HOW CHINA BUYS TECHNOLOGY

The China Business Review

THE MAGAZINE OF THE NATIONAL COUNCIL FOR US-CHINA TRADE
May–June 1987

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China and the Soviet Union
Points of Contact

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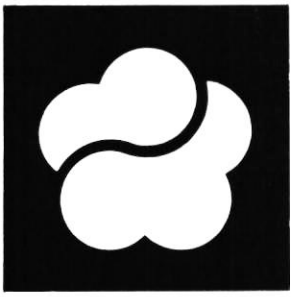

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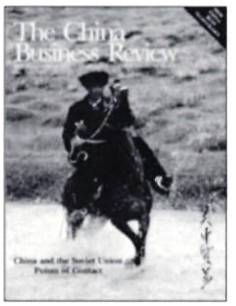
The China Business Review

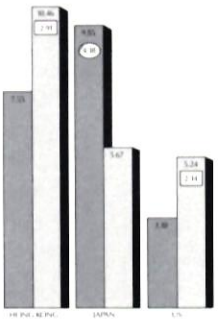
The magazine of the National Council for US–China Trade

May–June 1987 Volume 14, Number 3

Cover: China's trade with the Soviet bloc, which reached $5.9 billion in 1986, should continue to grow rapidly over the next few years. *Photo of Kirghiz horseman by Galen Rowell/Mountain Light.*



China Data: *CBR*'s annual compilation of statistics covers everything from televisions to trade shares. **Page 32.**



Technology transfer: Although China's overall imports rose only 2 percent last year, technology imports jumped 50 percent. *The CBR* looks at how these purchasing decisions are made—and what foreign suppliers should look out for. **Page 34.**

Departments

摘要

GAMBLING ON THE FUTURE

After nine months of negotiations with China, Portugal has formally agreed to return the oldest European outpost in East Asia to Chinese rule on December 20, 1999. Or rather, China has agreed to accept it. For more than 400 years, China was in no hurry to reclaim little Macau. The 16 sq km territory served as a naval base in the 16th century from which Portugal mounted operations against pirates and other barbarians China wanted removed from its southern coast—including the Dutch. A wealthy trading post until the 19th century, Macau lost its luster when Hong Kong cornered the opium market. For the next 100 years, it was all but forgotten. China wouldn't hear of taking it back, despite a United Nations attempt in 1972 to earmark it as a candidate for "decolonization" and proddings from Portugal in 1974.

Why the sudden change of heart? For a time, Macau was more useful to China as a Portuguese-administered territory. It was an important source of hard currency, a supplier of minerals and metals from South Africa, and an outlet for Chinese exports. Nowadays, Beijing considers it more valuable as the second demonstration (Hong Kong being the first) of the feasibility of "peaceful reunification": a policy chiefly aimed at persuading Taiwan to rejoin the mainland by promising not to tamper with its political and economic system.

Making Macau work as a test case of noninterference will not be easy. Although some 97 percent of the territory's 450,000 residents are Chinese, the civil service is overwhelmingly run by ethnic Portuguese. With native Chinese slow to take up posts in the government, the risk is that China will have to send some of its own to help with administration. Already the growing number of mainland Chinese assuming prominent posts in quasi-official organizations has the look of a quiet takeover to those who doubt the feasibility of "one country, two systems."

Macau's Chinese residents appear to be of two minds about the future. On the bright side, local Chinese hope that reunification will bring economic benefits to Macau, which is a great deal poorer than Hong Kong. China's investments in Macau are already growing. One notable example of cooperation is a Sino–Macanese joint venture in Macau's budding electronics industry that should assist the territory's efforts to expand high value-added exports.

On the other hand, thoughts of 1999 raise fears of the unknown. What will happen to gambling, for example, which employs 6 percent of the population and supplies more than half of government revenues? Most people believe that China will not risk ruining the Macanese economy by closing casinos down. But no one can say for sure.

Despite lingering apprehensions, the Macanese seem more accepting of the impending changes than are their brethren in Hong Kong, who may have a lot more to lose. Last year, Macau held a conference entitled "The Political Apathy of Macau Residents Toward the Macau Question." Only 40 people showed up.

—DDK

SETTING STANDARDS

A long history of problems with low-quality goods makes Chinese consumers leery of buying anything but the best brand-name products. Foreign customers often expect even more.

The Chinese government is in the midst of a concerted campaign to stimulate domestic sales and exports by improving product quality. Despite national, ministerial, industrial, and local standards to regulate production, only about 20 percent of China's major industrial products reportedly now meet international standards. By 1990 China wants to raise the proportion to 40 percent.

By introducing 2,500 international standards in 1984, China achieved the first goal of its ambitious drive, begun in 1979, to rapidly adopt international and advanced overseas standards. The next step is to introduce 500 more this year to bring more products up to par.

But not all enterprises can afford to develop or import the technology needed to reach these standards, nor are they realistically expected to do so. Instead, since 1978 China's Bureau of Standards and Metrology has employed a three-tier classification system to gradually bring enterprises along. "Special-class" enterprises must meet international standards for product quality; "first-class" enterprises must reach the global standards common in the 1970s or early 1980s; and "second-class enterprises" are to match the highest domestic quality standards for 1985. While some enterprises are working their way up the ladder, the bulk of them remain at the lower end—or even off—of the scale.

Enterprises in these three categories must also meet specific standards governing their use of energy and raw materials. If they meet both quality and efficiency standards, they are rewarded with preferential treatment in supplies, transportation, taxes, loans, and foreign currency. To give managers added incentive, the prices paid by China's consumers and foreign trading companies for some goods are now allowed to vary according to product quality, while enterprises repeatedly failing product quality inspections are fined.

Politicians in China may currently be lauding the merits of higher enterprise efficiency, but China's standardization drive has been promoting this goal for years.

—JSS

A TRADE PUZZLE

A strange entry called "returned goods" jumped into the top 10 US imports from China in 1986, according to US Department of Commerce statistics. Trade analysts trying to un-

derstand last year's trade patterns are puzzled by this category, which is now China's ninth largest export to the United States, worth $57.7 million in 1986. Just what is this entry, and why did it increase 154 percent since 1985?

To be counted in the returned goods category (otherwise known as TSUSA 800.0035), a product must have been sent to China and returned to the United States unaltered—except for some possible wear and tear—through the US Customs service. While a few big-ticket items could make the value of these goods surge upwards, the Bureau of Census foreign trade statistics division has no record of any individual items valued at over $2 million in this category last year. Many small entries were therefore needed to add up to this year's total.

The category is best known to include defective goods. But when most readers think of defective goods, the images are of Chinese goods sitting on US docks, rather than the other way around. It is possible, however, that the amount of goods being rejected is rising due to China's concerns over its shrinking foreign exchange reserves.

The possessions that expatriates take to China and then bring home with them are another wild card. The value of these goods returning to the United States is probably on the rise due to the growing number of US expatriates living in China. And heavy machinery, such as mining or seismological equipment, on temporary loan or leased to China for specific projects is also lumped in the 800.0035 category when these goods pass back through US customs.

In fact the rise is probably due to an aggregation of these factors: returned goods, the growing number of US expatriates in China, China's increasing desire for leased and loaned equipment, loaned art exhibits on their way home, and perhaps even clerical mistakes by US Customs officers. The size of this catch-all category is testament to the increasing complexity and diversity of goods exchanged by the United States and China.

At least one thing about this mysterious category *is* certain—the United States cannot blame "returned goods" for contributing to the trade deficit it ran with China last year. Because of its unusual nature, this category is not included in the trade balance calculations. —JSS

INVESTMENT PREFERENCES

In recent years, MOFERT's annual *Foreign Trade Almanac* has included a large, albeit incomplete, list of China's equity joint ventures with other countries. This list includes about half of the total number of joint ventures that MOFERT claims were signed with companies from all countries between 1979 and 1985. On the list are 97 Sino–American equity joint ventures, with an average commitment in China of $1.9 million. MOFERT's sampling of US joint ventures appears to be broadly representative, since this commitment is almost identical to the average US equity share in all of the 134 Sino–US equity joint ventures that MOFERT claims were agreed to during those seven years. This average US commitment slightly exceeds the $1.7 million average of three Asian countries' investments (the Philippines, Singapore, and Thailand) but is notably less than the averages of $2.7 million and $4.5 million respectively for Japanese and other Western investors as calculated from the MOFERT data.

US investors show a decided preference for locating equity joint ventures in the major metropolitan areas of Beijing, Shanghai, and Tianjin. Over 43 percent of US equity joint ventures are in these metropolitan areas, while 32 percent are in the other coastal provinces of Guangdong, Fujian, Zhejiang, Jiangsu, Shandong, Hebei, and Liaoning. MOFERT's sampling of Japanese and other Western equity joint venture locales (i.e., investments from Western Europe, Australia, Canada, and New Zealand) are almost identical to each other—but very different from the United States. Only 30–33 percent of the ventures from these other two broad categories are located in Beijing, Shanghai, and Tianjin, while 57–59 percent are found in the other coastal regions.

This isn't to imply that US investors don't want to venture beyond the reach of the better transport, communications, and living facilities of the major metropolitan areas. A larger percentage of US ventures (25.7) are located in inland areas than either Japan (7) or other Western countries (12.1). —David Denny

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ISSN No. 0163-7169; USPS No. 320-050

Political Watch

Conservatives muster strength, but no basic change in policy

Martin Weil

The sudden resignation of Chinese Communist Party Secretary General Hu Yaobang in January amidst shrill official denunciations of "bourgeois liberalism" raised fears of a major setback in China's reform policy. But several months later, the Hu Yaobang affair appears less and less likely to herald a major policy reversal. Rather, it marks the beginning of the battle to determine the political succession to Deng Xiaoping—a struggle that may be concluded at the 13th Party Congress this fall, but could easily extend beyond that time.

The conservatives who spearheaded Hu's downfall are fighting not so much to replace him with one of their own as to retain a voice in policymaking circles after Deng Xiaoping passes from the scene. All signs are that they will succeed in this endeavor. Deng's successor is likely to be someone in tune with present reform policies but not anathema—as Hu Yaobang was—to the conservatives and the military. As in the past, the conservatives are likely to retain their role as a brake on the pace of reforms.

Background to Hu's fall

Hu's downfall—and the nationwide student demonstrations that precipitated it—caught both Chinese citizens and foreigners by surprise. But political tension had been building for some time as the Communist Party prepared for its 13th Congress this fall and the moment of truth approached for a final decision on whether Deng would step down and, if so, who would succeed him.

When Deng orchestrated Hu's appointment to the post of Party secretary in 1981—the titular number-one position in China—it was with the intention of gradually handing

Deng: mending fences

Hu the reins of power within the Party. In the early 1980s a new generation headed by Hu Yaobang in the Party and Premier Zhao Ziyang in the government appeared to be taking over. A number of young people—many of them loyal to Hu Yaobang—ascended to important Party positions, while several elderly officials were edged out of leading Party organs at the 12th Party Congress in 1982 and the special Party conference in late 1985. Hu Yaobang and Zhao Ziyang assumed higher profiles and chaired important meetings, while Deng Xiaoping withdrew from routine administrative matters.

But on all the most important policy issues, Deng Xiaoping and, to a lesser extent, his elderly colleagues, retained decision-making power. Deng conspicuously failed to give up his positions on the Politburo Standing Committee and as head of the Party's Military Affairs Commission (MAC)—a position making him the de facto commander-in-chief of the military. Deng also found himself unable to retire key conservative Party elders like President Li Xiannian, Discipline Inspection Chairman Chen Yun, or National People's Congress Chairman Peng Zhen. Others who retired in name, such as Bo Yibo, Song Renqiong, and Wang Zhen, retained their influence behind the scenes.

There is considerable circumstantial evidence, furthermore, that Deng himself began to harbor doubts about Hu Yaobang by the middle of 1985 and that these doubts grew over time. His public promotion of a number of young reformist "third generation" leaders such as Hu Qili in the 1985-86 period suggests that he was at least considering the possibility of retiring Hu gracefully at the 13th Party Congress in 1987. Deng's motives can only be guessed at, but it is likely that he watched with distress Hu's failure to develop the necessary political skill of pushing reform forward while guarding his conservative flank—a skill that Deng has shown in abundance over the years. Whether a firm decision to retire Hu had been made or not, it is clear that by the second half of 1986 his future was far less secure than it had appeared during the first two or three years of his tenure as general secretary.

Hu's liabilities

Hu Yaobang had long aroused visceral opposition from conservatives who did not trust his ability to uphold the political authority of the Communist Party during the course of reform. More important, Hu was never accepted by the all-important military, as evidenced by his failure to

Martin Weil, a frequent contributor to The China Business Review, *is director of the National Council's Beijing office.*

assume chairmanship of the MAC.

Opposition to Hu also hinged on debates over basic theoretical questions. Hu, an outspoken advocate of the political/ideological component of Deng Xiaoping's reform program, became a lightning rod for conservative discontent over the implications of change in China—particularly the abandonment of Marxist dogma and Party control over literature, art, and the media. Hu's unenviable job was to preside over the Party at a time when the overall thrust of economic policy inevitably meant a diminished role for both Party and ideology.

Finally, some of Hu's difficulties can be traced to personal style. He appeared, to ordinary Chinese as well as politicos, as an overexcitable, undignified man. On many occasions he evinced a tendency to make impulsive, embarrassing statements—such as suggesting that China abandon chopsticks in favor of knives and forks and extending an invitation for 3,000 Japanese youth to visit China in one large delegation which, together with other actions, also stamped him as unseemingly pro-Japanese.

The denouement

The student demonstrations for greater democracy in November and December of 1986 struck China's already unsettled political scene like a thunderclap. While the students were probably unaware of the details of politicking over the succession issue, they knew that China was approaching a political turning point and wanted to weigh in on the side of reform. But their demonstrations had an unintended effect. They appeared to confirm the conservatives' worst nightmares about the chaotic consequences of a perceived breakdown of Communist Party control.

By early January, Deng had probably decided that it was necessary to give in to rising conservative demands for Hu's ouster in order to protect his larger interest of keeping hard-won reforms intact. The title of "acting secretary" given to Zhao Ziyang underscored the sudden, unplanned nature of Hu's dismissal.

In the aftermath of Hu's resignation, conservative views gained a prominence in the media unmatched in the three years since the abrupt termination of the "spiritual pollution" campaign. But the new conservative offensive has been confined primarily to selected attacks on intellectual scapegoats and the ill-defined concept of "bourgeois liberalism."

Despite the greater visibility of conservatives in recent months, Deng Xiaoping is still a force to be reckoned with. By the end of March, he felt confident enough to reintroduce the highly sensitive subject of political reform to the 13th Party Congress agenda. And true to reformist assurances (made with Deng's imprimatur), the attack on "bourgeois liberalism" has not been allowed to develop into a full-fledged political campaign.

Photo courtesy of China Features

Hu: had to be sacrificed

The conservatives have not yet shown any signs of mustering enough support to promote one of their own into the highest positions. The top Party position remains in reformist hands, with Premier Zhao Ziyang in control as acting secretary as well as head of the government.

But the conservatives have ensured that their voice will be heard in the process of determining Deng's successor. Informed sources say a small committee of elders, almost all with personal or factional ties to Deng Xiaoping, is currently deliberating the leadership lineup to be ratified by the 13th Congress. The members of this group have views spanning the political spectrum, with the conservatives represented by people such as Bo Yibo and Wang Zhen.

Whether the post-Deng leadership will be finalized at the 13th Congress is still up in the air, and the Congress could easily opt to postpone the decision by selecting elders. The Hu Yaobang experience has proven how difficult it is for a successor to consolidate his power as long as Deng remains on the scene—and Deng, having failed to establish the succession with Hu Yaobang, will almost certainly have trouble doing so in the six months before the Party Congress.

Only a candidate acceptable to all factions is likely to get the nod for a high leadership post at the Congress. Candidates are already being characterized as "reformers" (Vice Premier Tian Jiyun, for example), or "conservatives" (Vice Premier Li Peng), but these labels are misleading. The experiences of someone like Li Peng, essentially an ambitious middle-aged politician, and the committed elderly conservatives like Peng Zhen or Chen Yun, are too different to be lumped together as one political category. All the candidates are now trying to stake a claim to the middle. Many different combinations are possible—including returning Zhao Ziyang solely to the premier position where he can serve as the guiding force for economic reforms, or balancing Zhao with someone who, while not a hardcore conservative himself, has a larger base in the conservative camp.

Policy implications

The heightened conservative influence in this period of political transition is evident in some discussions on economic policy. Conservatives have asserted the primacy of grain production over cash crops and rural sideline industry, and cautioned against widening income disparities, hasty implementation of new economic practices such as issuing stock, and allowing more resources to circulate outside State planning channels.

So far, only a few conservative measures have been adopted—notably restrictions on credit to enterprises whose projects are not part of the State plan. On the foreign trade front, the first part of 1987 has brought an appreciable tightening of the foreign exchange approval process for imports of machinery and equipment that China has the capability of manufacturing itself. This echoes moves taken during the last major period of economic conservatism in 1981.

Where concrete measures have been taken, however, an underlying economic rationale usually supports the move. Restrictions on nonplan enterprise projects will help ensure

continued access to key resources for large government factories, while declining oil export revenues have forced planners to deal with shrinking foreign exchange earnings.

High-ranking officials—including a number of conservatives—have repeatedly claimed that political events are not affecting reforms or the opening to the outside world. While the pace of implementing new reforms has slowed down considerably, the domestic reforms undertaken during the past two to three years have been left intact for the most part. There have even been some new initiatives such as the decision to remove China's three largest automotive plants from the control of their parent bureaucracy (the China National Automobile Industry Corporation) and list them directly in the State plan. And the investment climate has improved with the Provisions to Encourage Foreign Investment and implementing regulations, issued since the fourth quarter of 1986.

The popularity of Deng Xiaoping's policies with the public gives rise to optimism about the future of reforms. High-level officials probably have taken note of the public's indifference to the campaign against "bourgeois liberalism," its cynical distrust of a "privilege-seeking" Communist Party, and its sudden surge of sympathy for Hu Yaobang—more popular now that he has resigned than he ever was as general secretary. Any attempt to roll back what has been given to people during the past five years is an invitation to big political trouble, as both conservatives and reformers are aware.

At the same time, maintaining the momentum of reform will be difficult. Even before the Hu Yaobang affair it was apparent that most of the "easy" reforms had already been implemented. Further reforms—such as freeing basic commodity prices and labor markets or allowing enterprises to go bankrupt—run the risk of cutting into people's livelihood.

From now on, the process of reform is likely to be restrained and fitful no matter what happens in the political sphere. Hence, the continuing presence of conservatives in the leadership organs can be seen as simply another factor prolonging the stop-and-go approach to reform that China has exhibited so far in the 1980s. 完

A Reform Too Far?

Christopher M. Clarke

The resignation of Chinese Communist Party General Secretary Hu Yaobang on January 16, 1987, demonstrates limits to reform that even the highest ranking Party official in the country may not overstep. Hu's mistake was to tolerate—and perhaps even encourage—what other Party leaders perceived as a public assault on the power and legitimacy of the Chinese Communist Party.

In short, Hu allowed a more far-reaching discussion of economic and political reforms than anything envisioned by Deng Xiaoping and his generation of Party elders. For Deng, reforms are a means of attaining China's age-old goals of wealth and power through greater economic and political efficiency; he does not favor fundamental transformation of the existing system. But for the free thinkers who flourished with Hu's support, China's existing system is the problem. Increasingly in the last two years they have voiced the view that, without fundamental systemic change, China cannot modernize.

One such challenge came from university vice president Fang Lizhi, who argued that democracy cannot be bestowed by the Party but rather must be seized from below. Official tolerance of Fang's public position, as well as the more direct influence of speeches on campus by other outspoken reformers, encouraged students to take to the streets last December—apparently believing that their demands for greater democracy were supported by the highest levels of the Party. Hu's real "sin" was not so much advocating political reform as allowing the initiative to slip out of the hands of the Party.

Hu's mishandling of sensitive ideological questions was enough to antagonize not only Deng, but any Party leader interested in preserving political consensus at the top. Virtually all Chinese leaders today can be called "reformers" in the sense that they support the goals of modernizing the economy, raising productivity and efficiency, rejuvenating the leadership, and improving the quality of life. But almost all are "conservative" in their belief that only the Party can provide the direction and coherence needed to implement reforms without engendering economic and political chaos.

At the time of Mao Zedong's death and the purge of his radical followers in late 1976, public support for the Communist Party had reached its lowest point in 30 years. Under Deng Xiaoping, the CCP set out to restore its legitimacy by espousing policies with wide popular support.

The first such reform efforts included reviving many of the policies that the same group of leaders had used during the early 1960s to help China recover from the disastrous Great Leap Forward. Responsibility for agricultural production devolved to the household, cities and provinces were given greater control over their economic affairs, foreign trade was decentralized, and the government apparatus was streamlined. The primary aim was to restructure decision-making to make the old system work better—not to alter the system in any fundamental way.

By the early 1980s, however, some in the leadership, including Deng, began to argue that reforms needed to be broadened to stimulate initiative at lower levels and increase individual and corporate accountability. Since 1984, the leadership has responded with a combination of economic and legal reforms. More than the earlier efforts, these reforms have introduced an element of uncertainty into people's lives by disrupting longstanding relationships. A negotiable contract system in agriculture, for example, has largely replaced the State quota system of purchases, while managers can increasingly make hiring—and firing—decisions on their own.

Whereas the earlier wave of structural reforms produced mainly winners, these post-1984 reforms threaten many people. Making the State less intrusive brings greater personal insecurity, as responsibility for many aspects of daily life previously handled by the government or work unit shifts to the individual.

This process also raises many politically sensitive questions which, by the spring of 1986, were being openly debated in China. The crux of the issue was the proper mandate of the Party and State in light of the ongoing reforms. If they were to play a reduced role in people's lives, how would they mediate conflict and ensure the social "safety net"? Should the Party be an active participant in economic affairs or a distant guiding force? And what of abuses by Party officials—how much supervision from the people should there be in the form of elections and legislative oversight, and what should be handled by internal Party discipline?

Despite the fact that very few citizens actually took part in these debates, they generated strong reactions within the Party. Of the more politically conscious student population, only a small minority appears to have seriously debated these charged questions; fewer still participated in the student demonstrations of December 1986. But college students in China have always been viewed as a vanguard element with special social responsibilities. The cynicism and strong desire for change displayed by these students and their mentors shocked most Party leaders, who felt that the terms of the debate were getting out of control and feared that the discontent might begin to spread among workers.

Thus the political demise of Hu Yaobang can be seen as the direct—if unexpected—result of a process of reform set in motion by Deng Xiaoping after his return to power in 1977. China's economic reforms have reached a stage where, to many, the system is now part of the problem. To achieve greater economic efficiency, political and institutional relationships need to change. The Communist Party, the stronghold of power in China, cannot help but see this as a challenge to its authority.

This evolutionary process will not necessarily lead China to adopt wholesale Westernization; indeed, such a development is unlikely. But it does suggest that the basic political questions being raised in China will have to be addressed by the current or post-Deng leadership. Judging from the controversy they have engendered to date, the answers will not come easily. 完

Christopher M. Clarke is a China analyst at the Department of State. The views expressed here are his own, not those of any government agency.

我会活动

NATIONAL COUNCIL COMPLETES INVESTMENT ANALYSIS

The National Council for US–China Trade has recently completed **US Joint Ventures in China: A Progress Report**, a study prepared under contract for the Foreign Commercial Service of the US Embassy in Beijing.

A unique component of this project was the preparation of a computerized data base providing detailed information on 155 Sino–US equity joint ventures and 39 contractual joint ventures formed since 1979. Information was collected and verified from many sources, including Chinese officials and US partners in the joint ventures.

A major portion of the study contains a quantitative evaluation of the 194 US joint ventures identified in the data base. This section analyzes the characteristics of these ventures, including their dollar commitments, size distribution, regional location, and economic activity. It also looks at why joint ventures have failed or are now inactive. Last, it compares and contrasts the characteristics of US equity joint ventures with the equity joint ventures in China of other countries. The analysis shows US joint ventures to be widely distributed in terms of both location and economic activity—and to be almost evenly distributed between manufacturing and nonmanufacturing activities.

The study also takes an in-depth look at the qualitative aspects of joint venture operating experiences in the past seven years. It explores issues of concern to manufacturing joint ventures in detail and identifies factors that have contributed to the success or problems of different ventures. The study differentiates between issues that can be constructively addressed by joint venture partners and Chinese officials now and those problems requiring more long-term solutions.

The final sections of the study describe China's recent efforts to improve the investment environment and recommend ways for the US partner in a joint venture to cope with the problems inherent in investing in China today.

For information on obtaining the study, contact Marianna Graham, director of Information Services, at the National for US–China Trade.

Seated left to right: Liu Yimin, director of MOFERT's Foreign Investment Administration; Zhang Haoruo, vice minister of MOFERT; Roger W. Sullivan, president of the National Council; Zhang Yundong, deputy director, State Council Foreign Investment Leading Group.

DIALOGUE WITH INVESTMENT OFFICIALS

The National Council hosted a meeting between MOFERT Vice Minister Zhang Haoruo and 16 member companies at the Council's Washington office on April 7. Zhang, who has special responsibility within MOFERT for investment issues, explained recent developments in China's investment regulations and answered questions from company executives.

Nine sets of implementing regulations related to last October's Provisions to Encourage Foreign Investment have been released to date. Zhang confirmed that more regulations are currently being deliberated, including rules for providing foreign exchange to import substitution joint ventures.

The meeting continued the Council's ongoing efforts to raise investors' concerns with the Chinese and improve conditions for US investors in China. A Council-led Investment Delegation began a dialogue with Zhang Haoruo and other Chinese leaders last November in Beijing (*see The CBR*, Jan-Feb 1987, p. 8). This dialogue will continue in September when He Chunlin, director of the State Council Leading Group for Foreign Investment, visits the United States at the Council's invitation. Mr. He, in charge of drafting and implementing China's investment regulations, will meet with companies in several cities. His visit is timed to allow for the completion of all the implementing regulations.

Well-cultivated in China

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Partners in Austerity

Economic relations between China and the Soviet bloc seem to thrive under adverse conditions

Deborah Diamond-Kim

Nineteen eighty-six was not a banner year for foreign sales to China. China's year-end customs statistics showed imports up by less than 2 percent over 1985. Although the value of Japan's exports to China dropped most sharply, many other countries were also affected by China's decision to cut back on imports after two years of heavy spending in 1984 and 1985.

Not so the Soviet bloc. Its share of China's foreign trade rose from 6.5 percent in 1985 to 8 percent in 1986. China's imports from the Soviet Union shot up 47 percent; from Poland, 130 percent; from Bulgaria, 106 percent; and from Hungary, 85 percent. Czechoslovak and East German exports also turned in respectable performances, up 14 percent and 2 percent, respectively. For all these countries, 1986 marked the beginning of their first ever five-year, long-term trade agreements with China. Even the less fortunate Romania, whose exports to China slipped by 6 percent, could take comfort in China's commitment to at least double trade with every member of the bloc in 1986–90 from the trade levels of the previous five years.

The start of something big?

With Sino–Soviet bloc trade set to grow much more rapidly than China's total foreign trade over the next few years, short-term prospects can not be lightly dismissed. This is especially true now that political relations are improving perceptibly with the Soviet Union, and dramatically with Eastern Europe. China normalized party-to-party relations with East Germany and Poland last fall, and more reunions are scheduled to take place this year. Bulgarian party leader Todor Zhivkov will make a pilgrimage to the Chinese capital in May, while Chinese Acting General Secretary Zhao Ziyang will tour Poland, East Germany, Czechoslovakia, Hungary, and Bulgaria in June. This will add up to de facto normalization of relations with all bloc members except the Soviet Union. Not to ignore Moscow completely, China is sending Vice Premier Yao Yilin there in May to head up talks on bilateral economic cooperation.

Without normalized relations, China's trade with the Soviet Union may be more vulnerable to political difficulties. After all, trade on both sides is conducted overwhelmingly by State-owned foreign trade corporations that respond to central government directives. But Beijing has apparently decided to encourage economic cooperation with the Soviet Union with less regard for the political obstacles that still stand in the way of normalized diplomatic relations.

Although China wants to make the most of the momentum it has set in motion, it would be premature to attach long-term significance to its rapidly growing trade with the Soviet bloc. China is, after all, in the midst of efforts to rebuild its hard currency reserves in the wake of record foreign trade deficits in 1984 and 1985. A strategy of increasing barter trade with the Soviet bloc while simultaneously stepping up exports to capitalist markets worked in 1986 and may succeed again this year. If and when foreign exchange reserves climb back to levels acceptable to Beijing, there is good reason to believe that China will again loosen its constraints upon nonsocialist imports, as it did in 1984 and 1985.

In fact, the better China's trade balance looks, the less attractive trade with the Soviet bloc appears. How long the bloc's share of China trade will continue to rise may therefore hinge on the competitiveness of China's exports, world prices for its key raw material exports like oil, and Western and Japanese willingness to keep their markets open.

Economic courtship gets under way

After two decades of political and economic estrangement, China and the Soviet bloc need time to assess their trade and investment potential. China's economic priorities have changed since 1960, when 1,390 Soviet advisers withdrew from the country. The Soviet Union can no longer expect to dominate half of China's trade as it did in the 1950s, nor be a primary supplier of loans and technical assistance. Unlike the 1950s, the Soviet Union and other bloc members now have to compete with developed capitalist countries in all these areas.

But economic cooperation in the 1980s presents new types of opportunities as well as new competition. China's shortage of funds for industrial development will probably be especially acute in the next few years, a fact likely to further encourage barter trade arrangements with the bloc. China is now willing to discuss not only coproduction arrangements, but joint ventures and even wholly foreign-owned ventures with Soviet bloc countries.

Deborah Diamond-Kim, associate editor of The China Business Review, *lived in Beijing in 1980–81 and traveled through the Soviet Union in 1984–85.* *She would like to thank* CBR *interns Natasha Wei and Sarah Peaslee, and Gideon Rosenblatt of the National Council, for their generous assistance in the research of this article.*

Labor offers another promising avenue for cooperation. Critical manpower shortages exist all over Eastern Europe and in Soviet Siberia. China's ample but low-wage work force could make a difference, especially since the post-Mao leadership has renounced former ideological objections to exporting "cheap labor."

Most of the bloc has already signed labor agreements with China. East Germany, for example, signed a 10-year agreement last year that will pay Chinese workers local wages while providing on-the-job training to Chinese workers for two to four years at a time.

The chance to send Chinese workers to Siberia looks especially promising. For some time, North Korea has sent workers to fell trees in Siberian forests in return for a portion of the timber. There appears to be room for many more newcomers, not only in the forestry sector, but in the extractive and construction industries as well. Approximately 200,000 Chinese laborers worked in Siberia during the 1950s, and Moscow seems willing to invite them back. In December 1986, on the occasion of the first Soviet industrial exhibition held in Beijing in 32 years, exhibition director Valery Shpakov expressed the hope that Beijing and Moscow would cooperate in exploiting the natural resources of Siberia.

A question of mutual benefit

For the nations of the Soviet bloc, China's economic overtures could not come at a better time. With their economies generally in the doldrums, prospects for boosting exports to nonsocialist countries in exchange for hard currency are not good. Expanding trade with China may not earn much hard cash, but it does keep the wheels turning in an otherwise sluggish export sector.

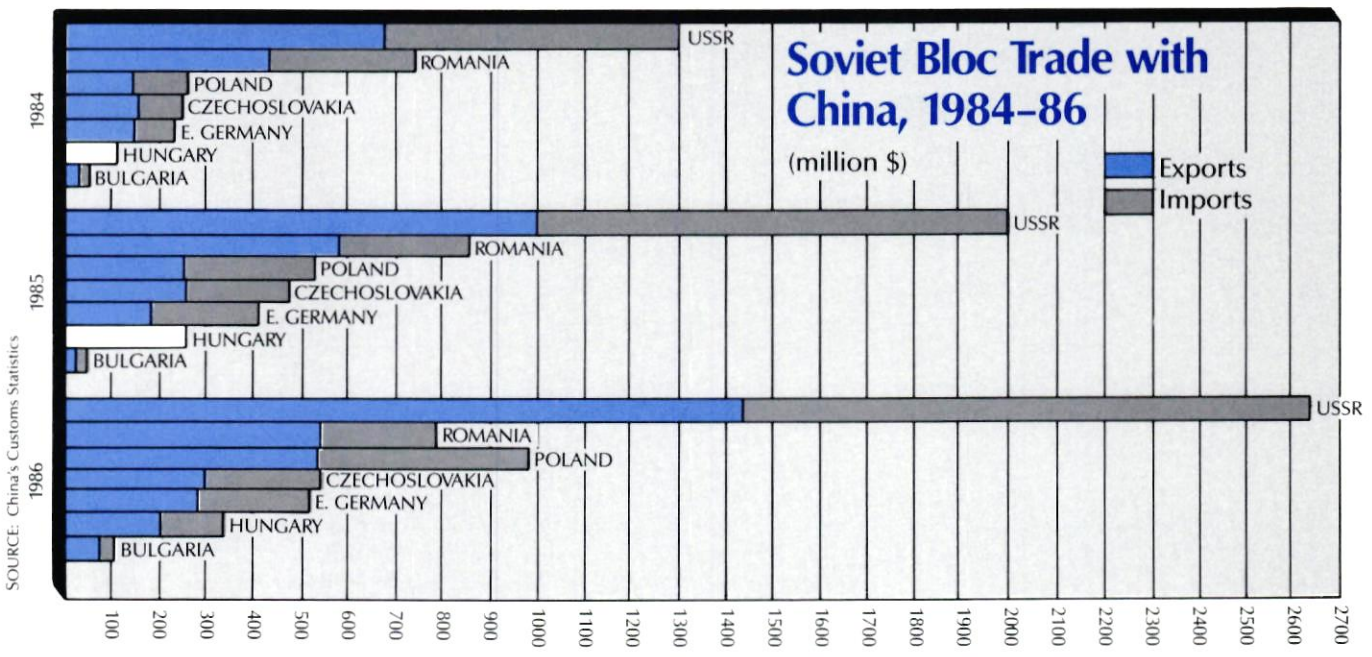
From the Soviet perspective, China makes an ideal economic partner. A fellow socialist country, sharing the longest border with the Soviet Union of any country, it is also rich in natural resources. This puts China in the same categories as the Soviet Union's other preferred trading partners in the Third World: socialist and/or neighboring countries like Afghanistan, Mongolia, India, Iran, and North Korea, and resource-rich countries lying further afield like Nigeria and Morocco. Were its geopolitical concerns more attuned to those of the Soviet Union, China would undoubtedly rank first among Soviet trade partners in the Third World, as it did in the 1950s. As things now stand, it ranks second after India.

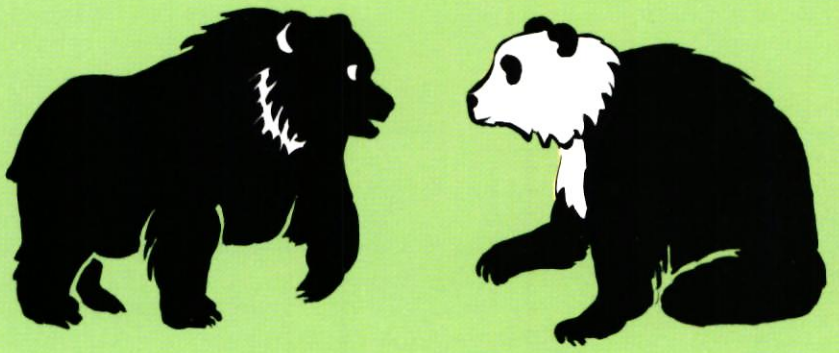
Motivated by a heavy dose of self-interest, the Soviet Union is therefore likely to find many reasons to cooperate extensively with its large neighbor to the south. Soviet economic interests in the Third World are heavily concentrated in resource development, and its technical assistance is usually paid back through compensation trade. Not only does China have the world's most abundant mineral resources, but its Seventh Five-Year Plan stresses many of the sectors where Soviet expertise is strongest: energy, transport, metallurgy, and resource development.

Like the Soviet Union, other members of the bloc are attracted to the opportunities in China's extractive, power, industrial raw material, and transport sectors. They are especially grateful for the chance to unload machinery and transport equipment that does not sell well in the West. In return, they get food, textiles and a variety of other consumer goods in short supply at home, without paying hard currency for it. "If China didn't exist, Eastern Europe would probably have to invent it," notes Josef Brada, professor of economics at Arizona State University.

Although China may have reservations about the quality of Soviet bloc merchandise (*see* box), goods are rendered more palatable because they can be acquired mainly through barter trade. And in a number of areas, says Brada, "East European goods may not be on the cutting edge, but they are basically on a par with international standards. Even where their equipment is less sophisticated, it may be more appropriate given China's level of development." This appears to be the case in such areas as machine-building, textile machines, and bottling lines, where Eastern Europe has made significant inroads in sales to China.

Bloc exports of industrial raw materials are even more competitive. In 1986 China's imports of Soviet bloc manufactured fertilizer accounted





CHINA'S LEADING IMPORTS FROM THE USSR

(million dollars)

	1985		Jan-Sept 1986	
	Value	% imported from USSR	Value	% imported from USSR
Crude Materials	$135	5%	$214	8%
Cork and wood	128	15	184	37
Chemicals and related products	108	5	78	3
Manufactured fertilizers	187	13	63	13
Manufactured goods	400	3	380	5
Nonmetallic mineral manufactures	26	8	28	10
Iron and steel	251	4	249	5
Nonferrous metals	119	7	103	15
Machinery and transport equipment	290	2	282	2
Road vehicles	194	6	143	9
Other transport equipment	59	4	115	9

CHINA'S LEADING EXPORTS TO THE USSR

(million dollars)

	1985		Jan-Sept 1986	
	Value	% exported to USSR	Value	% exported to USSR
Food and live animals	$500	13%	$381	12%
Meat and meat preparations	182	39	167	47
Cereals and cereal preparations	248	21	196	28
Oil seeds and oleaginous fruit	99	23	128	27
Crude materials	225	8	258	12
Textile fibers	44	4	56	6
Manufactured goods	150	3	171	4
Textile yarn, fabrics, and made-up articles	144	4	167	6
Electrical machinery, apparatus, and appliances	23	19	26	20
Articles of apparel and clothing accessories	92	4	50	2
Miscellaneous manufactured articles	121	1	71	8

SOURCE: *China's Customs Statistics*
Compiled by Sarah Peaslee and Deborah Diamond-Kim

Currency conversion rates:
1985: ¥2.9367 = $1
1986: ¥3.3636 = $1

for nearly 30 percent of total imports. Soviet bloc iron and steel made up 12 percent of China's imports that year.

Barter's appeal—and drawbacks

Barter certainly offers strong incentives to the parties involved. An article last year in *Caijing Yanjiu*, a journal of financial and economic studies, outlined the benefits of barter for Shanghai. Faced with "a sharp decline in easily marketable goods," Shanghai began to negotiate its own barter agreements (that is, outside the framework of State-negotiated agreements) with Eastern Europe in 1984. Such trade provides "demand thirsty" Soviet bloc countries with goods "such as children's clothes, thermos bottles, enamelware, common hardware, hand tools, and sewing machines." In return, Shanghai can import primary products, part of which can be processed into finished goods for export.

The fruits of Shanghai's efforts are borne out in its export statistics for year-end 1986. After five consecutive years of decline, the city's exports grew by 7 percent last year—including a 61 percent jump in exports to Eastern Europe.

Shanghai is not alone. Liaoning Province, too, attributes part of the growth in its exports to barter trade with the Soviet bloc. Other provinces and municipalities have taken note. At a symposium in Harbin last year, trade officials from Guangdong, Fujian, Shandong, Hebei, Jiangxi, Jiangsu, Shanghai, and Tianjin agreed to work with officials in the northeast province of Heilongjiang to increase trade with the Soviet Union. They plan to sell goods to Heilongjiang, which will then market these goods to the Soviet Union. Jointly run export industries aimed at the Soviet market are also envisaged.

The reasons behind this new interest in barter trade are not hard to find. Beginning last year, Beijing's hard-nosed emphasis on an "export-oriented" economy put trade officials at every level under enormous pressure to boost exports. But many are not confident that they can—especially in light of State policies aimed at curbing foreign exchange expenditures for imported technology. Without new technological inputs to increase the competitiveness of export products, many trading

corporations and enterprises have to turn to the next best thing—expanding barter trade with easier-to-please trade partners. Any increase in exports is likely to be applauded—even if it doesn't earn much foreign exchange in the bargain.

Yet even conservative leaders like Chen Yun and others who favor expanding trade with the Soviet bloc have said they do not believe that such exchanges can supersede China's trade with capitalist countries. As *Business PRC*, a Chinese trade publication, reported in its March 1986 issue, "Chinese trade authorities *never* believed [even in the 1950s] that the Soviet pattern of barter trade was of such high efficiency as to be the norm to which they ought to aspire."

One problem with barter is that the value of imports and exports, which ought to balance, rarely do. Some strange, and economically unsound, deals have to be made to correct imbalances. For example, China has had to buy ships it didn't need from Romania and sell that country coke briquettes it would have much preferred to use at home.

Border trade limps along

Much has been made of the prospects for complementary trade between China's northernmost provinces, with their numerous consumer goods industries, and Siberia, which is short of consumer goods but brimming with timber, cement, and other raw materials China sorely needs.

Ironically, Heilongjiang—the province considered best able to serve as a conduit for other provincial efforts to expand trade with the Soviet Union—recently suffered setbacks in its Soviet trade. In 1986 its export earnings rose nearly 20 percent over 1985—yet its trade with the Soviet Union, expected to reach $45 million in 1986, rose to only $14 million, an increase of just 8 percent.

Inner Mongolia, another region whose trade with the Soviet Union grew rapidly from 1983 to 1985, also found additional gains hard to make last year, with exports to the Soviet Union growing more slowly than its total exports.

Signs that all is not well with Sino–Soviet border trade were reinforced by official Chinese statements that trade with Eastern Europe is expected to grow at a faster rate than trade with the Soviet Union in the future.

Soviet trade officials apparently have similar reservations since they don't expect Sino–Soviet border trade to exceed 1 percent of total bilateral trade for some time to come.

Commenting on factors hindering the growth of Sino–Soviet border trade, a scholar at the University of Foreign Economic Relations and Trade in Beijing noted five main obstacles: 1) the absence of normalized relations; 2) excessive central controls in the Soviet foreign trade system, which restrict the power of localities in the Soviet Far East to conduct their own trade; 3) a small market (Siberia has only 30 million inhabitants) for which China faces stiff competition from Japan, North Korea, and to a lesser extent, Australia and Singapore; 4) faulty packaging of goods exported to the Soviet Union; and 5) falling market prices of China's exports which, combined with rising costs of production and transportation, make the Siberian market less attractive.

Technology takes center stage

Both China and the Soviet bloc stand to benefit from much more than just exchanging goods and equipment. Chinese missions have begun to investigate Eastern European patents and their findings are likely to gain attention in Beijing, which is strongly promoting acquisition of know-how over straight equipment imports this year.

Contracts involving a transfer of technology are also playing a growing role in Sino–Soviet bloc trade. If developments in 1986 are any indication, the Soviet bloc is already winning some of China's big technology import contracts, mainly involving power-generation equipment. During the Seventh FYP, China proposes to concentrate most intensively on expanding thermal power production, and the Soviet Union has al-

SOVIET INDUSTRIAL COMPETITIVENESS: A CHINESE VIEW

To those familiar with the quality of Soviet and Eastern European goods, China's pursuit of Soviet bloc trade may come as a surprise. Aren't the Chinese aware of the shoddy workmanship, the breakdowns, the inferior performance of Soviet bloc products in so many areas? The answer is, they are—and they're still buying. While China continues to complain about the quality of the Soviet Union's rough equivalent to the Boeing 727—the Tupolev 154-M—it has ordered 17 of them and promises to buy more. Although China demanded $1.6 million in compensation from the Soviet Union and Czechoslovakia due to major malfunctions in nearly half of the 9,000 Zetor tractors it purchased in 1985, it continues to import and coproduce a variety of Czechoslovak transport equipment. In fact, Chinese officials say that two-thirds of China's automobile imports will come from Eastern Europe in 1987.

The apparent explanation for China's persistent imports of goods with such shortcomings is its desire to conserve foreign exchange. Expanding barter trade with the Soviet Union, Eastern Europe, and the Third World is seen as a stopgap measure while China struggles to improve the quality and variety of its exports to countries that pay in hard cash. An article published in the scholarly economic journal *Guoji Wenti Yanjiu* in 1984 provides a candid Chinese view of the strengths and weaknesses of Soviet (and by extension, East European) technology in comparison with the United States.

The Soviets, claims writer Gao Shi, are 20 years behind the United States in their chemical fiber industry, 10–15 years behind in petrochemicals, and 10 years behind in synthetic fibers. A higher percentage of their steel is flawed; some 20–40 percent of their chemical fertilizers do not meet US technical standards. Gao casts thumbs down on Soviet metal-cutting machinery ("low efficiency"), tractors ("half the life of US tractors"), trucks ("need more maintenance"), and cement ("about 90 percent is low grade"). "To drill a 10,000 foot well," says Gao, "a Soviet drilling team needs 14 months, but an American team needs only 34 days." In general, it takes an inordinate amount of time for the Soviet Union to recover its industrial investments. Management is poor, labor productivity low.

Gao finds the Soviets superior in producing only "a small number of products." These include certain steel-making and metal processing technologies, nuclear and hydropower equipment, hydraulic coal mining, power transmission and power generating technology, welding equipment, and—now this is getting specific—the technology of eliminating the stress of the interior flakes of computers by means of infrared rays!—DDK

SOVIET PROJECTS IN CHINA

On July 10, 1985, China and the Soviet Union signed a five-year agreement to cooperate in the renovation of 17 of the 156 key industrial projects built in China with Soviet assistance during the 1950s. The agreement also calls for Soviet-assisted construction of seven new projects.

No list specifying the names and locations of these 24 projects has ever been made public by Chinese or Soviet officials. The following list, compiled from a wide variety of sources, identifies the most likely candidates for cooperation targeted in 1985. Since then, several Chinese factories have expressed reservations about their proposed Soviet partners. As of 1987, few projects appeared to be actively under way.

SOVIET-ASSISTED RENOVATION PROJECTS, 1986–90

Project name/Province	Previous Soviet aid	Details
Anshan Iron and Steel Corp./Liaoning	Originally Japanese-built; rebuilt and equipped with Soviet aid	Largest iron and steel complex in China. Renovation expected to add 2 million tonnes to annual production capacity.
Wuhan Iron and Steel Plant/Hubei	Built and equipped with Soviet aid from 1956-60.	One of the largest iron and steel complexes in China. Cost of renovation: $3 million
Baotou Iron and Steel Plant/Inner Mongolia	Built and equipped with Soviet aid in the 1950s.	One of the 12 largest iron and steel complexes.
Fushun Aluminum Plant/ Liaoning	Built with Soviet aid in 1954.	First and largest aluminum plant in China.
Xingantai Coal Mine/ Heilongjiang	Built with Soviet aid in the 1950s.	Largest coal mine in northeast China. Renovation to add 1.8 million tonnes to annual production capacity by 1990.
Luoyang Copper Processing Plant/Henan	Built with Soviet aid in the 1950s.	One of the largest copper processing plants in China.
Luoyang No. 1 Tractor Factory/Henan	Built with Soviet aid in 1959.	First and largest tractor plant in China. Main products: 75-hp crawler tractors.
Luoyang Bearing Plant/ Henan	Built with Soviet aid in 1953.	Largest ball-bearing plant in China.
Xi'an Electrical Manufacturing Corp./Shaanxi (Xi'an Power Rectifier Plant, Xi'an Voltage Apparatus Works, Xi'an High-Voltage Porcelain Insulator Plant)	Built with Soviet aid in 1953.	"XD" is China's largest manufacturer of heavy electrical equipment. Three of its 10 factories were slated for Soviet-aided renovation under July 10, 1985, agreement. In 1987, following an inspection team's visit to USSR, XD officials reported Soviet technology less advanced than XD's. The High Voltage Apparatus Works already has a coproduction agreement with Mitsubishi.
Taiyuan Chemical Fertilizer Plant/Shanxi	Built with Soviet aid in the 1950s.	Soviets to supply ammonia-based fertilizer technology.
Lanzhou Chemical Industry Corp./Gansu	Built with Soviet aid in the 1950s.	First and one of the largest petrochemical complexes in China. The two projects slated for Soviet-aided renovation involve the corporation's synthetic rubber and chemical fertilizer plants.
Nancha Hydrolysis Plant/ Heilongjiang	Built with Soviet aid in 1957.	Main products: alcohol for pharmaceutical industry.
Jiamusi Paper Mill/ Heilongjiang	Built with Soviet aid from 1954-57.	Largest paper mill in China. Cost of renovation: $25 million.
Harbin Flax Mill/ Heilongjiang	Built with Soviet aid in 1952.	Largest linen mill in China. Soviets to install weaving looms and 10 spinning machines.

ready garnered several lucrative contracts in this area. Hydropower is another area in which the Soviets appear keen to get involved. Last year, General Secretary Gorbachev proposed "uniting the efforts of the Chinese and Soviet people to exploit the very rich resources and water engineering installations in China for the common benefit." The suggestion is reminiscent of Soviet proposals in the late 1950s to build dams and jointly develop the hydropower potential of the Amur River along China's northeast border with the Soviet Union.

Compared with thermal and hydropower plants, China's current five-year outlook for nuclear energy development is modest, and stresses self-reliance. Although two nuclear power projects are under way, plans for three more were shelved last year. Just the same, the Soviets are ready for a change in policies. Early Soviet transfers of nuclear technology enabled China to develop its first heavy-water reactor in the 1950s. The Soviets offered to sell nuclear equipment to China again in 1984 and have invited a number of Chinese delegations to study their nuclear energy program. Some form of scientific cooperation may be in the offing this year, according to a Soviet official.

According to press reports, China imported $4.45 billion worth of technology in 1986. Compared to the United States, which signed 169 contracts worth $657 million, the Soviet Union signed only three—yet the total value of these contracts was $512 million, or 12 percent of China's total technology imports last year! East Germany also did well, with 11 contracts worth $159 million, more than three times the value of contracts going to Hong Kong, for example.

The bloc's success in clinching lucrative technology contracts is out of proportion to its share of China's foreign trade. This reflects the bloc's expertise in expensive heavy industrial projects. China may also be attracted to the generous training provisions included in most Soviet bloc technical assistance agreements with the Third World. This factor alone can be extremely important in costly renovation projects. And many of the projects going to bloc countries involve renovating facilities they helped establish in the first place.

By Chinese accounts, the Soviet Union alone supplied two-thirds of

the 320 complete sets of industrial equipment China purchased from the bloc in the 1950s. The $2 billion worth of Soviet bloc equipment ($1.4 billion of which came from the Soviet Union) was crucial to the development of China's industrial sector.

In July 1985 Beijing offered the Soviet Union a chance to renovate 17 of the 156 key industrial facilities it helped build and equip in the 1950s (*see* table). These include the largest iron and steel complex in China, the largest ball-bearing plant, the largest tractor factory, one of the largest coal mines, and the largest linen mill.

But in many cases, these projects have yet to get under way, suggesting that Chinese end-users may harbor doubts about the quality of bloc assistance. Indeed, Japanese, US, and Western European bidders are still winning the majority of contracts to renovate Soviet-built plants.

Strengthening transport links

On both sides of the border, key transport facilities remain largely unchanged since the 1950s. In China, these currently include three railway stations—Suifenhe in Heilongjiang, and Manzhouli and Erlian in Inner Mongolia; and the ports of Tongjiang and Heihe. Nearly two-thirds of the bilateral freight volume travels by rail.

Chronic delays and losses interfere with rail and waterborne trade alike. Because Soviet rail gauge is six inches wider than that of China, goods are held up at the border until they can be reloaded onto the other country's rail cars. Handling capacity is dismal at the ports of Tongjiang and Heihe on the Chinese side, and Blagovsinki and Lower Leninskoye on the Soviet side.

So serious are these problems that China and the Soviet Union established a permanent transport working group that has met twice since October 1986. Among the proposals raised at these meetings: developing containerized shipping, upgrading the ports, and establishing a common track system to carry Soviet goods directly to the major cities in northeast China.

Meanwhile, construction has begun on a 250-mile railway that will link Urumqi, the capital of Xinjiang, with the Sino–Soviet border. China has dusted off a more than 30-year-old request for Soviet loans and assistance with the project, which it hopes to complete by 1990, although no formal agreements have been reported to date. How quickly China and the Soviet Union act to resolve their common transport problems may provide the first true measure of their commitment to expanding trade.

Growing dissonance over the long term

China's grand-scale efforts to revamp its industrial sector should provide ample business opportunities to the Soviet bloc for some time to come. But by investing considerable sums in technological renovation of certain industries now, China hopes to drastically cut back on the very industrial raw materials that now form the backbone of Soviet bloc sales. Imports of bloc machinery should also diminish as China's domestic industry develops. Like India, which is already scaling back machinery purchases from the Soviet Union, China may outgrow the need for many kinds of Soviet machinery. It may also lose patience with the delayed deliveries and poor servicing that plague bloc exports not only to China, but to the West as well.

In fact, except as an export market, the Soviet bloc does not seem well suited to China's long-range plans. The bloc will likely continue to absorb an increasing percentage of Chinese exports, not only of consumer goods in short supply, but also of certain kinds of machinery. China already sells more of some machinery to the bloc than it receives in return. If the development gap between China and the bloc continues to narrow, as is widely expected, China could also emerge as an important supplier of certain types of industrial and metalworking machinery. Less beneficial to the bloc are prospects that its principal foreign exchange-earning sectors, including textiles, will be subjected to increasingly fierce competition from China.

Most important, China is anxious to strengthen its place as an integral part of the vibrant Asian Pacific economy. Its long-term goal of developing an "export-oriented economy" is intended mainly as a means of earning foreign exchange. In short, China is drawing its inspiration mainly from Japan and the Asian NICs. While it may continue to seek lessons in Soviet bloc efforts at economic reform, it does not see a blueprint for an export-oriented economy there.

For these reasons, China and the Soviet bloc appear more suited to each other in foul weather than in fair. If their export prospects in the West pick up enough for them to increase imports of hard currency items, they are all likely to lose some of their present enthusiasm for trade with each other. 完

NEW PROJECTS TO RECEIVE SOVIET ASSISTANCE, 1986–90

Project name/Province	Construction plans/objectives
Matou Ore-Dressing and Coal Mining Plant/Hebei	Design with aid of Leningrad State Mine-Dressing Institute. Soviets to supply coal-washing technology and equipment.
Yiminhe Coal Mine/Heilongjiang	Design, build and equip open-cast coal mine with aid of Soviet coal mining company, Tsvemetproexport. Add 5 million tonnes of mining capacity by 1990.
Yiminhe Thermal Power Plant/ Heilongjiang	Complete installation of two 500,000 KW generating units by August 1987.
Thermal Power Plants/Liaoning	One plant is to receive two 800,000 KW generating units; the other, near Tianjin, will receive two 500,000 KW units.
Power Transmission Lines	Build 1,000 km of 500,000-volt transmission lines and substation with Soviet-supplied equipment. One line extends from Dongfeng via Changchun in Jilin Province to Harbin in Heilongjiang. The other extends from Shentou in Shanxi via Xushui in Hubei Province to Tianjin. Contract signed in October 1986.
Rail Electrification	Length 1,000 km. Location to be determined during negotiations.

SOURCE: The National Council for US–China Trade
Prepared by Natasha Wei, Deborah Diamond-Kim, and Sarah Peaslee

Photo courtesy of China Features

Vice Premier Li Peng greets Nikolai Talyzin, first vice chairman of the Soviet Council of Ministers, in Beijing in September 1986. Li, a rising star in China's leadership and an active proponent of Soviet bloc trade, met with Soviet General Secretary Mikhail Gorbachev in 1985.

COUNTRY PROFILES

BULGARIA. *Population:* 9 million (1986 est.); *GNP:* $56 billion (1984 est.); *Two-way trade with China, 1986:* $103 million; *Official projected trade volume, 1986–90:* $477 million.

Cooperation projects: A protocol signed last year calls for cooperation in the renovation of textile mills and in the production of electric tools and fruit juices.

Best prospects: Bulgaria is China's least important trade partner in Eastern Europe. Balkankar Corp., which accounts for some 20 percent of the country's industrial output is, and will continue to be, Bulgaria's key link to the China market. It is already exporting spare parts for trucks as well as equipment for a forklift factory and automated warehouses in China as part of a five-year industrial cooperation agreement signed in January 1986.

China plans to return the favor by helping to modernize three textile mills in Bulgaria. And this year, Bulgaria should receive two marine diesel engines and six generating sets from the Shanghai Shipbuilding Corp.

CZECHOSLOVAKIA. *Population:* 16 million (1986 est.); *GNP:* $128 billion (1984 est.); *Two-way trade with China, 1986:* $542 million; *Official projected trade volume, 1986–90:* $2.4 billion.

Cooperation Projects: A protocol signed at the end of last year provides for Czechoslovak technical assistance to 26 Chinese projects. These involve machine building, electronics, geology, manufactured fertilizer, light industry, textiles, medicine, and nuclear energy.

Best Prospects: Czechoslovakia, together with the Soviet Union and East Germany, was a key supplier of industrial equipment to China in the 1950s. But as many Czechoslovak industries have become badly out of date since then, extensive participation in China's industrial renovation plans is by no means guaranteed.

Power-generating equipment should continue to figure prominently in bilateral trade and investment. In 1985 Czechoslovakia agreed to export two complete sets of equipment for the Shentou No. 2 thermal power plant in Shanxi Province, hailed in the Chinese press as the single-largest Czechoslovak sale of such equipment ever. Shentou had earlier imported four 200,000 KW generating sets from Czechoslovakia.

China's interest in Czechoslovak coal gasifying technology led to a contract last September for technical assistance and equipment for a project in Lanzhou scheduled for completion in 1990. Another highlight of last year's trade was China's reported purchase of a Czechoslovak cement works. Eight companies from capitalist countries were said to have competed for the order.

In a notable transport project, Czechoslovakia is supplying China with production technology and spare parts for its heavy-duty Tatra 815 trucks. The Changzheng motor and vehicle works in Hebei, which is assembling these trucks, expects to produce them on its own after five years.

Czechoslovakia will also share technology for producing open-end spinning machines, which it began exporting to China last year. China plans to produce these machines on its own within a few years. In return for the machines and know-how, China will add four 7,000-tonne freighters to Czechoslovakia's 14-ship merchant fleet.

EAST GERMANY. *Population:* 17 million (1986 est.); *GNP:* $164 billion (1984 est.); *Two-way trade with China, 1986:* $510 million; *Official projected trade volume, 1986-1990:* $2.8 billion.

Cooperation Projects: An October 1985 protocol calls for cooperation in 43 projects involving coal and mineral exploitation, renovating the Zhengzhou Grinding Wheel Plant, a polyvinyl chloride and a lignite wax production facility, and technical assistance for phosphate fertilizer plants.

Best Prospects: In the 1950s East Germany was China's second-largest trade partner after the Soviet Union. That was before China discovered the attractions of West Germany as a trade partner (now fourth largest).

Chinese trade officials say the outlook for commodity trade is hampered by East Germany's rather limited supply of important raw materials. East Germany's greatest strength continues to be its heavy industrial equipment. Its most celebrated deal in recent years was the agreement to export 1,000 refrigerated rail cars worth $160 million to China in March 1986. China's Minister of Railways has named East Germany the sole supplier of this equipment until 1990. And last fall China ordered 300 train coaches worth $100 million for delivery in 1988 and 1989.

Technical assistance is an East German forte, and the Chinese may welcome their help on a few large-scale heavy industry, geological prospecting, and construction projects. The biggest deal so far this year went to the Leipzig-Grimma Chemieanlagenbau combine and the Schwarze Pumpe gas combine, to supply China with technology and

equipment for a compressed gas plant in Harbin. East German deliveries of equipment for a soda ash factory are to begin this year.

East Germany's determined efforts to promote its electronics, and especially microelectronic products, are getting only a lukewarm response in China. More surprising perhaps, is the poor showing of East German optical equipment. Precision instruments, another East German specialty, are listed among the commodities slated for export to China under the LTTA, and East Germany's Friedrich Ebert Electrical Apparatus Works hopes to help upgrade one or more of the measuring works they helped to establish more than two decades ago.

HUNGARY. *Population:* 11 million (1986 est.); *GNP:* $77 billion (1984 est.); *Two-way trade with China:* $334 million; *Official projected trade volume, 1986–90:* $1.4 billion.

Cooperation Projects: A protocol signed in September 1986 calls for Hungarian cooperation in 39 projects involving transport and machinery, coal, light industries, and medical instruments.

Best Prospects: Hungary is no heavyweight in Sino–Soviet bloc trade. Trade was expected to increase to $448 million in 1986; it fell short of the mark by over $100 million.

Hungary's buses enjoy a good reputation within the bloc, and China has already ordered 510 buses and 1,400 bus chassis for assembly in Chinese plants. Hungary's Raba trucks are also selling well. China ordered 780 of the 26-tonne trucks in 1986. The highlight of Hungary's efforts last year in technology transfer was its export of technology and equipment for producing sorbitol to the large Nanning Organic Chemical Works in Guangxi. Hungarian machine tools are considered among the best in the bloc, and exports in this category have good potential.

A high point of China's efforts to expand manufactured goods and machinery exports to Eastern Europe was its recent contract to sell 21,400 television sets to Hungary, assembled under a licensing agreement with Hungary's Videoton Corp. Deliveries began last fall.

POLAND. *Population:* 38 million (1986 est.) *GNP:* $229 billion (1984 est.); *Two-way trade with China, 1986:* $979 million; *Official projected trade volume, 1986–90:* $3.17 billion.

Cooperation Projects: A November 1986 protocol calls for cooperation in 99 short- and long-term projects, including, first and foremost, retooling China's coal mining industries. Poland will also export complete sets of equipment for the machine-building industry. Other cooperative projects cover universal grinders, automatic lathes, construction and textile machinery, food processing equipment, and transport—including cooperation in ship designing and hydromechanics.

Best Prospects: Last year, Poland leaped into 11th place among China's leading trade partners, making it the largest Soviet bloc partner after the Soviet Union. China is now Poland's largest customer for motor vehicles, which it buys in exchange for large quantities of tea and cotton. In 1985 Poland exported 76,000 trucks and buses and 14,000 Polonez cars. Poland appears to be one of China's most anxious suitors—and for good reason. Western analysts believe that in 1986, transport sales to China alone were enough to spare Poland from another dismal export showing. With its ample industrial raw materials—including iron and steel, artificial resins, and manufactured fertilizers—Poland should remain China's second or third major trading partner in the bloc.

The fifth-largest shipbuilder in the world, Poland has earned Beijing's good will by maintaining a merchant fleet (Chipolbrok) jointly owned and operated with China through two decades of strained Sino–Soviet bloc relations. Polish participation in China's coal mining industry is also important. The principal exports in this area include 1,700 open coal wagons (due for delivery in 1988–90), hydraulic supports, coal cutters, and chain conveyors. Considerable technical assistance is likely to continue in both the coal mining and shipping industries.

Poland's electronics industry has had greater success in China than any other in the bloc. A Polish company won what was reported to be the industry's largest foreign contract ever in September 1985, a $6 million Chinese order to supply an entire production line of high-power silicon-controlled rectifiers and transfer technology.

ROMANIA. *Population:* 23 million (1986 est.); *GNP:* $118 million (1984 est.); *Two-way trade with China, 1986:* $795 million; *Official projected trade volume, 1986-1990:* $5.2 billion.

Cooperation Projects: A November 1986 protocol provides for Romanian cooperation in 31 projects, including light industry, machine-building, electronics, and electrical appliances. The six projects in light industry are evenly divided into technology imports and exports. China will import 19 beer and orange juice bottling lines, planing and cutting machines, and mattress-making equipment. Romania's import contracts include a watch production line, 12 sets of cigarette-making equipment, and candy wrapping machines. From 1979 to 1985 China and Romania cooperated on 173 technology projects, 123 of which involved Chinese imports from Romania.

Best Prospects: Well endowed with industrial raw materials and equipment, it is hardly surprising that Romania recently ranked second among China's partners in the bloc; eclipsed last year by Poland, Romania remains an important supplier of rolled steel, inorganic chemicals, fertilizers, and machinery (including oilfield equipment) and transport equipment. In exchange, it buys Chinese coal, textiles, and food. Much of the coal going to Romania is part of a compensation trade agreement, in which Romania provides equipment, steel, and technical assistance for three coal mines in Shanxi Province (combined capacity: 6–8 million tonnes) in exchange for a portion of the output.

Major deals in the transport sector include China's order for 12 bulk freighters and the coproduction of "Roman" heavy-duty trucks.

Although a member of the Warsaw Pact, Romania is something of a maverick in foreign policy, having retained party-to-party ties with China when other bloc countries were compelled to sever them during the 1960s. Its longstanding partnership with China and its greater trading flexibility—including its willingness

to pay hard cash for China's crude oil—has served it well over the years. But the Sino–Romanian connection has become less special in the wake of China's growing ties with other bloc members.

USSR. *Population:* 280 million (1986 est.); *GNP:* $1,958 billion (1984 est.); *Two-way trade with China, 1986:* $2.64 billion; *Official projected trade volume, 1986–90:* $16.8 billion

Cooperation projects: *See* table

Raw material trade under the LTTA: According to the Soviet journal *Foreign Trade*, Soviet raw materials being shipped to China in the 1986–90 period will include 2.8 million tonnes of coal; 2.15 million tonnes of oil products and pig iron; 4 million tonnes of rolled ferrous metal, steel pipes and other articles for further processing; 2.5 million tonnes of carbamide; 2.5 million tonnes of cement; 20 million sq m of sheet glass; 16 million cu m of timber.

Chinese exports during this period will include 1.6 million motor vehicle storage batteries; 1.3 million tonnes of mining industry products; 10.3 million tonnes of cereals and oil-bearing crops; 748,000 tonnes of meat and meat products; 500,000 tonnes of table salt; 275,000 tonnes of cotton; 1.5 billion meters of various fabrics; 15 million pairs of sports shoes; 460 million rubles worth of knitwear, garments, fur, down articles and bed linen.

Best Prospects: Now China's fifth-largest trading partner, up from ninth place in 1984, the Soviet Union is a key supplier of heavy industrial equipment and industrial raw materials. In the latter category, the Soviet Union has found a large market in China for its timber exports, which accounted for 20 percent of China's worldwide timber purchases in 1985, and 37 percent in the first nine months of 1986.

Moscow hopes to increase the share of machinery and transport equipment in its exports to China from less than a third in 1985 to about 50 percent in the 1986–90 period. Given the level of Chinese interest in Soviet power-generating, metallurgical, coal mining, and machine-building industries, these should all figure prominently in the Soviet export promotion campaign. Geological prospecting, another area in which the USSR can offer expertise, is almost certain to develop if political relations improve. As far back as March 1950, a month after the Sino–Soviet Treaty of Friendship, Alliance, and Mutual Assistance was signed, the two sides had agreed to joint prospecting, extraction, and processing of nonferrous and rare metals in Xinjiang Province for 30 years. Joint-stock companies were set up for this purpose, but in 1955, China liquidated these companies, apparently fearful of Soviet encroachment on its resources. Recently a more self-confident China has invited Soviet and East European geological survey teams to return. A Soviet team visited Chinese geological research facilities in January 1985.

China is among the Soviet Union's largest customers for civilian aircraft. What will happen to these sales when China phases in its own medium-range aircraft is another question. Similar questions may be raised about other manufactured goods now popular in the Chinese market. Soviet road vehicles and refrigerators, for example, have been purchased for their relatively low price and durability. In 1986 Soviet refrigerators reportedly sold for ¥800 in Heilongjiang, while similar Japanese refrigerators cost ¥1,800. But since the Soviet Union has not signed co-production agreements in this (or any other) area, it may find sales dwindling as new Chinese assembly lines, produced under license with Japanese, Western, and East European companies, introduce their goods to the domestic market.

A long-term strategy toward the China market may require the Soviet Union to demonstrate the same willingness to enter into coproduction agreements in China that Eastern Europe has shown. Soviet "Volga" cars, noted for their sturdy performance in cold weather, are a natural candidate for coproduction in northeast China. Textile machinery is another good bet, judging from the favorable reaction of Chinese experts to recent exhibits of Soviet textile machinery.

The Soviet Union, for its part, offers China an enormous and under-supplied consumer market. In the 1950s China supplied three-quarters of Soviet textile imports and two-thirds of its food imports. Not much has changed in the composition of China's exports to the Soviet Union except that China is now exporting a greater variety of these exports than ever before. Formerly an importer of Soviet cotton, China became a net exporter to the Soviet Union in 1985, with sales expected to grow rapidly over the next few years. By 1986 China had also become that country's largest soybean supplier. Both countries are confident that Chinese exports in these categories can grow substantially. And as things stand, the Soviet Union is already a major customer for Chinese foodstuffs and textiles. In the first nine months of 1986, 47 percent of China's meat, 27 percent of its cereals, and 10 percent of its textiles went to the Soviet Union. 完

Photo courtesy of China Features

Slow train to China. The Soviet Union supplies more than a third of China's timber imports, but deliveries such as this one to China's Suifenhe Railway Station are often held up by inadequate transport facilities.

NEGOTIATION STRATEGIES FROM THIS CENTURY'S MOST SUCCESSFUL CHINA TRADERS.

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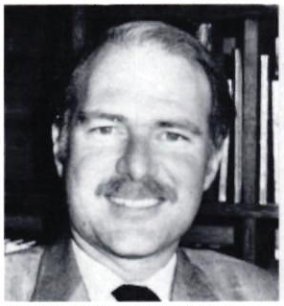

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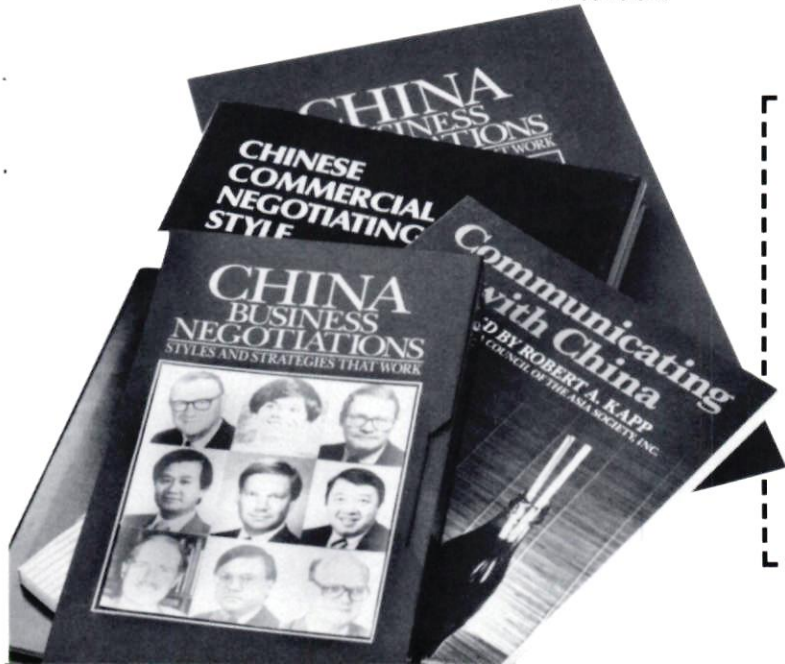

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Economic Reform in China and the Soviet Union

The world's two socialist giants differ markedly in their approach

John P. Hardt

The idea of reform in centrally planned economies has captured the imagination of many of the world's socialist nations in recent years. By introducing—or at least seriously discussing—extensive changes in planning and management, socialist countries hope to lay the groundwork for economic, social, and even limited political change.

Planners in both the Soviet Union and China are keenly aware that the system of central planning as it now exists fails to measure up against technological advancements taking place in the developed capitalist world, not to mention surging growth rates of capitalist "newly industrializing countries." Both the Soviet Union and China have underutilized economic potential. Although they have abundant natural resources and a large labor pool, their economic progress has been stunted. Inordinate amounts of resources and manufactured goods are lost through carelessness, poor planning, and outdated facilities. Labor productivity is low in the absence of incentives for better performance, while a deeply entrenched bureaucracy stifles technological innovation in civilian sectors of the economy. To advance their strategic interests in world affairs and to restore legitimacy to an economic system that has been losing credibility, Soviet and Chinese leaders have come to recognize that radical changes may be in order.

The need for economic reform is deeply felt in both countries, but China has stolen the march by putting ideas into practice. China will likely continue to move faster and with less resistance to reform—in part because its economy has never been as strictly controlled at the center as the Soviet economy. For the Soviet Union to attempt reforms of a similar scale, it must overcome far

Socialist Economic Reforms, Then and Now

China's foremost architect of reform, Deng Xiaoping, told visiting Australian Prime Minister Robert Hawke last year that he doubted the Soviet Union had the "flexibility" needed for economic reform. History appears to warrant Deng's skepticism.

Soviet reform efforts date back almost to the birth of Bolshevik rule. When Deng was just a student in Paris, Lenin launched his version of the open door policy to encourage foreign trade investment, and technology transfer. Lenin also tried to energize the Soviet economy by loosening the already stifling bureaucratic stranglehold over planning and resource allocation. Then, as now, "economic accountability" was the rallying cry.

For a time, it seemed to work. Under the New Economic Policy (NEP) (1922–26) industrial trusts and large enterprises cut redundant labor, concentrated on profit-making, and paid for materials and fuel formerly supplied by the State. Directors of trusts and factories were encouraged to run their own affairs, and quite a few apparently did. By 1923 some 75 percent of retail trade was back in the private sector.

What happened to the NEP? Party and State authorities, seeing control of economic planning slip out of their hands, drove private traders out of business by undercutting market prices. And peasants, discouraged by State efforts to keep grain prices in check, took to hoarding, only to have their produce confiscated. Artificially low prices created a shortage of goods, which in turn increased the "need" for State control over production and distribution. Although many authorities resisted this reversal of Leninist policies, most were eventually convinced that their interests lay with derailing the market economy.

Centralization gave these officials the power and resources to launch a program of rapid industrialization. But the tremendous industrial gains scored over the next two decades came at a high cost. Innumerable and often contradictory planning targets brought confusion; the obsession with fulfilling these targets at the expense of efficiency and quality led to a massive waste of resources.

Although Khrushchev tried to revive the drive for economic efficiency and greater managerial autonomy in the 1950s, his measures were confused, erratic, and limited. His successor, Brezhnev, began again with an ambitious decree in 1965 that combined greater managerial autonomy with centralization at the top—a plan that in its basic outline resembles the reforms that Gorbachev is now trying to implement. But the attempts to revive the profit motive in the early years of Brezhnev's rule were ineffective—in part because prices remained unresponsive to demand. Foot-dragging in one area was enough to sidetrack other reform ef-

greater bureaucratic opposition at all levels of government.

Rural reform

Rural reforms provide the most startling example of this dichotomy. China largely dismantled the commune system beginning in 1979, returning to household-based farming. The results were remarkable, especially compared to Soviet accomplishments during the same period. Chinese peasant income has doubled in less than a decade; from 1978–84, grain production grew 4.9 percent as compared to only 2.1 percent from 1957–78; and output of other crops grew still more rapidly, allowing China to become a net exporter of coarse grains, soybeans, and raw cotton.

These increases have been accomplished without significant central investment, due in part to a growing reliance on the use of rural credit. Moreover, the greater incentives inherent in the family responsibility system have led to more efficient use of existing resources, enabling China to increase output on reduced acreage.

While the decentralization of the rural economy and market-stimulated reforms are being put into practice in China, comprehensive rural reform is as yet only a declared policy in the USSR. Soviet rural reforms to date consist largely of institutional changes. The creation of a new super-ministerial State Agro-Industrial Committee (*Gosagroprom*), which establishes a power base for Gorbachev's lieutenants to control the development and implementation of agricultural policies, is the most significant step so far. A resolution passed in March 1986 called for this "super-ministry" to authorize local units (i.e., families and cooperatives) to make planting decisions, control distribution and marketing of part of the harvest, and retain profits resulting from revenue in excess of costs.

Reforming the industrial sector

Rural reform, by itself, is not likely to bring the dramatic improvements in economic efficiency that Soviet and Chinese planners are looking for. On the contrary, planners recognize that the key to stimulating economic productivity and efficiency is reforming the industrial sector, especially the cumbersome system of mandatory planning, through which the State sets production targets, controls distribution, and allocates supplies and capital to enterprises.

Chinese efforts to shift from mandatory to guidance planning and to decentralize decision–making to industrial enterprises began in the fall of 1984. Under the Chinese system, which now affects basically medium-sized and small enterprises, many decisions about production, price-setting, and marketing are left to the enterprises, within certain State-defined limits. Instead of deducting profits from these enterprises, the State now collects taxes—allowing the remainder of the profit to be used at the discretion of the enterprise for reinvestment, wage increases and bonuses, and worker housing and child care.

China has made far more progress in the reform of its planning system than the Soviet Union, although both countries are keenly aware of the need for reform in this area. Part of the explanation may lie in the fact that the planning system in China has never been as centralized as it is in the Soviet Union. In fact, China's managerial reforms are consistent with the comparatively decentralized approach that distinguished Chinese

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forts. By 1971 Soviet leaders were no longer talking about reform, but merely "improvements."

The economies of Eastern Europe are also locked in a bureacratic vise. Despite the much greater successes of Hungary and Yugoslavia in reducing the scope of mandatory planning since the 1960s, administrative interference in enterprise management remains considerable. Despite the institution of "worker self-management" in Yugoslavia in the 1950s, local officials have turned Yugoslavia's individual republics into virtual economic fiefdoms: economic cooperation outside their borders is discouraged, and wasteful duplication of effort is the norm. Hungary's officials are also having trouble letting go. As one Chinese scholar noted recently, "enterprises in Hungary watch the bureaucracy more closely than they watch the market."

To be sure, trial implementation of this or that reform is taking place in the Soviet Union and Eastern Europe. The first socialist country to establish a bond market, Hungary is in the process of decentralizing its banking system. The Soviet Union announced its first bankruptcy in March, while Poland allowed its third State-run enterprise to go bankrupt last year and is now giving enterprises greater control over their hard currency earnings.

The problem is that these reforms are piecemeal, rather than comprehensive. And as history shows, many reforms that work well as experiments fail when they are implemented more widely.

No country understands the obstacles to reform better than China, whose present leaders have been remarkably vocal about the need for a comprehensive approach to reform. Until this year, they have emphasized the need for commensurate political reforms to ensure that official policies are not quietly circumvented at lower levels. In concentrating upon these two fundamental obstacles to reform—uncoordinated implementation of economic reform and administrative interference—China's leaders have taken a great leap forward. But by apparently retreating from the consequences in 1987—postponing political reform and slowing the pace of economic innovation—leaders have given rise to speculation abroad in recent months that their reform program is actually taking a step backward—just as reforms in the Soviet Union appear to be pushing ahead.

As Sovietologist John Hardt suggests, however, the image of China regressing and the Soviet Union progressing may be more a temporary mirage than an enduring trend. According to Hardt, Soviet reforms are still very much in the planning stage, while China has forged ahead in practice.

Why does reform appear to be more easy for China than the Soviet Union? Hardt believes that central control over the economy in China was never as profound as in the Soviet Union. For the Soviet Union to match China's progress, it may require even more radical changes than those occurring in China. —Deborah Diamond-Kim

Photo courtesy of China Features

Chinese trade exhibition in Moscow, July 1986. The Soviets are intensely curious about Chinese reform efforts. But for them to achieve similar results, they will have to overcome far greater bureaucratic obstacles at all levels of government.

economic planning from the Soviet model at the outset. Even key industrial sectors such as steel, coal, and machine building have only been partially controlled in China. This relative slackness in the planning apparatus makes it easier for further decentralization to take place.

Ironically, substantial Soviet economic assistance to China in the 1950s may have helped spare China from the excesses of the Soviet central planning system. During the PRC's first decade, a good deal of industrial planning was 'made in Moscow' and transferred to China in a predigested package complete with technicians, blueprints, and detailed management directions. After the break in Sino–Soviet relations in the 1960s, Chinese economic decision-makers were beset with a series of disasters requiring immediate attention: the loss of Soviet industrial aid, the abortive Great Leap Forward program, the agricultural crisis of the early 1960s, and the Cultural Revolution. Each successive crisis further disrupted the consolidation of a firmly entrenched economic and Party bureaucracy.

The Soviet Union has a great distance to travel before it can attain even the levels of industrial decentralization achieved in China before urban reforms got under way there in 1984. Gorbachev's urban reform program apparently aims at streamlining the central apparatus rather than changing basic rights and responsibilities. The main objective is to change the focus of central economic ministries from "operational management" to long-range structural planning. To this end, two industrial super-ministries are scheduled to be created—a machine-building bureau that spans several industries and a new energy super-ministerial bureau. But these industrial super-ministries may have less success than the agricultural sector's equivalent, *Gosagroprom*, in transferring operational authority to the lower-level bureaus. How will these bureaus cope with the 4,000 major product categories used by the State Planning Commission, the 40,000 to 50,000 specifications of ministries, and the 1 million detailed specifications of the State Committee for Supply?

If enterprises are ever given significant rights and responsibilities, will they be held accountable for poor performance? If so, will more than a token number be allowed to go bankrupt? Will managers gain the right to hire and fire workers? These questions have been debated in the Soviet Union but not resolved. China, in 1986, went so far as to experiment with new contract labor laws. In the Soviet Union, the most significant development in this area occurred in early 1986 when the creation of the super-ministry *Gosagroprom* resulted in temporary unemployment of as many as 3,200 State agricultural cadres. These workers are reportedly receiving unprecedented unemployment and early retirement benefits, although they have not yet been transferred away from Moscow to jobs in smaller cities, which would be a more significant step. Whether such a strategy would be acceptable and achievable throughout the urban-industrial economy, given the political and social questions it raises, remains to be seen.

The USSR still lacks a detailed strategy for reforming government and Party economic bureaucracies. At this stage, Gorbachev has merely defined the outlines of his grand design. Among the proposals awaiting implementation are plans to use prices and bonuses as an active tool of economic and social policy; to allow enterprises to market above-plan output as well as unused materials and equipment; to encourage subcontracting and the piece-work system at the team level among work units and families; and to legalize or co-opt the informal or illegal service sector.

But reforms on the scale currently being implemented in China may be politically impossible in the Soviet Union. Despite years of discussion and debate, the Soviet Union has not yet been able to match China's record in implementing even the easier-to-manage rural reforms.

That is not to say that China faces a clear road ahead either. Fear of the costs of reform may hold both countries back to some degree. These costs include rising public expectations that cannot be quickly satisfied and declining political orthodoxy, both of which may threaten Party authority. Advocates of reform in both China and the Soviet Union can be expected to engage in an ongoing process of promoting and reassessing, as they search for solutions that will strengthen the nation without weakening their leadership. 完

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Soviet and US Connections

Beneath their Western suits, China's middle-aged leaders have a wide range of views. Where they were educated may have something to do with it.

Christopher M. Clarke

China's success in handing over power—except at the very highest levels—to a generation of better educated, more technologically sophisticated leaders in their forties and fifties is well documented. This has led many observers to wonder whether these up-and-coming Chinese leaders, many of whom were trained in the Soviet Union during the 1950s, will favor closer ties with Moscow. The rapid rise of technocrats like Vice Premier Li Peng, who studied electrical engineering in the Soviet Union from 1948–55, highlights the immediacy of this question.

At the same time, Western-educated leaders are also landing key positions. The most prominent include Chairman of the National Defense Science, Technology, and Industry Commission Ding Henggao and Secretariat member Wang Zhaoguo. Many of the 23,000 students trained in the United States since 1979 can be expected to join them in the coming years.

Soviet influence in the 1950s

Between 1950 and 1960, more than 11,000 Soviet experts worked for extended periods in China. At the same time China sent some 2,500 scientists and college professors, 8,000 technicians, and 20,000 workers to the USSR for training. Another 7,500 or so were enrolled as Chinese students in Soviet universities.

Those expressing concern about a possible tilt to the Soviet Union point out that Soviet influence is not limited to this relatively small number of Chinese who received formal training in the USSR. Soviet ideas were also transmitted to a wider group of university students in China who studied Soviet textbooks or were taught by Soviet lecturers. Years of schooling in this environment and decades of experience in Soviet-style industrial sectors and bureaucracies may have made it difficult for many Chinese to abandon familiar bureaucratic patterns of management in favor of a more flexible approach to politics and the economy.

At the same time, the influence of Soviet thinking on China's successors ought not to be overestimated. Those who studied in the Soviet Union represent only a small fraction of the Chinese college graduates during the 1950s. Undergraduates sent to the Soviet Union make up only 1 percent of all Chinese college graduates between 1949 and 1959. The 2,000 or so graduate students still represent only about 5 percent of Chinese graduate students during that time. Moreover, exposure to the Soviet Union on an extended basis has seldom influenced Third World citizens to be "pro-Soviet." Although many Chinese who studied in the USSR express affection for the Soviet people in general and for their former colleagues or fellow students in particular, many conversely cite experiences with isolation and perceived racism to justify their alienation from the Soviet system. And once Sino–Soviet relations turned sour in 1960, the returned students learned most of their practical skills in a distinctly anti-Soviet environment.

Attitudes among middle-aged technocrats

The "third echelon" now being promoted to positions of leadership in China actually consists of two age groups with rather different experiences. Only those over 50 years of age have had substantial exposure to Soviet advisers either in the USSR or in China. Members of this older group spent their adolescence in wartime China and grew into adulthood during China's "golden years" of the 1950s. Their attitudes were largely shaped by the prevailing nationalism of the late-war period and the optimism, economic success, and relative political stability of the early 1950s.

Those in their mid-forties and younger, on the other hand, generally experienced more turbulence at a younger age. While they attended school in the 1950s, getting a good education was seen as both a patriotic duty and a means of personal advancement. Their political exposure to the adult world, however, occurred during the chaotic decade of the Cultural Revolution. As a result, this younger group wants at all costs to avoid a repetition of that period.

The traumatic experience of the Cultural Revolution has influenced both groups of middle-aged technocrats to place a premium on order. Law, science, and practical, though largely apolitical, approaches to economic questions dominate their thinking. Attachment to a centralized economic system and a bureaucratic style of government may also be strong; one of the first signs of restored order in China following the Cultural Revolution was the rebuilding of the bureaucratic system. Thus, fearful of a return to chaos, many of these leaders are likely to resist fundamental change. This outlook may increasingly come to clash with the more adventurous outlook of Chinese now being trained in or by the West and Japan.

Christopher M. Clarke is a China analyst with the Department of State. Formerly a director of research at the National Council for US–China Trade, he has contributed numerous articles to The CBR. *The views expressed here are his own, not those of any government agency.*

Training the "fifth echelon" in the West

Since international exchanges blossomed in 1979, China has sent over 35,000 students abroad for training, most to the West and Japan. The estimated 23,000 students sent to the United States since 1979 make up by far the largest group. About 3,000 students have gone to Japan. The Federal Republic of Germany, Canada, the United Kingdom, and France have each hosted 1,000–2,000 Chinese students, and perhaps 500 each have gone to Romania and Yugoslavia. Only about 300–400 Chinese students are believed to have gone to the USSR since exchanges with that country resumed in 1984.

The number of Chinese trained in the United States has already surpassed the number trained in the USSR in the 1950s; by 1990 it will exceed the number trained in the West between 1840 and 1949. And, according to a recent US study, if current Chinese and US policies continue, China will be the source of the largest group of foreign students in the United States by 1990.

No scientific assessments have been made to determine the attitudes that China's overseas scholars take back with them about Western culture, politics, economy, and society. Most likely, as with the returned Soviet-trained students of the 1950s, experiences vary considerably and their attitudes will be influenced by the situation they return to in China. Nevertheless, it appears that exposure to the advanced scientific and technical research methods in many universities has promoted individualism among students who grow accustomed to thinking for themselves. The most recent evidence of this tendency was the open letter sent to Beijing expressing the concerns of 1,000 Chinese students in the United States over the political situation in China following the dismissal of General Secretary Hu Yaobang.

New policies toward study in the West may alter student attitudes, however. Until recently, the Chinese government permitted—and sometimes encouraged—students to stay three to five years and did not discourage them from financing their own education. But China now wants students to return home more quickly, equipped with practical skills. During the last two years, Beijing has moved to shorten foreign stays, monitor and influence courses of study, and assure a prompt return by restricting self-funded study.

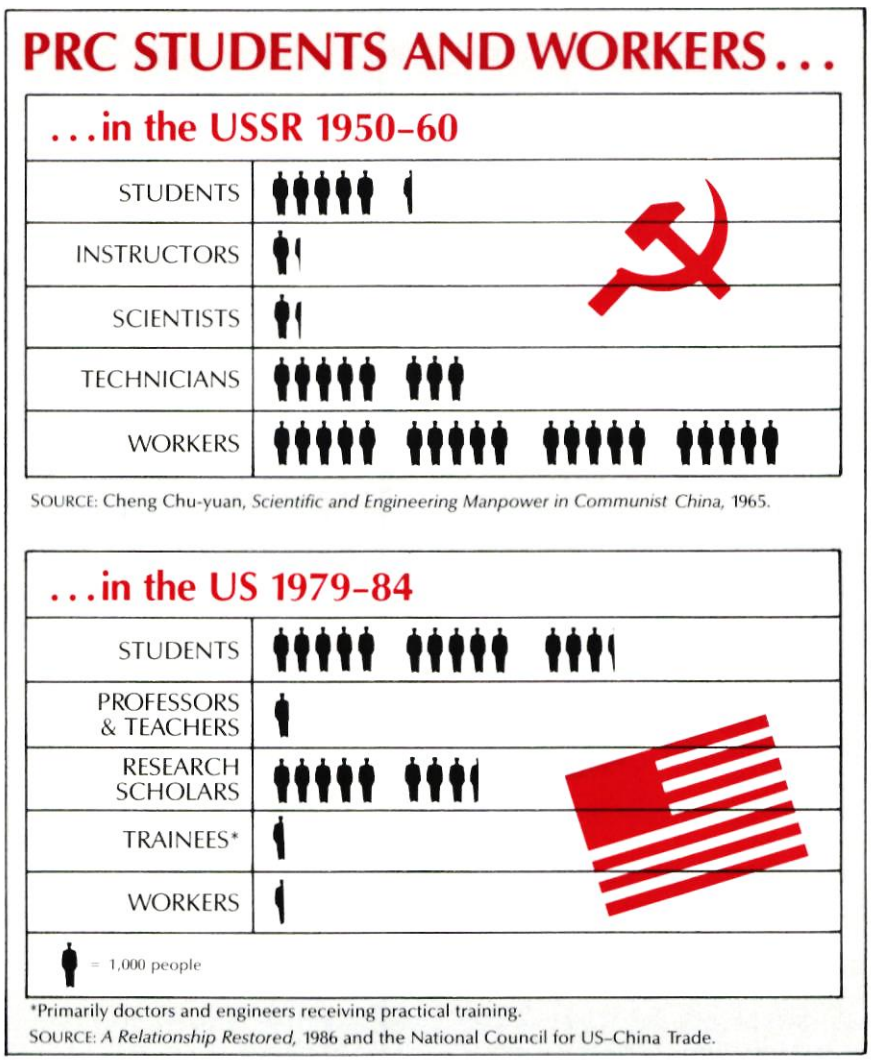
The longer term consequences of these steps can only be guessed at. But preliminary studies suggest that most Chinese students in the United States are unhappy and uncomfortable during the first year or two of their stay; only after this adjustment period do they overcome feelings of isolation and alienation. If this pattern is typical, the government's attempt to shorten stays in the United States could adversely affect the image of the United States that China's returning students—and future leaders—take back with them.

What of the future?

Whether Soviet or Western-educated, fluent in Russian or in English, the younger generation of leaders in their mid-forties and fifties are practical, task-oriented people, who have no desire to see the return of dogmatism and fanaticism to China. They support open door policies that allow China to draw lessons, not only from the capitalist world, but also from socialist countries experimenting with reform.

It would be premature to suggest that the educational ties of future leaders to the Soviet Union or the United States will cause them to tilt China toward one "camp" or another. China's "independent foreign policy" has great nationalist appeal. It is also a flexible policy that enables China to favor one or another power depending on the issue involved and how well it serves Chinese interests.

Whatever their possible differences on such issues as the role of central planning and the relative merits of various reforms, China's future leaders—both Soviet and Western trained—are likely to be united in seeking to develop socialism with Chinese characteristics. 完



SOURCE: Cheng Chu-yuan, *Scientific and Engineering Manpower in Communist China*, 1965.

*Primarily doctors and engineers receiving practical training.

SOURCE: *A Relationship Restored*, 1986 and the National Council for US–China Trade.

EDUCATION OF CHINA'S HIGHEST LEADERS

Of the 343 members and alternates of the Chinese Communist Party Central Committee, educational data is available on less than 60 percent. Of these, 124 are known or strongly believed to have attended—though not necessarily graduated from—some type of college-level institution, while 76 probably did not.

The actual level of education is probably lower than these figures suggest since the numbers include leaders such as Hu Yaobang who attended Chinese makeshift universities in Yenan and Party elders such as Deng Xiaoping and Vice Premier Wan Li who spent some time in colleges in Europe during the 1920s. They also include participants in advanced political training programs—like Sun Yatsen University—in the Soviet Union during the 1920s and 1930s and graduates of advanced Chinese military staff and command training programs during World War II.

Only 20–25 members and alternates of the Central Committee are known to have trained in the Soviet Union for some period between 1927 and 1960, while 10–12 received advanced training in the West, either before 1949 or after 1979. If this pattern is representative of all Central Committee members, it suggests that between 10–13 percent have a college-level Soviet background and 5–6 percent have similar Western exposure.

An undetermined number of China's leaders—perhaps as many as two dozen—also received college training in Western-run or -influenced colleges in China before 1949, including Vice Premier Yao Yilin at Qinghua University and Foreign Minister Wu Xueqian at St. John's College in Shanghai. Secretariat member Wang Zhaoguo and State Economic Committee vice chairmen Zhang Yanning and Ye Qing are graduates of the joint US–China management training center in Dalian.

Although some information is not available, the educational background of the 22 members of China's Politburo, the key policy-making organ of the Communist Party, illustrates this diversity:

Deng Xiaoping, 82
Studied/worked in France, 1920–26. Studied several months in USSR, 1926.

Zhao Ziyang, 68
No known higher education.

Li Xiannian, 76
No known higher education.

Chen Yun, 81
Possible short USSR stay in 1927.

Hu Yaobang, 71
Studied at the Anti-Japan Military and Political Academy beginning in 1936.

Fang Yi, 70
University background, possibly studied in Shanghai.

Hu Qiaomu, 74
Attended Qinghua University 1930–32.

Hu Qili, 57
Beijing University graduate, 1947–51

Li Peng, 58
Attended the Yenan Institute of Natural Sciences in 1941. Did advanced research at the Moscow Power Institute from 1948–55.

Ni Zhifu, 54
Completed a correspondence school technical study program.

Peng Zhen, 84
No known higher education.

Qiao Shi, 61
Higher educational training, possibly in Suzhou.

Tian Jiyun, 57
No higher education.

Wan Li, 70
Studied in France.

Wu Xueqian, 65
Studied at St. John's College, in Shanghai.

Xi Zhongxun, 73
Studied at the Central Party School at Wayaobao, 1935.

Yang Dezhi, 76
No known higher education.

Yang Shangkun, 79
Studied at Shanghai University, 1925. Later sent to Moscow to study at Sun Yatsen University, 1927–30.

Yao Yilin, 69
Attended a teacher's college and then Qinghua University.

Yu Qiuli, 72
No known higher education.

Alternate Members

Chen Muhua, 66
Studied at Fudan University, Shanghai.

Qin Jiwei, 76
Attended a course at the Anti-Japan Military and Political Academy, 1938.

VIDEOSHELF

书刊介绍

Businessweek China Business Briefing, filmed by Hawkshead Communications Ltd. Produced by Nigel Houghton. Includes two tapes with a total playing time of 75 minutes plus a 112-page text. Tapes, 1987. Text, 1986. Distributed in the US by Direct Cinema Ltd., P.O. Box 69799, Los Angeles, CA 90069-9976. $795. Multicopy discounts available. Distributed in Hong Kong under the title ***China Business Briefing*** by Longman Group (Far East) Ltd., 18/F Cornwall House, Tong Chong St., Quarry Bay, Hong Kong.

China Business Negotiations: Styles and Strategies That Work, produced and distributed by Executive Information Network, Inc., 140 SW Arthur St., Portland, OR 97201. Includes a 60-minute tape, user guide, and two books: ***Chinese Commercial Negotiating Style***, 1982, and ***Communicating with China***, 1983. Tapes and guide, 1986. $895. Nonprofit organizations $580.

Doing Business in China: 1987–1991, produced by China Films, Ltd. Distributed by Money Maker$ News, 3804 N. Washington St., Westmont, IL 60559. Includes 80-minute tape and guide. 1987. $800. Available in the fall; will be reviewed in a later issue of *The CBR*.

China business has entered the video era. The two new films reviewed here shed light on doing business with China through a trendy, albeit pricey, new medium that offers companies one alternative to the now-commonplace China business seminar. However, these videos cost almost as much as a day-long seminar, while providing less than 90 minutes of education and no question-and-answer period. Thus they can best be used by companies as part of in-house training packages or by banks and consultants that want to educate their clients on the China trade. These videos deal with similar subjects, but each has a very different approach.

China Business Briefing sets out to educate the newcomer to China trade and accomplishes this goal with flair. The quality of the video (done by the same group that produced the TV series, "Heart of the Dragon") is professional, as is the accompanying text. Divided into two parts, the film first broadly examines China's history, geography, agriculture, and industry. Special note is made of how aspects of Chinese culture such as family or language affect business practices. Five excellent case studies of companies active in China in part two are based on interviews with executives involved in negotiations. The pros and cons of the different types of business arrangements are clearly explained, with summaries of important strategies at the end of each case study.

This film comes with a text that could stand alone as a basic guide to doing business with China; it complements the video well, avoids duplication, and reflects a realistic, cautionary approach to the China market. It is divided into four parts: the political and economic context in China, strategic considerations, tactics, and a practical guide. Although the book's quality is good overall, its typeface is not easy to read, and the practical guide section sports a few dated facts, such as the inaccurate statement that daylight savings time is not used in China.

China Business Negotiations: Styles and Strategies that Work provides training for business negotiations in China and can assist in forming a corporate strategy toward the China market. It is targeted for an audience that already commands a basic knowledge of China. The film is divided into four sections: planning, preparations, negotiating strategies and tactics, and conducting successful negotiations.

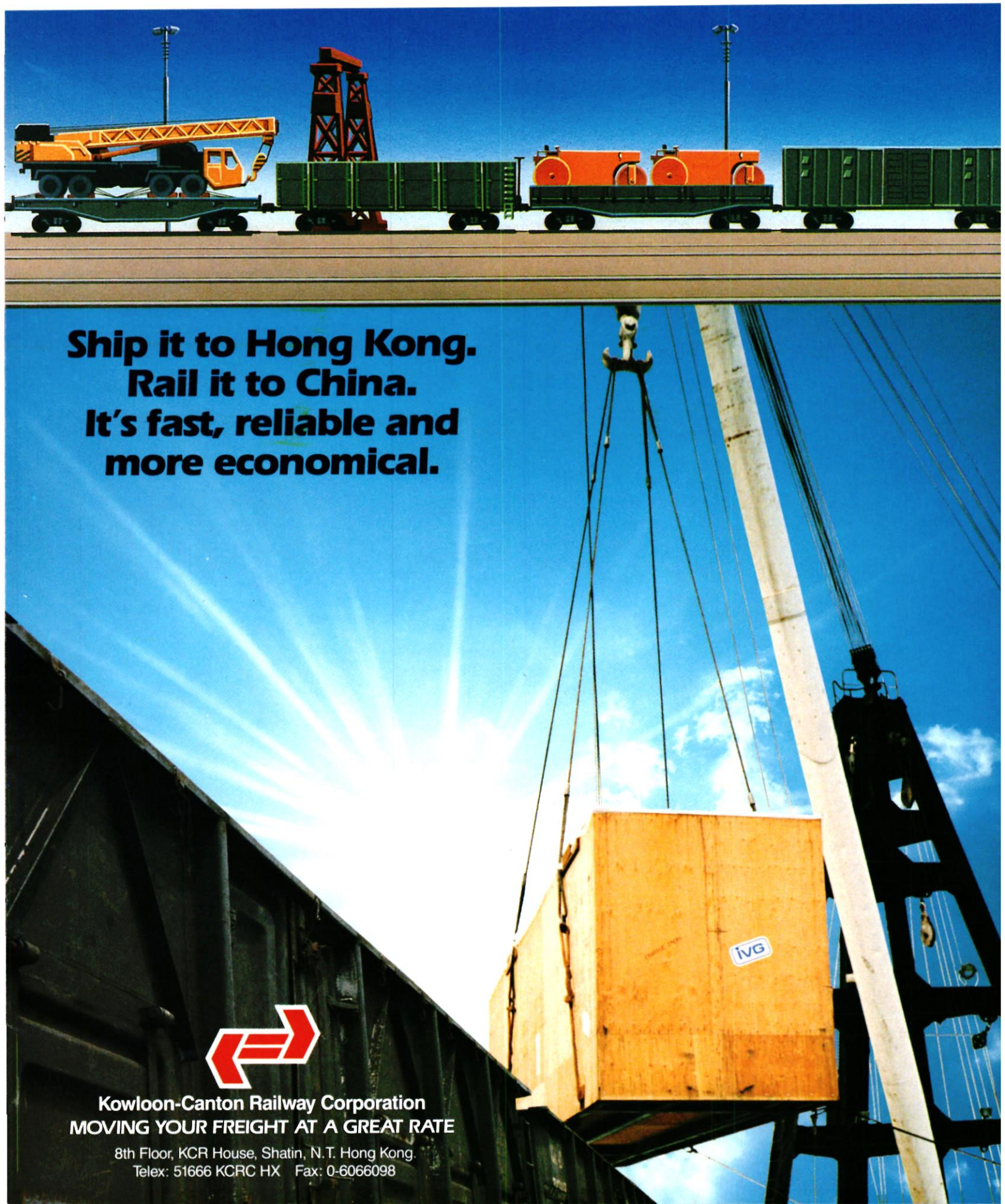
Although the sheer wealth of useful information provided in this video is not equalled by the other one reviewed here, it is more difficult to absorb due to the disjointed format and relatively mundane presentation. Short segments have been drawn from speeches and interviews with nine China business experts participating in a seminar in Seattle, Washington, in June 1986. The experts are generally well known in the field and present valuable insights from a broad range of perspectives including those of the corporate executive, academic, lawyer, and consultant. Other footage filmed in China is tossed in, although the same scenes annoyingly appear more than once throughout the video.

China Business Negotiations bills itself as an "information-rich package." The video comes with a slick guide to be used with the film and two well-known books. The film guide includes a transcript of the video, a useful bibliography on China and negotiations in general, photocopies of relevant journal articles, and an excerpt from Rosalie Tung's book, *China Trade Negotiations*.

Businessweek China Business Briefing and *Business Negotiation Strategies*, would best be shown in tandem. The rich film footage and smooth organization of the former offer a realistic introduction for the newcomer to the China trade. The latter prepares the businessperson for the next step by offering advice on subtle techniques required at the negotiating table.

—JLL

THE HONG KONG CONNECTION



CRS Sirrine: On a Fast Track in China

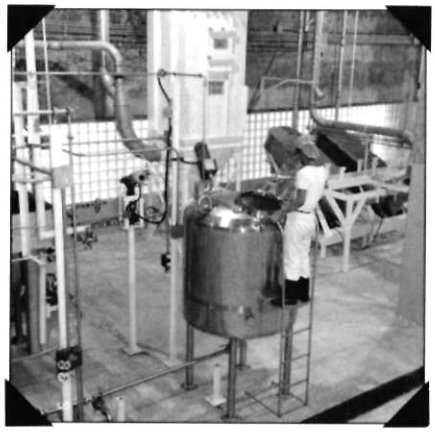
Perry M. King

A leading US design and construction services company, CRS Sirrine (CRSS) is also making a name for itself in China. The company has participated in more than 20 major projects in China since 1980. CRSS is currently involved in the design and construction of the Celanese cigarette filter manufacturing plant in Nantong and a 41-story office tower and hotel complex in Shenzhen.

The most challenging of CRSS' recent China assignments was building the Heinz UFE Infant Food Factory in Guangzhou. CRS Sirrine offered a lump sum turnkey design/build proposal to the H. J. Heinz Corp. and its Chinese partners, the Yangtang Combine and United Food Enterprises of Guangzhou. The $9.1 million contract, signed in December 1984, made CRSS responsible for the construction of the Heinz factory, including all the engineering and architectural design, equipment procurement and installation, and subcontracts with Chinese or Hong Kong suppliers and contractors.

The turnkey contract was paid 60 percent in dollars and 40 percent in renminbi (reflecting the terms of the 60:40 Heinz UFE equity joint venture) with the understanding that Chinese-supplied building materials would come through the State allocation system and be purchased by CRSS with the renminbi portion of its payment. CRSS had the option of purchasing other Chinese equipment and construction services with the remainder of the renminbi.

At their first meeting with officials from the Yangtang Combine and United Food Enterprises of Guangzhou at the site in February 1985, the Chinese surprised CRSS representatives by requesting that they break ground immediately and finish all design, procurement, installation, and start-up work by December 1985. This would have compressed an 18-month project into 10 months! CRSS representatives explained that it would be counterproductive to start construction before sizing underground utilities or to finish the building shell before the equipment arrived. But the Chinese continued to insist that the project be completed by the end of 1985. The project was actually completed by June 1986—in keeping with the original schedule.



Stainless steel rice cooker at Heinz-UFE plant

The availability of construction materials was an important factor in the construction strategy. During the design meetings in Guangzhou it became apparent the Chinese would not be able to supply basic construction materials (such as cement and reinforcing bars) through the State allocation system as originally planned. Under this system, materials must be requisitioned a year or two in advance in order to get into the pipeline. No materials were available from the State system during the fiscal year in which the Heinz-UFE plant was to be built. Moreover, due to a shortage of reinforcing bar on China's open market at the time construction began, CRSS was forced to purchase rebar in Hong Kong (with foreign exchange) and ship it to Guangzhou. This lead to unanticipated foreign exchange expenses as well as initial delays in constructing foundations. Because of the inadequate domestic supply of materials, CRSS was unable to use up the renminbi portion of its payment, which is now collecting interest at 2 percent in a bank in China.

Maintaining quality control was another important consideration. To ensure the quality of workmanship in both the structural design and interior finish of the plant, CRSS subcontracted some of the work to two reputable Hong Kong firms. These firms, in turn, engaged local subcontractors to assist them.

Success in meeting the tight design/construction schedule depended upon strict cooperation between CRSS' design office in Chicago and its procurement office in Houston. Three hundred and eighty-eight purchase orders for approximately $3.5 million worth of equipment were processed on the project and were supplied by 139 vendors from the United States, Western Europe, and Hong Kong.

CRSS assigned a member of its Hong Kong staff full time to supervise final shipment, receiving, and customs clearance. To hasten deliveries to the Heinz Factory, Chinese officials agreed to an unusual arrangement whereby equipment containers enroute from Hong Kong were able

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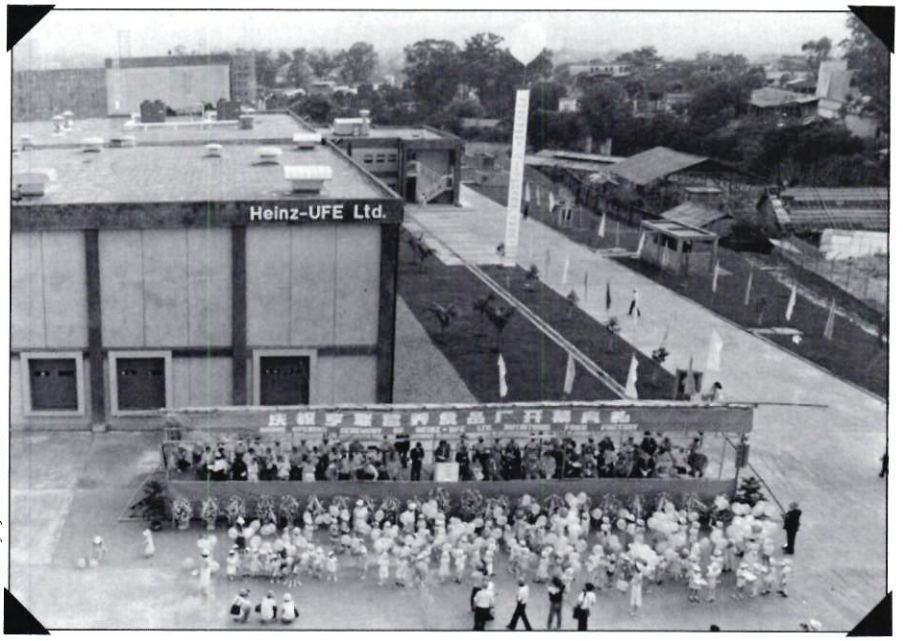
Perry M. King is senior vice president for marketing at CRS Sirrine corporate headquarters in Houston. He served as president of CRS Sirrine Asia Ltd., Hong Kong, during construction of the Heinz–UFE project. Mr. King has participated in three National Council-sponsored delegations to China and conducted management seminars in five Chinese cities.

to bypass time-consuming customs inspections at the Chinese border; instead, they were inspected at the construction site upon arrival.

In addition to international procurement, the CRSS Hong Kong office arranged direct procurement of two 1,000 KW stand-by generators from the Guangzhou Diesel Company and signed a fabrication contract with the Ministry of Light Industry to fabricate, weld, and deliver 14 stainless steel 3x8 meter storage silos. The stainless steel was produced in the United States and shipped to Guangzhou where it was rolled, formed, shaped, and welded. Other items procured in China included building materials, motors, pumps, fans, and office furniture.

The CRSS Hong Kong office supervised the day-to-day construction of the plant and acted as a liaison with the various Chinese bureaucracies involved in the project. The latter proved to be one of the most unpredictable aspects of the project, since approval was needed at various stages from numerous government agencies, including the municipal departments of quarantine, environment, public security, and city planning. However, the plant did open on schedule and is now in the midst of its challenging task of operating a modern food production facility to USDA standards in China.



Photos courtesy of CRS Sirrine

Opening ceremonies at the plant, June 1986

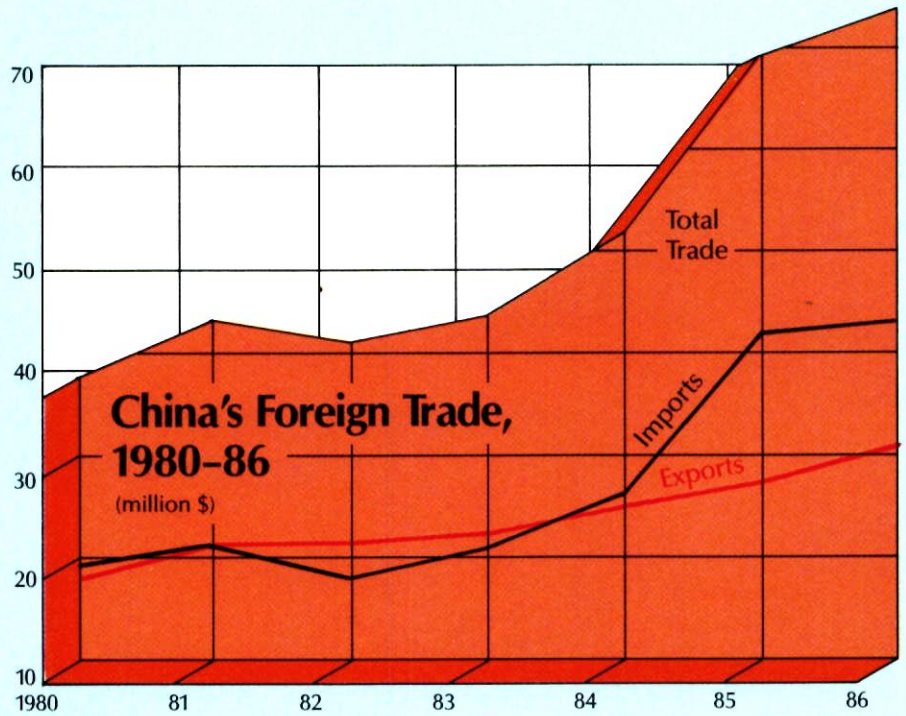
CHINA DATA

中國數據

KEY INDICATORS

	1982	1983	1984	1985	1986
Exchange rate (yuan per US $)	1.8887	1.9772	2.3200	2.9367	3.4528
Currency in circulation (bil ¥)	43.9	53.0	79.2	98.8	121.8
Reserves (bil. $)	15.9	19.7	21.3	15.9	15.2
Foreign exchange	11.1	14.3	16.7	11.9	10.5
Gold (at current market prices)	4.8	5.4	4.6	4.0	4.7
GDP* (bil. ¥)	552.9	607.1	691.5	778.0	938.0
State budget revenues (bil. ¥)	112.4	124.9	146.5	185.4	222.03
State budget expenditures (bil. ¥)	115.3	129.3	151.5	182.6	229.11
Consumer Price Index (1980 =100)	104.6	106.7	109.6	118.4	124.4
Gross value of industrial output (bil. ¥)	550.6	608.8	704.2	875.9	1115.7
of which:					
heavy industry	274.0	313.4	370.7	467.0	583.3
light industry	276.6	295.4	335.5	408.9	532.4
Gross value of agricultural output (bil. ¥)	278.5	312.1	375.5	451.0	394.7
of which:					
grain output (MMT)	353.43	387.3	407.2	379.0	391.1
cotton output (MMT)	3.598	4.637	6.077	4.150	3.540
Population (millions)	1012.0	1025.0	1034.8	1046.4	1060.0

SOURCE: *IMF Financial Statistics*, State Statistical Bureau, National Council files.
All values in current prices unless otherwise noted.
Information for 1980–81 in *The CBR* May–June 1986.
In 1986 China switched to reporting GNP, rather than GDP. Figures for 1982-85 reported in constant prices. 1982-83 figures derived.



CHINA'S FOREIGN TRADE 1980–86

	1980	1981	1982	1983	1984	1985	1986	% change 1986/85
Total Trade (fob and cif) bil $	38.04	43.13	40.88	43.48	51.78	69.62	73.83	+6.0
Exports (fob) bil $	18.10	21.56	21.94	22.16	25.03	27.36	30.93	+13
Imports (cif) bil $	19.94	21.57	18.94	21.32	26.75	42.26	42.90	+1.6

SOURCE: State Statistical Bureau

OUTPUT OF INDUSTRIAL AND CONSUMER PRODUCTS

	1985	1986	% change 86/85
Coal (MMT)	872	870	−0.2
Crude Oil (MMT)	124.9	131.0	+4.8
Steel (MMT)	46.79	52.05	+11.2
Cement (MMT)	146.0	161.6	+10.7
Timber (MMT)	63.23	62.88	−0.6
Chemical insecticide (MMT)	.211	.223	+5.7
Electricity (bil kwh)	410.7	445.0	+8.3
hydroelectricity	92.4	93.2	0.9
Motor vehicles (thous. units)	437.2	369.0	−15.6
Locomotives (units)	746	818	+9.7
Machine tools (thous. units)	167.2	158.6	−5.1
Bicycles (mil. units)	32.3	35.7	+10.6
Refrigerators (mil. units)	1.45	2.24	+54.5
Television sets (mil. units)	16.65	14.47	−13.1
Color TV sets	4.32	4.14	−4.2
Cameras (mil. units)	1.79	2.15	+20.0
Washing machines (mil. units)	8.87	8.99	+1.4
Sewing machines (mil. units)	9.91	9.86	−0.6
Wristwatches (mil. units)	54.31	64.45	+18.7
Cloth (bil. meters)	14.7	15.8	+7.5
Cigarettes (mil. cartons)	23.70	25.93	+9.4
Beer (mil. tons)	3.10	4.02	+29.7

SOURCE: State Statistical Bureau

MAJOR ITEMS IN US–CHINA TRADE

TOP TEN US DOMESTIC EXPORTS TO CHINA IN 1986 (FAS, THOUSAND $)

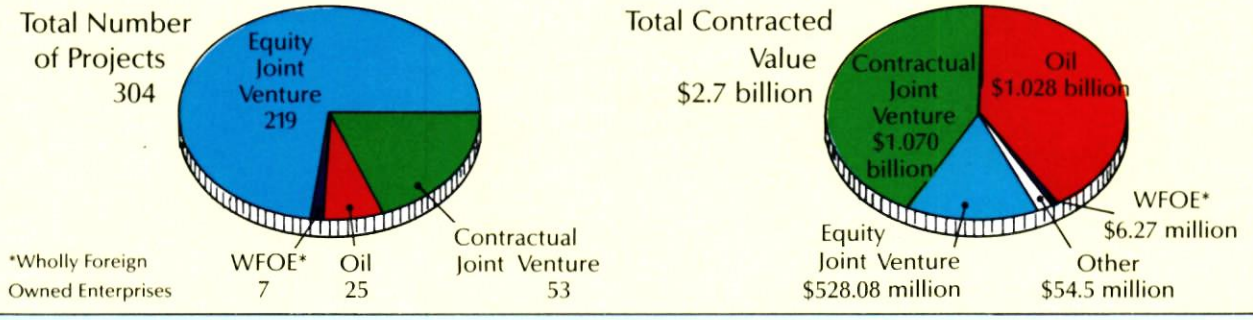
Locomotives and tenders	159,800
Airplanes, nonmilitary, new for passenger transport	148,554
Douglas Fir Logs	111,647
Oil & Gas Drilling Machine Parts	104,953
Digital Automatic Data Processing Machines	97,171
Aircraft Parts for use in civil aircraft	96,670
Fertilizer and Fertilizer Materials	96,138
Polypropylene Resins	81,691
Machines and parts thereof for production and assembly of semiconductor devices, diodes, transistors and integrated circuits	62,987
Western Hemlock Logs	60,829

TOP TEN US GENERAL IMPORTS FROM CHINA IN 1986 (CIF, THOUSAND $)

Crude Petroleum and Shale Oil	528,516
Leaded Gasoline	113,966
Womens', Girls', and Infants' Sweaters	89,594
Gold Coins	86,173
Cotton Print Cloth	80,992
Artificial Flowers	76,541
Stuffed Toy Animals	72,048
Wool Floor Coverings	71,101
US Goods returned	67,668
Dolls	65,092

SOURCE: US Department of Commerce Trade Statistics 7-digit Schedule B and TSUSA Numbers

Cumulative US Investment in China, 1979–86



FOREIGN TRADE WITH SELECTED COUNTRIES, 1982–86

(MILLION $)	1982	1983	1984	1985	1986	% change 1986/85
Hong Kong exports (fob)	1954	2495	5031	7858	7550	−3.9
imports (cif)	5431	5847	7131	7568	10460	+38.2
Total	7385	8342	12,162	15426	18010	+16.8
Share of 2-way trade	18.1%	19.2%	23.5%	22.2%	24.4%	
Japan exports (fob)	3510	4912	7216	12477	9850	−21.0
imports (cif)	5352	5087	5957	6482	5670	−12.5
Total	8862	9999	13173	18959	15520	−18.1
Share of 2-way trade	21.7%	23%	25.4%	27.2%	21.0%	
United States exports (fob)	2912	2173	3004	3856	3105	−19.4
imports (cif)	2502	2477	3381	4224	5241	+24.1
Total	5414	4650	6385	8080	8346	+3.3
Share of 2-way trade	13.2%	10.7%	12.3%	11.6%	11.3%	
West Germany exports (fob)	853	1075	1038	2230	2867	+28.5
imports (cif)	702	768	851	871	1200	+37.8
Total	1555	1843	1889	3101	4067	+31.2
Share of 2-way trade	3.8%	4.2%	3.6%	4.4%	5.5%	
Italy exports (fob)	210	265	442	797	1002	+25.7
imports (cif)	428	414	431	593	682	+15.0
Total	638	679	873	1390	1684	+21.2
Share of 2-way trade	1.6%	1.6%	1.7%	2.0%	2.3%	
United Kingdom exports (fob)	179	244	424	512	783	+52.9
imports (cif)	339	351	372	475	623	+31.1
Total	518	595	796	987	1406	+42.4
Share of 2-way trade	1.3%	1.4%	1.5%	1.4%	1.9%	
France exports (fob)	336	450	310	781	666	−14.7
imports (cif)	437	433	440	499	583	+16.8
Total	773	833	750	1280	1249	−2.4
Share of 2-way trade	1.9%	2.0%	1.4%	1.8%	1.7%	
Canada exports (fob)	1005	1295	968	929	797	−14.2
imports (cif)	182	219	284	326	407	+24.8
Total	1186	1514	1251	1255	1204	−4.1
Share of 2-way trade	2.9%	3.5%	1.9%	1.8%	1.6%	

SOURCE: *IMF Direction of Trade Statistics*, various trading partners' official data

US INVESTMENT COMPARED TO TOTAL FOREIGN INVESTMENT IN CHINA

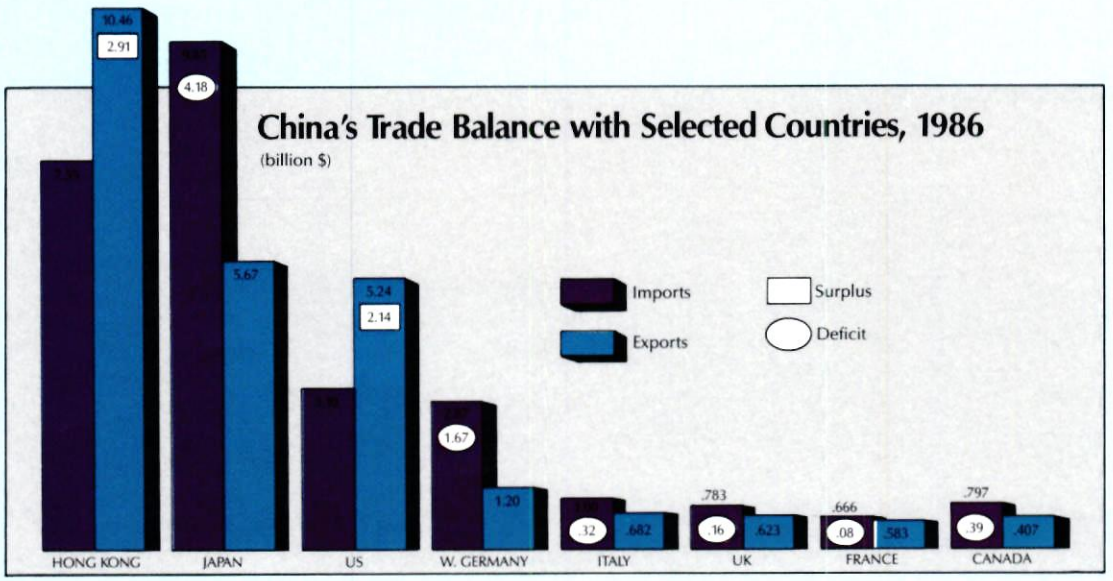
Number of Projects 1979–86

	US	All countries	US %
Equity joint ventures	219	3,213	6.8
Contractual joint ventures	53	4,383	1.2
Offshore oil	25	41	61.0
Wholly foreign-owned enterprises	7	138	5.1
Total	304	7,775	3.9

Contracted Value 1979–85 (million $)

	US	All countries	US %
Equity joint ventures	265.08	3,411.68	7.8
Contractual joint ventures	890.00	8,210.09	10.8
Offshore oil	960.00	2,782.50	34.5
Wholly foreign-owned enterprises	5.42	516.99	1.0
Compensation trade	54.54	1,253.72	4.4
Other	0	485.73	0
Total	2,175.04	16,660.71	13.0

SOURCE: *US Joint Ventures in China: A Progress Report*, prepared for the Foreign Commercial Service of the US Embassy in Beijing by The National Council for US–China Trade.



How China Buys Technology

Building blocks of technology import decisions

Technology transfer. Nowhere are these words given more weight than in China today. Despite recent swings in China's overseas purchases, technology imports as defined by MOFERT have maintained a steady upward march since 1981.

China is no newcomer to technology transfer, although technology purchases in their present form are relatively new. In the 1950s, China's main technology suppliers were the Soviet Union and Eastern Europe. Manufacturing know-how came as part and parcel of the large turn-key projects built in China by these countries. When the Sino–Soviet split brought these exchanges to an abrupt halt in 1960, China turned to Japan, Western Europe, and eventually the United States for technology—again, mainly embedded in large industrial projects.

By the early 1980s, as the open door policy brought flexibility in foreign business transactions, China increasingly looked at the more cost-effective option of buying know-how separately from equipment. Purchasing decisions gradually filtered down to lower levels, consistent with the overall thrust of trade reforms, as technology transfer became the mainstay of China's industrial renovation program.

But by 1985 the leadership had come to recognize the magnitude of longstanding problems in the technology import process. These included widespread purchases of inappropriate technology, wasteful duplication, and low utilization rates. Since then, officials have been struggling to make better use of the funds being spent on foreign technology.

Changes in the way China purchases technology are of great interest to firms doing business throughout China's industrial sectors. Most difficult to generalize about are the many relatively small technology transfer projects. Unlike priority national projects supported with State funds, the decision-making process for smaller projects is less clear cut, and funds may have to be raised by the localities or enterprises themselves. The following articles look at the building blocks of these smaller technology import decisions.

As Roy Grow's case study demonstrates, the voice of the factory in technical decisions appears to be stronger than ever. And as Alice Davenport reports, local bureaucracies also play a key role, since much of the effort to better coordinate technology imports is being made by city and provincial governments. In 1986 the number of technology import projects approved by localities reached 39 percent of the total.

TECHNOLOGY PURCHASES 1981–86

	value (billion $)	No. of contracts
1981	$.107	73
1982	.363	102
1983	.558	219
1984	.951	332
1985	2.960	671
1986	4.455	744
TOTAL	**9.394**	**2,141**

SOURCE: MOFERT

Many firms choose licensing as their method of transferring technology, and the common body of licensing experience in China has grown rapidly in the last three years. Jerome Alan Cohen and David G. Pierce summarize the issues a prospective licensor should consider. And China licensing negotiator James K. Yuann reminds companies that the negotiating process will not be easy, but with the right preparation it can be very rewarding.

Domestic technology is another building block in technology transfer. Chinese enterprises are told not to import technologies already available domestically, and as Erik Baark explains, great efforts are under way to apply China's research advances to practical purposes. If a decision to seek foreign technology is made, Chinese research institutes may also help production units select the appropriate foreign technology.

In March, the State Economic Commission, which has overall responsibility for technical renovation projects, announced that technology imports will be even more selective this year. But these efforts to screen purchases more carefully should not—in most cases—be viewed as an attempt to obstruct sales. Rationalizing the technology import process, as described by the following articles, has become a national priority precisely because foreign technology is so essential to the country's modernization. —Ed.

How Factories Choose Technology

In this case study, competing Japanese and US firms learned that the end-user can increasingly call the shots

Roy F. Grow

China has given the world many essential technologies, including manufactured steel, the suspension bridge, and the cybernetic machine. Chinese scientific skill gave us the decimal system, immunology, and modern geology.

Now the favor is being returned. Almost every contract a foreign firm signs in China puts the Chinese on the receiving end of technology transfer. Manufacturing expertise, management strategies, and scientific formulae play as large a role as equipment in most business negotiations.

The road to technology acquisition, however, is a rocky one. Chinese end-users in search of know-how must steer their way through the national, provincial, and local agencies that channel the flow of technologies across China. End-users must also consult their customers and suppliers, each of which has limited power to veto any decision to change the production process.

The case of the Fuyang Parts Plant illustrates the hurdles a Chinese end-user must overcome before making a final decision on what technology to acquire. The plant's key personnel set out to find new die-casting technologies to reshape their entire production process. But locating appropriate foreign suppliers was only the beginning. The real challenge came when members of the enterprise found themselves at loggerheads with a battery of local and regional interests. Conflicting concerns within their own factory complicated an already difficult choice between two very different proposals. In the end, however, the factory leaders got the technology they wanted, and the plant is now expanding its operations.

What criteria did Fuyang consider in choosing one supplier over another? What strategies used by foreign suppliers worked best? Because the decision-making process at the Fuyang Parts Plant is in many ways typical of the approach used by other Chinese plants importing foreign technology, the answers to these questions hold important lessons for the foreign technology supplier.

The Fuyang Parts Plant is located on the outskirts of Shenyang, capital of highly industrialized Liaoning Province. The largest city in northeastern China, Shenyang is a regional manufacturing and commercial center. Many small and medium-sized factories in the area are tied into the huge iron and steel complex in neighboring Anshan, China's largest.

The Fuyang Parts Plant was established in the 1940s as a supplier of small parts for trucks. Today it has grown to include several hundred skilled and semiskilled workers. Its most important products are metal parts cast from a reheated specialty steel made at Anshan. These parts are shipped to other Chinese enterprises for use in small appliance and advanced vehicle assembly operations.

Much of the plant's equipment received new life during the industrial rehabilitation drives of the 1950s. But by the early 1980s most of the equipment was old, cranky, and outmoded. The heating furnace, for example, was a Soviet-style, coal-fired model so inefficient that one Chinese visitor called it a "revolutionary museum piece." Much of the other equipment was in the same shape. The plant's customers complained about quality problems, delivery delays, and cost.

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Study group defines the problem

Personnel in the Fuyang plant had been discussing these complaints for some time. In 1983 the plant manager, Mr. Xiu, put together a "central study group" to rethink the plant's production capabilities. The group included manager Xiu, the plant's chief engineer and several of his assistants, the head of the customer liaison office, and members of several workers' councils. They met in a series of free-wheeling weekly sessions to analyze the enterprise's needs.

Manager Xiu reported to the group that several customers might begin to buy parts from newly renovated plants in Dalian and Guangzhou. The group discussed the impact that such customer "defections" would have on the long-term health of the Fuyang plant—especially in light of rumors that inefficient Chinese plants might be folded into other operations or even allowed to go out of business.

The study group discussed the option of producing new kinds of parts while simultaneously upgrading the quality of the parts the plant already produced. The group concluded that their enterprise should seize the opportunity that China's growing demand for light industrial goods—and consumer products in particular—would provide in the coming decade.

They identified four products needed by neighboring assembly operations: casings for electrical toasters, bicycle wheels and mirrors, headlight covers, and kitchen utensils. If Fuyang could produce high-quality products in these areas while retaining its old metal parts customers, the plant would be assured of long-term markets.

But the study group also concluded that the current plant's facilities simply were not adequate for the production of these new items. The plant would need a more advanced die casting system to stay competitive with the south China factories beginning to ship products into the area. The chief engineer outlined the basic requirements: a new heating furnace—perhaps one fired by gas rather than coal to maintain the more uniform heating patterns required of higher quality specialty metals; new casting stands equipped with a more up-to-date cooling system; and a plating system to give the products a more durable and 'shiny' finish.

Searching for foreign suppliers

The Fuyang study group emerged from its weekly discussions with a shopping list. But how to find the equipment and funds needed to finance the purchase?

Enterprise managers usually turn to administrators in local bureaucracies who are familiar with their unit, fellow managers in other production units, and patrons in municipal and provincial organizations to provide support, guidance, and information on the technology acquisition process, and manager Xiu was no exception. One Shenyang official later recalled that whatever office he visited during that period, Xiu always seemed to have just departed. Many of Xiu's visits led down blind alleys, but some paid off in valuable knowledge about foreign firms and their operations. At one provincial office, for example, an elderly official had been clipping advertisements from foreign trade magazines for years; his files contained information about foreign products and firms, as well as numerous pictures. Another official brought forth a collection of foreign business cards, catalogued by industry and geographic region—including remarks about each businessperson's personal qualities! Manager Xiu and his staff spent some time in these offices making notes on the foreign firms that could supply the equipment they needed.

The next step was to seek out these foreign suppliers. When manager Xiu learned that an old acquaintance in municipal government would visit Japan in 1983 and New York, New Jersey, Texas, Minnesota, and California in 1984 as part of a Shenyang delegation, he briefed his friend on the factory's needs. The friend urged Xiu to prepare a one-page overview of what the Fuyang Parts Plant was seeking to be carried by the delegation to Japan and the United States, along with several hundred other descriptions of projects in the Shenyang area.

The price of the Mitsubishi proposal was about half that of the American proposal. Mitsubishi's price was made possible by an ingenious marketing ploy that called for them to sell, as a package, several dozen furnaces to a number of separate factories in northern China.

The Japan connection

Meanwhile, several Liaoning provincial officials were putting together their own economic plan based on several years of discussions with representatives of the Mitsubishi Group—the Japanese consortium that includes Mitsubishi Bank, Mitsubishi Shoji (the trading company), Mitsubishi Heavy Industries, Mitsubishi Steel, and a dozen other firms. The Mitsubishi Bank's China Research Section had long followed developments in China's steel industry, especially at Shenyang's Anshan Iron and Steel Complex, built by the Japanese in the 1930s. Their analysis revealed that China's growing consumer spending was generating increased demand for specialty steels used in consumer items. By 1984 Mitsubishi representatives had visited most of the Anshan-related plants in the area, including the Fuyang Parts Plant.

Mitsubishi concluded that a number of Chinese enterprises crafting manufactured metal parts and implements could use new equipment. In 1984 the Mitsubishi Group was ready to open discussions on rehabilitating or replacing many of the heating furnaces in the plants they had visited. They proposed to work with provincial and central government officials to upgrade much of the provinces' production capacity.

Two proposals take different paths

Manager Xiu was fortunate. His technology quest would yield, finally, two foreign proposals to consider. One resulted from a contact made by his friend on the Shenyang delegations' American tour. The other came from Japan's Mitsubishi Group.

National Products, an American supplier of heating furnaces for small and medium-sized industrial firms, had been seeking a point of entry into the China market for some time. When they learned of the Fuyang project, the firm decided to follow up.

Not that getting additional information was easy. Neither the US Department of Commerce nor a Hong Kong agent National Products had used in past dealings in Southeast Asia could tell them more about the Fuyang project. Finally, a small National Products team went to see the Fuyang plant for itself. Six weeks later the team visited Fuyang again, this time with several project engineers and representatives from two companies that supplied components for a die cast operation.

This larger American team proposed to upgrade the Fuyang Parts Plant in stages. The first step would involve replacing the heating furnace itself, incorporating stands for new types of dies, and installing a larger cooling system with a more sophisticated monitoring system. The plant could later add an electric plating system and perhaps several presses to handle different aspects of the metal forming process. Some Fuyang employees would be trained in the United States. Components would come from three US firms: the heating system from National, the cooling system from a large Midwestern company, and the monitoring system

from a maker of high-quality gauge systems. The price of the project was estimated at slightly over $8 million.

Like their National Products counterparts, Mitsubishi representatives saw the heating furnaces as the starting point of the plant's renovation. The Mitsubishi proposal also outlined renovations of the plant's process technology, with a cooling system and quality-control monitoring system supplied by other firms in the Mitsubishi Group.

The price tag on the Mitsubishi proposal was about half that of the American proposal. Mitsubishi's lower price was made possible by an ingenious marketing ploy that called for them to sell, as a package, several dozen furnaces to a number of separate factories in northern China. By working on all the projects at the same time and by using a relatively standard furnace configuration, the Mitsubishi team figured it would save money on start-up, transportation, engineering, and management costs.

Perhaps the greatest difference between the Japanese and American proposals, beyond the economies of scale, was that Mitsubishi worked primarily through provincial and national-level agencies in putting together its plan. Mitsubishi had devoted a great deal of energy to forming a consortium of potential Chinese purchasers with the same general needs and then building relationships in Shenyang and Beijing to tie the consortium together into one large project. The Americans, on the other hand, spent most of their time designing a new production configuration scaled specifically to the needs of the Fuyang plant.

American firm wins favor at the factory

Decisions on what technologies to buy are most often made by the actual end-users—the managers, chief engineers, and production specialists who will use the new methods—and the Fuyang Parts Plant proved no exception. The most important discussions about the two proposals took place among the plant personnel, of whom Xiu was the most influential.

At first glance, Mitsubishi's proposal seemed far more attractive. The Mitsubishi management was conversant with the plant and its needs, the furnace was reputed to be of excellent quality, and the price was low. Much of the financing was to come from a joint arrangement between Mitsubishi Bank, and possibly the Japan Export–Import Bank. To sweeten the deal even more, the Mitsubishi Shoji representative hinted that they might purchase some of the Fuyang output for use in a Mitsubishi truck assembly operation.

The American proposal, on the surface, did not offer as much. The price was higher, the management team less familiar with China, and the participating companies not as well known.

Both actual and potential downstream customers of the Fuyang Parts Plant also had to be consulted. Some of them were worried: would the new production processes change the quality of the plant's output? Would prices increase as the plant paid for the new equipment? How much 'down time' would be required for the installation of the new equipment?

The most important discussions within the plant occurred in technical staff meetings convened by the chief engineer, who found some troubling points in the Japanese proposal. In order to reduce costs, for example, the Mitsubishi plan called for a furnace configuration that could be used not only at the Fuyang Parts Plant, but also by the other plants included in the project. The furnace was not, after all, that well suited to Fuyang's specific needs. The energy required for heating and cooling was greater than the plant had access to, and the mechanism by which the steel billets were to be placed in the new furnace required a more sophisticated charging device than would be available at the plant.

As the chief engineer reported his findings, it was evident that either the Mitsubishi proposal needed substantial alteration or that more equipment would have to be purchased. The initial price might indeed be lower, but the technology's suitability was questionable. Within the plant, then, a decided tilt toward the American proposal emerged.

Input from all sides

Discussions involving groups outside the plant were more complicated. The Fuyang plant is part of a complex network of suppliers in and around Shenyang. The plant receives energy, alloys, water, and other inputs from upstream suppliers. Changes in the plant's production technology would lead to changes in most of these inputs: gas instead of coal, different grades of steel and other metals shaped in ingots and strips of different sizes, increased water for the new cooling system, more electricity for the plating system. Would all of these new inputs be available?

Both actual and potential downstream customers of the Fuyang Parts Plant also had to be consulted about the proposals. Some of them were worried: would the new production processes change the quality of the plant's output? Would prices increase as the plant paid for the new equipment? How much 'down time' would be required for the installation of the new equipment?

Manager Xiu discovered that Mitsubishi had worked hard to cultivate a reputation for quality and reliability in the region and that several of his suppliers and customers already knew of the company. Several Mitsubishi firms had given technical seminars in Liaoning and had used these seminars to build a Chinese mailing list for company reports and brochures. Because Mitsubishi was a known quantity, there was a perceptible tilt among Fuyang's suppliers and customers toward the Japanese proposal.

Negotiating political cross currents

Manager Xiu discussed the plans with agencies whose mandates cut across Fuyang's inputs, outputs, and work rules. The plant's "official" designation puts it under the nominal jurisdiction of one of Liaoning's

light industrial bureaus. But that bureau is not the only agency important to Fuyang's continued well being. Fuyang purchases its steel from Anshan, and these contracts are negotiated through a complex arrangement between the Anshan Iron and Steel directorate and two departments in the Ministry of Metallurgical Industry (MMI). The China National Automotive Industry Corporation is an important end-user of Fuyang's vehicle components.

As he pondered the two proposals, manager Xiu spent a great deal of time discussing his plans—especially construction plans and the possible disruption in production schedules—with officials in some of these offices. Manager Xiu also found himself discussing air and water pollution, transportation permits for the new equipment, rates of taxation for marginal equipment, the need for additional workers, and new work rules for the plant's personnel—each with a different county, municipal, or provincial authority.

Manager Xiu received contradictory signals from higher authorities.

LESSONS FOR BOTH SIDES

China's complex bureaucratic decision-making process in many ways shapes the foreign side's decision to extend technology: some firms are simply not capable of working through all of the stages of negotiations. Still, a growing number of foreign firms are adept at finding and delivering the technologies needed in China. Several valuable lessons about technology transfer can be learned from the experience of National Products and other firms that have transferred technology to China.

• **The Chinese end-user is the crucial link.** Increasingly, the changing character of the Chinese economy gives the end-user—the production enterprises, service organizations, and distributors—the most predominant voice in decisions about new technologies. While State agencies may put general guidelines for technology acquisition in motion, it is usually the end-user who has the expertise as well as strategic position in the decision-making process to make the "first cut" at a decision about specific technologies. Will it be a Matsushita or Honeywell machine? Del Monte or Ajinomoto food processing equipment? General Electric or Honeywell CAT scanner? Many successful foreign firms in China find that it pays to direct their most concerted efforts at these end-users, especially factory managers and chief engineers.

• **Technical decisions involve numerous interest groups.** Each end-user makes decisions about new technologies in close consultation with other enterprise members—technical personnel who may worry about a new production configuration, workers who resist new assignments, and specialists who feel threatened with obsolescence. Outside the unit, upstream suppliers must be consulted about new inputs, downstream consumers must agree to the new products and costs, and local agencies must be consulted to allow them to play their oversight role.

Unless the end-users have a solid working relationship with each of these different participants, their operation may well bog down under red tape and unexpected complications.

• **Ratification is not the final hurdle.** The procedures for obtaining official imprimatur for a project are among the most difficult for outsiders to comprehend. Understanding these hurdles means distinguishing between substantive decisions that produce results and administrative activity that leads to final approval. In the Fuyang project, Manager Xiu's decisions about specific technologies were separate from the Shenyang and Liaoning bureaucracies' approval of the general project. Xiu negotiated the specifics, Liaoning ratified the choices, and Beijing took note of the activity.

Many foreign firms that are new to China confuse the decision and ratification stages. A number of businesspeople think they are "selling" to a national ministry in Beijing and later end up wondering what happened to their agreement.

• **Contradictory demands come from competing bureaucracies.** Fuyang was caught between the different priorities of municipal, provincial, and national agencies in its search for new heating furnaces. It is a rare Chinese manager who has *not* experienced competing pressures from different bureaucracies. Economic bureaucracies might view a factory's acquisition of new technology in a different light than, say, a municipal environmental agency. Managers in such situations must make some difficult choices that, if not handled correctly, can be costly to future projects. Foreign firms must be sensitive to the cross-pressures faced by the Chinese managers. Too often a foreign firm will identify one Chinese agency interested in a technology transfer project and make the mistaken assumption that its favorable influence is all that is required.

• **Enterprise managers have options.** Competing lines of authority and many points of control imply multiple points of access. An alert manager can use these competing bureaucracies to his own end. Managers who prove themselves enterprising and energetic in maneuvering through such a system are more likely to be successful in concluding their technology transfer agreements.

• **Big projects can be tackled as many small projects.** Many foreign firms involved in large-scale projects find it useful to think of the project as a series of smaller and quite manageable choices about such issues as energy sources, transportation, raw materials, work rules, and construction permits. While the process of ratification frequently crosses jurisdictional lines, the specific technologies, even in larger projects, are usually the province of technical specialists and managers—not agency bureaucrats. In large projects, as in small, the trick is to focus on operational and technical decision-making as separate from the ratification process.

• **Price is not the same as cost.** Contrary to popular opinion, price is not always the most important factor to a Chinese end-user. Over the past several years, many Chinese managers have learned the hard way that low-cost projects often have to undergo significant modification. These adjustments can raise the final cost to the organization. Chinese managers increasingly undertake the complex calculus of weighing the short-term cash price against the unforeseen problems that may arise in the future from a short cut or inexpensive piece of equipment.

• **Some technology is too advanced.** The "state of the art" continues to be seductive—who doesn't want a bit of the best? But tales of managers and project directors who have overreached their grasp are legendary in Chinese managerial circles today. Many managers have learned the hard way that the best technology for a given situation is not necessarily the most advanced. Instead, "the best" is that most suited to solving a particular, well-defined problem. The most successful foreign firms are those transfering solutions to problems, not simply "hi-tech" hardware.

—RFG

Officials at the China National Automotive Industry Corporation claimed to be interested in the Mitsubishi proposal. But they (as well as officials in other departments and agencies) were also concerned about China's growing trade deficit with Japan. MMI was concerned that the new proposals would require more Anshan steel for Fuyang, adding to the growing demand for high-grade steel. Shenyang municipal authorities saw the project in personnel terms: the Fuyang Plant's proposal might help increase employment in a region that had been in the doldrums since the late 1970s.

Negotiating strategies

After these consultations, the Fuyang plant was ready to begin negotiations. The process proved to be both delicate and time-consuming.

There are several ways to proceed with negotiations once foreign firms express initial interest in a project. "Higher authorities" at the provincial and national levels can handle all the discussions; a professional negotiating team may be called in to represent the major players; or the enterprise itself can take responsibility for the negotiations.

Because of the very different logic behind the American and Japanese proposals, negotiations for the Fuyang Parts Plant took two forms. With the American bidders, negotiations were handled by a joint team composed primarily of members from several Shenyang agencies and headed by manager Xiu himself. The Americans brought a seven-man team to Shenyang that met regularly with Xiu during a three-week period. Their discussions covered most of the basic considerations: delivery conditions and schedules, training programs, warranty and service arrangements, and financial details.

Discussions with the Americans were peppered with moments of real tension and friction. It was National Product's first negotiation in China, and the company had difficulty with both procedure and pacing. They found it hard to accept, for example, the fact that every change in the Fuyang and American positions had to be renegotiated in turn with many Chinese groups and agencies.

But the American team included some very talented technical specialists. Most important, the American group showed flexibility. When the Fuyang representatives suggested changes based on engineering and production needs, the Americans were willing to make the necessary modifications. Over the weeks, a good working relationship was established, especially between the technical personnel on both sides.

Manager Xiu kept a much lower profile in the Mitsubishi negotiations. Fuyang sent several representatives to these sessions, but their involvement was more passive than it had been with the US firms. Mitsubishi had worked closely with several provincial-level agencies, so representatives from each of these agencies participated in negotiations. Progress was slow, and it took Mitsubishi and the provincial bureaucracies over two months to reach an agreement. The agreement was thorough and detailed, specifying equipment, delivery schedules, and types of technical support. But Xiu was left with important questions about the equipment still unanswered and some very real worries about how his constituencies might react.

Manager Xiu worried that choosing Mitsubishi might prevent his factory from functioning well as a production unit. But if he went with the American proposal, the price would be higher and the ruffled feathers of provincial officials would be difficult to smooth.

Xiu makes a difficult decision

Ultimately, manager Xiu played the pivotal role in choosing Fuyang's supplier. Although provincial bureaucrats hoped he would accept the Mitsubishi proposal, they recognized that Xiu, as the actual end-user of the new technologies, was clearly the individual who must make the final decision.

To go with Mitsubishi would have been, in many ways, a comfortable decision: Mitsubishi Shoji had hinted at the purchase of Fuyang output, which would make the plant's position more secure, and higher-level ministries wanted Fuyang as part of their larger project. But selecting the Japanese firm would bring additional burdens for the Fuyang staff, especially the engineers responsible for making the technology work. The "human dimension" did not seem quite right: Mitsubishi seemed eager to sell machinery but not to transfer skills and expertise. Manager Xiu worried that while choosing Mitsubishi might generate valuable goodwill from the provincial bureaucracies, such a decision might prevent his factory from functioning well as a production unit.

Nor was the American proposal without pitfalls. Not only would the price be higher, but the ruffled feathers of provincial officials would be difficult to smooth.

At the same time, the Americans offered hands-on training, some of it in the United States. They also tailored their proposal to Fuyang's requirements and seemed more willing to work through special problems with the Fuyang management.

A Chinese official familiar with the project later recalled Xiu's dilemma. The American proposal had more merit on technical grounds, and it had support within the Fuyang Plant. The Mitsubishi proposal had slightly greater support among the plant's important suppliers, customers, and supporting network of agencies.

At this juncture manager Xiu's consulting and negotiating talents were critical. With his chief engineer, Xiu made the rounds of the different offices, explaining key differences between the proposals. Several factors such as long-term costs, hands-on training, and down time proved to be the most telling points in the discussions. A loose consensus began to build: The American proposal was viewed as "safer" and potentially less costly in the long run.

In late 1985 a group including manager Xiu, Shenyang municipal representatives, and several Liaoning provincial officials initialed an agreement with National Products. The agreement called for a four-year phased development project that would begin with the heating furnace and include the eventual rehabilitation of the whole Fuyang plant. 完

Local Technology Import Decisions

Learning how to buy foreign technology the hard way

Alice Davenport

The local experience with technology transfer has been a learning process for all involved. After technology transactions became more widespread in 1979, gradually the decision-making process became more decentralized. But local enterprises and provincial or municipal import/export corporations proved, not surprisingly, inexperienced and ill-equipped to make technology import decisions. Some provincial-level trading organizations were accused of indiscriminate foreign procurement, and many technology study groups, sent abroad by local import departments, were nothing more than junkets.

Local enterprises have faced their share of problems in the process. Limited knowledge of international companies often led them only to the best-known international technology suppliers. Many enterprises entered negotiations with little idea of what they wanted. In some cases, Chinese authorities complain that foreign firms took advantage of their inexperience to unload obsolete goods at inflated prices. But Chinese buyers admit that they sometimes contributed to the inflated prices by flooding the market with price inquiries.

Beginning in the early 1980s, local units were required to perform feasibility studies before receiving approval to import foreign technology. In theory, these studies were to include a careful technical assessment of the item (compared with similar items in China and abroad); an evaluation of the raw materials, energy, communications, and transportation requirements associated with the new technology; and a cost-benefit analysis conducted by trained accountants. The process assumed that trained technical personnel from the appropriate approval agency would evaluate the feasibility study before allocating funds. In practice, however, feasibility studies were often nothing more than a formality used to support a foregone conclusion.

Nanjing Municipality must wait until national and provincial authorities have determined its foreign exchange allotment before assigning funds to local projects. Sometimes it is midsummer before city authorities have a clear idea of their calendar year allotments. At the same time, there is pressure to spend the allocation before the end of the year or risk losing the funds. In the past, this has led to an end-of-the-year flurry of project approvals and technology purchases.

By early 1985 imported equipment lay idle throughout China because factory personnel did not know how to operate or repair it. Even worse, large amounts of foreign exchange were being wasted on unnecessary equipment and technology.

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Reining in the localities

The country's technology import policies clearly bordered on chaos. Beginning in 1985, national authorities took concrete steps to rationalize technology imports by strengthening government supervision at all levels. At the national level, the State Council Office for Introducing Technology and Knowledge coordinates technology imports, while the State Economic Commission plays a more direct role. The SEC encouraged the establishment of technical advisory centers throughout the country to review all technology import proposals before contracts were finalized, monitor technology upgrade projects, and collect information on investments, negotiations, international market prices, and technical evaluation methods. Proposals submitted to the advisory centers were to include the aforementioned feasibility study and a plan for assimilating the imported technology.

National, provincial, and local economic commissions were told to periodically assess whether domestic production can satisfy demand for items to be produced with foreign technology. If so, the economic commissions are supposed to stop imports of the technology or raise import taxes on these items.

Throughout 1985 and 1986, the State Economic Commission tightened up on technology study groups sent abroad by restricting participation of high-level cadres with little industrial expertise. Better planning and preparation before attending (or hosting) international technology forums was also advocated by the SEC. This stepped-up government role will

continue for the foreseeable future.

THE CASE OF NANJING

Nanjing provides a good example of this local-level crash course in the process of international technology transfer.

Nanjing is the capital of Jiangsu Province, traditionally one of China's most prosperous regions. In 1978 Jiangsu began to handle many of its own technology and equipment imports, although the city of Nanjing did not get independent authority to import technology until a few years later.

Demand for foreign technology in cities like Nanjing remains strong despite the many problems it has brought. West German, Swiss, and Italian firms are all important technology suppliers in Nanjing, partly because they have shown the most willingness to transfer technology along with equipment.

The institutional framework

As in most cities, Nanjing's municipal government plays an important role in efforts to upgrade local enterprises. The Nanjing Economic Commission (NEC) is perhaps the most important branch of the municipal government in the process. Although economic commissions throughout China have been charged with monitoring technology imports, their effectiveness varies from city to city. The NEC, staffed with highly qualified technicians and managers, has thrown itself wholeheartedly into this supervisory role, and provides a good example of what such municipal organizations are expected to do in the technology import process.

The economic commission has two technical branches, the Technical Quality Department and the Technical Transformation Department, that oversee new product design, encourage improvements in product quality, establish product standards, and issue certain types of engineering permits. Both departments also help enterprises assess the market for new products and assist them in applying for loans to buy new equipment. These technical departments also help local factories deal with foreign companies and monitor the "digestion and absorption" of foreign technology. Although only an adviser in the technology import process, the NEC often plays a key role in factory decisions along the way.

How factories learn about foreign technology

The first hurdle for an enterprise that hopes to import technology is determining what type of technology it needs. Nanjing factories claim that advertising has little influence on their purchasing decisions. Most often, they rely on favorable reports from other local companies that have bought a particular product. A Japanese flame-cutting machine was such a success at one Nanjing plant that it led to a number of additional sales after other local factory representatives visited the plant. If a technology import project has been particularly successful and can serve as a positive example, the NEC may allow copies of the regular progress reports that technology importers must submit to local authorities to circulate among city factories.

Local enterprises also learn about foreign technology through exhibitions and conferences organized by provincial or nearby municipal economic commissions. These local exhibitions have been a boon for Nanjing factories, since it is difficult for them to find out about exhibitions in far off Chinese cities—and usually impossible to send representatives to such events abroad.

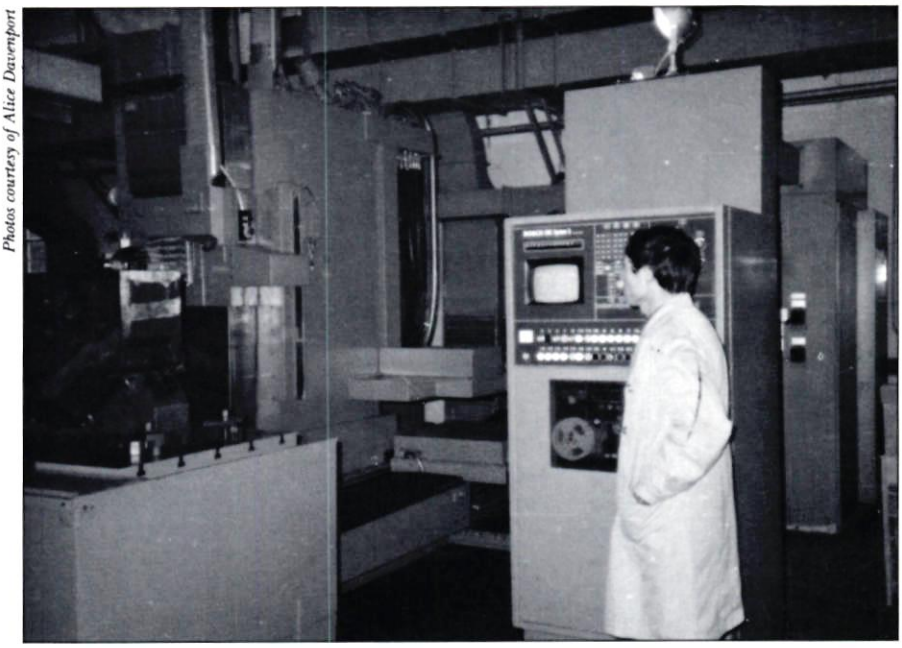
In a few cases, Nanjing factories write directly to foreign companies to request information about equipment or technology. But this is relatively rare, since few factories have staff with a knowledge of foreign languages—and many factories are not sure just what they are looking for in the first place.

A preferred source of information for many companies is the Chinese media. The soaring interest in technology has given rise to a host of new publications and increased the fortunes of old ones: *Technology Market*, for example, formerly a local weekly in Tianjin, was upgraded in mid-1985 to a national newspaper. Another publication, a newsletter from the National Defense Technology Information Committee, is intended to help transfer military industrial technology to civilian enterprises.

A few factories have their own trade research departments that collect brochures, product catalogs, and technical reports from Japan, the United States, and Western Europe. But most local factories are forced to rely on advice from the Nanjing Economic Commission, which often puts them in touch with a special provincial consulting service for more detailed advice on foreign technology and equipment.

When a local enterprise needs technical as well as business advice, Nanjing's Economic Commission acts as a liaison with science and technology research institutes. Nanjing has about 120 such institutes: some are branches of national or provincial research institutes, others are

Photos courtesy of Alice Davenport



The Nanjing Machine Tool Factory purchased this West German computerized machine tool manufacturing system in 1983 at a reduced price, in exchange for the factory's help in marketing this product line in China.

run by the city. All may contract with local enterprises to do research in their area of specialty (i.e., electronics, chemicals, computers). The Nanjing Economic Commission recommends several science and technology institutes to factories based on their needs. The factory is then free to shop around—institute fees vary considerably—and negotiate its own price for services. These institutes play an important technical advisory role, since Chinese factories rarely have the capability to carry out technical research themselves.

The municipal review process

With the tightening of national controls on foreign currency in 1985, Nanjing decreed that new factories requiring foreign exchange to import equipment or technology must first present both project proposals and feasibility studies to a special municipal review board organized by the Nanjing Economic Commission. Those factories using their own funds (or funds from a foreign partner) to import technology are not required to go through this extra review process, but they must still routinely report their planned purchases to the commission.

Members of the review board include experts in management, technology, and environmental issues. A representative from the Nanjing Planning Commission attends to ensure that the proposed project fits into Nanjing's overall development plan and that new equipment will not overburden municipal services like power and water supplies. Other municipal bureaus and the People's Bank of China may also send representatives on occasion.

The review process seems to be viewed, at least in part, as a means of educating local factories about technology import procedures. After municipal experts on the review board have had a chance to comment on the proposal, the local unit is asked to incorporate these suggestions into a second, more refined feasibility study. The second study is then brought before a smaller board organized by the NEC which gives (or withholds) its approval for the foreign exchange allocation requested by the company.

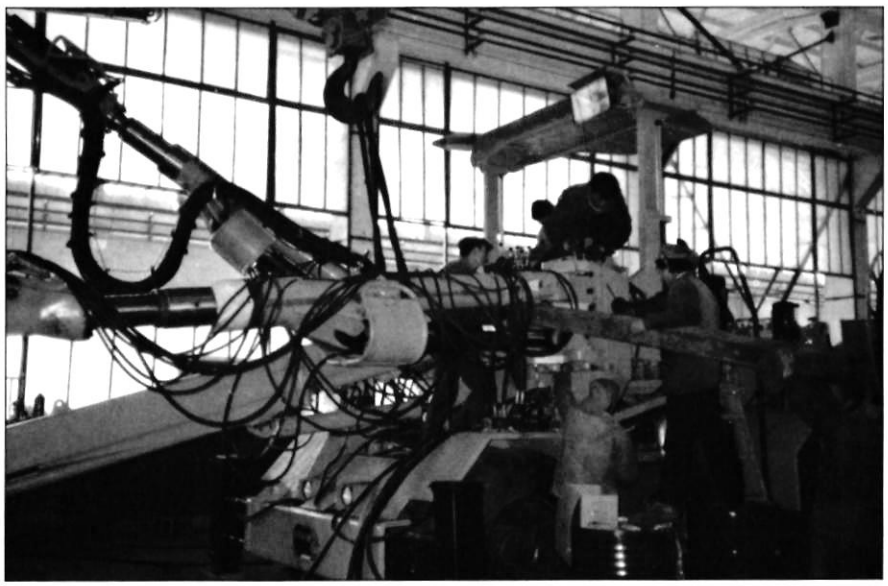
In theory, securing foreign exchange allocations of under ¥5 million for projects already approved by the municipal government should be a relatively straightforward procedure for a Nanjing enterprise. After a project is approved by Nanjing's Economic Commission, the local branch of the People's Bank of China is instructed to allocate municipal funds accordingly. The bank, however, must clear the proposed transaction with provincial and national authorities before it can turn over the foreign exchange to the local unit. This, of course, causes delays.

Higher level approval

Under current regulations, technology transfer projects valued at over ¥5 million must be cleared by provincial or national authorities. In these cases, the procedure is considerably more complex. To take one example, if a Nanjing machine tools factory wants to import foreign technology, it must first receive approval from the Nanjing Machine-Building Bureau, which weighs the merits of the proposal against claims from about 70 other factories under its jurisdiction. If the bureau supports a factory's proposal, the enterprise must then secure approval from both the city economic and planning commissions. Depending on the sum requested, the proposal may need additional clearances from provincial and national-level machine building bureaus, and provincial and national planning and economic commissions. This already requires dealing with three separate chains of command with overlapping jurisdiction, and the factory still must secure approval from the People's Bank of China.

Not surprisingly, the whole process takes a good deal of time to complete. In many cases, interested factories must wait more than a year before they receive permission to purchase foreign equipment or technology. Even in cases involving small sums, there are frequent delays. For example, since national and provincial authorities determine Nanjing's annual foreign exchange allotment, sometimes it is mid-summer before city authorities have a clear idea of their calendar year allotments and can assign funds to local projects. Pressure to spend the allocation before the end of the year (December 31), or risk losing the funds, has in the past led to an end-of-the-year flurry of project approvals and technology purchases.

National authorities have begun to take note of the local level dissatisfaction with this clumsy approval process. In late 1986 participants in two national conferences supported the idea of giving more autonomy back to local factories for some types of technology import decisions. Although no one is predicting a return to the technology import boom of 1984–85, national authorities have made the approval process for foreign exchange easier in some cases. For example, it should be relatively simple for a Chinese factory to acquire the foreign technology necessary to set up assembly lines for products to be sold abroad. But for less straightforward transactions, the central gov-



The Nanjing Construction Machinery Plant has contracted with a Swedish firm to assemble these drilling and boring machines in China, using a mix of Chinese and foreign parts.

ernment is not ready to loosen its control over the pursestrings governing technology imports.

Promoting "digestion and absorption" of technology

Having witnessed the numerous problems of inexperienced local factories *after* purchasing foreign technology, the Nanjing Economic Commission has taken on the additional task of supervising and assisting with the subsequent "digestion and absorption" of foreign technology.

The NEC works informally with local firms in a number of specific ways. If a factory lacks sufficient technical staff to work with the new technology, the commission will temporarily reassign technicians from other units to help out. In some cases, the city may call in foreign experts to unravel the problem—national authorities have been encouraging the use of foreign experts as a kind of "software."

To ensure a steady supply of raw materials and energy to the importing factory, the city tries to ensure that sufficient allotments for the factory are included in the city's own economic plan. And since building materials are in short supply, Nanjing will help procure building materials (and equipment) to construct new buildings if they are required for the imported technology. The city has helped enterprises construct special climate-controlled facilities for imported computers and other sensitive equipment, for example.

The NEC offers cash awards to companies with good records in utilizing imported equipment or technology, but these relatively small sums are seen by factory managers more as a token form of recognition than as a major cash bonus. And Nanjing officials look with favor on factories that have already demonstrated an ability to use foreign technology, so factories with good "digestion and absorption" records are often successful when they apply to the city for permission to import a second item of technology.

City officials insist that technology "digestion and absorption" has improved in recent years, partly because of increased technical competence among factory personnel, and partly because factories have pressed foreign suppliers for more training and after-sales service. Nanjing factories say that US companies have not sent as many technical representatives as, say, West Germany or Japan. So, although many managers feel US technology is very attractive, they believe they will receive more technical support from other countries.

In addition, many US companies use Hong Kong agents to represent them in Nanjing. Although there have been a number of highly successful relationships between local factories and the Hong Kong agents of US companies, some Nanjing enterprises complain that middlemen tend to be unfamiliar with technical details and unable to guarantee the after-sales service they need.

In the future, the pattern of local factories initiating their own technology buying decisions with help and advice from local governments and technology research institutes is likely to continue. China's technology import process will inevitably require considerable government involvement, from the local government approval process to the central government's control over the amount of foreign exchange available to each locality. Foreign companies who find the process difficult should remember that it can be just as frustrating for the would-be Chinese purchasers as for the foreign vendor. 完

"ABSORBING AND DIGESTING" . . . WHAT DOES IT ALL MEAN?

China says it wants to import "advanced and appropriate technology" that its industries can "digest and absorb." But foreign firms that try to pin down just what the Chinese mean by these terms are often left more puzzled than before.

In the narrowest sense, China defines "technology transfer" as trade in technical knowledge—including design blueprints, patent manuals, technical standards and guides, and computer programs for designing, manufacturing, and testing technology. But the concept of technology transfer may also include the import of key equipment in technical licensing agreements, the employment of foreign experts, and technical training programs. Sometimes Chinese technology transfer discussions include *any* trade in equipment, testing methods, or production lines, blurring the line between "software" (technology) and "hardware" (equipment).

Chinese buyers stress their desire to import "advanced" technology. This is often interpreted as state-of-the-art, but many factories have a limited ability to use even early 1980s technology. Therefore, buyers also mention that technology should be "appropriate": that is, more advanced than the level currently available, but not so advanced that Chinese enterprises cannot assimilate it easily.

To determine whether an item of technology is both appropriate and advanced, the government advises enterprises to look at a number of criteria. Will the technology lead to the development and production of new products? Will it decrease consumption of energy and raw materials? Will the technology help make better use of local Chinese resources, help protect the environment, improve product safety, or upgrade management techniques? More broadly, will the technology help expand China's exports and increase the country's foreign exchange earnings? And finally, will the imported technology "contribute to the advancement of science and technology in China?"

What Chinese officials mean when they call for improving technology "digestion and absorption" is easiest to define in a negative sense. It does not refer to simple assembly or operation of foreign equipment, nor mere copying of blueprints. Factories held up as successful models of digesting and absorbing foreign technology do not all share the same characteristics, but a composite profile might include the following:

- The foreign vendor agrees to transfer substantial technology to the factory along with equipment sales, and will provide extensive training and after-sales service.
- The factory provides suitable facilities for new imported equipment.
- The factory uses Chinese raw materials and parts whenever possible.
- If necessary, factory operations and departments are reorganized to facilitate assimilation of the foreign technology.
- The foreign technology helps the factory's products find a profitable market at home and abroad.
- The factory learns from its experiences with imported technology and develops lateral technology geared to its own production needs. —AD

Legal Aspects of Licensing Technology

Issues facing the licensor in China are becoming both clearer and more complex

Jerome Alan Cohen and David G. Pierce

Foreign companies wishing to transfer technology to China now have a variety of options. They may choose to license technology or sell it outright (under PRC law the distinctions are often minimal), provide it as part of a compensation trade or coproduction arrangement, or contribute it as their investment in a joint venture or wholly foreign-owned enterprise.

Although this last option is an important means of technology transfer worldwide, capitalization of technology is often discouraged by Chinese authorities, who are increasingly concerned about the underfinancing of ventures launched with largely intangible assets. In the Shenzhen Special Economic Zone (SEZ) and the Guangzhou Economic and Technological Development Zone (ETDZ) the use of technology as an investment contribution is specifically restricted by statute to 20 percent of the registered capital in most cases. Both places also require that any company investing technology make a capital contribution in cash or goods-in-kind that is not less than the value of the technology contributed. A January 1987 revision of the Guangzhou provisions stated that a technology contribution of up to 30 percent of the registered capital is permissible in the case of an equity or cooperative joint venture located within the ETDZ that qualifies as a "technologically advanced enterprise."

Elsewhere in China, the Chinese side frequently tries to discourage the contribution of technology as capital by citing an "internal rule" variously stated to impose a 15–20 percent maximum or even an absolute prohibition. PRC officials deny the existence of such rules, however, and in practice the Chinese and foreign parties often reach a compromise. Nevertheless, the problems involved in capitalizing technology have led to a greater reliance on licensing when the licensor is a joint venture partner in the license.

Issues for technology licensors

Once the choice is made to license technology to a Chinese unit, a licensor must know how to structure the transaction to suit the Chinese context. The most important licensing considerations are discussed below.

1. The nature of the licensee. A foreign firm should determine the identity, legal status, and authority of a Chinese licensee by reviewing its business license and, if available, its articles of association. At least at the outset, the licensor will often be negotiating with one of China's specialized foreign trade corporations, not with the actual end-user. The licensor should therefore establish that the end-user will also be a party to the contract and bound by its provisions. On the other hand, if the licensor is not dealing with a foreign trade corporation, it is essential to confirm that the licensee has been given authority to deal directly with foreigners and to spend foreign exchange. According to officials of the Ministry of Foreign Economic Relations and Trade (MOFERT), no more than 200 State enterprises in China are now authorized to import technology.

2. Applicable law and regulations. The Regulations of the PRC on the Administration of Contracts for the Import of Technology (the "Regulations") and the Measures for the Examination and Approval of Technology Import Contracts (the "Approval Measures") apply in principle to all acquisitions of technology by companies, enterprises, organizations, or individuals within China from sources outside of China, except when the technology is contributed as capital to an enterprise with foreign investment.

There are also local regulations to be dealt with if the licensee is located in the Shenzhen or Xiamen SEZs or in the Guangzhou ETDZ. Unfortunately, the national Regulations and Approval Measures do not refer to such local regulations, despite the fact that the original versions of all three local provisions were promulgated earlier. The relationship between national and local legislation in China is problematic, but MOFERT officials indicate that, when licensing contracts are concluded with entities in the various zones, the local rules will apply—at least when they are more stringent than the national laws.

While PRC law governs the formation of the licensing contract and provides certain other basic principles, the contracting parties are not required to choose PRC law to govern most aspects of their relations under the contract. Some foreign parties agree to a PRC governing law clause, and occasionally a Chinese party can be induced to accept a choice of foreign governing law. Yet the usual compromise has been to omit a governing law provision and leave the matter for resolution in the event of a dispute. Recently, Chinese negotiators have pressed harder for an explicit choice of PRC law, but most licensors continue to resist

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such a choice.

3. Documents confirming project authorization. A licensor should make sure that the relevant planning authorities have authorized the proposed project. The foreign party should ask to see the required feasibility study prepared by the Chinese party, as well as the project authorization certificate. Sometimes the foreign company may even participate in the feasibility study's preparation, although unlike the case of joint ventures, the law applicable to technology transfers does not require the foreign company to do so. If the study is jointly prepared, the parties should first agree on the terms for sharing costs incurred in its preparation, preserving confidentiality, and dealing with third parties.

The Regulations provide that the license contract may not, without special approval, restrict the licensee's "acquisition from other sources of technology similar to that imported or technology of the same type that is competitive with it." Obviously, such an acquisition could completely undercut royalties based on sales.

The monetary value of the proposed transaction determines which level of government has the power to authorize the project and approve the feasibility study and contract. At present, projects involving more than $5 million must be authorized by the State Planning Commission, and the contracts for such projects must be approved by MOFERT. Projects involving lesser amounts may be authorized by provincial or municipal planning commissions, with contracts for those projects approved by MOFERT's designee or subordinate local organization.

It is inadvisable to rely exclusively on assurances from the Chinese party or even from local officials that a local authority has the power to authorize a project or approve the contract. Occasionally, local personnel misunderstand the relevant rules or erroneously claim that the authorization and approval limits can be finessed by dividing the contract into phases, as one foreign company in Shanghai recently learned at the cost of considerable delay. When in doubt, it is always best to check with the relevant central authorities.

4. The level of technology. Under PRC law, technology transferred to a Chinese party must be "advanced and appropriate" and meet at least one of a number of rather general statutory criteria. The licensee is usually eager to obtain the most "advanced" technology available, while the licensor may be convinced that such technology does not suit the particular circumstances. In addition, the foreign party is often reluctant to license its very latest technology because PRC law usually allows the licensee unfettered use of the licensed technology at the end of the contract term. Disagreements should be expected.

One way to deal with the problem is to license technology in stages, and use the achievement of certain levels of production, sales, or market share as triggers for successive stages. Another option is to postpone the issue by arranging only a limited initial transfer, with subsequent transfers arranged in supplementary agreements. Presumably the parties will, in the later stages, have a better appreciation of what is appropriate under the circumstances.

5. Technology valuation. Agreeing on the value of technology is often difficult. The Regulations give the parties broad discretion over compensation, requiring only that the contract set forth the "remuneration, the form of remuneration, and the means of payment." Some foreign parties may try to win over the Chinese party by providing evidence of prices paid by others for the same technology. Although many companies understandably dislike disclosing the terms of other deals, under the Shenzhen and Guangzhou provisions the licensor is *required* to provide the licensee with copies of earlier license contracts for the same technology, and under the Xiamen provisions such copies may be demanded by the licensee. One option is to appoint a third party to make the valuation. This technique has received statutory recognition in cases involving the capitalization of technology in Chinese–foreign equity joint ventures and has been accepted by MOFERT in licensing transactions as well.

6. Methods of terms and payment. Payment for technology may be made through lump-sum payments, running royalties, product payback, or a combination of these methods, according to PRC law. MOFERT officials try to discourage lump-sum payments, because they wish to defer the expenditure of foreign exchange and to tie payments to tangible results. Yet the matter is open to negotiation. Each method has advantages and drawbacks. A lump-sum payment, for example, avoids the problems that arise in the calculation of royalties. Yet in many cases the Chinese party can only pay out of sales revenue. A variation that may resolve this problem is a lump-sum payable in installments after sales begin.

If payment is to be made by running royalty, Chinese negotiators typically seek to base the royalty on the "net sales value" of goods produced using the technology, defined as gross sales revenue minus all costs incurred in the course of marketing and selling the goods, including sales taxes. Royalties usually range between 2–5 percent of net sales value, although PRC law leaves the entire matter to negotiation.

The foreign party should be concerned with the manner in which gross sales revenue is defined in royalty calculations. For example, should the Chinese domestic price or the licensor's own export price be used as the basis for computation? One solution is to use the greater of the domestic sales price or a specified percentage of the international sales price for the same goods during the period in

question. A further issue is whether to put a ceiling on the licensee's deduction for "costs" by referring to international cost standards for similar operations. In any case, as in all licensing contracts, the licensor should press for submission of regular and detailed reports by the licensee, as well as the right to verify them.

Another concern regarding royalties is whether the licensee may later enter into similar transactions with the licensor's competitors. The Regulations provide that the license contract may not, without special approval, restrict the licensee's "acquisition from other sources of technology similar to that imported or technology of the same type that is competitive with it." Obviously, such an acquisition could completely undercut royalties based on sales. MOFERT officials explain that the purpose of the rule is to deal with "special circumstances" in which the recipient learns of better technology later. They recognize that the original licensor should receive some compensation in the event its interests are harmed by a subsequent acquisition. The licensor should anticipate this problem and press for inclusion of a reasonable restriction on its licensee's rights in this regard. Such a restriction might require the licensee to give the technology a fair chance to perform before looking elsewhere. The contract should also deal with the possibility of lost royalties due to a failure to meet production targets for any reason other than a fault in the technology. One solution is to provide for a fixed minimum royalty. Most licensees strongly oppose this option, however.

The licensee's access to foreign exchange affects its ability to pay both lump-sum payments and running royalties. If the source of foreign exchange payment is to be export sales, or if compensation will be made in goods produced with the technology, the licensor should first determine whether the licensee has authority to export such goods and whether a market exists for those goods. One advantage of lump-sum payments is that it is easier to ensure that a definite amount of foreign exchange will be made available. The obvious advantage of product payback is that foreign exchange is not required.

7. Acceptance testing and guarantee. While the national Regulations do not refer specifically to acceptance testing, the Shenzhen, Xiamen, and Guangzhou provisions each state that the contract should expressly provide for it. Even for licenses not subject to these local regulations, the scope of the guarantee required by PRC law makes it imperative for both parties to ensure that the technology transferred is complete and operational in accordance with contract specifications. They should therefore agree at the outset on the precise method of testing the technology, including the standards to be used and the technical personnel to be involved, as well as responsibility for costs.

The objectives of the license and the expected results of the licensee's use of the technology must be set forth in the contract as fully and accurately as possible. This is because the licensor is required not only to guarantee that the technology is *capable* of achieving those objectives but also that the objectives are attained, at least to the extent that relevant inputs are under its control. A licensor will naturally be uneasy about giving a broad guarantee when it has no control over a licensee's raw materials, equipment, and personnel. The licensor should be sure that the contract absolves it of responsibility for problems outside its control. A licensor may also wish to obligate the licensee to abide by specified quality control procedures and to permit inspection of the latter's premises by the licensor's technicians to ensure that quality standards are maintained.

8. Tie-in arrangements. In addition to asserting the right of licensees to import competing technology, the Regulations strongly uphold the rights of licensees in several other important respects, not the least of which are tie-in arrangements. Unless special approval is received, the licensee may not be required to purchase "unnecessary technology, technical services, raw materials, equipment, or products," nor may its freedom to purchase "raw materials, spare parts, or equipment" from sources other than the licensor be restricted.

These rules pose a serious problem for potential licensors, since such tie-in arrangements often provide a major inducement to foreign companies to transfer their technology. The scope of the guarantee required by Chinese law is another concern. The contract must therefore present in detail the licensee's requirements for raw materials, equipment, spare parts, and other inputs and make plain that any restrictions upon sourcing of such inputs are essential for attaining the contract's objectives. The licensor should further protect itself by providing that, to the extent that inputs are not sourced according to the licensor's specifications, the licensor shall not be liable under its guarantee for problems caused by inputs that do not meet technical specifications.

A separate sales contract may allow greater freedom for the licensor to sell the licensee various inputs. In cases where a trademark is also licensed, which should for reasons explained below be done in a special trademark license contract, the foreign party may also wish to provide that its trademark shall not be affixed to any goods produced with substandard materials.

9. Restrictions on exports. Most foreign firms are unwilling to accept contracts that entitle the licensee to use their technology to produce goods that will compete with their own products outside China. The Regulations, however, prohibit "unreasonable restrictions on the recipient's sales channels or export market." Fortunately, Chinese authorities often accept restrictions that prevent direct competition with the licensor's own products. A possible compromise is to provide that the licensee may export goods produced with the technology to designated markets that do not greatly concern the licensor, such as countries of the socialist bloc.

10. Duration and restriction on continued use. As with licensing elsewhere, the contract duration desired by the licensor depends in part on whether payment is by lump-sum or running royalty. In the Chinese context, however, the licensor must also be aware that in most cases PRC law effectively makes a license contract an installment sale by prohibiting, unless specially approved, restriction of the licensee's continued use of the technology following

expiration of the contract.

The Regulations provide that license contracts shall generally not exceed 10 years in duration. Shenzhen's rules make five years the normal limit. Officials of MOFERT's Technology Import and Export Bureau—which is responsible for approving, directly or indirectly, all technology licensing contracts except those between a foreign investor and a Chinese enterprise formed with its investment—indicate that terms of up to 20 years have been approved. In practice, however, special approval for an extended term is usually difficult to obtain. Longer terms have sometimes been granted to foreign joint venturers that have licensed technology to their Chinese ventures; such licensing contracts are approved, directly or indirectly, by MOFERT's Foreign Investment Administration Bureau.

At the negotiation stage, in order to downplay the significance of a brief contract term, potential licensees often indicate their interest in renewing the contract at the end of its term. However, foreign parties should bear in mind the inevitable diminution of their bargaining power, unless the licensee needs continuing updates of the technology, as well as the fact that the relevant authorities may later reject an extension.

11. Patent and trademark rights. Because protection of proprietary rights under the terms of the contract will not be effective against third parties or in most respects beyond the expiration of the license, the foreign party should take all possible steps also to secure protection available under the patent and trademark laws of the PRC.

A thorny problem may arise if, before the licensor files a PRC patent application, a Chinese entity or one of the licensee's present or former employees attempts to patent the licensor's technology within China. In a recent Shenyang case such an attempt was made (unsuccessfully) by a former employee of the licensee who had been trained by the licensor. The licensor should press for contract terms that oblige the licensee to assist in protecting the licensor's proprietary rights within China. Such assistance could take the form of reporting information relevant to any alleged infringement and helping with the investigation and prosecution of such acts.

Similar problems may arise if the licensor fails to register its trademark for all of China's relevant classes of goods. Under PRC law, a trademark must be registered in China before it can be licensed to a Chinese entity. Trademark licenses are often delayed because the would-be licensor underestimates the time required to complete the registration process or the difficulty of obtaining approval for its mark. PRC trademark law requires that copies of each trademark licensing contract be filed with the Trademark Office "for the record" and with the local administrative departments of industry and commerce "for reference." Failure to file may raise questions about the validity of the contract as well as whether the licensor has met the "use requirement" of PRC trademark law. The trademark license can be included in the technology licensing contract or, preferably, embodied in an independent contract. If the trademark license is included in the technology licensing contract and, after filing, either recipient agency finds a flaw in the trademark arrangements, implementation of the entire contract may be delayed.

12. Training. Both national and local PRC legislation obligate the supplier of technology to train the recipient's personnel. A licensor should be prepared to provide such training either within China or in the licensor's home country or both, and should include provisions in the contract for the reimbursement of related personnel costs and travel, accommodation, food, and insurance expenses incurred. It is also easier to have the licensee make domestic travel and accommodation arrangements of a specified standard for the licensor's personnel, and assist in obtaining necessary entry and exit visas. The licensor should, of course, be willing to undertake reciprocal obligations.

13. Confidentiality. PRC law provides that the licensee must adhere to the confidentiality provisions of the contract—and publicity given to a recent Shenyang case involving the attempted appropriation of proprietary technology by a licensee's former employee was designed to confirm that the authorities take the matter very seriously. Nonetheless, confidentiality remains a worrisome issue, and licensors must be careful to broadly define the scope of this obligation and place limits on authorized disclosure.

The contract should first of all provide a detailed definition of confidential information. Second, the obligation of the licensee not to disclose such information without written authorization should continue after expiration of the license. MOFERT officials have indicated that confidentiality periods extending beyond the term of the contract are acceptable and that in one case a period of 99 years was approved. Third, the contract should provide that disclosure of confidential information to employees shall only be on a need-to-know basis. Fourth, each employee to whom such information is disclosed should sign an individual confidentiality agreement with the licensee (and preferably also with the licensor); this obligation should continue beyond the term of the license and remain valid regardless of whether the individual is still affiliated with the licensee.

Finally, in the event of a breach of confidentiality obligations, money damages will usually not be sufficient. The licensor should therefore provide for the return of all proprietary information and the right to terminate the license contract, a right expressly conferred only by the Xiamen provisions. In addition, of course, the licensor should have a contractual right to compensation from the licensee for all losses arising from unauthorized disclosure of confidential information by licensee, its employees or its former employees.

14. Product liability. Contract provisions seeking to limit a licensor's liability to third parties for damage inflicted by products produced with the transferred technology and requiring the licensee to indemnify it for such claims have recently increased in importance. The civil responsibility provisions of the new General Principles of Civil Law reinforce other recently promulgated regulations making "product liability" part of PRC law, although the matter of liability of a supplier of technology is not addressed in these laws. The enforceability of contractual limitation of liability and in-

demnification provisions has not yet been clarified under PRC law. It should be possible, however, at least with respect to products that are not regarded as extra-hazardous, for the licensor to protect itself against liability and to be indemnified by the licensee, if the technology is legally determined not to be at fault.

15. Language. The Law on Economic Contracts Involving Foreign Interests (the "Foreign Contract Law") provides that contracts should normally contain a provision concerning the languages used in the contract and their effectiveness. The parties to license contracts often agree to sign only an English text, although in practice a Chinese translation will be prepared for internal review purposes. To avoid misunderstandings it is essential that any Chinese text, even if not signed, be an accurate translation of the foreign language text. Moreover, if both the Chinese and foreign language texts are to be signed, the contract should provide that they are equally authoritative, unless of course the parties agree that, in case of discrepancies, one text prevails over the other.

Often, neither party is willing to make the text in the other party's language the prevailing one. European companies have in some cases found ingenious solutions to this problem. One compromise had the contract prepared in Chinese, English, and French (the language of the licensor); the Chinese and French versions were said to be equally authoritative, but the English text was declared definitive in case of dispute. In another matter a French licensor agreed that English would be the only legally valid text, with Chinese and French versions prepared for the parties' reference only.

16. Settlement of disputes. PRC legislation generally requires each foreign-related contract to have a dispute resolution clause. No special rules apply to licensing, and details are left to the parties. During negotiations, however, the Chinese normally press for an arbitration clause to follow the virtually obligatory clause calling for "friendly consultation" between the parties as a first choice. MOFERT officials make plain their strong preference for arbitration over litigation if some form of adjudication should prove necessary.

Third-country arbitration clauses are permitted by the Foreign Contract Law and are often accepted. Stockholm's arbitration institution is the most popular foreign choice to date, although Zurich is occasionally agreed to, and Hong Kong's current effort to become an arbitration center seems to be drawing Chinese support of late. Chinese parties sometimes suggest arbitration in the country of the defendant as a compromise. However, Chinese licensees have recently been negotiating harder for arbitration by a Chinese arbitration organization, which foreign parties have sometimes accepted.

Another solution might be to provide for arbitration within China by an ad hoc body in accordance with the Arbitration Rules of the United Nations Commission on International Trade Law. The familiar and detailed procedures and equitable selection of arbitrators under those rules tend to comfort foreign parties. The award rendered by such an arbitral panel may also prove easier to enforce in China than that of a foreign panel. Yet the process of enforcing foreign awards in China has just been simplified by China's decision to accede to the 1958 New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards.

17. Contract approval. The examination and approval process gives Chinese authorities an opportunity to second-guess the negotiators and impose further conditions on the transaction. Of particular concern to licensors will be whether restrictions agreed to by the negotiators that require "special approval" under the Regulations will be considered necessary and reasonable by the examination and approval authority, which has broad discretion. A potentially useful technique, recognized by the Approval Measures, is for the licensee, before and during the negotiations, to keep in close touch with the relevant authority and even request a preliminary examination of the contract before it is signed. In practice, however, it remains very difficult to obtain even informal advance rulings in China.

As for the examination and approval procedure, the Regulations provide that, within 30 days following signature, the license contract must be submitted along with certain other documents to the relevant authority, which is then required to make a decision within 60 days. If it fails to act within that period, the contract is deemed approved. The problems arising in connection with deemed approval are very difficult, especially as this method of approval is not mentioned in the Approval Measures themselves. One obvious issue is whether a contract that contains clauses requiring "special approval" can be approved in this fashion. Moreover, the requirement in the Approval Measures that an "approval certificate" be produced in order to carry out such procedures as applying for foreign exchange settlement and tax reduction or exemption makes deemed approval virtually worthless, unless a certificate is made available at the same time.

Although MOFERT officials indicate that a deemed approval should be fully effective and that an approval certificate can be obtained on this basis, they admit that there have been no cases to date. To shorten the period of uncertainty (assuming that preliminary approval is unavailable), the foreign party may wish to stipulate that the licensee shall be obliged to submit the contract to the examination and approval authority within a shorter period, say 10 days after signature, and that either party may terminate the contract if an approval certificate is not received within, say, 70 days of signing.

18. PRC taxation. Before signing a contract, it is advisable to seek a written ruling on the tax consequences of any transaction in China and to include it as an appendix to the contract. Unfortunately it will be difficult to obtain one, even though the Approval Measures recognize that the tax authorities may agree in advance to tax preferences for certain technology transfers. In Beijing, the municipal tax bureau has informed MOFERT officials that it will only give rulings after a contract has been signed. The contract should therefore spell out the anticipated tax treatment for the transaction, obligate the Chinese party to assist the foreign party in obtaining available tax reductions or exemptions, and tie the contract's effectiveness to official approval of the desired tax treatment. Attempts to put the entire bur-

den for the payment of taxes on the Chinese party have been consistently rejected by the Ministry of Finance.

Licensors having an "establishment" in China will be taxed under the Foreign Enterprise Income Tax Law on net income at progressive rates, while others will be subject on a withholding basis to a flat 20 percent tax on the gross income. Generally, foreign enterprises earning fees for the use within China of proprietary technology have been taxed on the withholding basis. The withholding tax applies to fees for the use of proprietary rights within China, technical training, technical services (whether conducted within or outside of China), and technical documentation provided in connection with a transfer of technology. It is important to distinguish such fees from those relating only to an upgrading of existing facilities or to the installation and operation of equipment sold to a Chinese entity in connection with a technical transfer but not involving a transfer of proprietary technology. These amounts may well be exempt from tax.

When technology fees are subject to withholding, the tax may be reduced to 10 percent or a total exemption may be granted under special provisions issued by the Ministry of Finance. A reduction to 10 percent normally requires approval by the local tax authorities, but if the licensee is located in one of the SEZs or the 14 open coastal cities the rate of withholding tax has been reduced to 10 percent across the board. The local authorities may grant further reductions or a complete exemption from tax if the transferred technology is considered "advanced" or the terms of the transfer are "preferential." For transfers to licensees outside of such areas, total exemption from withholding tax must be approved by the Ministry of Finance itself and will be available only if the technology is "advanced" *and* the terms of the transfer are "preferential."

Any special withholding tax rules in treaties between China and the licensor's country will also be relevant. For example, the US–PRC agreement for the avoidance of double taxation limits the rate of taxation of royalty income by the source country to 10 percent. Thus, US licensors are now entitled to a reduction of the 20 percent withholding rate even for technology that does not otherwise qualify for a reduction, at least with regard to royalties.

Lessons of experience

China's present legislation governing the licensing of technology has been enacted in the course of only three years. Although some Chinese negotiators had accumulated considerable experience with technology import contracts before the onset of the Open Policy in 1978, much of that experience related to policies quite different from those which the present legal structure is designed to serve. Moreover, the scale of the transfers sought and the number of Chinese technology importers have greatly expanded over the past few years.

The new laws go a long way in helping both Chinese and foreign parties decide how to structure a technology transfer transaction. As further experience is gained, shortcomings in the legal framework for technology transfers will undoubtedly become clearer to PRC authorities as well as to foreign companies, and necessary modifications are likely to be made. In the meantime, it is important for foreign parties to understand the laws and keep abreast of current policy developments in order to tailor their objectives and expectations to the realities of doing business with China. 完

Negotiating a Technology License

Tips from a leading US licensor in China

James K. Yuann

The process of transferring technology to China has changed dramatically in the last two decades. When Western countries first began to transfer technology to China in the 1960s, China lacked project experience and engineering skill. Enterprise management was highly centralized, and end-users had little say in technology transfer decisions. Since funds were supplied by the central government, very little attention was paid to absorbing technical know-how in the most cost-effective way. Individual risk and responsibility were minimized by importing complete plants and equipment on a turn-key basis.

Economic reforms began to change this picture in the the late 1970s. Chinese enterprises grew more concerned with project costs as soon as they were made to bear a portion of the financial responsibility for technology imports. End-users now have an incentive to take risks and develop their own engineering and construction plans.

China's technology buying patterns have shifted toward purchases of software and know-how and away from hardware and turn-key imports. To ensure that this know-how has been properly transferred, foreign companies are being asked to play a more interactive role, that sometimes entails cooperation with Chinese engineering design institutes. Now, more than ever, it is important for foreign firms to know what will be expected of them as they consider technology licensing in China.

GETTING TO KNOW YOU

The invitation to China. After identifying the need to produce a specific type of product, the Chinese government will authorize the proposed manufacturer to conduct a feasibility study. Although the scope of the study depends both on the type of product/technology and the size of the required capital investment, all feasibility studies cover such topics as feedstock supply, capital cost estimates, financing, utility requirements, end-product distribution and market analysis, site assessment, and preliminary technology evaluation based on published information.

Upon completion and approval of the initial feasibility study, either the end-user or a designated agent (usually a State-owned trading company) will invite a carefully selected group of foreign suppliers to China for preliminary discussions. Any company accepting this invitation should prepare thoroughly and be ready to face a barrage of detailed questions on its technology capabilities.

Introducing the technology. As part of preliminary discussions, foreign companies are usually asked to hold a technical seminar explaining the applications of their technology to Chinese end-users and other interested parties. This seminar, which usually takes place in the offices of the Chinese trade agent involved or at the factory itself, begins the official technology screening process. Many foreign companies require prospective licensees to sign a confidentiality agreement before such a seminar.

The right project team is crucial. The team leader should have a high level of credibility and complete authorization to negotiate on the company's behalf. The rest of the team should consist of one or two technical specialists who can introduce the technology and answer technical questions. Retaining the same team throughout the negotiations is an essential means of gaining the Chinese sides' trust. Including a bilingual agent or company employee of Chinese descent in the discussions may help minimize the language barrier during meetings and facilitate general two-way communication. (The Chinese side usually provides interpreters, but they vary greatly in ability.)

Preparing a comprehensive package of background information before leaving for China will make the team's job much easier. The National Council for US–China Trade can be a valuable resource at this point. The package should include general information about doing business with China, specific information relating to your industry sector and customers in China, and evaluations of your technology relative to that of competitors. Project specific background information, however, is usually very difficult to obtain. Going to China with as much information as possible will facilitate good rapport with counterparts in China. The parties in China have usually done their homework, and you should follow suit.

Plant visit and project scope definition. If your company passes muster during the initial technical discussions, the end-user will usually send a technical team (consisting of end-us-

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ers, agents, and government officials directly or indirectly associated with the project) to visit the foreign company's plant. Sometimes, particularly if funds are in short supply, the end-user will request that the foreign firm's technical teams visit their plant instead. Complex projects may require both steps.

The Chinese ask often probing questions about technology under consideration, but if the answer involves proprietary company knowledge and cannot be disclosed, it is reasonable to simply say so. An honest, direct answer is usually the best way to establish reasonable expectations among your Chinese counterparts.

During this second stage of contact, both sides usually draw up a letter of intent or a meeting memorandum outlining the scope of the technology transfer and the future work plan agreed to in principle by both sides.

GETTING THROUGH NEGOTIATIONS

If everything proceeds smoothly, formal contract negotiations will follow. Formal negotiations begin with technical discussions and then move to commercial discussions. The length of negotiations can vary from approximately two weeks to five months or more and usually requires the prospective supplier to make several trips to China. Frequently the Chinese invite several competing suppliers for negotiations at about the same time.

Chinese end-users prefer to approach technical discussions based on the technical appendix of their own draft contract or the foreign firm's draft contract. The end-user typically wants to discuss the following areas: overview of the scope of technology to be licensed; description of technology; list of patents and know-how to be licensed; description of technical documentation with specified delivery terms; training program; technical assistance to be offered at different stages of the project; technology ownership and warranty; personnel issues including travel arrangements, visas, medical care, and housing; and performance guarantee.

A major portion of negotiating time will be spent resolving the conflict between the end-users, who prefer a very tight performance guarantee, and the technology supplier who wants to establish certain performance margins. The Chinese often propose holding back 20–30 percent of the payment for technology until after the performance test period is completed.

Commercial discussions cover legal liability, contractual obligations and penalties, and payment terms, with the payment schedule and price negotiations usually taking place last. Pay special attention to the following areas during commercial negotiations:

Scope of technology. Although agreed upon during technical negotiations, the scope of technology needs to be clearly restated at the beginning of price negotiations to make sure both parties explicitly agree on the content of the technology to be licensed and the exact types and specifications of product to be produced.

If a technology transfer project is large and complex, consider dividing the technology transfer package into several smaller components with different license fees. Depending on the funding available, the end-user can then choose a suitable combination of technology. Smaller technology transfer projects are usually easier for Chinese units to purchase and implement—particularly if the project does not have strong financial backing from the central government. Additional technology can always be offered for future installation.

Be forewarned, however, that the end-user may perceive a decision to divide the technology package as a sign that integrated technology can be purchased piecemeal. Don't arbitrarily divide up the technology transfer project simply to meet the purchaser's budget. The integrity of the technology, its performance, and important safety features cannot, of course, be sacrificed.

Technical assistance fee. Having the proper resources available for technical assistance is essential in a technology transfer project. Technical assistance fees should be determined in the main contract. Usually this fee is distinct from the license fee, negotiated on a cost-plus basis, to be allocated by the licensee to the licensor on a per diem basis. Travel expenses associated with technical assistance should be specified.

Guidelines govern the technical assistance fees foreign companies can charge. Although rates vary by indus-

Photo courtesy of Standard Oil Chemical Company

The Shanghai Petrochemical Complex has been operating a plant using the Standard Oil Company's technology since 1976.

try, technical assistance fees in China generally do not exceed $275 per day, and it is very difficult to negotiate a higher fee.

License fee payments. The payment schedule, along with the engineering and construction schedule, must be structured to reflect the fact that a technology transfer project takes several years to complete. Before discussing the payment schedule, the two parties should agree on the general type of license fee payment—whether it will be in the form of lump sum front-end payments or running royalties.

A typical payment schedule offered by the Chinese for a front-end lump sum license fee would be: 15 percent of the fee payable shortly after the license agreement is signed (usually 60 days since the contract will need the Chinese government's approval to become effective); 30–45 percent payable after the basic engineering package is completed by a selected engineering contractor and is approved by the licensor; and 40–55 percent payable after the plant starts up. Most Chinese licensors prefer the less-complicated front-end lump sum option, and State-sponsored projects often even have funds specifically allocated to cover the license fee.

For a running license fee, the payment usually amounts to 2–5 percent of the selling price (or cost) of the product. Part of the license fee must be made in the form of a down payment shortly after the license agreement is signed. The rest is paid to the licensor over a period of five to 10 years after production begins using the licensed process.

Payment schedule. Negotiating the payment schedule is the next step. The licensor, of course, would like an accelerated payment schedule to realize a better net present value from the license fee. Chinese negotiators have come to understand this point, and payment schedule discussions now focus on the net present value of the license fee.

It is essential for both sides to agree initially on the estimated inflation index over the entire payment period. To avoid subjective estimates, the forecasts of independent financial institutions (such as the World Bank or major international banks) should be used.

Once the escalation factor is agreed upon, the licensor is usually able to explain to the buyer that the license fee is based on the net present value and must therefore be adjusted for inflation on the basis of the payment schedule. Most Chinese negotiators understand the time value of money and will agree to adjust the payment schedule within their authority—although perhaps not as much as the licensor would like.

THE BOTTOM LINE

Serious price negotiations are usually postponed until all the price-related issues are resolved. Since price is the most critical part of any business transaction, the licensor should start preparations well in advance.

First, participants should get to know each other and establish trust before beginning serious negotiations. Licensing of technology is contingent on building this relationship, since the performance of the technology will not be proven to the end-user until two or more years after the transaction is initialed.

Although many Chinese enterprises are beginning to better understand the technology transfer process, smaller Chinese enterprises, particularly those in more remote areas, can still be unfamiliar with international licensing practices. An accurate calculation of the value of the technology to the enterprise will help convince the Chinese buyer of the benefits to be gained. But quantitative analysis is extremely difficult to execute in China, as in many other countries, because information such as the price for feedstock and materials, and project economic data is often not available.

Finally, the license fee should be justified early in the negotiation process, based on the value of the technology, the need for reasonable profit, and any other benefits to be derived from the licensing deal. These principles should be conveyed to the licensee long before price negotiations begin. Be careful not to make claims that will be hard to fulfill later. Honesty is probably the most important factor in negotiating in China because it builds trust, a major consideration in the Chinese decision.

Price negotiations are usually lengthy, complicated, and difficult. Pricing strategies need to be prepared and reviewed before negotiations begin, and Chinese counteroffers should be anticipated. If your company has long-term goals in China, your future market development plans should play a role in setting your license fee. Also, remember that your competitor(s) may well be negotiating at the same time.

Keep in mind that China likes to conduct business on an "old friend" basis, and referral is a common business practice. A Chinese organization will collect all the information it can about a foreign company from other Chinese organizations. If you deliver what you promise, your China licensing business can be very rewarding.完

Putting Domestic Technology to Work

Chinese researchers and scientists get down to business

Erik Baark

The technology transfer achievements of most Chinese research and development (R&D) organizations are nothing to brag about. For years the 5,000 institutions that make up the core of the science and technology system—operated by ministries, provinces, municipalities, and the Chinese Academy of Sciences (CAS)—were told what to research by higher authorities. Operating and research funds were provided irrespective of performance. This left researchers with little incentive to worry about the practical applications of their work in industry and agriculture.

To revitalize practical technology exchanges within China, efforts to strengthen the links between research and production began in the the early 1980s. Based on the simple assumption that know-how can be exchanged as a commodity, the "commercialization of technology" is already changing the nature of domestic technology transfer. Contracts are now used on a wide scale to govern sales of research results or technical services. One-third of all China's research institutes were reportedly experimenting with contractual R&D by 1985, while a 1986 survey found that 10 percent of the central-level research organs engaged in technical development have become economically independent by selling technology and services.

The proliferation of technology fairs exhibiting—and marketing—the latest advances of China's R&D institutes are another innovation. At the first National Technology Fair in 1985, research institutions signed letters of intent for project fees totaling more than ¥2 billion. The total value of actual domestic technology transfer in 1985 is estimated at ¥2.3 billion, or roughly one-quarter of China's total R&D expenditures that year.

Few Chinese enterprises can afford to spend more than 1 percent of their output value on R&D—a meager amount compared to the 5–10 percent spent by firms in industrialized countries.

Diversifying research funding

The State Science & Technology Commission (SSTC) sees this commercialization of technology as primarily a means to diversify research funding. "The reform of the funding system is currently our most important task," an official from the SSTC Policy Research Bureau explains. The attempt to cut fixed State subsidies for most research institutes engaged in industrial R&D began with a 10 percent reduction of operating expenses in 1985—with deeper cuts to follow. "Our goal is to abolish fixed funds for these institutes by 1990," the official declares, adding that the SSTC anticipates that many institutes will be forced to team up with enterprises while others will verge on bankruptcy.

In the future, research funding will consist of three major components: (1) The Natural Science Foundation provides basic science project grants—primarily to institutes under the Chinese Academy of Sciences and universities. Competition for these grants has been keen since experiments began in 1982. (2) Awards to research institutes working on key national projects are now made by the SSTC through competitive bidding. Reputation and past performance are two considerations in determining contract awards, but the bottom line (i.e., who provides the lowest bid) perhaps plays an equally significant role in deciding the outcome of these tenders. (3) Research contracts and sales of technology to enterprises account for a growing share of income for R&D units. Two forms of long-term contractual arrangements are common: some institutes act as technology development centers for a group of enterprises, while others establish "combined research-production units" and receive a share of the profits reaped by factories employing new technology.

In early February the State Council decided to take these reforms one step further by issuing the *Regulations to Promote Reform in the Scientific and Technological Management System.* This calls on central ministries to delegate their managerial role in scientific research to lower-level departments. To link research more closely with production needs, research institutes are to be gradually integrated

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into large and medium-sized Chinese enterprises. Many factories will welcome this move, since only 27 percent of China's large and medium-sized enterprises now have their own R&D departments.

A host of new technology purveyors

The pressure caused by a decline in direct R&D funding and the attraction of a booming market has lured many old and new players onto the scene. The Chinese Academy of Sciences has teamed up with various provinces to secure long-term cooperation contracts for the academy's institutes. University professors and researchers—previously largely ignored as a source of know-how by the government and enterprises alike—are now involved in the business of providing technical services. More than 700 nongovernmental technological development organizations had been established by the end of 1986.

With Deng Xiaoping's blessing, research organizations in the defense sector have also entered the scene in force, taking advantage of their sophisticated research facilities and outstanding scientists. In fact, trade in technology between defense research units and civilian industries reached ¥1 billion in 1985, almost half the national total.

A host of new consulting firms are also offering technical services or acting as intermediaries in the purchase of know-how. The Chinese Association for Science and Technology, for instance, appears to have cast off its staid image as a promoter of science popularization and interdisciplinary research, and now presents itself in glossy brochures as a leading consulting firm.

TAXING TECHNICAL ENTREPRENEURSHIP

To encourage technology transfer, Chinese lawmakers have ruled that the income from technical services and the sale of technology is, in principle, tax-free. In practice, however, individuals and members of collectives paid for their research or technical services are as likely to be punished as rewarded.

In a notorious case of overtaxation, the Shanghai Tax Bureau effectively caused the Shanghai Science and Technology Consultative Service to go bankrupt by demanding payment of ¥400,000 in retroactive taxes for 1985, even though the firm had only earned ¥220,000 during that entire year. Officials from the Shanghai Commission for Science and Technology admit that the practice "may be a bit unreasonable," but explain that a tax rate of 300 percent applies to bonus rewards if they exceed the sum of five months' average wages. To distribute the income from technical services among its members, the Shanghai firm would find itself paying a tax rate of 30 percent on bonus rewards exceeding ¥110, 100 percent on rewards exceeding ¥330, and the astonishing rate of 300 percent on every yuan beyond the sum of ¥550.

This rule applies only to employees who receive rewards through their work unit. Scientists working freelance in their spare time are taxed according to new income tax regulations in effect since January 1, 1987. Any income the individual receives from technical services, license fees, or other research activity is tax free if the total is less than ¥800. Any income above the ¥800 level is subject to a 20 percent tax rate. Cash awards from State and local government for science and technology achievements remain exempt from income tax. Then rewards may be more liberal, but few people can develop significant research results on their own.

Individuals being paid for their technical services may also be harassed by resentful local authorities. Engineer Huang Daosheng, for example, was sentenced to two years in prison on a charge of embezzlement for accepting ¥760 in bonuses upon completion of a contracted project. Huang headed a 19-member geological prospecting group that, according to a contract concluded in 1984–85 with Zhaozhuang Coal Mine, was to receive substantial bonuses if they completed the project ahead of schedule—as they did. The procurator of Gaoping County subsequently brought Huang and the group's accountant to trial and confiscated more than ¥10,000 from the other 19 members of the team—providing no justification for his actions.

The strict tax regulations on bonus awards are effectively eliminating technology development incentives in the workplace and preventing the growth of private or collectively operated R&D units. By using taxation in this manner, China continues, even after reforms, to stifle the creativity of its R&D personnel. —EB

Strengthening control over the technology market

The surge in China's domestic technology transfer business has taken many authorities by surprise. Almost instinctively, they reacted by calling for strict management of the markets. During 1985 a network of technology market development centers was created at the national and local levels to supervise transactions and act as financial brokers for units engaged in technology transfer.

At the end of 1985, authorities also moved to curb some questionable practices. For instance, some enterprises are trying to take advantage of tax exemptions on technology sales by registering the sale of spare parts as technology transfer.

The tax authorities are aggressively pursuing these offenders (*see* box). The crackdown in Shanghai has been so effective that it is credited with the 33 percent drop in the number of consultation contracts signed (and an 85 percent decline in the amount of money involved) in the first half of 1986.

The legal framework for technology transfer and contractual R&D fails to provide sufficient protection for all parties. The section of the Economic Contracts Law of 1981 that deals with science and technology cooperation is not detailed. A new Technology Contract Law drafted in 1986 and expected to be passed in 1987 should provide a firmer foundation for both domestic and international technology transfer contracts.

Whether or not such a law is adopted, most conflicts will probably continue to be settled through mediation. Chinese units and bureaucrats generally resent civil lawsuits and prefer to solve problems through the intervention of higher authorities.

The bias against domestic technology

These ongoing technology reforms face a major hurdle in buyer's attitudes. Although small rural enterprises are often eager to purchase China's latest technology, many larger State-owned units are reluctant to spend their money on domestic technology, new or not. "People still do not understand the concept of technology as a commodity," a vice director of the Science and Technology Bureau of the Ministry of Metallurgical Industry argues.

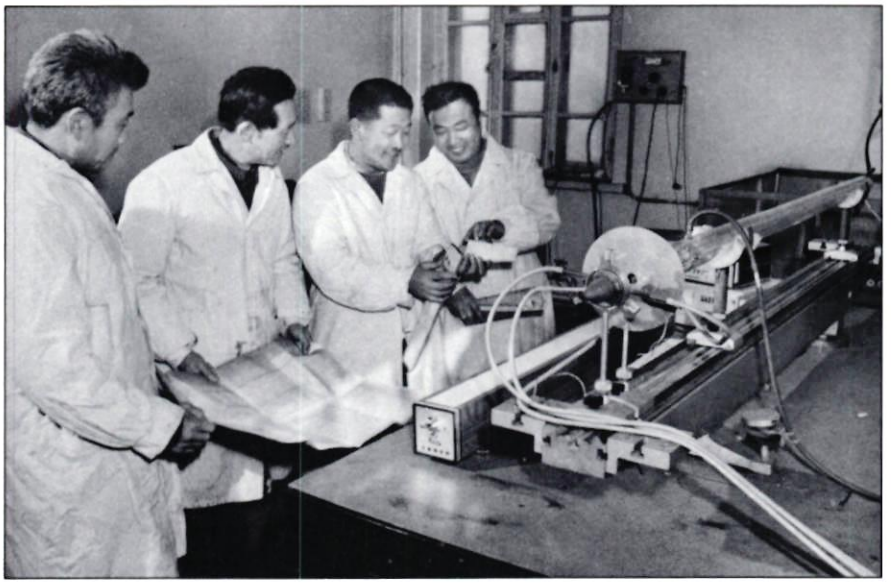
"They want to receive new technology gratis just like in the old days!" Yet many Chinese managers exhibit high levels of "consciousness" when it comes to importing advanced technology from abroad.

At least two factors contribute to this prejudice. First, demand for technology is largely dependent on the ability of industrial units to raise funds for technical transformation. Previously, enterprises could use their own funds to finance R&D, but these efforts are being severely restricted as the government attempts to reduce excessive investment rates. Few Chinese enterprises can afford to spend more than 1 percent of their output value on R&D—a meager amount compared to the 5–10 percent spent by firms in industralized countries. Even when they receive approval to invest in R&D, the primary source of funds comes from the State Economic Commission, which apparently does not explicitly pursue a policy of favoring indigenous sources of technology.

Second, the technologies offered by a majority of Chinese R&D organizations still lack proven engineering development—a result of the longstanding isolation of R&D from the production sphere. Therefore, purchasing domestic technology can be risky; frequently, substantial development costs must be added to the budget, and many Chinese industrial enterprises simply do not have the personnel for such efforts.

The success of China's R&D reforms—and the survival of research institutes—is coming to depend more and more on the general progress of economic reforms in the enterprises themselves. Many Chinese scientists are now keenly interested in the commercial applications of their work, but whether industry can make full use of this resource depends on the availability of funds and the degree of competition within each industrial sector. 完

Photo courtesy of China Features



Technicians analyzing laser-cut timber. New laser and infrared ray technology is being applied to the machine-building, metallurgy, food, medicine, and timber processing industries in China.

Working Out in Beijing

Keith W. Strandberg

As the daily stresses of living in China mount, many expatriates turn to exercise for relief—and most of the options now open to them are also available to the business traveler. However you like your recreation—as calm as putting on a practice green, as laid back as a round of bowling, or as vigorous as a game of basketball or tennis—you can now find facilities to practice your favorite sport in Beijing.

Located primarily in the Western hotels, these recreational facilities are generally open to long-term residents and any foreign business traveler—for a fee, of course (*see* table). Hours of operation vary with the season and activity, so it is advisable to call before you go.

But there are also ways to get exercise without spending money. Ice skating is a favorite pastime among both Chinese and foreigners during the winter months. And when the ponds melt, rowboating becomes the rage. Basketball and volleyball courts can be found in parks, gymnasiums, stadiums, and universities. All you need is your own ball or to be invited to join a game already in progress.

Joining the Hash House Harriers, an international running group, is one way to meet Beijing residents while exercising. This group of approximately 40 runners goes out for 3–5 mile jogs every Sunday and invariably winds up at the pub in the British Embassy. The people from other countries you meet during the run often pass on news about athletic activities among other embassy groups, such as an ad hoc soccer league or baseball games.

Running is, of course, the most convenient athletic option, but to jog in Beijing you must pay a price. Some runners wear surgical masks to keep from breathing the dust blown in from the northern plains and the noxious fumes let off during Beijing traffic jams. And to escape the deluge of bicycles, buses, and cars, a runner must rise before 6 a.m.

If you have the stamina, running can be very rewarding. The business traveler, often cooped up in meetings or a taxicab all day, can get out to explore the narrow back roads of the city or the surrounding countryside.

Of course, there is always *tai ji quan* (shadow boxing) for those whose tastes run to less strenuous exercise. Chinese practitioners of this ancient martial art and health ritual can be found in every park and on almost any street. They won't mind if you join in—as long as you stay at the back of the pack.

Keith W. Strandberg, a Pennsylvania-based free-lance writer and consultant for companies doing business in Asia, works out in Beijing whenever he can.

SOME RECREATIONAL FACILITIES IN BEIJING

Beijing Hotel
Dong Changan Avenue
Tel: 5005566
Facilities: Massage (¥35–¥45).

Changping Golf Course
Near Ming Tombs (located one hour's drive from Beijing)
Tel: 331346
Cost: ¥250; rental golf clubs available.

Diaoyutai State Guest House
Sanlihe Rd., western Beijing
Tel: 868831
Facilities: swimming pool, fitness center, sauna, massage, tennis.
Hotel guests only.

Fragrant Hills Hotel
Haidian District
Tel: 285491
Facilities: fitness center (¥8), outdoor swimming pool (¥8), sauna (¥8).

The Friendship Hotel
Baishiqiao Road
Tel: 890621
Facilities: tennis (free with foreign passport), outdoor swimming pool (¥5), indoor basketball (¥5).

Great Wall Sheraton Hotel
North Donghuan Rd.
Tel: 5005566 x2251
Facilities: tennis courts (¥34/hour), indoor swimming pool (¥12), fitness center (¥18), sauna (¥18), basketball court in rear.

The International Club
11 Ritan Road, Jianguomenwai
Tel: 522144
Facilities: Outdoor swimming pool (¥4), tennis courts (¥30–¥50/hour), table tennis (¥6/hour), billiards.

Jianguo Hotel
Jianguomenwai Avenue
Tel: 5002233
Facilities: indoor swimming pool.
Hotel guests only.

Jinglun (Beijing-Toronto) Hotel
3 Jianguomenwai Avenue
Tel: 5002266
Facilities: indoor swimming pool (¥5), sauna (¥5), massage (¥20–40).

Lido Holiday Inn
Jichang Rd. and Jiangtai Rd.
Tel: 5006688 (bowling, x3805)
Facilities: Bowling (¥6/set), indoor swimming pool (¥12), fitness center (¥12, but free if swimming); golf, squash, and racquetball facilities to open May 1987.

Shangri-La Hotel
29 Zizhuyuan Road
Tel: 8021122
Facilities: fitness center (¥10), sauna (¥10), solarium (¥20), massage (¥45), indoor swimming pool (free for hotel guests, ¥10 for others).

Xiyuan Hotel
Erligou, Xijiao
Tel: 890721
Facilities: swimming pool (¥5), sauna (¥10), fitness center.

中外貿易

Betsy Saik

The following tables contain recent press reports of business contracts and negotiations exclusive of those listed in previous issues. For the most part, the accuracy of these reports is not independently confirmed by *The CBR*.

National Council member firms can contact the library to obtain a copy of news sources and other available background information firms concerning the business arrangements appearing below. Moreover, firms whose sales and other business arrangements with China do not normally appear in press reports may have them published in *The CBR* by sending the information to the attention of Betsy Saik at the National Council for US–China Trade.

CHINA'S IMPORTS THROUGH MARCH 31

Foreign Party/ Chinese Party	Product/Value/ Date Reported
Agricultural Commodities	
(Peru)	CT: Signed agreement to supply 50,000 tonnes of fish meal in exchange for 100,000 tonnes of rice. 11/86.
Chemicals and Chemical and Petrochemical Plants and Equipment	
Iprochim (Romania)	Constructing 204 TPD phosphoric acid plant and 465 TPY DAP plant in Tongling. 10/86.
Lummus Crest Inc., subs. of Combustion Engineering Inc. (US)/SINOPEC International	Signed contract for 10,000 TPY ethylbenzene expansion project in Shanghai. 12/86.
OLEF and Co. Handelgesellschaft and two other firms (FRG)/ Shanghai No. 2 Beilei Plastics Factory	Put into operation line producing 250 plastic bags per minute. $538,184 (DM1 million). 12/86.
SinoKellogg Engineering Co. (Sino-US joint venture)	Signed two contracts: to provide 60,000 TPY linear low-density polyethylene facility at the Lanzhou Chemical Industry Co. and to modernize 1,000 TPD ammonia plant at the Dong Ting Nitrogen Fertilizer Complex in Yueyang, Hunan. $75 million. 12/86.
Chisso Engineering Co. Ltd. (Japan)/CITIC	Signed agreement to build 10,000 TPY propylene oxide plant at Zibo, Shandong. 1/87.
Leipzig-Grimma Chemical Plant Construction Combine and Schwarze Pumpe Gas Combine (GDR)/Harbin	Signed agreement to supply technology and major equipment for new compressed gas works. 1/87.
Occidental Chemical Corp., subs. of Occidental Petroleum Corp. (US)/CNCCC	LIC: Signed agreement to supply technology to modernize polyvinyl chloride (suspension resin) plant in Wuxi, Jiangsu. 1/87.
Singapore subsidiaries of Royal Dutch/Shell Group, Exxon Corp., and Mobil Corp./SINOCHEM	Signed agreement to process 30,000 bpd; 15,000 bpd-20,000 bpd; and 35,000 bpd of crude oil respectively in 1987. 1/87.
Speichim SA and Rhone-Poulenc SA (France)/Liaoyang Petrochemical Complex, Liaoning	Signed contract to build phosphoric acid unit. 2/87.
Chemicals (Agricultural)	
Kuwait Petrochemical Industries Co.	Signed two contracts to supply fertilizer and 400,000 tonnes of urea. 11/86.
SinoKellogg Engineering Co. (Sino-US joint venture)	Signed two contracts: to provide 60,000 TPY linear low-density polyethylene facility at the Lanzhou Chemical Industry Co. and to modernize 1,000 TPD ammonia plant at the Dong Ting Nitrogen Fertilizer Complex in Yueyang, Hunan. $75 million. 12/86.
(Canada)	Will supply 500,000 tonnes of potash for fertilizer. $42 million. 1/87.
Cros SA (Spain)	LIC: Will supply technology and manufacturing licenses for new fertilizer plant in Hebei. 1/87.
Dragados y Construcciones SA (Spain)/Sino-Arab Chemical Fertilizer Co. (Kuwait-Tunisia-China joint venture)	Signed agreement to build 1,600 TPD diammonium phosphate and 2,000 TPD complex fertilizer plant in Qinhuangdao. $40 million. 1/87.
Construction Materials and Equipment	
Indeco Engineers, subs. of MND Holdings Group (Singapore)/China World Trade Center (under construction in Beijing)	Awarded mechanical and electrical contract to supply and install intake substation, fire-alarm and fire-protection equipment, air-conditioning and heating system, two building automation systems, and water and drainage systems. $60 million. 11/86.
Consumer Goods	
Therapedic International (US)/Yugang Furniture and Engineering Co. Ltd. in Zhengzhou, Henan	LIC: Signed agreement to set up factory to produce 100,000 mattresses annually. 12/86.
THORN EMI Plc and GEC Osram Glass Bulbs (UK)/ Rongcheng Glass Factory, Shandong	Will supply and maintain equipment for wine glass production line including three glass-blowing machines, a stem-stretching machine, and a burn-off machine. $1.9 million (HK$14.5 million). 1/87.

NA = Not available.

NOTES: Contracts denominated in foreign currencies are converted into US dollars at the most recent monthly average rate quoted in *International Financial Statistics (IMF)*. Contracts concluded over two months ago are also included if they were not reported in the last issue of *The CBR*. Leasing (LEAS), Licensing (LIC), Compensation (CT), and Assembling (ASSEM) deals are now included in the "China's Imports" section.

KEY: CAAC: Civil Aviation Administration of China; CAIEC: China National Automtive Industry Import-Export Corp.; CCTV: China Central Television; CEIEC: China Electronics Import-Export Corp.; CEROILFOODS: China Natinal Cereals, Oil, and Foodstuffs Import-Export Corp.; CHINATEX: China National Textiles Import-Export Corp.; CITIC: China International Trust and Investment Corp.; CITS: China International Travel Service; CNCCC: China National Chemical Construction Co.; CNOOC: China National Offshore Oil Corp.; CNTIC: China National Technical Import Corp.; COSCO: China Ocean Shipping Co.; CPIC: China National Corporation of Pharmaceutical Economic and Technical International Cooperation; ICBC: Industrial and Commercial Bank of China; INSTRIMPEX: China National Instruments Import-Export Corp.; ITIC: International Trust and Investment Corp.; MACHIMPEX: China National Machinery Import-Export Corp.; MEI: Ministry of Electronics Industry; MLI: Ministry of Light Industry; MPT: Ministry of Posts and Telecommunications; NDSTIC: National Defense, Science, Technology, and Industry Commission; SINOCHEM: China National Chemicals Import-Export Corp.; SINOPEC: China National Petrochemical Corp.; SINOTRANS: China National Foreign Trade Transportation Corp.; SPC: State Planning Commission

Electronics and Electrical Equipment

Japex Inc. (Japan)/ MACHIMPEX	Concluded sales agency contract for electrodischarge machines. 11/86.
Penfield, Inc. (US)/Beijing No. 2 Semiconductor Device Factory and SINOTRANS	Shipped sixth reverse osmosis water purification system for semiconductor manufacturing applications. 11/86.
Toshiba Corp. (Japan)/ Fuzhou, Fujian	Put into operation fluorescent lamp line producing 3 million lamps annually. $5.1 million. 11/86.
ANT Nachrichtentechnik GmbH (FRG)/Xinhua News Agency	Received orders to supply and install computer systems for processing, storing, and distributing news reports in Xinhua's head offices in Beijing and Shanghai; and to install central computer system and 43 bilingual workstations for English and Russian in Beijing international newsroom. 12/86.
Digital Equipment Corp. (US)/State Education Commission	Signed contract to supply computer system for World Bank-supported Provincial Universities Project. $5.4 million. 12/86.
Fox Research Inc. (US)/ Beijing Polytechnic Institute	LIC: Signed contract to manufacture computer boards and translate database. 12/86.
IBM China Corp. (US)/ State Education Commission	Signed contract to supply computer equipment for World Bank-supported Second Universities Development Project. $1.1 million. 12/86.
MacCaddy Ltd. (HK)/ China Star Technology and Investment Corp., affiliate of NDSTIC	Supplied computerized fire detection system including monitors, alarms, fire control gas, and protective devices for computer center of Geophysical Research Institute near Beijing. 12/86.
NEC Corp. (Japan)/Chinese Academy of Sciences	Agreed to jointly develop Chinese-language keyboard and accompanying software. 12/86.
Sun Hung Kai Securities Ltd. (HK)/State Education Commission	Signed contract to supply computer equipment for World Bank-supported Provincial Universities project. $3.1 million. 12/86.
Fujitsu Ltd. (Japan)/ Huadong Shifan Daxue (East China Teachers' College), Shanghai	Signed memoranda of understanding to cooperate in developing software for scientific computations. 1/87.
Hitachi Ltd. (Japan)/two Shanghai companies	LIC: Reached 5-year agreement for linear IC assembly and testing technology. $12.9 million (J¥2 billion). 1/87.
IBM China Corp. (US)/ Hangzhou Institute of Financial Management of ICBC	Supplied computer system. 1/87.
Matsushita Electronics Corp. (Japan)/Dandong, Liaoning	Awarded contract to supply semiconductor manufacturing technology and related facilities. $2.6 million (J¥400 million). 1/87.
MITI (Japan)/SPC	Will develop data base for economic information. 1/87.
Nisshin Electric Construction Co. Ltd. (Japan)/East China Electric Industry Bureau, Shanghai	Received order for 11 shunt reactors (payment with IBRD loan). $107.5 million (¥400 million). 1/87.
Western Library Network (US)/National Library of China	Signed agreement to supply software for computerized card catalog system. 1/87.

Electronics (Consumer)

Nippon Ferrite (Japan)/ Beijing No. 7 Radio and Television Parts Factory	Supplied equipment and technology to produce color TV set coils. 11/86.
NV Philips (Netherlands)/ Nanjing	Signed letter of intent to provide equipment and technology for color TV tube plant to produce 1.5 million tubes annually. $95.4 million (NG200 million). 12/86.
Fujitsu Ltd. (Japan)/ Chongqing Refrigerator Plant, Fuzhou TV Factory in Fujian, and Foshan Radio Factory in Guangdong	Will produce refrigerators and color TVs for export. 1/87.
Nippon Electric Glass Co. Ltd. and Sumitomo Corp. (Japan)/CEIEC and China Electronics Leasing Co. Ltd.	CT: Signed contract to build glassworks in Anyang, Henan to produce 4.6 million color picture tubes annually, including supplying equipment, technology, and technical guidance. $62 million. 1/87.
The Singer Co. (US)/ Ningxia Islamic ITIC, Shizuishan Municipal Foreign Economic Relations and Trade Commission of Ningxia Hui Autonomous Region, and Ningxia Nonferrous Metals Smeltery	Signed agreement to supply tantalum electrolytic condenser production line. $13.9 million (¥29.28 million plus $5.99 million for purchase of technology and equipment). 1/87.
Singer-Nikko Co. (Japan)/ CITIC and Shanghai No. 1 Sewing Machine Factory	Concluded contract to supply manufacturing technology and equipment and technical guidance, to cooperate on manufacturing sewing machines for home use, and to develop new type of sewing machine. 1/87.
TBS Development Co. (Japan)/China International Television Corp.	Will establish videocassette rental service. 1/87.

Finance, Leasing, and Insurance

Copenhagen Handelsbank A/S (Denmark)/ICBC	Signed agreement to exchange business information and employees. 12/86.
The Nippon Credit Bank Ltd. (Japan)/China Investment Bank	Concluded business cooperation agreement. 1/87.

Food Processing and Food Service

Nippon Reizo KK (Japan)/ CEROILFOODS and Aquatic Products Freezing Plant in Tangshan, Hebei	Will supply prawn freezing plant. 11/86.
NA (Denmark)/ Heilongjiang Sugar Co. and Hailun Sugar Plant	Signed contract to supply 3,000 TPD sugar plant. $17 million. 12/86.
C. Itoh & Co. Ltd. (Japan)/Rudong County, Jiangsu	CT: Put into operation 2,000 TPY frozen vegetable production line. 12/86.
MacBeth Engineering Corp. and Wego Chemical and Mineral Corp. (US)/CNTIC	Supplied potato chip production lines to Potato Chip Researching Center in Enshi (Hubei) and plants in Hohhot (Inner Mongolia) and Taiyuan (Shanxi). 12/86.
Nora Industrier A/S (Norway)/Beijing Five Star Brewery	Signed contract to brew alcohol-free beer. $418,293 (NK3 million). 12/86.
Verenigde Machinefabrieken Stork NV (Netherlands)/Beijing	Signed contract to supply 250,000 TPD dairy product processing plant. 12/86.
(Austria) and (Sweden)/ Yongkang Foodstuff Factory in Hefei, Anhui	Installed equipment for edible oil refining facility to process 60,000 tonnes of rapeseed oil and 20,000 tonnes of refined oil annually. $8.9 million (¥33 million). 1/87.

Machine Tools and Machinery

Transamerica Delaval, Inc. (US)/CNCCC	Signed contract to supply synthetic gas topping turbine internal, two air trains, HP compressor, and spare parts for World Bank-supported Fertilizer Rehabilitation Project. $2.1 million. 10/86.
Century Machine Inc. (US)	Will supply horizontal honing equipment. $95,000. 11/86.
Nokia Corp. (Finland)/ Beijing No. 5 Rubber Factory	Installed PVC boot injection molding line to produce 1 million pairs of boots annually. 11/86.
BSP International Foundations Ltd. (UK)/Ministry of Communications and Third Navigation Bureau	Awarded contract to supply 30-tonne hydraulic piling hammer. $602,520 (£400,000). 12/86.
Cutting Machinery (UK)/ Fuxin Rubber Plant, Liaoning	Received order for machine to manufacture heavy duty conveyor belts. $376,575 (£250,000). 12/86.
Feldmuehle AG (FRG)/ Jiangsu	Will supply used paper machine. 12/86.

Foseco International Ltd., subs. of Foseco Minsep Plc (UK)/Qinhuangdao Refractories Plant	Signed contract to transfer technology and supply specialized equipment to manufacture insulating boards for Chinese steelworks. $1.7 million (£1.16 million). 12/86.
Lentjes AG (FRG)	Signed agreement to cooperate in industrial plant and pipeline construction. 12/86.
Rautomead (UK)/China National Metallurgical Products Import-Export Corp.	Awarded contract to supply continuous casting machine. $301,260 (£200,000). 12/86.
Thermo Process Systems Inc. (US)/CAIEC	Awarded contract to supply gear processing equipment. $1.2 million. 12/86.
Japan Servo Co. Ltd. (Japan)/Changzhou Electrical Machinery and Instrument Factory, Jiangsu	Will supply plant to manufacture 500,000 stepping motors annually. 1/87.

Metals, Minerals, and Processing Technology

Sumitomo Metal Industries Ltd. (Japan)/Anyang Steel Corp. and Dashiqiao Brick Factory	Will supply equipment and technology to manufacture refractory materials for revolving furnaces and assist in improving electric furnace operation. 11/86.
ADE Corp. (US)/Shanghai Smelter No. 2	Shipped two silicon sorters. 12/86.
Schmutz Manufacturing Co. (US)	Signed contract to supply aluminum-processing machinery. $1 million. 12/86.
BNF Metals Technology Center (UK)/Beijing Research Institute for Mining and Metallurgy and copper refinery at Zhuzhou, Hunan	Will modernize refinery. 1/87.
Nippon Kinzoku Co. Ltd. (Japan)/transformer manufacturing plants in Xi'an, Baoji, Fuyang, and Chengdu	Supplied 0.03-mm silicon steel sheet. 1/87.
Nisshin Steel Co. Ltd. (Japan)/China National Metallurgical Products Import-Export Corp. and Taiyuan Iron & Steel Co.	Signed contract to provide expertise and technology for 3½ years to improve production of cold-rolled stainless steel plates. 1/87.
Kaiser Engineers and Constructors, Inc. (US)/CNTIC and Baogang Iron and Steel Complex, Baoshan	Awarded project to design and supply computer-aided heating control system for metallurgical coke oven facility. 2/87.

Military Equipment

GEC Avionics Ltd. (UK)/CATIC	Signed contract to supply electronics to modernize 100 Jian-7 fighter aircraft. $100 million. 12/86.
Department of Defense (US)	Will supply radio and radar equipment. $62 million. 1/87.

Mining Equipment

Kolmex (Poland)/MACHIMPEX	Signed contract to supply 1,700 open coal wagons and transport steering stands. $77.1 million (SwF120 million). 1/87.

Packaging Materials

Kirin Brewery (Japan)/MLI, China National Light Industrial Machinery Corp., and Guanghua Glass Factory in Wukou, Anhui	Will supply portion of bottle-manufacturing plant and supplementary technology. $323,666 (¥50 million). 11/86.
Black Clawson International (UK)	Signed contract to supply process line to convert bamboo into packaging material. $4.5 million (£3 million). 12/86.
Fried, Krupp GmbH (FRG)	Awarded contract to supply three can manufacturing plants. $5.4 million (DM10 million). 12/86.
Chuo Kagaku (Japan)/Beijing Municipal Government and China Railway Administration	Will cooperate in manufacturing polystyrol foam food containers. $400 million. 1/87.

Petroleum, Natural Gas, and Related Equipment

Geolograph-Pioneer, Inc. (US)/Xinjiang, Liaohe, Dagang, and Sichuan Oilfields	Completed first of four scheduled shipments of solids control equipment for oil well drilling. 12/86.
Fluor Corp. (US)/Port of Dalian	Will supply components and equipment for gas plant. 1/87.

Pharmaceuticals

Nippon Zoki Pharmaceuticals Corp. (Japan)/CNTIC	Signed contract to supply plant to manufacture blood products such as gamma-globulin, blood plasma, and albumin in Shanghai. $19.4 million (J¥3 billion). 1/87.

Ports

ICH Coland NV (Netherlands)/Yantai Port, Shandong	Provided technology to build screw dredger for port expansion project. 12/86.

Power Plants and Equipment

Balfour Beatty Ltd., subs. of BICC Plc (UK)/Yueyang, Hunan	Negotiating for 350-mw coal-fired power station. 10/86.
Antona (UK)/Guangdong	Received order for steam components for new nuclear power station. $4.5 million (£3 million). 12/86.
Eb Nera, part of Elektrisk Bureau, which is subs. of Investa, A/S (Norway)/Guangdong General Power Co.	Awarded contract to supply radio transmission line equipment. $5.6 million (NK40 million). 12/86.
State of Washington Export-Assistance Center and Ederer Inc. (US)	Arranged Export-Import Bank guarantee for sale of cableway system to be used in construction of Yantan hydroelectric project. $1.75 million. 12/86.
Weir Pumps Ltd., subs. of The Weir Group Plc, and GEC Turbine Generator Services Ltd. (UK)/Guangdong Nuclear Power Joint Venture Co.	Signed letter of intent to supply six tandem reactor feed pumpsets for Daya Bay Nuclear Power Station. 12/86.

Printing Equipment, Publishing, and Broadcasting

20th Century Fox (US)/CCTV	Barter: Will provide 52 features with six minutes for international sale in each and CCTV will air one feature per week. 12/86.
Baker & Taylor (US)/State Education Commission	Signed agreement to supply books for universities. 1/87.
Paramount Pictures, subs. of Gulf & Western Industries Inc. and Universal Pictures, subs. of MCA Inc. (US)/CCTV	Agreed to supply 100 hours of television shows in return for advertising time. 2/87.

Property Development

Holiday Inns Inc. (US)/Guilin and Dalian	Signed contracts to manage Guilin Hotel and Dalian Hotel. 1/87.
Mainland Investors (Singapore)/Shanghai Jinjiang Holding Corp.	Awarded contract to build Jinjiang Mandarin Hotel in Shanghai. $43.7 million (S$94 million). 1/87.
The Sheraton Corp. (US)/Guilin National Palace Hotel Co., Guangxi	Signed management agreement to operate 567-room Sheraton National Palace Hotel to open in 1989. $40 million. 1/87.
The Sheraton Corp. (US)/Yanyuan International Hotel	Signed contract to manage Sheraton Tianjin Hotel. 2/87.
Tian An Hotels International Ltd. (Sino-US joint venture)	Signed contract to manage Bell Tower Hotel in Xi'an. 2/87.

Scientific Instruments

Uniphase Corp. (US)/Beijing Scientific Instrument Factory	Signed contract to transfer portion of helium-neon laser technology, including production equipment and component parts. $1 million. 12/86.

Shipping

Offshore Marine Engineering Ltd. (UK)/CNOOC	Signed contract to install saturation diving system aboard diving support vessel in Shanghai. $1.5 million (£1 million). 11/86.

Marinteknik Shipbuilders (Singapore), part of Marinteknik Verkstads (Sweden)	Awarded contract to build catamaran units. 12/86.
Koninklijke Nedlloyd Groep NV (Netherlands)/ COSCO	Signed service contract for 160 vessels. 1/87.

Telecommunications

Fujitsu Ltd. (Japan)/CNTIC	Will supply 70,000 circuit electronic switchboard. 11/86.
NEC Corp. (Japan)	Will supply 40,000-circuit electronic switchboards to Tianjin and Guangzhou. 11/86.
(Iran)/Great Wall Industry Corp.	Signed letter of intent to launch communications satellite on Long March III. 12/86.
Dominion Video Satellite, Inc. (US)/Great Wall Industry Corp.	Signed agreement to launch direct-broadcast satellite before December 1987 and a second before March 1988. 12/86.
Furukawa Electric Co. Ltd., Oki Electric Industry Co. Ltd, and Anritsu Corp. (Japan); and Case Communications Ltd. (UK)/Ministry of Railroads	Signed contracts to provide telecommunications to equip Datong (Shanxi)-Qinhuangdao (Hebei) railway. 12/86.
BellSouth International (US)/Shanghai Center	Signed 18-year contract to provide voice and data communications equipment and services. 1/87.
Cable and Wireless Plc (UK)/Guangdong Posts and Telecommunications Administration	Signed agreement to develop mobile radio telephone and paging services in Guangdong. 1/87.
International Telecommunications Satellite Organization (US), subs. of Cable and Wireless Plc (UK)	Will supply satellite repeater to improve communications for rural areas. 1/87.
KDD (Japan)/MPT	Will provide 2,000 telex terminals and four echo suppressors at no cost. 1/87.
Nokia Corp. (Finland)/ Daqing oilfields	Received order to supply telecommunications network including digital switching system for fixed and mobile subscribers. 1/87.
Nokia Corp. (Finland) and Standard Electrik Lorenz AG (FRG)/Ministry of Railroads	Signed two contracts to supply telephone switching, facsimile, and optical fiber systems for Datong (Shanxi)-Qinhuangdao (Hebei) railway. $7 million. 1/87.

Textiles and Textile Plants and Equipment

Sumitomo Bank, Sumitomo Corp., and a garment company (Japan)/Qingdao Textiles Joint Import-Export Corp. and Qingdao No. 7 Knitwear Mill	Will supply 20 knitting machines, one fashion processing equipment set, and 100 sewing machines to set up T-shirt assembly line to process 4 million shirts annually. 11/86.
Hua Shek Co. (US)/ Xinghua Garment Manufacturing Factory (Tianjin) and Tianjin Branch of CHINATEX	Signed contract to provide managerial skills and expatriate managers to supervise operation of two factories. 12/86.
Sir James Farmer Norton (International) (UK)	Awarded contract to supply range of textile machinery including rotary screen printing machine. 12/86.

Transportation and Transportation Equipment

(US)	Signed accord to exchange information on railway science and technology and to work together on railroad projects over next five years. 12/86.
Metro Canadian International Ltd. (Lavalin Inc. and Urban Transportation Development Corp. joint venture) (Canada)/ Beijing Subway Authority and Xiangtan Electric Manufacturing Works (XEMW)	Signed agreement to study Beijing's transit system and plan ring-type subway with four branch lines; will cooperate with XEMW to produce rolling stock for project. 12/86.
Sicma Aero Seat (France)	Awarded contract to supply seats for Airbus aircraft. $500,460 (FF3.10 million). 12/86.
Volvo AB (Sweden)/ Shanghai	Will provide consultancy services and know-how to set up public transport network. $605,923 (SK4 million). 12/86.
Apollo Services, Inc. and United Airlines, units of UAL Inc. (US)/CITS, Beijing	Signed three contracts including supply of computerized reservation services and selling of United's tickets in China (subject to Chinese regulatory approval). 1/87.
Boeing Commercial Airplane Co., unit of Boeing Co. (US) and Rolls-Royce (UK)/Guangzhou Branch of CAAC	Received order for three 757 jetliners. $125 million. 1/87.
Pratt & Whitney, subs. of United Technologies Corp. (US)/CAAC	Received contract for 16 engines and unspecified number of spares for use in Boeing 767 and 747 aircraft. $100 million. 1/87.
Racal-Milgo (US) and Cable & Wireless Systems Ltd. (HK)/CAAC	Signed contract to supply and install computerized airlines reservation system network. $423,000. 1/87.
Verson International Ltd. and Verson Wilkins (UK)/ Shanghai	Will supply presses, provide overall engineering design, and make all critical internal components to produce 100,000 cars annually. 1/87.

Miscellaneous

Southern Illinois University (US)/Hangzhou Teachers College	Signed formal agreement for 5-year program of scholarly exchanges. 11/86.

JOINT VENTURES AND DIRECT INVESTMENT THROUGH MARCH 31

Foreign Party/ Chinese Party	Arrangement/Value/ Date Reported

Agricultural Technology

International Rice Bran Industries Ltd. (US)	Signed six joint venture agreements to supply technology for producing food products from rice bran. 11/86.

Chemicals and Chemical and Petrochemical Plants and Equipment

Loctite Corp. (US)/a Shandong Province co.	Signed joint venture agreement including manufacturing, technical services, sales, and marketing for sealants and adhesives. 11/86.
S.C. Johnson and Son, Inc. (US)/a Shanghai chemical plant	Scheduled to sign agreement establishing joint venture enterprise to produce shoe polish, wax products, insecticides, and cosmetics. $8 million. 2/87.

Consumer Goods

NA (Japan)/Liyuan Township Industrial Co., Wuxi	Put into operation 15-year joint venture to produce photo albums, wrapping paper, and printed plastic paper. $2.7 million (¥10 million). (50–50). 1/87.
NA (US)/a social welfare shoe factory in Jinan, Shandong	Signed contract to establish joint venture to produce 1 million pairs of womens' leather shoes annually. 1/87.
Herald Metal and Plastic Works (HK)/Shanghai No. 1 Aluminum Product Factory, Shanghai Minhang United Development Co., and Shanghai Kailong Investment and Development Co.	Signed contract establishing Herald Metal Products Co. to produce aluminum nonstick cookware. $1.3 million (HK$10 million). (HK:51%–PRC:49%). 1/87.
Maes International NV (Belgium)/Dalian	Set up joint venture to produce kitchenware. 1/87.
Sunstar Inc. and ADI (Japan) and Shuihua Enterprises Development (HK)/ Baiyunshan Pharmaceutical Corp.	Signed agreement establishing Rixing Baiyunshan Co. Ltd. to produce cosmetics and toiletries including medicinal skin-protection products. $3 million. 1/87.

S.C. Johnson & Son, Inc. (US)/a Shanghai chemical plant	Scheduled to sign agreement establishing joint venture enterprise to produce shoe polish, wax products, insecticides, and cosmetics. $8 million. 2/87.

Electronics and Electrical Equipment

Kollmorgen Co. and Dijoh Co. (US)/Shanghai Instruments and Meters Factory and Shanghai Computer Development Corp.	Signed 15-year contract establishing Delta Electric Circuit Co. to produce 50,000 square meters of standard printed circuits annually as well as solder-mask and anti-corrosive printing inks. 12/86.
NV Philips (Netherlands)/ Nanjing, Jiangsu	Signed letter of intent to establish joint venture to build plant to produce 1.5 million TV tubes annually. $95.4 million (NG200 million—for equipment and know-how). (NETH:30%–PRC:70%). 12/86.
Carrier China Ltd., subs. of Carrier Corp., subs. of United Technologies Corp. (US)/Shanghai First Refrigerating Machinery Works	Established 30-year joint venture Shanghai Hezhong-Carrier to produce semi-hermetic compressors, reciprocating chillers, and centrifugal chillers. Total investment in two Carrier ventures (see below): $18.3 million (¥68 million). 2/87.
Carrier China Ltd. Technologies Corp., subs. of Carrier Corp., subs. of United Technologies Corp. (US)/Shanghai Mechanical, Electrical, and Industrial Investment Corp.	Established Shanghai Tong Hui-Carrier Air Conditioning Equipment Co. Ltd. 30-year joint venture to manufacture, market, and service air handlers and air terminals for heating and cooling. Total investment in two Carrier ventures (see above): $18.3 million. (¥68 million). 2/87.
Digital Equipment Corp. (US)/INSTRIMPEX	Signed agreement establishing DEC Beijing Service Center to provide computer maintenance and training. 2/87.

Electronics (Consumer)

NA (HK)/Ningxia Islamic ITIC and Shenzhen General Corp. of Culture and Education Enterprises	Established joint venture to produce video tapes in Shenzhen SEZ. $1.6 million. (HK:25%–NIITIC:61%–SGCCEE:14%). 1/87.

Finance, Leasing, and Insurance

Islamic Bank (Egypt)/ Ningxia Hui Autonomous Region	Put into operation 50-year joint venture China Ningxia-Islam International Investment Co. to conduct financial business activities in and outside China. $40 million investment for Phase-I. Registered capital: $120 million. (50–50). 1/87.

Food Processing and Food Service

Gerber Products Co. (US)	Negotiating contract to establish baby food joint venture in Beijing. 12/86.
Leyland Ltd. (HK)/China Electronic Kitchenware Corp. Ltd.	Put into operation Huali Food Corp. Ltd. in Shenzhen SEZ to produce 45 million tonnes of ham annually. 12/86.
Marubeni Corp., Nitto Food Manufacturing Co., and Toa Shokuhin Kaihatsu Co. (Japan)/a Chinese research institute	Will establish joint venture to produce konnyaku (food made from ground-up root of devil's tongue plant) in Chongqing, Sichuan. $1 million. (MC:37.5%–NFMC:10%–TSK:2.5%–PRC:50%). 1/87.
Suez Asia Development Capital and Pernod-Ricard SA (France) and Caldbecks Macgregor (UK)/Beijing Winery and China Incomic Development Corp.	Signed 14-year contract establishing Beijing Friendship Winery Co. Ltd. to produce 600 TPY of various wines. $967,196 (¥3.6 million). 1/87.
Suntory Ltd. and Toko Inc. (Japan)/CAAC and CITIC	Established 12-year joint venture Beijing Airport Dining Service Corp. $1.9 million (¥7 million). (S:20%–TC:20%–CAAC:50%–CITIC:10%). 1/87.
TME Resources Inc. and OFFA International (US)	Negotiating letters of intent to establish joint venture restaurants. 2/87.

Machine Tools and Machinery

Cord Turbo-Blowers Ltd. (Canada)/Shenyang Blower Works	Signed joint venture agreement to manufacture blowers for sewage treatment. 11/86.
Trasko Corp. (Japan)/ Qingdao Economic Development Corp.	Established Trasko China to produce 100,000 internal combustion engine filters annually. Capital: $2 million. 1/87.
Keytech Co. Inc. (US)/ Chengdu Seamless Steel Tube Plant and Deyang No. 2 Heavy Machine Manufacturer, Sichuan	Established Hua Mei Steel Tube Engineering Corp. to produce steel tube equipment and offer other services related to steel tube industry. 2/87.

Medical Equipment and Devices

International Hydron (US)/Tongji Medical University, Wuhan	Established joint venture to sell soft lenses and solutions. (50–50). 12/86.

Military Equipment

Australian Aircraft Consortium Ltd.	Negotiating contract to purchase and co-produce turboprop trainers. $4 billion. 12/86.

Minerals and Metals, and Processing Technology

GEC Industrial Controls Ltd. (UK)/China Metallurgical Construction Corp. and Ma'anshan Iron and Steel Design and Research Institute, Anhui	Signed agreement to open joint technical department. 10/86.
Leybold-Heraeus GmbH (FRG)/INSTRIMPEX and Technology Popularization Division of Beijing Iron and Steel Research Institute	Opened INSTRIMPEX-Leybold Heraeus Service Center to provide installation, adjustment, and maintenance of instruments and personnel training for iron and steel business. 1/87.
National Research Institute for Metals (Japan)/ Beijing Steel Academy	Will jointly develop iron ore reserves to produce gallium, chromium, nickel, and cobalt including construction of steel mill to produce 1 million TPY of crude steel and 30 million TPY of gallium. 1/87.
New Energy Development Organization (Japan)/Ministry of Coal Industry	Will jointly investigate coal resources in Shandong Province. 1/87.

Petroleum, Natural Gas, and Related Equipment

Kawasaki Heavy Industries Ltd. (Japan)/Fushun, Liaoning	Signed 5-year contract to jointly produce steam generators for oil recovery. 2/87.

Pharmaceuticals

CIBA-Geigy AB (Switzerland)/Beijing General Pharmaceuticals Corp.	Will establish joint venture plant to produce cardiovascular, infection-fighting, and anti-rheumatism products. $11.6 million (SF18 million). 1/87.
Warner-Lambert Co. (US)/CPIC	Began construction of gelatin capsule plant in Suzhou to produce empty hard gelatin capsules. $14 million. 1/87.

Power Plants and Equipment

Huatian Co. (Sino-Japanese joint venture)/ CNTIC, Fujian Provincial Electric Power Bureau, and Fujian Huafu International Tendering Co.	Signed final contract for 1.4 million kw Shuikou hydroelectric station. $147 million (¥550 million). 12/86.
Huangpu Co. Ltd. and Hong Kong Electric Lamp Co. Ltd., subs. of Li Jiacheng Group (HK)/ Wuxi	Established joint venture to build 2.4 million kw power plant. (HK:40%–PRC:60%). 1/87.

Printing Equipment, Publishing, and Broadcasting

Intercontinental Publishing Corp. (HK)/China National Publishing Industry Trading Co.	Established joint venture to produce book on the history of the Long March and a view of life along Long March route. 9/86.
Parry China Development Corp., subs. of Parry Corporation, and ICOM Ltd. (Australia); and COMSAT (US)/CCTV and INSTRIMPEX	Signed 20-year contract to design, develop, and operate international broadcast exchange center in Beijing. $50 million. (PCDC:50%–CCTV:30%–INSTRIMPEX:20%). 1/87.
Xerox Corp. (US)/China Computer Systems Engineering Corp., unit of MEI	Established Beijing Xerox Electronic Printing Center service bureau in Beijing. 2/87.

Property Development

Promises Investment Ltd. (Sweden-Finland-HK joint venture)/Beijing Huaqiao (Overseas Chinese) Mansion	Established joint venture to renovate hotel. Registered capital: $12.25 million. (50–50). 12/86.
NA (Hong Kong) and NA (Switzerland)/Xi'an General Merchandise Corp.	Established equity joint venture to build and manage Xi'an Tongji Mansion with Swiss firm providing financing and management services. $35 million. 1/87.
Deutsche Lufthansa AG, Lufthansa German Centre GmbH & Co. KG, Kempinski International SA, Philipp Holzmann AG, and Heilit-Woerner Bau AG (FRG)/Beijing Municipal Government	Signed preliminary joint venture contract establishing Beijing Lufthansa Center multipurpose business complex including 600-room hotel. $215.3 million (DM400 million). (50–50). 1/87.
NA (Japan)/a local travel agency, Hangzhou	Signed contract to build Putuoshan International Hotel. $4.5 million. 2/87.
Ansett Transport Industries Ltd. (Australia)/Jiangtai Rural, Agricultural, Industrial, and Commercial Combine of Beijing	Signed final agreement to build business service center. $13.2 million (A$20 million–first phase). 2/87.
Aon Alpha Construction Co. (Canada)/Guilin Municipal Travel and Tourism Corp.	Established Guilin National Palace Hotel Co. to construct Sheraton National Palace Hotel. 2/87.
CIT-UIC (Singapore-Sino joint venture)/Tianjin Travel and Tourism Corp.	Established Yanyuan International Hotel Co. to construct Sheraton Tianjin Hotel. 2/87.

Shipping

EAS Express Aircargo System (China) Ltd. (HK-Sino joint venture)/SINOTRANS	Concluded agreement for a joint operation in port of Tianjin to transfer shipments between land and sea. 1/87.

Telecommunications

Ericcson Information Systems Sverige AB (Sweden)/Beijing Jingan Co.	Signed contract establishing Beijing service center for radio communication systems. 12/86.
Training 'n' Technology Inc. (US) and SEC Technologies (Canada)/Chinese Academy of Electronics Technology	Establishing 15-year joint venture SINO-CAD circuits to build PCB plant in Zhuhai SEZ. 12/86.

Textiles

Nichii Co. Ltd. (Japan)/Dalian	Established joint venture clothing plant. 11/86.
Marubeni Corp. (Japan) and NA (HK)/Shenzhen Hualian Textiles Co.	Signed joint venture contract to establish two lady's garment plants in Shenzhen. $192,246 (HK$1.5 million). 12/86.
Marubeni Corp. (Japan) and Nanji Knitting Co. Ltd. (HK)/Zhuanglun Enterprise	Signed joint venture contract to establish garment plant in Fujian. $192,246 (HK$1.5 million). 12/86.
China Thread Development Co. Ltd. (HK)/Guangzhou No. 2 Cotton Mill	Put into operation Guangying (Guangzhou-Britain) Yarn Co. Ltd. joint venture to annually produce 23,000 spindles of polyester yarn for industrial sewing machines. $10.8 million. (50–50). 1/87.
Gruppo Finanziario Tessile SpA (Italy) and Natcan Finance (Asia) Ltd. (HK)/CITIC, Tianjin Economic and Technological Corp., Tianjin Garment Industry Co. Factory No. 12	Established Tianjin Jintak Garments Co. Ltd. to produce 200,000 Western-style suits annually. Registered capital: $2 million. 1/87.
Proneco Co. (Spain)/Beijing Textile and Garments Development Co. and Beijing ITIC	Established Beijing Fashion Corp. to produce 150,000 women's garments annually, including overcoats, Western-style dresses, pants, and skirts. $1 million. (PC and BITC:45%–BTGDC:55%). 2/87.

Transportation and Transportation Equipment

The Flying Tiger Line Inc., subs. of Tiger International Inc. (US)/CAAC	Established joint air cargo venture for charter flights between China and other countries. 10/86.
Hutchison Whampoa Ltd. and Lockheed Aircraft (Asia) Ltd. (HK), subs. of Lockheed Corp. (US)/Guangzhou Branch of CAAC	Submitted proposal for establishing 30-year joint venture aircraft service center in Guangzhou. (HWL:25%–LC:25%–PRC:50%). 12/86.
DHL International Ltd., subs. of DHL Worldwide Express (US)/SINOTRANS	Signed agreement establishing DHL SINOTRANS air express joint venture in Beijing. 1/87.
Protech Capital Investments (Australia)/Jiangsu Automobile Company	Signed letter of intent to coproduce Chinese economy car that will run on soybean and diesel fuels. 1/87.
Shortridge Co. (HK)/CITIC	Opened Union Car Rental Co. joint venture in Beijing offering rental and repair services. 1/87.

Miscellaneous

ACT Enterprises Pte Ltd. (Singapore)/Tianjin Municipal Science and Technology Co.	Will open Tianjin International Science and Technology Consultants Co. to offer consulting, design, production, and sales services. 1/87.
Koike Manufacturing (Japan)/Beijing	Will set up technical service center. 1/87.
(FRG)	Signed agreement to jointly run industrial technology training center in Tianjin to train teachers, managerial personnel, and technicians to work in machinery and electronics cooperation enterprises and in economic and technological cooperation projects. $5.4 million plus $13.4 million (FRG:DM10 million plus DM25 million as loan). 2/87.

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