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SECURITY ASSISTANCE IN THE MODERNIZATION
OF THE PEOPLE'S LIBERATION ARMY:
A CASE STUDY

THESIS

Christopher J. Hebner
Captain, USAF

AFIT/GLM/LSM/88S-33

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Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Logistics Management

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September 1988

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Table of Contents

Acknowledgements	iii
Abstract	v
I. Introduction	1
Background	1
Research Objective	2
Research Questions	3
II. Research Methodology	4
III. Literature Review	5
Introduction	5
China Prior to 1949	5
China After 1949	8
US Security Assistance	10
The PLA	13
Factors in the PLA's Current Modernization Program	16
The Chinese Aerospace Industry	19
US Modernization of the PLA	25
Technology Transfer	27
Cooperative Programs	35
Policy Goals	36
Arguments Against Arms Sales	37
Arguments For Arms Sales	38
Patterns of Arms Sales to the PRC	40
External Factors	45
Internal Factors	48
PRC Exports	51
Considerations for Cooperation	53
IV. Analysis	56
PEACE PEARL	56
General	56
The F-8 II.	57
Program Phases	58
Logistics	58
Training	60
Technical Description	61
Summary	65
V. Conclusions and Recommendations	67
Conclusion	67
Recommendation	69
Bibliography	70
VITA	77

Abstract

This study concludes that increased interactions between the United States (US) and the People's Republic of China (PRC) will be beneficial for both countries and for global political stability. An examination of current security assistance programs between the countries will enable us to enhance the success of future projects.

This thesis reviews briefly the historical background of relations between the PRC and the world in general and specifically between the PRC and the US. After summarizing the basic goals of general security assistance programs this thesis examines the arguments for and against these programs. It provides a summary of the People's Liberation Army (PLA) modernization program with a focus on the capabilities of the PRC aerospace industrial base.

Finally, this work provides a technical analysis of the PEACE PEARL foreign military sales program with a political analysis of the potential for future programs between the US and the PRC.

SECURITY ASSISTANCE IN THE MODERNIZATION
OF THE PEOPLE'S LIBERATION ARMY:
A CASE STUDY

I. Introduction

From the end of the Communist Chinese revolution in 1949 until President Nixon's visit to China in 1972, the United States questioned the legitimacy of the ruling government on Mainland China, representing one fifth of the world's population. Since the United States (US) and the People's Republic of China (PRC) formally resumed diplomatic relations January 1, 1979, interactions have expanded on a number of fronts (Acker, 1987:18; US Congress, 1987:197). Since the visit of the Secretary of Defense in 1980, the US has decided to actively aid in the modernization of the military forces of the PRC.

Background

The US has decided to help the PRC modernize its obsolescent forces and strengthen its economic development mechanisms. Specific policy goals and program objectives have been established to implement this policy (DOD, 1987b:273). The potential for continued cooperation between

the US and the PRC in this area is, to a large degree, dependent upon the success of these initial programs.

The People's Liberation Army Air Force (PLAAF), in the fall of 1986, launched a program to modernize the avionics in 50 F-8II defensive fighter aircraft (O'Lone, 1987e:55; DOD, 1987b:273; Kenny, 1987:61). The United States Air Force (USAF) was assigned responsibility for management of this program, and it was assigned the code name PEACE PEARL (AFSC, 1987:2).

With the signing of the letter of acceptance on 30 October 1986 by the representative of the PRC, PEACE PEARL became the first USAF military cooperation project with the PRC. Through a study of this program I will examine the military and economic aspects of this reversal in the official attitude toward the PRC. By studying this project, we can apply the lessons learned to future cooperative ventures with the PRC.

Research Objective

The research objective is to study the historical relations between the US and the PRC and analyze the recent policy shift in the respective governments toward each other. I will examine the pros and cons of security assistance and arms sales in general, and the details of the PEACE PEARL foreign military sales program in order to gain an understanding of the potential for future security assistance programs.

Research Questions

1. How did historical considerations in the US and the PRC fit into this new relationship between these countries?
2. What are the major types of US security assistance programs and the issues associated with these programs?
3. What is the role of the PLA modernization in the overall PRC economic modernization program?
4. What are the overall US and PRC objectives of security assistance programs and the specific objectives of the PEACE PEARL program?
5. What are the prospects for future security assistance programs?

II. Research Methodology

I reviewed the current literature to obtain the political and historical background of this issue. This included a DTIC and DIALOG search of key words, a search of the local libraries to include the AFIT library, Wright State University, the University of Dayton and the specialized libraries at Wright-Patterson AFB. Also, information on current issues was obtained from general and specialized magazine articles, current books and recent bibliographies.

Information concerning the PEACE PEARL program was obtained from government documents, visits and interviews with the AFSC program manager and his staff and the AFLC-ILC country manager. I also talked with personnel from the Air Staff, DOD and Department of State offices dealing with cooperative programs in this geographic region and personnel from the San Antonio ALC/MMM office which will have support responsibility after the program management responsibility transfers from AFSC to AFLC.

Information obtained from the literature review assisted in pinpointing potential benefits, problems and conflicts in security assistance programs.

III. Literature Review

Introduction

When the Roman Empire was at its zenith, the Han Dynasty ruled a unified China which stretched from Central Vietnam to the Korean Peninsula and west into Central Asia and the Tibetan Plateau. The rise and fall of successive dynasties periodically interrupted China's administrative continuity, but the Han people, as the Chinese called themselves, never lost their cultural identity or racial distinctiveness. While the age of empire may have passed, China's Communist heirs are setting forth with vigor and determination toward an ambitious goal: restoring China to what they see as their rightful place in the first rank of world powers. And, although China's present leaders have cast aside much of the intellectual impedimenta of Confucian China, their sense of historical continuity remains undiminished (Starbuck, 1981:1).

China Prior to 1949

Western contact with China had been established by explorers, merchants and missionaries for hundreds of years before the arrival of British gunboats in the first half of the nineteenth century. But China was comparatively disinterested in the West. The first and second opium wars (1839-1842 and 1856-1860), the Sino-French War of 1884 and

the Russian annexation of territories along China's northern frontier (Treaty of Peking, 1860) alerted the Qing rulers to the strength of western military power. But entrenched conservatism among the ruling elite precluded the adoption of western technology. In the 1860s, China was powerless to stop Japanese encroachments in Korea and suffered a disastrous defeat in the Sino-Japanese War of 1894-1895 (PRC, 1984:29).

After the humiliating failure of the Boxer Rebellion (1900) that sought to oust foreign powers, reformist groups gained increasing popular support. In 1911, Sun Yat-sen (Sun Zhongshan) organized a coup that overthrew the Qing dynasty. Inaugurated as provisional president in 1912, Sun stepped down two months later in favor of the powerful warlord and former imperial commander Yuan Shikai, in the hopes of averting civil war between the republicans and the warlords. The early death in 1916 of the dictatorial Yuan saved the republicans and they took hold of the cities. In 1919 Chinese students led the May Fourth Movement in which they protested western recognition of Japan's seizure of Shandong Peninsula. Nationalist feelings of betrayal by the West inspired Sun to turn to the newly established Bolshevik government in Moscow for assistance (PRC, 1984:30).

Soviet aid to Sun's Nationalist Party continued after his death in 1925. At Soviet insistence, the Chinese Communist Party (CCP) joined ranks with the Nationalists in

1924. During this period of alliance, government armies launched a series of northern campaigns that subdued the warlords. Encouraged by his victories and distrustful of Soviet intentions in China, Nationalist leader Chiang Kai-shek (Jiang Jieshi) turned on the Soviet backed Communists in 1927. By 1931 Mao Tse-tung (Mao Zedong) had established a Chinese Soviet Republic with its own military. In 1934, after destruction of his base by Nationalist armies, Mao and approximately 150,000 followers escaped northward in the 10,000 kilometer trek known as the "Long March". In 1935 the 20,000 survivors established a new headquarters at Yanan (PRC, 1984:31; Snow, 1968:434).

The Communists and Nationalists briefly joined forces in an attempt to defeat the invading Japanese, but by 1938 this united front had collapsed because of mutual distrust. In 1945, following the end of World War II, a bloody civil war broke out in China between the Communists and the Nationalists. In January, 1949 Beijing was taken by the Communists without a fight. Between April and November major cities passed from Nationalist to Communist control with only occasional small resistance. On October 1, 1949, the People's Republic of China was established with its national capital at Beijing. The remnants of the Nationalist forces fled to Taiwan where Chiang proclaimed Taipei as the temporary capital of China (DA, 1981:30).

China After 1949

The Soviet Union recognized the PRC on October 2, 1949 (DA, 1981:30). With the implications of the Communist victory underscored by the aggressive attitude of China's new rulers, Americans generally were shocked by what had happened. Ignoring the nationalistic movements sweeping across Asia, they could see only another manifestation of the international Communist conspiracy. The US response was governed by a firm resolve to contain any further expansion of Communist China's power and to safeguard American interests at any cost (Dulles, 1972:5). The Korean War and the expansion of US military involvement in Vietnam were seen by Beijing as the most serious threats to Chinese security until the Soviet buildup along the Sino-Soviet border (Godwin, 1984:216). In the late 1960s, China's military weakness demanded a critical review of Beijing's defense and foreign policies. The need to deter the USSR ultimately caused Beijing to reject the policies that had left China in self-imposed isolation, weak and vulnerable. Rapprochement with the US was initiated (Godwin, 1984:218).

In February, 1972 President Nixon made his historic visit to China. During this visit, Nixon and Mao completed the Shanghai Communique, a document that tried to reflect the common interests of the two nations even as it revealed their differences. The major points of the agreement were a common wish to normalize relations and a commitment to oppose

'hegemony' in Asia (Goldstein, 1985:6). During the period between this visit and the December 1978 agreement to normalize relations, Sino-American rapprochement lost some of its momentum. Exchanges were limited, trade fluctuated and relations made little headway (Goldstein, 1985:7).

In September, 1976 Mao died and in mid-1977 Deng Xiaoping made his second political comeback and began to put China on a different course. In December, 1976 Beijing and Washington announced that they would grant each other full diplomatic recognition. The evolution of Sino-American relations moved up and down during the following years. China invaded Vietnam on February 17, 1979. President Carter signed the Taiwan Relations Act in April, 1979. In December, 1979 the Soviet Union invaded Afghanistan, and, when Secretary of Defense Brown arrived in Beijing on a previously scheduled visit in January 1980, Chinese and American defense specialists discussed concrete areas of cooperation (Goldstein, 1985:11). Taiwan again became a problem between the two countries in 1981 and 1982. In June, 1983 Washington announced that China would join Egypt as a 'friendly, nonaligned' nation (Goldstein, 1985:14). In 1985 President Reagan approved Foreign Military Sales (FMS) to China.

After the fall of the Gang of Four in 1977 the Chinese leadership reaffirmed the modernization program begun by Zhou Enlai in 1975 under the slogan of the 'Four Modernizations' (modernization of agriculture, industry, science and

technology, and defense) to rally China to a program of rapid modernization (DA, 1981:176; Acker, 1988:18; Osborne, 1986:11). Interaction with foreign countries was to play a major part in the modernization drive. Foreign equipment, plants and designs were to be imported in large numbers, along with foreign technicians to install them and resolve key technological problems. Chinese students were to study abroad and "foreign experts" were to be hired to teach in China (DA, 1981:176). The economy and the government has been experiencing a period of readjustment since that time in order to accomplish these goals. While defense is always listed last of the modernizations, professional military officers realize that a modern military force is predicated on a sound economic and technological infrastructure. High defense expenditures would only drain the economy and jeopardize medium and long-term defense planning (PRC, 1984:36).

US Security Assistance

The US cannot afford to build sufficient military forces to meet all its security commitments alone. The US must continue to pursue a strategy that draws upon the combined resources of allied and friendly nations to their full and mutual advantage. Security assistance is and will continue to be the most efficient way to spend defense dollars (Gass, 1984:26).

Security assistance programs are also one of the most effective instruments of foreign policy. Military equipment grants, training under the Military Assistance Program (MAP) and International Military Education and Training (IMET) Program, and Foreign Military Sales (FMS) cash and credit transactions are adjuncts to economic aid provided by the US to foreign nations.

A historic review of security assistance programs indicates that the levels of the programs have risen and fallen in relation to major international crisis perceived by US policy makers requiring the use of security assistance programs to serve important national security interests (Grimmett, 1985:38). Security assistance is a term capable of myriad definitions and the US assists the security of other nations in a variety of ways. Arms are sold to other nations directly by the government and by commercial sources pursuant to government license. Equipment is leased or loaned by the US to foreign governments. War reserve stocks for wartime use by allies are set aside. Special terms are arranged by the US to finance some weapons purchased by other countries, and generally recoverable costs of weapons may sometimes be waived by the US in making sales (Kramer, 1985:101).

Four types of assistance comprise the bulk of the security assistance budget - FMS credits, grant military aid,

economic support funds (ESF) and International Military Education and Training (IMET) funds (Kramer, 1985:102).

FMS credits are used to lend money to foreign countries to purchase weapons (usually from the US). Grant military aid is the gift of appropriated funds to purchase weapons from the US. ESF may be either loans or grants and provide budget support for countries pressed by the burden of maintaining their military. IMET funds are grant funds that provide for the training of foreign military personnel by the US armed forces (Kramer, 1985:102).

Security assistance is obviously a military oriented program, but motivations go beyond the military. Participants emphasize the international political aspects, especially the effect of the program on US relations with recipient countries. The arms transfer business is perceived by some as being entirely political. Major decisions are made often not on military grounds, but rather are made for domestic and international political reasons (Kramer, 1985:107). One participant divides the programs into four categories, depending on the motivating factor:

- Base rights countries (ie: Spain, Philippines, Portugal) where assistance is looked upon as an entitlement and the US needs to maintain access to bases and facilities in the country.

- Countries with legitimate military needs (Morocco,

Oman, Kenya) but not of substantial importance to the US except as they provide access to US forces.

- Real military programs (Korea, Thailand, Pakistan) where the countries face hostile neighbors and military assistance provides US support.

- Highly political (Egypt, Jordan) countries where it is possible to justify some assistance, but the main point of security assistance is political (Kramer, 1985:107).

The executive branch rationale for security assistance has remained fairly constant over the years: The US has world-wide interests that are vital to its security and economic well-being; these interests are threatened by Soviet expansionism and regional conflicts; cooperation with friendly governments in a system of collective security is the best way to face these threats; security assistance provides the resources and symbolic ties to make collective security work (Graves, 1985:166).

The PLA

The People's Liberation Army (PLA) was modernized in the 1950s generally along the lines of the Soviet model. This was a direct result of the 1950 Sino-Soviet Treaty and the Soviet advice and assistance furnished during the Korean War (USDIA, 1979:13). However, the continuing Sino-Soviet dispute led to the removal of all Soviet advisors, equipment, parts and supplies in 1960. This forced the Chinese to chart a course of military self-reliance which continues today.

Chinese weapons development since that time has mainly been modifications and copies of Soviet equipment and aircraft. China is today a major exporter of arms to Third World nations, primarily in Africa and Asia, using weapons based on these early Soviet designs (Copley, 1986:147).

The PLA constitutes the world's largest military force. The PLA's naval and air armed forces are the largest in Asia and the third largest in the world (Kaplan, 1980:124). All military forces in the PRC are organized under the PLA. In 1982, PLA personnel totaled 4.7 million distributed among the three main branches: the army (3.9 million), the air force (490,000), and the navy (360,000) (Gass, 1984:32). In addition to the regular PLA, the armed militia of five million members receives regular training.

Aside from its conventional military role, the PLA fulfills other functions in Chinese society. During the Cultural Revolution the Army set up revolutionary committees which ruled China at the provincial level (Nelsen, 1981:27). During the Ninth Communist Party Congress (CCP) in 1969, military officers made up 48 percent of the members of the Politburo (Kaplan, 1980:127). While this role has faded recently with the depoliticalization of the PLA, the PLA has historically played a major politico-ideological role in the Chinese Communist revolutionary movement. The PLA participates also in programs that directly affect the civilian population in material ways (ie: economic

construction projects), and the PLA often engages in its own economic undertakings (ie: growing its own food, making its own clothing, producing consumer goods).

The emphasis on the four modernizations has caused recent changes in the structure of the PLA. The size of the force is being reduced by approximately one million and more concentration on the commercial and civilian economy has forced the production facilities of the PLA into the commercial sector.

The PLA is a defensive force with little ability to project power far beyond the boundaries of the PRC (US Congress, 1975:75). Currently, the most obvious threat is the Soviet Union, most likely on China's own territory. However, it has become clear for some years that the likelihood of a Sino-Soviet conflict has become increasingly smaller (Robinson, 1986:101). The chances that China will be involved elsewhere on its borders are also small. India and China are unlikely to go to war under present circumstances. China is doing whatever it can to prevent North Korea from invading the South. If China were to try to teach a second lesson to Vietnam (as they did in 1979), it would involve either a relatively small force, or be of such short duration as to be of little consequence. This leaves only Taiwan. In this case, the probability of a Mainland initiated military operation against the island is small for the next decade or longer (Robinson, 1986:102). As long as the US remains a

military supplier of Taiwan and stands behind Taipei as security guarantor, Beijing will neither launch an attack nor threaten to do so. Thus, in the conventional war theatre, China has nowhere to go during the next 10 to 15 years.

The picture appears to be somewhat different in the nuclear weapons and delivery arena. Having joined the nuclear club two decades ago, China must face the implications in high cost systems and the necessary infrastructure that this implies. China has no choice but to continue to invest more and more heavily in nuclear weapons and delivery systems. Of course, there are advantages for China in investing more in the nuclear area: the prestige from being an increasingly relevant and equal member of the strategic triangle; the belief that a nuclear buildup may be the cheapest and most effective way to deter the Soviets, in the medium term; and the fact that a strong nuclear club would provide Beijing the means to act with more confidence in Asian and international affairs (Robinson, 1986:102).

Whatever the short to medium term implications, it is clear that China is determined to successfully modernize its military in every area over the long term.

Factors in the PLA's Current Modernization Program

The military reforms currently being undertaken by the PLA can be divided into four broad areas of doctrine, personnel and training, organization, and equipment and logistics (Corbett, 1986:9).

Of the various factors affecting the capabilities of the PLA, all depend on strategic doctrine. The Chinese have concluded that their military doctrine needs to be modernized before equipment (Joffe, 1985:148). As a consequence of this, three main changes have occurred in the evolution of a doctrine based on Mao's writings, currently described as 'People's War under modern conditions' (USDIA, 1979:16; Huaizhi, 1985:7). First, military doctrine and tactics are now formulated more by military professionals with less interference from party bureaucrats; second, China has formally abandoned the notion of letting invaders in to 'swallow them in a sea of people's war'; and thirdly, the PLA has abandoned its primary reliance on ground forces and simple tactics in favor of more regular combined arms operations (Joffe, 1985:148).

In the area of personnel and training, the Chinese have felt that they can make great strides at relatively little cost. The PLA has recognized the need to have soldiers and officers capable of operating in the complex modern world (Huaizhi, 1985:11). Changes have included the recruitment of higher quality soldiers, reinstitution of a formal education system for officers (Henley, 1987:55), elimination of overage soldiers, and standardization of personnel procedures (promotions, assignments, transfers, etc.) (Corbett, 1986:11). Training at all levels throughout the armed forces has been upgraded. Among the changes are widespread use of

simulators, increased small unit training, standardization of training, reduction of time devoted to political study, less involvement in economic activities, greater interface among the active, reserve and militia units, and a serious attempt to hold large-scale combined arms exercises (Corbett, 1986:12).

A major change affecting the Chinese military organization was made in 1985 when Premier Hu Yaobang announced a one million man reduction in the size of the armed forces (Copley, 1986:149). Other significant changes soon followed: the number of military regions was reduced from 11 to seven, the sizes of staffs at all levels were reduced, and large numbers of elderly, high-ranking cadre were retired and replaced by younger leaders (Corbett, 1986:12). These reforms reflect Deng's attempt to move the PLA out of the political structure.

The modernization of the equipment used by the PLA has been subject to some of the greatest constraints. While recognizing that the bulk of their equipment is obsolescent at best, they have relied on product improvement and refinement of known designs to get the most out of their currently domestically produced equipment. With an army the size of the PLA, the costs to modernize is prohibitive. Estimates of the cost to modernize 300 Chinese divisions range from 200 to 300 billion dollars, and from 41 to 63 billion dollars for China to purchase enough US military

equipment to gain a 'confident assurance' of beating off a Soviet ground and air attack (Gass, 1984:31). Because of their policy of self-reliance and scarce foreign currency resources, the Chinese have rejected large scale purchases of modern equipment from outside sources. They have expressed much interest in Western equipment and weapons, but there has not been many significant purchases. One solution to this dilemma on outside assistance is a technology acquisition strategy of buying a limited number of systems while acquiring the manufacturing technology which would enable them to produce the equipment with minimal continued dependency on other countries (Corbett, 1986:14; Godwin, 1983:70). The Chinese are also now in the process of an extensive logistics system modernization including emphasis on communications and transportation networks, repair and production facilities, medical treatment systems, fuel and ammunition storage, computerization of logistics networks, and education of logistics personnel (Corbett, 1986:14).

The Chinese Aerospace Industry

Chinese leaders have realized that a modernization of their aviation industry is necessary and they are demonstrating that they have the will and the resources to replace outmoded techniques and systems with high technology from the West. They are concentrating on civil aviation, a departure from the almost exclusive military aircraft production of the past. Because of economic limitations and

this new emphasis, China's near-term military aircraft needs will be met primarily with the modification and upgrading of existing designs (Fink, 1987:13). Due to China's vast size, large population, and the relatively undeveloped ground transportation network, the focus of civil aviation requirements include: the expansion of China's domestic fleet, modernization of the air traffic control system, and production of aircraft for export. Emphasis has also shifted from the direct import of aircraft to coproduction efforts which will allow China to acquire the technology for eventual self-sufficiency (O'Lone, 1987c:16).

The Chinese ability to produce aircraft has been questioned at times. In the US it is commonly held that the Chinese will not be able to compete internationally because they are so far behind the West in technology and automation. But a look at China's aerospace manufacturing capability is revealing:

- China has Soviet supplied aircraft and rocket manufacturing facilities, designs and technology, vintage 1960.
- China gets its titanium from the Soviet Union, which produces it more cheaply and at higher quality than in the US.
- China is gaining Western aircraft manufacturing technology from free-world commercial aircraft subcontracting.

- China has access to electronics technology. It builds its own maxi-computers and is involved in the development of super computers. Digital Equipment Corporation VAXs are being manufactured in China.

- The Xian aircraft factory manufactures both civilian and military aircraft. It has over 15,000 workers and has been quality-certified by Boeing.

- China is implementing significant process improvement programs in almost all its basic manufacturing operations: castings, turbine blades, aircraft, electronics assembly, etc.

- China's applied research is on the cutting edge of technology.

- China has a large low cost skilled labor pool.

- Materials are relatively inexpensive (Bertain, 1987:62).

Clearly, the Chinese, who have been manufacturing aircraft since the Japanese established an industrial foundation in the northwest in the 1930s, have the capability to become a potential international aircraft power (Editing Team, 1983:12).

Chinese national aircraft factories function under the Ministry of Aviation Industry and include some 200 factories and technical institutions employing almost 500,000 workers (O'Lone, 1987c:18). Until recently they were devoted almost exclusively to military aircraft production. These factories

are scattered throughout the nation and are self-sufficient to a large degree, often making their own tooling as well as such detailed parts as bolts and rivets. In many cases the facilities are located close to sources of raw materials (O'Lone, 1987c:20).

With the shift to civilian aviation production, most factories are temporarily under-utilized and are producing consumer goods to help take up the slack. At the Harbin Aircraft Manufacturing Corporation, for instance, the workers are producing trucks, natural gas canisters and aluminum door and window frames in addition to aviation products (O'Lone, 1987e:97).

Part of the slack is also being taken up with contract work for other nations. Xian, for example, has 11 overseas contracts valued at \$46 million under which it is providing parts for Boeing (fabrication of the vertical tail for the 737-300), Airbus Industries, Canada's Canadair CL-215 and the French-Italian ATR-42 (O'Lone, 1987c:17). Shanghai Aviation Industrial Corporation (SAIC) has been producing MD-80 landing gear doors since 1979 (O'Lone, 1987c:19). Harbin Aircraft Manufacturing Corporation produces cabin doors and wing parts for the Shorts Brothers 360 transport, cabin doors for the BAe 146, and some composite materials for Sikorsky Black Hawk helicopters which are operated by the Chinese air force (O'Lone, 1987f:101).

China currently produces aircraft under licensed production or coproduction agreements with other nations. Harbin is currently producing, under license, 50 Aerospatiale Dauphin 2 helicopters. The Dauphin is primarily fabricated from composite materials (87%) which are provided from the French. This has enabled the Chinese to gain experience in working with and fabricating composite aircraft components (O'Lone, 1987c:17; O'Lone, 1987f:97). SAIC is producing, under a coproduction agreement, McDonnell Douglas MD-82 transports. Two aircraft have been completed and are in service, and 25 aircraft will be completed by 1991. The Federal Aviation Administration has certified the facility (O'Lone, 1987c:17; O'Lone, 1987d:38).

Domestic aircraft production includes the Y-12, a 17 passenger utility transport produced at Harbin for export. This is one of the first all-Chinese designed civil aircraft (O'Lone, 1987f:97). The Y-7, a 52 passenger twin turboprop transport, is produced at Xian. This is based on the Soviet Antonov An-24 with current production of approximately 1.5 a month (O'Lone, 1987g:54). The B-6 bomber, based on the Soviet Tupolev Tu-16 design, has been produced at Xian for the last 30 years (O'Lone, 1987g:55).

There is a trend towards more cooperative ventures with foreign firms. Italy is currently involved in the modernization, by Aeritalia, of the avionics in the Chinese A-5M export fighter (O'Lone, 1987b:28). In October, 1987

China and West Germany signed an agreement for development and production of the MPC-75, a 75-100 passenger advanced technology transport (O'Lone, 1987c:17; 1987d:39; 1987g:54). The predevelopment phase will last into the mid-1990s partially because of the advanced technology that will be incorporated into the aircraft: ultrahigh bypass engines, carbon-fiber wings, and natural laminar flow (O'Lone, 1987a:30).

Lufthansa German Airlines will establish an aircraft maintenance center in Beijing in a \$160 million joint venture with the Chinese. The development will include an engine repair facility and training center for technicians and engineers. This is an attempt by China to modernize its maintenance capability as advanced Western aircraft replace the aging Soviet transports and their configurations in the civil fleet (O'Lone, 1987b:28). China has also entered into a joint venture with Lockheed Aircraft-International to build a maintenance center at Guangzhou's Baiyun International Airport. This new facility will service the 30 aircraft in the fleet of China South Airlines. Lockheed will provide the expertise and supervision required to bring the facility up to Federal Aviation Administration standards with an eye toward acquiring international aircraft maintenance contracts in the future (O'Lone, 1987b:28).

After eight years of negotiations, Lockheed recently sold China two L-100-30 Hercules cargo transports. Lockheed

is now hoping to assist China with the establishment of a badly needed air cargo infrastructure which, potentially, could lead to a coproduction program for about 50 additional Hercules aircraft (O'Lone, 1987b:28).

From these and other examples, we can see that while the aerospace industry in China may at times appear to have difficulties and seem to be antiquated and labor-intensive, it has the potential to be a significant force in international aviation in the future.

US Modernization of the PLA

In 1982 the PRC contacted the US government concerning the modernization of the PLA forces with US assistance. Basic policy goals and program objectives were established by the US. Underlying these is the belief that a secure, friendly China, serving as a contributor to regional stability in Asia and a deterrent to Soviet expansion or aggression, is in the best interests of the US (Gass, 1985:9). The goals included strengthening China's self-defense capabilities, expanding parallel interests in mutual opposition to Soviet expansionism in Asia, support for an independent foreign policy which is non-threatening to our friends and allies in the region, and support for China's economic modernization program. The US program objectives are:

1. Continue assistance in modernization of the avionics in China's F-8 II defensive fighter aircraft.

2. Continued assistance in modernization of production facilities for large-caliber artillery ammunition components.

3. Assist China in production of torpedoes for anti-submarine defense.

4. Foster mutual understanding through increased military-to-military contacts (DOD, 1987b:273).

The US will derive some advantages from assisting in China's defense modernization. The US has the opportunity to influence China's economy, defense policy and foreign relations. It will create vested interests for both countries to promote friendly relations, but PRC interests will always come first (Gass, 1984:27).

By placing the military fourth in the four modernizations, the PRC could remain a relatively weak military power vis-a-vis the USSR for many years and could be a strategic liability for the US rather than as asset. The US may not have to structure forces or plan for a Sino-US armed conflict, but the PRC cannot be depended upon to be a counterweight to the USSR during this period (Gass, 1985:42).

The US must decide what it wants in the long run from the PRC in a security relationship. If it is just improved stability in East Asia then relatively little assistance will be needed. If the US wants the PRC strong enough to join in a global conflict with a two front war then the price will be higher and the dangers more difficult to calculate, in addition to being a massive undertaking (Gass, 1985:43). A

case by case approach to weapons sales cannot lose sight of the overall US objective or strategic program.

Initially, US cooperation with the PRC was seen as a means of controlling Soviet expansion in Asia and as a tool for influencing the course and pace of Chinese military modernization (Robinson, 1986:103). Whatever the reasons for cooperation between the US and the PRC, the basic reason for any cooperation between sovereign nations will always be that the countries perceived an advantage (political, military, economic, ideological, etc) in cooperating.

Technology Transfer

The defense of the US, and the defense of the Western Alliance generally, depends on the quality of our military technology. Because of political and economic factors, the US and its allies have not been willing to keep pace with the Soviet Union in the quantity of tanks, guns, planes or artillery pieces produced (DOD, 1988:20). The Soviet Union accounts for nearly one half of the world's output of military material. The Soviets outproduce the West in most types of weapons by a ratio of better than two to one (DOD, 1988:37). We have depended upon, and will continue to depend upon, weapon systems that are qualitatively superior to their Soviet equivalents (Perle, 1987:3). Because of this belief, there have been serious questions raised about the transfer of military armaments, military technology and commercial

technology that could have military applications (dual-use technology) to any foreign nation, even including our allies.

The PRC wants coproduction agreements with the US and the technology to modernize their own industrial base. The US could sell any Vietnam-era technology to the PRC without concern for destabilizing Asia or worrying that US forces would have difficulty if this technology is used in other regions (Gass, 1985:49). The US could provide jet engine technology, several radar options (for use on the Sino-Soviet border), close air support (A-10) aircraft, antitank capabilities, and antisubmarine warfare assistance (Lockheed P-3 aircraft) (Gass, 1985:50). The PLA needs intermediate airlift and the C-130 aircraft is ideally suited but a significant number of Chinese copies could provide force projection capability sufficient to reach Taiwan, and destabilize that relationship (Gass, 1985: 51). Improvement of the Chinese nuclear deterrent capability could be provided by computers to control over-the-horizon radar and satellite cameras to increase the PRC early warning capability, therefore decreasing the danger of a surprise Soviet attack and overall decreasing the risk of a Sino-Soviet nuclear war without increasing the threat to the US significantly (Gass, 1985:51).

Although China recognizes the need to acquire new technology and new capabilities in its efforts to modernize and expand their economy, their historical experiences with

the West and their fear of reliance on foreign sources has been an important factor in formulating their acquisition strategies. In the early years of their open policy, the Chinese tended to believe that all they needed to do was to purchase some new equipment and, operating it themselves, create their own modern enterprises. They soon learned that this was not a realistic approach, given the level of Chinese managers at that time, after several of their ventures languished or failed because they could not effectively operate the equipment they had purchased. The Chinese realized, finally, that managerial skills count as much as modern equipment (Hammer, 1988:461).

From the American point of view, China is a strategic asset in the global competition with the Soviet Union. Cooperation and technology transfer to China helps them build ties to the US and increases China strength vis-a-vis the Soviets. Commercial ties and the export of American products is another aspect of this cooperation.

Current US policy is predicated on the assumption that close relations with China are generally beneficial but that caution must be exercised in the transfer of advanced, sensitive technology. This policy has had some success: China has played a more constructive role internationally, trade has increased and is presently significant, and many areas of common interest have been found (US Congress, 1987:3).

But there are some who urge caution and even say that US policy has gone too far. They view China as a potential adversary with an unstable political system, as a newly industrialized country rapidly expanding production technology, aggressively seeking international markets and potentially becoming economically a more powerful Japan or Korea (US Congress, 1987:4). Arguments are made for both points of view, but the current reality is that official policy is favorable to improving relations to China. The transfer of technology is being addressed on a case-by-case basis, with review by several agencies in different branches of the government.

Most technology transfer from the US is from private firms. Many firms that want to sell products to the Chinese find that they must include technology transfer as a condition to gaining access to the Chinese market:

- General Electric, after several years of negotiations, won two large orders for locomotives in part because they were willing to transfer material and manufacturing technology.

- American Motors established a joint venture with the Beijing Automotive Works to produce AMC's Cherokee model. The intent was to manufacture most parts in China.

- McDonnell Douglas, after nearly ten years of negotiations, is coproducing 25 MD-82 twin jet transports in Shanghai following the sale of five of the aircraft to China.

- Wang Laboratories is preparing a joint venture for the assembly and eventual manufacture of microcomputers. Wang is concerned about monitoring quality control and China's lack of experience with large scale production (US Congress, 1987:7).

There are several areas that have caused problems in talks and negotiations in the past that the Chinese will have to recognize: the shortage of foreign exchange; bureaucratic rigidity and confusion between the central and local governments; taxes and unexpected expenses; the lack of management concepts of quality, efficiency and timeliness; the length of time necessary to negotiate and obtain contracts; and the political uncertainty of the country. While all these issues are being addressed, their solutions are not all easily found.

The Chinese have also experienced difficulties when dealing with Americans that are attributable to US firms or US government policy: the lack of long range planning and commitment; emphasis on short term goals and profits; US export controls including prohibited technologies and equipment that is freely available from other sources in the West; US disenchantment with the myth of the Chinese market potential; China's potential for entry into US markets with competing goods, especially in Asia.

Because of the nature of the Chinese society and organization, technology transfer, even commercial

technology, will assist China's military. The primary considerations for the US are how much it will help (a question of Chinese military needs and capabilities) and how much that help matters to the US and its allies (foreign policy questions).

China's military can benefit from foreign technology by either buying military technology directly, obtaining civilian technology that has a military application, or developing its own modern weapons as the economy modernizes.

Acquiring modern weapons would be the fastest way to a modernized the military. But, China does not feel the need to be pressing enough to sacrifice its economic priorities that have been established. The amount of foreign currency that would be required, with little or no payback at this time, to procure the vast quantity of weapons that would be necessary to supply their armed forces also precludes this approach at this time.

The transfer of dual use technology has occurred in the past but, just because the military has access to this technology does not mean that they would be able to use it effectively. They have had trouble assimilating new technology in the past. For example, in 1975 the Rolls Royce Company of Great Britain signed a contract for the transfer of the Spey jet fighter engine technology to China for eventual Chinese domestic production. But, the factory was never able to manufacture it and the project was abandoned

after several years and millions of dollars (First Peek, 1983:2). Reverse engineering has also proven difficult for other very sophisticated weapon systems, although they have been successful with early Soviet designs.

China would like to manufacture all their weapons systems domestically, but they will not have the economic depth to become a superpower with the capability to develop and produce their own major weapon systems for several decades (US Congress, 1987: 11).

Gains in Chinese defensive power via the transfer of militarily significant dual use technology are of greater concern to the Soviet Union than to the US.

US policy currently supports technology transfer to China within certain national security limits. The fundamental rationale is that assisting China in its modernization is in the best interests of the US (US Congress, 1987:13).

This rationale is consistent with the government's overall policy concerning US arms sales and transfers which are supported primarily for economic and security reasons. The US recognizes the growing trend of countries to seek cooperative arrangements which maximize the benefits of their industrial and technical base. The US also must recognize and respond to the legitimate self-defense needs of these countries. The US needs to recognize the corrosive effect that declining arms sales have on the US industrial base. The

US must continue to provide financing and funding to our developing friends and allies to enhance their security, foster their development and more securely bind them to the West (DOD, 1987b:366).

Militarily, there is the belief that by providing arms and technology to China we can ultimately dictate their use and perhaps influence political decisions, depending on the degree to which the Chinese have become dependent on the US for security. But, China has a domestic production capability that has the potential to develop and produce its own spare parts or weapon systems; there are other sources available to the Chinese for arms and technology, both in the West and East, that are just as advanced and usually easier to obtain; and China, given her historical background, would never willingly give up her political sovereignty and would never become dependent on any other foreign power again, as in their relationship with the USSR prior to the Sino-Soviet split. Therefore, this belief is probably not valid.

Again, our defense relationship with China is based on a commonality of security interests. A secure, modernizing China can be a force for peace and stability in Asia and the world (DOD, 1987b: 264). A powerful China will alter the Asian balance of power in the next two decades and become an element in its own right in the global strategic equation. By creating military ties to China through assistance and technology transfer the US may be able to execute some degree

of control over that process which will continue regardless of the US policy (Robinson, 1986:103). In light of this, it behooves the US to utilize what instruments it has to affect that change. The choice is between leadership and laissez faire.

Cooperative Programs

Technology transfer can occur through different types of government and commercial cooperative programs including:

Coproduction - overseas production based on government-to-government agreement that permits a foreign government or producers to acquire the technical information to manufacture all or part of a US origin defense article.

Licensed production - overseas production of a part or component of a US origin defense article based upon transfer of technical information under direct commercial agreements between a US manufacturer and a foreign government or producer.

Subcontractor production - overseas production of a part or component of a US origin defense article. The subcontract does not necessarily involve license of technical information and is usually a direct commercial arrangement between the US manufacturer and a foreign producer.

Overseas investment - investment arising from an offset agreement, taking the form of capital invested to establish or expand a subsidiary or joint venture in the foreign country (Louscher, 1987:2-3).

We can also differentiate between a product and a process transfer. A product transfer involves the import of goods and services that have few indigenous substitutes. A process transfer entails the import of knowledge necessary and sufficient for indigenous production of needed goods and services (Louscher, 1987:3).

Armaments cooperative programs can include, in addition to the above examples, military assistance through the Foreign Military Sales (FMS) and grant aid programs, and commercial sales, including coproduction and codevelopment. Codevelopment and coproduction programs are generally limited to our allies (European primarily) while FMS, grant aid and commercial sales are available to a wide range of countries including allies, friends, third world nations, developing countries and less developed countries.

Policy Goals. The foreign policy goals of the US include efforts to insure the strength and unity of our alliance relations, the effective management of East-West relations, the peaceful resolution of regional conflicts and the advancement of our broader security and economic interests (Schultz, 1988:28). The US cannot achieve these interests and objectives alone. Many countries around the world cannot adequately protect their security, ensure their domestic welfare, or protect their democratic institutions if the active support of the US was not available. Military assistance and cooperative programs are an aspect of the aid

the US can provide to these countries. Military assistance, through the FMS program, aids in the realization of our national goals. Military assistance also helps establish productive relationships with foreign political and military leaders and is instrumental in obtaining and preserving access to strategic foreign military facilities (Carlucci, 1988:44). Defense sales, like PEACE PEARL, are an important element of US strategy. They enable our friends and allies to assume a greater share of the common defense burden.

Arguments Against Arms Sales. There are several general arguments against arms sales to other nations. Arms sales are not always in the US national security interest because weapons technology may fall into an adversary's hands. Arms sold to countries could be used against the US or its allies or not used for the purpose they were sold. US policy options are limited by arms sales if there are large numbers of US military personnel or dependents in countries providing support or if base rights have been exchanged for arms. Also, arms sales may deplete stocks or delay acquisition of arms by US military forces. Arms sales may not prevent the spread of nuclear weapons. Ultimately, arms sales may harm the prestige and influence of the US as an advocate of regional stability and the peaceful settlement of disputes (Labrie, 1982:58).

There is also the contention that arms sales don't always provide the US with diplomatic leverage and the lack

of approval of arms sales to friends may do more harm to relations than good. The economic benefits of arms sales are often overstated: Exports of weapons are only 4-5% of total US exports, therefore they contribute little to the balance of payments; employment benefits are minor; few top defense contractors depend on overseas sales for their survival; most of the items sold do not result in significant unit cost savings or research and development recoupment of investments; and most countries will not go to other sources if the US is not willing to sell. Critics also contend that arms sales can exacerbate existing tensions among neighboring countries and destabilize regional balances. Additionally, arms sales can adversely affect the internal stability of foreign countries (Labrie, 1982:59-60).

Arguments For Arms Sales. Conversely, proponents of arms sales argue almost the opposite on each point. A realistic, well developed policy of arms sales can make important contributions to US national security and foreign policy goals and can improve our economic posture. Arms sales promote global stability as a counter to Soviet aggression. Providing arms strengthens friends to fulfill regional security needs thus reducing the potential for direct US involvement. US arms sales can also restore regional military balances, thereby promoting stability. Arms sales can be used to get us base rights, also compatibility with our systems can give us logistical bases

for regional deployments. Arms sales help nations establish and maintain security and infrastructures essential for social and economic progress. Additionally, arms sales provide US access to political elites and potential influence. Refusal to sell can have negative consequences. Sales can be used as leverage to have recipients modify their behavior or pursue policies compatible with US interests. Arms sales improve the US trade balance. The industrial base is strengthened and employment rises. Savings are realized from expanded production and economies of scale. Arms sales discourage indigenous arms industries in Third World nations. Purchases of advanced systems leads to dependence on the US for spare parts and technical support. Unilateral arms sales restraints would not restrict arms sales world wide because the US is not the only source for many items (Labrie, 1982: 77-79).

Depending on the historical period and the specific cases studied, examples of each of these arguments, pro and con, can be provided.

With respect to the PRC specifically, those in favor of arms sales contend that the immediate US goal of a strong China would be increased stability in East Asia and the Pacific. A long term goal could be the Chinese involvement against the Soviets in the event of a US-USSR global war. The mere threat of a second front should serve as a deterrent

against Soviet aggression not only in the Pacific region but also in Western Europe and the Persian Gulf (Gass, 1985:9).

Again, those opposed to arms sales to the PRC believe that enhancement of the PRC influence in third world nations would decrease US effectiveness in the Pacific and other areas. There is the fear that a militarily strong China, with an economic Japanese alliance, could challenge the US position as a Pacific power. Globally, a militarily strong China would have less to fear from Soviet hegemony and less dependence on the US, leading to a possible reconciliation between the USSR and the PRC, perhaps as a way to avoid involvement in a US-USSR conflict (Gass, 1985:10).

Patterns of Arms Sales to the PRC

Until the 1980s China was proscribed by US policy from receiving any military items whatsoever. By the late 1970s, however, the Sino-Soviet split and the opening of China under the Nixon administration crystallized into a major strategic realignment of China.

These changes within China soon impacted on US arms transfer policy. In March 1980, the Department of State issued Munitions Control Newsletter No. 81, opening the PRC for the first time to exports of combat support equipment such as trucks, recovery vehicles, certain cargo/personnel-type aircraft and helicopters, some training and communications equipment and airborne cameras (Kenny, 1987:39; Kaplan, 1980:125). The following month, the

licensing of civilian goods with possible military use (dual-use items) was facilitated by the creation of a new category, P, for China under commodity control export regulations administered by the Department of Commerce. The new policy permitted exports at a significantly higher level of technology than those of most other communist countries.

The liberalization process continued in subsequent years with the removal of China in 1981 from the list of countries that are denied US approval for munitions exports, and the movement of China to Category V on the export commodity control list, the same category as for other friendly countries to which the US exports (Kenny, 1987:39).

From the American perspective, throughout this period of liberalization, a prime consideration was the position of China vis-a-vis the Soviet Union. Arms transfers were a natural consequence of the developing Sino-American cooperation. China was characterized throughout this time as a "friend" and not an "ally", but the global advantage of China's tying down a significant proportion of Soviet military power was not overlooked.

From a Chinese perspective, the Soviet threat was also a force leading to cooperation with the US, including arms and technology purchases.

China still feared Soviet encirclement. To the North, the Soviets have deployed 57 divisions (four in Mongolia) with 14,900 tanks and 1,300 tactical aircraft (among other

weapon systems) (DOD, 1988:15). To the West, Soviet forces include 30 divisions in their Southern theatre of military operations, including four divisions in Afghanistan. To the South, the increased Soviet military relationships with India, support of the Vietnamese expansion into Cambodia and the establishment of Cam Ranh Bay as a major Soviet base in the area are of concern to the Chinese. Finally, to the East, China saw the increased power and presence of the Soviet fleet and the dramatic rise in the flow of ships and planes between Vladivostok and Cam Ranh Bay (Kenny, 1987:39).

In the face of this military build-up, China turned to the US and other Western nations for assistance. This was viewed in the West with anticipation because of the potential market that would be available. But, as the realities of arms transfers to the PRC developed, these expectations have subsided. There are important factors mitigating against, as well as in favor of, a rapid expansion of US arms sales to the PRC. These factors are applicable to all arms transfers to a certain degree, and certain definable patterns have emerged.

The most striking characteristic of US arms transfers to the PRC is that the overall volume of the trade has been quite small with no major upsurge in the value indicated. During the period 1982-1986, the value of US arms delivered to China totaled \$89 million, less than one quarter of one percent of worldwide US military exports during the same

period. A second pattern is that while the overall trend in deliveries is upward, there is no imminent surge in military deliveries indicated (Kenny, 1987:40).

A third pattern of arms trade with China is that, while US sales to date have been overwhelmingly commercial, sales under the government-to-government Foreign Military Sales (FMS) program are on the rise. China was not authorized FMS until 1984, and then only on a cash basis. The rise in FMS reflects both increased military-to-military contacts and the high level of attention given significant arms sales by the US. Nevertheless, the Chinese generally prefer commercial rather than FMS transactions, so that in the vast majority of cases American defense industries are attempting to match their capabilities with Chinese needs within the limits established by US policy (Kenny, 1987:40).

A fourth pattern that emerges is the clear Chinese preference for acquiring technology rather than military end-items in quantity (Boatman, 1988:24; Friedman, 1986:64). This is true in their commercial acquisition strategy also. From FY82 to FY86 some 500 licenses have been issued for commercial exports, with a total value of \$500 million (Kenny, 1987:40). The majority of these transactions involve the transfer of technical data, components of combat or combat support equipment, a single item, or a handful of items. Large quantity purchases are few and far between, while the level of technology requested tends to be

relatively sophisticated. This approach is basically 'window shopping' by which the PRC seeks to examine only a few of the items it has expressed interest in, illustrated by the fact that from 1982-1986 less than 17 percent of the value of licensed items was actually purchased (Kenny, 1987:40). Beijing continues to seek technology rather than large scale arms purchases (Growing Link, 1988:28).

Another aspect that emerges is that Chinese purchases have largely consisted of high technology items for future integration into Chinese systems, rather than standard equipment of immediate need but of declining value in the face of the sophisticated weaponry of the 1990s and beyond (Kenny, 1987:40). Most commonly sought are computers, communications equipment, night vision devices, fire control systems and airborne reconnaissance systems. Few of these have direct military applications without integration into complete weapons systems. Most are applicable to the air and naval systems, while applications to the ground forces are a less significant consideration.

The most striking characteristic of Chinese military development is the struggle between the drive for self-reliance and the understanding that strong ties with the West will assist them in developing new military technologies (Kenny, 1987:41). Chinese leaders want their nation to build their own weapons and wherever possible avoid dependence on

foreign sources for national security. This is rooted in their dealings with the Soviets during the 1950s and 1960s.

The continuing belief in self-reliance not only mitigates against massive arms purchases, but means that China will invest fairly heavily in training and technology, even when immediate results may be negligible. It will take many years to overcome the legacy of the cultural revolution - thirteen years in which universities were closed, scientific literature discontinued, and technological experts sent to do farm work. Because of this, China still has a major problem absorbing Western military technology, even when it is available.

The persistence of these patterns depends, in part, on the external and internal influences that are factors in the initial motivations of the two countries to seek arms cooperation and trade.

External Factors. The greatest external determinant of Chinese arms purchases continues to be overall Soviet military power. Although quantitative increases in conventional Soviet forces on their borders have been modest in the 1980s, current strength remains significant and has been modernized at an accelerated pace (Kenny, 1987:41; DOD, 1987a:68). Also, Soviet activity in support of Vietnam gives the Chinese cause for concern. The Soviet Union had provided Vietnam almost \$7 billion in military aid between 1982 and 1986, and continues to supply military aid. The Soviet Union

also provides the economic support needed to sustain Vietnam's faltering economy. Economic aid is currently \$1.5 to \$2 billion annually (DOD, 1988:28). This has enabled the Vietnamese to continue their occupation of Cambodia and to confront the PLA in skirmishes along the Sino-Vietnamese border (vanDeleur, 1988:508). Increased Soviet use of the facilities at Cam Ranh Bay continue to concern the Chinese. In addition to deploying 20-25 Soviet ships routinely from this base, Bear D/F bomber aircraft and a squadron of FLOGGER C/G fighters are also based there (Kenny, 1987:42).

Increased Soviet military support in North Korea is also of concern to China. In May, 1985 Moscow began delivering 46 MiG-23/FLOGGER aircraft to North Korea (DOD, 1988: 27). These deliveries, combined with the initiation of Soviet military reconnaissance overflights and the first port calls by Soviet naval combat ships in 1985 and 1986 are all disquieting activities.

These strictly military considerations all have political consequences including the Chinese objections to the Soviet occupation of Afghanistan, Soviet support of the Vietnamese occupation of Cambodia, and the high level of Soviet troops along the Sino-Soviet border and in Mongolia. Known collectively as the 'three obstacles' to normalized Sino-Soviet relations, they have long been a thorn in the side of the Chinese leadership and collectively preclude rapprochement with the USSR (Kenny, 1987:42; DOD, 1988:27).

However, despite this Soviet build-up, China does not appear to be overly anxious about the threat, does not perceive it to be as imminent as the increased Soviet capabilities would lead you to expect, and has not initiated a crash program of military modernizations in response. Explanations for this vary, but China weighs military intentions quite heavily and it experienced only a mild Soviet reaction to its attacks on North Vietnam in 1979 (Kenny, 1987:42). China may also believe that its limited nuclear capability deters much of the Soviet threat. China could also perceive advantages in countering increased Soviet strength not so much by increases of its own as by the threat of a greater military arms relationship with the US. Finally, Beijing may see Moscow as too concerned with the problems of the Soviet Union and of overextension in the Third World, as in Afghanistan, to risk a costly cross-border attack. In any case, the Chinese appear to view the Soviets as a long-term threat rather than an imminent one and have orchestrated their planned military purchases accordingly. This conclusion is supported by China's weak foreign exchange position and its relegation of the military to the least important of the four modernizations (Kenny, 1987:42).

The fact that Soviet military power has failed to translate into effective political influence elsewhere in East Asia and throughout the world has not been lost on the Chinese. Despite substantial military aid, the Soviets have

been expelled from some countries (Egypt) partially because of the strings that were attached to the aid packages. Other countries, while continuing to accept Soviet military assistance, have sought closer ties to the West (Algeria, North Yemen, Iraq) (DOD, 1988:23).

The USSR is seen as a long-term national threat to the PRC with a significant and probably growing lead in military strength vis-a-vis China; therefore, only a long-term solution making the best of a difficult relationship with the USSR, while simultaneously building the domestic economy and long term military strength, will assure the security of China into the 21st Century (Kenny, 1987:42).

Internal Factors. A restructuring of the PLA has been attempted since Mao proposed a reorganization of the army in 1975. The inadequacy of the PLA as a fighting force was illustrated in 1978. While attempting to teach the Vietnamese a lesson for the invasion of Cambodia, the PLA suffered heavy losses in a poorly executed operation into North Vietnam. Poorly trained, ill-equipped and insufficiently supported, the campaign also raised questions about the traditional PLA strategy of people's war. Under this strategy, the Soviet invasion forces would be lured deep into China and then forced to pay a high price in an attempt to hold Chinese territory. The Soviet experiences in Afghanistan, in which they failed to subdue even a primitive

guerrilla force, seemed to support this fundamental strategy (Kenny, 1987:43).

But, at the same time, the increasing sophistication and mobility of Soviet troops close to the Chinese positions in the northeast, where Chinese industry and mineral production are heavily concentrated, introduced another danger. This threat would be the destruction of large parts of the Chinese infrastructure and economy in a punitive raid by Soviet forces. The objective would not be to take and hold territory (Kenny, 1987:43). Under these circumstances, the Soviets might be deterred less by the traditional PLA armaments and tactics than by a modernized people's war, in which PLA main force units would utilize increased firepower, mobility and shock action to delay and disorganize any invader, and then join with regional and local forces to isolate and attack in areas of penetration. While still dependent on popular support and defense in depth, the PLA would need restructuring to utilize modern weapons, technology, and tactics.

This restructuring would involve difficult decisions to reduce the size of the force, replace its leadership, and reorganize its units to fight a people's war under modern conditions.

Of particular significance is that since 1982 the PLA has dropped approximately one million men, but Chinese defense expenditures have not dropped at the rate of the PLA

force levels. Moreover, the PLA has undertaken several roles in economic production, to include converting some military facilities to civilian use, transferring military technology to civilian projects, and assisting Chinese civilian aircraft and commercial rocket and satellite production (Kenny, 1987:43). There is substantial overall potential for growth of the Chinese economy, including its international component.

There are, however, at least three inhibiting factors as far as arms purchases are concerned. The first, and most significant to date, is the lower priority of military modernization when compared to the other segments of the Chinese economy. Deng and Hu Yaobang made it clear, in 1985, that military modernization would continue to be subordinated to economic considerations (Copley, 1986:149). Secondly, there is the technology problem mentioned earlier. The very need for military modernization which initially enticed and encouraged arms transfers to China also served to limit them, since the Chinese quickly realized the enormous challenges posed in absorbing modern technology. Thirdly, a significant inhibitor of Chinese arms purchases is the fact that Chinese imports have been growing at a much brisker rate than exports, leading to a deterioration of the current account and depletion of the foreign exchange reserves (Kenny, 1987:43). Therefore, the Chinese government has indicated

its intentions of holding down the growth of imports, including defense related items.

PRC Exports. It might be noted that one of the ways the PRC has decided to satisfy its conflicting needs for arms and foreign exchange is through its own military exports. China sells primarily low priced, moderately sophisticated weapon systems to states who do not need, or cannot afford, the most advanced systems (DOD, 1987b:366). Sales, although usually for cash, appeal to their clients because of the lack of political strings attached (MacFarguhar, 1988:45). Chinese arms exports have grown dramatically during the past five years, in 1984 defense equipment accounted for exports amounting to \$1.66 billion, nearly seven percent of total exports (Copley, 1986:147), and during the period from 1980 to 1985, its military exports have exceeded imports. The Chinese today are the fourth largest arms supplier to the Third World, behind the Soviet Union, the United States, and France (MacFarguhar, 1988:45).

Deng established an organization in 1980 called the China North Industries Corporation (Norinco) (Silverberg, 1988:25) with the objective of selling arms to the Third World to earn foreign currency to import the 'hi tech' equipment which the PLA required (Copley, 1986:147). Norinco has over one million employees and makes everything from automobiles to chemicals to consumer optics. It also makes light arms, main battle tanks, armored personnel carriers,

howitzers, mortars, air defense guns, a variety of rockets and ordinance (Silverberg, 1988:25). Another major Chinese corporation is Polytechnology, manufacturer of the Silkworm antiship missile.

The PRC has sold considerable quantities of arms to Albania, North Korea, Thailand, Pakistan, Egypt, the Gulf States, Algeria, Saudi Arabia, Zaire, Sudan, Somalia, Tanzania, as well as other African and South American countries, rebels in Afghanistan and Cambodia. The real boost to Chinese exports has been the Iran-Iraq war. China has been able to supply equipment to both sides: aircraft, tanks, artillery, Silkworm antiship missiles to Iran; bombers with antiship missiles, tanks and upgrades of Scud-B missiles to Iraq (Silverberg, 1988:25; MacFarquhar, 1988:45). China has become one of the largest suppliers of missiles and missile technology to developing countries (Stanglin, 1988:36). Their announced sale, in March 1988, of intermediate-range CSS-2 missiles to Saudi Arabia marks the first time an outside power has provided a Middle East nation with medium range missiles (Bailey, 1988:123; Growing Link, 1988:28). The military, as well as the defense industry, is being called upon to turn a profit and Army commanders in Beijing have been told to earn what they need to finance their military hardware upgrades (Silverberg, 1988:25; MacFarquhar, 1988:45).

Considerations for Cooperation

The willingness and capabilities of individual countries to cooperate with the US depends on mutual interests and a number of different factors which can change over time. But the existence of a mutual interest does not necessarily signify an underlying ideological compatibility.

China and the US have widely different historical backgrounds and political-economic systems. Chinese and American leaders do not share a common view of the international environment, the world order that should govern that environment, or the role of their respective nations in that world order. These differences do not preclude the long-term development of cordial and mutually beneficial Sino-American ties, but they do demand that the US not inadvertently try to shape China in its own image (Bouchard, 1981:320).

China's willingness and capability to collaborate with the US rests on five principal considerations:

- A perception of mutual or parallel US and Chinese security interests.
- The PRC's assessment of the creditability and consistency of American policy.
- The judgments of the Chinese leadership about the strengths and liabilities of the US administration in power.
- The Chinese leadership's evaluation of the state of US-Soviet relations.

- The stability of the Chinese leadership (Pollack, 1984:vii).

The US can most effectively contribute to the further development of Sino-American security ties through:

- Implementation of symbolic steps that testify to China's strategic importance and policy independence.
- Facilitation of technology transfer to the PRC in areas of expressed Chinese interest.
- Devising procedures and institutional arrangements for more regular exchanges with the PRC defense establishment.
- Exploring opportunities for Sino-American cooperation on matters of common political and security concerns.
- Seeking more harmonious political relations that would permit a sustained dialog on US-PRC security cooperation (Pollack, 1984:ix).

There are tangible security gains for both the US and the PRC in cooperative agreements. For the PRC, increased interactions with the US: greatly diminished China's previous isolation and vulnerability in relation to Soviet power; reduces the likelihood that Moscow will attempt to coerce or intimidate Beijing; enabled China to concentrate its manpower and financial resources on pressing agricultural, industrial and scientific priorities; help defer 'quick fix' allocations to the defense sector that would have provided little security in the long run; and

increased the availability of advanced technology from the West vital to China's long term modernization objectives (Pollack, 1984:vii).

The US stresses the indirect benefits of closer Sino-American relations. These include: China keeps large numbers of Russian and Vietnamese troops committed along its northern and southern borders; positive Sino-American relations help limit US military requirements in the Western Pacific; China generally supports the US political and military presence in the Western Pacific; China generally supports a larger Japanese defense effort; China diminished its support for revolutionary movements in Asia and elsewhere; and China supports US policy in other areas of common interests (Pollack, 1984:vii).

IV. Analysis

PEACE PEARL

The PEACE PEARL program had its genesis in 1982 when the PRC contacted the US government (USG) concerning the modernization of their military systems with USG assistance. In 1984, President Reagan granted the PRC eligibility for FMS. The USAF conducted a site survey in November 1984 and presented price and availability data in March 1986. Congressional and Coordinating Committee for Multi-Nation Export Controls (COCOM) approvals were obtained in the summer of 1986 and a Letter of Offer and Acceptance (LOA) was presented to the PRC in August 1986. The PRC signed the LOA on 30 October 1986 (AFSC, 1987:1).

General. The LOA signed in 1986 was for a multi-million dollar avionics package to upgrade the Chinese F-8 air defense interceptor (Kenny, 1987:61; O'Lone, 1987e:55; Zagoria, 1987:108). This is a six-year program covering 55 aircraft which are to be deployed to Manchuria and Northern China to protect the border with the Soviet Union. Grumman is the prime contractor and will assemble and test the avionics packages prior to shipping them to Shenyang for installation in the aircraft (AFSC, 1987:3).

Because this is the first joint venture between the USAF and the PLA Air Force (PLAAF), it is imperative that the lessons learned during this process be applied in future

cooperative ventures between the USG and the PRC. There are benefits for both the USG and the PRC in the successful completion of this program.

The F-8 II. Development of a single-seat, twin engine air superiority fighter began in China in the mid-1960s. Prior to this, all Chinese aircraft were derivatives of Soviet models that had been provided prior to the Sino-Soviet split in the late 1950s. A variant of the MiG-21 (F-7) began to be serially produced in 1969, and the F-9 (a twin jet tactical fighter-bomber for ground support missions) also entered quantity production at this time (Heymann, 1975:26).

The first air superiority fighter aircraft, designated J-8 0 (Jianjiji-8 or fighter aircraft 8, Western designation was F-8) was completed in 1969. Only limited production of this model (approximately 50) was undertaken (Taylor, 1988:46). An improved version was expected and the possible existence of a J-8 with twin lateral air intakes was reported as long ago as 1979. Confirmation came in January 1985 when the Xinhau news agency announced that a J-8 with wingroot intakes had made a successful first flight in May 1984. Initial flight tests showed a considerable improvement in performance compared with the earlier model.

The version of the J-8 modified by the PEACE PEARL program is intended for service in Manchuria and along China's northern border with the USSR. The avionics package is approved only for use within China, but other alternatives

are being sought by the PRC to enable the aircraft to be exported.

Program Phases. PEACE PEARL is divided into three program phases: system definition, full-scale development, and production/installation. Systems definition consists of studies and analysis to refine system requirements. This phase concluded at the Preliminary Design Review (PDR) in May 1988. The full-scale development phase includes design, development, fabrication, test aircraft modifications, qualifications testing, systems integration, flight testing of the pre-production modifications, weapons integration, and the preparation of the Class V modification. The production/installation phase is the actual Class V modification of the applicable aircraft. The program is currently in the full-scale development phase. The production/installation is scheduled to last until June 1995, after the scheduled production decision is made in June 1990 (AFSC, 1987:3,4).

Logistics. According to the LOA signed on 30 October 1986 by the representative of the PRC, the Commission of Science, Technology and Industry for National Defense (COSTIDN), the PRC agreed to the offer by the USG to develop and produce 55 Digital Fire Control System (FCS) production kits for the PRC's aircraft, plus four spare kits and one production kit to be used for maintenance training at an estimated cost of \$501,757,733 (AFSC, 1987:6). The agreement

included support equipment, spares, maintenance, training, and a total of 75 man-years of dedicated USAF military and civilian personnel (DOD, 1986:11).

The USAF plans to assist the PRC in developing an organic support capability at the organizational and intermediate level. But detailed maintenance knowledge will be controlled by the US. All depot level maintenance will be performed by the contractor at a site outside the PRC. Current plans call for items requiring depot level maintenance to be shipped back to the US for repair actions (AFSC, 1987:13). Technical manuals developed for the organizational and intermediate levels will not contain a detailed theory of operation. The contractor will write the fault isolation sections of the manuals as go-no-go type testing. The intermediate level maintenance will test to the circuit card level as determined by the repair level analysis. There will be no circuit card repair in the PRC and no software configuration changes will be made by the PRC. The depot level maintenance that will be performed at the contractor's facilities outside the PRC (AFSC, 1987:14) will include:

- Technical assistance and the actual maintenance support beyond the responsibility and capability of the PRC facilities

- Repair of unserviceable line replaceable units (LRU) and shop replaceable units (SRU) coded for depot repair

- Calibration, alignment and test requirements

Failed units from the PRC facilities will receive a diagnostics examination at the contractor's depot. Contractor personnel will evaluate the data to determine whether to repair or discard the unit primarily based on the cost to repair compared to the cost of a new unit.

Training. The training provisions included logistics training for PRC personnel in formal USAF technical training courses including Inventory Management training, Specialist training (maintenance and supply) and Base Supply Officer training. Qualification training is to be provided at an operational base supply organization along with technical instructor training. Maintenance training will be provided by the contractor to a cadre of PRC personnel at the organizational and intermediate level of repair on the aircraft's FCS, the Environmental Control System (ECS) and the Electrical Power System. Ground school FCS operator training will be provided for three instructor pilots from the PRC. It is expected that this base of trained specialists, pilots and officers would then return to the PRC and train others in the logistics, operation, and maintenance of the system.

The LOA specifically states that there is to be no coproduction or coassembly of production kits (DOD, 1986:16), production and assembly of the components for this system will be accomplished by the US manufacturers and the

integrating contractor. All components will be assembled into kits. The kits will be assembled at the contractor's facility in the US and shipped to the PRC where PRC personnel will install the assembled kits (AFSC, 1987:5). All data to be provided to the PRC is subject to review by the USG. The USAF reserves the right to edit or rewrite data packages to exclude military information that is clearly beyond the scope of that offered for sale in this case. But, besides maintenance manuals and copies of the organizational and intermediate level technical orders, other information to be provided to the PRC include engineering information and drawings for acceptance, installation, alignment, test, storage and transportation of the components. This information could be valuable to the PRC in the future if a more detailed knowledge of these systems were desired. This, in addition to the relative freedom of access to the manufacturer's facilities and USAF facilities, could greatly aid in the transfer of additional information and technology from other sources in spite of the limitations of the contract.

Technical Description. The PEACE PEARL program will provide an improved FCS for the PRCs F-8II interceptor aircraft. The FCS will provide the aircraft with air-to-air attack capability against both low altitude, high speed penetrator aircraft and high altitude, high speed penetrators. In addition to the airborne intercept

capability, a secondary air-to-ground capability will be provided. The electrical and environmental control systems on the aircraft will have to be modified to meet the electrical and cooling requirements of the new FCS (DOD, 1986:22). The alternating current (AC) electrical power generating system will consist of two constant frequency and voltage generators operating independently into a split bus system. A cross tie will be provided between the transmission system such that a single AC generator can provide the total AC power required by the aircraft. The environmental control system provides the pressurization and air conditioning required for the avionics equipment as well as for cockpit cooling. The modified environmental control subsystem will not degrade the performance of the original cockpit environmental system (AFSC, 1987:7).

The FCS will consist of 13 major components:

1. Radar, continuous wave illuminator (CWI) compatible. The radar will be an x-band, coherent, pulse doppler radar which provides lookup and lookdown detection, manual and automatic target acquisition and track for highly maneuverable air combat attack. Real beam ground map and air-to-ground ranging will be provided for the secondary air-to-ground role.

2. Radome. A new radome will be designed with suitable electrical characteristics to allow the radar to meet its performance requirements.

3. Inertial Navigation Systems (INS). The INS will provide attitude and velocity to the radar for stabilization and clutter tracking, as well as to the Fire Control Computer for weapon delivery computations. The INS will also provide a medium accuracy navigation capability.

4. Fire Control Computer (FCC). The FCC will provide the necessary computations and control for both air-to-air and air-to-ground weapon delivery and fire control. It will provide for overall system data integration and primary multiplex bus control. It will provide for FCC self-test, system test and management of certain functions and modes of the displays and controls.

5. Multiplex Data Bus. A MIL-STD-1553B digital multiplex data bus will be used for information transfer among, and integration of, all elements of the FCS.

6. Backup Control and Interface Unit (BCIU). The BCIU will perform the dual role of backup multiplex bus control and data bus interface for existing and/or newly installed aircraft equipment.

7. Air Data Computer (ADC). A digital air data computer will be used to provide the necessary air data outputs for flight control, navigation, and weapon delivery functions.

8. Head-Up Display (HUD). A HUD will be provided to display primary flight symbology, weapon aiming symbology and system status data to the pilot.

9. Head Down Display (HDD). A radar display will provide both air-to-air and air-to-ground radar video with appropriate overlay of symbology on the video.

10. Display Recorder. The display recorder system will consist of a small video camera mounted on the HUD and a video tape recorder. The system will be capable of recording the HUD symbology overlaid on the outside scene viewed through the HUD combiner. It also will be capable of recording the video signal being displayed on the radar display.

11. Control and display panels. Control panels will be provided to control all system modes and functions and to display output data.

12. Computer Program. Computer programs will be identified as Computer Program Configuration Items (CPCI) and will be designed with flexibility to provide for growth and ease of modification and maintenance. In addition to the operational computer programs, support equipment programs and software maintenance programs will be provided.

13. Stick and Throttle Controls. The stick and throttle will be modified to add the necessary hands-on system controls. Compatibility with existing controls and interfaces will be maintained (DOD, 1986:23).

While the technology and capability that will be provided by this program are an improvement over what the PRC currently has operational, it is not (by design) the most

advanced in our inventory. For example, the radar is a Westinghouse Electric Corporation AN/APG-66 X-band radar that originally entered service in 1978 for the F-16. Line replaceable units (LRUs) for this radar are produced by the European F-16 operators, and the radar is in use in the USAF and the air forces of Belgium, the Netherlands, Norway, Venezuela, Israel, Pakistan, Egypt, Indonesia, Thailand and Singapore (Blake, 1988:866). This radar is being replaced in many F-16 aircraft by the Westinghouse Electric Corporation AN/APG-68 X-band airborne radar. This unit, which has been installed in the USAF F-16C/D aircraft since March 1985, is an improved version that was developed based on the AN/APG-66 (Blake, 1988:867).

Summary. The PEACE PEARL program represents a compromise in expectations and requirements for both the PRC and the US. For the PRC, this program satisfies their immediate need to upgrade some of their fighter aircraft to obtain an enhanced defensive capability on their northern borders. They did not receive all the components they desired, some of which were denied to them because the US believed the technology was too advanced and the potential applications would have exceeded strictly defensive requirements. After the assimilation of the technology in this program the future domestic production of similar components for other PRC aircraft is a possibility.

For the US, the program provides obvious economic benefits - the program is a cash sale, all components are manufactured in the US, assembly is accomplished in the US, assistance will be provided in the PRC by US personnel, and depot level repair will be provided by US companies. Militarily, US personnel have been afforded a closer interaction with the personnel of the PLA and exposure to their strategy and philosophy. We have been provided a detailed look at some of their equipment and facilities and an appreciation for their industrial capability. Politically, we may have gained some future influence in the policy decisions of the PRC leadership, the potential for additional military hardware purchases, commercial follow-on sales, and the good will of the PLA because of the professionalism of the personnel involved.

V. Conclusions and Recommendations

Conclusion

The Chinese are the most numerous of the Far Eastern peoples and until the present century their culture has been dominant in that part of the world. The Chinese have the longest continuous history of a nation (over 3500 years), a history punctuated by invasion and disorder, but one in which the invaders adopted the superior culture of the conquered. The Chinese call their country the "Middle Kingdom" because they believe that they are the center of the earth, the center of civilization. For centuries, in their isolation, they knew no other world and Chinese scholars assumed that nothing outside China was worth knowing. China has always considered itself as an advanced culture and world leader.

Historically, the US has always had a fascination with China since the first Americans visited in the late 1700s. The visit by President Nixon in 1972 and subsequent improvement in relations between the two countries has enabled us to continue this fascination.

Of the problems discussed above with cooperative ventures, perhaps the most significant is that as times change a nation's basic strategic interests remain constant, but short term goals cause reappraisals and realignments of alliances. This is evident from a cursory glance at the changes in the world in the past fifty years - a political

structure where former allies are now mortal enemies, nations have been created and destroyed, and empires have disappeared. A very real problem in providing advanced technology to the Chinese and assisting them in the modernization of their economy is that with a change in political alignment in either country, they may again become adversaries instead of friends.

The benefits of military cooperation between our countries rests primarily on a better understanding of the underlying principals, beliefs, and cultural roles of the different military organizations. China's PLA, while primarily a defensive force structure, has, by her sheer size, the potential for being a world destabilizing force. Thus, one of the primary disadvantages to military cooperation between our countries (although it is true also between any nations) is that at some future date we may be opponents on the battlefield and the prospect of facing our own equipment and tactics is very real.

PEACE PEARL, if politically successful, may be the first of many military cooperative ventures between our countries. These ventures may take many years to develop. Conversely, we must remember that limited currency reserves preclude the PRC from purchases of large quantities of advanced weapons systems and armaments, the desire to procure advanced technology and manufacturing techniques to enable domestic production is a national goal, and their status as a

sovereign nation with different political goals may lead them to adopt foreign policies that are contrary to our foreign policies and, potentially, in conflict with our best interests.

Recommendation

A continuing study of military security assistance and commercial cooperative ventures and trade between the US and the PRC could help in identifying additional trends in relations between our nations. The success of PEACE PEARL and the completion of other military assistance programs could provide valuable lessons that could be applied to future joint projects. These lessons could also enhance the development of improved relations between our military organizations and political establishments, in the interests of a better understanding and appreciation for the rationale underlying policy decisions in both countries.

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This study concludes that increased interactions between the United States (US) and the People's Republic of China (PRC) will be beneficial for both countries and for global political stability. An examination of current security assistance programs between the countries will enable us to enhance the success of future projects.

This thesis reviews briefly the historical background of relations between the PRC and the world in general and specifically between the PRC and the US. After summarizing the basic goals of general security assistance programs this thesis examines the arguments for and against these programs. It provides a summary of the People's Liberation Army (PLA) modernization in the context of the overall PRC economic modernization program with a focus on the capabilities of the PRC aerospace industrial base.

Finally, this work provides a technical analysis of the PEACE PEARL foreign military sales program with a political analysis of the potential for future programs between the US and the PRC.