25 1 OF 1

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CHINA

TRANSLATIONS ON PEOPLE'S REPUBLIC OF CHINA
(FOUO 1/79)

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(FOUO 1/79)

CONTENTS

ECONOMIC

PRC SEEKS JAPAN'S AID IN BUILDING HEAVY CRUDE CRACKING PLANT

Tokyo THE DAILY YOMIURI in English 13 Dec 78 p 4 OW

[Text] China has asked Japan's petrochemical and plant industries to extend overall cooperation for the construction of heavy crude cracking facilities in China, informed sources revealed Monday.

The Japanese petrochemical industry has not been willing to expand its import of crude oil from China because Chinese crude is rich in heavy fractions, but the sources noted that the proposed project would pave the way for a solution to this problem.

China plans to construct a heavy crude cracking plant capable of processing about 20,000 barrels a day.

It has not clarified the site of construction or timetable but the sources said that the best possible place would be in Pohai Bay and the timing sometime after 1982 when the Sino-Japanese long-term agreement on oil expires.

Pohai Bay is where the joint undersea oil development project by the two countries has been underway.

According to the sources, China plans to export to Japan such intermediary products as gasoline, kerosene and naphtha to be produced at the plant in order to pay for its construction and put heavy oil, which Japan does not need so much, to its domestic use.

Japanese industries concerned intend to wholeheartedly cooperate with the Chinese proposal because such a project will mean relatively low costs in terms of land rent, personnel expenditure and pollution countermeasures to make its products sufficiently competitive with their Japanese domestic counterparts.

As matters stand, Japan is not likely to achieve its goal of importing 1.5 million tons of Chinese crude in 1982 as provided in the Sino-Japanese long-term agreement nor is it likely to carry out the plan to increase the import up to 30 million tons by 1990.

China probably had this in mind in making the latest proposal, the sources said.

CSO: 4020

ECONOMIC

JOINT HITACHI-CHINA SHIPYARD PLAN REJECTED

Tokyo MAINICHI DAILY NEWS in English 5 Dec 78 p 5

[Text]

Hitachi Shipbuilding and Engineering Co. discounted Monday the possibility of establishing a joint venture with China to construct and operate a shipyard.

A spokesman for Hitachi said a visiting Chinese shipbuilding mission proposed such a joint enterprise to build and operate a 100,000-ton capacity shipyard.

The spokesman said his company, like other Japanese shipbuilders, is suffering from a serious slump and has no financial leeway whatever to make such an investment.

He said that under prevailing conditions, the plan for a proposed Chinese-Japanese nongovernmental shipyard is far from practicable.

If the Japanese government were to invest in such a venture, it could materialize, the spokesman said. He added, however, that the Japanese government seemed unlikely to make such an investment. . . .

The spokesman said his company submitted a price estimate to China last month for the modernization of its Red Flag shipyard in Kuta, northeastern China.

He said the modernization project calls for construction of a 100,000-ton capacity building berth, which is estimated to cost 20 to 30 billion yen in Japan currently.

Ishikawajima-Harima Heavy Industries Co. also presented such an estimate to China earlier in the year.

The Hitachi spokesman said the modernization and the joint venture project are apparently separate.

CSO: 4020

ECONOMIC

BIG CEMENT DEAL MADE WITH JAPAN

Tokyo MAINICHI DAILY NEWS in English 5 Dec 78 p 5

[Text]

In the largest deal in terms of volume ever shipped abroad, Japan's eight cement makers have jointly contracted to export more than 1.5 million tons of cement to China next year, industry sources said Monday.

The sources said the contact was signed with the Peking government late last month when a mission of the Japan Cement Exporters Association of Tokyo visited the Chinese capital.

The contract calls for a shipment of at least 1.5 million tons, more than 20 percent of the 7.1 million that Japan exported last year.

The sources said, however, the industry expects an increase in volume to be shipped to around 2 million tons, noting growing demand there in the wake of the Peking government's modernization campaign.

They said the price was reportedly fixed at $60 per ton, including freight costs, for shipments in the first half of 1979.

Prices for the latter half will be negotiated in May, the sources said.

The eight companies included Onoda Cement Co., Nihon Cement Co. and Mitsubishi Mining and Cement Co., they added.

CSO: 4020

ECONOMIC

BRIEFS

GOLF COURSE REPORT CONFIRMED--Peking (KYODO)--Reports that China is planning to build a golf course were confirmed recently by a leading Chinese official when he met with a visiting Japanese mission. He said a site near Shihsanling in the northern outskirts of Peking was being considered at present as the most likely place for construction of the golf course. Liao Cheng-chih, vice chairman of the Standing Committee of the National People's Congress and president of the China-Japan Friendship Association, had revealed that China planned to build a golf course when he visited Japan in October with Vice Premier Teng Hsiao-ping. Shihsanling is located close to the Great Wall of China and there are 13 mausolea of the Ming dynasty. Technicians who built the golf course which existed in Shanghai before the birth of New China reportedly will be commissioned to build the new course for completion in 1980. There are rumors that the Chinese already have started surveying of land. As a result, Japanese trading firms are reported to have started moves to sell golf implements, such as golf clubs, to China or supply knowhow for the construction project. [Text] [Tokyo MAINICHI DAILY NEWS in English 5 Dec 78 p 12]

CSO: 4020

SCIENCE AND TECHNOLOGY

FEATURES OF AIR DEFENSE WARNING SYSTEM OUTLINED

Peking HANG-K'UNG CHIH-SHIH [AERONAUTICAL KNOWLEDGE] in Chinese No 9, Sep 78 pp 22-24

[Article by T'ao wang-p'ing [7118 2598 1627]: "Moving Air Defense Commands From the Ground Into the Sky"]

[Text] An air defense warning system has three components. The first component is a radar network which consists of warning radars separated by several hundred kilometers; these radars are distributed along the territorial boundaries or shore lines. The second component is the air defense command, which receives all the radar information about invading targets and processes them by high-speed electronic computers. The third component is the communication, command and control system which provides communication links between the air defense commands, the individual radars and the national air defense command; it allows the commander to direct the interceptors, the missiles, or the anti-aircraft guns to destroy the incoming targets.

One of the weak points of a ground radar is that there exists a blind region because of the straight line propagation of electromagnetic waves. If the height of the radar antenna h_a (generally located on high grounds) is 100 m, and the flight altitude of the target h_t is 30 m, then the line-of-sight range of the radar R is given by (see Fig. 1):

$$R(\text{公里})_{(1)} = 4.1\left(\sqrt{h_{\text{天}}(\text{米})}_{(2)} + \sqrt{h_{\text{目}}(\text{米})}_{(2)}\right)$$

$$R = 4.1\left(\sqrt{100} + \sqrt{30}\right) \approx 64\ \text{公里}_{(1)}.$$

Key:
1. km
2. meter

A target more than 64 km from the radar is located in the blind region and cannot be detected; the straight line-of-sight is blocked by the earth curvature.

To illustrate the phenomenon of radar blind regions, we shall present two actual examples. The first example was an incident in October 1969 when low flying Cuban MIG-17's entered U.S. territory without being discovered. The second example was an incident in September 1976 when a Soviet MIG-25 defected to Japan by flying at low altitude into Japanese air space; only one of the ground radars in northern Japan detected the airplane at a range of 25 km, only 2 or 3 minutes before the plane landed.

Airborne Warning Radars

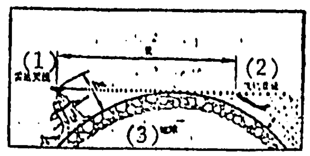
To reduce the blind region and to increase the line-of-sight range of the radar, the elevation of the radar must be increased. This can be illustrated by the visual range of human eyes. The visual range of a person standing on the ground is only several km, any object outside the visual range will be below the horizon and cannot be seen. If the person stands on a mountain, his visual range will be increased; the higher the mountain, the larger the visual range. Currently, some radars are installed on a radar tower to detect cruise missiles flying at an altitude of several tens to several hundred meters. But the limited height of a radar tower (several tens of meters) cannot meet the elevation requirement.

Since the 60's, it has been suggested to install the warning radars on airplanes. If the flight altitude of the airplane is 10,000 m, then using the above formula, one can calculate the radar range for a target at 30 m altitude to be more than 400 km. The practical ceiling of a modern early warning airplane can often reach 12,000 m, hence the detection range of an airplane several hundred meter above the earth surface may be over 600 km.

The first early warning airplane appeared during the early 50's. But since the antenna beam of an airborne radar is always pointing toward the ground, the signals reflected by the earth surface and ocean surface are thousands of times stronger than that reflected by the airplane, and the target is often difficult to detect. Consequently, this type of airplane did not receive a great deal of attention. By the early 70's, the development of the so-called pulse doppler radar provided an effective means for suppressing ground clutter and detecting low-flying airplanes. Since then, early warning airplanes were able to demonstrate their full potential.

Like a conventional radar, a pulse doppler radar uses a pulsed waveform; the difference is that the reflected signal from the moving airplane contains a doppler frequency shift which can be detected by a filter, whereas the reflected signals from the ground have no doppler shifts and are rejected by the filter. A modern airborne doppler radar can detect an airplane target from ground interference signals which are 100,000 times stronger. The success of this type of radar depends on modern technologies such as digital computer, digital circuits, and a computational scheme called fast Fourier transform. In addition, it also requires new frequency stabilization techniques and new antenna technology.

Fig. 1 The operating range of a ground radar



Key: 1. radar antenna
2. airplane target
3. earth

Airborne Air Defense Command

The operating range of a modern airborne radar is about 800 km; it covers an area of 300,000 square km. The operating range of a conventional ground radar without considering blind region is about 200 km; its coverage is only 40,000 square km. Therefore, an early warning airplane can perform the same function as eight ground radars. A regional air defense command controls only ten or more radars. Hence, suggestions have been made to move the air defense command also into the sky.

We know that the development of new offensive weapons poses an increasing threat to air defense command. For example, bombers and attack airplanes have low altitude penetration capabilities; long range missiles can be launched from the ground or from the air; also, nuclear explosion can inflict severe damage to an air defense command system. In order to improve the survivability of a command and control system, it is necessary to move the air defense command onto an airplane. This led to the development of the so-called "airborne early warning and control system". Since this type of system is a combination of command, control, communication, and computers, it is also called the C^4 system. It should be re-emphasized that this type of system was made possible only after the successful development of the pulse doppler radar.

Special Features of an Airborne Warning and Control System

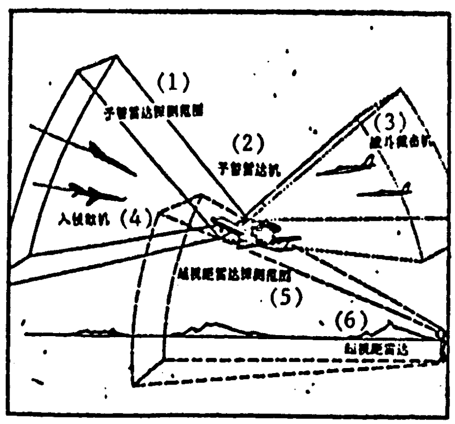
An airborne warning and control system not only reduces the radar blind region and increases the survivability of the command and control system, but also represents a new landmark in the modernization of air defense. The following two applications clearly demonstrate the value of such a system.

One application is a new air defense system which consists of over-the-horizon radars and airborne warning and control systems(as shown in Fig. 2). The over-the-horizon radar generally has a detection range of 4000 km, but its resolution capability is only of the order of 100 square km. When an invading bomber is detected by the over-the-horizon radar, it transmits the information to the airborne warning and control airplane, which enters into a corresponding strategic status and begins to search in a designated region. Upon detection of the target, it commands the interceptors to intercept the target. When the enemy airplane is sufficiently close, it then commands the launch of air defense missiles and firing of anti-aircraft guns.

The other application of an airborne warning and control system is to increase the warning time against strategic bombers and high speed low flying airplanes. Since the airborne warning system can patrol at an altitude of 10,000 m and 1000 km from its home territory, and has an operating range against high altitude targets of 450 km, it is capable of detecting targets 1450 km from the center of defense. Suppose that the enemy airplane approaches at a speed of Mach 3; a ground based early warning radar can only provide 6 minutes of warning time, but an airborne warning and control system can provide nearly 30 minutes of warning time. If the invading airplane penetrates by flying at an altitude 100 m above the ground, then a ground based radar with an elevation of 100 m can only detect the target at a range of 82 km, which does not provide sufficient warning time against a modern supersonic airplane. An airborne warning and control system, however, can detect the target 1450 km from the defended site, and can direct long range interceptors to intercept the target far away from homeland.

The results of repeated combat exercises show that an airborne warning and control system can simultaneously distinguish and display 600 airborne targets, and can simultaneously direct 100 attack airplanes to intercept the targets and then return to the base. We know that a ground based radar complex not only has early warning radars but also has guidance radars which can measure the range, azimuth, and elevation of a target and can guide interceptors toward the target. The early warning radar on an airborne warning and control system also has the ability to measure the three coordinates of a target; in addition, it has the multi-function capability of scanning its beam electrically in the elevation coordinate and operating in a track while scan mode to distinguish and track several hundred targets simultaneously. A conventional ground based early warning radar or guidance radar does not have this capability.

Fig. 2 Operating range of an airborne early warning radar



Key: 1. detection range of an early warning radar
2. airplane carrying early warning radar
3. fighter interceptor
4. invading enemy planes
5. detection range of an over-the-horizon radar
6. over-the-horizon radar

Communication Requirements

The warning and command operations of an airborne warning system may be disrupted if the enemy employs electronic counter measures against the communication links of the system. Therefore, this type of system requires a highly advanced communication network which has several thousand communication ports and uses high speed and reliable digital communication techniques.

Multi-channel communication can be realized either by frequency division methods or time division methods. Frequency division method uses a device whose communication units can each receive and transmit randomly at any one of several thousand frequencies. Time division method uses a wide frequency band (e.g., L band which ranges from 962 to 1215 MHz) which is distributed among many communication units, and the signals are transmitted synchronously at designated times to avoid mutual interference. Because of the large number of channels, two units can randomly share the same frequency; also, time division system is used to transmit and receive signals synchronously during specified time intervals. As a result, the interference rejection ability of the communication system is greatly improved.

Digital communication has the following advantages: its transmission speed is 1000 times higher than analog signals; it is highly reliable and has large communication capacity; it can easily interface with the digital processing computer so that security measures can be easily implemented; it uses wide band modulation which is difficult to jam by the enemy.

Current Status in Applications and Development Abroad

At present, the Soviet Union and the United States have both established airborne warning and control systems which serve as airborne command centers. They are equipped with improved radars which can detect low flying enemy planes, and can rapidly alert various defense systems to direct interceptors or surface-to-air missiles to attack the invading targets.

The North Atlantic Treaty Organization has established a system in western Europe which consists of 18 airborne warning and control airplanes, and was purchased from the U.S. for 1.9 billion dollars. Great Britain, which is threatened by its own economic crisis, developed its own airborne warning and control system. The airplane used is a modified version of the high speed Witchhund patrol airplane whose radar is installed in the nose and in the tail. In addition, Iran, Israel, and Japan are all planning to purchase early warning airplanes to strengthen their air defense systems. The development of airborne warning and control systems has become an essential requirement in the modernization of air defense systems.

To increase our alertness and to prepare for war, we must also establish a modern air defense system and demolish the invading enemies.

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CSO: 8111/0216

AGRICULTURE

JAPANESE COLD REGION EXPERTS INVITED TO KIRIN

Tokyo MAINICHI DAILY NEWS in English 6 Dec 78 p 5

[Text] PEKING (Kyodo)—Eight Japanese farming experts will be invited to Kirin Province of China to teach Chinese farmers cold region rice cultivation methods for one year.

According to an agreement signed Monday in Peking, eight agricultural experts from six prefectures of the Tohoku district in northern Honshu will be invited to Kirin for about one year from next March to teach local Chinese farmers how to grow high-yielding rice in cold regions.

The Japanese farming experts will be led by Minoru Tanaka, an authority on cold region rice culture and breeder of a high-yielding rice species. He is an adviser to the Aomori prefectural government.

The eight are all experts on high-yielding rice culture, soil, fertilizer and insecticides.

They will demonstrate high-yielding rice culture technology by using farming machines and implements, chemical fertilizer and agricultural chemicals which are being used in the Tohoku district and the paddy rice species grown in the cold areas of Tohoku prefectures.

All their expenses will be borne by the Chinese authorities, and farming machines and implements to be brought to Kirin by them will be later bought by the Chinese authorities.

This is a new form of technical exchange worked out between Japan and China.

The agreement was signed between the Japan-China Agriculture and Farmers Exchange Association and the Chinese Agricultural Society.

Chinese authorities are reportedly eager to learn Japanese farming technology which has succeeded in producing as much as six tons of rice from one hectare of paddy field in cold regions as a means to step up the modernization of farming in China.

According to Tadashi Yaoita, president of the Japan-China Agriculture and Farmers Exchanges Association, China plans to use in Heilungchiang Province American-style mammoth ranch farming technology and in Kirin Japanese-style cold region rice culture technology.

Great expectations are placed on this project as the initial step towards Japan's technical cooperation in agriculture with China, Yaoita, who is visiting Peking, said.

By Monday Yaoita had reached final agreement with Peking City leaders on another plan to invite young Chinese farmers to Japan to study farming techniques.

According to the agreement, 20 young Chinese men and women who are members of the Japan-China friendship people's commune in Peking will be invited to Fukushima Prefecture to study Japanese farming methods.

They will live with Japanese farmers and study paddy rice farming, cattle raising and dairy farming as well as orchard and horticulture farming for one year from next March. Their expenses will be borne by Japanese circles concerned, Yaoita said.

CSO: 4020

END