and development
RF	Russian Federation
RMB	Renminbi, the Chinese currency
SABIT	Special American Business Internship Training Programme
SKD	Semi-knocked down
SOE	State-owned enterprise
SMEs	Small and medium-size enterprises
TI	Technology incubators
TIC	Network of Technological Innovation Centers
TNC	Transnational corporation
TVEs	Township and village enterprises
UN	United Nations
UNDDSMS	United Nations Department of Development Support and Management Services
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
USA	United States of America
USAID	United States Agency for International Development
USSR	Union of Soviet Socialist Republics
WFOEs	Wholly foreign-owned enterprises
WIPO	World Intellectual Property Organization
WTO	World Trade Organization