

# THE CHINA BUSINESS REVIEW

MARCH-APRIL 1996

VOLUME 23 NUMBER 2



## TALKING TELECOM ~~TALKING TELECOM~~

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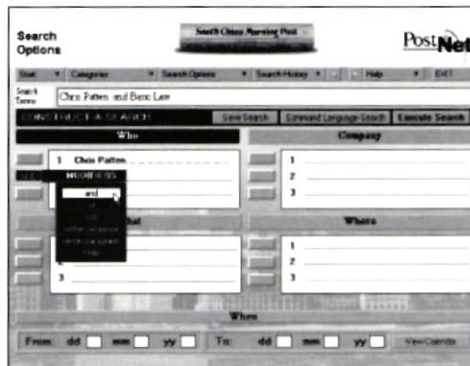
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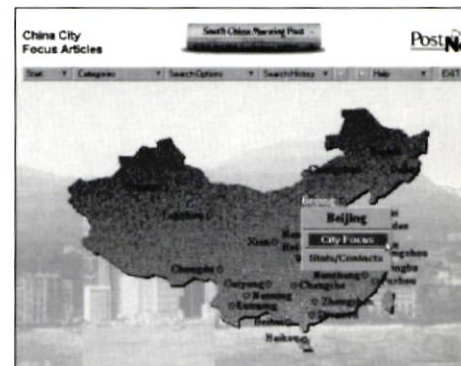
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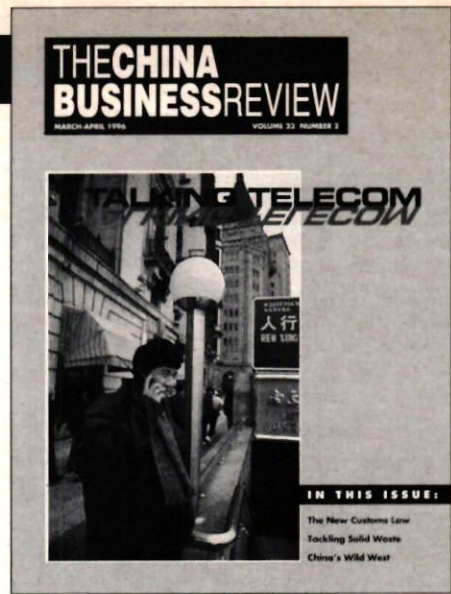


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## Easing up on Foreign Exchange

China announced new regulations in February on purchasing foreign exchange. The People's Republic of China Regulations on Management of Foreign Exchange, which take effect April 1, 1996, replace the 1980 Provisional Regulations and allow both Chinese enterprises and foreign-invested enterprises (FIEs) to exchange *renminbi* for foreign currency at local banks.

The SAEC has confirmed, though, that the annual inspection requirements for FIEs are still in effect. Under that system, quietly implemented in March 1995, FIEs are required to submit audited financial records to the SAEC once a year for authorities to check compliance with contract provisions. If the SAEC deems an FIE's finances to be in order, it issues a certificate enabling the FIE to open a foreign-currency account.

The new rules allow FIEs with foreign-currency accounts to swap currency at a local branch of one of the

large PRC banks—such as the Bank of China, the Industrial and Commercial Bank of China, and the Agricultural Bank of China—permitted to handle foreign currency and linked to the national interbank trading system.

The new regulations standardize a system of limited, *de facto* convertibility that has been in place since late 1993. Before that time, companies could meet all the legal requirements for making an exchange but still be left holding their *renminbi* because dollars were in short supply at the swap centers.

Many ambiguities are embedded in the new rules, however. Chinese companies appear to be able to hold onto their own foreign exchange, for example, in contradiction to the April 1994 regulations prohibiting domestic PRC companies from retaining any foreign currency earnings. The new regulations make the swap centers unnecessary, but there is no clear word on how and when the

swap centers will be eliminated. Council sources suggest June 1996 as a target date. And, while the SAEC reaffirmed that pricing in and circulation of foreign currencies within China (except for Shenzhen) is strictly illegal, foreigners likely will continue to see goods and services priced in foreign currency.

The early analysis is that the new regulations provide investors with a thin margin of security rather than a blanket assurance that their *renminbi* earnings will be convertible. It is customary in China, however, for practice to precede stated policy. Perhaps the best assurance China can provide to foreign investors of the *renminbi*'s limited convertibility is the approximately \$73 billion in foreign reserves held by the central bank as of early 1996.

—Anne Stevenson-Yang

*Anne Stevenson-Yang is director of the Council's China operations.*

### SHORT TAKES

#### Turning Inward

Nine cities in China's interior have been added to the list of those "open" to foreign investment and, thus, allowed to offer special tax incentives to foreign investors. The nine cities are Baoji, Shaanxi Province; Jinyang and Panzhihua, Sichuan Province; Zunyi and Liupanshui, Guizhou Province; Mudanjiang and Jiamusi, Heilongjiang Province; Guilin, Guangxi Province; and Yili, Xinjiang Uygur Autonomous Region. Of the 350 cities previously designated as "open" in China, only 40 were located in inner provinces. Open cities may offer foreign ventures a 24 percent tax rate, less than the standard 33 percent rate, but higher than the 15 percent rate available to foreign firms in the country's 30-odd economic development zones.

#### A China-Sized Train Station

The first phase of Beijing's new train station, which will be the largest in Asia, opened in late January. Phase one of the Beijing Western Railway Station cost \$720

million and took 20,000 workers three years to complete. When the second construction phase is finished, scheduled for 2000, the new station will be 10 times larger than the old station and will be able to handle 600,000 passengers daily.

#### Chinese Yankees

The PRC government issued \$400 million in dollar-denominated securities for sale in the United States in late January. The Yankee bonds included \$300 million in seven-year, 6.625 percent notes priced 113 basis points above seven-year US Treasury bonds, and \$100 million worth of 100-year 9 percent bonds, priced at 299 basis points above 30-year Treasury bills. The notes were given favorable ratings of A3 by Moody's Investor's Service and BBB by Standard & Poor's Corp.

#### The Top 10 Jobs

According to a recent survey by the Shanghai Vocational Education Research Institute and the *Personnel Market News*,

the most popular occupation in Shanghai was salesperson, followed by electrical and electronics engineer, a category that includes computer programmers and operators. Administrative and managerial positions, accountants, secretaries, and mechanical engineers and technicians were among the other prized jobs.

#### Restrooms a Must

Since February, according to Shanghai authorities, department stores, restaurants, and other businesses open to the public have been required to provide customers with clearly signposted toilets and hand-washing facilities.

#### Let Them Eat Bamboo

The Beijing Zoo's 14 giant pandas reportedly were suffering from indigestion earlier this year as a result of an arrow bamboo shortage. Zoo keepers were forced to feed them beef, eggs, apples, carrots, and other non-standard panda fare. Giant pandas typically prefer to eat up to 10 kg of bamboo a day.

# China Retains its FDI Allure

Foreign direct investment (FDI) flows into China last year remained strong. For the second year in a row, China ranked second only to the United States as a host country for foreign direct investment (FDI). After three years of large increases, however, the growth rate of China's FDI appears to be slowing. The total number of projects approved fell roughly 31 percent, from about 34,000 during the first nine months of 1994 to 23,508 for the same period in 1995, according to Ministry of Foreign Trade and Economic Cooperation (MOFTEC) sources. Contracted investment fell from \$56.9 billion between January-September 1994 to \$50.5 billion over the same nine-month span in 1995, posting an 11 percent drop.

The value of US investment in China, which tends to consist of long-term, high-tech investment projects, rose slightly during the first three quarters of 1995, albeit more slowly than in 1994. In the first three quarters of 1995, US companies signed contracts for approximately 2,265 deals, a 25 percent de-

crease over the same period in 1994. In dollar terms, the US deals were worth about \$4.1 billion.

The plateau in the growth of new FDI stems, in part, from the finite supply of investment capital worldwide, but also reflects Beijing's tight credit policy. Beijing's promulgation last year of more selective investment guidelines and reductions in the value-added tax refund rate discouraged new export ventures from Hong Kong and Taiwan, the leading sources of foreign investment in the PRC's low-margin, export-processing ventures. Speculative real estate investment and the establishment of "false foreign devils"—foreign-invested projects that recycle PRC capital into China to take advantage of the preferential treatment accorded to foreign capital—also were adversely affected by the new investment guidelines.

—Piper Lounsbury, Dan Martin

*Piper Lounsbury and Dan Martin are with the Council's business advisory services.*

## PRC Revokes Import Tax Exemption

The State Council, as expected, repealed the tax and tariff exemptions for foreign-invested enterprise (FIE) imports of capital equipment at the end of 1995, though the government has yet to release the State Council order revoking the exemption. Ministry of Foreign Trade and Economic Cooperation (MOFTEC) sources say that the implementing regulations also remain "internal," but could be released shortly.

For now, it appears that projects approved prior to April 1, 1996, will be eligible for grandfather exemptions. Projects with total investment under \$30 million will be allowed to import capital goods tax- and tariff-free until the end of 1996; those with total investment in excess of \$30 million will have until December 31, 1997, to do

so. For projects that do not enjoy grandfather status, the Council estimates the new policy will mean an average increase of around 30 percent in project costs. In addition, many projects approved last year will apparently require re-approval. In early February, the State Planning Commission, the State Economic and Trade Commission, and MOFTEC issued a joint notice requiring that all projects approved locally between October 1, 1995, and March 31, 1996, be reapproved at the central level. Beijing's motivation for this latest move is to weed out deals that are inconsistent with national investment goals.

—Dan Martin

*Dan Martin is manager of the Council's investment program.*

## THE CHINA BUSINESS REVIEW

The magazine of the US-China Business Council

美中商貿評論

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PRINTED IN THE USA

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*The China Business Review*, ISSN No. 0163-7169, is published bimonthly by the US-China Business Council, 1818 N Street NW, Suite 200, Washington DC 20036-5559, USA (Tel: 202/429-0340), a nonprofit organization incorporated under the laws of the District of Columbia. Second class postage paid at Washington, DC, and additional mailing offices. Postmaster, please send address changes to *The China Business Review*, 1818 N Street NW, Suite 200, Washington DC 20036-5559, USA.

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Annual Subscription rates: \$99 US/Canada; \$150 international. Single copy issues: \$20, airmail \$25; issues over 1 yr: \$10, airmail \$12.50. DC residents add 5.75% sales tax.

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Robert A. Kapp

## Steady As You Go

We're at sea again, but staying the course

Welcome to the tumultuous spring of 1996, a challenging season for the US-China business community and for US-China relations in general. The ark of US-China affairs is being tossed by confusing and conflicting currents. A long list of acrimonious issues confronts us in trade, the nonproliferation field, human rights, and Pacific security affairs.

The task of defining and maintaining a satisfactory overall relationship between China and the United States in the face of the myriad specific irritants is a daunting one. Devotees of "The Relationship" must focus on common US-China goals, aspirations, responsibilities, and interests above the drumbeat of reciprocal annoyance on both sides of the Pacific.

And the smell of domestic politics hangs heavy in the air. Each issue, each clash of press releases, each negotiating deadline in the spring of 1996 is jostled by the positioning exercises of candidates in pursuit of high office and by media with their eye on the big domestic political story of the year.

American businesses engaged with China watch with concern. We have worked extremely hard each spring to defend stable US-China economic relations; this year, it seems, our mission may be even tougher. Political insiders give us conflicting advice: "Stick closely to business topics; you're not qualified to have opinions on anything else" ver-

sus "Don't just talk about narrow business topics lest you be disparaged for your narrow materialism." Well, we might as well say what's on our minds; sitting around hoping the storm will blow over isn't going to work. So here are three basic points we should memorize for ourselves and suggest over and over again to others debating US relations with China this year:

■ **MFN=NST, or NO SPECIAL TREATMENT** Say it and remember it. This spring, we must bury yet again the persistent and utterly mistaken notion that "MFN," or Most Favored Nation, trade status is a special gift that favors China. Of course, the truth is the exact opposite: MFN is nothing special. The United States maintains MFN/NST trade with all but a tiny handful of nations (North Korea, Cuba, and a few others) worldwide. It is the wholly ordinary trade treatment the United States and China grant to each other on the basis of a bilateral trade agreement signed in 1980. The Jackson-Vanik Amendment to the 1974 Trade Act requires the President to review and renew MFN/NST annually for non-market economies, and to date the amendment has been applied to the PRC. In its genesis, though, Jackson-Vanik aimed to condition America's MFN trade with the Soviet Union on proof of Moscow's willingness to permit the emigration of Soviet Jews. The USSR is history and emigration from China has

never been a serious issue between the United States and the PRC. But Jackson-Vanik still causes bitter annual political convulsions over MFN.

The MFN/NST storm in the months to come is expected to be very rough, perhaps the roughest it has been since the Tiananmen disaster. The US-China Business Council and our allies will be doing our utmost to defend normal economic and trade relations between the two countries. Can we at least hope that everyone interested in this debate, including every single member of the US Congress, will understand once and for all that **MFN=NST, or No Special Treatment?**

■ **ECONOMICS: THE ANCHOR** The United States and China continue to face serious disagreements in the economic and commercial sphere. The US business community has been resolute in its determination that US officials pursue vigorously at the government-to-government level the rapid improvement of the Chinese business environment and the elimination of a long list of discriminatory policies and barriers to the pursuit of business development with and within China.

The business community, however, can also legitimately claim that the record of US-China business progress since the 1970s is the most positive aspect of US-China relations overall. America sells to, and buys from, China at great benefit to itself; if the benefit

weren't there, the business wouldn't be, either. Moreover, US commercial investments in China are strategic commitments to the long-term future viability of US-based companies and the US global economic position. US exports to China create hundreds of thousands of US jobs. American operations in China contribute quietly but effectively to China's evolution in ways that most Americans would welcome, by encouraging PRC progress toward a market economy, global economic responsibility, and individual opportunity and fulfillment.

Our economic relations with China are and will remain the centerpiece of post-Cold War US-China ties. The metaphor of the anchor is appropriate. The US-China economic relationship holds the ark of our relations reasonably steady. If we sever the anchor chain, we cast the ark adrift. Broader US interests are served by well-grounded US-China relations: the two nations need to cooperate in regional security, scientific and technical interchanges, and other global fields of shared interests. Can anyone seriously maintain that those interests would be better served by the rupturing of normal trade and investment relations? I think not.

■ **TO DEAL WITH THE PRESENT WE MUST TAKE ACCOUNT OF THE PAST**

Fierce winds may be blowing our boat about, but this isn't the first storm. The United States and China today are playing out the latest act of a drama that began in the 18th century. If we do not understand the power of that legacy in shaping our course today we will harm ourselves. The problem is not that Washington or Beijing will intentionally equate the present with the past; rather, the danger is that one or both sides will fail to see the longer-term traditions and tendencies that continue to shape our relations today.

For example, what most Americans see as the militant Chinese defense of PRC sovereignty today, in the form of powerful sensitivity to foreign "interference in China's internal affairs," has its roots in the very definition of modern Chinese nationhood. The two great Chinese political forces of the 20th century—the Kuomintang and the Chinese Communist Party—were both predicated on reclamation of China's compromised

dignity and on the expulsion of foreign domination after a "century of humiliation." Westerners today sometimes have trouble taking this Chinese view seriously, but we ignore such historical legacies at our peril.

Our musings today over the future course of China's development—toward more restrictive nationalism or toward economic cosmopolitanism—have an ancient ring to them. In 1932, only four years after Chiang Kai-shek's army had set up the new National Government in Nanking, the Chinese Communists were largely bottled up in the remote mountains of Jiangxi, and US and other foreign businesses enjoyed special privileges on Chinese soil—privileges that dwarf the reciprocal concessions of today's WTO system. Musing about China's future economic evolution, a now-obscure scholar named Enid Ware noted:

Where the balance will rest between extreme policies of political nationalism, and economic development and stability, it is, at present, impossible to determine...Chinese sovereignty and opportunity for Chinese—vital interests of China and the Chinese—are undebatable. Details of policies and their effect upon foreign business are alike unpredictable. Will they be governed by the Chinese experienced in business, the moderates, who declare that business knows no national boundaries, who believe that out of business development China will achieve what she wants?... Here, within China itself,

is the conflict between nationalism and party politics on the one side, and the economic well-being of the nation on the other. Will the Chinese cling to politics or will they work out their economic well-being?

[*Business and Politics in the Far East* by Enid Ware. New Haven, CT: Yale University Press, 1932.]

The times and the actors were different, but the core concerns 60 years ago have an eerily yet reassuringly familiar ring. We are taking part in an evolving encounter with a long history. Progress must be continuous, but without the perspective of time—something too often in short supply in the public dialogue on China—the problems of today can feel more monumental, more colossal, than a longer view might justify.

We hear, this spring, more and more calls for a "fundamental re-evaluation" of US-China relations. Think tanks and public policy associations are turning to major research projects on China's future global role, on the future of US-China relations, and indeed on the nature of US policymaking on China matters. All of this is to the good; US policymaking thrives on free and open (hopefully, thoughtful and well-grounded) discussion. For now, we in the core constituency of contemporary US-China relations need to reiterate these three points:

- MFN=NST — No Special Treatment;
- Economics are the Anchor of the US-China Relationship; and
- To Handle the Challenges of the Present, We Must Keep the Past in Mind.

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# On the Fast Track

## Modest liberalization in China's telecommunications sector means more sales—and new competition

Alexandra Rehak and John Wang

China's telecommunications market has undergone unprecedented growth over the past two years. The public network in the PRC has developed faster than that of any other country, fueled in large part by a tremendous increase in competing suppliers. Foreign vendors have stopped at nothing to establish a foothold in China's market, agreeing to cut equipment prices and transfer technology on a scale they would not even consider in most other foreign markets. At the same time, these firms have signed countless memoranda of understanding (MOUs) to invest in network development.

Competition from domestic groups, too, is helping to spur modernization of China's telecom sector. On the operating side, the emergence of a second telecom provider in 1994 and the sharp increase in the number of PRC paging and value-added services companies have changed market conditions significantly. On the vendor side, Chinese-designed telecommunications equipment could begin to give foreign suppliers a run for their money.

### The end of a monopoly

The Ministry of Posts and Telecommunications (MPT), under the leadership of the State Council, remains the major player in China's telecommunications sector. MPT, which held a monopoly over all telecom services until 1994, is responsible for policy, equipment approval, planning, and interprovincial network

construction and operations. MPT operates China's vast public fixed network, the majority of the country's cellular and paging networks, and national packet-switched and digital data networks. Originally, MPT had complete responsibility for both regulation and operation of networks. In 1993, a new division, the Directorate General of Telecommunications, was spun off from MPT to handle telecom network operation and maintenance. The transfer of responsibilities between the two entities is still not complete, however, and many aspects of network operation remain under MPT's direct control.

MPT's 30 provincial and municipal posts & telecommunications administrations (PTAs) have considerable autonomy in planning provincial networks and investing in network development. Though MPT retains authority over network standards and any portion of the local networks connected to the national network, some PTAs purchase or install non-MPT approved equipment. The amount of a PTA's telecom autonomy seems to vary according to the wealth of the province. PTAs in the poorer central and western parts of China, in particular, face difficulties financing much-needed expansion. The larger customer bases in the more affluent coastal provinces and municipalities, including Guangdong, Shanghai, Beijing, and Tianjin, generate substantial revenues for the PTAs in these localities, which thus have more funds to reinvest in telecom networks.

At the local level, posts and telecommunications bureaus (PTBs) within cities and towns are responsible for planning, approving, and installing the local portion of the fixed, paging, and cellular networks and can select suppliers. Like the relationship between PTAs and MPT, though, the amount of autonomy PTBs have relative to the provincial-level PTA depends on their financial strength.

MPT saw its income from telecommunications services more than double from 1992-94, from ¥22.18 billion (\$2.67



■ Alexandra Rehak and John Wang are senior associates at Pyramid Research, Inc., a telecommunications market research and consulting firm with offices in Cambridge, Massachusetts and Singapore. The information in this article was drawn from a February 1996 Pyramid Research study, *Telecommunications Markets in China*.



billion) to ¥56.1 billion (\$6.76 billion). Fixed-asset investment in posts and telecommunications grew from ¥13.7 billion (\$1.65 billion) to ¥69.3 billion (\$8.35 billion) over the same period. MPT has had to reconsider its development strategy, however, in the face of competition from newcomer China United Telecommunications Corp. (Unicom). A State-owned company authorized by the Chinese government to compete with MPT in all spheres of telecommunications operation, Unicom came into existence through the political backing of three powerful ministries—the Ministry of Railways (MOR), the Ministry of Electronics Industry (MEI), and the Ministry of Power Industry (MOPI)—and the financial support of 13 influential PRC investors, including China International Trade and Investment Corp. MOR and MOPI, both of which operate extensive private telecom networks, supported the creation of Unicom because they hoped to utilize their excess communications capacity by offering public network services. MEI, which is primarily involved in the manufacture of telecommunications equipment, was a natural partner for Unicom. By mid-1995, Unicom had invested an estimated ¥700 million (\$82 million) in network installation nationwide.

Unicom has ambitious plans to install a national trunk network based on the private network infrastructure of its investors. But to generate revenues quickly, it is focusing first on cellular services and has been a driving force behind the spread of the GSM digital cellular standard in China (see glossary). Revenues from Unicom cellular networks will be funneled back into fixed network development. MPT has attempted to stave off Unicom's cellular plans by dragging its heels on interconnection agreements with Unicom. MPT controls the local wireline networks to which a cellular network has to connect for cellular subscribers to make international and domestic long-distance calls (see p.14). MPT also is expected to try to thwart Unicom's planned local fixed-network installations, which require connection to MPT's extensive local and long-distance networks. In mid-1995, the State Council intervened to require an interconnection agreement

## TELECOM TERMS

Like other high-tech fields, the telecom industry has developed its own vocabulary:

### **Code Division Multiple Access (CDMA):**

CDMA is the newest American digital standard to receive approval by the US Telecommunications Industry Association. Approved in August 1993, the standard promises to deliver far greater capacity gains than GSM and is expected to require fewer cell sites to achieve the same coverage. CDMA now enjoys limited commercial use in some parts of California, Hong Kong, and South Korea.

### **Electronic Data Interchange (EDI)**

This series of standards provides for computer-to-computer exchanges of business documents via telephone or data lines. EDI is commonly used for the transmission of purchase orders, shipping documents, and invoices.

### **Global System for Mobile Communications (GSM):**

A pan-European standard for digital cellular communications, GSM is emerging as the dominant digital standard in Asia.

### **Integrated Services Digital Network (ISDN):**

This service combines voice, data, and imaging signals onto a single digital stream. An ISDN line enables the telephone, cable television, and computer industries to provide integrated telecommunications service.

### **National Roaming:**

This technology allows cellular phone subscribers to make and receive their calls outside of their designated service areas. In China, the interconnection of all analog networks in 30 provinces, municipalities, and autonomous regions enables analog cellular customers to "roam" anywhere in the country.

### **Personal Communication Systems (PCS):**

These wireless communication systems use "microcells," or radio cover-

age areas that are smaller than those used by traditional analog and digital cellular systems. Well suited for shorter calls within urban areas, PCS service offerings usually include Personal Communication Networks (PCN) and advanced paging and messaging services.

### **Private Branch Exchange (PBX):**

Smaller-scale telephone switching equipment that traditionally is used by businesses or hotels to manage and direct telephone service, PBX exchanges also have been used in some less-developed telecom infrastructure markets as an economical alternative to larger central-office switching systems.

### **Synchronous Digital Hierarchy (SDH):**

This digital transmission structure operates by organizing information streams into "payloads" and inserting them into time-synchronized networks. SDH-based networks offer greater control over discrete streams of information and enhanced operation, administration, and management capabilities.

### **Total Access Communications Systems (TACS):**

The industry standard for analog cellular telephone communications, TACS operates in the 900-MHz range.

### **Videotex:**

This system provides for two-way interactive electronic data transmission or one-way information retrieval via telephone or data lines. Individual home subscribers can use videotex to access information such as news and weather reports.

### **Wireless Local Loop (WLL):**

Using wireless technology, WLL, an alternative to the traditional fixed-line medium, provides subscribers with access to the local telephone network. Stationary WLL systems enable quick-installation for new subscribers. WLL does not compete with the cellular technology that is employed in mobile phones.

between MPT and Unicom, enabling Unicom to launch GSM service in July 1995. Competition from Unicom, particularly in long-distance service, is one reason MPT is installing cross-provincial high-capacity synchronous digital hierarchy (SDH) fiber-optic trunks.

Paging operators, too, face growing competition. Prior to 1993, hundreds of

paging operators had been selling pagers illegally. In late 1993, paging, 450-MHz and 800-MHz mobile radio services, and domestic very small aperture satellite (VSAT) network operations were officially opened to non-MPT operators. Consequently, over 1,700 licensed paging operators in China now compete with MPT. And the decontrols

contributed to a boom in subscriber-ship—from 17.7 million paging subscribers at the end of 1994 to over 26 million at the end of 1995. Other telecom services that have been liberalized, such as electronic data interchange and videotex, have yet to see such dramatic growth, but the paging-sector reforms suggest that the gradual opening of

## High Hopes, Shallow Pockets

Beijing's restrictions on foreign equity ownership in telecommunications operating ventures remain a major stumbling block to telecom financing. For foreign telecom firms unable to provide their own financing packages to Chinese buyers, current financing options include: supplier credit, foreign government-sponsored loans, commercial loans, term repayment plans that a supplier arranges with a foreign bank, and World Bank or Asian Development Bank financing. Build-operate-transfer financing structures have not proven popular with telecom authorities. Soft-loan financing from foreign governments, once a favored financing tool, has declined since 1992, when new Organization for Economic Cooperation and Development rules curtailed these loans. China's efforts to tame runaway economic growth also led to tighter internal controls on foreign loans. A moratorium specifically targeting foreign loans for telecom equipment imports was instituted in the early 1990s, though it was loosely interpreted in 1994-95 and recently was relaxed.

As with many developments in the China market, the push to expand financing options is emanating not from the center but from local and provincial telecom authorities eager to accelerate network development. More and more foreign suppliers are being forced to arrange favorable financing terms themselves to win equipment contracts. Installment payment plans, which in effect serve as low-interest loans to Chinese buyers, have become an increasingly common means of financing equipment purchases. Average interest rates for installment payments range from 3-5 percent and are normally paid in *renminbi*

to a Chinese bank, with a Chinese financial institution or the MPT itself acting as guarantor. Some joint ventures also offer leasing as an option, but many local and provincial telecom authorities consider the rates too high. Under a typical leasing arrangement, charges are set one to two percentage points above the London Inter-Bank Offered Rate, and the buyer assumes ownership of the equipment at the close of the lease period. Since payments can be made in *renminbi* for joint-venture equipment, the buyer has no foreign exchange payment commitments. Leasing has been most commonly used for cellular network construction, where capital inflows are rapid enough to make this option cost effective.

As operators devise new ways of circling the restriction on foreign equity ownership in telecom joint ventures, it seems inevitable that authorities will relax the rules. The much-publicized 1994 agreement between Hong Kong Telecom (HKT) and the Beijing Telecommunications Authority (BTA) is one example of creative financing: HKT is funneling \$259 million into the construction of a 3,000-km fiber-optic link between Beijing and Hong Kong and a GSM cellular network in Beijing. While details of the agreement remain private, it is widely assumed that HKT will provide informal operations assistance and share operating profits with BTA. Such an agreement clearly poses a risk to the foreign partner, who lacks formal control over operations and management. To counter the risk, several foreign partners to telecommunications joint ventures have insisted on appointing foreign "technical advisors" when negotiating telecom projects. Nonetheless, without equity ownership, foreign investors have

few legal guarantees if the project fails—and no official control over management of the network.

Financing difficulties reportedly have plagued newcomer Unicom from its inception. Despite its roster of cash-rich backers, including China International Trade and Investment Corp. and the Ministry of Railways, Unicom lacks sufficient capital to dive into construction of its planned long-distance backbone. The company has invested in networks in a manner that skirts China's restrictions on foreign equity ownership in telecom operating ventures: Unicom encourages prospective foreign investors to form joint ventures with its subsidiary branches, which invest in Unicom's network development and operate networks that have no direct ties with the foreign partner. The sub-branch then funnels a share of its revenues back to the foreign partner, its parent branch, and Unicom.

Unicom has established numerous alliances with foreign companies looking to assist in network development. While many of these agreements take the form of nebulous promises of cooperation, some formal contracts have been signed in which foreign operators commit to provide both monetary and technical assistance. For example, Unicom's agreement with Singapore Telecom (ST), signed in October 1995, is the basis for ST's \$18 million investment in GSM network development in Jiangsu Province. The arrangement bypasses the limitation on equity ownership in network service by giving ST a stake, not in Unicom, but rather in a joint venture with a company affiliated with Unicom.

—Alexandra Rehak

China's telecom market will encourage domestic competition in other areas as well.

**Unparalleled investment**

The scale of China's plans for telecom network development lacks comparison anywhere in the world (see p.12). MPT plans to add 12-14 million new lines of switching capacity—the equivalent of the entire network capacity of a regional Bell operating company in the United States—annually during the Ninth Five-Year Plan (FYP) from 1996-2000. MPT plans include the addition of 114 million lines of public network switching capacity by 2000, though some MPT sources cite targets as high as 140 million lines of new capacity, including toll and PBX exchange lines. The ministry is planning to more than double the number of toll-switching circuits during the coming five years. Its plans call for telephone density (the number of telephones per 100 people) to reach 8 percent nationwide, and 30-40 percent in urban areas, by 2000. MPT expects to have 10 million mobile phone subscribers by 2000, but given current demand and growth rates, this target likely will be surpassed well before 2000—even excluding Unicom cellular subscribers.

Data networks, including the China Public Packet Switching Data Network (ChinaPac) and China Public Data and Digital Network (ChinaDDN), are being installed so quickly at the local and provincial levels that these targets will likely be surpassed as well. Currently, foreign companies are prohibited from holding equity stock in data-service joint ventures. Sprint International and Asia-Info Services, Inc., however, are serving as systems integrators in the implementation of national data networks and Internet platforms. MPT and a second data services provider, Jitong Communications Co., will be the main purchasers of data service equipment from mostly foreign vendors.

Not included in Beijing's plan for the telecom sector are Unicom's own far-reaching telecom goals for 1996-2000. Unicom is expected to become a significant purchaser of public network transmission equipment from 1996 onward, with sales forecast to pick up significantly in 1997 as the carrier expands its national long-distance network. Unicom also is

Allocation of funds for rural network development has taken a back seat to flashier urban projects.

likely to increase its purchases of trunk-switching equipment during this period. By the year 2000, Unicom aims to have 2.4-3.0 million mobile phone subscribers (roughly 30 percent of the national subscribership, according to MPT estimates) and provide 10 percent of national long-distance services. Unicom plans to boost China's telephone penetration rate by one percent in the next five years by providing about 300,000 users in more than 10 major cities with fixed-line telephone service.

Left off both the MPT and Unicom blueprints, for the most part, are rural networks—one area of China's public telecom network that has yet to see significant growth. The rural population of 800 million has been seriously underserved so far, with allocation of funds for rural network development taking a back seat to flashier urban projects such as trial

integrated-services digital networks (ISDN) and digital cellular operations. Rural lines nearly doubled during the Eighth FYP (1991-95), but still accounted for less than 26 percent of all switching capacity in China at the end of 1994. MPT leaves most rural-network planning to local and provincial authorities, though it provides limited funding for overall rural installation targets. Generally strapped for cash, rural PTBs have a reputation for accruing debt, making them less-than-popular customers for foreign suppliers and domestic manufacturers. Beijing's ambitions aside, rural networks will continue to lag behind urban networks during the Ninth FYP period.

**Leaping into high-tech telecom**

China has become the world's largest testing ground for some of the newest telecom technologies. Following the lifting of restrictions imposed by the Coordinating Committee on Multilateral Export Controls (COCOM) on the export of advanced SDH transmission equipment to China in 1994, MPT became a major purchaser of SDH fiber-optic transmission systems. During the Ninth FYP, MPT plans to install 30,000 km of SDH fiber-optic trunk lines as well as SDH technology at the provincial and local levels. AT&T Corp. has emerged as the primary supplier of SDH equipment in China, followed closely by Northern

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Telecom (NORTEL), Siemens AG, and a number of other suppliers. China also has become one of the first countries in the world to install long-haul SDH digital microwave radio equipment for telecommunications purposes. The first national SDH microwave trunk is being constructed by MPT and will consist of an 800-km system of microwave stations connecting the cities of Wuhan, Nanchang, and Fuzhou.

Foreign suppliers are also looking to the promise of wireless local loop (WLL) (see p.18) as well as the rapid development of data communications networks in China. Currently, three data communications backbones are under construction: ChinaPac, a packet-switched data network; ChinaDDN, a nationwide digital data network; and the Golden Bridge network, a VSAT-based data communications backbone which will be operated by non-MPT carrier Jitong. MPT and provincial PTAs have been building the national packet-switched network, ChinaPac, since 1992. NORTEL is supplying the backbone nodes for ChinaPac, which already has over 10,000 users, and ultimately will cover all major cities in China. Construction on ChinaDDN began in 1993. Digital data networks stemming

## SDH fiber-optic transmission equipment suppliers have sparked price wars in their rush to claim market share.

from these communication backbones are spreading like wildfire in China, with hundreds of local and provincial PTBs and PTAs constructing their own DDNs to connect with the national DDN backbone. Both ChinaPac and ChinaDDN serve as platforms for Internet services in addition to transferring data (see *The CBR*, September-October 1995, p. 47).

Foreign management of data networks remains prohibited, but companies such as Canada's NORTEL supply much equipment to ChinaPac. Competition in the data transmission equipment market is also keen, especially among SDH fiber-optic transmission equipment suppliers, who have sparked price wars in their rush to claim market share since the lifting of COCOM restrictions.

### The driving force

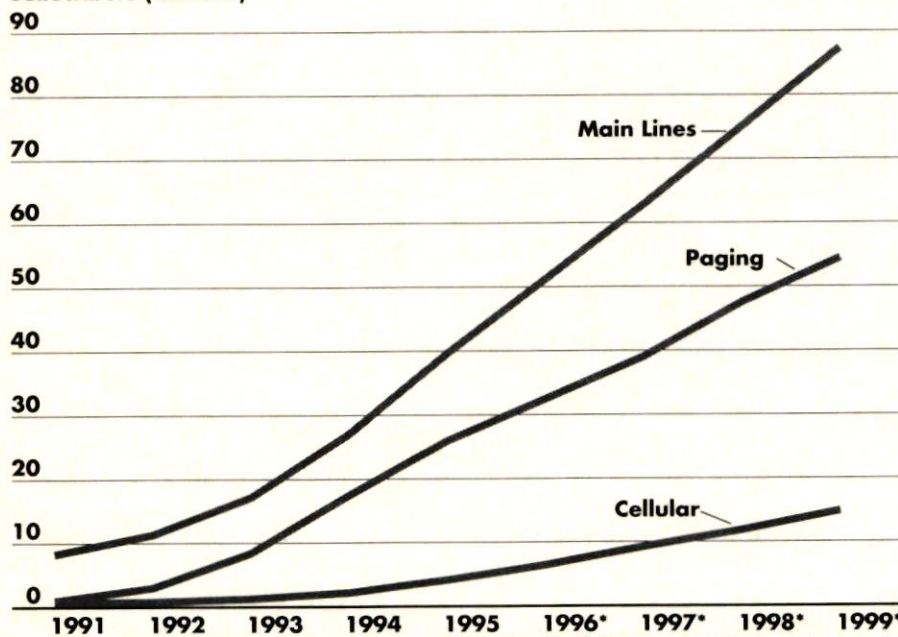
With so many suppliers ready to bid, most are willing to negotiate on terms favorable to Chinese customers simply to close deals. Foreign suppliers have discovered that their ability to provide favorable financing terms, whether through foreign government-backed soft loans, installment payment plans, or other means, can mean the difference between winning and losing contracts (see p.10). In such a low profit-margin environment, foreign companies have been cutting costs by setting up joint ventures to produce public network equipment locally. Foreign switching equipment suppliers, including Alcatel, Siemens, AT&T, and NORTEL, began to establish local production bases in the 1980s in cooperation with factories or companies affiliated with MPT or MEI. Most large, foreign fiber-optic transmission equipment manufacturers either have already or are planning to set up manufacturing joint ventures to produce SDH fiber-optic transmission systems.

After briefly restricting the switching market to a handful of foreign vendors, China now permits seven foreign switching suppliers to manufacture locally and sell to MPT, resulting in the lowest prices for digital switches in the world. Local manufacturing by foreign switching companies will remain limited to these seven companies for the foreseeable future. Alcatel is the dominant supplier and local manufacturer of central office exchange equipment, largely due to its highly successful joint venture, Shanghai Bell.

In theory, equipment-manufacturing joint ventures allow suppliers to bypass some of the restrictions on imports of foreign equipment, but Beijing continues to issue contradictory regulations on telecom imports. While encouraging foreign suppliers to set up joint-venture production facilities so that local producers eventually can supply all of the country's telecom equipment, Beijing continues to levy import duties on the parts needed to assemble the equipment. More vexing, Beijing has simultaneously permitted certain State organizations to import assembled equipment duty-free. Thus, in 1994 and early 1995, some joint-venture telecom equipment was more expensive than imported equipment, but companies now report that enforcement of import regulations appears to be more even.

### PRC Telecom Services, 1991-99

Subscribers (millions)



SOURCES: MPT, Pyramid Research

NOTE: Includes public operators not affiliated with the Ministry of Posts and Telecommunications

\* Projected figures

Beijing is encouraging local manufacturers, including MEI- and MPT-affiliated factories and privately held facilities, to raise production capacity and compete with foreign suppliers. Chinese manufacturers of switching and transmission equipment are beginning to capture market share. After years of unsuccessful experiments with locally designed digital central office exchanges, several domestic producers have developed viable alternatives to foreign-designed switches. Chinese-made digital exchange models now comprise over 3 million lines of China's installed public switching capacity, primarily in local networks in rural areas and smaller cities. On the transmission side, sales of Chinese-designed low-capacity digital microwave equipment are increasing rapidly, particularly to rural PTBs.

If low prices and an emerging domestic telecom manufacturing industry are not enough to keep foreign suppliers on their toes, the trend toward consortia of Chinese manufacturers organizing to maintain prices at levels profitable to their operations and coordinate marketing efforts only makes foreign suppliers more nervous. Eight State-run manufacturers of the HJD-04 switching exchange model, for example, formed the China Great Dragon Telecommunications Group Co. in March 1995. The group expects to produce 3.5 million lines of HJD-04 equipment in 1996. On the mobile telephone production front, the Golden Cellular consortium aims to establish a foothold for Chinese suppliers in the mobile handset and, eventually, mobile telecommunications infrastructure markets.

### Down the line

Several trends in the Chinese telecom market are likely to persist over the next five years. Though liberalization came slowly to the Chinese market, a freer telecom market is taking hold. Incremental, bottom-up change as reflected in recent deals struck by local or provincial PTAs with foreign companies in the cellular and paging sectors, where standards still are evolving, is more likely than sweeping reforms implemented from the center. Such deals will form the roots of lasting change in the market, regardless of whether they are officially sanctioned.

The move toward localized production of equipment for both public and private

networks, through joint ventures and the development of China's own telecom equipment models, is inevitable given the growing demand for telecom services. But it will be at least a decade before the technical level and reliability of Chinese-designed equipment pose a real threat to foreign suppliers of central-office switching and transmission equipment. Localization, and entry by more foreign companies into the market, too, should

continue to push equipment prices down. The tolerance of foreign equipment suppliers for low profit margins is wearing thin, however. Foreign suppliers will go to great lengths to gain market share in China's telecom sector, but with prices dropping, several foreign suppliers already have begun bidding less aggressively. Nevertheless, the sheer size of China's market will continue to tempt most foreign telecom firms. 完

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# Walking and Talking

■ John Wang



## China is becoming a top market for cellular sales

China's cellular phone providers signed up more than two million new subscribers in 1995, making the PRC the world's fourth-largest cellular market. Trailing only the United States, Japan, and the United Kingdom, China now boasts over four million cellular subscribers (see Table 1). A projected five-fold increase in cellular subscribers and estimates of nearly 20 million subscribers by the end of the decade have made China a particularly promising market for sales of cellular equipment.

Virtually every leading international telecom company is pursuing opportunities in China. In 1995, the PRC digital cellular market experienced its strongest growth to date, as LM Ericsson, Motorola Inc., Nokia Telecommunications, Siemens AG, Northern Telecom (Asia) Ltd. (NORTEL), Alcatel, Italtel S.p.A., and AT&T Corp. all hustled to capture market share. Beijing permits foreign companies to sell telecom equipment and handsets in China and provide after-sales service, but limits network operation to two domestic carriers, the Ministry of Posts & Telecommunications (MPT) and China United Telecommunications Corp. (Unicom). In 1995, Unicom launched a cellular network to compete with the MPT system. By breaking the MPT monopoly over telecom services, Unicom opened the possibility that foreign firms, too, might one

day be able to operate cellular networks as well as sell equipment in China.

### Digital on the rise

The introduction of digital cellular systems in China has created new opportunities for equipment vendors. MPT selected the Total Access Communications System (TACS) as the analog standard for public cellular services in China, but has yet to designate an official digital mobile standard. Ericsson and Motorola, the only two approved suppliers of analog TACS equipment, maintain dominant positions in China's cellular market. As of June 1995, the two companies had captured 60 and 30 percent, respectively, of the PRC cellular infrastructure equipment market. And the number of TACS analog subscribers continues to grow, driven in part by the move last year to connect Ericsson and Motorola analog networks to allow nationwide "roaming." When the two firms complete network connection this year, roughly three million analog customers will be able to use their cellular phones throughout China.

While most of China's cellular subscribers are on TACS networks, the fastest growth in the cellular market in 1995 occurred in sales of Global System for Mobile Communications (GSM) digital cellular equipment. Though more expensive than TACS, GSM technology allows more subscribers to use the same frequency. Unicom's decision to invest in GSM sys-

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tems spurred MPT's entry into the digital market as well. By the middle of last year, MPT had set up 15 GSM networks, while Unicom had established four. By year's end, Unicom had installed networks in 16 additional cities, bringing the total capacity of all MPT and Unicom GSM networks to approximately 1.5 million subscribers—a 275 percent increase from the nearly 400,000 GSM users at the beginning of the year. Only TACS systems, however, allow national roaming—an advantage the analog systems will likely hold for a few more years.

**The players**

Though GSM lacks official sanction as the digital mobile standard, foreign ven-

Only TACS systems allow national roaming—an advantage the analog systems will likely hold for a few more years.

dors have wasted no time in seeking to claim their share of the GSM equipment market. In addition to Ericsson and Motorola, foreign vendors of GSM equipment include NORTEL, Nokia, Italtel,

Siemens, and Alcatel. With so much competition among vendors and few financing sources available to PRC buyers, many companies are forced to bid low for GSM cellular projects.

Ericsson appears to have translated its TACS dominance into early success in the GSM market. The company expanded the subscriber capacity of Guangdong Mobile Communications Corp.'s trial GSM network by 400,000 in July 1995 and installed a 70,000-subscriber GSM network in Shandong Province in August. Last December, the Swedish company signed a \$240 million contract to expand further both the TACS and GSM networks in Guangdong Province. In late 1995, Ericsson also supplied a 125,000-subscriber GSM network to the Liaoning PTA, as well as a 120,000-subscriber GSM network to the Heilongjiang PTA.

Motorola also has been active in the GSM equipment market. In June 1994, Motorola's Cellular Infrastructure Group (CIG) began working with Nokia to supply base-station equipment for the Beijing Telecommunications Administration (BTA) GSM network, which was later expanded to serve 100,000 subscribers. The US company was the initial supplier for a GSM system in Guangzhou in 1994. Late last year, Motorola's CIG and Xian Datang Telephone Co. signed a memorandum of understanding (MOU) to provide joint cellular and wireless local loop (WLL) base-station and switching equipment in China (see p.18). Motorola also will provide Xian Datang technical support to develop industry standards for interfaces between cellular and WLL applications.

Canadian vendor NORTEL boasts contracts with Hebei PTA and with Unicom in Tianjin, Heilongjiang, and Zhejiang. The company recently announced the signing of a contract with Shaanxi PTA for a turnkey GSM cellular network linking Xian, Yanan, Xianyang, and Baoji. In October 1995, NORTEL disclosed that it had signed an agreement with Unicom that is expected to result in approximately \$40 million in sales and production contracts. As part of the agreement, the company will provide a GSM system in Zhejiang Province. The network is expected to be installed in early 1996 with an initial capacity of 60,000 subscribers.

Finnish vendor Nokia won a contract from Jiangxi PTA in October 1995 for a

**Table 1**  
**MPT Cellular Subscribers by Province, 1994-95**

Province/Region	Year-end 1994 Subscribers (thousands)	Year-end 1995 Subscribers (thousands)	Percent Change over 1994
Anhui	22.6	59.9	165.0%
Beijing	76.6	160.4	109.4
Fujian	69.1	155.0	124.3
Gansu	9.2	18.5	101.1
Guangdong	480.1	987.7	105.7
Guangxi	45.3	99.1	118.8
Guizhou	5.8	14.1	143.1
Hainan	19.5	31.1	59.5
Hebei	39.6	120.0	203.0
Heilongjiang	53.0	132.0	149.1
Henan	51.5	121.7	136.3
Hubei	41.1	124.7	203.4
Hunan	36.2	121.6	235.9
Jiangsu	97.7	231.8	137.3
Jiangxi	11.3	31.6	179.6
Jilin	31.6	79.2	150.6
Liaoning	78.8	197.5	150.6
Inner Mongolia	8.4	22.1	163.1
Ningxia	3.4	7.0	105.9
Qinghai	1.1	2.6	136.4
Shaanxi	21.1	35.1	66.4
Shandong	70.1	164.5	134.7
Shanghai	72.5	168.1	131.9
Shanxi	18.1	41.3	128.2
Sichuan	54.0	123.0	127.8
Tianjin	32.3	80.2	148.3
Tibet	0.7	1.4	100.0
Xinjiang	13.4	26.9	100.7
Yunnan	11.4	22.1	93.9
Zhejiang	92.2	248.0	169.0
Total	1,567.7	3,628.2	131.4%

SOURCES: MPT, Pyramid Research

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30,000-subscriber capacity provincial GSM network, to be installed this year. Last year, Nokia also began setting up a 60,000-subscriber GSM cellular network for Henan PTA, which is scheduled for installation in early 1996. Nokia currently provides GSM networks for the Fujian and Zhejiang PTAs, as well as for the Shanghai branch of Unicom.

Italian vendor Italtel installed three GSM networks for MPT in 1995. The first was a small-capacity network for Guangdong Mobile Communications Corp. in Zhuhai as part of a five-supplier GSM trial. The second network, installed in

Hainan Province, has a capacity of 30,000 subscribers in Haikou and Sanya. The third Italtel network, one of the PRC's largest GSM networks, is capable of supplying 150,000 subscribers in Wuhan and four other cities in Hubei Province.

Siemens, another player in the GSM market, won the bulk of Unicom's first-phase GSM network supply contract for Beijing, Shanghai, and Tianjin last July. Working with Motorola, the German vendor also supplied the GSM mobile exchange for a 40,000-subscriber Unicom GSM network in Guangdong. In conjunction with Alcatel, which provided the

switching equipment, Siemens furnished GSM base stations for the Shanghai PTA's 50,000-subscriber GSM network.

### Home-field advantage

Attempting to ensure that "Made in China" labels will be found in the marketplace, the Chinese Jinfeng (Golden Cellular) consortium, established in 1994, calls for PRC manufacturers to join forces to produce cellular infrastructure equipment and handsets to compete with foreign suppliers. While Golden Cellular has yet to undertake any concrete projects and is not expected to pose a threat to foreign sales in the next few years, Chinese officials hope that the consortium will be able to boost domestic sales over the long term.

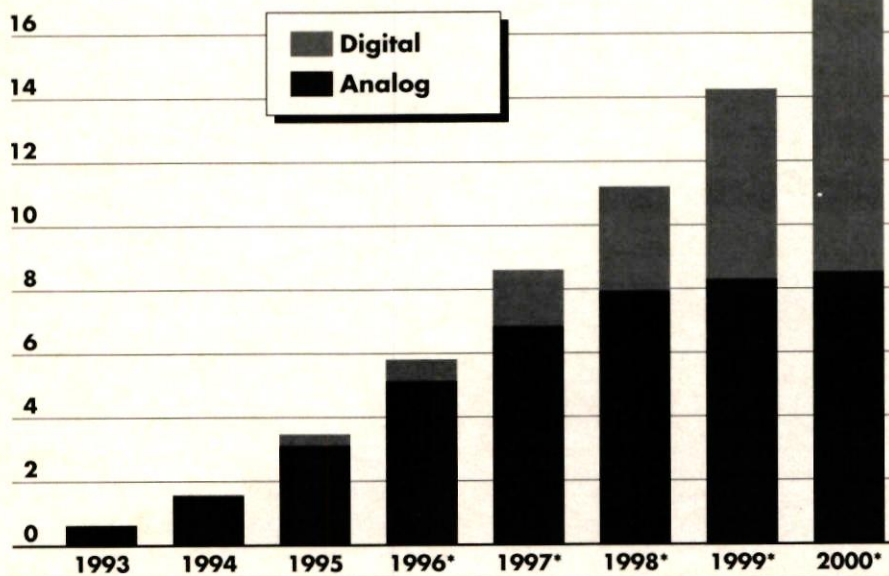
Increasingly, vendors who manufacture outside of the PRC are feeling the pressure to move production onto the mainland to keep prices low. Two Ericsson mobile communications joint ventures in China, Nanjing Ericsson Communications Co. Ltd. and Guangdong Ericsson Co., Ltd, began producing analog equipment in 1993. Both ventures plan to begin producing GSM equipment in 1996. Ericsson intends eventually to manufacture all of its GSM equipment sold in the PRC at these two factories.

Nokia signed a joint-venture agreement with the Posts & Telecommunications Industry Corp. in April 1995 to establish Beijing Nokia Mobile Telecommunications Co., which is scheduled to begin production of Nokia's GSM cellular infrastructure equipment this year. Siemens established the Siemens Shanghai Mobile Communications Co. in 1995 with Shanghai PTA, the Shanghai municipal government, and MPT to manufacture GSM cellular radio base station (RBS) equipment and handsets. The Sino-German venture also will adapt switches produced by the company's Beijing joint venture, Beijing International Switching Corp., to cellular applications. French vendor Alcatel, meanwhile, is hoping to build upon its success in the public switching market. In 1995, the company signed a joint-venture contract to establish Shanghai Bell Alcatel Mobile Communications Co., which began producing RBS equipment for GSM systems and controllers as well as mobile exchanges in late 1995.

**Table 2**  
**Cellular Subscribers in China, 1993-2000**

Subscribers (millions)

18



SOURCE: Pyramid Research

\* Projected figures



At the current rate  
of expansion,  
China will rank  
as the world's  
second-largest cellular  
market by 1997.

Unlike other vendors, Motorola initially opted to license its technology to Chinese manufacturers rather than enter into joint-venture production. In March 1995, Motorola signed a licensing agreement with the Hangzhou Communications Equipment Factory (HCEF), which makes TACS infrastructure and handsets, and Zhejiang Technical Import and Export Corp. The two PRC companies are participating in the design, manufacture, installation, and distribution of Motorola's GSM digital cellular infrastructure equipment in China. Motorola, which recently announced a \$720 million investment in Tianjin to manufacture semiconductors, also has a paging joint venture in Leshan.

#### Looking ahead

Since MPT has yet to adopt GSM as the official digital cellular standard, the door is still open for other, possibly more efficient, technologies to receive official sanction. MPT will conduct trial runs of several new standards, technologies, and applications, including WLL, code division multiple access (CDMA), and personal communications systems (PCS) in 1996, creating new opportunities for foreign vendors. MPT interest in CDMA reportedly remains strong, putting CDMA in the running for the official digital cellular standard.

American CDMA equipment vendors, including Motorola, AT&T, and California-based QUALCOMM Inc., are sparing neither time nor expense in their efforts to market CDMA technology in China. CDMA advocates claim that the systems can support a higher user capacity than GSM networks. QUALCOMM successfully executed the first CDMA trials in the PRC in 1994, but Motorola gained a foothold by signing a contract last September with

the Zhejiang Provincial PTA to build the PRC's first CDMA network in Hangzhou. Though the network has not yet been installed, it will accommodate 4,000 subscribers and include an exchange, three base stations in Hangzhou, and a base station in the suburbs. If CDMA networks prove to be commercially viable, Beijing may designate both GSM and CDMA as official digital cellular standards, which would launch full-scale development of CDMA technology in China.

Another emerging technology, PCS, could make its China debut in 1997. Ideally suited for use while biking or walking in urban areas, PCS offers subscribers a service that is comparable to traditional cellular mobile service, but limited to a shorter calling range. Both MPT and Unicom currently are bidding for PCS licenses in Hong Kong. If the Hong Kong PCS networks prove successful, the two operators likely will look to apply PCS technology on the mainland.

If the current rate of expansion continues, China will be home to more than 8.7 million cellular subscribers and rank as the world's second-largest cellular market by 1997 (see Table 2). In the

coming months, the number of analog subscribers, spurred by growing demand for roaming services, is projected to reach over 5.1 million. As the industry continues to expand, intense competition among vendors will push prices for handsets, transmission equipment, and services down. In their efforts to secure a strategic advantage, more foreign suppliers are likely to localize production and introduce more advanced technologies.

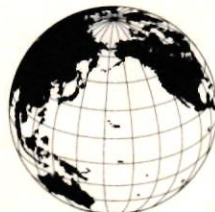
Though many foreign suppliers are eager to operate telecom networks in the PRC, permission to do so is unlikely to be granted for quite some time. Beijing remains committed to preserving a domestic monopoly over both fixed-line and cellular networks, two areas the government considers of strategic importance. But even without foreign operators running cellular networks in the near future, the digital market will continue to expand rapidly. With the promise of such robust growth in high-tech telecom, it seems that before long, wherever the average PRC citizen travels, by bicycle, train, or car, a phone will be easily in reach. 完

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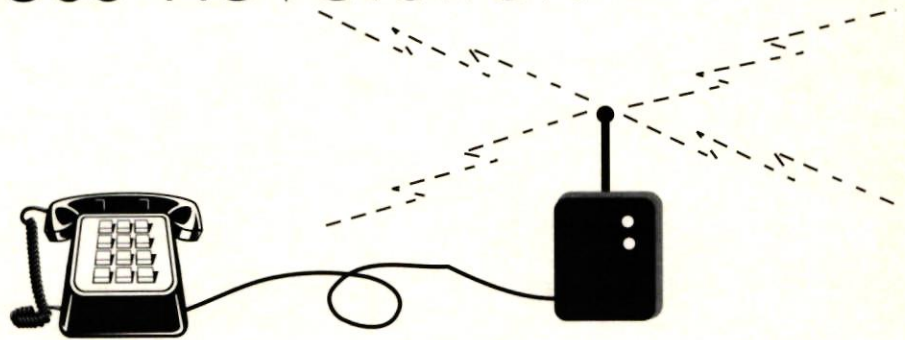
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# The Wireless Revolution

■ Douglas Denton



An alternative to copper wire is set to transform the PRC telecom landscape

Driven by economic reform, growing global trade, and technological advances, the PRC's telecommunications infrastructure has developed rapidly. Advances in technology, such as digital switches and fiber optics, have reduced dramatically per-subscriber costs for installing network switching and transmission segments. Despite these high-tech innovations, the "local loop"—usually twisted-pair copper cable buried underground or strung overhead to connect the local telephone exchange to the telephone subscriber's premises—remains costly and time-consuming to install.

Local switching capacity in the PRC is increasing much faster than new subscribers can be connected. By the end of 1995, China's local exchange capacity had reached 71 million lines, but total phone subscribership stood at only about 41 million. China's Ministry of Posts and Telecommunications (MPT) estimates that, on average, the local loop accounts for more than one quarter of the PRC's Public Switched Telephone Network (PSTN) capital expenditures.

Wireless local loop (WLL), an application of radio technology, is emerging as a cost-effective complement to—and, in some cases, a substitute for—copper wire installations. WLL systems use radio waves rather than cables to make the final connection between the switching office and the enduser (see diagram). Unlike mobile

cellular systems, WLL provides limited, if any, mobility. WLL systems must support all the qualities that the enduser associates with the PSTN, including prompt, reliable dial tone and sound quality, and full integration with the numbering plan, billing system, and call rates of the local telecom administration.

There are several categories of WLL systems: fixed cellular; WLL systems based on cordless technology; and point-to-multipoint microwave systems. Fixed cellular—systems adapted from mobile cellular technologies—can provide both fixed and mobile services. Based on proven cellular technologies, fixed cellular systems can handle high user capacity. WLL systems based on cordless technologies offer only limited mobility (under 500 m) and are best suited for densely populated areas. Point-to-multipoint microwave systems enable remote, rural telephone service in harsh environments. Their high per-subscriber cost and low user capacity, however, make them inappropriate for urban deployment.

WLL systems are being installed in a number of places around the world, including India, Indonesia, Malaysia, and countries in Eastern Europe and Latin America. The largest WLL system contract to date—won by Motorola in June 1995—is for a 200,000-subscriber system in Hungary. Although a number of systems are in the early planning stages in

■ Douglas Denton is a consultant with International Technology Consultants, a Bethesda, Maryland-based firm. This article is adapted from an upcoming ITC study, *Wireless Communications Markets: China*.

the PRC, no large-scale systems have been installed in China.

**Some advantages...**

Compared to copper wire systems, WLL technology allows faster network set-up, potentially lower costs, and greater planning and deployment flexibility. Given MPT's goal of hooking up subscribers as quickly as possible and the limited government funding available for telecom development, WLL technology is well suited for the PRC telecommunications environment. WLL technology may prove cost-effective in China's high-growth urban areas, sparsely populated rural regions, and areas where hard-wiring proves difficult, such as the Pearl River delta and the mountainous sections of Sichuan Province.

The real savings in WLL occur as the distance from the switching office increases, as WLL costs, unlike copper wire, are largely independent of distance. Because the technology is sensitive to the volume of calls, however, WLL systems in high-traffic areas require additional equipment to provide extra capacity, resulting in higher installation costs.

Determining the specific cases in which WLL may be advantageous requires careful analysis. A number of environmental, technical, and economic factors must be considered, including population density, distribution, and projected growth; anticipated network growth; availability of existing infrastructure; service requirements; life-cycle costs; geographical characteris-

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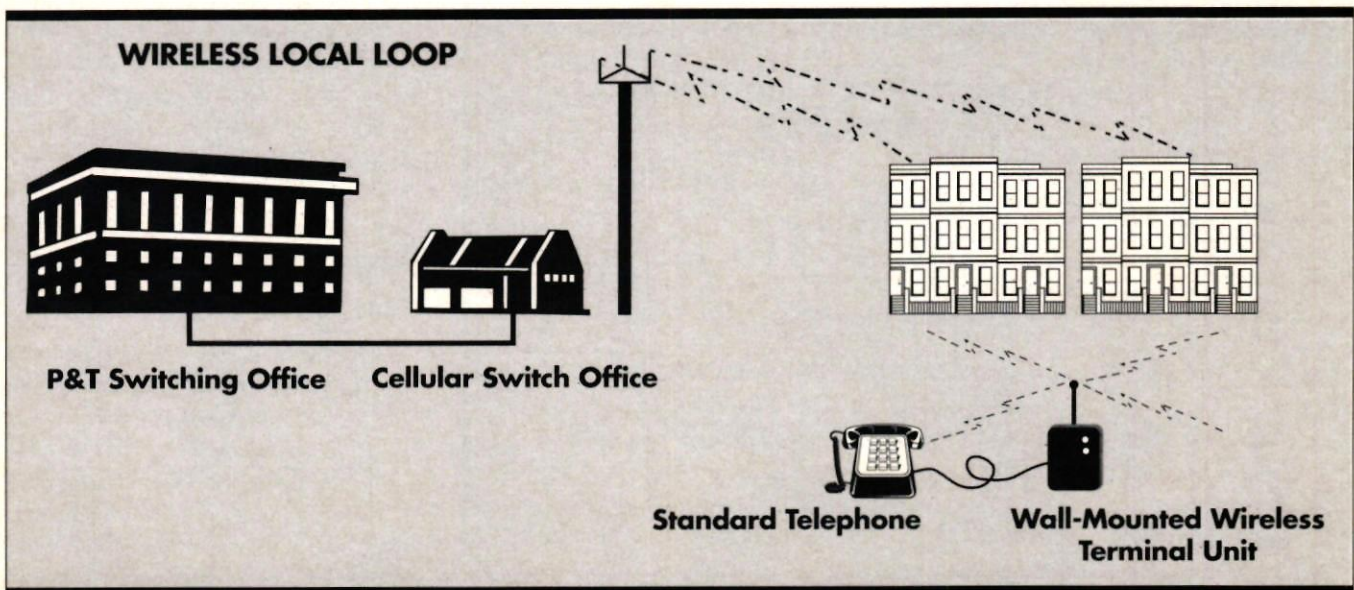
tics; and even environmental factors such as the amount and frequency of precipitation, which can interfere with radio transmissions.

The most common application of WLL over the next few years may be in "reconstruction districts," the vast number of buildings, towns, and districts—such as Shanghai's Nanshi District—slated for reconstruction over the next few years. During the reconstruction period, local residents are likely to clamor for telephone service. However, because of the short time period telecom authorities have to recoup the installation costs in these areas, they are unlikely to foot the bill for laying traditional copper cables. Setting up a WLL network, in contrast, involves capital expenditures mainly for the equipment, which can be simply and rapidly installed and, when necessary, dismantled and relocated.

WLL's ability to realize a quick return gives the technology an additional marketplace edge. Economic reforms in the PRC have shifted much of the burden for financing network expansion to local telecom administrations and bureaus. PRC telecom operators are much more likely, therefore, to invest in a network if they can expect subscriber installation fees to offset the initial outlay of capital within a short period. WLL technology makes it possible for subscribers to be connected in only a few months following payment of the installation fee, instead of the several years typical of copper-based technology in many regions of China. Consequently, WLL can attract a much larger pool of subscribers in less time.

The flexibility of WLL also proves attractive to telecom operators. Unlike a copper wire network, which requires advance installation of extra infrastructure for future capacity expansion, additional investment in a WLL system can be phased in as needed.

WLL technology also opens up the possibility of local-loop financing structures that skirt the government ban on foreign investment in telecom services. For instance, Phoenix Wireless Group, Inc. currently is working on a deal to provide equipment and installation for a small WLL system in Jilin Province in exchange for a guaranteed percentage of the revenues that the system will generate during its first years of operation. In this manner, the local Posts & Telecommunications Administration (PTA) is using future revenue



streams to finance a new telecom network and a foreign company is investing indirectly in telecommunications services.

### **...and disadvantages**

Despite its many positive features, WLL will never replace hard-wired copper cable systems altogether. One advantage of wire networks is that once the telecom service provider acquires the right-of-way for laying cables, an unlimited number of subscribers can be connected. Expanding the network means simply laying more cable.

All wireless technologies, including WLL systems, face the challenge of efficiently utilizing limited radio spectrum resources. WLL, which does not make use of the mobile telephony that radio waves allow, may not be the most efficient use of finite radio frequencies in the long run. As demand increases for mobile communications, WLL technologies will be forced to compete with other mobile technologies for radio space.

Many PRC operators, meanwhile, may not be able to realize fully the returns from the fast network installation made possible by WLL technology. If the PSTN switch is not upgraded to handle the additional connections, the extra WLL connections are of little use. Likewise, a network's "back-office" infrastructure, including the billing and numbering systems, must be in place and operational for a PTA to benefit from the rapid set-up time possible with WLL networks.

All wireless technologies, including WLL systems, face the challenge of efficiently utilizing limited radio spectrum resources.

Further, WLL's manpower savings in both installation and operation may not be a critical consideration in the PRC, where cheap labor is abundant. It would be difficult, for instance, for State-owned operators like MPT to downsize, since they have little ability to lay off redundant workers.

### **Tuning in**

Over the long run, though, the prospects for WLL in China may depend on how the State Radio Regulatory Commission (SRRC) allocates radio frequencies. Since only a handful of small WLL trials are now operating, the lack of set frequencies has not hampered the expansion of WLL technology yet. SRRC has been researching the topic actively and has sought advice from foreign telecom companies. SRRC has considered using 1.5 GHz and above, as well as the 400 MHz-500 MHz range and the 806 MHz-823 MHz

trunk radio band as possible WLL frequencies; the most likely frequency allocation for WLL will be in the 1.8-1.9 GHz range. Industry players closely associated with the PRC frequency allocation process expect that SRRC will announce the WLL frequencies early this summer.

Disclosure of the allocated WLL frequencies will boost the spread of WLL networks; costs should decrease as a result of equipment standardization. Currently, vendors cannot import one set of equipment that will work in all PRC applications; the locally available frequency is one of many factors which dictate what type of equipment is installed. A national policy set forth by the SRRC, however, will not guarantee that frequency allocations will be enforceable nationwide. The military controls its own radio spectrum outside of the SRRC's jurisdiction. Local governments also can have a great deal of independence. A variety of frequencies and protocols, therefore, could continue to be used for WLL applications.

In the meantime, foreign companies active in China's WLL market include: Alcatel; AT&T Corp.; Diva Communications, Inc.; LM Ericsson; Hughes Network Systems; Italtel S.p.A.; Motorola Inc.; NEC Corp.; Northern Telecom Ltd.; Nokia Telecommunications; Philips Communications Systems; Phoenix Wireless Group; QUALCOMM Inc.; Siemens AG; and SR Telecom Inc.

With contracts for at least eight WLL networks in China and a recent Memorandum of Understanding with Xian Datang Telephone Co. of Shaanxi Province to provide WLL-CDMA equipment, Motorola has been the most active of the large WLL-system suppliers in China to date. Likewise, Alcatel, AT&T, Ericsson, and Northern Telecom also are increasing their investments in the PRC wireless market. AT&T Network Systems recently announced that the company will introduce its digital WLL system in China by April.

### **Setting the right price**

Currently, average wireline network costs per subscriber in China are roughly \$800, but copper-based connections can cost up to \$3,000 per subscriber in some rural areas. Given the PRC's limited capital, such high-cost connections are rare. Some WLL manufacturers claim to be competitive with copper-based solutions

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## Industry insiders maintain that per-subscriber costs for WLL systems now average \$700-\$900.

in all but heavily urban applications—where the distance between the switching office and subscriber is short and requires comparatively little laying of cable. But meaningful cost comparisons of copper versus WLL solutions must factor in the unique environmental and technical characteristics of each case and the full range of life-cycle costs, including civil works, ongoing operations, maintenance, training, and personnel.

Industry insiders maintain that per-subscriber costs for WLL systems now average \$700-\$900, though costs in China, like those in other countries, vary depending on the specific application. Some companies, such as Phoenix Wireless Group, are aiming to bring the cost down to \$450-\$500 per subscriber over the next year. A recent study conducted by a PRC government research organization concluded that for widespread implementation of WLL systems to occur, per-line prices of WLL systems must fall below \$620 in urban settings, \$432 in affluent rural areas, and \$370 in poorer central and western regions.

A substantial drop in WLL-network costs to make the technology comparable in cost to wireline systems may not be attainable over the next year, but is likely to occur within five years. Assuming WLL network costs are at least equivalent to wireline-system costs, forecasts of future WLL market penetration range from 5-30 percent of the PRC's total telephone subscribers. Rural areas are likely to have a higher penetration rate than urban zones.

During 1995, the PRC installed more than 22.9 million ports of urban and suburban program-controlled switches, which could translate into 22.9 million new subscribers once access lines are installed. If this rate of telecom expansion continues over the next few years, and if just 10 percent of new urban installations use WLL systems, approximately 2.3 million new WLL users could be added an-

nually. In this scenario, by 2000, urban and suburban WLL subscribers could total 9.2 million. The Ninth Five-Year Plan (1996-2000) calls for the addition of 44 million new rural telephone lines. If 25 percent of these are part of WLL networks, 11 million new rural subscribers will be connected to WLL systems by the end of the decade. The combined total of suburban, urban, and rural WLL users would exceed 20 million by 2000.

In the near term, at least, even conservative projections suggest that ample op-

portunities exist in the PRC for WLL equipment providers. Beijing, however, is trying to keep foreign producers from dominating the WLL equipment market as they have controlled the PRC's cellular and switching markets. Central leaders are encouraging domestic research on WLL and other new technologies. Nevertheless, China's strong demand for telephone access should mean increased sales for foreign WLL equipment manufacturers. 完

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# Training the Troops

■ Sheila Melvin



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## Foreign firms take the lead on teaching new workplace ethics

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■ Sheila Melvin is associate director of the Council's Beijing office. This article is based on a report prepared for the US-China Business Council.

The PRC's arrival onto the stage of international business brings a new demand on foreign companies investing in China: employee training for local hires. In discussions with foreign managers about company training needs, two themes recur—the need to instill a new kind of thinking among PRC managers and workers to carry out the company's mission, and the need to respect Chinese cultural values. At first glance, these goals may appear contradictory, but in actuality they are not. What ultimately is required, many expatriate and Chinese general managers say, is for foreign investors and their local managers to recognize the differences between American and Chinese management methods. While the demands of running a business in the PRC can make establishing and maintaining a cohesive training program difficult, companies that train regularly find the effort worthwhile. Properly implemented, a good training policy can help attract and retain skilled workers as well as improve company productivity and morale.

Some foreign companies make a point of training all local hires, from clerks to managers, while others train only managers, who then give on-the-job training to the workers they supervise. In either case, classroom training generally is required for "hard" skills such as accounting and marketing, but "soft" skills such as communication styles, time manage-

ment, and problem solving can be taught through more innovative courses. Most companies utilize a combination of lectures and activities, but a few foreign companies in China look to foster discipline, team spirit, and confidence through adventure-style courses that involve climbing mountains or scaling the Great Wall.

### Winning the war

Western and Chinese managers—from the PRC as well as Taiwan and Hong Kong—see themselves as battling constantly against the lingering influence of communist-era attitudes toward work and business in the PRC. The Western director of a major US company's China headquarters believes that Chinese managers and workers need to feel empowered to make independent decisions and see them through. Hard-skills training is relatively straightforward; many expatriate trainers are generally impressed with the ability of Chinese trainees to learn new concepts quickly. But soft-skills training, which involves breaking down long-held attitudes, is often more difficult to implement. To keep operations running smoothly, Chinese managers and employees must understand *why* it is important to do something a certain way, not just what to do or how to do it.

To change attitudes, however, experts emphasize that training programs must incorporate Chinese cultural values—a

task that can prove difficult. Although large US companies often draw on extensive internal training resources, many in-house instructors lack firsthand China experience. As a result, they tend to teach American management techniques, taking little account of China's distinct cultural and business environment. Though eager to understand Western business practices, Chinese managers are often reluctant to see their own values shunted aside and may resist making the very changes they are being trained to implement. Many China-based businesses and training institutes are now striving to use PRC-specific examples and case studies.

### Who merits training?

Deciding which local hires should receive training is an issue of primary importance. Though company policy may require that all employees participate in a minimum number of training hours per year, each venture still must develop a system to select which employees receive extra training. For firms with small PRC-based staffs, training as many people as often as possible has clear advantages, since such exercises can foster camaraderie and establish common ground for the staff. Joint ventures, especially those partnered with a pre-existing Chinese enterprise, often employ workers from a wide range of backgrounds. This type of foreign enterprise should hold separate training sessions targeting different categories of staff. Placing all Chinese staff—from engineers to receptionists—into the same training sessions may cause unease among Chinese workers, who tend to be concerned with status.

Some companies present training as a perk for which employees must compete. Other firms, though, find that Chinese managers are reluctant to allow their best employees to leave the office or factory long enough to receive further training. Companies with operations in several parts of China, for instance, may find that the Guangzhou branch will send second-tier managers to company-sponsored training programs in Beijing, presumably because the Guangzhou head managers believe that the top employees are too valuable to be diverted from their daily duties. Still other firms, particularly those in service industries, view training as a

Workshops should teach Chinese managers how to criticize an employee constructively without causing the employee to lose face.

mandatory part of company employment, not a perk. One American fast-food company even requires its managers to spend one hour each day on the job studying company training materials.

### Portrait of a Chinese manager

General managers typically divide their company's training needs into hard and soft skills. While the necessary hard-skills training will vary from company to company, management soft-skills requirements cross industry lines. As many foreign investors aim for their Chinese managers to take over the reins of the joint venture within a matter of years, they push managers hard to grasp not only job-specific hard skills, but also the soft skills necessary to integrate the venture's business with the Western parent company's operations.

Because most local Chinese managers were educated in a system that emphasizes teaching students what to think rather than how to think, corporate management training programs should stress decisionmaking skills and individual initiative. Chinese employees tend to be unaccustomed to the concept of individual accountability and the pressure that comes with personal responsibility for a given task. One expatriate bank manager commented that most of his employees—especially those who had previously worked for a State-owned enterprise (SOE)—failed in the beginning to realize how challenging their new jobs would be.

Management training programs also typically cover Western ways of delegating and defining job responsibilities. Most Chinese workers, accustomed to hierarchical organizations, have little or no experience with matrix organizations, in which an employee can have up to

three or four supervisors. Trainers should be sure to emphasize to Chinese employees the importance—to the company and to their own careers—of being able to handle ever-increasing amounts of job responsibility. Training exercises should also address problem-solving skills in the context of crisis or high-pressure situations.

Training workshops also should teach Chinese managers ways to convey their ideas to Western colleagues. Because Western and Chinese meeting styles are so unlike, Chinese managers are often at a disadvantage in Western-style company meetings. Chinese and Western negotiating styles differ greatly, and Chinese managers need to learn Western negotiating styles to communicate effectively with their superiors based outside of the mainland.

Performance reviews generally were unheard of in the past, so Chinese foreign-invested enterprise (FIE) managers may have difficulty adjusting to the continuous evaluation process that Western employees find commonplace. Workshops should teach Chinese managers how to criticize an employee constructively without causing the employee to lose face. Workers, of course, also need to learn that criticism on the job is not meant to be taken personally, but rather is part of the employee education process. Some training companies dedicate entire programs to teaching Chinese managers how to write performance reviews and discuss them with subordinates.

Chinese staff, for their part, must understand that they need to prove themselves before they will be given more responsibility or higher pay. Many Western managers express concern that Chinese employees seem to lack a sense of career development and tend to change jobs frequently in pursuit of higher wages. Training, therefore, can promote company loyalty by stressing the benefits of building a career over simply receiving a better salary. Managers and staff also need to understand that a foreign firm, unlike a Chinese SOE, is not likely to punish or embarrass anyone for trying something new. On the contrary, Western managers tend to get upset at an employee who takes no initiative at all. But, to be effective, such a philoso-

phy must be backed up by the company's actions.

### Getting it right

Through much trial and error, Western companies are beginning to develop a recipe for successful training courses for Chinese local hires. Effective training involves several ingredients:

#### ■ A well-formulated training policy

The success of company training programs rests on a comprehensive training policy to which all China-based divisions and offices adhere. FIEs should take into consideration, for instance, that effective training programs in China may take longer than in the United States. The expatriate manager of an American joint-venture service company reports that training for service employees that would take two days in the United States takes 14 days in China.

■ **Prepared participants** Pre-training preparation is as important as the training itself. The objectives of training and the company's expectations should be made

clear before the actual training activities begin and the expatriate manager should ask Chinese employees what they hope to gain from the training. If participants are uncertain about the purpose of the training, or are skeptical of its worth, the training session could be less effective.

■ **Follow-up evaluations** After a training program is completed, foreign managers should meet with Chinese employees to learn if the participants believe the training objectives were realized. An objective analysis also may be desirable, through checks of sales figures and productivity before and after training.

■ **Repetition of basic tenets** Many experts stress the need not only to train, but also to re-train managers and staff in China. A training course that involves a follow-up session several months after the core training might be especially effective. One highly successful American service company puts its managers through the same series of training courses every three years. Fresh ideas are bound to emerge in a new session, they

maintain, and managers who have already been through the cycle can serve as mentors to newcomers.

■ **An appreciation of cultural differences** Training should address Chinese cultural values and norms, as well as idiosyncracies considered undesirable in a joint-venture employee. The general manager of a joint-venture food establishment, for instance, quickly discovered that Chinese employees accorded one type of service to Chinese customers and another type of service to foreigners. Through training, employees began to understand the importance of treating all customers equally.

■ **Accurate training records** Companies with comprehensive training policies keep sophisticated records to track what kind of training each employee has received, the relationship between training and productivity, and whether specific training programs boost retention efforts.

■ **An in-house training manager** Companies that take training seriously have full-time training managers on staff. Should budgetary concerns preclude this, one person should still be solely responsible for full implementation of the company's training policy.

■ **Accurate translations** Translating training materials into Chinese is no small matter, since many Western business terms and concepts lack exact equivalents in Chinese. When translations are completed, the training instructor, together with a native Chinese-speaking trainer, should review them carefully.

### Training in China vs. overseas

An increasing number of joint ventures conduct their training in China to keep costs low. The amount of money companies spend on management training in China still varies widely, however. Some companies invest millions to establish their own training centers in the PRC, while others allocate a lump sum each year. Though some companies view any training expenses as prohibitive, others argue that the lost wages of a worker pulled away from his duties to attend a training session are a relatively minor expense in a low-wage country like China. Private training companies in China are developing rapidly and in-country training for all but the highest-level Chinese managers is becoming common (see p.26).

## Off on the Right Foot

While company managers certainly will want to investigate a professional training company's ability to match corporate needs, foreign-invested enterprises should also look for the following in a training program:

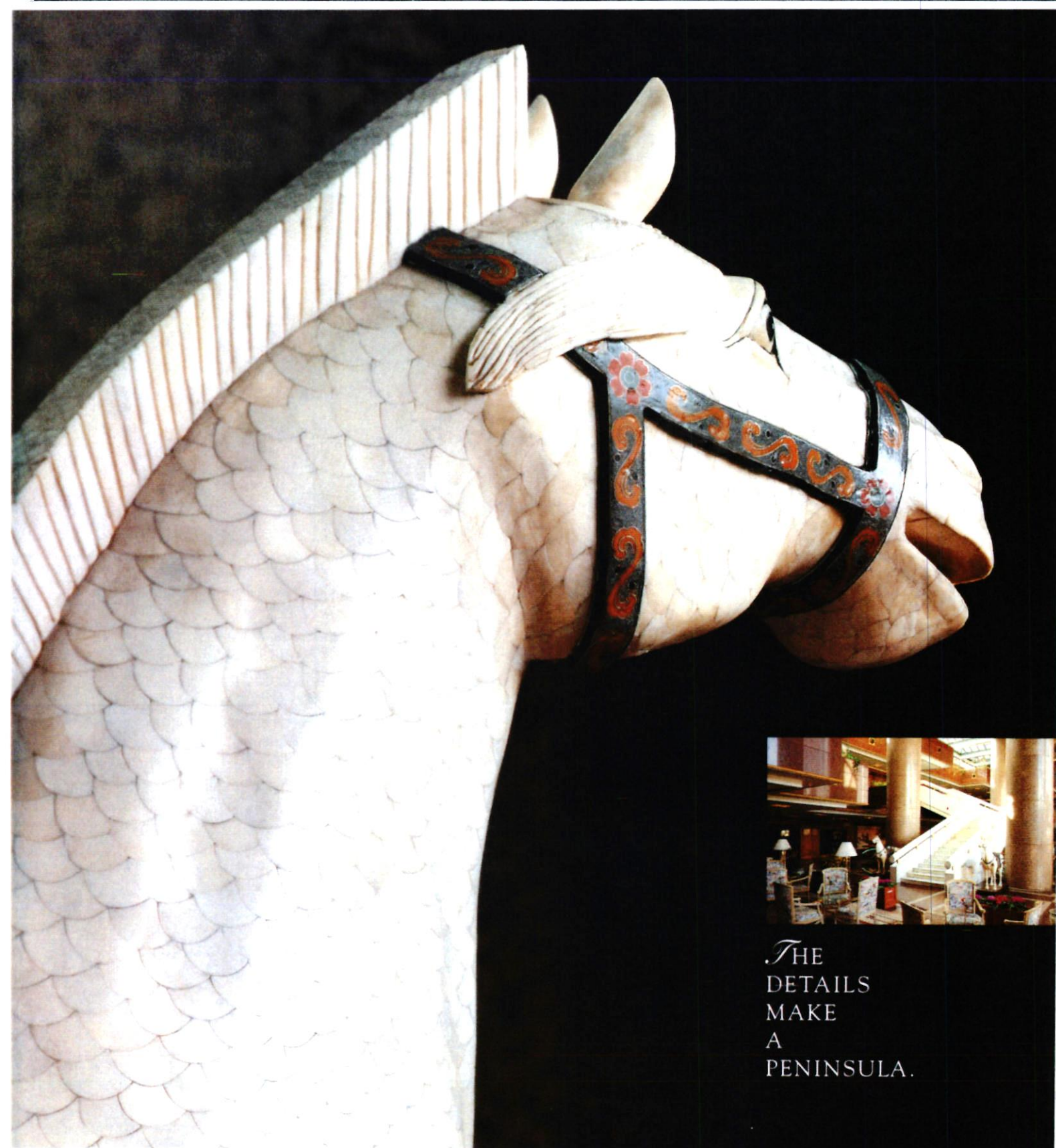
- Trainers should clearly outline to participants the goals of the course. Participants should receive checklists of what they are supposed to learn so they can measure their progress.
- Training should be highly structured. Loosely structured courses will almost always be poorly received in China.
- Giving clear, immediate, and frequent feedback to training participants is essential. Constructive feedback should be given by both the instructors and the other students.
- A good course must challenge its participants. In the words of one training expert, "Chinese managers are thirsty for new ideas, new tools, new information."
- Any course designed to teach "soft" skills such as communication must be

interactive, featuring role-plays, presentations, and games. Interactive training, though generally a foreign concept to most Chinese, usually proves more effective—and more fun—than lecture-style training.

- High-level managers should participate in training by working with the trainers to formulate goals, attending some of the sessions, and actively seeking post-training feedback from employees.
- Participants should leave the training with special goals—outlined on paper—and the skills to achieve them. General or human resources managers, with the help of professional trainers, should formulate post-training action plans for company employees. Some companies enable training participants to set their own action plans, with supervisory approval. Significant progress must be made on the goals outlined in the plan before the participant enrolls in another training session.

—Sheila Melvin





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Training in China tends to be a cost-effective option, as most companies can afford to send only a few star employees abroad each year. When companies conduct training in China, on the other hand, it is financially feasible to train an entire management team, making acceptance of new ideas and implementation of new methods easier.

Nonetheless, many expatriate managers believe there is no substitute for overseas training. No amount of in-country training, they argue, beats seeing what other countries look like and how they operate. One human resources manager emphasized that overseas training should not be limited to travel to corporate headquarters in an industrialized country like the United States or Japan. On the contrary,

he thinks that companies with operations in other developing countries should send Chinese employees to these sites. Touring a successful plant in the Philippines, for example, can help Chinese employees understand how their own plant operations can be more efficient.

A Chinese-American joint-venture manager points out that overseas experience, be it training or work experience, allows a Chinese manager to speak with greater confidence and knowledge. Further, once a Chinese manager has functioned professionally outside of China, even if only for a few months, he or she is more likely to gain the confidence of peers and the respect of subordinates. Overseas training, many managers feel, is the best way to impart the values of an American

corporation to a Chinese manager. One way to combine overseas training with a company's desire to keep costs down would be initial training sessions in China followed by a trip overseas to apply the skills learned in China.

### The language of business

The language in which training is to be conducted demands serious consideration. Typically, when company training resources from outside of China are used, English is the language of instruction by default. If a company uses Taiwan or Hong Kong trainers, training seminars generally are held in Chinese. Some US companies insist on English because they believe Chinese managers must be comfortable with the company's primary lan-

## The Training Scene

Training resources in China are expanding rapidly. This list is a sampling of available resources and is not intended to be comprehensive:

### China-based resources:

*CDI China Canada Business Career Training Center* CDI offers daytime and evening courses on business English and computer and office skills.

Bernard Lui, general manager  
28 Dong Hou Xiang, An Ding Men Wai  
Beijing 100011  
Tel: 8610/422-5551 ext.218, 220  
Fax: 8610/421-1497

*China-Europe International Business School* The China-Europe International Business School (CEIBS) was formally established in Shanghai in November 1994. A cooperative venture between Shanghai Jiaotong University and the European Foundation for Management Development, the school is an outgrowth of the China-Europe Management Institute which operated in Beijing for 10 years. CEIBS offers an 18-month MBA program, taught in English; a two-year, part-time MBA program for mid- and senior-level managers; and short-term executive programs covering such areas as general management, leadership, finance, marketing, production management, and human

resources management.

Stefaan van Hooydonk,  
executive development manager  
CEIBS, Jiaotong University  
800 Dong Chuan Road  
Shanghai 200240  
Tel: 8621/6463-0200  
Fax: 8621/6435-8928

*I Will Not Complain* I Will Not Complain, an experiential management training company based at the Jinshanling section of the Great Wall, uses outdoor rope courses and problem solving activities to foster teamwork, effective communication, and trust.

Ian M. Robson, sales manager  
Room B04, No.9 Ritan East Road  
Beijing 100020  
Tel: 8610/592-4473  
Fax: 8610/595-8752

*Mercer Human Resources Consulting* Mercer holds skills-development programs periodically in Beijing, Shanghai, Tianjin, and Guangzhou. Topics addressed include time management, presentation skills, problem-solving, and effective English communication. The company also offers custom-designed training programs for companies.

Judith Anne Marasco, chief representative  
Regus Business Center Suite E

Beijing Lufthansa Center Offices  
50 Liangmaqiao Road  
Beijing 100016  
Tel: 8610/465-1306  
Fax: 8610/465-1240

*Mt. Eliza Business School* Mt. Eliza has been providing management training to Chinese managers since 1991. Introductory and advanced management courses teach leadership, human resource management, time and quality management, and cost-effective use of resources. Mt. Eliza holds public programs in Beijing and Shanghai and designs programs for individual companies.

David Chen, chief representative  
Regus Office Center Room 11  
Beijing Lufthansa Center Offices  
50 Liangmaqiao Road  
Beijing 100016  
Tel: 8610/465-1261  
Fax: 8610/465-1240, 465-1291

*Shanghai East Gate Consulting Company* East Gate offers foreign-invested enterprises targeted, interactive training, both on- and off-site. Training has two "tracks": sales and marketing skills, and management skills. The company offers training in sales management, presentation skills, communication skills, team building, and leadership. The company uses its own

guage. But companies that opt to teach in Chinese argue that since the language of business in the PRC is Chinese, training should be conducted in the students' native tongue. The argument for training in Chinese is particularly strong when training activities are interactive. As the Chinese administrative manager for a US firm in Shanghai points out, trainees will be more comfortable participating in discussions, role plays, and presentations—teaching techniques little used in the Chinese education system—if they can do so in Chinese.

### Implementing the vision

FIEs are now using a number of resources to carry out their training policies. Many FIEs are developing in-house

resources. Some companies, for example, pay for a small group of Chinese employees to participate in "train the trainers" programs so they can teach future sessions. Other companies go to Chinese universities and develop relationships with Chinese business professors willing to become the primary consultant responsible for conducting training sessions. This has proven a particularly effective way to teach marketing, sales, and accounting techniques. Some firms that have large internal training resources based elsewhere in Asia periodically bring staff to China to run training courses. Companies with offices in Taiwan, for example, may find it cost-effective to bring in Taiwan-based trainers.

Some FIEs hire outside consultants to develop specialized, on-site training courses for their employees. Ideally, the development of such a course involves pre-training interviews with high-level Chinese and expatriate managers to help the trainers understand the company's operating procedures and training needs. After gaining a sense of how the company operates, trainers are better able to implement the goals of senior management.

To reduce training costs, maximize use of training resources, and expose employees to more frequent training, some FIEs have formed training consortia. Usually based on geographic proximity and similar training needs, a consortium is a loose affiliation that draws on individual companies' internal training resources

Chinese-language training materials.

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managing directors  
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Shanghai 200233  
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Fax: 8621/483-6230

**Chinese universities:** China began experimenting with MBA programs in 1991, when nine schools were chosen by the State Education Commission (SEC) to establish pilot MBA programs. In 1993, the SEC allowed 17 more universities to set up MBA programs. By 1994, 1,500 Chinese students were enrolled in MBA programs. Entrance to these programs is extremely competitive and MBA graduates find themselves choosing among dozens of job offers. Schools that have MBA programs often offer short-term, targeted training for companies. It is important to note, however, that a Chinese MBA requires students to cover much more theory than is the practice in Western MBA curricula.

Several US universities are currently exploring opportunities to provide targeted management training or establish MBA programs in China. Ohio State University, for example, ran a management training program with Fudan University in 1993-94, and Rutgers University has established a cooperative relationship with Dalian University. The following Chinese universities offer MBA programs:

*Fudan University School of Management*  
Yuan Xu, associate dean  
220 Handan Road  
Shanghai 200433  
Tel: 8621/549-2222, ext.2411  
Fax: 8621/545-3039

*Harbin University of Technology*  
92 West Dazhi Road  
Harbin, Heilongjiang 150080  
Tel: 86451/362-1000

*Jiaotong University*  
28 Xianning Road  
Xian, Shaanxi 710049  
Tel: 8629/323-1169

*Nankai University*  
94 Weijin Road  
Tianjin 300071  
Tel: 8622/334-4112

*People's University*  
39 Haidian Road  
Beijing 100872  
Tel: 8610/255-5431

*Qinghua University*  
Qinghuayuan, Beijing 100084  
Tel: 8610/259-4114

*Shanghai Jiaotong University*  
1954 Huashan Road  
Shanghai 200030  
Tel: 8621/431-0310

*Shanghai University of Finance and Economics (SUFE)*  
Luo Zu Wang, dean of the Hengtong Business School  
777 Guoding Lu  
Shanghai 200433  
Tel: 8621/549-0001

*Shenzhen University*  
Nantou, Shenzhen  
Guangdong 517060  
Tel: 86755/666-0166

*Tianjin University*  
92 Weijin Road  
Tianjin 300072  
Tel: 8622/335-2250

*University of International Business and Economics*  
Huixin Dong Road  
Beijing 100029  
Tel: 8610/422-5522

*Xiamen University*  
422 Siming South Road  
Xiamen, Fujian 361005  
Tel: 86592/208-5102

*Zhongsan University Management School*  
Wang Chunben  
135 Xingang West Road  
Haizhu District, Guangzhou 510275  
Tel: 8620/444-6300

and spreads the expense of outside trainers among several parties. Though this approach can help cut costs, a consortium can be difficult to organize. The organizer of a successful training consortium in Shanghai recommends limiting the number of companies involved and hiring an outside manager to oversee the administration of the programs.

Other FIEs, though, are beginning to devote substantial resources to establishing comprehensive company training centers in China aimed at employees from all the company's PRC operations. One such project is Motorola's "Motorola University" in Beijing's university district. A major commitment in time, money, and effort, these training centers generally are created by corporations that place great emphasis on both training and their China business. More companies likely will follow Motorola's example as their China operations expand.

While many FIEs make use of private training resources to cultivate a corps of Chinese management experts, many seem to overlook the possibilities at Chinese universities. Twenty-six Chinese universities are currently authorized to offer masters in business administration (MBA) programs; several of these programs also offer targeted, short-term training courses focusing on Western corporate culture in general or on topics specifically requested by the company.

Praxair, Inc. has undertaken sponsorship of a program developed jointly by

Overseas training,  
many managers feel,  
is the best way to  
impart the values of  
an American  
corporation to a  
Chinese manager.

the University of Buffalo and People's University in Beijing to train Chinese general managers. The first students are expected to begin their studies at People's University this year. And the China-Europe Management Institute, funded partly by the European Community, has set up a full-fledged business school in Shanghai that also offers short-term training courses.

#### More than just efficiency

For many FIEs, the fruits of training programs are not just higher-skilled workers. A generous training policy can be a powerful tool for attracting and retaining competent managers and staff in a job market in which skilled workers continue to push up the income ceiling. Most PRC managers and staff are eager to learn and improve their professional abilities. One Chinese manager said he has remained with his company for 10

years—despite generous job offers from competing firms—largely because of the opportunities he has to receive training in the PRC and abroad. He believes that his company lets its workers learn, treats them fairly, and respects them. His Chinese colleagues apparently agree—the company's turnover rate for managers is only eight percent, low by FIE standards. Many foreign general managers agree that the best way to improve retention rates in China is to allow employees to enhance their skills.

Some companies are afraid to spend too much on training because they think employees will jump to another job as soon as the training ends. But by expanding the pool of Chinese employees trained in the basics of Western corporate culture, foreign companies can help reduce "poaching" of top Chinese employees. A company should explain to its new hires that the investment in training is made with the expectation that employees remain with the company for a reasonable period of time, typically several years. Some companies ask employees to sign contracts promising to stay with the company for at least a few months after training, though such contracts rarely prove to be binding.

#### The wave of the future

The days when US companies left responsibility for training—and other human resources issues—to their Chinese partners are long gone. Foreign companies now see training as an integral part of their successful China operations and a vital step on the road to localization of managerial talent. FIEs are beginning to devote more resources to training and experiment with different training methods to discover which produce the best results. A growing number of international human resources managers also are visiting China, suggesting that multinational corporations realize the importance of Chinese workers with strong skills and company loyalty. The PRC leadership, too, welcomes FIE-sponsored training, which it views as a demonstration of a foreign corporation's long-term commitment to China. No single path to success in the China market exists, but a good training program can be an excellent starting point. 完

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- **IMS China Update**, a newsletter on latest developments of China's healthcare markets co-published by IMS and WiCON
- **Marketing Pharmaceuticals in China** (1995 edition)
- **Directory of Bulk Pharmaceutical Products and Manufacturers in China** (3rd edition - 1996)
- **Guide to Pharmaceutical and Related Research Institutions in China** (1995 edition)

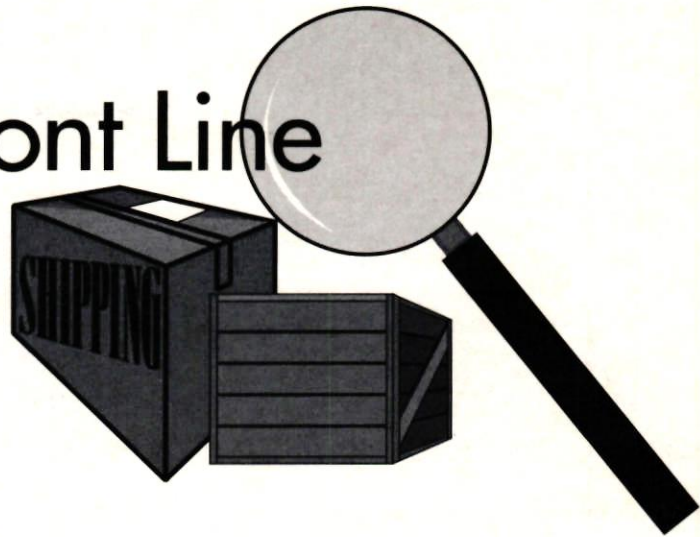
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# A Stronger Front Line



■ Joseph T. Simone, Jr.

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## New Customs regulations may help China enforce intellectual property rights

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**N**ew Customs rules introduced in late 1995 promise to give foreign companies a valuable new tool to block the flow of counterfeit products through China's borders. The Regulations of the PRC on Customs Protection for Intellectual Property, promulgated in July 1995 by the State Council, and corresponding implementing measures issued in September by the General Administration of Customs (GAC) went into effect on October 1, 1995. The new regulations permit owners of registered trademarks, copyrights, and patents recorded with the GAC to seek Customs enforcement against suspected infringements.

Together with the 1982 Trademark Law, 1983 Patent Law, 1990 Copyright Law, and the 1993 Anti-Unfair Competition Law, the new Customs regulations arguably fill the last gaping hole in China's intellectual property legislation and will help pave the way for the PRC's accession to the World Trade Organization (WTO). The promulgation of the regulations also helps China meet its obligations under the Sino-US Action Plan outlined in the February 1995 bilateral agreement on intellectual property protection (see *The CBR*, July-August 1995, p.22).

The new regulations empower PRC Customs authorities to confiscate goods that infringe intellectual property (IP) rights, provided the IP owner has

recorded its rights with the GAC in Beijing. PRC Customs officials also have the power to impose larger fines on infringing parties than those which can be imposed under other IP laws—a sign of significant progress on the legislative front. Effective implementation of the new regulations at the local level will be the real test of success, however. Installing computer networks and training border personnel, for example, may take several months, if not years.

The regulations are subject to interpretation by the GAC, which is expected to supplement the legislation—and, it is hoped, close troublesome loopholes—by issuing notices and regulations to be published in the *Customs Gazette*. Such supplementary regulations will be crucial to ensuring the effectiveness of the new protection regime.

### Mandatory steps

The Customs regulations generally require IP owners to submit copies of recordal certificates issued by the GAC as a condition for procuring enforcement measures. Nonetheless, the new regulations do permit parties that have identified suspected goods but have not yet obtained a recordal certificate to apply directly to the GAC in Beijing for enforcement measures, rather than to local Customs offices—subject to the condition that they concurrently file IP recordal applications with the GAC (see p.30).

GAC officials recently indicated that they will encourage local Customs offices to seize infringing products even if the relevant IP has not yet been recorded with the GAC in Beijing. Such seizures would appear sanctioned under China's Customs Law, which generally prohibits the import or export of illegal products. However, the willingness and ability of local Customs authorities to seize goods which incorporate unrecorded IP remains untested.

The new regulations provide for recordal and enforcement only with respect to trademarks registered with the PRC Trademark Office, patents issued by the PRC Patent Office, and copyright

## The new Customs regulations arguably fill the last gaping hole in China's intellectual property legislation.

works. Although other countries, including the United States and Japan, have similar systems, some foreign trademark owners have expressed concern that unregistered marks cannot be recorded with PRC Customs. Meanwhile, given current backlogs, the PRC Trademark Office re-

quires at least two years to process applications and issue trademark certificates to applicants. During this period, trademark owners are unable to avail themselves of Customs protection unless some other aspect of their product can be recorded as copyright or patent subject matter.

The US-China Action Plan requires that China eventually allow the recordal of unregistered trademarks that have been recognized as "well-known" (*chi ming*). Draft regulations specifying the procedures and standards for achieving well-known status are being circulated among trademark experts in Beijing, though the timing for issuance of these new regulations remains unclear. Ulti-

## Recording Your Rights

Currently, recordal of intellectual property (IP) with the PRC's General Administration of Customs (GAC) under the new Customs regulations is permitted only with respect to copyright works, trademarks registered with the PRC Trademark Office, and patents issued by the PRC Patent Office. Unregistered trademarks, trade secrets, and other forms of IP may not be recorded and therefore will not be protected by Customs.

Copyright owners need not first register or record their works with the National Copyright Administration of China (NCA). However, documents issued by NCA or equivalent bodies in other countries—such as the US Copyright Office—may be used to support GAC applications.

Foreigners must submit applications to the GAC in Beijing through a representative office, subsidiary, or agent maintaining a place of business in China. The GAC has not imposed limitations on who may represent the IP owner in the filing process. Although PRC laws require that foreign trademark and patent applications be filed through a limited number of government-approved trademark and patent agencies, this restriction has not been applied by the GAC under the new Customs regulations and foreign companies are not limited to filing only with these agencies.

The agent the foreign company designates will be contacted by the GAC or local Customs authorities when suspect goods are detected. The agent would then be required to present the Certificate of Recordal of Customs Protection for Intellectual Property for the relevant IP, confirm if goods are infringing, and submit applications for further enforcement measures, including the destruction of the goods and the imposition of fines.

The new Customs regulations and implementing measures state that all applications and supporting documentation must be submitted in Chinese, or with a Chinese translation, and must be accompanied by a completed GAC application form. The applications must include the following items:

•**Evidence of IP ownership** In trademark and patent recordal applications, a copy of the trademark or patent registration issued by the PRC Trademark or Patent Office must be submitted. Applications to record copyright subject matter can be supported with copies of the work and other identification documents and need not be accompanied by NCA registration certificates.

•**Information about the IP owner's products** Applications must be accompanied by photographs of products, the names and addresses of bona fide licensees and manufacturers in the PRC,

the normal ports of import and export of legitimate goods, the "main features" and price of the IP owners' products, and any information Customs authorities should treat with confidentiality.

•**IP owner identification documents** Applications must be accompanied by documents confirming the identity of the applicant, such as a certificate of incorporation (in the case of a company) or a copy of a passport (in the case of an individual).

•**Other information** Customs has the power to request additional information from IP owners, although neither the Customs regulations nor the implementing measures indicate what additional information may be required.

•**Application fees** The regulations permit the GAC to charge filing fees for each application. GAC officials recently indicated that the maximum charge for each application will likely be less than \$250, but the fee chart has yet to be approved by the Ministry of Finance. The GAC is willing to begin processing applications immediately, on the condition that applicants agree to pay filing fees after the fee scales have been published, most likely by the summer of 1996. A separate application must be filed for each trademark registration, patent, or copyright work.

•**Power of attorney** IP owners must supply their agents with a signed power

mately, however, the standards will likely be too high for the vast majority of unregistered foreign marks to achieve.

### Detecting fakes

GAC officials have indicated that local Customs offices soon will begin conducting random inspections of up to one percent of exports and imports. Until then, the majority of Customs enforcement actions no doubt will be based on information concerning specific shipments that have been identified and reported by IP owners themselves to the GAC and local Customs offices. IP owners also can approach local Customs officials with the

names of suspected infringers and the likely ports of entry and exit for illicit goods, and educate the officials further on methods for distinguishing genuine and fake items.

GAC officials recently confirmed their intention, at least for the time being, to investigate infringements only after illicit goods have been identified and seized within Customs territory. It remains unclear whether Customs will assist other enforcement bodies in their investigations. In other countries, including the United States, Customs officials are empowered to investigate *any* suspected import or export activity, regardless of whether or not goods have already been

seized. Foreign IP owners hope that PRC Customs, over the long term, will widen the scope of their investigations as their resources grow.

Many of the requirements imposed upon IP owners who are notified of seizures of infringing goods are quite onerous. In cases where Customs identifies a suspect shipment, officials are required by the new regulations to detain the goods and notify the IP owner or its agent. The IP owner then has only *three* working days to request formal enforcement measures and to confirm whether the detained goods are infringing. Moreover, the IP owner must pay a bond equal to the full C&F value of goods in-

of attorney form, although this need not be notarized or legalized.

• **Information concerning prior infringements** Applications may include information concerning prior infringements to help Customs monitor shipments from specific parties or ports. The new Customs regulations indicate that such information should include the names of known infringers, the prices of past infringing goods, the ports of import and export, "special features," and photographs. The GAC has indicated that it will accept and disseminate to local Customs offices information concerning suspected infringements, and not just confirmed infringements. IP owners that supply Customs with the names of mere suspected infringers in their recordal applications should be aware that, in theory, they may be liable for slander if their information is determined by a PRC court to be false.

### After receiving approval

The Customs regulations require GAC to notify parties within 30 days whether applications have been approved. Upon approval, the GAC issues a recordal certificate, which the IP owner or its agent must present when seeking enforcement measures through local Customs. GAC officials have indicated that only original or GAC-issued duplicate copies of recordal certificates will be accepted by local Customs for enforcement purposes. GAC officials have suggested that photocopies may in

some cases be provided upon the filing of a request for enforcement, with GAC-issued duplicate copies submitted later.

The Customs regulations indicate that recordals are valid for seven years, provided the rights in a given work do not expire within this period. Applications for renewal may be submitted during the six months prior to their expiration. Renewal applications will not be accepted after the expiration of recordals.

The Customs regulations and implementing measures require IP owners to file applications to amend recordal details when there has been an assignment of IP rights, changes in the name of the IP owner or its address, addition or deletion of licensees, substitution of the IP owner's agent, or changes in the use of IP on products (such as changes in packaging designs). The Customs regulations impose a deadline of 10 days for filing amendment applications with respect to assignments and changes in the name or address of an IP owner. This 10-day window begins only after the change has been formally approved or recorded with other relevant PRC government departments. This requirement undoubtedly will create confusion for IP owners and Customs, since the Trademark Office currently takes several months—in some cases years—to approve such changes, and GAC officials recently indicated that they are unwilling to accept applications for amendment of recordals until the changes have been verified by the Trademark Office and other

government departments. The Customs regulations do not indicate specific deadlines for failing to amend recordal information. However, the implementing measures indicate that the GAC may cancel recordals in cases where the failure to amend information on record leads to "great mistakes" in enforcement.

### Extending the scope of protection

The Customs regulations were not intended to provide protection for trade dress of products. However, the GAC has expressed willingness to begin immediately recording rights in trade dress under the assumption that it is protected under China's Copyright Law. NCA has not yet confirmed its willingness to protect or permit the registration of copyrights in product labels or other trade dress and the GAC may well change its policies to accord with those NCA develops in the future.

China's Copyright Law and relevant regulations also extend protection to works of applied art (*meisbu shiyong zuopin*), though this term has not yet been defined by NCA or Chinese courts. The definition may include a wide range of consumer items such as clothing, textile designs, watches, furniture, and writing instruments. As with trade dress, the GAC appears willing to record rights in such works pending the issuance of formal interpretations by NCA or the courts concerning their protectibility under the PRC Copyright Law.

—Joseph T. Simone, Jr.

tended for import or the FOB value of goods intended for export.

GAC officials recently indicated that bonds must be paid in *renminbi*, though procedures may be introduced later permitting IP owners instead to procure bank guarantees or other security in lieu of cash bonds. It is unlikely, however, that Chinese banks will be willing to offer this sort of guarantee service anytime soon.

GAC officials have responded to complaints about the severity of the three-day deadline and bond requirement by suggesting that foreign IP owners need not pay the bond within three days, but merely need to declare that the bond will be provided in the future. These officials have not indicated the actual deadline for payment of bonds in such circumstances,

although presumably Customs would be unwilling to commence an investigation or impose penalties upon the infringing party until the bond is paid. Unfortunately, the uncertainties surrounding these burdensome requirements could deter foreign companies from pursuing infringements.

### The goods in question

If the IP owner fails to respond within three days after notification, the new regulations grant Customs the power to release the suspected goods to the importer or exporter. However, GAC officials have indicated that this power is discretionary and that local Customs authorities may dispose of infringing goods and impose penalties even if the IP owner fails to re-

spond to Customs in time or does not pay the required bond. But it remains to be seen whether local Customs authorities will take such action of their own accord.

A company that wants to avoid paying bonds, but desires to pursue infringing goods being exported from China that have been detected by PRC Customs, may in some cases be able to arrange seizures in the destination port for such goods. However, the viability of this strategy will depend on whether Chinese Customs authorities will share vital information with IP owners concerning the destination of the goods, and whether Customs will refrain from informing the exporter that the IP owner is aware of the infringement. If such conditions exist, many IP owners may make it standard

## Tips for Battling Fakes

Local staffers in China are the front lines in the war against fakes and are often in the best position to deal with PRC Customs and other officials when enforcement action is required. Here are a few pointers for joint ventures setting up their own intellectual property (IP) enforcement teams.

- Develop guidelines to follow when potential infringements are discovered. Set out clear lines of authority for reporting and follow-up tasks, which should include notifying the foreign IP licensor's in-house counsel.

- Where the scope of infringements warrants, establish a separate department within your China venture to deal with fakes. Be sure to train staff adequately and coordinate closely with the IP licensor's in-house counsel.

- Do not allow local staff to conduct detailed investigations into infringements. Counterfeiting is serious business in many places and the risk of bodily harm to staff cannot be ignored.

- Identify and place on retainer local investigators or trusted "moles" who can monitor the market and ask questions of vendors without raising suspicion. Be prepared to offer rewards for information.

- Ensure that preliminary inquiries by investigators reap as much information as

possible without tipping off infringers. Investigators should try to confirm the wholesale price of fakes, the amount of product held in the vicinity, and how long delivery of a large order will take. If a large order takes two days or less, the manufacturer is probably nearby.

- Require sales personnel or agents to notify management of suspected fakes in writing within 24 hours and caution them not to discuss the matter with anyone—including other staff members and the vendor of the suspect goods. Sales representatives often want to issue on-the-spot warnings to vendors of infringing goods—a sure way to see valuable investigative leads vanish.

- Pursue cost-effective remedies, which might include hiring local investigators, trademark agents, and lawyers. Local agents may be inexperienced and require some hand-holding, but will likely have better connections with local officials or a better understanding of how to address local protectionism. In serious cases, or where local agents are not trustworthy, consider using Hong Kong- or Taiwan-based investigators and advisors.

- Obtain contact information for relevant enforcement officials in all major cities where fakes appear, including prosecutors, the technical supervision bureaus,

and the trademark and advertising divisions and economic supervision divisions (also known as the fair trade bureaus) of the local administrations for industry and commerce (AICs).

- Provide local enforcement officials with adequate information describing your product line, including catalogues and, if necessary, samples. Some foreign-invested enterprises (FIEs) distribute regular news updates to all AICs by fax.

- Keep records of known and suspected infringers and make sure that marketing staff, investigators, or local officials visit these operations periodically.

- Raids are fairly easy to procure in many parts of China; the key to any successful anti-counterfeiting strategy is ensuring that the penalties are severe enough to have a deterrent impact on both the infringer and third parties. Lobbying officials to impose harsh penalties requires intensive effort by FIE agents, staff, and the IP licensor, and is crucial in cases handled by prosecutors. Experience suggests that if a criminal case is dropped by prosecutors because of lack of support from the IP owner or licensee, infringers will be encouraged to continue their illegal operations.

—Joseph T. Simone, Jr.



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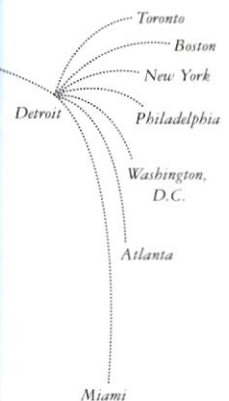
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policy to allow goods which violate their rights to depart from China and have them seized at destination ports where the bond and other requirements imposed on IP owners are less demanding. In Hong Kong, for example, Customs and Excise authorities will seize infringing goods and pursue criminal prosecutions of infringers without requiring IP owners to post a bond.

If PRC Customs detains goods suspected of infringing IP rights, Customs must notify the consignor or consignee of the detention of the goods. The consignor or consignee then has seven days to file an opposition to the detention directly with Customs.

Foreign industry associations have criticized provisions in the new regulations that permit suspected infringers to apply for the release of their goods, subject to payment of a bond equal to twice the value of the goods. In such cases, the infringer must provide Customs with a sample of the shipment for evidentiary purposes. Article 25 of the implementing measures to the regulations prohibits Customs from returning suspected goods in the following circumstances, notwithstanding the infringer's willingness to provide a bond: if the suspect party misses the seven-day filing deadline to oppose the detention of its goods; if a PRC court issues an injunction on the release of the goods; or if the goods "have another illegal nature." IP owners hope that this latter criteria will be interpreted broadly so that few, if any, counterfeit goods will be returned to infringers.

If Customs ultimately concludes that previously released goods indeed violate IP laws, the implementing measures require the infringing party to deliver the goods back to Customs for confiscation—or else pay an additional fine equal to the value of the goods concerned. The implementing measures leave unclear, however, whether Customs will permit the export of goods which have been released to the custody of infringers.

### Legal confirmation of infringements

Local Customs offices are responsible for investigating and deliberating over most infringement cases, though the new regulations grant IP owners the right to request adjudication by other enforcement bodies, including administrative authorities

## The Customs regulations take a harsh stance on pirated software, films, and books.

and the courts. Such requests must be filed within 15 days after the alleged infringer is notified of the detention of its goods, thereby giving IP owners at least seven days to consider transferring a case if an infringer has filed an opposition.

It remains unclear if the courts, the administrations for industry and commerce (AICs), or other administrative enforcement bodies will accept complaints from IP owners after the 15-day deadline. It is also unclear whether Customs will suspend its own decision while the investigations of these other authorities are pending. By contrast, the regulations do not permit suspected infringers to seek similar adjudication from other authorities, though they can appeal Customs decisions to the courts later.

### Significant new penalties

Article 28 of the new regulations permits local Customs offices, after making an affirmative determination of infringement, to issue a fine up to the value of the goods. These fines may be imposed only on IP violators that "knew or should have known" that goods were infringing—a standard which appears in China's present trademark, copyright, and patent laws with respect to vendors of infringing items.

An additional fine up to the value of the goods may be imposed under Article 29 if the infringing party "failed to explain the factual situation" concerning the IP incorporated in the goods. Thus, depending on the circumstances, an infringer may be fined up to three times the value of the infringing goods. The value of the goods is determined by the declared value or, if this seems inaccurate, by Customs' own estimate of the value of the goods.

The PRC Trademark Law provides for fines of only up to 50 percent of the value of infringing goods, so the new Customs penalties are significantly more severe. However, neither the Trademark Law nor the Customs regulations specify

minimum fines or provide standards for calculating fine amounts. As a result, local enforcement authorities likely will continue to enjoy a high level of discretion in handling IP infringement cases.

The new regulations grant Customs the power to destroy goods that infringe trademarks if the relevant mark cannot be deleted or separated from the infringing product. If the trademark can be removed without totally eliminating the commercial or salvage value of the goods, Customs requires that the goods be forfeited and sold either to non-infringing parties or donated for "public use" (presumably by charities or government departments). Meanwhile, the Customs regulations take a harsh stance on pirated software, films, books, and other copyright subject matter by specifying that all such goods be destroyed. The regulations fail to indicate how goods that infringe patents are to be disposed of, though this issue may be addressed in future GAC regulations.

Upon issuance of penalty decisions, Customs will return the bond provided by the IP owner, less actual expenses incurred in storing and maintaining the infringing goods. The IP owner can seek the recovery of any storage or maintenance expenses in a separate court action against the infringer. The AICs or other administrative authorities rarely award such compensation in actions filed with them.

Any party may appeal penalty decisions issued by Customs. Appeals may be filed with either the courts or with the same or a higher-level Customs authority. Appeals will be decided within 90 days of filing. No comparable rules exist for filing appeals with other IPR enforcement bodies.

### Criminal enforcement

Customs is required, under the new regulations, to forward all serious cases to prosecutors for criminal investigation. Regulations issued in 1993 by the Supreme People's Protectorate allow local prosecutors to commence criminal investigations against IP violators if the total value of the goods in question exceeds \$12,000, or if profits from the sale of such goods would be more than \$2,500. China's criminal code allows prosecutors to impose prison terms of up to seven years for illegal producers and vendors of products bearing registered trademarks.

Many foreign IP owners nevertheless remain concerned that prosecutors will refuse to pursue criminal responsibility for even the largest cases referred to them by Customs.

In the last few years, even where Chinese prosecutors have undertaken seizures at the behest of IP owners or administrative enforcement authorities, they have usually failed to bring cases to the court for the imposition of criminal fines and/or prison sentences. The reasons behind this reluctance to prosecute confirmed infringers are varied and include, in part, a lack of policy direction from either Beijing or local governments, local protectionism, limited financial and human resources, and, in some cases, corruption.

Although criminal enforcement of trademarks in such northern cities as Tianjin, Beijing, and Shenyang has improved greatly in recent years, enforcement in many other cities and regions is considered non-existent—thereby attracting producers and wholesalers specializing in fakes (see p.32).

#### Action by other authorities

The new regulations indicate that Customs will only investigate and penalize consignors and consignees of infringing goods that have been physically seized within Customs' jurisdiction. Cases that Customs is unable or unwilling to pursue, such as those involving infringing goods which have already left China or those against factories that made infringing goods but did not act as the consignor or consignee thereof, can still be investigated, but only by other enforcement authorities, including the AICs, prosecutors, technical supervision bureaus, the National Copyright Administration (NCA) and local copyright bureaus, and the courts. In past cases involving cross-border infringements, these other enforcement authorities have not always been successful in obtaining evidentiary documentation and other cooperation from Customs. The new regulations suggest—but by no means guarantee—the beginning of a new era of cooperation among Customs and other IP enforcement bodies.

Regrettably, the Customs regulations fail to clarify whether an infringing party may be fined by two separate enforcement bodies for the same offense. Article

Fines may be imposed only on IP violators that “knew or should have known” that goods were infringing.

26 of the regulations states that Customs will not accept complaints concerning cases which are already being handled by the courts or other departments. This would not necessarily exclude Customs from imposing fines in a case referred to other departments or the courts after a Customs seizure. However, in practice, the traditional rivalries among IP enforcement organs and the lack of clear regulations governing the transfer of cases may pose serious obstacles to Customs enforcement in such cases.

Many foreign IP owners are concerned that their legitimate exports to China will be interrupted or otherwise subject to unwanted scrutiny once they record their IP rights with Customs. A significant portion of foreign goods enter China's market through importers unknown to the IP owner. Many of these “parallel imports” are sourced by Hong Kong trading companies from countries all over the world. Others are “water goods” which are imported at reduced-duty rates or upon payment of no duty at all. IP owners are seeking clarification from the GAC on whether they may request that Customs refrain from examining or detaining suspect infringing goods incorporating their IP.

#### China and the WTO

Many key provisions in China's existing IP laws and regulations fail to meet the minimum standards set out in the Agreement on Trade-Related Aspects of Intellectual Property (TRIPs), to which WTO members must adhere. But the new Customs regulations meet virtually all of the requirements in the TRIPs Agreement for Customs protection of IP, so their issuance represents an important step for China towards WTO accession.

China recently announced plans to overhaul all of its main IP legislation in the near future. The Trademark Office, NCA, and the State Council now are busily

drafting new legislation intended to ensure compliance with all of the standards set out in the TRIPs Agreement. No target dates have been announced, but the new legislation will almost certainly be introduced before the PRC joins the WTO.

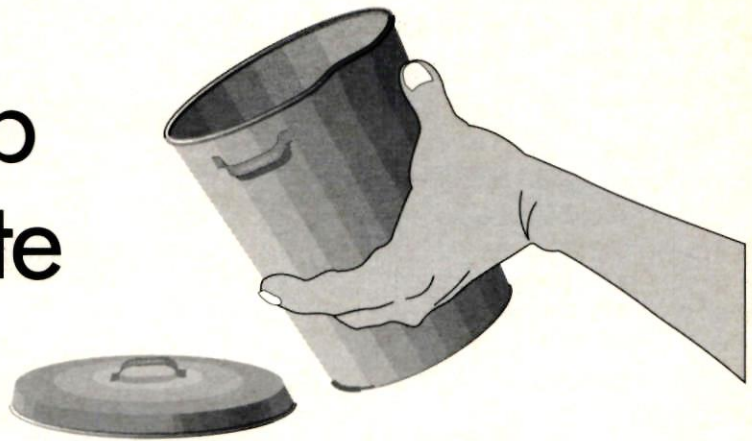
The TRIPs Agreement requires member countries to treat *all* cases of counterfeiting—complete copying of a product and its packaging, and not just the reproduction or imitation of a trademark—as criminal offenses, regardless of the number or value of infringing items involved. Officials with the PRC Trademark Office and State Council's Intellectual Property Working Conference recently have confirmed that the proposed amendments to the current trademark and copyright laws will provide significantly greater maximum fines, and that a new law or regulation dealing exclusively with counterfeit products may be introduced to ensure more severe penalties are levied on the makers and vendors of such goods.

Another hopeful sign is the fact that domestic companies and industry associations have been more active in lobbying the Chinese government on various proposals for reform. Such industry groups include the China Trademark Association and the China Software Alliance, both of which are managed in part by former government officials, but which seem to be doing more than just promoting the government line on IP matters. PRC enterprises clearly suffer dramatically from counterfeiting, both domestically and abroad, and the improvements in IP protection that are being negotiated currently with the American government in the context of the Special 301 dispute should ultimately provide even greater benefits to local enterprises than to their foreign competitors.

For the moment, the officials designated to handle enforcement in local Customs offices are still learning the basics of IP law, investigations, and enforcement. Customs also lacks adequate infrastructure and other resources to identify and seize the vast majority of infringing goods that cross China's borders. Foreign companies must therefore be aware of local authorities' limitations in enforcing IP rights under the new Customs regulations, but also take advantage of the conveniences the new rules currently afford. 完

# Getting a Grip on Solid Waste

■ Ellen R. Spitalnik



A new PRC law helps outline the comprehensive regulation of solid and hazardous waste

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Incidents such as China's 1994 import of 6,440 barrels of South Korean chemical wastes, including waste alkalines, acids, and chemicals from dozens of factories—all labeled on Customs forms as "engine oil"—have begun to garner much attention in the PRC. Having learned the hard lesson that solid and hazardous waste problems are not the exclusive concern of developed countries, Chinese authorities are beginning to address waste management policies, particularly where hazardous waste is concerned. Sources in China indicate that environmental officials have been reviewing waste regulations in the United States, Europe, and Asia in an effort to adapt these to PRC circumstances. In response to China's increasing generation of industrial and hazardous waste—and associated health and ecological problems—the PRC embarked on a multifaceted waste management strategy following the UN Conference on Environment and Development in 1992. Chief among the PRC environmental leadership's tactics is a new law on solid waste issued late last year.

After over a decade of debate and more than 20 drafts, the Law of the PRC on Preventing and Controlling Environmental Pollution Caused by Solid Waste was promulgated on October 30, 1995. Effective April 1, 1996, the law will fill a significant gap in China's environmental statutes, and is the latest addition to related legislation already on the books,

which include water and air pollution laws and waste regulations. The law imposes new obligations on those who generate, collect, store, transport, utilize, dispose of, or import urban garbage, industrial solid waste, and hazardous waste, though full details await national and local implementing regulations. The law establishes a broad framework for cradle-to-grave management of hazardous and industrial solid waste and authorizes new reporting, registration, and licensing requirements. All enterprises in China, whether foreign or domestic, are responsible for proper waste disposal. The new law also suggests that incentives will be offered to encourage enterprises to implement cleaner production techniques.

If fully and effectively implemented, the law will increase significantly the power of the National Environmental Protection Agency (NEPA) and provincial environmental protection bureaus (EPBs) to improve waste management practices. But like all countries that seek to develop comprehensive waste management regimes, the PRC faces a long and arduous path. For China, the particular challenge will be implementing this potentially far-reaching environmental legislation while balancing the desire for continued industrial growth.

## Waste in China today

In pursuing economic development, China's strategy of rapid industrialization

## At least 30 million tonnes of hazardous waste is generated annually in China.

has encouraged growth in many industrial sectors that typically generate hazardous and industrial waste, including chemicals, mining, metallurgy, electroplating, steel production, printing, and dying. NEPA Administrator Xie Zhenhua's recent testimony to the Standing Committee of the National People's Congress (NPC) during a review of the solid waste law suggests that the production of industrial and hazardous waste has far exceeded the PRC's capacity to treat, store, and dispose of it safely: "Because of our limited technology, funding, and administration ability, the handling and disposal of solid waste in China is still in the initial stage. Most procedures do not meet the environmental protection standards." Ineffective waste management practices prevail, resulting in discharges of industrial and hazardous waste, contamination of land, air, and water resources, and foregone cost-saving recycling opportunities. Xie estimated that solid waste pollution costs China more than ¥90 billion (\$10.8 billion) annually.

The PRC's "Agenda 21" plan, approved by the State Council in the wake of the 1992 UN conference, estimated that as much as 70 percent of the industrial waste generated annually in China might be hazardous, and warned that "5.9 billion tonnes of industrial waste occupying 540 million cu m have been improperly stored or discarded in recent years." The majority of the waste—which includes hexavalent chromium and polychlorinated biphenyls (PCBs)—is piled on unprotected areas where, according to the Agenda 21 report, it leaches into the water supply, endangering the health of surrounding populations.

Liu Peizhe, director general of the Administrative Center for China's Agenda 21, maintains that 620 million tonnes of industrial solid waste is produced annually, of which about five percent—30 million tonnes—is hazardous. In a 1994 presentation at a Superfund conference in Washington, DC, Liu estimated that annual production of industrial solid wastes in China has grown by 2.6 percent since 1980, and that farmland polluted by solid wastes now exceeds 20,000 ha nationwide. In one particularly notorious incident recounted by Liu, a factory in northeast China producing chromium salts piled up 200,000 tonnes of chromium-

contaminated waste, resulting in such serious groundwater pollution that 1,800 wells in nine villages had to be abandoned.

### The law's scope

The new law, while it attempts to cover the broad spectrum of safe waste management practices, is quite slim on the necessary implementation details. The purpose of the law is "to prevent and control environmental pollution caused by solid waste, protect human health, and promote the development of socialist modernization" (Article 1). Addressing a wide range of waste matters, the nine-page law contains 77 articles and defines solid waste as "environment-polluting discarded matter in a solid or semisolid state that is generated during the course of production, construction, daily life, and other activities" [Article 74(1)], a definition that includes residential garbage in urban areas [Article 74(3)] and industrial solid waste [Article 74(2)].

Article 10 grants NEPA unified, nationwide supervision and management responsibility over the prevention and control of environmental pollution caused by solid waste. Local EPBs are to exercise "unified supervision and management" in their regions. NEPA is authorized, in conjunction with other relevant departments, to "define what constitutes environmental pollution caused by industrial solid waste; draw up technological policies that prevent and control environmental pollution caused by industrial solid waste; and organize efforts to popularize advanced production techniques and equipment that prevent and control environmental pollution caused by industrial solid waste" (Article 26). The law also applies to hazardous waste, which is defined as "waste included in the state list of hazardous waste or waste deemed to be of a dangerous nature according to state standards and measures used to de-

fine hazardous waste" [Article 74(4)]. While the law applies to waste in liquid and gaseous forms, it exempts environmental pollution caused by radioactive solid waste, solid waste pollution to the marine environment, liquid waste discharged into water, and gaseous waste released into the atmosphere (articles 2 and 75), all of which are regulated by other legislation.

The new statute focuses on prevention and control of environmental pollution caused by solid waste, applying to a broad range of industrial activities associated with the full cycle of waste management. The law goes far beyond the mere regulation of discharge of waste into the environment—calling for enterprises to minimize waste generation through cleaner production and to ensure safe waste management throughout the collection, transportation, comprehensive reutilization, treatment, storage, and disposal processes. Industrial enterprises, for example, must build facilities and establish sites according to as-yet unreleased NEPA standards to store or dispose of their industrial solid waste (Article 32). Special storage facilities must be built for slag, coal ash, chemical dregs, waste minerals, tailings, and other industrial solid waste (Article 33). Article 34 authorizes NEPA to assess pollution discharge fees for non-compliance with environmental protection standards for storage and disposal.

The new waste law establishes reporting and registration systems for industrial solid waste and hazardous waste (articles 31 and 45), which build on 1992 NEPA regulations requiring enterprises that generate solid waste or discharge pollutants to register with local environmental protection authorities and complete "pollutant discharge report and registration forms." Article 31 of the statute further provides that waste generators "must furnish material on the amount, flow, storage, and disposal" of industrial solid waste to local environmental authorities in accordance with NEPA provisions.

NEPA also is charged with developing unified methods for distinguishing hazardous wastes and marks whereby hazardous wastes can be recognized (Article 43). These methods likely will specify characteristics of waste and methods for distinguishing them—such as tests for toxicity, reactivity, flammability, corrosive-

ness, explosiveness, leaching potential, and infectiousness. Sources in Beijing report that NEPA, in conjunction with other relevant departments, currently is drafting a "State Catalogue" of hazardous wastes, as required in Article 43 of the new law. Determined to implement the law, NEPA reportedly will issue a tentative list of hazardous wastes in the near future.

One NEPA official estimates that the final list specifying types of hazardous waste will be released roughly within the year. The extensive definitions of hazardous waste contained in the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal—an international treaty signed by China—likely will serve as the blueprint for the State Catalogue. Until the NEPA catalogue is issued, hazardous waste generators will continue to refer to the Basel Convention (Article 76) and other documents, such as the 1991 Circular on the Strict Control of Transboundary Movements of Hazardous Wastes to China, to verify whether PRC authorities consider certain types of waste to be hazardous. The 1991 circular's list of regulated hazardous waste imports includes heavy metal, PCB, pesticide, asbestos, solvent, explosive, and phenol wastes, as well as waste from the production, formulation, and use of inks, dyes, pigments, paints, lacquers, varnish, resins, latex, plasticizers, glues, and adhesives. While EPBs already have some scattered waste regulations on the books, they need to see the State Catalogue before issuing their own local regulations pursuant to the new law.

### A closer look

The solid waste law begins by enunciating key policy principles and suggesting, in broad terms, how the Public Security Bureau, Customs, NEPA, the ministries of railway, chemical industry, metallurgical industry, construction, and other agencies involved with waste matters will coordinate their activities. The waste law's emphasis on clean production and comprehensive reutilization indicate that NEPA is moving away from a reactive, or "end of the pipe," approach to waste management and toward pollution prevention. Article 3, for example, states that, "In preventing and controlling envi-

NEPA appears to be moving away from an "end of the pipe" approach to waste management.

ronmental pollution caused by solid waste, the State shall implement the principles of reducing solid waste generation, make full and rational use of such waste, and render such waste harmless." The general principles also stress adoption of economic measures that aim to prevent and control waste production (articles 4 and 6), though observers in Beijing believe far-reaching incentives are probably unlikely to appear in NEPA's implementing regulations in the near term.

Responsibility for encouraging multiple use of resources and comprehensive utilization of waste is not limited to NEPA or the waste law, however. Other authorities, including the State Planning Commission, play a key role. Moreover, the Ministry of Foreign Trade and Economic Cooperation (MOFTEC), in conjunction with NEPA and other relevant State Council departments, is tasked with issuing a target list of "outdated production techniques and equipment that generate seriously polluting industrial wastes" to be eliminated within a certain period of time (Article 27).

Chapter 2 amplifies the authority of NEPA and its local bureaus to monitor waste and conduct spot-checks to ensure compliance, with confidential treatment of business secrets guaranteed (articles 11 and 14). The law reiterates the pre-existing requirement that a developer of a new industrial plant prepare an environmental impact report for approval from either the local EPB, for projects below a certain value, or from NEPA, for larger projects. An environmental impact report for construction projects "must evaluate the pollution and effects on the environment of solid waste generated by such projects and specify measures for preventing and controlling environmental pollution" (Article 12). In addition, companies must comply with the well-established "three simultaneous" policies of pollution control measures at the design,

construction, and operation stages of industrial projects (Article 13).

Chapter 3 sets forth a host of new obligations for solid waste management agencies and companies and addresses industrial solid waste and residential garbage. New packaging provisions also are spelled out (Article 17) that require products to be wrapped in "easily recyclable, disposable, or biodegradable" packaging. The law offers tougher provisions regarding storage and disposal facilities: closing, idling, or dismantling industrial solid waste pollution control facilities is prohibited without special authorization (Article 20). Centralized storage and disposal facilities for industrial solid waste and residential garbage landfills cannot be located near designated sources of drinking water, or in nature

## Tapping into Leads

For information on environmental technology opportunities in China, and for copies of *China: Environmental Technologies Export Market Plan*, first contact:

Eric Fredell  
Office of Environmental  
Technologies Exports  
International Trade Administration  
US Department of Commerce  
HCHB Room 1003  
Washington DC 20230  
Tel: 202/482-5225  
Fax: 202/482-5665  
E-mail: eric\_fredell@ita.doc.gov

For the latest word from Beijing on US environmental technology opportunities in China, contact:

Chris Adams  
US & Foreign Commercial Service  
US Embassy  
Xiu Shui Bei Jie, No.3  
Beijing 100600  
Tel: 8610/6532-6924  
Fax: 8610/6532-3297  
E-mail: cadams@doc.gov

preserves, scenic spots, or other specially protected areas (Article 22).

As a result of numerous cases of unwanted waste imports into China, the new law addresses in detail waste dumping and inter-provincial waste transfer. Article 23 establishes administrative

consent procedures for domestic transfers of solid waste for the purposes of storage and disposal. Article 24 institutes a ban on most solid waste imports for the purposes of "dumping, storage, or disposal"; NEPA, in consultation with MOFTEC, is charged with issuing a list of those solid wastes which can be imported for use as raw material (Article 25). Such wastes will only be importable upon prior approval by NEPA—not EPBs or other local government entities—in conjunction with MOFTEC. A State Council notice issued on November 7, 1995, confirms that only NEPA has approval authority over waste imports.

A NEPA official indicated that the list of permissible imports, still being drafted, will include scrap iron and steel, scrap copper, aluminum, paper and cardboard, and food and agricultural waste that can be used as animal feed. Article 25 emphasizes that solid waste imports for the purpose of disposal in China are banned, but those intended for recycling in China may be permitted: A NEPA official confirmed, for example, that a foreign-invested enterprise (FIE) that seeks to import plastic parts from spent rolls of film to be recycled into plastic for the venture's production process could probably secure import approval.

### **A new policy on hazardous waste**

Chapter 4 contains special provisions on preventing and controlling hazardous waste pollution, imposing new obligations on all players, from hazardous waste generators and transporters to operators of treatment, storage, and disposal facilities. Hazardous waste generators must register and dispose of their waste in accordance with relevant State regulations (articles 45 and 46). They can only transfer hazardous waste to a unit licensed in the business of collecting, storing, or disposing of hazardous waste (Article 49).

The law should enhance opportunities for US suppliers of environmental services.

generator's expense (Article 46), and, if hazardous waste was disposed of in a landfill, assess a special pollution discharge fee according to implementation details to be released by the State Council (Article 48). To transfer hazardous waste to another location, companies must file forms with environmental authorities in the jurisdictions of origin and destination (Article 51). Transportation and storage of hazardous waste must comport with safety requirements contained in articles 50, 52, and 53. Personnel directly engaged in the collection, storage, transportation, recycling, and disposal of hazardous waste must be professionally trained, tested, and certified (Article 54).

The law also requires those who produce or handle hazardous waste to prepare emergency plans (Article 55). If an accident involving hazardous waste causes "serious environmental pollution," the unit responsible must take immediate measures to rectify the situation, promptly notify those in danger, and report the problem to environmental authorities (Article 56). The government's role in hazardous waste management includes organizing construction of facilities for collective disposal of hazardous waste (Article 47) and taking remedial action when hazardous waste "is seriously polluting the environment and threatening residents' lives and property" (Article 57). Under the new law, the PRC can no longer serve as a transit country for trans-frontier movements of hazardous waste (Article 58).

Chapter 5 of the waste law covers legal responsibilities and establishes a gamut of potential enforcement actions, with sanctions including fines ranging from ¥10,000-¥1 million (\$1,204-\$120,048), suspension and closure orders, clean-up orders, compensation suits, and criminal responsibility in accordance with the Criminal Law. One criminal case involving

If a hazardous waste generator fails to dispose of the waste in accordance with the regulatory requirements, the law authorizes environmental authorities to order correction of the problem within a certain period, designate a unit to dispose of the waste at the

generator's expense (Article 46), and, if hazardous waste was disposed of in a landfill, assess a special pollution discharge fee according to implementation details to be released by the State Council (Article 48). To transfer hazardous waste to another location, companies must file forms with environmental authorities in the jurisdictions of origin and destination (Article 51). Transportation and storage of hazardous waste must comport with safety requirements contained in articles 50, 52, and 53. Personnel directly engaged in the collection, storage, transportation, recycling, and disposal of hazardous waste must be professionally trained, tested, and certified (Article 54).

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a serious dumping incident near Shanghai reportedly resulted in the maximum penalty—the death sentence—though the sentence was commuted. While this case reached conclusion before promulgation of the solid waste law, it suggests that criminal sanctions could be applied for very serious violations of regulations to be issued under the new waste law. More likely than the death penalty for egregious violations of the new law, however, is application of Article 115 of the Criminal Law, which calls for up to seven years' imprisonment for violations of regulations governing hazardous substances that result in especially serious consequences.

### **The bottom line**

Many foreign ventures in China, particularly those involved in processing chemicals and metals and others in industries that generate large quantities of hazardous waste, should anticipate an increase in regulatory demands as NEPA and local EPBs issue implementing regulations. NEPA and the EPBs will no doubt face significant difficulties in enforcing all provisions of the law, however. The promulgation of other important environmental legislation, such as the recently revised Air

Pollution and Control Act, suggests that scarce enforcement resources will be spread even thinner as environmental protection priorities expand.

After dealing with critical issues of inter-agency coordination and resource allocation, China is likely to follow the path of many countries beginning to implement waste laws: NEPA will phase in requirements and develop an enforcement strategy to identify key waste streams and waste-producing sectors and focus on those generating large quantities or presenting special hazards to human health and the environment. On its face, the solid waste law neither details this implementation process, nor guarantees provision of necessary funds to national and local environmental authorities for enforcement and development of standards. While it is difficult to predict whether FIEs will be singled out by enforcement officials, non-compliance by any enterprise that results in serious consequences is likely to attract the immediate attention of enforcement authorities, who can select from administrative, civil, and criminal enforcement options under the new law. Moreover, the high degree of publicity surrounding unwanted waste imports suggests that those who violate the import restrictions set forth in articles 24, 25, and 58 likely will face high fines, clean-up orders, and even criminal charges (articles 66-68 and 72).

Though the law may impose greater regulatory burdens on FIEs, it also should enhance market opportunities for US suppliers of environmental services. Alan Blakey, director of public and international affairs for the US-based Environmental Industry Association, recently noted, "The solid waste industry of the rest of the world is looking toward China." He Shengtao, executive vice president of China's Environmental Protection Machinery Industry Association, sized up China's environmental protection industry as "springing up like a bamboo shoot after a spring rain." The US government also considers China a high-growth market for environmental exports and recently released an extensive report on the subject. Prepared by the Trade Promotion Coordinating Committee's Environmental Trade Working Group, a multi-agency group co-chaired by the US Department of Commerce

## Strong implementing regulations are needed.

(DOC) and US Environmental Protection Agency, the study concludes that the best US sales prospects in China's waste sector will be in recycling equipment, street sweepers, incineration equipment, process controls, sanitary landfill liners, and environmental instruments.

DOC also has created a new Office of Environmental Technologies Exports to help the US environmental industry meet its export potential (*see* box). The office provides US exporters of environmental technologies informational resources and advocacy support for US companies seeking foreign projects. Recognizing the importance of the PRC market, the US & Foreign Commercial Service has posted an environmental specialist in the US embassy in Beijing.

### Beyond the law

With the promulgation of the solid waste law, China has taken another step toward environmental protection. As China's market economy develops, so, too, will its environmental protection system—with help from influential officials such as NPC's Environmental and Resources Protection Committee Chairman Qu Geping, who brought environmental protection to national awareness when he served as head of NEPA from 1987-94. Without sufficient capacity to treat, recycle, store, and dispose of industrial and hazardous waste properly, however, legislation alone will be no solution. Regulations currently on the books that overlap with the new law may provide some clues to which parts of the solid waste law will receive enforcement priority. For example, chromium, cyanide, PCBs, non-ferrous metals, and pollution from mine tailings are already singled out in older regulations.

One NEPA source, however, acknowledged that issuing all the new implementing regulations contemplated by the new law will take years. The official commented that drafting the standards for landfills and generation, treatment, and proper disposal of waste by enterprises alone will require up to two years.

Nonetheless, the NEPA official seemed confident that implementation of the new law—however slow and halting—will spur investment in landfills and incinerators in richer coastal cities.

Continued financial and technical support from the international community, too, will be crucial to effective, sustained implementation of the PRC solid waste law. With assistance from multilateral development banks, bilateral agencies, and international organizations, China has begun a series of waste management and cleaner production demonstration projects that PRC policymakers are likely to use as references when formulating implementing regulations. World Bank consultants have already provided technical expertise to hazardous waste management centers in several major Chinese cities. Several foreign-funded projects have focused on incorporating waste minimization and other cleaner production techniques—especially cleaner production audits—into such sectors as chemicals, pharmaceuticals, and metal finishing.

In the final analysis, though, the new law will lack teeth unless strong implementing regulations reflecting the consensus of many affected agencies are issued soon at both the national and local levels. Without a definition specifying exactly what waste is subject to the law; rules on waste import, reporting, and registration; manifests that track hazardous waste movements; and technical standards for comprehensive reutilization and treatment, storage, and disposal facilities, the law will remain little more than a broad framework for future tasks.

China must devote significant resources to procuring trained personnel, developing regulations and implementation plans, enhancing data collection and analysis, and creating facilities for waste treatment, storage, and disposal. Effective enforcement of the waste law will require environmental authorities to set priorities for dealing with the most offensive hazardous wastes quickly. It also will require a stricter overall environmental enforcement regime: If factory managers can do away with the hazardous waste they generate by throwing it into waterways with abandon, they will appear to have no waste to manage in accordance with this new law. 完



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# China's Wild West

■ Paul S. Triolo and Christopher Hegadorn

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A wealth of natural resources has made Xinjiang a bustling new frontier

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■ Paul S. Triolo is the energy and infrastructure officer in the economic section of the US embassy in Beijing. He has traveled extensively in Xinjiang to report on oil and gas developments in the region. Christopher Hegadorn is a vice consul at the embassy.

The Xinjiang Uygur Autonomous Region, in China's northwest corner, is becoming known as more than a huge desert once crisscrossed by the Silk Road and other ancient trading routes. Rather, officials in Beijing now believe Xinjiang's vast untapped natural resources and potential for cash crop farming could contribute much to China's economy well into the next century. The region's capital, Urumqi, is emerging as a modern city, complete with a rising skyline, the sparkle of nighttime neon, and typical urban headaches such as traffic congestion. Xinjiang officials, now flush with attention from central leaders, also are determined to make the region a gateway to China for travelers from Europe and Central Asia.

Great hopes are pinned on Xinjiang's stores of "black and white gold"—oil and natural gas reserves, and large-scale cotton production. Oil beneath Xinjiang's Tarim, Turpan-Hami, and Junggar basins could yield billions of tonnes of crude oil and billions of cubic meters of natural gas (see p.44). Cotton production, estimated at 925,000 tonnes in 1995, is rising steadily. The region is home to growing petrochemical and textile industries, as well as an extensive animal husbandry sector. Yet Xinjiang's ability to realize fully its vast potential will hinge on whether the region can overcome the limits imposed by the harsh topography and severe technological and infrastruc-

ture inadequacies which make these riches difficult to access and transport.

## Investing in the west

With a population of 16 million living on the 40 percent of its territory not covered by desert, Xinjiang at first glance appears an inhospitable place for development. Worries of ethnic tension in the region, home to the predominantly Muslim Uygur minority, also have slowed investment in the past by both central authorities and foreign businesses.

In recent years, however, Beijing has stressed the need to develop China's interior, which has lagged far behind the coast over the last decade. Enhancing the development of Xinjiang and other inland areas is a central theme in the Ninth Five-Year Plan (FYP) for 1996-2000. Beijing is particularly concerned about growing unrest in China's poorer central and western provinces and autonomous regions, where rural incomes have failed to keep up with the incomes of coastal residents. Shrinking crop acreage in fast-developing coastal areas, meanwhile, is prompting central authorities to push for greater agricultural production inland. Declining output at aging eastern oil fields is forcing officials in Beijing to look west—particularly to Xinjiang—for new sources of oil and gas (see *The CBR*, July-August 1994, p.8).

Investment is now beginning to funnel into the Tarim Basin area, including the

towns of Korla, Luntai, Kucha, and Aksu. Foreign firms, which have been eyeing the oil-rich basin since the bidding rounds for exploration rights began in 1992, are scheduled to begin drilling this year. The recently concluded third bidding round will bring in several more major foreign oil companies. Further, abundant stores of recently discovered natural gas soon will be transported via newly constructed pipelines to cities and towns within Xinjiang, to be used first as fertilizer and petrochemical feedstocks and eventually as a cleaner source of fuel for homes and businesses. If funding can be found, the pipelines later will extend as far as eastern Gansu Province.

Central and local officials also see parts of Xinjiang as ideal for growing cotton and other cash crops, which could offer a way to increase national production while easing the burden on eastern provinces. Many of these provinces are losing arable land to industrialization and have been hard hit by floods and other natural disasters. Officials forecast that by the year 2000, Xinjiang's cotton produc-

## Xinjiang officials are promoting cultivation of cash crops such as cotton, fruit, sugar beets, and tomatoes.

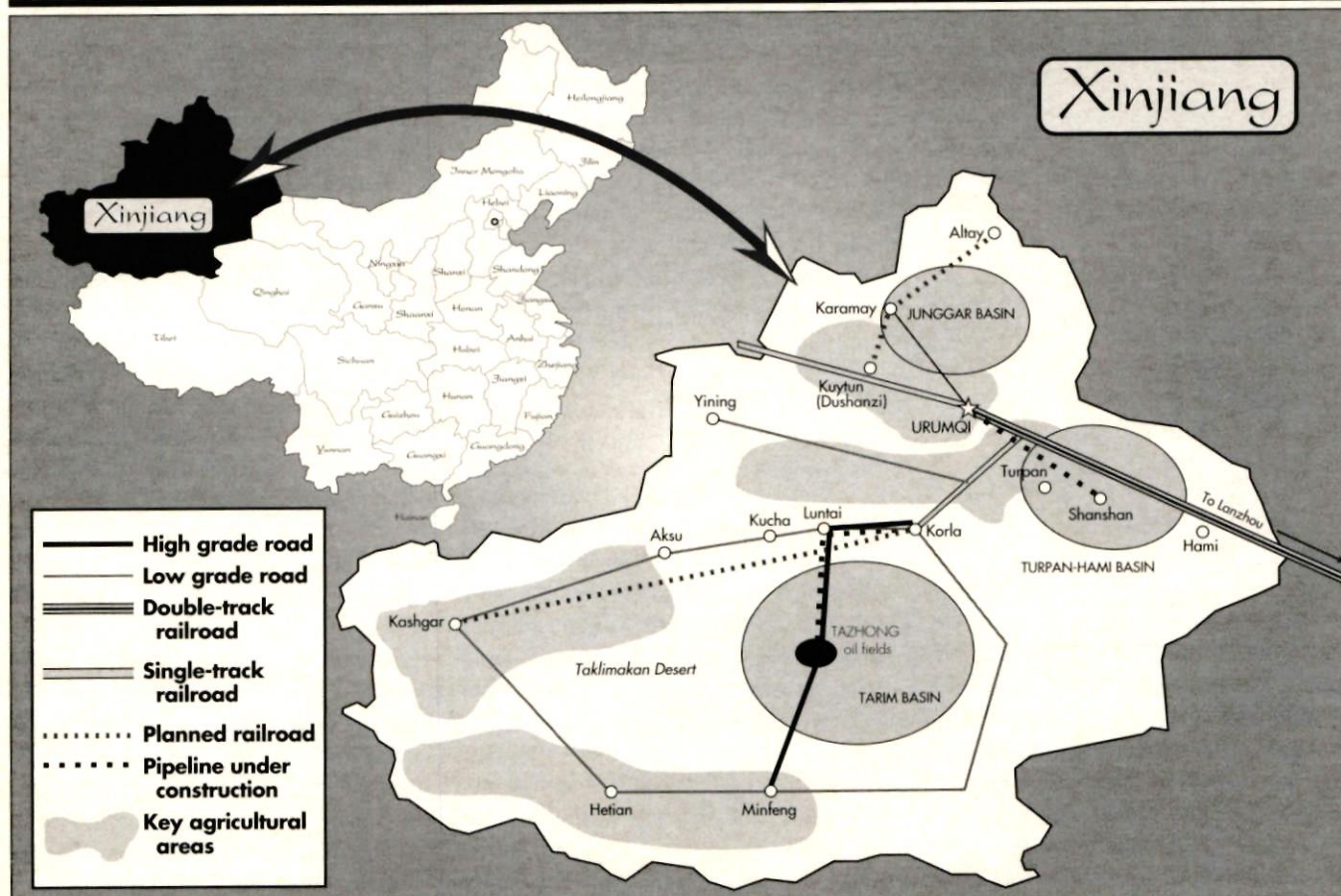
tion could reach 1.5 million tonnes, or half of China's total supply. In the large cotton-growing area south of the Tian-shan mountains in central Xinjiang, farmers are using fertilizer imported from the United States to shift more land to cotton cultivation. Most new water conservation efforts and irrigation projects in the region are geared toward reclaiming land for cotton production.

The downstream textile industries, too, are receiving greater attention. During his tour of western China in 1995, Vice Premier Zhu Rongji emphasized Beijing's commitment to developing Xinjiang's cotton-based textile sector. The

region also stands to benefit from a new PRC policy to relocate clothing manufacturing equipment from the east coast and develop new facilities to increase value-added production closer to the material source.

Xinjiang officials are trying to raise rural incomes by promoting cultivation of other cash crops such as fruit, sugar beets, and tomatoes. They are keen to expand exports of value-added food products. Sugar is a particularly promising export, and the region is seeking foreign investment to augment production at its 14 sugar refineries, which churn out over 300,000 tonnes annually, mostly for export to the republics of the former Soviet Union. In the Turpan region, rich grape harvests currently support several juice and wine factories that generate significant income. In Urumqi, two Sino-Italian joint-venture plants process tomato paste for export to Europe and the United States. Corn, another crop of increasing importance to Xinjiang, is used for a variety of processed products, including corn oil and ethyl alcohol.

### Infrastructure Development in Xinjiang



## Xinjiang at a Glance

*Population:* 16.3 million

*Gross value of industrial output:* ¥79.5 billion (\$9.6 billion)  
(up 16.7 percent from 1994)

*Average GDP per capita:* ¥4,968 (\$598)

*Imports:* \$665 million (up 47.1 percent)

*Exports:* \$763 million (up 15.2 percent)

*Barter trade:* \$694 million

*Foreign direct investment:* 132 contracts worth \$347 million signed in 1995

*Major industries:* cotton, corn, sugar beet, and other cash crop farming; animal husbandry; oil, natural gas, and minerals extraction; petrochemicals; textiles



All figures are for 1995.

Source: *Xinjiang Statistical Bureau*

The wool industry is flourishing with help from central and local governments. Local groups, including Uygur wool producers and the local branch of the Ministry of Agriculture, are looking to compete with synthetic fiber producers. Hoping to maintain wool production as an important local industry, these groups are encouraging the adoption of modern herding and wool-processing techniques. To improve efficiency and quality control, institutions such as the Xinjiang Academy of Animal Science are moving the industry toward large-scale wool production centers and away from smaller, family-based herding operations. Local animal husbandry officials have welcomed assistance from such foreign sources as the Australian government, which is funding a research project in Urumqi that includes a sheep stud farm and a state-of-the-art laboratory for measuring wool fiber quality. In addition, Urumqi is home to several modern wool garment factories sporting advanced weaving equipment from Japan and Europe.

### The bottleneck problem

Despite concerted efforts on the part of central and local officials, Xinjiang has a long way to go before its resources can be utilized fully, and even then faces physical limits on its growth. Over 60 percent of the region is desert and the arable land is heavily cultivated and irrigated by snow-melt, which can vary considerably from year to year. Efforts are under way to reclaim marginal land, but

there are limits on the amount of land that can be put into production. Further, oil beneath Tarim's Taklimakan Desert is proving difficult to extract and transport without modern technology and considerable investment. Beijing has, however, injected substantial capital into expanding and modernizing the region's lagging transportation and communications infra-

structure. This is a much-needed step to reduce Xinjiang's isolation from central and coastal China and potential markets in Central Asia and Europe, and is crucial to improving the flow of goods within the region.

In the rail sector, a vital link to neighboring Kazakhstan was completed in late 1990, connecting China with Western Europe through the single-track Eurasian Continental Bridge. The line from Urumqi to Lanzhou in Gansu Province was double-tracked in 1995, boosting the transport capacity of crude oil and derivative products between the two railheads to around 25 million tonnes annually. With further rail upgrades, annual transportation capacity soon could reach 50 million tonnes. Other new lines are planned, including one line running from Urumqi north through the oil-producing region of Karamay to Altay, and another going south from Korla to towns on the rim of the Tarim Basin, including Kashgar, a historic Silk Road market town and favorite tourist stop.

A new, modern four-lane highway now links Urumqi with Karamay to the north in the Junggar Basin. The government is

## All That Glitters

Xinjiang is seeking foreign assistance to help develop what it believes are rich, untapped mineral resources, consisting primarily of iron, lead, zinc, and titanium—though lodes of gold, copper, nickel, and beryllium also exist. The local geological exploration bureau of the State-owned China Non-ferrous Metals Industry Corp. (CNNC) hopes to establish exploration and development agreements with foreign partners in the future similar to a successful joint effort with the South Korean government. To this end, CNNC recently has given the local bureau more say in charting future development plans.

During the 1960s and 1970s, substantial quantities of lead and zinc were produced in the northern Altay region. With a \$1 million investment from the South Korean government as part of its 1992 mineral exploration co-

operative agreement with CNNC, however, the bureau has turned its attention to the Hami-Shanshan area in eastern Xinjiang, resulting in significant titanium and iron discoveries. The local bureau has applied to the State Science Commission for approval to extend the agreement for another year and is discussing contract options with South Korea to develop the stores.

Conditions for developing Xinjiang's mineral resources remain difficult, as transportation, geological, and logistical obstacles abound, and CNNC lacks resources to expand exploration efforts. CNNC has sent representatives from Xinjiang and other mineral-rich provinces such as Qinghai, Gansu, and Tibet to the United States to stir up interest in joint development of PRC mineral resources.

—Paul S. Triolo

constructing additional roads, including the 370-km Turpan-Urumqi highway, a \$300-million project supported by \$150 million in World Bank loans. The World Bank also will fund part of a new expressway linking Urumqi with Kuytun, a cotton- and petrochemical-producing area in northern Xinjiang. Some eastern cities that have contracts with cotton-producing areas in Xinjiang are planning to build a major cross-desert highway that will allow better access to raw cotton supplies.

Meanwhile, work on the international airport in Urumqi continues around the clock. When the expansion is completed sometime in 1997, the airport, intended to be the main airport for western China, will be able to handle well over one million passengers a year—more than dou-

## New pipelines and highways are needed to transport oil and gas.

ble the current level. A new 3,200-m runway is being built to accommodate larger planes than the regional carrier's current stock of Russian Tupolevs and Ilyushins and two Boeing 737s. China Northwest Airlines, Xinjiang's airline, is negotiating with foreign aircraft producers Boeing Co. and Airbus Industrie to purchase new long-haul planes. The Urumqi airport will

feature a maintenance hangar capable of holding a wide-body aircraft, and a larger control tower.

Air and border links elsewhere in Xinjiang are being expanded. The region plans to increase the number of entry points for foreign trade from 13 to 20 by the year 2000. Total handling capacity for these ports and the international airport at the end of 1995 was estimated at 4.3 million tonnes of goods and 3.2 million passengers.

On the power front, regional officials are hoping to increase local power plant capacity and are working to attract investment and joint-venture partners to develop wind and solar power energy sources. In 1989, with the aid of Danish government loans, Xinjiang water re-

## A Tale of Three Basins

Xinjiang's Tarim, Junggar, and Turpan-Hami basins are the focus of intense exploration efforts by PRC and foreign oil companies. Though these basins hold the potential to quench China's growing thirst for fossil fuel, oil firms face tremendous physical obstacles to extracting and transporting the region's oil and gas resources.

■ **Tarim** The giant Tarim Basin has long been thought to contain enormous oil reserves. Roughly the size of France, the 560,000 sq km basin is 60 percent desert. Chinese oil industry officials estimate the basin contains nearly 11 billion tonnes of crude reserves and 240 billion cu m of natural gas. Gas reserves make up an estimated 44 percent of the basin's total reserves and PRC officials are eager to develop the basin's natural gas potential. Sizeable reserves of gas condensate—natural gas in liquid form which is easier to transport—also have been found.

PRC oil officials have committed major financial resources to explore the earth underneath the moving dunes of the Taklimakan Desert. They are now pouring more money into a field in the central part of the basin at Tazhong, as well as into smaller existing fields in the western part of the basin. China National Petroleum Corp. (CNPC), the country's major crude oil producer, and its local branch,

the Tarim Petroleum Exploration and Development Bureau (TPEDB), are building pipelines to move Tazhong oil and gas to Urumqi and, in the future, further east.

Production is just beginning at the Tazhong oil and gas fields and TPEDB officials expect Tazhong to account for 2 million of the 2.3-million-tonne increase in the Tarim Basin's capacity in 1996. At present, only the Tazhong-4 well is producing, but a number of other wells are under development and will come on line within the next year. Natural gas reserves at Tazhong also are believed to be large. When a new collection station now under construction at the site is completed, natural gas and crude oil will be separated and the oil treated to remove water. The facility will incorporate advanced technology purchased from western suppliers to automate the process.

Oil is transported for now by tanker truck over the newly constructed trans-desert highway, though new tandem oil and gas pipelines are under construction alongside the desert highway. The highway and pipelines will extend to the Lunan oil field near Luntai on the northern edge of the Tarim, where the oil and gas eventually will go via pipelines to Korla. When the system is completed in 1998, oil will be piped from Korla to Shanshan, an oil-producing area in the Turpan-Hami

Basin that is slated to become the major rail hub for Tarim oil. Rail capacity from Korla, however, is limited currently to points east, though double-tracking on the Korla-Turpan line eventually will increase transport capacity.

Over the long term, if Tarim output grows substantially, the pipeline system could be extended from Shanshan east to Lanzhou, Xian, or Sichuan. Moreover, another pipeline project now in the planning stages aims to transport gas from Turkmenistan in central Asia across China to the eastern coast. If it links up with Tarim's gas pipelines, foreign firms in the basin eventually could have access to the large markets in eastern China.

Construction of a refinery and fertilizer plant has begun at Korla on the northern rim of the Tarim. Having made such a huge investment in the Tarim infrastructure, including the desert highway, CNPC is reluctant to continue shipping Tarim crude oil to refineries in Urumqi or east to Lanzhou and beyond, as these facilities are controlled by the major State-owned refining company China National Petrochemical Corp. (SINOPEC). CNPC hopes to make Korla a fertilizer and petrochemical production center, believing a ready market already exists in the Korla area and southern Xinjiang, where the cotton industry requires large quantities of fertil-

sources officials built the 2.05 MW Da-bancheng Wind Power Plant outside of Urumqi, at the time the largest wind station in China. The second-phase expansion of the plant is now under way with German financial assistance; when completed, the plant will be capable of generating 10.7 MW. At present, 34 counties in Xinjiang are promoting the use of wind power. Xinjiang's solar power generation is second only to Tibet's in China. Some 28 counties now utilize solar-generated power for lighting and televisions for rural consumers, as well as for the fiber telecommunications relay stations that are clearly visible along the main road from Kuytun to Urumqi.

Other efforts are under way to upgrade Xinjiang's inadequate communications in-

frastructure. The Xian-Lanzhou-Urumqi fiber-optic cable was completed in late 1995, stretching 3,000 km to link Urumqi to 39 cities in four provinces.

### Elbow room for foreign business

Xinjiang has adopted a foreign investment policy similar to that found in coastal China. Like other regions, Xinjiang prioritizes investment in the so-called "pillar" industries, including agriculture, energy, telecommunications, textiles, food, and building materials. Two official development zones, the Urumqi Economic and Technological Development Zone and the Urumqi High-Tech Industrial Development Zone, offer foreign investment incentives and tax breaks on par with those offered in most

coastal zones. The incentives include a 15 percent enterprise tax rate, considerably less than the standard 33-percent rate imposed on foreign-invested enterprises (FIEs), and a full or partial tax holiday of 3-10 years (see *The CBR*, January-February 1995, p.19). By late 1995, the two development zones had 938 foreign and domestic firms with total revenues topping ¥620 million (\$75 million). Many of the foreign investors in the existing zones are from Japan, Hong Kong, Taiwan, and South Korea.

As evidence of the growing importance to Beijing of attracting foreigners to China's interior, Yili, near Yining, was one of nine inland cities designated by Beijing in early 1996 as "open" to foreign investment, and thus allowed to levy a

imizer inputs. CNPC does not yet have the financial resources to expand into downstream development on its own, however.

While all the crude oil production so far has come from CNPC fields, several Western oil companies operating in the basin are completing seismic exploration work and plan to begin drilling in the blocks they acquired during the first round of on-shore bidding in 1992. US-based Exxon Corp., through its subsidiary Esso China Ltd., and Italy's Agip S.p.A. plan to start drilling their first wells in fall 1996. One firm, British Petroleum Co. PLC, pulled out its teams and appears to have abandoned hope in its block, also acquired in the first round. Western firms are assessing offerings in the third bidding round, which includes blocks in the southwestern and northwestern sections of the basin, but most foreign firms are looking to assemble consortia to spread the risk. Atlantic Richfield Co., Amoco Corp., Mobil Oil Corp., and Elf Hydrocarbures Chine teamed up to bid on third-round blocks, as did Agip and Texaco China B.V. As part of the third bidding round, Texaco and Agip recently signed exploration contracts for blocks 6 and 7 in the Tarim. The Chinese are also anxious to work with foreign firms to develop sizeable gas-condensate reserves in Tarim.

■ **Turpan-Hami** The smallest of Xinjiang's three basins, the Turpan-Hami Basin in eastern Xinjiang recently yielded

substantial oil and natural gas discoveries. A new pipeline, submerged to a depth of 1.5 m, is being built to bring gas from a new field near Shanshan, roughly in the middle of the basin, west to Urumqi. CNPC is financing the \$50 million project. Construction of the pipeline began in September 1995, and Turpan-Hami officials hope to have it finished by the end of the year. Gas from a major formation north of Shanshan will be combined with associated gas from oil fields in the basin, and sent into the pipeline via compressors supplied by the Dresser-Rand Co. Halfway to Urumqi, the gas will pass through a unit that will clean impurities and readjust the gas temperature and pressure. The gas will then continue to a major fertilizer plant south of Urumqi. The city of Urumqi will switch eventually to gas for heating and cooking, though there are no immediate plans for the change.

The pattern of development of the Turpan-Hami Basin appears to be an ideal one from the perspective of China's oil industry officials. Just one-tenth the size of the Tarim Basin, the less complex terrain of the Turpan-Hami Basin is being explored and developed by Chinese teams. With CNPC providing the drilling crews and managing the direction of development, the PRC has relied on foreign firms only for high-tech components such as compressors and communications and automation equipment. Foreign firms also

have provided training, but according to Turpan-Hami officials, there is little likelihood that blocks in the basin will be opened to foreign exploration or development.

■ **Junggar** The oil town of Karamay in northern Xinjiang sits in the middle of the one of the country's oldest oil-producing regions. A virtual one-company town dominated by CNPC's Xinjiang Petroleum Bureau (XPB), Karamay is aiming to become a regional transportation and economic center. Three new highways offer improved overland links to Urumqi as well as access to the central oil-producing portions of the Junggar Basin. A new railroad, to be built during the Ninth Five-Year Plan, will link Karamay with Urumqi and Xinjiang's main east-west route—and, eventually, continue to Altay in the north. The city also plans to build a new airport in the hopes of becoming a hub for passengers from the border areas.

The PRC's third onshore bidding round, for the first time, offered several Junggar blocks to foreign firms for joint exploration and production. XPB has purchased a variety of advanced US and European equipment to continue exploration and development of the basin and is expanding its main refinery at Dushanzi.

—Paul S. Triolo



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reduced income tax rate of 24 percent to FIEs that set up operations there.

By the end of 1995, Xinjiang boasted 665 FIEs, including over 500 in Urumqi involving more than \$1 billion in investment. European, Japanese, and Australian firms are particularly active investors in petrochemicals, minerals, food-processing, and textile ventures. One Australian firm, for example, recently added a paraxylene unit to the Urumqi General Petrochemical Works. Italian firms are heavily involved in expanding production of ethylene, polyethylene, and other petrochemicals at the Dushanzi refinery west of Urumqi. Xinjiang officials are searching for foreign partners to develop the region's rich mineral resources and expect to issue regulations governing foreign cooperation in the field of mineral development this year (*see* p.43).

Businesspeople from around the world are visible in local hotel lobbies making deals via cellular phones. Some of those now doing business in Xinjiang have historical ties to the region. Many of the Taiwan investors, for example, left after the area was "liberated" by the Communists in 1955 and are now returning to an area they once called home. In 1995, foreign investors signed contracts for 132 new projects worth \$347 million, and total utilized foreign direct investment was up 38.3 percent over 1994, at \$67 million.

At a trade fair held in Urumqi in late 1995, the list of projects seeking equity joint-venture investment included meat-and tomato-processing ventures; expansion of the Xinjiang dacron fiber factory; upgrades of factories within the Xinjiang cotton textile industrial group; acrylic fiber production at the Urumqi Petrochemical Works (to include nearly \$300 million in foreign investment); production of alkyl benzene and alcohol/ether at the Dushanzi refinery; expansion of Yili's thermal power plant, and construction of four new 200 MW units at the Hongyanchi power plant, which will require \$206 million in foreign investment.

Central officials in Beijing, along with local leaders, are planning to develop three major petrochemical bases, all of which are currently seeking foreign investment: the Urumqi Petrochemical Works; the Dushanzi refinery; and a cen-

ter at Korla to the south, with inputs to be supplied by Tarim oil and natural gas. The Dushanzi and Urumqi petrochemical complexes currently are expanding their capacity to produce ethylene, polypropylene, and paraxylene. Regional authorities intend to funnel a portion of the petrochemical output into the production of synthetic fibers to diversify the Xinjiang textile industry, which is now heavily focused on cotton and wool fiber production. In addition to petrochemical investment, Korla is seeking foreign funds to become a garment industry center.

A final sector of interest to foreign business is the tourism industry: the number of tourists visiting Xinjiang last year was up 25.7 percent from 1994. Scenic spots in the Tianshan mountains, including Tianchi, or "Heavenly Lake," and other undeveloped tourist sites north of Urumqi, will be the focus of Xinjiang's plans to develop tourist facilities. Trekking and adventure tourism are promising prospects in Xinjiang, which features vast areas of unexplored and rugged terrain.

### Who profits?

Economic development on any of these fronts may bring new tensions, however. Xinjiang's majority Uygur population appears to have mixed feelings about the benefits of development and many Uygurs feel that Han Chinese stand to gain more from economic growth in the region. Xinjiang leaders so far have failed to combat this perception and must work hard to integrate the Uygurs and other ethnic groups into the economic mainstream. With the current emphasis on development of China's hinterland gaining momentum, though, central planners are likely to continue pouring investment into a region they view as a treasure trove of natural resources.

While far from potential markets in eastern China and beyond, Xinjiang sits in the heart of central Asia, borders six countries with rapidly developing market economies, and boasts new links west to Europe and the Middle East. A stroll through the bustling cities of Urumqi, Kashgar, and Turpan makes it clear that despite insufficient infrastructure and other current shortcomings, foreign investors and Han Chinese alike will increasingly be looking to Xinjiang as a new frontier. 完



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## Professional Interactive Chinese for Windows, Version 2.1, Level 1

Ardmore, PA: VentureTech, 1995. \$99 CD-ROM.

Though Chinese language purists may argue that *Professional Interactive Chinese for Windows* on CD-ROM cannot compete with a human instructor, others will find it an excellent complement to traditional classroom language training. This CD-ROM is an effective, user-friendly learning tool for Chinese language novices. It would be especially useful for businesspeople who must master basic Chinese phrases and vocabulary in a short time before relocating to the mainland or Taiwan.

The hardware components necessary for complete utilization of this program include a DOS-based personal computer with Microsoft Windows, a sound card with speakers, and a microphone. The CD-ROM teaches 1,000 characters in 12 fully interactive lessons, each of which has a

short dialogue, phonics drills, vocabulary words, and cultural background points. While audio dialogues play, users can view the script in traditional or simplified Chinese characters, *pinyin* romanization, or *zhuyin* phonetics. They also can view or listen to English translations.

The multi-media CD-ROM also features animated visual displays of the mouth to demonstrate the correct physical pronunciation techniques. Users can click on a pronunciation icon to listen to tone combinations. Simulating a language laboratory, the computer program recognizes a student's pronunciation of a phonic sound or character and immediately scores how close the student's pronunciation was to that of a native speaker. An "interactive vocabulary builder" enables users to master new words, characters, and sounds simultaneously. By using the mouse to click

on objects on the screen, the student hears the name of the object and sees the correct character(s).

*Professional Interactive Chinese* also teaches users how to write Chinese characters. The program illustrates the proper way to write a Chinese character and then lets students practice tracing characters on the screen using the mouse. In addition, the CD-ROM contains exercise sheets that can be printed and used for actual writing practice.

Though many students will learn best in a private tutorial or group language class setting, *Professional Interactive Chinese* enables users to set the pace, timing, and setting of their Chinese language study. This CD-ROM product is well worth the price, especially for companies that recognize the importance of foreign language proficiency among their overseas employees.

—TLK

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## Strategic Management of the China Venture

by Paul Steidlmeier. Westport, CT: Quorum Books, 1995. 240 pp. \$65 hardcover.

As the scale of foreign investment in China continues to grow, this book offers a framework for analyzing the keys to successful China ventures. Businesses new to the China market will find Steidlmeier's guidance useful as they begin to structure their China operations. He contends that companies should not enter into a China venture solely on the basis of the market's size, but rather on the basis of the company's overall global strategy.

The first half of the book discusses elements of the market that affect business in China, including the political structure and economy, development policies, and bilateral and multilateral relations. The second half addresses specific management issues—human resources management, technology management, local sourcing, total quality control, market access strategies, and financing and accounting. Steidlmeier highlights China's infrastructure development needs in the energy, telecommunications, and transportation sectors, but advises companies to study Beijing's development priorities before committing to an investment.

While *Strategic Management of the China Venture* touches on many elements of China's current business climate, it is sparse on operational details and case studies. The assessment of China's investment environment might prove useful to business students, but experienced executives with established operations in China may desire a less academic approach.

—Piper Lounsbury

Piper Lounsbury is a business advisory services associate at the Council.

## Fiscal Management and Economic Reform in the PRC

by Christine P.W. Wong, Christopher Heady, and Wing T. Woo. Hong Kong: Oxford University Press (China) Ltd., 1995. 271 pp. \$49.95 hardcover.

With Beijing's unexpected announcements late last year of major tax and tariff changes, this analysis of China's finance and tax regime arrives at an unfortunate time. A historical overview of tax and fiscal reform in the 1980s and early 1990s, the book is likely to be outdated for many business readers. The book also suffers from a lack of analysis of the drastic tax reforms undertaken by the State Tax Administration in January 1994, which included the enactment of value-added, consumption, and business taxes that currently are of primary concern to foreign investors in China.

Published by Oxford University Press for the Asian Development Bank, the book contains several very clear sections, though they are nestled amidst dense passages on pen-

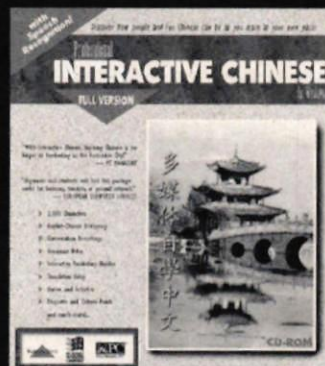
sion reform and State-owned enterprise (SOE) wage elasticity. Especially interesting are the analyses of how municipal, provincial, and central governments divide public revenues. This volume also gives readers an idea of the extent of the central government's redistribution of revenues from China's coastal provinces to less-developed regions like Tibet.

The authors make recommendations for tax, exchange rate, and SOE reforms—they suggest requiring all SOEs to participate in city-wide pension funds—but some changes likely would prove difficult to implement. Though published in 1995, the research for *Fiscal Management* appears to have been completed in late 1993—most tables include data only through 1992. In short, if answers to current tax questions are what you seek, specialized finance periodicals are more likely to satisfy.

—Dan Martin

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# Twists In The Road Ahead

United States Trade Representative (USTR) Mickey Kantor opened the Council's annual Forecast meeting on January 31, stating that the Clinton Administration is prepared to "enforce US trade laws and take decisive action" if China does not adhere to its commitments under the February 1995 intellectual property rights (IPR) agreement. Despite his tough language, Kantor stressed the importance of continuing engagement, noting that the most repressive periods in modern Chinese history have occurred in times of isolation. The theme of engagement—especially in the current climate of rising political pressures—resounded throughout the day as other speakers stressed the importance of the strong linkages forged by US businesses in the PRC.

In the short term, though, the United States and China are in for a bumpy ride over IPR. While the PRC reportedly has conducted over 3,200 raids and seized over two million CDs and hundred of thousands of pirated sound recordings and books in the past 11 months, Kantor maintained that the February 1995 Memorandum of Understanding has not been fully implemented. USTR sources indicate 34 CD factories with production capacity of 90 million disks per year continue to manufacture and export CD-ROMs, motion pictures on CDs, and sound recordings. Kantor also acknowledged that PRC enforcement authorities "have yet to target major manufacturers and distributors of pirated products."

The second Forecast speaker, Nicholas Lardy, a senior fellow at the Brookings Institution, gave a fairly positive report on the Chinese economy's performance last year. Lardy asserted that Beijing has managed to moderate inflation and GDP growth, while allowing real urban income to grow. However, Lardy warned that the "seeds of the next inflationary cycle are evident" and said that growth in the money supply, if not tempered, could provoke inflationary pressures by the beginning of 1997. He also cautioned that reform of State-owned enterprises has been insufficient, and has not re-



**US Trade Representative Mickey Kantor gives the keynote address.**

lieved inter-enterprise debt nor allowed reform of the nation's nearly bankrupt banking system to move forward.

Following the economic update, David M. Lampton, president of the National Committee on US-China Relations, reported that "Sino-American ties are very troubled—they are likely to remain so for the next year or more." Growing perceptions of the United States as unfriendly, confusion over the lack of coherence in US policy toward Beijing, escalating tensions in the Taiwan Strait, and reports of the mistreatment of orphans and dissidents in China create a climate of mutual distrust.

In contrast to his stark evaluation of bilateral relations, Lampton was optimistic about PRC domestic and foreign policies. He predicted that Beijing will make important leadership decisions in 1996 in anticipation of the 15th National Party Congress in 1997, though regime change in the near-term post-Deng era is unlikely. In foreign policy, he characterized the current period as China's "most successful since 1949." PRC relations with its neighbors, including Russia, India, and Vietnam, are improving. Russian President Boris Yeltsin is scheduled to visit China in April.

Rounding out the morning session, Anne Stevenson-Yang, the Council's director of China operations, presented a rundown of the operating issues affecting

US business in China. Stevenson-Yang pointed out that corruption continues to be perhaps the most serious problem in China. Foreign companies complain that smuggling, red tape, and local protectionism all hinder their operations in China.

On some fronts, though, the economic environment appears to be improving. Foreign investors should benefit in 1996 from a decline in the average tariff rate from 36 percent to 23 percent. By 2000, the average tariff rate will drop to 13-15 percent, with a 17 percent value-added tax (VAT) levied on almost all imports, according to Stevenson-Yang. Beijing reportedly will consolidate the number of preferential economic zones by 2000, phasing out the special investment incentives now offered in over 360 zones. She asserted that Beijing's moves toward de facto convertibility, establishment of an interbank market, and efforts to assert control over the PRC securities markets are all signs of long-term economic stability.

## The mood in Congress

During the luncheon, Representatives Lee Hamilton (D-IN) and Jim Kolbe (R-AZ) demonstrated bipartisan support for strong US-China ties and previewed upcoming China-related legislation. Representative Kolbe predicted that a Resolution of Disapproval would be introduced again this summer, following the annual vote to extend Most Favored Nation trade status to the PRC. Both congressmen encouraged Council members to show their congressional representatives how US exports—and US jobs—depend upon stable bilateral relations.

After lunch, Forecast '96 participants attended workshops addressing a wide range of operational issues. Andy Searls, an independent consultant, and the Council's Business Advisory Associate Meredith Gavin led a workshop on corporate relocations to China. James McCarthy of Motorola Inc. discussed how to select China-based staff and provide medical coverage, cultural and language training, housing, and education in China. Terry Jones of Price Waterhouse

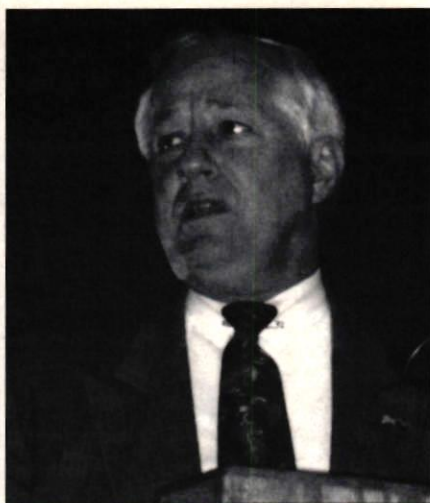
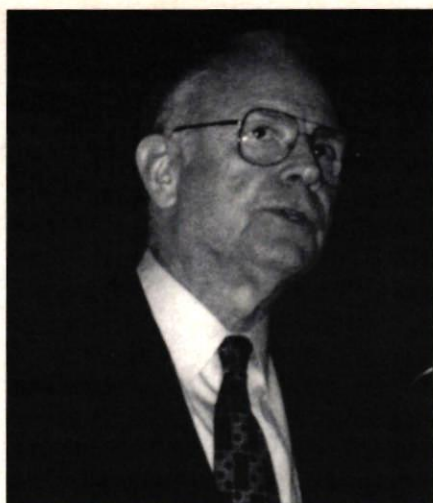
LLP emphasized the importance of financial planning for expatriate employees that takes into consideration company as well as China-specific tax issues. David McKee of Ford Motor Co., who lived in China from 1991-95, concluded the workshop by giving his candid impressions of expatriate life in the PRC.

In the workshop on labor and social insurance issues,

Nicholas Howson, a lawyer with the firm of Paul, Weiss, Rifkind, Wharton & Garrison, offered recommendations on structuring joint-venture employment packages. Howson suggested that foreign companies emphasize that an expatriate commands a higher salary than his Chinese counterpart because of higher expatriate living costs. He also warned that there is no statutory basis for a Chinese partner to insist that the foreign company provide a lump-sum payment to compensate workers laid off by the joint venture, and urged foreign partners to negotiate firmly on this point.

Ames Gross, president of Pacific Bridge, Inc., a consulting firm specializing in the recruitment of Chinese nationals, said that China's emerging free labor market presents new opportunities for Chinese students living overseas. In China, unlike the United States, there are many more jobs opening up than there are applicants to fill them. Consequently, foreign companies should not overlook the pool of Chinese graduates living overseas who are willing to return to China and assume high-skill positions.

Anne Stevenson-Yang from the Council's Beijing office outlined the primary features of China's emerging social insurance system. Of the nationally mandated social insurance funds—unemployment, disability, medical, welfare, and maternity—unemployment funds have been implemented most widely. Stevenson-Yang emphasized that the new requirements come on top of pre-existing requirements outlined in the 1979 Joint Venture Law.



**Representative Lee Hamilton (left) and his House colleague Jim Kolbe preview 1996 China legislation.**

### Taxing matters

Many Forecast '96 participants attended a particularly timely workshop on the capital equipment import tax, VAT, and tariff changes. Joyce Peck of Price Waterhouse assessed the financial impact of the April 1 revocation of the capital equipment tax exemption. Imported equipment valued at \$10 million, for example, would be subject to a total import tax of \$2.87 million. Peck outlined what types of projects can be grandfathered and what documentation is required. Erin Endean of Hills & Co. highlighted recent changes in the PRC's VAT system. A 17 percent VAT rate now applies to most products, with the exception of foodstuffs, many energy products, books, and magazines, which are subject to a 13 percent rate. Endean also provided an overview of China's tax system reforms, noting that Beijing has attempted to boost tax revenues by clarifying the roles of central and local tax authorities and passing legislation against fraudulent VAT tax rebate claims. Dan Martin, manager of the Council's investment program, discussed tariff changes that take effect April 1. With some notable exceptions, many big-ticket items such as computers, telecom equipment, electronics, and motor vehicles are not included among the affected categories.

A fourth workshop on defense issues offered both an overview of China's defense conversion activities and detailed information for the foreign investor considering a venture with a defense-related PRC enterprise. Peter Almquist, a defense conversion specialist at the US Arms Con-

trol & Disarmament Agency, gave a brief history of China's conversion activities from the 1960s, when Mao initiated the "Third Front" campaign to develop defense capabilities in China's interior, to the late 1980s, when Deng's reforms gave defense-related enterprises free rein to pursue non-defense production.

Eden Woon, executive director of the Washington State

China Relations Council, listed the pros and cons of entering into joint ventures with military-related enterprises and stressed that foreign involvement is limited to PRC enterprises related to and under the supervision of the Commission on Science, Technology, and Industry for National Defense (COSTIND) in Beijing. He added that foreign joint ventures with COSTIND-related firms often go more smoothly than those between foreign firms and a local Public Security Bureau-backed enterprise.

Speaking in detail about export control matters of concern to investors in defense-conversion enterprises in China, Sue Eckert, assistant secretary at the US Department of Commerce's Bureau of Export Administration, offered basic guidelines for determining whether a project would be subject to export controls under current US law. David R. Walters, vice president for government affairs, international, at Westinghouse Electric Corp., spoke of his company's successful joint defense conversion project to develop electric buses for Beijing's city bus system.

Finally, Frank Colson, executive director of the US Department of Defense Policy Board on Federal Aviation, gave his report of a recent visit to China to discuss with Chinese defense officials the possibility of integrating the PRC military and civilian air traffic control systems. He viewed this development as unlikely in the near future, despite the country's pressing need for a single, unified air traffic control system.

## SETC Vice Minister Yu Speaks to Council

Sounding themes familiar to China-watchers, Vice Minister of the PRC's State Economic and Trade Commission (SETC) Yu Xiaosong spoke to more than 80 Council members at the Sheraton Carlton Hotel in Washington on January 25. He focused his remarks on elements of PRC economic policy that reflect China's growing openness to foreign business participation and successful shift away from central planning. Yu argued, though, that China is not as developed economically as organizations such as the World Trade Organization (WTO) would suggest. In terms of per capita output,

the PRC ranked 105th out of 132 countries. Thus, he stated, the PRC's WTO accession is unlikely as long as its status as a developing country is denied.

The vice minister highlighted several important changes that China is now implementing: reducing import tariffs on thousands of items; leveling the playing field within China by removing special tax exemptions accorded to foreign-invested enterprises; and taking concrete steps to protect intellectual property rights (IPR). Acknowledging the contention by some foreigners that problems persist in PRC compliance with the Multi-

Fiber Arrangement, IPR agreements, and WTO requirements, Yu pointed out that monitoring the country's commerce is no easy task—China's trade volume today is 10 times larger than it was a decade ago.

The vice minister repeatedly mentioned the need for further opening of China's economy to foreign investment and trade, and stated that China would never return to the days in which its economy was closed to foreign participation. He also asserted that the shift from central planning to a market economy would be completed over the next decade.

### Chemical Industry Working Group Meets

The Council's Chemical Industry Working Group convened on January 30 to discuss developments in China's chemical registration process and the promulgation of new environmental legislation affecting chemical company operations in China. Council staff reported that little progress has been made on the registration front. Although many companies have begun to pay registration fees for chemical products, few have received registration certificates from China's National Environmental Protection Agency (NEPA). NEPA's compilation of China's inventory of chemical substances, meanwhile, is proceeding slowly.

Lester Ross, an attorney with Chadbourne & Parke LLP, provided a detailed overview of two new Chinese environmental regulations, the solid waste law (see p.36) and amendments to the air pollution law, and assessed how these developments will affect chemical company operations in China. He acknowledged that China is trying to catch up to other countries by expanding the scope of its environmental legislation to deal with extensive domestic pollution problems and meet international standards.

### Hong Kong Members Welcome Clinton Aide

Boosting US exports to China was the topic on everybody's mind at a January 19 lunch with Ira Magaziner, senior advisor to the President for policy development. Hong Kong representatives from Council member companies shared ideas on such issues as export controls, US government sanctions; the Jackson-Vanik amendment, and financing problems, all of which

pose obstacles to US business in China.

Magaziner is heading an interagency team tasked with developing ways to increase US sales abroad. The team's proposal will be submitted to the President this spring. Their recommendations, if implemented, could have a strong impact on US trade over the next five to ten years.

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## ■ Olivia H. Zhao

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*. Contracts denominated in foreign currencies are converted into US dollars at the most recent monthly rate quoted in the International Monetary Fund's *International Financial Statistics*.

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 the editor.

SALES AND INVESTMENT	September 15, 1995-January 1, 1996
Foreign party/Chinese party	Arrangement, value, and date reported

### Accounting and Insurance

#### OTHER

**Aetna International Inc., part of Aetna Life and Casualty (US)**  
Will open representative office in Shenzhen. 12/95.

**Manufacturers Life Insurance Co. (Canada)**  
Will operate in Shanghai to sell life insurance to Chinese citizens. 12/95.

**AGF Assurances (France)**  
Opened representative office in Shanghai. 11/95.

### Agricultural Commodities and Technology

#### OTHER

**World Food Program**  
Donated aid to help set up an agricultural project in Guizhou Province. \$15.7 million. 12/95.

**Asian Development Bank**  
Will provide 25-year loan for agricultural and multi-purpose projects in Fujian Province. \$65 million. 10/95.

### Banking and Finance

#### CHINA'S IMPORTS

**NTT Data Communications Systems, a unit of Nippon Telegraph & Telephone Corp. (Japan)**  
Will build an ATM network linking postal savings accounts in eight cities. 9/95.

Abbreviations used throughout text: BOC: Bank of China; CAAC: Civil Aviation Administration of China; CNAIEC: China National Automotive Import-Export Corp.; CATIC: China National Aero-Technology Import-Export Corp.; CITIC: China International Trust and Investment Corp.; CITS: China International Travel Service; CNOOC: China National Offshore Oil Corp.; ETDZ: Economic and Technological Development Zone; ICBC: Industrial and Commercial Bank of China; MPT: Ministry of Posts and Telecommunications; NA: Not Available; NORINCO: China North Industries Corp.; P&T: Post and Telecommunications; PBOC: People's Bank of China; SEZ: Special Economic Zone; SINOCEM: China National Chemicals Import-Export Corp.; SINOPEC: China National Petrochemical Corp.; SINOTRANS: China National Foreign Trade Transportation Corp.; SPC: State Planning Commission; UNDP: United Nations Development Program.

### CHINA'S INVESTMENTS ABROAD

#### ICBC

Opened branch in Hong Kong to handle trade and non-trade settlements, provide loans, finance trade activities, buy and sell foreign exchange, and raise funds in Hong Kong's capital market. 11/95.

**Agricultural Bank of China**  
Granted banking license to conduct business in Hong Kong. 10/95.

#### OTHER

**Hang Seng Bank Ltd. (Hong Kong), a subsidiary of HSBC Holdings PLC (UK)**  
Opened a branch in Guangzhou. 12/95.

**ABN-AMRO Holding N.V. (Netherlands)**  
Opened an international banking branch in Shenzhen, Guangdong Province. 11/95.

**Banque Nationale de Paris (France)**  
Opened branch in Guangzhou. 10/95.

**Bayerische Vereinsbank Groupe (Germany)**  
Opened representative office in Shanghai. 10/95.

**Dresdner Bank AG (Germany)**  
Opened branch in Shenzhen. 10/95.

**Rabobank Nederland (Netherlands)**  
Opened representative office in Beijing. 10/95.

**Tai Fung Bank (Macao)**  
Opened representative office in Guangzhou. 10/95.

### Chemicals, Petrochemicals, and Related Equipment

#### INVESTMENTS IN CHINA

**DuPont China Holding Co., Ltd., a subsidiary of E.I. duPont de Nemours & Co., (US)/Foshan No.3 Plastic Factory (Guangdong)**  
Established joint venture to produce Mylar polyester film in Foshan, Guangdong Province. \$70 million. 12/95.

**DuPont China Holding Co., Ltd., a subsidiary of E.I. duPont de Nemours & Co. (US)/Shanghai Chlor-Alkali Chemical Co., Ltd.**

Will establish joint venture to produce fluoropolymers in Shanghai. 12/95.

**Rhein-Chemie Rheinau, a subsidiary of Bayer Group (Germany)/Red Star Chemical Factory (Shangdong)**

Established Rhein Chemical (Qingdao) Co. Ltd. joint venture to produce rubber and petrochemicals. \$22 million. (Germany:70%-PRC:30%). 12/95.

**Imperial Chemical Industries PLC (UK), Swire Pacific Ltd. (Hong Kong)**

Established joint-venture paint plant in Shanghai. \$40 million. (UK:70%, Hong Kong:30%). 11/95.

**Toray Industries, Inc. (Japan)**

Will build a factory to produce polyester fiber in Nantong, Jiangsu Province. \$373.8 million. 11/95.

OTHER

**BASF Group (Germany)**

Will establish China headquarters in Shanghai. 12/95.

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**Consumer Goods**

INVESTMENTS IN CHINA

**Electrolux, AB (Sweden)/Tianjin Household Appliances Co., Ltd.**

Established joint-venture plant in Tianjin to manufacture vacuum cleaners. \$15 million. (US:70%-PRC:30%). 12/95.

**Matsushita Electric Industrial Co. (Japan)/Beijing Building and Engineering Group**

Established Beijing Changcheng Matsushita Fine Works and Air Conditioning Equipment Co., Ltd. to produce air conditioners and components. \$14 million. 12/95.

**Sanyo Electric Co., Ltd. (Japan), Nissho Iwai Corp. (Japan)/Dalian Bingshan Group (Liaoning)**

Established Dalian Sanyo Air Conditioner joint venture to produce and sell air conditioners. (Japan:55%, 5%-PRC:40%). 12/95.

**Seiyu Ltd., a group of The Saison Corp. (Japan)/Tongxian Industrial Products Corp. (Beijing), China Commerce Enterprise Group Corp.**

Will establish department store in Beijing. \$25.7 million. (Japan:42%-PRC:40%, 18%).12/95.

**Sony Corp. (Japan)/Shanghai Guangdian Stock Co., Shanghai Vacuum and Electronics Stock Co.**

Established Suoguang Visual Products Co. Ltd. joint venture in Pudong to produce television sets and color picture tubes for domestic and export markets. \$410 million. (Japan:70%-PRC:30%). 12/95.

**Toshiba Lighting & Technology Co. (Japan), Sanmei Trading Co. (Japan)/Fuzhou Bulb Factory (Fujian)**

Established Fuzhou Lighting Co. joint venture to produce light bulbs in Fuzhou, Fujian Province. \$18 million. (Japan:66%, 1%-PRC:33%). 12/95.

**A.O. Smith Water Products Co., a unit of A.O. Smith Corp. (US)/Nanjing Water Heater Co. (Jiangsu)**

Established joint venture to make gas water heaters for the Chinese market. (US:80%-PRC:20%). 11/95.

**Daikin Industries, Ltd. (Japan)/Shanghai Yah Chong Sewing Machine Corp.**

Established Daikin Yah Chong Air Conditioning joint venture in Shanghai. \$30 million. (Japan:60%-PRC:40%). 11/95.

**Fedders Corp. (US)/Ningbo General Air Factory (Zhejiang)**

Established Fedders Xinle joint venture to make air conditioners in Ningbo, Zhejiang Province. \$24.4 million. (US:60%-PRC:40%). 11/95.

**Matsushita Electric Industrial Co., Ltd. (Japan)/Hangzhou Hardware Co., Hangzhou Goldfish Electric Appliances Co. (Zhejiang)**

Established joint venture in Hangzhou, Zhejiang Province to manufacture and market gas water heaters and cooking appliances. 11/95.

**Matsushita Electric Industrial Co., Ltd. (Japan)/Shandong TV Factory, Shandong Dong Chen Industrial Group, Beijing Huasong Electronic Technology Development**

Established Shandong Matsushita Television and Visual Co. joint venture to develop and produce color television sets. \$25 million. (Japan:50%-PRC:50%). 11/95.

**Sanyo Electric Co. Ltd. (Japan)/Xikou Town Corp. of Agriculture, Industry, and Commerce (Jiangsu)**

Established Sanyo Electric Home Appliances (Suzhou) Co., Ltd. joint venture in Jiangsu Province to produce vacuum cleaners. \$10 million. (Japan:90%-PRC:10%). 11/95.

**Fuji Photo Film Co., Ltd. (Japan)**

Opened wholly owned company in Suzhou, Jiangsu Province. \$30 million. 10/95.

**Jusco (Japan)/Guangdong Tianmou Department Store**

Established joint venture to invest and operate department stores in Guangdong Province. \$32 million. (Japan:80%-PRC:20%). 10/95.

**Samsung Group (S. Korea)**

Will build video recorder factory in Tianjin. \$32 million. 10/95.

OTHER

**Alfred Dunhill (UK)**

Opened two retail outlets in Guangzhou. 12/95.

**Carrefour (France)**

Opened retail outlet in Beijing. 12/95.

**Gianni Versace (Italy)**

Opened men's and women's clothing and accessories boutiques in Beijing and Shanghai. 12/95.

**Luxottica Group S.p.A. (Italy)**

Opened Valentino boutique in Guangzhou. 12/95.

**Yaohan International Group (Japan), NA (Singapore)/NA (Shanghai)**

Established goods distribution center in Shanghai. \$70 million. 12/95.

**Amway Corp. (US)**

Will open offices in Shanghai, Zhejiang Province, and Jiangsu Province. 10/95.

## Electronics and Computer Software

### INVESTMENTS IN CHINA

#### **Kyocera Corp. (Japan)/Shanghai Instrumentation & Electronics Holding Co.**

Established joint venture in Shanghai to produce electronic components, including chip condensers. \$20 million. (Japan:75%-PRC:25%). 12/95.

#### **LG Group (S. Korea)/Panda Electronics Group**

Established joint-venture electronics company in Nanjing, Jiangsu Province. \$29.4 million. (S. Korea:60%-PRC:40%). 12/95.

#### **NA (Japan)/Shenzhen Baoheng Co., Ltd. (Guangdong)**

Will build joint-venture electronics factory in Shenzhen. \$131.5 million. 12/95.

#### **Ricoh Co., Ltd. (Japan), NA (Hong Kong)/Shanghai Fax Machine Co.**

Established Shanghai Ricoh Fax Machine Co. Ltd. joint venture to manufacture fax machines. 12/95.

#### **Siemens Nixdorf Informationssysteme AG (Switzerland), a subsidiary of Siemens AG (Germany)**

Will build two factories in the Yangtze River valley to produce personal computers, notebook computers, and automatic teller machines. 12/95.

#### **Sony Corp. (Japan)**

Established wholly owned Sony Precision Devices (Huizhou) Co., Ltd. in Guangdong Province to produce optical pickups for compact discs and CD-ROMs. \$16.5 million. 12/95.

#### **Hewlett-Packard Co. (US)**

Will establish plant in Shanghai's Waigaoqiao free-trade zone to produce inkjet printing equipment for computers. \$29 million. 11/95.

#### **Motorola International Development Corp., a wholly owned subsidiary of Motorola Inc. (US)/Panda Electronics Group (Jiangsu)**

Established Nanjing Power Computer Ltd. joint venture in Jiangsu Province to develop, produce, and sell computer systems based on PowerPC microprocessors. (US:60%-PRC:40%). 11/95.

#### **NEC Corp. (Japan)/State Information Center of China**

Will co-develop nationwide personal computer network. \$10 million. 11/95.

#### **Motorola Inc. (US)**

Will build new plant in Tianjin to produce semiconductor wafers. \$720 million. 10/95.

### OTHER

#### **Apple Computer Inc. (US)**

Established bonded warehouse in Beijing to handle spare parts. 12/95.

#### **Bay Networks (US)**

Opened office in Beijing and signed agreements with nine domestic and foreign companies to distribute its computer network products. 12/95.

#### **Dell Computer Corp. (US)**

Named Beijing Nine City Jiye Technology Development Center as its general sales agent in China. 12/95.

#### **Hewlett-Packard Co. (US)**

Established Networked System Consulting Group in China, with branches in Beijing and Shanghai, and a third branch to be established in Guangdong. 12/95.

#### **Computer Associates International Inc. (US)**

Opened office in Beijing. 11/95.

#### **Sumitomo Electric Industries, Ltd. (Japan)**

Will open representative office in Shanghai. 11/95.

## Engineering and Construction

### CHINA'S IMPORTS

#### **Polytec Engineering Co., Ltd. (Hong Kong)**

Won contract to provide pumps for the Sun Dong An Plaza in Beijing. \$1 million. 12/95.

### INVESTMENTS IN CHINA

#### **Schaeff (Germany)/Xiamen Engineering Machinery Co. (Fujian)**

Established joint venture to make excavators and other construction vehicles in Xiamen, Fujian Province. \$29.3 million. (Germany:50%-PRC:50%). 12/95.

#### **Stow International N.V. Storage Solutions (Belgium)**

Will establish wholly owned manufacturing venture in Shanghai to produce storage equipment. \$4 million. 12/95.

#### **Akzo Nobel N.V. (Netherlands)/Red Lion Coatings Co., Ltd. (Beijing)**

Will establish joint venture to research, produce, and sell coatings used in building construction, wooden furniture, automobiles, and aviation products. \$21 million. 11/95.

#### **Forest Overseas Co., Ltd. (Japan)**

Will erect an office building in Pudong, Shanghai to accommodate 36 Japanese and US financial institutions and businesses. \$960 million. 11/95.

#### **NKK Corp., Marubeni Corp., Mitsubishi Corp. (Japan)/NA**

Established Bohai NKK Drillpipe Co. joint venture in Cangzhou, Hebei Province to produce tool joints used in oilfield excavators. 11/95.

#### **Schindler Holding AG (Switzerland)**

Established wholly owned enterprise in Suzhou, Jiangsu Province to produce aluminum steps for escalators. \$10 million. 11/95.

#### **Schuller International Group Inc., a unit of Manville Corp. (US)/China National New Building Materials Corp., Tianma Corp.**

Established joint venture in Changzhou, Jiangsu Province to produce fiberglass mat. (US:60%-PRC:20%, 20%). 11/95.

#### **Shun Wo Resources Co. (Singapore)/NA (Heilongjiang)**

Established a joint-venture timber processing factory in Yichun, Heilongjiang Province to produce boards for domestic and export markets. \$120 million. 10/95.

### OTHER

#### **Syndicate of 16 Asian and European banks**

Offered loan for infrastructure construction in Suzhou Industrial Park, a joint project between China and Singapore. \$100 million. 12/95.

**Samsung Engineering & Construction Co. (S. Korea)**  
Won contract to construct a 38-story building in Shanghai.  
\$54 million. 10/95.

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## Environmental Technology and Equipment

### CHINA'S IMPORTS

**Alanco Environmental Resource Corp. (US)**  
Sold China National Environmental Protection Corp. a charged dry sorbent injection system to fight coal pollution. 12/95.

### INVESTMENTS IN CHINA

**Ebara Corp. (Japan)/SPC, Ministry of Power Industry**  
Will build a large electron-beam desulfurization project in Chengdu thermal power plant. \$12 million. 10/95.

### OTHER

**World Bank**  
Offered \$125 million loan and \$25 million credit to support wastewater handling, air pollution control, and solid waste management in Hubei Province. \$150 million. 12/95.

**Swiss Government**  
Will offer loan to the Chinese government for environmental protection projects. \$53 million. 10/95.

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## Food and Food Processing

### CHINA'S IMPORTS

**Harradura (Mexico)**  
Began exporting Jimador-brand tequila to China. 12/95.

### INVESTMENTS IN CHINA

**PepsiCo, Inc. (US)/Anshan Fast Food Factory (Liaoning)**  
Established Anshan Pepsi Co., Ltd. joint venture in Anshan, Liaoning Province. \$20 million. (US:60%-PRC:40%). 1/96.

**Asahi Breweries Ltd. (Japan), Itochu Corp. (Japan)**  
Will jointly purchase a 75 percent stake in China Brewery Holdings Ltd., the holding company for Beijing Zhongce Beijing Beer Co. and Shandong Province's Yantai CSI Beer Co. \$52.2 million. (Japan:45%, 30%-PRC:25%). 12/95.

**Mitsui & Co. Ltd. (Japan), Toyo Seikan Kaisha Ltd. (Japan), Kerry Oils and Grains China Ltd. (Hong Kong)/NA**  
Established Sichuan Kerry Foodstuffs Industrial Ltd. joint venture to produce instant noodles in a suburb of Chengdu, Sichuan Province. 12/95.

**Carrefour (France), President Enterprises Corp. (Taiwan)/Tianjin Vegetable Corp.**  
Established joint-venture warehouse distribution center in Tianjin. \$15 million. (France:50%, Taiwan:40%-PRC:10%). 11/95.

**CPC International Inc. (US)/Beijing Poultry and Egg Co.**  
Established joint venture in Beijing to produce chicken products and salad dressing for the northern China market. \$12 million. 11/95.

**Jusco Co. Ltd. (Japan), Mitsubishi Corp. (Japan), Kerry Group PLC (Ireland)/NA (Shanghai)**  
Established Shanghai Jusco Co., Ltd. joint venture to open a chain of supermarkets. \$4.3 million. (Japan:32.5%, NA, Ireland:32.5%-PRC:NA). 11/95.

**PepsiCo, Inc. (US)/Ningbo Light Industry Co. (Zhejiang)**  
Established joint venture to produce soft drinks. \$20 million. (US:40%-PRC:60%). 11/95.

**Wein International Co., Ltd. (Germany)/Beijing Red Star Wine-making Group Co.**  
Will establish wine-producing joint venture in Beijing. 11/95.

### OTHER

**Sella & Mosca (Italy)**  
Appointed Shandong Hongyi Group Co., Ltd. as its PRC sales agent for wine products. 12/95.

**Subway Franchise Advertising Fund Trust (US)**  
Established Beijing Subway Foodstuff Development Co., Ltd. and announced plans to open outlets in major Chinese cities. 11/95.

**Pizza Hut, Inc., a division of PepsiCo, Inc. (US)**  
Opened Shanghai's first Pizza Hut. 10/95.

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## Foreign Assistance

### OTHER

**Asian Development Bank**  
Will provide technical assistance grant for a project to provide water, flood protection, irrigation, and hydroelectric power in Wenzhou, Zhejiang Province. \$1 million. 1/96.

**World Bank**  
Will provide IDA credit to China for disease-prevention project in 10 of the country's poorest provinces. \$100 million. 12/95.

**World Bank**  
Will provide loan to the Chinese government for scientific and technological development projects. \$200 million. 11/95.

**World Bank**  
Will provide poverty relief loan to 35 counties in Yunnan and Guizhou provinces and the Guangxi Zhuang Autonomous Region. \$247 million. 10/95.

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## Machinery and Machine Tools

### INVESTMENTS IN CHINA

**Barmag Maschinenfabrik AG (Germany)/Shanghai No.2 Textile Machinery Share-Holding Co. Ltd.**  
Will establish Shanghai Barmag Machinery Co. Ltd. joint venture to produce spinning machines for polyester fiber, polypropylene fiber, and silk. \$6.5 million. 12/95.

**Komatsu Ltd. (Japan), NA (Japan)/Changzhou Forestry Machinery Plant (Jiangsu), Suzhou Forestry Machinery Plant (Jiangsu)**  
Will establish Komatsu Changlin Casting Co. joint venture to produce auto-casting for China and Japan. \$29.9 million. (Japan:50%, 15%-PRC:35%). 10/95.

### OTHER

**Deere & Co. (US)**  
Opened representative office in Beijing. 10/95.



## Medical Equipment and Devices

### INVESTMENTS IN CHINA

#### **Baxter International Inc. (US)/NA (Guangdong)**

Established Baxter Guangzhou Health Care Co. joint venture to produce kidney dialysis equipment. \$12 million. (US:75%-PRC:25%). 11/95.

#### **Sola International (US)**

Will produce hard resin spectacle lenses in Guangzhou. \$25 million. 11/95.

## Metals, Minerals, and Mining

### CHINA'S INVESTMENTS ABROAD

#### **Jiangxi Corp. for International Economic and Technical Co-operation**

Will establish copper-processing factory in Kabwe, Zambia. \$514 million. 11/95.

### INVESTMENTS IN CHINA

#### **Praxair, Inc. (US)/Shanghai Meishan Group Corp., Ltd.**

Established Praxair Shanghai Meishan, Inc. joint venture to build a 550 tonne-per-day air separation plant in Meishan, Jiangsu Province. The plant will supply oxygen, nitrogen, and argon by pipeline to Shanghai Meishan Metallurgical Corp.'s new steelmaking facility. \$30 million. 1/96.

#### **Asian Minerals Co. (Canada)/Zhaoyuan Gold Industrial Group Corp. (Shandong)**

Established a gold-mining joint venture in Shandong Province. \$72 million. (Canada:50%-PRC:50%). 12/95.

#### **NKK Corp. (Japan), NA (Taiwan)**

Will establish tin-plate manufacturing facility in Fujian Province. (Japan:65%, Taiwan:35%). 12/95.

#### **Pohang Iron & Steel Co., Ltd. (S. Korea)/ Jiangsu Shagang Group Co. (Jiangsu)**

Will establish joint venture near Shanghai to produce stainless steel cold-rolled coils. \$180 million. (S. Korea:70%-PRC:30%). 12/95.

#### **Marubeni Corp. (Japan)/NA**

Established joint venture to distribute steel products in China. \$3 million. 10/95.

#### **Veitsch-Radex Group (Austria)/China Metallurgical Import and Export Liaoning Co. (Liaoning)**

Established joint venture to produce 50,000 tpy of unshaped refractory products and 10,000 tpy of magnetite carbon bricks in Yingkou, Liaoning Province. \$29 million. (Austria:55%-PRC:45%). 10/95.

### OTHER

#### **Kawasaki Steel Corp. (Japan)**

Will open representative office in Shanghai. 11/95.

## Packaging, Pulp, and Paper

### CHINA'S IMPORTS

#### **Jinguang Group (Indonesia)**

Awarded contract to build paper mill in Zhuhai SEZ in Guangdong Province. \$3 billion. 12/95.

### INVESTMENTS IN CHINA

#### **Asia Pulp & Paper Co., Ltd. (Singapore)**

Will fund planting of a 293,000 ha forest in Hainan Province to produce paper pulp. \$220 million. 12/95.

#### **Coca-Cola Amatil Ltd. (Australia)**

Established wholly owned Leigh-Mardon (Beijing) Packaging Co., Ltd. to produce packaging materials for ice cream, cookies, and medicines. \$13 million. 11/95.

#### **Halla Group (S. Korea)/NA (Heilongjiang)**

Will establish joint-venture pulp mill in Yichun, Heilongjiang Province. (S. Korea:60%-PRC:40%). 11/95.

## Petroleum, Natural Gas, and Related Equipment

### INVESTMENTS IN CHINA

#### **Caltex China Ltd., a subsidiary of Caltex Petroleum Corp. (US)/Shantou Ocean Enterprises (Guangdong)**

Will construct and operate a liquefied petroleum gas terminal in Shantou, Guangdong Province. \$125 million. 12/95.

#### **NA (United Arab Emirates)/Jingtang Port Office (Hebei)**

Will establish Tangshan International Petroleum Gas Co. Ltd. joint venture in Tangshan, Hebei Province. \$22 million. (UAE:80%-PRC:20%). 12/95.

#### **Texaco China BV, a subsidiary of Texaco Inc. (US)/China National Petroleum Corp.**

Signed contract to explore and develop oil fields in Leshan and Ya'an, Sichuan Province. 12/95.

#### **Cairn Energy (UK)/CNOOC**

Will explore for oil in the Beibu Gulf Basin of South China Sea. 11/95.

#### **Nippon Oil Co., Ltd. (Japan), Meiwa Trading (Japan)/Tianjin Hangu Petrochemical Works**

Established Tianjin Nisseki Lubricant Oil & Grease joint venture to produce lube oil. \$7.3 million. (Japan:40%, 10%-PRC:50%). 11/95.

### OTHER

#### **European Investment Bank**

Will provide loan to China for oil and natural gas exploration in the East China Sea. \$72.6 million. 12/95.

#### **Export & Import Bank of China**

Will offer soft government loan for oil exploration project in the Sudan. \$12 million. 12/95.

#### **Royal Dutch/Shell Group of Companies (Netherlands)/CNOOC**

Will study a 25,000 sq km area in the South China Sea for hydrocarbon prospects. 12/95.

#### **Standard Chartered PLC (UK)**

Will offer loans for two Shell Oil projects in Zhejiang Province. \$30 million. 10/95.

## Pharmaceuticals

### INVESTMENTS IN CHINA

#### **Roche Holding Ltd. (Switzerland)/Pharmaceutical Factory No.6 (Shanghai)**

Will form joint venture to produce vitamin A in Shanghai. (Switzerland:70%-PRC:30%). 12/95.

**Roche Holding Ltd. (Switzerland)/Shanghai Sunve Pharmaceutical Corp.**

Will form joint venture to produce vitamin E in Shanghai. (Switzerland:60%-PRC:40%). 12/95.

**Aluisse-Lonza Holding Ltd. (Switzerland)/Guangzhou Pesticide Factory (Guangdong)**

Established joint venture to produce nicotinamide in Guangzhou. \$30 million. 11/95.

**Chugai Pharmaceutical Co. Ltd. (Japan)/Xinxing Group Corp. (Shanghai)**

Will establish joint venture to produce advanced pharmaceuticals in Shanghai. \$20 million. 11/95.

**Sanofi Pharmaceuticals Inc. (US), a subsidiary of Elf Aquitaine (France)/Minsheng Pharmaceutical Group Co. (Zhejiang)**

Established Hangzhou Sanofi-Minsheng Pharmaceutical Co. joint venture to develop and produce medicines for children. \$15 million. (France:36.7%-PRC:63.3%). 10/95.

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## Ports and Shipping

### CHINA'S IMPORTS

**Halla Engineering & Heavy Industries Co. (S. Korea)**

Will build two bulk carriers for Sinotrans. \$60 million. 10/95.

### OTHER

**Orient Overseas Container Line (Asia Pacific) Ltd. (Hong Kong)**

Launched a new feeder service between Dalian and Hong Kong. 1/96.

**Asian Development Bank**

Will offer \$63 million loan and \$490,000 technical assistance grant to finance the second Yantai port project in Shandong Province. 12/95.

**Hapag-Lloyd AG (Germany)**

Will begin making direct calls at Chinese ports in 1996. 11/95.

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## Power Generation Equipment

### CHINA'S IMPORTS

**Itochu Corp. (Japan), Hitachi Ltd. (Japan)/Harbin Electrical Machinery Co. (Heilongjiang)**

Will use Asian Development Bank loan to provide turbine generator for the 240MW Lingjintan hydroelectric project. \$65 million. 12/95.

**Peebles Electric, a unit of Rolls-Royce PLC (UK)**

Will supply four generator transformers to Guangdong Pumped Storage Power Station Joint Venture Corp. in 1997-98. \$9 million. 12/95.

### INVESTMENTS IN CHINA

**Rolls-Royce PLC (UK)/Fushun Electrical Ceramics Co. (Liaoning), a unit of Northeast China Power Transmission and Transformation Facilities Group**

Established joint venture to produce power transmission facilities in Fushun, Liaoning Province. \$6 million. 12/95.

**Westinghouse Electric Co. (US)/Shanghai Turbine Works, Shanghai Electric Machinery Works, Shanghai Power Plant Auxiliary Machinery Works**

Established three power-producing joint ventures. \$305 million. (US:40%-PRC:60%). 12/95.

**Sithe China Holdings Ltd., a unit of Sithe Energies Inc. (US)**

Will build a 20MW plant in Zhejiang Province. \$63 million. 11/95.

**Sithe Energies Inc. (US)/CNOOC**

Will build a 4,000MW gas-fired power plant in Zhanjiang, Guangdong Province. \$1.6 billion. 11/95.

**Westinghouse Electric Corp. (US)/China Research Institute for Nuclear Service Operation**

Established Wuhan Huixin Engineering Technology joint venture to provide services for commercial nuclear plants. \$8 million. (US:48%-PRC:52%). 11/95.

**Coastal Corp. (US)/NA (Jiangsu)**

Established joint venture to build and operate 58MW gas-turbine plant in Suzhou, Jiangsu Province. \$29 million. (US:60%-PRC:40%). 10/95.

**Westinghouse Electric Corp. (US)/Shanghai Electrical Products Manufacturing Corp.**

Established four joint ventures to manufacture turbines, turbo generators, power station auxiliary machines, and engineering projects, respectively. \$376.5 million. (US:21.8%-PRC:78.2%). 10/95.

### OTHER

**Asian Development Bank**

Will provide \$200 million loan and \$422,000 technical assistance grant for a power project in Henan Province. 11/95.

**World Bank**

Will provide \$400 million loan for the second-phase construction of Ertan Hydroelectric Station. 11/95.

**Banque Nationale de Paris (France), leading a consortium of 14 French banks and 7 British banks**

Will offer syndicated loan to finance construction of Guangdong Ling'ao Nuclear Power Station. \$2.3 billion. 10/95.

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## Property Management and Development

### INVESTMENTS IN CHINA

**Daiwa House Industry Co., Ltd. (Japan), Mitsubishi Corp. (Japan)/NA**

Established joint venture to build and operate rental housing for foreigners in Tianjin. \$20 million. 12/95.

**Days Inns of America Inc. (US)**

Will develop three-star hotel chain in China. 12/95.

**Daewoo Corp. (S. Korea)/Xujiahui Commercial Center (Shanghai)**

Established joint venture to construct an 89-story office, commercial, hotel, and residential complex in Shanghai. \$550 million. (S. Korea:90%-PRC:10%). 11/95.

### OTHER

**Motorola Inc. (US)**

Purchased new office tower in Beijing as the site of future China headquarters. 11/95.

**Sumitomo Corp. (Japan)**

Purchased more than 2,000 sq m of office space in Full Link Plaza in downtown Beijing. \$10 million. 10/95.

## Telecommunications

### CHINA'S IMPORTS

#### **Hughes Electronic Corp., an affiliate of General Motors Corp. (US)**

Will sell a HS376 satellite to ChinaSat, an MPT subsidiary. \$130 million. 12/95.

#### **AT&T**

Will sell synchronous digital hierarchy (SDH) equipment to Shanghai P&T Bureau. \$13 million. 11/95.

#### **LM Ericsson (Sweden)**

Awarded contract by Hunan P&T Administration for expansion of TACS analog mobile cellular system in Hunan Province. \$43 million. 11/95.

#### **LM Ericsson (Sweden)**

Awarded contracts by Liaoning P&T Administration for the expansion of TACS analog mobile cellular system in Liaoning Province. \$34.5 million. 11/95.

#### **Newbridge Networks Corp. (Canada)**

Awarded contracts to supply Newbridge MainStreet products for Digital Data Networks of Shanghai P&T Bureau, Hebei P&T Administration, and Hainan P&T Administration. 11/95.

#### **Northern Telecom (Canada)**

Will sell DMS switching systems to Beijing, Chongqing, and the provincial telecommunications administrations in Guangdong, Jiangxi, Jilin, Yunnan, Henan, and Hebei. \$220 million. 11/95.

#### **Northern Telecom (Canada)**

Sold a FiberWorld SDH Radio 5/40 system to China National P&T Appliances Corp. \$14.5 million. 11/95.

#### **Oy Nokia AB/Nokia Group (Finland)**

Will supply a GSM network to Zhejiang MPT. \$20 million. 11/95.

#### **Siemens AG (Germany)**

Will supply SDH equipment to MPT for the Beijing-Shenyang-Harbin trunk line. 11/95.

#### **Sprint Corp. (US)**

Will sell equipment to increase Chinanet's capacity. 11/95.

#### **Motorola Inc. (US)**

Will sell MPT and Zhejiang Technical Import and Export Corp. cellular infrastructure equipment. \$268 million. 10/95.

#### **Northern Telecom (Canada)**

Will sell digital mobile telephone services and paging services to China United Communications Co., Ltd. \$40 million. 10/95.

#### **Scientific Atlanta, Inc. (US)**

Will sell a voice and data satellite communications network to Ministry of Foreign Trade and Economic Cooperation as part of the Golden Customs Project. \$10 million. 9/95.

### INVESTMENTS IN CHINA

#### **Motorola Inc. (US)**

Will sell data communications equipment to Ministry of Power Industry to be used in the second-phase construction of national electricity data exchange network. 11/95.

#### **Nemic Lambda Co. (Japan), a subsidiary of Unitech PLC (UK)/China Electronics Weihua Industry Development Co.**

Established Beijing Lianhua Power Source Technology Co., Ltd. joint venture to manufacture switches. 11/95.

#### **Siemens AG (Germany)/Shanghai Video & Audio Electronics**

Established Siemens Shanghai Communication Terminals in the Pudong New Area to produce telephones. \$7 million. (Germany:60%-PRC:40%). 11/95.

#### **Sony Corp. (Japan)/Beijing P&T College, Beijing Jingzhi Electronic Information Co., Beijing Tianzhu Air Harbor Industrial Development Co.**

Established joint venture to produce telecommunications equipment in Beijing. \$29.2 million. 11/95.

#### **Harris Corp., Digital Telephone Systems Division (US)/Guangzhou Wire Communications Equipment Factory (Guangdong)**

Established Guangzhou Harris Telecommunications joint venture to provide research and development, manufacturing, sales, and support for digital telephone switches and other telecommunication systems and services. 9/95.

### OTHER

#### **Bell Northern Research, a subsidiary of Northern Telecom (Canada)/Zhongshan University (Guangdong)**

Established joint-venture advanced telecommunications research laboratory. 12/95.

#### **Emcee Broadcast Products (US)/First Zhangjiakou Radio Plant (Hebei)**

Established joint venture to manufacture microwave distribution systems in Zhangjiakou, Hebei Province. 12/95.

#### **Sprint Corp. (US)**

Will open office in Shanghai. 12/95.

#### **American Electronics Association (US), Software Publishers Association (US), Telecommunications Industry Association (US), Telecommunications Industry Association (US), US Department of Commerce**

Opened US Information Technology Office in Beijing. 11/95.

#### **Asian Development Bank**

Provided loan to finance telecommunications project linking inland and coastal areas. \$100 million. 9/95.

## Textiles and Apparel

### INVESTMENTS IN CHINA

#### **Toray Industries Inc. (Japan)**

Will begin producing polyester in Jiangsu Province. \$388 million. 11/95.

## Transportation

### CHINA'S IMPORTS

#### **Airbus Industrie (France)**

Sold three A320 Airbus aircraft to Sichuan Airlines. 12/95.

### INVESTMENTS IN CHINA

#### **American Standard Inc. (US)**

Opened automobile accessory factory in Shandong Province. 12/95.

**Compagnie Générale des Etablissements Michelin (France)/NA (Liaoning)**

Will establish joint-venture tire company in Shenyang, Liaoning Province. \$30 million. (France:90%-PRC:10%). 12/95.

**Daewoo Corp. (S. Korea)**

Will establish facilities to produce auto parts for export to Daewoo assembly plants in South Korea and other countries. \$963 million. 12/95.

**Federal-Mogul Corp. (US)/Shanghai Automotive Industry Corp.**

Will establish Shanghai F-M Bearing Co. joint venture to produce engine bearings in the China and Asia markets. 12/95.

**Fuji Heavy Industries Ltd. (Japan)**

Will take a 15 percent stake in Hebei Zhongxing Automobile, and provide technical assistance in manufacture of commercial vehicles. 12/95.

**Honda Motor Co., Ltd. (Japan)/Dongfeng Motor Co, Ltd.**

Will establish joint venture to produce small passenger car engines. 12/95.

**Iveco Fiat S.p.A., a subsidiary of Fiat S.p.A. (Italy)/Nanjing Auto Works (Jiangsu)**

Will establish joint venture in Nanjing to produce light Iveco Daily vans and diesel engines with 100 percent local content. \$200 million. (Italy:50%-PRC:50%). 12/95.

**Kaisai-Kogyo Co., Ltd. (Japan), Itochu Corp. (Japan)/Changzhou Plastics Weaving Factory (Jiangsu), China Automotive International Corp.**

Will establish Changzhou-Kasai Kogyo Automotive Interior Decorative Co., Ltd. joint venture in Jiangsu Province. \$1.4 million. (Japan:45%, 10%-PRC:30%, 15%). 12/95.

**Isuzu Motors Ltd. (Japan)**

Established Isuzu (China) Investment Co., Ltd. \$35 million. 12/95.

**ZF Freidrichshafen (Germany)/Guangxi Liugong Machinery Co., Ltd.**

Established Liuzhou ZF Machinery Co., Ltd. to produce WG200 reversing power shift gearboxes and AP400 and AP411 wet-brake drive axles in Liuzhou, Guangxi Province. \$26 million. 12/95.

**American Aviation Investment (US)**

Purchased 25 percent stake in Hainan Airlines. \$25 million. 11/95.

**China Motor (Taiwan)**

Will build two plants in Fujian Province to produce 150,000 cars a year each. \$30 million. 11/95.

**Connecteurs Cinch Division, a subsidiary of Labinal SA (France)/Hangzhou Electrical Connectors Factory (Zhejiang)**

Established Cinch Orient joint venture in Hangzhou to produce automotive connectors for Chinese-made Focan, Traffic, and Peugeot cars. (France:75%-PRC:25%). 11/95.

**Cummins Engine Co., Inc. (US)/China National Heavy-Duty Truck Corp.**

Established Chongqing Cummins Engine Co. joint venture in Sichuan Province to build engines for automakers, shipyards, and oilfields in China and abroad. \$96 million. (US:50%-PRC:50%). 11/95.

**Linde AG (Germany)/NA (Fujian)**

Established Linde-Xiamen Forklift Truck Corp. joint venture in Xiamen, Fujian Province to produce forklift trucks. \$169 million. 11/95.

**McDonnell Douglas Corp. (US)/North China Airlines**

Will establish joint-venture pilot training center in Liaoning Province. \$50 million. 11/95.

**Monroe Auto Equipment Co., a subsidiary of Tenneco Automotive (US)/Beijing Automobile Industrial Group**

Established joint venture to build shock absorbers. \$16.6 million. (US:51%-PRC:49%). 11/95.

**NA (Czech Republic)/NA**

Established Desta joint venture to produce forklifts in Changsha, Hunan Province. \$38 million. 11/95.

**NA (Germany)/Shanghai Pudong Automotive Lighting Factory**

Established Shanghai Hella Automotive Lighting Co., Ltd. joint venture to produce automotive lights. \$11.4 million. (Germany:55%-PRC:45%). 11/95.

**Shell China Holdings BV, a subsidiary of Royal Dutch/Shell Group of Companies (Netherlands)**

Purchased 40-percent stake in Zhanjiang Best Lubricant Blending Ltd. in Guangdong Province to produce automotive lubricants. 11/95.

**Western Star Trucks Ltd. (Canada)/Zhuhai Manufacturing Co. (Guangdong), an unit of China National Special Automobile Co.**

Will cooperate to produce special-purpose vehicles in Zhuhai SEZ in Guangdong Province. \$220 million. 11/95.

**AlliedSignal Aerospace, an unit of AlliedSignal Inc. (US)/Aviation Industries of China**

Established joint venture in Nanjing, Jiangsu Province to design, develop, and manufacture environmental control systems for commercial aircraft in China. \$11 million. (US:50%-PRC:50%). 10/95.

**Harkinsen Corp. (France)/Dongfeng Industrial Development Corp., a subsidiary of Wuhan Dongfeng Automotive Corp. (Hubei)**

Established Dongshen Automotive Rubber Products Corp. joint venture to produce rubber sealing elements. \$27.6 million. 10/95.

**Hitachi Ltd. (Japan)/Changsha Auto Electrical Appliances Factory (Hunan)**

Established joint venture to produce electric motors for Isuzu light vehicles and other vehicles produced by Hitachi. \$10.2 million. (Japan:60%-PRC:40%). 10/95.

**Lucas Aerospace Ltd., a subsidiary of Lucas Industries PLC (UK)/Taikoo Aircraft Engineering Co. (Fujian), a joint venture between Hong Kong Aircraft Engineering Co. (Hong Kong), Cathay Pacific (Hong Kong), Singapore Airlines (Singapore), Japan Airlines**

Established joint venture in Fujian Province to repair and overhaul aircraft equipment. (UK:65%-PRC:35%). 10/95.

**Chin Fon Group (Taiwan)/Jinan Qingqi Co. (Shandong)**

Formed joint venture to produce motorcycle engines. \$100 million. (Taiwan:50%-PRC:50%). 9/95.

**Ford Motor Co. (US)**

Purchased 20 percent of Jiangling Motor Corp. of Nanchang, Jiangxi Province. \$40 million. 9/95.

OTHER

**Galileo International (US)/CAAC**

Will link computer airline reservation systems. 12/95.

**Daimler-Benz AG (Germany)**

Opened representative office in Beijing. 11/95.

**Isuzu Motors Ltd. (Japan)**

Established Isuzu (China) Holding Co., Ltd. in Beijing to handle all investment in China. 11/95.

**Mercedes-Benz AG (Germany)**

Will establish 30 service stations and sales offices in China. 11/95.

**World Bank**

Will provide loan to build the Shanghai-Hangzhou expressway. \$260 million. 11/95.

**Messier-Bugatti, a subsidiary of Société Nationale d'Etude et de Construction de Moteurs d'Aviation (France)/Huaxing Co. (Shaanxi), a subsidiary of China Aviation Industries Co.**

Contracted Huaxing Co., a subsidiary of China Aviation Industries Co., to manufacture basic brake parts and to set up brake-test facilities in Shaanxi Province. 10/95.

**Miscellaneous**

OTHER

**General Electric Co. (US)**

Will sponsor Shanghai Television broadcast of "Zhima Jie," the Chinese version of "Sesame Street." 12/95.

**Beiten Burkhardt Mittl & Wegener (Germany)**

Opened international law office in Beijing. 11/95.

**McKinsey & Co., Inc. (US)**

Opened management consulting office in Beijing. 11/95.

**Reed Exhibition Co. (US)**

Opened office in Beijing to organize trade and public shows. 11/95.

**Wallonia and Flanders Administrative Regions (Belgium)**

Opened trade offices in Shanghai. 11/95.

**Britain-China Trade 48 Group (UK)**

Opened office in Wuhan, Hubei Province. 10/95.

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