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13 March 1986

China Report

ECONOMIC AFFAIRS

ENERGY:

STATUS AND DEVELOPMENT--47

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CHINA REPORT

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POWER NETWORK

HYDROPOWER

NATIONAL POLICY

1985 POWER OUTPUT PUTS NATION IN FIFTH PLACE WORLD-WIDE

Beijing RENMIN RIBAO (OVERSEAS EDITION) in Chinese 31 Dec 85 p 1

[Text] Having completed the Sixth Five-Year Plan ahead of schedule, China's power industry has announced that in 1985 the total amount of electricity generated came to 406 billion kilowatt-hours, an increase of 31.4 billion kilowatt-hours over 1984 and a record increase for any single year since the nation was founded. Today, China is in fifth place world-wide for power generated.

This was announced by Minister of Water Resources and Electric Power Qian Zhengying yesterday [30 December] during a news conference. She revealed that one of the state's key construction projects--the mission to put on stream 5 million kilowatts--had been completed to bring newly added generator capacity during the Sixth Five-Year Plan to 16.13 million kilowatts.

Also in the area of electric power, the cascade development of the Hongshui He River Valley is fully under way with work having begun on Dahua, Yantan, Tianshengqiao, and Lubuge. Among these, the Dahua hydropower station is now operational. A 500 kV transmission line from Gezhouba to Shanghai is now in service and a joint agreement has been signed with foreign concerns on the Guangdong nuclear power plant. Foreign capital is being used to set up the Hua Neng Electric Power Development Company which will build projects with an installed capacity of 2.4 million kilowatts. This will play a major role in relieving the shortage of power now hampering the development of coastal regions.

/12913
CSO: 4013/63

NATIONAL POLICY

ENERGY IS KEYSTONE IN AMBITIOUS NORTHWEST GROWTH SCHEME

HK280847 Xi'an XIBEI XINXI DAOBAO in Chinese No 2, 13 Jan 86 p 1

[Report by Yuan Linsheng [5913 2651 3932]: "Electric Power Industry in Northwest Develops Relatively Fast During Sixth Five-Year Plan; Growth Will Be Still Greater in Seventh Five-Year Plan"]

[Text] The electric power industry in the northwest developed relatively fast during the period of the Sixth Five-Year Plan. Generating unit no. 1 of the Ningxia Dawukou power plant built in 1985 and the additional generating units of the Xinjiang Hongyanchi power plant and the Shaanxi Qinling power plant have successively gone on stream, and the installed capacity increased by 400,000 kilowatts in the year. By the end of 1985, the northwest's total installed capacity amounted to 7.4 million kilowatts. During the period of the Seventh Five-Year Plan, the development of the power industry in the northwest will be further expanded as compared with the period of the Sixth Five-Year Plan and, consequently, total generation will be raised greatly. The northwest will become one of the country's major power source bases.

The vast northwest is rich in natural resources. The area possesses rich coal and water power resources. The rich energy and other resources of the northwest represent tremendous latent power for economic development. During the Sixth Five-Year Plan, the state invested about 3 billion yuan in the electric power industry in the northwest. While the construction of the Qinghai Longyangxia hydropower station and the Shaanxi Ankang hydropower station was accelerated and major power plants in Qinling, Shaanxi, Qiaotou, Qinghai, Liancheng, Gansu, Dawukou, Ningxia, and Hongyanchi, Xinjiang, were newly built or expanded. Also, a number of supporting power transmission and transformer substation projects were constructed. As a result, Ningxia's power transmission network was linked to those Shaanxi, Gansu, and Qinghai; southern Shaanxi was linked up with Sichuan, Guanzhong was linked up with Henan, and the main power transmission network structure has been steadily reinforced. Various localities have raised funds to build more small hydropower and thermal power stations which now exceed 3000 in number with a total installed capacity of more than 1.2 million kilowatts. More than 10,000 kilometers of 35-kilovolt transmission lines and more than 600 35-kilovolt transformer substations now dot the vast countryside forming a complete power transmission network.

The rapid development of the power industry in the northwest has contributed to local economic growth in successive years. The adoption of the open policy regarding use of electricity has attracted a large number of heavy power-consuming enterprises to move to the area and this has given a great impetus to the development of the nonferrous metallurgical industry in the northwest. At present, apart from several established large-sized metallurgical enterprises, a few big power consumers, including the Northwest Iron Alloy Works in Gansu Province, Baiyin Aluminum Works, Jinchuan Nickel Works, Qinghai Aluminum Works, and the Ningxia Qingtongxia Aluminum Works, are now under construction in the northwest. After all these enterprises are built, the northwest will become another major nonferrous metallurgical industrial base.

During the Seventh Five-Year Plan, as a number of big power consumers are to be moved to the northwest with its rich energy resources, the existing third-line-construction enterprises will also have to undergo readjustment and transformation. Meanwhile, following the development of local industrial enterprises, the people's livelihood will be improved, and it is estimated that average annual growth in power consumption will be about 10 percent. In order to meet all these needs, the power industry must develop accordingly in the northwest. According to the plan, the power plants affiliated with the bureau in charge of the power transmission network will have to raise their installed capacity by a total of about 4.3 million kilowatts, an increase of 257 percent over the growth of installed capacity in the Sixth Five-Year Plan. With regard to the scheduled growth of installed capacity, the completion of Longyangxia hydropower station on the upper reaches of the Huang He and the Ankang hydropower station built on the Han Jiang will not only prepare favorable conditions for moving high power-consuming enterprises west, but will also substantially raise the peak power regulating capacity of the power supply system, and will provide reliable power for the expanded joint power transmission network and the easing of the power shortage during the peak period in neighboring areas. During the Seventh Five-Year Plan, the total length of the 330-kV transmission lines in the northwest will be extended by more than 3,700 kilometers, the transformer substations' capacity will be raised by more than 6 million kilovolt-amperes, the Shaanxi-Gansu-Qinghai-Ningxia main power supply network and various municipal power supply networks will be further strengthened, and a power transmission project will be constructed to link Pinganyi, Qinghai, with Beijing.

/9738
CSO: 4013/68

EXPERTS OFFER OPINIONS ON DEVELOPING HEILONGJIANG'S ENERGY RESOURCES

Harbin HEILONGJIANG RIBAO in Chinese 22 Dec 85 p 1

/Text/ In a conference convened recently in Heilongjiang, the province's energy experts and technical personnel put forward major suggestions concerning strategy to develop energy resources.

In investigative studies, the experts used masses of data to analyze the province's energy situation. They stated that although Heilongjiang's energy resources are abundant, because of the large volume of transfer and export trade, the amount actually available for distribution and use within the province itself is limited. When you add to that the low utilization rate of energy in the province, a glaring contradiction emerges. Industrial and agricultural output value is to quadruple by the year 2000 but calculations show that the amount of energy will only double. By the year 1990, the energy gap will be 6.73 million tons of standard coal and by the year 2000 this gap will be 15.5 million tons of standard coal. Because of this, the energy issue is a major factor impacting on the province's economic growth.

On the basis of the above situation, the experts feel that a policy of equal stress on development and conservation must be adhered to.

In the exploitation and use of energy resources, the experts hold that Heilongjiang must first make a great effort to develop hydropower resources. The province's hydropower resources are rich--one-half of the hydropower resources in the three northeastern provinces--but only 1.8 percent of these resources has been developed at the present time. Today, the amount of investment in medium and small hydropower stations and thermal power plants is about the same but the development of hydropower stations brings additional benefit in the form of aquaculture, irrigation, and flood control. Next, the coal exploitation and management system needs to be overhauled. There must be unified marketing and production and a unified plan for the development of energy resources; there must be rational distribution, regular exploitation, and total utilization. Such a policy will lead to the unification of the state, the collective, and the individual, the large, medium, and small. However, the destruction of natural resources must be avoided. Third, the geological exploration funds of the Provincial Coal Field Geology Corp. should be part of the province's annual fiscal budget. Fourth, a rural energy resource development strategy should be drawn up to resolve the rural energy problem and to create rural energy resource districts.

As for an energy conservation strategy, the experts proposed that: 1) the province's economic structure be adjusted and rational strategic targets for economic growth be determined; 2) the energy management infrastructure be strengthened at all levels, especially at the highest provincial levels, and the rational distribution and conservation of the province's energy resources be placed under unified command; 3) energy legislation be progressively enacted and energy use strictly controlled; 4) the current irrational energy price system be overhauled; 5) the management of energy quotas be strengthened; 6) energy conservation research work be broadened and technical progress in energy use and conversion be accelerated; 7) central heating requirements be drawn up during urban construction; and 8) ventilation equipment and water pumps be upgraded or replaced and a major effort launched to promote electricity conservation technology for the motors for this equipment.

/12228
CSO: 4013/75

NATIONAL POLICY

NEI MONGGOL MAKES FULL USE OF ENERGY RESOURCES

OW281155 Beijing XINHUA in English 1122 GMT 28 Jan 86

[Text] Hohhot, 28 Jan (XINHUA)--The Inner Mongolia Autonomous Region is making full use of its rich energy resources, according to regional government authorities.

An oil refinery is being built near Erenhot, on the border between the region and the People's Republic of Mongolia, where 700 million barrels of oil reserves have been discovered.

The region's 82 power plants, with a total generating capacity of 2.4 million kW, now supply its 7,000 industrial plants with 7.8 billion kWh a year; eighty-two out of the 89 banners (counties) in Inner Mongolia now have electricity.

About 2 billion yuan have been invested in colliery development over the past 5 years in Inner Mongolia, where the known coal reserves amount to 200 billion tons, next only to Shanxi province, China's leading coal producer.

Altogether, 34 coal mines--including the Yiminhe and Huolinhe opencast mines, each with an annual production capacity of 4 million tons--have gone into production since 1981.

An official in charge of regional energy development said that a coal deposit with an estimated reserve of 90 billion tons has been found in the southwestern part of the region and an overall program is being worked out to develop it.

/9738
CSO: 4010/31

SHANXI INVESTS HEAVILY IN ENERGY PROJECTS

OW151606 Beijing XINHUA in English 1502 GMT 15 Feb 86

[Text] Tiayuan, 15 Feb (XINHUA)--Shanxi Province, China's leading coal producer, invested nearly 5.8 billion yuan in energy production between 1981 and 1985--3.44 billion yuan, or 1.46 times more than that of the previous 5 years.

According to the provincial statistics bureau, the investment in energy accounted for 41.4 percent of the province's total for capital construction, as against 31.7 percent during the Fifth Five-Year Plan (1976-1980).

A total of 3.81 billion yuan was invested in the coal industry during the five-year period.

Meanwhile, the state directly invested more than 17 billion yuan in 16 of the province's major projects, including double-tracking and electrification of six railway lines across the province, and the development of large coal mines, coke plants, and thermal power plants. These projects have been completed or will be completed soon.

The big investment brought Shanxi new fixed assets valued at over 20 billion yuan during the period. As the province completed 3,600 capital construction projects and put 600 of them into operation, the annual coal-production capacity jumped by over 17 million tons, and the capacity of electricity generators by 1.4 million kW.

The coal output of the province reached 210 million tons last year, one-fourth of the total coal output of the country. And in the past 5 years, the province also transported 570 million tons of coal to 26 provinces, autonomous regions, and municipalities.

The province will focus on the improvement and construction of railway and highway connections to other provinces in the Seventh Five-Year plan (1986-1990), so that more coal can be transported outside the province.

/6662
CSO: 4010/35

REGULATIONS ON ENERGY CONSERVATION PROMULGATED

OW260400 Beijing XINHUA Domestic Service in Chinese 0736 GMT 23 Jan 86

/Text/ Beijing, 23 Jan (XINHUA)--Provisional Regulations on Supervision of Energy Conservation

(Promulgated by the State Council on 12 January 1986)

Ch I: General Principles

Art 1: These regulations are drawn up for the purpose of implementing the state's general policy of paying equal attention to energy development and conservation, utilizing energy rationally, lowering energy consumption, achieving better economic returns, and ensuring a sustained, steady, and coordinated development of the national economy.

Art 2: These regulations must be observed by all enterprises and institutions in urban and rural areas, as well as by official organs, military units, organizations, and individuals.

Art 3: "Energy" referred to in these regulations includes coal, crude oil, natural gas, electricity, coking coal, coal gas, steam, gasoline, kerosene, fuel oil, firewood, and so forth.

"Energy conservation" referred to in these regulations means achieving maximum economic returns with minimum energy consumption by means of technical improvements, rational utilization, scientific control, and rationalization of the economic structure.

Ch II: Supervision of Energy Conservation

Art 4: An energy conservation administrative conference set up by the State Council shall study and examine the general and specific policies, regulations, plans, and measures for energy conservation reform, and plan and coordinate energy conservation projects. The State Planning Commission and State Economic Commission shall be responsible for daily routine work.

Art 5: The people's governments of all provinces, autonomous regions, and municipalities directly under the central government, and the departments

concerned of the State Council shall designate principal responsible personnel to take charge of energy conservation. They may also set up energy conservation administrative conferences. Daily routines shall be handled by energy conservation supervisory organs.

Major energy consuming departments and bureaus of the various provinces, autonomous regions, and municipalities directly under the central government, and of prefectures and cities, shall have principal responsible personnel take charge of energy conservation and shall have relevant supervisory organs.

Energy conservation supervisory organs of local authorities and departments shall be primarily responsible for implementing the state's general and specific policies, regulations, and standards concerning energy conservation. They shall draw up the technical policies and projects concerning energy conservation in their districts, trades, or departments; organize and guide the development and improvement of technical measures for energy conservation; inspect and supervise the work of the various districts and trades, or of enterprises under the various departments, in improving their management of energy conservation; and make overall plans to coordinate the various energy conservation projects.

Art 6: An enterprise whose combined energy consumption amounts to 10,000 metric tons of standard coal or more annually (hereafter referred to as a major energy consuming enterprise) shall have principal responsible personnel take charge of energy conservation and shall have relevant supervisory organs. On the basis of the aforementioned regulations, as well as of the actual situation, the local authorities and departments shall draw up regulations governing those enterprises whose combined energy consumption is under 10,000 metric tons of coal each annually.

An enterprise's energy conservation supervisory organ shall be primarily responsible for implementing the state's general and specific policies, regulations, and standards concerning energy conservation, as well as the regulations promulgated by the local authorities and departments concerning energy conservation. It shall also draw up the enterprise's technical measures for conserving energy, organize their implementation, streamline the scientific management of energy conservation, lower the energy consumption per unit output, and carry out various energy conservation projects.

Art 7: Local authorities, departments, and enterprises shall set up a system of responsibility to control energy conservation.

Energy conservation supervisory organs at all levels shall have cadres and technicians who are knowledgeable in this special field, and who are proficient and enthusiastic in energy conservation.

Art 8: Energy conservation supervisory organs under local people's governments or under departments concerned of the State Council shall also supervise the implementation of these regulations in districts under their jurisdiction, or in their affiliated enterprises.

Besides fulfilling the supervisory responsibilities prescribed in Art 5 of these regulations, energy conservation supervisory organs in various localities and departments may also commission centers providing technical services for energy conservation or other relevant units to monitor and inspect consumption of energy in production and daily life in their districts or affiliated enterprises.

Ch III: Basics for Supervising Energy Conservation

Art 9: The State Statistical Bureau shall establish and improve its energy statistical system. Statistical departments at all levels should work in coordination with the competent departments of various enterprises in compiling energy statistics.

Enterprises should establish and improve their original records and statistical accounts. In accordance with the Statistical Law of the People's Republic of China and other state regulations concerning statistical work, they should send energy statistical charts to statistical departments, energy conservation supervisory organs, and the competent authorities of various enterprises at regular interval.

Art 10: In accordance with the People's Republic of China Law of Weights and Measures, and other relevant regulations, enterprises should have energy-gauging equipment, and should intensify their control of energy measurement.

Art 11: The State Bureau of Standardization should organize the formulation of various basic energy standards and standards for energy control and energy consumption in production. In accordance with the state's standards, as well as their actual situation, various localities and departments should draw up their own energy conservation standards. Enterprises should earnestly follow all the energy conservation standards.

Art 12: In accordance with the standards for assessing combined energy consumption and energy consumption for individual projects--standards formulated by competent departments under the State Council--the competent authorities of enterprises should work in coordination with energy supply departments and, at regular intervals, draw up advanced and rational norms of energy consumption for the major energy-consuming products, and seriously assess the results. Enterprises should institute systems governing the use of energy by setting quotas of energy consumption for various workshops, teams, groups, and machines.

Art 13: An enterprise should analyze its energy consumption and balance its energy use according to its actual needs. Major energy-consuming enterprises should set up a system to assess their combined energy consumption and that for individual projects.

Ch IV: Control of Energy Supply

Art 14: Local energy conservation supervisory organs should work in coordination with energy supply departments and the enterprises' competent departments,

organizing them to make a success of energy supply and conservation. Enterprises receive their energy supply on the basis of their performance in energy control, consumption of energy in production, and combined economic performance. According to different situations, enterprises whose energy is basically supplied by the state, receive fixed quantities of energy, or quotas of energy supply on a contract basis. The unused portion are at their disposal.

Art 15: The coal industry should improve coal quality by developing coal sifting, dressing, and processing; and supply coal to consumers in a planned manner, according to their needs.

Departments in charge of coal production, communications, and transport should ensure qualitative and quantitative coal supply in accordance with the state's allocation plan and the contracts they have concluded with various enterprises concerning coal supply, marketing, and delivery. In addition to supplying coal to such large consumers as the metallurgical, power, chemical engineering, and construction material industries, according to their individual needs, they should also gradually set up fixed supply depots.

Fuel companies in cities should ration the coal supply to medium-sized and small enterprises according to their energy needs.

Art 16: The system for measuring commodity coal and for converting energy into standard coal shall be gradually adopted for coal metology.

Art 17: Supply and consumption of electricity must be strictly planned. Electricity suppliers and consumers enjoy their privileges and fulfill their obligations according to the Regulations for National Power Supply and Consumption, drawn up by the State Council's competent authorities.

There should be multiple power rates. Enterprises should be encouraged to consume power when excessive water has to be discharged during the high-water season, and when power load is in a valley. Power rates should be calculated according to the Interim Regulations for Encouraging the Establishment of Power Plants With Collective Funds and for Multiple Power Rates drawn up by the State Economic Commission and other departments, and transmitted by the State Council.

Art 18: The burning of oil is under strict control. Newly approved oil-burning units must complete application procedures according to government regulations. Enterprises already approved to burn coal instead of oil must undergo technological transformation within a time limit.

A special oil-burning tax will be levied, according to the tax regulations, on crude oil and fuel oil sold at a fixed price for burning by boilers and industrial kilns.

Art 19: The use of oil by diesel generating sets is under strict control. Oil supplies are not ensured except for those related to production in areas without power resources, consumption in frontier and pastoral areas, and necessary power supplies for hospitals, radios, posts and telecommunications, and scientific research.

Art 20: Petroleum-supplying departments should work together with departments concerned in arranging the construction of filling stations in urban and rural areas in order to minimize losses and waste of gasoline in storage and transport.

Ch V: Supervision of Energy for Industrial Use

Art 21: In building an industrial enterprise, it is necessary to give overall consideration to the state of energy resources and the balance between energy supply and demand in the locality, and make reasonable arrangements for the circulation of energy resources. In areas short of energy resources, construction of energy-inefficient industrial projects is forbidden, except for those that meet the special needs of the state.

Resumption or development of energy-inefficient production using small blast furnaces, converters, electric furnaces, rolling mills, thermal power plants, and small-scale nonferrous smelting and electrolysis is forbidden, except in areas with rich energy resources, a convenient location, and an approval from the provincial, autonomous regional, or municipal people's government, or its commissioned organs.

Art 22: On condition that the needs of society are ensured, it is necessary to readjust the industrial set-ups, structure of enterprises, and product mix in accordance with the principle of rational use of energy resources.

Art 23: To avoid energy losses and waste, enterprises should arrange production in a balanced, steady, centralized, and coordinated manner in accordance with the principle of rational use of energy resources.

Art 24: Enterprises should follow relevant rules in the State Standardization Bureau's "Guide for Evaluating Enterprises' Techniques in the Rational Use of Heat" in operating and managing the heat supplying system and in using waste heat.

Art 25: Expanding boiler capacities without prior approval is forbidden. In adding new boilers to its facilities or expanding boiler capacities in the course of transformation, an enterprise must submit an application to and obtain prior approval from local energy conservation supervisory organs that work together with departments supervising the enterprise and labor and fuel-supplying departments in examining the application.

Art 26: A department in charge of overseeing enterprises of a certain trade should regularly inspect their main kilns and give promotion in grade according to the criteria for evaluating the performance of kilns of the trade.

Art 27: The indigenous method of coking is strictly restricted. Under special conditions, however, an enterprise may continue using this method with approval from local provincial, autonomous regional, or municipal people's government, or its commissioned organ.

Art 28: Power departments should rationally build and transform electric network structures in order to raise power supply capacities and ensure quality supply. They should lower the consumption of water and coal, and conserve fuel through rationally utilizing hydraulic energy, installing highly efficient thermal electric generating sets, and improving the economic management of electric networks.

Enterprises should follow relevant rules in the State Standardization Bureau's "Guide for Evaluating Enterprises' Techniques in the Rational Use of Electricity" in meeting the technical requirements for power supply and consumption.

Art 29: It is necessary to develop production combining heat and electricity. When a heat-consuming enterprise has produced a certain level of steam volume and regular and stable heat load in their production year round, power departments and local authorities should instruct the enterprise to carry out the production combining heat and electricity in accordance with the principle of "using heat to determine electricity."

Enterprises should be encouraged to generate electricity with waste heat and pressure. Power departments should, in compliance with the government policy, assist enterprises selling, through the electric networks, the electricity generated with their self-financed thermal power stations or locally built small thermal power stations.

Art 30: In areas with dense industrial enterprises, local economic management departments should organize in a planned manner such specialized production as heat processing, electrolysis, casting, forging, and oxygen produciton in order to raise the energy utilization rate.

Art 31: Inflammable gas generated by metallurgical, petroleum, chemical, coal, and other industries should be recovered and rasonably utilized by all possible means.

If economically feasible, coal mines and industrial enterprises in their vicinity should make extensive use of gangue. Those areas that are rich in bone coal, low-quality coal, and oil shale should extensively utilize local low-calorific-value fuels according to economic results achievable.

Ch VI: Supervision of Energy for Use in Daily Life in Urban and Rural Areas

Art 32: Coal for use in daily life should be made into practical shapes, and use of honeycomb briquet should be vigorously promoted. We should make positive efforts to develop smokeless combustion technologies of using soft coal, and diversify the sources and increase the variety of coal for civilian use.

Art 33: We should actively develop fuel forests and promote the use of firewood-economical and coal-efficient stoves. Where feasible, we should vigorously exploit and make us of marsh gas, solar energy, wind energy, geothermal heat, and other energy resources.

Art 34: The use of gas in urban areas should be promoted by diversifying gas sources. In cooperation with departments concerned, departments of urban construction and environmental protection should draw up plans to popularize the use of gas in urban areas.

Art 35: While ensuring reasonable indoor living conditions, a building should be properly designed and oriented, and heat-insulation structures should be improved. Energy consumption of illumination and heating should be reduced by using low energy-consumption facilities, by taking full advantage of natural light, and by taking other appropriate measures.

Art 36: We should develop central heating systems. New houses and public buildings to be equipped with heating facilities should be designed to adapt to a central heating system. Active measures should be taken to convert existing individual heating systems into central heating systems, and low-efficiency boilers should be phased out.

Hot water heating systems should be adapted for buildings, or heating facilities of other types should be converted into this system in order to be more efficient economically.

Art 37: The use of electricity, water, and gas by residents in urban and rural areas should be charged according to readings registered by meters. The system of fixed gees and resupply of electricity, water, and has without recompense should be suspended.

Ch VII: The Need To Accelerate Technological Progress

Art 38: Advanced technologies and facilities for the economical use of energy should be employed in building, revamping, and expanding construction projects. The energy consumption of such technologies and facilities should not be higher than established levels in China. All departments concerned must list specific requirements concerning energy conservation in drawing up or revising design criteria, guiding principles, and regulations for their individual industries. Feasibility studies and initial designs of engineering projects must be supported by evidence of the capability of economically utilizing energy. All projects that do not meet the requirements stipulated in design criteria, guiding principles, and regulations should not be approved for construction by units authorized to evaluate and approve these projects.

Art 39: All localities, departments, and enterprises should draw up long- and medium-term plans as well as annual plans for energy conservation projects according to the policies of individual industries on energy conservation technology, and implement them. Major energy-consumption industries should systematically develop a number of technologically-advanced and economically-efficient model energy-conservation projects that can be easily promoted.

Art 40: An enterprise's funds for improving energy-conservation technologies should primarily be drawn from the enterprise's depreciation fund and detained production fund. Key energy-consumption enterprises whose energy consumption of their major products is higher than the average level of the same industry

must list energy conservation as a key project of their technological modernization programs, give priority to incorporating this project into their plans, and allocate funds for the implementation of it.

A certain percentage of depreciation funds controlled by local authorities and departments concerned should be taken out annually for energy conservation projects of enterprises. The percentage taken by localities depending on energy from other localities, and key energy-consumption departments must not be less than 20 percent of the depreciation funds under the control of those localities and departments.

Art 41: Energy conservation loans covered in the state credit plan will be extended at preferential interest rates. At the same time, the departments in charge of this matter may help pay the interest according to state regulations, and allow the enterprises that accept loans to pay back the loans with newly increased income before they pay their income taxes.

In dealing with projects in which funds appropriated for the development of capital construction work aimed at energy conservation have been changed to loans--projects with fairly larger social benefit but little benefit to the enterprise itself--the relevant responsible department may exempt the enterprise from paying a part or the entire amount of the principal and interest.

In developing capital construction projects for energy conservation under the state plan, the state will make partial investments, while encouraging various localities, departments and enterprises to raise funds to develop engineering projects for energy conservation.

The method of public bidding should be used in developing energy conservation engineering projects.

Art 42: In developing major energy conservation projects, it is necessary to ask the designing and consulting units approved by the energy conservation administrative organ to provide technical and economic proof or make feasibility studies. Based on the provisions of the contracts, the designing and consulting units must shoulder due legal responsibilities for the technical reliability and economic rationalization of the construction projects.

Art 43: Major energy conservation development projects must be included in the state key scientific research plans. Energy conservation organs in various localities and under various departments should actively organize the study and propagation of applied technology for energy conservation.

Art 44: With the examination and approval of the responsible department under the State Council, preferential prices will be set for high quality, energy-efficient products which are in great demand.

New energy-saving products appraised and approved by the department concerned will be exempt from product and value-added taxes for a given period according to the "Interim Regulations Concerning Some Policies in Promoting Technical Advancement in State-run Enterprises" approved by the State Council and distributed among the State Economic Commission and other departments.

Art 45: In importing technology and equipment from abroad, it is essential to take technical conditions, economic results and energy consumption into consideration in an overall manner. Priority must be given to importing energy-efficient products, while the import of products with higher energy consumption must be restricted.

Art 46: Machinery, equipment, testing meters and instruments imported by various enterprises for carrying out technical transformation in an effort to save energy will enjoy exemptions or reductions of import duties and product taxes (or the value-added taxes) according to state tax laws.

Art 47: Manufacturing enterprises must stop turning out or selling, within a prescribed period, those electric products that the state has already declared to be obsolete.

When enterprises still use those electric products and equipment with excessively high rates of energy consumption--and which the state has already declared to be obsolete--they must stop using these obsolete products and pieces of equipment or renovate them according to the regulations of the responsible department. They are also forbidden to relocate such products and equipment for other uses.

Art 48: The various localities and departments should expand the market for energy conservation technology, and make compensated transfers of technology. Service centers to propagate energy conservation technology, provide enterprises with consultation and information services, test energy resources and carry out other vocational activities may be set up on the basis of needs and conditions.

Ch VIII: Rewards and Penalties

Art 49: The state will periodically carry out activities to choose advanced energy-saving units and commend those units that have scored remarkable achievements in saving energy.

Art 50: The state encourages the masses of people to participate in various energy conservation activities. Those who put forward rational proposals for energy conservation should be given rewards by the beneficiary units on the basis of the economic benefits reaped from these proposals and according to state regulations. The state protects the legitimate rights of those who criticize energy-wasting phenomena and bans anyone from taking countermeasures against them.

Art 51: With the approval of energy conservation administrative organs and other relevant departments, state-run industries and enterprises in the field of transportation may draw energy-saving rewards according to the relevant regulations of the state on rewarding those who save special fuel and raw and other materials, if such industries and enterprises meet the requirements specified in the provisions of Arts 9, 10, 11 and 12 of these regulations.

Art 52: Measures to give awards to those who conserve water in cities and in hydraulic power generation will be formulated separately by the Ministry of Urban and Rural Construction and Environmental Protection and the Ministry of Water Resources and Electric Power. They will be promulgated and go into effect after being examined and approved.

Art 53: A unit or individual that violates these regulations shall be subjected to criticism and education by an energy conservation supervisory organ if the case is not relatively serious. If the case is fairly serious, it should be handled in accordance with the following provisions, depending on the nature of the case:

A. Oil supplies will be discontinued to an enterprise that fails to abide by the provision explained in the first paragraph of Art 18 by continuing to burn oil beyond a time limit. The decision to discontinue oil supplies should be made by an organ in charge of reducing the use of oil and the fuel supply department will be notified for implementation.

B. In the case of an enterprise that goes against the provisions contained in the second paragraph of Art 21 and the provisions under Art 27 by resuming or developing energy-inefficient production using small blast furnaces, converters, electric furnaces, rolling mills, thermal power stations and small nonferrous smelting and electrolysis or by continuing to preserve the indigenous method of coking, the local energy conservation supervisory organ may decide to discontinue its energy supplies and the department of administration for industry and commerce may suspend its business license.

C. With regard to an enterprise that violates the provisions under Art 25 by expanding boiler capacities without prior approval, a fine may be imposed by the local energy conservation supervisory organ. The fuel supply department should withhold the energy supply needed for the unauthorized expanded portion of the boilers.

D. With regard to an enterprise that violates the provisions under Art 47 by continuing, after the prescribed time limit, to produce, market, use or make other use of the mechanical or electrical products and equipment referred to under this article, the banks may stop its loan payments and the local energy conservation supervisory organ may decide to suspend its energy supplies or impose a fine.

E. In the case of an enterprise that violates the relevant articles and provisions listed in above and causes a serious waste of energy as a consequence, in addition to the aforementioned measures, the energy conservation supervisory organ should assist the concerned departments in investigating the enterprise's responsible persons and other persons directly responsible for the waste to affix administrative responsibility.

A unit or individual punished by the aforementioned measures is not exempted from continued fulfillment of the relevant obligations set forth under these regulations.

Art 54: "The fees charged for the portion of energy in excess of the fixed quota should be collected at an increased price. The payment incurred through the increased price must not be included as part of the cost or nonoperational expenses. The income realized by the localities from the increased price should be controlled and arranged by the local energy conservation supervisory organs for use in enforcing energy conservation measures.

An enterprise that has made payments at the increased price is not exempted from undertaking the responsibility of paying the fine imposed for its violation of the provisions of these regulations.

Ch IX: Propagation and Education

Art 55: The propaganda departments should actively propagate the principles and policies of and scientific and technical knowledge in energy conservation. They should make full use of the radio, television, newspapers, periodicals, seminars and other means to raise the understanding of the people of the whole country in energy conservation work and improve their scientific and technical knowledge.

Art 56: The education departments should actively carry out the training of qualified energy conservation personnel at different levels. Universities and technical secondary schools should act in a planned way to train senior and middle-ranking energy conservation supervisory personnel.

Primary and secondary schools should pay attention to imbuing young people with knowledge in energy matters and developing their consciousness of energy conservation.

Art 57: Plant directors of the enterprises in charge of energy conservation work, administrative personnel of the energy conservation organs and the operation workers concerned should all undergo energy conservation training in a planned manner. The tested results achieved in such training should be considered as part of the overall assessment of the workers and staff members.

Ch X: Appendices

Art 58: The provincial, autonomous regional and municipal people's governments, concerned departments of the State Council and the PLA units may formulate detailed enforcement rules and regulations in accordance with these regulations and in combination with the specific situations.

Art 59: The State Economic Commission will be responsible for the interpretation of these regulations.

Art 60: These regulations will come into force on 1 April 1986.

Beginning from the date these regulations become effective, the "State Council Directive on Reducing the Burning of Oil by Various Kinds of Boilers and Industrial Kilns and Furnaces," the "State Council Directive on Conserving Electricity," the "State Council Directive on Conserving Oil as a Finished Product," the "State Council Directove on Conserving Coal for Industrial Boilers and Furnaces" and the "State Council Directive on Developing Coal Washing, Dressing and Processing and Reasonable Use of Energy" will be abolished.

/12228
CSO: 4013/62

CHINA'S COAL LIQUEFACTION TECHNOLOGY NOW AT WORLD LEVEL

Beijing ZHONGGUO MEITAN BAO in Chinese 14 Dec 85 p 1

[Article: "Our Coal Liquefaction Technology Reaches World Level; Technology Now Making Transition From Experimentation to Practical Application"]

[Text] On 23 November, a number of capital city news reporters visited the Beijing No 1 Paper Mill where they witnessed the successful burning of hydrogenerated coal in an experiment that had been in progress for some 15 days. Spokesmen told the reporters that China's coal liquefaction technology had reached world levels and was now making the transition from experimentation to practical application. This particular test ran from 500 to 700 hours and consumed some 2,000 to 3,000 tons of the mixture.

The emergence of coal liquefaction technology immediately caught the attention of various countries in the West and the United States and Sweden were among the first to develop it and respectively have built plants to produce 250,000 tons and 200,000 tons a year; experiments have been conducted involving boilers of 20 and 30 steam/tons. Considerable progress [in the field] has also been made in Canada, Japan, and West Germany. Today, some countries are in the process of making the transition from the experimental stage of commercialization. Assistant Chief Engineer of the Ministry of Coal Industry Hao Fengyin stated that following several years of research and experimentation, the additive development, fuel technology, and extrusion materials associated with Chinese coal liquefaction technology have reached international standards. The Beijing No 1 Paper Mill has been keenly interested in hydrogenated coal experiments [as a way] to substitute coal for oil. The plant's chief engineer stated that based on the experiments with their 20 steam/ton boiler, 1.8 tons of the mixture can replace 1 ton of heavy oil so in the period of a year close to 1 million yuan could be saved in fuel costs--an obvious economic benefit. According to statistics, about 30 million tons of heavy oil are used yearly in Chinese boilers so coal liquefaction technology that would permit coal to be substituted for oil has a very bright future.

/9274
CSO: 4013/71

CONVERSION FROM OIL TO COAL WILL HAVE BIG IMPACT ON INDUSTRY

Beijing RENMIN RIBAO in Chinese 2 Feb 86 p 1

[Text] "Liquefied coal preparation and combustion technology" was a major item of the Sixth Five-Year Plan. Working together, the Chinese Institute of Mining, Zhejiang University, the 52d Institute of the Ministry of Ordnance Industry, the Planning and Design Institute of the Ministry of Coal Industry, the Fushun Bureau of Mines, the Zhaozhuang Bureau of Mines, and the Beijing No 1 Paper Mill have successfully completed an industrial application experiment which passed State certification a few days ago. In a 560-day load operation using the 20 steam/ton fuel oil boiler at the Beijing No 1 Paper Mill it was demonstrated that 1.8 tons of this low-polluting liquid coal fuel could replace 1 ton of heavy oil for a saving of more than 1 million yuan a year.

The coal-water misture contains 70 percent coal and 30 percent water and a very small amount of additivies. It has the viscosity of oil and does not precipitate in storage; in vapor form the fuel has a combustion efficiency of 92-97 percent. With minor modifications, industrial kilns and boilers that use oil as a fuel can be converted to this mixture.

Although China now faces oil shortages, 30 to 40 percent of its oil is burned in industrial boilers. If this fuel oil could be used as raw material for the chemical industry or directly exported, some hundreds of millions of yuan could be earned yearly. China's coal resources are rich and substituting these resources for oil has become a basic government conservation policy.

Liquefied coal is one of the comprehensive-use products produced in the processing of coal. At present, two production facilities have taken shape in Fushun in Liaoning Province and in Zhaozhuang in Shandong Province with respective yearly capacities of 50,000 tons and 30,000 tons.

/9274
CSO: 4013/71

BRIEFS

COAL SLURRY TO SAVE OIL--Beijing, 29 Jan (XINHUA)--A newly developed fluid fuel will save China 210 million bbl of fuel oil every year, according to today's WORKERS DAILY [GONGREN RIBAO]. The fuel, known as coal slurry, is made from powdered coal, water, and additives. It is claimed to be suitable for use in heating boilers, which consume 210 million bbl of fuel oil annually in China, including 84 million bbl of crude oil, one-tenth of the country's crude oil output. The 3-year research project on coal slurry was conducted by scientists from the Coal-processing Association and Zhejiang University. Tests at the Beijing No 1 Paper Mill showed that 1.8 tons of coal slurry can replace 1 ton of fuel oil. Two coal slurry production lines with a [total] annual production capacity of 80,000 tons have been built as part of the research project, the paper said. [Text] [Beijing XINHUA in English 0704 GMT 29 Jan 86 OW]/12766

CSO: 4010/32

POWER NETWORK

TECHIMPORT ACCEPTS FOREIGN BIDS FOR POWER EQUIPMENT

OW251434 Beijing XINHUA in English 1311 GMT 25 Jan 86

[Text] Beijing, 25 Jan (XINHUA)--The China National Technical Import Corporation [TECHIMPORT] will purchase machinery, building materials, and generating and transmission equipment for its energy construction projects in the form of international bidding this year.

The projects include the Lubuge hydropower station in Yunnan, Beilungang thermal power station in Zhejiang, Shuikou hydropower station in Fujian, Yantan hydropower station in Guangxi and the 500 kV transmission line from Xuzhou to Shanghai.

An official from the International Tendering Company of TECHIMPORT told XINHUA that the World Bank will provide loans equivalent to nearly U.S.$1 billion for these projects.

The Shuikou hydropower station on the Min Jiang in Fujian is the biggest of these projects, with a generating capacity of 1.4 million kW in its first phase of construction. The World Bank will provide a loan for its construction.

Firms from Canada, the Federal Republic of Germany, France, Italy, Japan, Sweden, Switzerland, and the United States attended the bid-opening ceremony for the Lubuge project today, held under the auspices of the International Tendering Company. A total of 12 bids was received.

The bids were mainly for purchasing energy management systems and communications system for the project, which will use a loan equivalent to more than U.S.$140 million provided by the World Bank.

The Lubuge hydropower station, located about 200 km east of Kunming, the capital of Yunnan Province, is China's first project of its kind constructed using a World Bank loan. It will be completed in 1989 and have a total generating capacity of 600,000 kW.

/9738
CSO: 4010/31

IMPORTANCE OF DEVELOPMENT OF NEI MONGGOL'S POWER INDUSTRY STRESSED

SK100246 Hohhot NEIMENGGU RIBAO in Chinese 16 Dec 85 p 4

[Article by Wu Liji [3527 0500 0679], deputy director of the Nei Monggol Power Industrial Administrative Bureau: "Accelerate the Development of Nei Monggol's Power Industry"]

[Text] Because the Nei Monggol Autonomous Region is adjacent to the eight provinces and regions in north, northwest, and northeast China, accelerating the development of Nei Monggol's power industry is significant for the economic development of both Nei Monggol and north, northwest and northeast China.

Our region has many favorable conditions for developing the power industry. For instance, coal deposits are extremely rich here. As of 1984, the proven coal deposits in the region totaled 208.5 billion tons, and the Jungar, Wuhai, Yiminhe, Huolinhe, and Yuanbaoshan coal fields have already become the major coal bases of our country. Nei Monggol has already scored some achievements in the first stage of the development of the power industry, and has completed the feasibility study of several power plants with a total installed capacity of 8 million kW. In addition, Nei Monggol has stored up a considerable amount of "available coal resources" for building the power industry.

The question in the future is how to take advantage of these favorable conditions to accelerate the development of the power industry. In accordance with the important plans of central and regional authorities on economic development, we must greatly increase the power industry mainly by depending on expansion of the scale of construction. In the near future, we should pay attention to work in the following aspects:

First, we should adopt different measures for the areas with different quality of coal deposits. Abounding in brown coal whose ash content is high and quantity of heat low, the eastern part of our region is suitable for building large hydropower stations where the principle of "fixing the coal production target according to the electricity supply capacity" should be implemented. Abounding in quality coal whose ash content is low and quantity of heat high, the western region should give priority to power transmission in line with the principle of "fixing the electricity

generation target according to coal deposits" and the principle of developing the intensive processing of energy resources, and should strive to achieve an overall balance among coal production, electricity generation and transport capacity, in order to utilize energy resources reasonably and comprehensively and make the best use of our favorable conditions.

Second, we should adhere to the principle of simultaneously developing large, medium-sized and small power plants. Large power plants constitute the backbone of the power industry, and their development is one of our future targets. However, in light of the state financial and material capacity, at the present time we should speed up the development of medium-sized and small power plants.

Third, we should vigorously build hydropower stations. Both the Huang He and Dai Hai in our region provide us with favorable conditions for developing hydropower stations. We should build a number of small hydropower stations in a planned way in order to relieve the burden on thermal power stations and improve the power supply service.

Our region is rich in wind energy resources. After many years of experimental work, our region has already achieved success in generating electricity with wind power, and has begun to popularize it on an extensive scale. As of now, the region has installed more than 10,000 wind-driven generators. In the next 5 years, in the course of using wind-driven generators to ease the shortage of power supply to herdsmen in their daily life, we should gradually apply the wind-driven generators to production.

Fourth, we should gradually move those key energy-inefficient industrial enterprises to the energy base areas. A principle construction of the power industry is that power stations should be built in places near those enterprises which consume large amounts of energy. In many places other than the Nei Monggol Region, the power shortage has already restricted the development of energy-inefficient industries. But in our region, abundant power resources provide conditions for developing energy-inefficient industries. Therefore, we should develop, step-by-step and in a planned manner, the ferrous, the non-ferrous, and heavy industries which consume much energy, and strive to promote the power industry with other industries, promote coal production with the power industry, and effect a comprehensive economic development.

Fifth, we should strive to raise funds to run power industry enterprises. A large amount of capital will be needed to run power industry enterprises. At present, the most conspicuous problem is the shortage of funds for building the power industry. During the Sixth Five-Year Plan, the yearly average real investment in building the power industry was 50 million yuan. According to the Seventh Five-Year Plan, however, the yearly average investment in building the western power grid alone will reach 150 million yuan. Therefore, we should vigorously encourage state units and collectives in and outside the region to raise funds through various channels to run power industry enterprises in order to boost the region's power industry and make contributions to the four modernizations.

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CSO: 4013/58

POWER NETWORK

DEVELOPMENT OF NORTHWEST POWER INDUSTRY DURING SIXTH FIVE-YEAR PLAN

HK071523 Xi'an Shaanxi Provincial Service in Mandarin 2300 GMT 6 Jan 86

[Text] During the Sixth Five-Year Plan, the electric power industry in northwest China developed greatly. By the end of 1985, the installed capacity in northwest China totaled 7.4 million kilowatts and its electric energy production totaled over 3.2 million kilowatt-hours. At present, its daily electric energy production is equal to three times the annual electric energy production in the period before 1949.

During the Sixth Five-Year Plan, the state invested 3 billion yuan in the electric power industry in northwest China, thereby expediting the construction of the Longyangxia hydropower station in Qinghai and the Ankang hydropower station in Shaanxi Province, as well as the construction and expansion projects of five major power plants. The state also built a number of related power transmission projects, including the erection of more than 3,000 kilometers of high-tension power transmission lines. Thus, the state linked the grids between Ningxia and Shaanxi, between Gansu and Qinghai, between southern Shaanxi and Sichuan, and between the central Shaanxi plain and Henan.

Moreover, various localities raised funds for building over 3,000 small hydropower stations and thermal power plants with a total installed capacity of more than 1.2 million kilowatts. The rural areas also erected more than 10,000 kilometers of 35-kilovolt power lines and built over 600 35-kilovolt transformer substations, thereby forming a comprehensive power supply network in the rural areas and electrifying 98 percent of counties and cities in northwest China.

/8918
CSO: 4013/74

POWER COOPERATION BETWEEN HONG KONG, GUANGDONG DETAILED

HK130840 Hong Kong SOUTH CHINA MORNING POST in English 13 Jan 86 p 6

[From the "South China Beat" column, based on research by Albert Chan and compiled by Timothy Jim: "China Light Lends a Hand, Says Kadoorie"]

[Text] Hong Kong is playing a key supporting role in China's ambitious energy exploration effort which is moving into high gear as the country this month enters its Seventh Five-Year Plan.

Hong Kong's China Light and Power Co [CLP] and its Guangdong counterparts have already forged close links in the past 7 years since CLP was plugged into Guangdong's supply grid.

This cross-border co-operation could be further boosted in the near future, judging from current and planned projects.

Apart from the sale of electricity to Guangdong, CLP has been providing Guangdong General Power Co (GGPC) access to the company's expertise and training facilities.

It has also been assisting GGPC in its planning and economic studies, according to Lord Kadoorie, CLP's chairman.

In a recent interview with the SCM POST, Lord Kadoorie said he believes Guangdong will continue to buy electricity from CLP as the province will not be self-sufficient "for a number of years to come."

CLP has been selling electricity to Guangdong for almost 7 years.

In a few months' time, CLP's supply will also reach Shekou Industrial Zone which is about 30 km west of Shenzhen.

The sale agreement was reached in July last year between CLP and the China Merchants Steam Navigation Co which manages Shekou.

The first electricity sale agreement CLP entered with China took effect in April 1979--only a few months after China declared its open door policy.

This agreement lasted until March 1982 and was renewed to continue until the end of last year.

The latest agreement, which was signed last month, will take care of the supply from this month up to the end of next year.

During the first supply period, from April to end of September, 1979, Guangdong bought 157 million units from CLP.

The amount of power sent across the border has increased progressively since 1982. The figures are:

1980--310 million units.
1981--254 million units.
1982--239 million units.
1983--323 million units, a 35 percent rise.
1984--641 million units, a 98 percent rise.
1985--988 million units, a 54 percent rise.

"The demand for energy is one of China's first requirements and is almost unlimited," said Lord Kadoorie.

But he was quick to add that any sales of electricity to China must fall within the concept that the CLP was set up to serve Kowloon and the New Territories rather than developments taking place in China itself.

Turning to the running of CLP, Lord Kadoorie agreed that political jitters in the territory have had an adverse impact on the company.

"Uncertainty as to 1997 has certainly made it more difficult for CLP to retain qualified staff," he said.

"But training programs were instituted within the company years ago in order to overcome this problem."

He also disclosed that the company is currently estimating the annual growth in electricity demand at around 6 percent.

He said this was a conservative estimate judging from the 10 percent average annual growth over the past 10 years.

The forecast has shown that Castle Peak's fourth and last unit will be required in 1990, and a firm order has been placed, he said.

Another co-operation project between CLP and Guangodng is a feasibility study of a pumped storage generation scheme in the province.

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CSO: 4010/33

POWER NETWORK

GUANGDONG SEEKS INCREASE IN POWER-GENERATING CAPACITY

HK130846 Hong Kong SOUTH CHINA MORNING POST in English 13 Jan 86 p 6

[From the "South China Beat" column, based on research by Albert Chan and compiled by Timothy Jim: "Power Is the Top Priority"]

[Text] Guangdong Province is working hard to boost its power generating capacity and hopes it will soon be able to stop buying electricity from its Hong Kong supplier, China Light and Power.

The head of the provincial power company is optimistic that Guangdong will be in a position to stop buying from Hong Kong within 2 or 3 years, which in turn will mean substantial cash savings.

China Light and Power sold almost 1 billion kWh of electricity to Guangdong last year, earning 401 million--the equivalent of 8 percent of the company's today sales.

Guangdong General Power Co-director and General Manager Mr Chen Gang told the South China Beat that the provincial government is making energy resources exploration one of its top priorities in China's current 5-year plan.

"We hope to be self-sufficient in electricity supply as soon as possible," he said.

Guangdong currently consumes about 20 billion kWh of electricity a year, but the power plants in the province can only generate 15 billion at present.

Development plans drawn up for the next few years, however, could see a substantial boost in domestic electricity generating capability.

These include construction of new power stations at Sha Jiao and Huangpu as well bringing in additional supplies from Guangxi, which has rich hydropower resources.

Sha Jiao will have five generating units, scheduled to be commissioned in three stages starting late this year.

The first unit is already under construction and will swing into operation before the end of this year with a capacity of 200 magawatts.

Two more units at the plant will be commissioned next year, boosting the capacity of 750 MW.

The last two units will be ready the following year, taking the total capacity to 1,300 MW--roughly the same as the China Light and Power's Castle Peak A station.

The next major power station will be in Huangpu and will consist of two 300-MW units that are expected to start supplying the province in 1989 and 1990.

This means Guangdong will have an additional 1,900 MW of power generating capacity by early 1990, 2 years before the 1,800-MW Daya Bay plant is scheduled for completion. Another new and vital source of power will be in Guangxi Province, which is developing the country's largest hydropower plan--the ambitious Hongshui scheme.

This will have a combined generating capacity of 11,000 MW, six times as much as the Daya Bay plant.

Energy planners in China are even hoping to supply Hong Kong with electricity from this scheme if there is a surplus. At today's prices, Guangdong buys electricity from Guangxi at about one-third the cost from China Light and Power.

Under an agreement between the two provinces, Guangxi will supply power to Guangdong starting next month. The two provinces were recently linked with a common power grid.

Guangxi is expected to supply Guangdong with between a half and 1 billion kWh per year, which is roughly the same as the amount Guangdong now gets from Hong Kong.

With all these projects coming up, Mr Chen believes the shortage of power in Guangdong will be considerably relieved after next year.

"It may no longer be necessary to rely on China Light and Power after 1988," he said.

One major factor that affects the quantity of electricity that the Guangdong government can buy is its reserves of foreign currency.

Under the latest agreement with China Light and Power, which was signed last month, Guangdong will buy at least 500 million kWh per year from Hong Kong.

"The amount could increase if there is a need and if we have the money on hand," Mr Chen said.

"We have been assured that the government will foot the bill for 500 million kWh but anything more than that is up to the discretion of the government and the availability of foreign currency," he explained.

Guangdong must pay for the electricity it buys from Hong Kong in Hong Kong currency.

"We have to pay HK$0.40 for each kWh of electricity purchased from Hong Kong, but electricity from Guangxi is only 0.05 yuan (HK$0.125) per unit. So you can see how much we could save if we no longer needed to buy from Hong Kong," he said.

/8918
CSO: 4010/33

POWER NETWORK

YUNNAN STEPS UP CONSTRUCTION OF FIVE BIG POWER FACILITIES

Beijing RENMIN RIBAO (OVERSEAS EDITION) in Chinese 4 Jan 86 p 1

/Text/ Kunming, 3 Dec--Li Degang, head of the Yunnan Provincial Electric Power Bureau, announced to reporters today that Yunnan will become a major power base serving southwest China.

He stated that the province is now in the process of constructing five large- and medium-sized hydroelectric and thermal power facilities with a total installed capacity of 2.95 million kilowatts to go on stream during the period of the Seventh Five-Year Plan (1986-1990).

According to statistics, as of the end of last year, the province's power stations and plants had an installed capacity of nearly 2 million kilowatts.

Surveys by the relevant provincial departments have shown that Yunnan has rich hydropower resources in more than 600 large and small rivers. Among these are the Jinsha Jiang, the Nu Jiang, the Lancang Jiang, the Hong He, the Nanpan Jiang, and the Irrawaddy River, six big river systems that have some 71 million kilowatts of exploitable hydraulic resources. Only about 1.7 percent of these resources is being used today.

Li Degang added that the Lancang Jiang is one of the biggest river systems in the country in terms of hydropower reserves. On this one river alone, 12 cascade power stations with a total of 18 million kilowatts could be constructed.

/12228
CSO: 4013/75

BRIEFS

SHANDONG POWER GRID--As of 10 December 1985, the Shandong power grid had generated a total of 23,301 billion kWh of electricity, prefulfilling the annual power generation plan by 21 days. [Excerpt] [Jinan DAZHONG RIBAO in Chinese 15 Dec 85 p 1 SK] /8918

ANHUI 300,000 KW UNIT--Hefei, 13 Jan (XINHUA)--An electric power generator with a capacity of 300,000 kW began operation Saturday in coal-rich Huainan, one of China's energy bases in Anhui Province. The coal-fired unit at the newly built Luohe Power Plant will provide 1.7 billion kWh a year, easing eastern China's power shortage. Altogether, Huainan produces 10 million tons of coal and more than 5 billion kWh of electricity a year. [Text] [Beijing XINHUA in English 1440 GMT 13 Jan 86 OW] /8918

HUNAN 7TH FYP PROJECTS--According to HUNAN RIBAO, in order to ensure steady and sustained development of the province's economy during the Seventh Five-Year Plan and to meet the power needs of the Hengyang-Guangzhou railroad double-tracking project--a major national artery--the Hunan Provincial CPC Committee and government have decided that during the period of the plan the focus will be on expanding the Yueyang thermal power plant, constructing the Leiyang power plant and the Dongjiang hydropower station, and constructing the ultra-high voltage power transmission line from Gezhouba to Changde and Zhuzhou. When these four major protects are completed, they will increase the province's installed generating capacity by 16 billion kilowatts and boost annual power generation by 6 to 6.5 billion kilowatt-hours. This will represent an increase of 40 percent over the Sixth Five-Year Plan. With the addition of some power to be supplied from Gezhouba, the province's power shortage will be eased to some extent. [Text] [Changsha Hunan Provincial Service in Mandarin 2300 GMT 12 Jan 86 HK] /8918

ZHUJIANGKOU STRIKES NEW WELL--According to the China Offshore Oil Corporation, China has struck another high-yielding oil well in the South China Sea's Zhujiangkou basin, and it is estimated that more than 1,600 tons will be produced daily. This well is located in the Phillips Group tract 260 km to the southeast of Guangzhou. It is the third high-yield well struck in this tract, the two previous wells yielding 922 tons and 2,000 tons of crude a day. [Text] [Shijiazhuang HEBEI RIBAO in Chinese 30 Dec 85 p 2] /9274

CSO: 4013/72

NEI MONGGOL POWER INDUSTRY--As of 13 December, the power departments in Nei Monggol Autonomous Region had generated 4,208.52 million kWh, prefulfilling the annual target by 18 days. [Summary] [Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 18 Dec 85 SK] /6091

ZHEJIANG 6TH FYP POWER GROWTH--Zhejiang's power industry developed rapidly during the Sixth Five-Year Plan. During this period, the province expanded its generating capacity to 1,085,000 kilowatts, equivalent to 40 percent of the total generating capacity registered at the end of 1980. During the 5-year period, the province's power plants generated a total of 53.9 billion kWh of electricity, or a nearly 91 percent increase over the previous 5-year period. It is expected that, by the end of this year, the province will have a total generating capacity of 3.8 million kilowatts and will be able to generate 12.2 billion kWh of electricity annually. [Excerpts] [Hangzhou ZHEJIANG RIBAO in Chinese 18 Nov 85 OW] /6091

ANHUI 500KV LINE COMPLETED--The Huainan-Fanchang section of East China's first 500,000-volt extra-high voltage transmission line was completed on 26 November. This is the first-stage project of the entire transmission line from Huainan to Shanghai. The line is 240 km long. [Summary] [Hefei Anhui Provincial Service in Mandarin 1100 GMT 2 Dec 85 OW] /6091

LIAONING 220KV LINE OPERATIONAL--The 220-kV high tension power transmission line extending from the Taiping Wan power station to the Dandong primary power substation went into operation on 10 December. The Taiping Wan-Dandong transformation project is a supporting project of the Taiping Wan power station. The project was initiated in July 1984 and completed in November 1985. The quality of this project was proven to be up to standards. [Summary] [Shenyang Liaoning Provincial Service in Mandarin 1030 GMT 10 Dec 85 SK] /6091

HEBEI SURPASSES PLAN--16 Dec--As of today, [1985] Hebei Province's electric power system has generated 13.15 billion kilowatt-hours of electricity, 150 million kilowatt-hours over the plan. [Excerpt] [Shijiazhuang HEBEI RIBAO in Chinese 17 Dec 85 p 1] /9274

SHANXI INCREASES INSTALLED CAPACITY--The task handed down by the state this year of adding 700,000 kW to Shanxi's installed generating capacity was completed on 15 December. The order in which the 700,000 kW was completed is: 200,000 kW from the Shentou No 5 generator on 24 September; 200,000 kW from the No 3 generator of the Datong No 2 plant on 24 October; 100,000 kW from the Zhangze plant No 1 generator on 24 October; and 200,000 kW from the Shentou No 6 generator on 25 December. Previously, the greatest installed capacity that had been added in a single year in Shanxi was 400,000 kW in 1984, so the 700,000 kW installed this year is an all-time record. In addition, Shanxi also completed two 500 kV ultrahigh tension transmission lines from Datong to Fangshan and from Shentou to Datong as well as the Yanggao transformer station. [Text] [Taiyuan SHANXI RIBAO in Chinese 17 Dec 85 p 1] /9274

TIANJIN-HEBEI TRANSMISSION LINE--The installation of the 220 kV high-tension power transmission line between Hancheng in Oangshan City, Hebei Province, and Dagu District, Tianjin, was completed on 29 December. This project was jointly undertaken by the Tianjin and Benxi power transmission and transformation engineering companies. With the operation of this transmission line, the 170,000-kW electricity from the Douhe Power Plant in Tangshan can be transmitted to Tianjin, which will relieve the strain on Tianjin's power supply. [Text] [Tianjin City Service in Mandarin 0030 GMT 31 Dec 85 SK] /8918

GUANGDONG GROWTH PLANS--Guangzhou, 11 Jan (XINHUA)--Guangdong Province in southern China expects to add 3 million kilowatts of power generating capacity during the Seventh Five-Year Plan (1986-1990). According to local electric power authorities, the power generating capacity to be added will match the total increase in the last 15 years. One million kilowatts of the added generating capacity will come from the eight major power plants now under construction. Another 2 million kilowatts will come from 9 plants to be built or expanded during the plan period. In addition, the province will construct 700 kilometers of 220 kV and 100 kilometers of 550 kV power transmission lines and 12 power transformer stations, each with a capacity of 220 kV. [Text] [Beijing XINHUA in English 1550 GMT 11 Jan 86 OW] /12858

POWER TRANSMISSION PROJECT--The Wenchun-Muling power transmission and transformation project was completed and went into operation on 15 December 1985. This project includes the construction of a 68-kilometer long 220 kV power transmission line and a 220 kV superhigh tension substation. This project has played a part in easing the power shortage in the coastal city of Suifenhe. [Summary] [Harbin HEILONGJIANG RIBAO in Chinese 20 Dec 85 p 1 SK] /8918

HENAN 200,000 KW UNIT--Zhengzhou, 30 Dec (XINHUA)--Another 200,000-kW generating unit became operational at the Jiaozuo Power Plant in Henan Province on 20 December. The Jiaozuo Power Plant is located at the Jiaozuo mining area, an important bituminous coal production base. The new generating unit will relieve the power shortage in Henan Province and play an important role in regulating hydropower and thermal power supply in Hubei and Henan Provinces. [Summary] [Beijing XINHUA Domestic Service in Chinese 1532 GMT 30 Dec 85 OW] /8918

HEILONGJIANG 1985 OUTPUT--As of 21 December 1985, the Heilongjiang Provincial electric power front had fulfilled its state-assigned power generation plan, generating 16.04 billion kWh of electricity and showing an increase of 6.8 percent over 1984. Power supplies increased by 140 million kWh, or 7.2 percent, over the previous year. [Summary] [Harbin HEILONGJIANG RIBAO in Chinese 22 Dec 85 p 1 SK] /12712

YUNNAN INCREASES GENERATOR CAPACITY--Kunming, 1 Feb (XINHUA)--Electricity is now available in almost all the 115 counties in Yunnan Province, one of China's less developed areas, reports the YUNNAN DAILY. The province has increased its electricity generating capacity by 19.66 percent in the past 5 years, bringing the total generating capacity to 2 million kilowatts. This includes 550,000 kilowatts for small hydropower stations started by local authorities or peasants themselves. Yunnan is gearing up to become a major electricity supplier for southwest China. [Excerpts] [Beijing XINHUA in English 0242 GMT 1 Feb 86 OW] /6662

JILIN 220 KV LINE--The 220 kV high-tension power transmission running through the Longliao plain in Jilin Province, which links Siping, Tongliao and Changchun, was completed in late October 1985. Since the two sets of 200 MW power generating equipment of the Tongliao power plant went into operation in mid-December, power has been delivered in Changchun through this transmission line. [Excerpt] [Changchun JILIN RIBAO in Chinese 13 Jan 86 p 1 SK]

ZHEJIANG 6TH FYP GROWTH--During the Sixth Five-Year Plan, Zhejiang made rapid progress in power generation., Over the past 5 years, the province's total installed capacity increased by nearly 1 million kilowatts; its total generating capacity doubled that of the Fifth Five-Year Plan. By the end of 1985, the total installed capacity of the province's hydropower stations and thermal power plants of 500-kilowatt capacity or more had reached 3.21 million kilowatts. During the Sixth Five-Year Plan, Zhejiang invested some 1.24 billion yuan in power facilities, including the installment of nearly 2,000 kilometers of 110 kV transmission lines. [Summary] [Hangzhou Zhejiang Provincial Service in Mandarin 1000 GMT 9 Feb 86 OW]

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BENEFITS OF THREE GORGES PROJECT DETAILED

Beijing ZHONGGUO SHUILI [WATER CONSERVANCY IN CHINA] in Chinese No 9, 15 Sep 85 pp 9-11

[Article by XINHUA Reporters Yu Quanyu [0827 2938 1008] and Wang Haizheng [3769 3189 1767]]

[Text] Editor's note: During the spring of 1985, some comrades were vocally urging that the Sanxia [Three Gorges] project not be built or that it be postponed, and that it be replaced with a number of large or medium-scale power stations. These comrades feared that the Sanxia project would spend a great deal of money and take a long time to build, and that the state could not bear the financial burden. They were afraid that the silt problem could not be solved, which would silt up the large dam and obstruct navigation. They also feared that China's technical forces could not support this enormous world-famous project. To clarify these questions, XINHUA reporters travelled downriver from Chongqing to examine the Three Gorges on the Chang Jiang and the planned site of the Sanxia large dam. They visited with responsible comrades in related departments and academic specialists at Chongqing, Gezhouba, Yichang, Wuhan and other places. Beginning with this issue, our journal will publish a series of reports on their visits and investigations.

Carrying various doubts, concerns, and questions, the reporters went to visit the Three Gorges and various units related to the Sanxia project. After their visit and investigation, the first impression of the reporters was that many comrades do not understand the significance of the Sanxia project and feel that its only (or main) role is to generate electricity. Actually, the main goal of building the key Sanxia water conservancy project is flood prevention, followed by power generation and navigation. Even if it can be said that other methods could be substituted for the power generation role of the Sanxia project, there is no way that substitutes can be found for its flood prevention and navigation roles. The Sanxia project should be constructed, and the best opportunity should be grasped to begin it. Missing this opportunity would mean that it would be too late to repent.

I. One Loss From Flood Would Exceed Total Estimated Investments in the Sanxia Project

The Chang Jiang is a flood-prone river with serious flooding in middle and downstream areas. A major flood has occurred every 10 years on the average over the more than 2,000 years between the Han Dynasty and the end of the Qing Dynasty. The fertile Jianghan Plain and Dongting Hu Plain depend on several thousand kilometers of dikes for protection and much of the area within the dikes is several meters to several tens of meters below the floodwater level of the Chang Jiang. Every year millions of people must go to the dikes during the rainy season. Two especially large floods occurred during the 19th century, with a breach at Ochikou on the southern bank of the Chang Jiang in 1860 and a breach of both banks of the Jing Jiang in 1870. The 1931 flood was not especially large, but the breach of the Jing Jiang large dikes drowned 145,000 people and nearly 30 million suffered from the disaster. After Liberation, the People's Government established a flood diversion region on the southern bank of the Chang Jiang and built the Jing Jiang flood diversion gates. During the serious 1954 floods, the gates were opened to divert the floodwaters and protect the Jing Jiang large dike. However, even this led to the deaths of quite a few people, with 47.55 million mu of land inundated and 18.88 million people affected by the flood.

Yearly expenditures of manpower and materials over the past 30 years have prevented breaches of the dikes and floods. The economies of the Jianghan Plain and the Dongting Hu Plain have developed very quickly and there are growing worries that a major flood will occur. The occurrence of a large flood like the one in 1954 (which is entirely possible on the basis of natural laws) would be an extremely serious situation. Should the large dikes on the northern bank of the Jing Jiang be breached, the area along Shashi would be devastated. Protection of the large dike on the Jing Jiang would require the opening of the Jing Jiang flood diversion gates, which also would be disastrous. More than 400,000 people now live in the Jing Jiang flood diversion region and the "people have been full of worries" for quite a while. According to surveys, the occurrence of a large flood like the one in 1954 and regulation based on ideal situations to utilize the flood diversion and storage region would lead to direct losses of 21 billion yuan, which is greater than the total budgeted investments in construction of the Sanxia project. As for those who would be drowned, money cannot be used for calculation.

If the danger of flooding that hangs over the heads of the several tens of millions of people who live to the north and south of the Jing Jiang is to be removed, then the key Sanxia water conservancy project must be built. This project can control more than 95 percent of the floodwater sources in the Jing Jiang region and has three programs, high, medium and low. If built according to the low program (a dam top elevation of 175 meters and normal water storage level of 150 meters), the flood prevention reservoir capacity would be 22 billion cubic meters. If a flood of a severity seen once every century occurs, it could assure that the large dikes along the Jing Jiang would not burst and that there also would be no flood diversion in the Jing Jiang flood diversion region. If a major flood that occurs once in more than 100 years but less than 1,000 the Jing Jiang flood

diversion gates could be opened to divert the floodwaters and no breach of the large dikes along the Jing Jiang could be assured. This would restrict losses to the lowest degree.

For this reason, flood prevention alone makes it necessary to build the Sanxia key water conservancy project.

II. Only Construction of the Sanxia Project Will Make It Possible To Improve River Navigation

The amount of cargo shipped on the Jing Jiang at present is very small and accounts for only 1/18th of cargo shipments on the Chang Jiang. Everyone sighs about "a river of spring water that flows unused to the east." The reason is that the 660-kilometer-long ship channel between Yichang and Chongqing has many curves and steep slopes, flows rapidly and has many dangerous shoals. Moreover, there are 46 single-passage ship channels and 24 locations where they must wind through sandbars, so navigation conditions are very poor. Generally they move barge trains of less than 3,000 tons (one tug towing three barges). The strong current means they carry little cargo. Each horsepower can tow only 0.7 to 0.9 tons of cargo only 1/10th the amount in the middle and lower reaches of the Chang Jiang, so shipping costs are very high.

At Wuhan, the reporters asked a question of leaders and specialists in the Chang Jiang Navigation Management Bureau of the Ministry of Communications; If we do not build the large Sanxia dam and instead adopt a method of controlling ship channels, is a basic improvement in the navigation conditions of the river possible and would 10,000-ton barge trains be able to pass through the Three Gorges? After gathering the opinions of bureau leaders and other engineers, Chief Engineer Rong Tianfu [2837 1131 1381] of the Chang Jiang Ship Channel Bureau told the reporters: besides construction of the Sanxia project, there is no other method for improvement in the river's navigation conditions!

What would be the case if the Sanxia project were constructed? Engineer Yao Lingquan [1202 5107 3123] of the Chang Jiang Basin Planning Office [Chang Jiang Office hereafter], who is responsible for work in this area, provided the reporters with data based on mathematical models, physics models and various other estimates. A dam constructed according to the low program could form a reservoir 400 to 500 kilometers long that could flood 107 dangerous shoals at the dead water level (130 meters), 77 percent of the total number of dangerous shoals in the Yichang-Chongqing ship channel. At the normal water storage level (150 meters), 93 percent of the dangerous shoals could be submerged. The 46 single-passage ship channels that cover a total length of 135 kilometers basically would be eliminated, as would 24 shaol crossing points. A 10,000-ton barge train (one tug with four 3,000-ton barges or three 4,000-ton barges) could pass directly through the Three Gorges to Wanxian County. During the dry season, Yichang also could increase regulated flow by 2,000 cubic meters per second. Improvements to the ship channel would mean that each horsepower could tow seven to ten tons

of freight and reach the level of shipping channels in the middle and lower reaches, a roughly ten-fold increase over the situation at present, which would greatly lower shipping costs. At that time, the "lonely river" would become the "bustling river."

III. The Benefits From Power Generation at the Three Gorges Power Station Would Exceed That of the 20 Power Stations in "Substitute Programs"

Some comrades have proposed that the Sanxia project not be built or that it be postponed, and that it be replaced instead with construction of 20 large and medium-sized hydropower stations. This is the well-known "substitute program." Actually, the "substitute program" is un-economical.

Preliminary design programs have been prepared for only six of these 20 hydropower stations. The remaining 14 only have preliminary plans. Moreover, no preparatory work has been done, so there would be no way to begin construction within the next few years.

Constructed according to the low program, the Sanxia power station would have an installed generating capacity of 31 million kW. The area supplied with electricity would extend east to Shanghai, south to Guangzhou and north to near Beijing. This could play an enormous role in the economy of eastern and central China in the 1990's and 21st century.

Because the Sanxia power station cuts across the Chang Jiang, the yearly utilization time could reach 5,200 hours. This means that guaranteed output from this power station would reach 3.32 million kW and annual power generation would be 67.7 billion kWh. The power output would be one-third greater than for the 20 substitute power stations (their installed capacity also could reach 13 million kW, but yearly utilization time would be less than 3,000 hours).

The Sanxia power station also is superior to the "substitution program" when unit investments are calculated.

The amount of earth and rock engineering per kW of installed capacity is 6.22 cubic meters for the Sanxia power station and 11.96 cubic meters for the "substitute power stations" (note: this is calculated according to the average amount of engineering for the six power stations for which preliminary design programs already have been done, and the same holds true below).

The amount of concrete engineering per kW of installed capacity is 1.76 cubic meters for the Sanxia power station and 2.65 cubic meters for the "substitute program."

Concerning the number of people who must be resettled and the amount of cultivated land that must be flooded per 10,000 kW of installed capacity, the figures are resettlement of 256 people and inundation of 112 mu of land at the Sanxia power station, while the figures for the "substitute program" are resettlement of 399 people and inundation of 266 mu of land.

Even if we do not consider invsetment sharing, which would involve investments of 1,230 yuan per kW of installed capacity and investments of 0.236 yuan per kWh of electric power at the Sanxia power station, the figures still are much lower than the average level of investments for current large and medium-scale hydropower stations in China.

It is apparent from these figures that the power generation benefits of the Sanxia power station are very high while the amount of engineering and losses due to inundation are rather low in relative terms. Not only is the "substitute program" incapable of solving the problem of flood prevention and shipping on the Jing Jiang, it also cannot substitute for the Sanxia Project in terms of power generation (from purely economic considerations).

IV. Our National Strength Can Bear the Investments in the Sanxia Project

The reporters heard people in Beijing saying that once the Sanxia project is begun, the state will have to invest all of its financial resources in it and will be unable to bear the burden. A well-known person also said that the Sanxia project will consume more than $20 billion in foreign exchange, meaning that spending all of the foreign capital that the state can import still will be insufficient. Neither of these statements conform to reality.

According to the project outline developed by the Chang Jiang Office in May 1985, total investments in the Sanxia project would be 15.947 billion yuan renminbi (including around $1 billion in foreign exchange). The figures include 3.547 billion yuan for population resettlement, so the total project cost would be 12.4 billion yuan. This amount of money would be spent over a 17-year period. The principle and interest could be recovered completely from electricity generation alone within 6 years after construction of the project is completed (calculated at 7 percent annual interest and the price of electricity at 0.045 yuan per kilowatt-hour).

There is a 3-year preparation period for the Sanxia project that requires total investments of 1.148 billion yuan (including resettlement costs, same below), so average yearly investments would be less than 400 million yuan. Some 14 years would be required from the formal start of construction to completion of the main project, so average annual investments would be about 1 billion yuan. The peak investment period at 1.306 billion yuan would occur during the seventh year of construction. This is something that our national strength can bear.

The more than 15.9 billion yuan required for the Sanxia project would not come entirely from state coffers. First, the Gezhouba project is an important component part of the Sanxia key water conservancy project and was built in preparation for construction of the Sanxia project. Income from power generation at Gezhouba was 460 million yuan in 1984. After all of the 21 generators go into operation in 1989, it is possible that the yearly income from power generation could more than double, which would provide effective assistance for the Sanxia project. Second, in the eighth year after formal construction on the main body of the Sanxia project gets underway, two

generator sets (1 million kW) will go into profitable operation by generating electricity and afterwards four generator sets (2 million kW) will go into operation each year. In actuality, beginning in the eighth year after formal construction begins, the construction costs of the Sanxia project basically can be supported by the capital recovered from the power generated by the Sanxia power station itself.

Some comrades have said that the investment outline for the Sanxia project is based on current prices and that the actual result may greatly exceed [the estimates] because wages and raw materials prices may rise. Moreover, past experience indicates that few such large projects fail to exceed budgets in reality.

As for this question, the reporters made detailed inquiries. Comrade Wei Yancheng [7614 1693 3821], director of the Chang Jiang Office, and Engineer Xiang Ming [0686 2494], who are responsible for economic budget estimates feel that there will be no major breakthroughs in investment budgets because the amount of engineering (earth and stone, concrete, generator installation) is specified and could not exceed plans.

The reporters feel that the factors of increases in wages and the price of raw materials deserve consideration. If, however, the Sanxia project is not built and other power stations are constructed instead, these also may be subject to increases in wages, the price of raw materials and other factors. Furthermore, the price of raw materials is determined primarily by the price of coal (energy). Is it possible that a rise in the price of coal would not lead to an increase in the price of electricity? In regard to hydropower stations, the advantages and disadvantages in this area may be mutually offsetting for one part. To go back a step, if the costs of the Sanxia project exceed the budget to a substantial degree (of course the utmost efforts must be taken to avoid this situation), a consideration of the benefits of this project in flood prevention, shipping, power generation and other areas still would make the expenditure of additional funds worthwhile.

V. Postponement of Construction of the Sanxia Project Could Result in Enormous Losses

If the Sanxia project is postponed for a number of years, the losses will be enormous. First, a delay of 1 year means that the several tens of millions of people in the Jianghan Plain and Dongting Hu Plain would be subject to the danger of flooding for another year, which would require the expenditure of another year's capital and manpower for flood prevention. Second, a delay of 1 year would delay basic improvements in river shipping by a year, which would have negative effects on the economic development of Sichuan, Hubei, and Guizhou. Second, a delay in starting construction would scatter the technical forces and construction forces that already have been gathered. Bringing them together again in the future to build the Sanxia project would lengthen the construction period and increase expenses.

The Sanxia project will have one very favorable condition over the next few years, which is the existence of the Gezhouba Engineering Bureau. We should thank Premier Zhou Enlai for this.

Premier Zhou expended a great deal of effort for the Sanxia project. He was profoundly aware of the important significance and degree of formidability of building this project and made strategic deployments several years ago. He first organized forces to build the Danjiangkou [mouth of the Dan Jiang] project and then sent these contingents to Gezhouba. These two large projects were used to train staffs and accumulate experience, and they later pressed on without letup toward successful construction of the Sanxia project. Premier Zhou said before his death that "the Gezhouba project is combat preparation for the Sanxia project."

History has proven that the strategic deployments of Premier Zhou were totally correct. The current Gezhouba Project Bureau has 50,000 employees and a large amount of modernized construction equipment. Moreover, it also has built a base area on an enormous scale and has a full complement of equipment at a location only 40-plus kilometers from the Sanxia dam site. This contingent has good political qualities, superb technologies, strong forces and exuberant morale. They broke through technical problems one after another for successful construction of the world famous Gezhouba key water conservancy project, and they have the strength to build the Sanxia project well.

At the Gezhouba work site, the reporters saw that some of the civil construction during the second period of the project already have been completed and that the main work in the future is to install the electricity generators, so there already is a large group of workers who have taken part in excavation, filling and pouring concrete that have nothing to do now. Shifting them to the Sanxia project and linking up the Gezhouba and Sanxia projects would be extremely beneficial in terms of manpower, technology and economics.

[No 10, 15 Oct 85 pp 9-11]

[Text] The question of silting at the Sanxia project is one that concerns everyone the most and that has been debated the most publicly. During their visit, the reporters also were concerned with asking specialists and scholars to educate them on this point. After the visit and investigation, the least that can be said is that the silting question is not as serious as stated and should not cause us to waver in our determination to build the Sanxia project.

I. The Chang Jiang Carries Little Silt and Silt Discharge Is Easy

To bring rivers under control, scientific and technical personnel in China have applied themselves to the study of the silt question for more than 30 years. Silt research in China now stands at the front ranks worldwide and has been acknowledged internationally. Hydrological data on the upper reaches of the Chang Jiang has been accumulated for more than a century and silt data has been accumulated for more than 30 years. Moreover, we have practical experience in solving silting problems at Danjiangkou and at the Gezhouba project, so the situation now is understood fairly well.

The Chang Jiang and the Huang He are different. There are not loess plateaus in the upper reaches of the Chang Jiang and the vegetation is better than in the upper reaches of the Huang He, so the river water has a lower silt content. According to statistics recorded over many years at the Yichang Hydrology Station, each cubic meter of water contains an average of 1.19 kilograms of silt, the maximum amount of silt being 10.5 kilograms. The long-term average silt content is only 1/31 that of the Sanxian station on the Huang He.

The Chang Jiang has a large amount of water and a rapid flow rate. The amount of flow during the driest years at Yichang still was 2,770 cubic meters per second, which is equivalent to the average amount of flow in the Huang He during the rainy season. The flow rate during the driest year is 2 meters per second, which is a very large silt flushing force. The ratio between the silt content and the amount of flow in the Chang Jiang in the Yichang section is only 1/30 that at Danjiangkou on the Han Shui and 1/300 that at Sanmen Gorge on the Huang He. This is a guarantee that the Chang Jiang never will become a yellow [silt laden] river and that the phenomenon of severe silt accumulation will never arise in the Sanxia reservoir.

II. The Reservoir Will Not Be Silted Up and the Power Station Can Be Used Forever

Some comrades in Beijing have stated that after the large Sanxia dam is built, it will be silted up completely within several decades. The reporters posed this question everywhere during the visit and investigation and all the specialists felt that it was laughable. Advanced engineer Tang Richang [0781 2480 7022], deputy director and committee member of the Chinese Water Conservancy Society Silt Specialization Committee and formerly deputy chief engineer of the Chang Jiang Water Conservancy and Hydropower Scientific Research Academy (recently retired to the second line) explained this question in detail to the reporters.

Silt in the Chang Jiang can be divided into two types: bed load and suspended load.

Bed load refers to coarse sand and cobbles. According to long-term records, the amount of bed load silt reaching Fengjie County at the upper mouth of the Three Gorges each year totals 703,000 tons, which is not a large amount. The bed load settles out into the river bed and depends on the flow of water for its forward motion, so it moves very slowly. After construction of the Sanxia dam, the water level will be raised 100 meters higher than at present and the reservoir will be 400 to 500 kilometers long. It will be very hard for the bed load silt coming from the upper reaches to enter the dam region and even that which does arrive will be in small amounts, which will not result in any danager to the reservoir for many years to come.

Suspended load refers to very fine silt. The amount of suspended load silt reaching Yichang at the lower mouth of the Three Gorges averages 523 million tons per year, which is a very large amount. This sort of fine silt, however,

is suspended in the water and flows along with it so it only settles out in still water. The ship channel at Gezhouba is calm water, so there will be a problem with silt accumulation at that location. Opening the silt flushing gates along the side of the boat locks will cause the water to flow quickly and flush out the silt.

Reservoirs come in two types, the lake type (the Danjiangkou reservoir, for example) and the river channel type. The future Sanxia reservoir is of the river channel type. After the reservoir is constructed, the amount of water flowing and its flow rate will remain large, making it easy to flush the silt. However, the flow rate in the reservoir region will of course be slower than before the reservoir was built, so some of the suspended load silt may settle out. Current studies of the silt question at the Sanxia reservoir mainly involve research concerning the effects and results of suspended load silt accumulation.

The future Sanxia reservoir can be divided into four water layers according to their roles. The lowest layer is dead reservoir capacity, 11.0 billion cubic meters, and will play no direct role in any of the reservoir's functions. The second layer is the power generation reservoir capacity. It can be used for periodic regulation of water levels and amount of flow, and all of the water can be used for power generation. The third level is flood prevention reservoir capacity that coincides partially with the power generation reservoir capacity. It can be used during the rainy season to impound floodwaters and reduce the danger of water downstream. The fourth level can be called the ultrahigh floodwater blockage reservoir capacity. It can block and store ultrahigh floodwaters to reduce the danger of especially large floods in the middle and lower reaches of the Chang Jiang.

According to mathematical models, physical models, and other kinds of estimates, silt deposition may fill up the dead reservoir capacity of the Sanxia large dam 80 years after it is completed. After that point in time, it will be hard for the silt entering the reservoir to remain. Enormous deep flood drainage holes will be installed below the dam. The intense flow of floodwater drainage during the rainy season can flush out the silt entering the reservoir and bring about a basic equilibrium in the amount of silt entering and leaving the reservoir. After the period of equilibrium in the flushing of silt entering the reservoir, the power generation reservoir capacity can be maintained at 82 percent and the flood prevention reservoir capacity at 95 percent. After this, the comprehensive benefits of the reservoir can attain permanent utilization.

III. The Point of Difficulty Lies in the Backwater Alteration Region of the Reservoir Tail

The location with true problems is at the reservoir tail. Current research and debate now focus on this point.

Construction of the dam according to the low program (with a dam elevation of 175 meters above sea level) means that the reservoir tail will be near Luoqi at the boundary of Changshou County below Chongqing. Alterations in

the elevation of water storage will occur because the reservoir must be used for power generation and flood prevention, and the site of the reservoir tail also will change as a result. When the fierce river reaches this point, the rate of flow inevitably will slow and form a backwater. Some of the silt will settle out, to the extent that certain obstructions to normal navigation may arise. Some are afraid that Chongqing harbor will become a "dead harbor" for this reason.

A large group of scientific and technical personnel in China have undertaken research to gain an understanding of this problem. They are working their hearts out, using electronic computers for mathematical modelling computations, and they are working on an enormous physical model of the river section in the backwater alternation region of the Sanxia reservoir at Hankou, Wuchang, Beijing, and Tianjin for experiments concerning the flushing of accumulated silt. It involves tedious research and a great deal of work that has caused foreign water conservancy experts who have visited and examined it to marvel. The reason is that foreign countries (including the U.S.) often use only mathematical models to study the question of silt when building hydropower stations. Very few of them do physical experiments on such a large scale. The famous silt expert Professor Qian Ning [6929 1337] exclaimed that this matter fully illustrated the superiority of China's socialist system.

After experiments in many areas and a long period of research (and sometimes controversy), the situation has been understood, as have the differences. A rather unanimous view is that under normal conditions, there would be major improvements in shipping conditions and the silt that accumulates in the backwater alteration region at the tail of the Sanxia reservoir during the rainy season can be carried off by the river water during the sandy period following the rainy season. Under special conditions (when the previous year is one of abundant sand and the following year is a dry one), there are four locations in the river section that has many sandbar accumulations between Changshou and Zhong County where temporary silt accumulation may occur, making it possible to maintain a water depth of only 3 meters or less (river ship channel departments now are striving to maintain it above 2.9 meters) and resulting in problems in the passage of large barge trains.

Is this problem serious or not?

The mathematical model calculations made by Advanced Engineer Han Qiwei [7281 0366 3634] of the Water Conservancy and Hydrpower Scientific Research Academy and others indicate that after the large dam is built "there will be a phenomenon whereby the profile upstream from Changshou will have an average water depth of less than 3 meters (but it will remain above 2.7 meters) during the first 20 years. After 50 years, the entire profile will be have a water depth of more than 3 meters."

Four units have done physical modelling experiments in four river sections containing shallow shoals. The reports on three of the locations basically are identical to the results of mathematical modelling calculations, while one location has different experimental results. This is the site of the current controversy.

Qinghua University has done silt modelling experiments for the Lanzhuba river section. The experimental report states that when this section of river "encounters an especially dry year, although the dimensions of the ship channel in some transitional river sections will be able to meet requirements, it will be fairly tense."

The Chang Jiang Water Conservancy and Hydropower Scientific Research Academy has done silt modelling experiments on the Siquaqi river section. The experimental report states that "during hydrologically unusual years, short-term and temporary obstruction of navigation in this section of the river occurs."

The Wuhan Water Conservancy and Electric Power College has done silt modelling experiments for the Qingyanzi section of the river. The experimental report states that "during the period of silt movement after 1968, which was a year of abundant silt," the amount of flow dropped to around 3,000 cubic meters per second and in the shipping channel below Dahekou "the water depth throughout the shipping channel met shipping width conditions at 3 meters, approaching the permissible boundary conditions."

The Tianjin Water Transport Engineer Scientific Research Institute of the Ministry of Communications used Yangquan coal powder to do silt modelling experiments of the Luoqi river section. The report felt that "there were rather substantial problems in this section of the river." The river sections above and below Luoqi are exactly at the tail end of the region of backwater influence and the elevation of water blockage is small. The flow rate begins to drop and the sand-carrying ability is reduced, so the silt inevitably accumulates. Because the water depth at this bar is just about 3 meters, slight accumulation could obstruct navigation."

In order to take responsibility for the party, the people and future generations, silt experts also are doing further experiments to correct the data. This sort of spirit deserves admiration. Just as we said, however, half of the stone pressing down on our hearts has been cut away. The reason is that even under the worst conditions the situation would be the same. Nevertheless, the experiments of the silt experts were done under several "assumptions." One assumption is that there will be no progress in afforestation by the people of the upper reaches of the Chang Jiang and that the vegetation situation will remain at its present level. The second assumption is that there will be no dam and reservoir construction in the future on the Min Jiang and Jinsha Jiang (45 percent of the bed load in the Three Gorges comes from the Min Jiang and 45 percent of the suspended load comes from the Jinsha Jiang). The third assumption is that we will adopt no measures whatsoever to control the four sections of the river channel that

have problems (mechanical dredging, clearing of the shipping channels and other work now is in progress). The fourth assumption is that there will be no progress in existing dredging technologies and dredging machinery 20 years from now.

These assumptions were necessary for the silt specialists to do their experiments. Ourselves and our descendants will not make these assumptions reality.

According to new information, related specialists recently completed modelling experiments for a program of measures for projects to control these four river sections. The result indicate that there are obvious benefits from control measures and that not a great deal of work is required.

IV. The Long-Range View of Shipping Specialists

If shipping is subjected to serious obstruction by silt, shipping departments of course would suffer the greatest. For this reason, the reporters visited with the Ministry of Communications Chang Jiang Shipping Service Management Bureau in Wuhan and met with bureau leaders and engineers. Those at the meeting included deputy bureau director Cen Yisheng [1478 3015 3932] who is in charge of navigational questions on the Chang Jiang, director Rong Tianfu [2837 1131 1381], (chief engineer with the Chang Jiang Ship Channel Bureau) and deputy directors Lin Bangzhen [2651 6721 6591] and Lu Wangcheng [7120 2598 4453] of the Sanxia Navigation Office and engineer Hua Kejian [5478 0344 0313].

Contrary to the expectations of the reporters, while society is full of debate concerning shipping obstruction by silt at the Three Gorges, those in the Chang Jiang Shipping Bureau who were in charge of shipping in the Three Gorges were calm and said very little. Ship channel experts have three main viewpoints concerning design programs for the Sanxia project. The first view is that the low program for the large dam cannot be adopted, that the middle dam (with a normal water storage level of 180 meters) be constructed, and moreover that it should be done without delay to facilitate direct access of 10,000-tons barge train to Chongqing. The second view calls for changing the four-level ship locks to two-level ones and building an interconnecting ship channel between them. The third view is that the ship passage capacity of the large dam now designed is too small and will be inadequate in the future.

Reporters' question: How much cargo is now being shipped in the Three Gorges each year?

Their answer: The figure was 5 million tons in 1984.

Reporters' question: What will the design ship passage capacity of the Sanxia project be?

Their answer: 50 million tons per year.

Reporters' question: That is a nine-fold increase. How could it be inadequate?

Their answer: When the large Sanxia dam is built, it will not be managed for 100 years or 200 years, but will exist forever. After the Sanxia reservoir is formed, there will be a many-fold increase in the amount of cargo carried on the river. It certainly will exceed 50 million tons 100 years from now. What can be done then?

These ship channel experts have gained the respect of everyone. They have a well thought-out plan and already are considering enormous barge trains 100 years after the completion of the large dam at the Three Gorges.

The reporters left the offices of the Chang Jiang Office as "optimists" concerning the silt question at the Sanxia project.

[No 11, 15 Nov 85 pp 15-16]

[Text] The Sanxia [Three Gorges] key water conservancy project is to become one of the largest water conservancy projects in the world. Are China's technical forces capable of undertaking it? Chief Engineer Hong Qingyu [3163 1987 0151] of the Chang Jiang Basin Planning Office who is responsible for designing the Sanxia project told the reporters: "The technical problems in the Sanxia project certainly are rather complex ones. However, the technologies needed by the project are within the technical levels already attained in China and there are no special problems that cannot be resolved."

After making this statement, Chief Engineer Hong Qingyu also said laughingly: "If you had asked me 30 or 20 years ago, I would not have dared to say this. I can make the statement now, however. Nevertheless, I also wish to say some other things: although we can depend on China's technical forces to build the Sanxia project, we still are preparing to utilize the favorable conditions of opening up to the outside to spend a small amount of foreign exchange to import advanced equipment and technologies from abroad or to engage in technical cooperation between China and foreign countries. The reason is that absorption of the strong points of various countries can permit the Sanxia project to be built better and more inexpensively, and it also can raise China's technical levels, so spending a little foreign exchange is worthwhile."

Next, Chief Engineer Hong Qingyu discussed the main technical problems in the Sanxia project key water conservancy project.

I. The Weir and Dam

The role of the weir is to divide the river water to facilitate construction of the dam and installation of the electric generators in the river bed in the center of the river. Nothing can be done before the weir is completed. The most perplexing technical problem during research in the 1950's and 1960's concerning the Sanxia project was how to construct a weir to block the mighty Chang Jiang. Practice during the cutoff of the great river at Gezhouba now provides an understanding.

It was decided originally that 13 days time would be used to close the weir on the great river at the Gezhouba project, but the result was that it was completed successfully in only 36 hours. Not long after the great river weir was completed, the especially large flood in 1981 was encountered and the flow reached 72,000 cubic meters per second. Everyone was especially concerned but the weir held.

According to the current construction plan, the Sanxia project will require the construction of weirs during three periods (times). The highest weir, 80 meters (40 meters below the water), will be the one during the second period and will be twice as high as the Gezhouba large river weir (over 40 meters). The geological conditions at the Sanxia large dam site (at Sandouping), however, are much better than the dam site at the Gezhouba project. It is an ideal dam site seldom seen in the world. Although the weir is rather tall, we also can build it successfully.

A key question in the flow cutoff of the large river is the intensity of construction (also called construction forces). By casting in large material at a rapid pace and in amounts that exceed those washed away, the weir can be joined. The material cast in during the closure of the great river weir at Gezhouba had the shape of solid pyramids. Each piece weighed 25 tons. We now have dump trucks with a loading capacity of 60 to 80 tons, so even larger and heavier material can be cast in during construction of the Sanxia weir. Combined with the better hydrological conditions of diversion through clear channel flow separation compared with Gezhouba, we do not have to worry about a failure due to confluence at the Sanxia weir.

As for the body of the Sanxia large dam, the low program involves a height of 175 meters and the height of the middle program is less than 195 meters. Switzerland's Grande Dixence large dam completed in 1962 is 285 meters tall and the Rogun large dam in the Soviet Union is 325 meters tall. China's Longyangxia large dam also is 175 meters tall.

The key to dam building is the intensity of construction. When the Gezhouba project was being built, the amount of concrete poured each year reached 2 million cubic meters. The amount of concrete to be poured each year when the Sanxia large dam is built will be only slightly greater than the Gezhouba project, with 4 million cubic meters being poured during the peak period. The construction machinery and construction forces that China now has can achieve this, and we also are preparing to purchase even more advanced construction machinery from abroad to increase construction forces a bit.

II. Water Turbine Generator Sets and the Plant Building Behind the Dam

This was the second major problem encountered during research on the Sanxia project during the 1950's. The world's largest water turbine generator at that time was less than 200,000 kW and China only manufactured 75,000 kW generators. The planned installed capacity of the Sanxia project at that time was 25 million kW, which would have required the installation of more

than 300 domestically manufactured water turbine generators. There was no way that this could be arranged in the plant building behind the dam at the large dam.

The world's science and technology has surged ahead in recent years. Foreign water turbine generators include 600,000 kW (the Itaipu power station in Brazil) and 700,000 kW (the Grand Coulee No. 3 power station in the U.S.). For this reason, we plan to install only 26 generator sets in the future Sanxi power station, each generator being 500,000 kW. This type of water turbine generator can be manufactured in China's heavy electrical generator plants. To bring the quality of water turbine generator sets up to advanced international levels, however, we are preparing to import some generators from abroad and manufacture our own afterwards, or we may cooperate with advanced plants in foreign countries for production. We now are making inquiries of some foreign companies and talking business. If they want a high price, the talks will fail (the possibility of this is not great) and we will make them ourselves.

III. High Voltage Electricity Transmission and Transformation Technologies

During the 1950's, China only had 110 kV electricity transmission and transformation. At the Sanxia power station, however, even 220 kV electricity transmission technologies will be inadequate, so 500 kV will be required. This problem can be solved now. The Sanxia power station will use the advanced 500 kV [level] for AC and DC electricity transmission. This can greatly reduce electricity losses caused by electricity transmission and transformation.

IV. The Boat Locks and Ship Lifts

The permanent navigation equipment at the Sanxia project will involve mainly boat locks with auxiliary ship lifts.

The 150-meter program of the Chang Jiang Office uses four levels of ship locks, each level with a water level differential of 22 to 25 meters. The head of each level will be slightly lower than that at the already constructed Gezhouba ship locks (27 meters). There are no major technical problems. The ship locks are to be located at the northern tip of the large dam and will require the excavation of high slopes (the reporters have seen the Sandouping dam site, a small mountain, about half of which must be cut away). This is an excavation project and the technology is not complex. It is just that the project is large. According to our understanding, excavation of high slopes is a skill of the Swiss and their rock dynamics research leads the world. We are preparing to study Switzerland and import their advanced techniques to conserve on investments.

The Sanxia project will require the installation of a ship lift similar to the one at the Gezhouba ship locks. The scale of course is much larger and the technology is much more complex. One of the main problems is the safety equipment for the ship lift. The Chang Jiang Office and specialists

in China's ship transport and machinery manufacturing departments already have examined the world's advanced equipment. The ship lifts in the Federal Republic of Germany use a rotating elevator nut pillar that can support the ship carrying compartment (vessels passing through the dam are placed in the ship carrying compartment) in the event of an accident. Ship lifts in Belgium (capable of raising 8,000 to 10,000-ton vessels) use a method whereby water is added to the ship carrying compartment to prevent accidents in which balanced weight systems lose their equilibrium due to the leakage of too much water from the ship compartment. Our ship lifts will study and borrow from their experiences.

V. Can the Large Dam Be Raised Higher in the Future?

Shortly before the visit was to end, the reporters raised an "odd question." Some comrades now propose that the Sanxia project not be built or that it be postponed because they fear that it will be rebuked by later generations. Isn't it possible, however, that future generations will rebuke us for building the Sanxia large dam too low and wasting the hydropower resources of Sanxia?

Chief Engineer Hong Qingyu answered that the current design for the Sanxia project actually does not make full use of the hydropower resources of Sanxia. The main reasons are a concern that construction of a high dam would inundate a broad area and require resettlement of more people, greater investments and longer construction periods, and everyone could not wait for it. Nevertheless, our descendents can make the large dam taller in the future. The Guri large dam built by Venezuela was raised by several tens of meters after it was completed, so this is a precedent. Moreover, the technologies in this area are not too complex.

12539/9738
CSO: 4013/50

HONGSHI'S FIRST 500MW UNIT NOW GENERATING POWER

Changchun JILIN RIBAO in Chinese 27 Dec 85 p 1

[Excerpts] Yesterday, the first 500MW unit of the Hongshi hydroelectric power station officially went on stream to feed power into the grid and today a victory celebration was held at the station.

The Hongshi hydropower station is situated between two mountains near the village of Hongshi in Huadian County, on the Di'er Songhua Jiang. Located between the Fengman and Baishan hydropower stations, Hongshi is the third station in this cascade development plan. Its concrete gravity dam measures 438 meters in length and is 46 meters high; the reservoir capacity is 149 million cubic meters. Some 470,000 cubic yards of concrete were used in its construction. Four generators are installed in the powerhouse, located on the downstream side of the dam and their total installed capacity is 200,000 kilowatts. The facility will generate 440 million kilowatt-hours of electricity a year. In November the gates were lowered to impound water and in December work was completed on the tailrace. Quality standards have been met in every case.

During the construction of this hydropower station, the First Engineering Bureau of the Ministry of Water Resources and Electric Power correctly coordinated the cascade development plan which includes the construction of the Baishan hydropower station. The generator joined the grid one year before the date in the original plan.

/12913
CSO: 4013/63

HYDROPOWER AIDS NEI MONGGOL RURAL ELECTRIFICATION

OW241951 Beijing XINHUA in English 1519 GMT 24 Jan 86

[Text] Hohhot, 24 Jan (XINHUA)--The setting up of hydropower stations has boosted the economy of Hexigten Banner--one of the 100 pilot counties chosen to pioneer rural electrification--in Nei Monggol.

The pilot-county program was suggested by Hu Yaobang in 1982, and approved by the State Council.

According to the NEI MONGGOL DAILY, the banner's total industrial and agricultural output value last year amounted to 112.5 million yuan, 6.3 times the 1970 figure.

Endowed with rich water resources, Hexigten Banner has built eight hydropower stations with a total generating capacity of 10,000 kW [figure as received] since 1970.

The banner turned out 26 million kWh of electricity last year. Apart from supplying its households and industry, it has also transmitted 2.94 million kWh to other northeastern provinces.

Hexigten Banner has set up a number of industries to make full use of electricity. They include cement making, sugar refining, motor vehicle repair and processing of meat, dairy products, and furs, as well as breweries.

The Banner's industrial gross output value last year received 20.86 million yuan, accounting for one-fifth of its total industrial and agricultural output value.

Thanks to the installation of electric-pump-operated wells, wheat output per hectare in the dry mountain areas has gone up from 1,500 kg to 4,500 kg.

/8918
CSO: 4010/33

SMALL HYDROPOWER DEVELOPMENT IN GUANGXI DETAILED

Beijing RENMIN RIBAO (OVERSEAS EDITION) in Chinese 17 Nov 85 p 3

[Article: "Small Hydropower in Guangxi's Cenxi County Develops Quickly--Capital Collected through Many Channels, Construction in Many Forms"]

[Text] Cenxi County in the Guangxi Zhuang Autonomous Region, one of 100 rural electrification trial counties nationwide, has adopted a method of collecting capital through many channels and construction in many forms to develop small hydropower construction at a rapid pace. Installed capacity in the county has reached 22,167 kW and 76 percent of peasant households now have electricity.

Cenxi County is crisscrossed with streams and rich in hydropower resources. The county People's Government decided to adopt a method of joint progress by the state, collectives and individuals for power station construction. Those who operate power stations utilize the electricity and receive the benefits. The actual method used is that large scale power stations are managed by the county, medium and small scale power stations are managed by water management offices or townships and towns, while mini power stations are managed by villages, households associations or households. Besides running some county level power stations, hydropower departments in the county also have been active in organization of technical forces to guide and assist townships and towns as well as villages, household associations and households to manage small and mini power stations. The entire county is managing power stations and gathering capital through multiple channels. The water management office of Guiyi Township built a 400 kW hydropower station at Sitang that required a total of 214,000 yuan in investments. Apart from a bank loan of 50,000 yuan, the remaining portion was raised themselves by using electricity to develop electricity and by income from water fees in irrigation districts. Besides state subsidies, a bank loan and an advance from the county hydropower bureau, the township government of Shuiwen Township collected the capital from township enterprises and related units that was needed for the small 400 kW hydropower station run by Shuiwen Township. From 1984 to September 1985 the county, water management offices and townships and towns invested a total of more than 2.969 million yuan in power management, including 400,000 yuan in state subsidies and 400,000 yuan in bank loans. The various levels collected over 2.169 million yuan themselves and villages, household associations and households basically collected the capital themselves needed for mini power stations.

Since 1984, the county has installed 182 generators with a total capacity of 4,592 kW. From January to September 1985, the amount of electricity generated in the county grid alone exceeded 55 million kWh, up by 73 percent over the same period in 1984. The county not only basically met the its electricity needs but also transmitted 13.5 million kWh of electricity to Wuzhou Prefecture.

12539/13068
CSO: 4013/39

BRIEFS

ERTAN STATION DESIGN EXAMINED--According to SICHUAN RIBAO, the State Planning Commission, the minister of water resources and electric power, and the Sichuan provincial authorities jointly held a meeting in Beijing on 4 January to examine the preliminary design for the Ertan hydropower station. The Ertan hydropower station is located in Miyi and Yanbian counties under Dukou City in western Sichuan. It represents the first stage of a seven-stage plan for the lower reaches of the Yalong Jiang, a tributary of the Jinsha Jiang. This power station is a comprehensive pivotal water conservancy project whose main function is to generate power. Its installed capacity will be 3 million kilowatts, second only to Gezhouba. It will generate 16.2 billion kilowatt-hours a year. When completed, the station will supply power to the Sichuan power grid and to the Dukou and Xichang areas, and will also link up with the Yunnan grid. The construction of this station will provide a huge source of electric power for Sichuan and play a major role in stimulating the development of Sichuan's industrial and agricultural production. [Text] [Chengdu Sichuan Provincial Service in Mandarin 2300 GMT 8 Jan 86 HK] /8918

GUANGDONG 1985 OUTPUT--According to statistics, by the end of December 1985, the output of small hydropower stations in the province for 1985 reached 4.1 billion kilowatt-hours, an increase of 8.2 percent over 1984 and an all-time high. The annual target for 1985 was overfulfilled. [Summary] [Guangzhou Guangdong Provincial Service in Mandarin 1000 GMT 21 Jan 86 HK] /12712

XINJIANG HYDROPOWER GROWTH--The hydropower industry in Xinjiang Autonomous Region developed greatly during the Sixth Five-Year Plan. Annual power output reached 840 million kilowatt-hours, accounted for one-fourth of total power output in whole region, and ranked first among all provinces, municipalities, and autonomous regions north of the Chang Jiang in hydropower output. The installed capacity of all large and small hydropower stations already built in the region has now reached 361,000 kilowatts. Of the 16 prefectures, autonomous prefectures, and cities, 8 are now relying on hydropower stations for the supply of electricity. Of the 86 counties and cities, 60 now completely rely on hydropower. With the development of the hydropower industry, 60 percent of the townships, 47 percent of the villages and 45 percent of the peasant households throughout the region now use electricity. [Summary] [Urumqi Xinjiang Regional Service in Mandarin 1300 GMT 23 Jan 86 HK] /12712

CSO: 4013/67

THERMAL POWER

WORK ON PINGYU PLANT AHEAD OF SCHEDULE

Hefei ANHUI RIBAO in Chinese 3 Dec 85 p 1

[Excerpts] Work on installing the 600MW large-scale gas turbine at the Pingyu power plant in Huainan City is progressing at an accelerated pace. The gas turbine generator was built in China using imported technology. Today, the construction and installation work is a full quarter ahead of schedule; quality is excellent and all design requirements have been met or surpassed.

The Pingyu power plant, a major State construction project, is located just to the northeast of the Huai He road and rail bridge in Huainan City; it is 15 km from the Panji coal mine. Transportation is convenient and there is an ample supply of coal. It is an altogether ideal site for a pit-mouth power plant. According to plan, the Pingyu power plant will have four 600,000-kilowatt gas turbines and, along with the Tianjia'an power plant and the Luohe power plant now under construction, will constitute the "three sisters" that will make up the Huainan General Power Plant. Total installed capacity will be more than 4.2 million kilowatts, to make it an electric power supply base for the East China Grid.

The work now under way on the 600 MW unit represents the first stage of the Pingyu power plant scheme. Compared to other types of generators, these can reduce consumption by several tens of kilograms per kilowatt-hour produced. The generators have a high degree of automation with operations controlled by computer.

/7051
CSO: 4013/65

200 KW GAS TURBINE OPERATIONAL AT ZHENHAI PLANT

Beijing BEIJING KEJIBAO in Chinese 8 Jan 86, p 1

[Article: "The Beijing Heavy Electric Machinery Plant Has Become China's Large-Scale Thermal Power Equipment Production Plant--Adhere to Innovation and Exploitation of Potential, Digest Imported Technologies"]

[Text] The first structurally original 200 kW steam turbine electric generator has gone into formal operation at the Zhenhai Power Plant in Zhejiang. This generator was manufactured successfully by the Beijing Heavy Electric Machinery Plant on the basis of adherence to innovation, exploitation of potential, and digestion and absorbtion of advanced foreign technologies, and it is the largest generator of the 700 kW in installed generators completed at the Zhenhai plant during 1985. It is indicative of the fact that the heavy electric machinery plant has become one of China's four large-scale thermal power equipment plants. The 200 kW generator is the primary generator in electric power industry equipment in China during the Sixth and Seventh Five-Year Plans. The heavy equipment plant was built during the 1960's and the original design capacity was to produce 25 kW generators. Under conditions of the state's inability to provide large amounts of investments and a shortage of large electrical generators, the cadres and employees of the plant imported technologies, strengthened themselves and took the route of intensive development of production. They took aim at domestic and foreign advanced technologies and adopted a pattern of cooperative production to process and manufacture 14 sets of 250 kW generators for foreign countries, and they improved technical and managerial levels in the plant. During the process of innovation and exploiting potential, the plant achieved more than 140 major technical transformation projects and attacked 46 key technical problems, including nine major scientific research topics and three topics that received scientific and technical awards from Beijing Municipality. This gave the plant the preliminary capacity to produce large scale generator equipment and pushed them into the ranks of China's four large thermal power equipment producing plants.

6539/12539
CSO: 4013/76

BRIEFS

50,000KW GAS-FIRED PLANT--The Wutongqiao power plant, at a cost of 100 million yuan and many years in the building, formally went on stream at 1912 hours today. More electricity is now being transmitted into the western Sichuan power grid, easing the power shortage in the region. The Wutongqiao power plant is built in a cave and uses natural gas as its fuel. Work on the project, on which ground was broken in 1966, dragged on for 12 years until the first generator became operational. After operating for only 800 hours, the equipment was shut down due to a lack of natural gas supply. The facility now has an installed capacity of 50,000 kilowatts. [Text] [Chengdu SICHUAN RIBAO in Chinese 12 Dec 85 p 1] /9274

NATION'S BIGGEST GENERATOR--According to a report in NEI MONGGOL RIBAO, China's largest (600,000 kilowatts) gas turbine generator went on stream in mid-December at the Yuanbaoshan power plant. The generator was a major item of the Sixth Five-Year Plan and the entire installation was imported from the Federal Republic of Germany. Its level of automation is the highest of any thermal power generator in China. Its coal-consumption-to-power ratio compares favorably to 300 MW units now in operation, requiring only 20 grams of coal for each kilowatt-hour of electricity generated; 70,000 tons of coal can be saved annually. The unit can generate 3.6 billion kWh of electricity a year which is fed into the grid via a 500kV high-tension power line. [Excerpt] [Beijing RENMIN RIBAO (OVERSEAS EDITION) in Chinese 20 Nov 85 p 1] /9274

SHENTOU 200MW UNITS--Two 200MW units have gone into production at the Shentou power plant. These two generators are the third stage of the Shentou expansion project. The No 5 generator began generating power on 24 September followed by the No 6 generator on 24 December. These two generators were completed 99 and 97 days ahead of schedule, respectively. These two generators have advanced equipment and a high level of automation. After going into production they will greatly relieve the power shortage in Beijing, Tianjin, and Tangshan and will have realized the arduous task raised by the leading comrades of the State Council when inspecting the Shentou plant site of putting two imported 200,000 kW generators into operation in 1 year. [Summary] [Taiyuan SHANXI RIBAO in Chinese 31 Dec 85 p 1] /9274

XUZHOU 200MW UNIT--The No 6 200MW unit of the Xuzhou power plant has been completed. It completed the required trial operation on the 20th, was put into production ahead of schedule, and every month will provide 140 million kWh of electricity. Xuzhou is now a large power plant with an installed capacity of 900 MW. [Text] [Nanjing XINHUA RIBAO in Chinese 21 Dec 85 p 1] /9274

XIAOLONGTAN 100MW UNIT OPERATIONAL--On 6 December, a 100MW generator at the Xiaolongtan power plant began generating power. Now, Yunnan has freed itself of the past and long-standing situation of inadequate small generators and small networks. This generating unit is Yunnan's first 100MW high-temperature, high-pressure unit and its successful operation will be of economic benefit to the power grid and bolster the province's power supply, playing a considerable role in meeting industrial and agricultural demand for electricity. [Text] [Kunming, YUNNAN RIBAO in Chinese 8 Dec 85 p 1] /12913

ZHEJIANG'S LARGEST GENERATOR--Hangzhou, 21 Dec (XINHUA)--The largest thermo-power generating set in Zhejiang Province started to operate at Ningbo's Zhenhai power plant today. The generator has a capacity of 200,000 kilo-watts. The Zhenhai power plant, which is situated in the southeastern part of the East China power grid, is one of the state's major construction projects during the Sixth Five-Year Plan. The plant's current generating capacity has already reached 450,000 kilowatts. [Text] [Beijing XINHUA Domestic Service in Chinese 1445 GMT 21 Dec 85 OW] /6091

GUIXI POWER PROJECT--A new 125,000-kW generator unit became operational on 18 November at the Guixi Power Plant in Jiangxi. This is part of a key construction project in the state plan, aimed at boosting the power-generating capacity. The completion and operation of the new generator will serve to alleviate the power shortage in Jiangxi. [Summary] [Nanchang Jiangxi Provincial Service in Mandarin 1100 GMT 19 Nov 85 OW] /6091

JILIN TO DOUBLE OUTPUT--Changchun, 14 Jan (XINHUA)--Northeast China's Jilin Province plans to double its thermoelectric generating capacity to almost 3 million kW in the next 5 years, according to a local newspaper. The province started expansion projects on two existing plants and construction of two new ones last year. They will add a combined capacity of 1.4 million kW. [Text] [Beijing XINHUA in English 1320 GMT 14 Jan 86 OW] /12858

CSO: 4010/30

MAJOR CHANGES IN COAL INDUSTRY OUTLINED

Beijing ZHONGGUO MEITAN BAO in Chinese 7 Dec 85, p 1

[Article: "Ten Major Changes Have Occurred in the Coal Industry During the Sixth Five-Year Plan"]

[Text] Comrade Yu Hongen [0060 3163 1869] spoke at the National Congress of Coal Industry Labor Models and Advanced Collectives on 30 November. The topic was "Focus on the 'Two Civilizations.' Build a Workforce with Ideals, Ethics, Culture, Discipline and a Special Ability to Contribute to the Coal Industry." During the speech, he first of all analyzed the development situation in the coal industry during the Sixth Five-Year Plan. He said that during the Sixth Five-Year Plan the coal industry underwent 5 years of readjustment and rectification, 5 years of reforms, 5 years of improvement, and 5 years of struggle toward construction of a socialist modernized coal industry with Chinese characteristics that is struggling toward the goal of "doubling to assure to quadrupling" [doubling coal output to assure the quadrupling of the total value of output in industry and agriculture by the year 2000]. He divided developments over these 5 years into ten major changes.

1. Coal output has seen sustained and substantial growth, the supply and demand relationship is tending toward alleviation and production is becoming the main force. During the Sixth Five-Year Plan, there was a net increase of 210 million tons in coal output, an average of more than 42 million tons per year, something unprecedented. Coal output in 1984 reached 789 million tons, surpassing the Soviet Union and rising to second place in the world. Local coal mines expanded from nearly 20,000 sites in 1978 to 60,000 sites at present. They accounted for half of China's total output in 1984 and will surpass this figure in 1985. Current coal reserves exceed 54 million tons and the situation of supply shortages is tending toward alleviation. A look at the overall situation indicates that it will not be alleviated too much by the year 2000, so production and construction cannot be relaxed to the slightest extent.

2. The scale of capital construction has expanded, the pace has speeded up and schedules are shorter. The mine construction period has been reduced from 8 or 9 years to about 6 years. To promote capital construction, the principle of the "two ups and one down" was formulated and they implemented systems of economic responsibility for contractual construction, contractual

responsibility for wage content per 100 yuan in value of output, bidding and other reform measures. The first 4 years of the Sixth Five-Year Plan saw the completion of 15.89 billion yuan in investments, a construction scale of 96.94 million tons and a capacity of 64.80 million tons put into operation, all of which exceeded the Fifth Five-Year Plan. In the past 5 years newly proven reserves in the coal field geology system reached 110.0 billion tons, more than double the planned amount, and industrial reserves increased by 25.0 billion tons. Design units established new design ideologies, raised design standards and guaranteed rather well the needs of construction, and they shortened mine construction schedules and created the conditions for changing the face of new mining technologies.

3. They relied on scientific and tehcnical progress for coal, and unified distribution mines are advancing in the direction of modernized production adapted to China's conditions. During the Sixth Five-Year Plan, two coal science and technology conferences were convened. They clarified the strategic principle that "coal production and construction must rely on progress in science and technology, and scientific and technical work for coal must be oriented toward production and construction." They formualted a series of policy measures, made a preliminary deployment of reforms in coal systems and attained more than 400 major S&T achievements during the 5-year period, including 5 that received national invention awards and over 40 that received national S&T conference awards and S&T progress awards. The manufacturing capacity for coal machinery has been strengthened and domestic manufacturing systems for comprehensive extraction equipment have taken shape in a preliminary fashion. The degree of mechanization in coal extraction in unified distribution mines rose to 44.7 percent while comprehensive extraction rose to 22.2 percent. Coal enterprise management also is striving to modernize.

4. Labor productivity has broken down the long-term situation of hesitation and is shifting from the past pattern of increasing workforces to increase output to one of increasing output while increasing personnel only slightly, not increasing personnel or even reducing personnel. From 1984 to the first half of 1985, unified distribution mines increased output by more than 24 million tons while production personnel declined by 300,000 persons. Labor productivity for the entire workforce surpassed 0.9 tons in 1984 and increased to 0.942 tons from January to September 1985. Labor productivity in local state-run mines also has risen gradually. Good arrangements have been made for the reduced personnel.

5. There is a trend toward the better in the safety situation in unified distribution mines and local state run mines. Safety monitoring systems have been filled out, safety management has been reinforced and many accounts due have been repaid. In the past 3 years, 20 safety training centers have been built and all units are developing safety training and diversified education. In 1984, the death rate per 1 million tons in united distribution mines was the lowest in more than two decades and there has been an additional drop from January to September 1985. There also is a trend toward declining accident rates in local state run mines.

6. Coal mines are beginning to move from single item administration and single products and developing in the direction of a focus on coal with economic diversification and product diversification. Output is being taken seriously, as is management and administration, quality and results. They are focusing on increasing income and reducing expenditures, on lowering consumption and on lowering deficits and raising profits. In 1984, the number of coal mine collective enterprise employees engaged in economic diversification grew to over 960,000, with a yearly value of output of 2.13 billion yuan and actual profits and taxes of 212 million yuan. There have been new developments in coal dressing and processing and in comprehensive utilization. Profits from dressed coal in 1985 may reach 1 billion yuan, double the figure in 1980. Sorting and processing also has developed quickly in the past 2 years. In the past, direct sales of coal accounted for more than 70 percent of output in unified distribution mines, but the figure dropped to 40 percent in 1984 and may reach about 30 percent in 1985. The lowest levels in gangue content of commodity coal have been reached for 2 years in succession.

7. Positive results have been achieved in foreign technology and economic exchanges and cooperation, and they have begun to develop from a "closed type" to an "open type." Total utilization of foreign capital during the Sixth Five-Year Plan reached $1.58 billion and it was used for construction of 13 shaft mines and pit mine projects. In addition, there has been a shift from the past pattern of a focus on importing complete sets of equipment to importing manufacturing technologies and cooperative research. Technical exchanges and cooperation have been carried out with more than 20 coal producing nations.

8. Education in coal has developed vigorously and the atmosphere among employees of studying science, culture and technology has grown stronger. Ministry of Coal Industry investments in education have risen from the past level of 10 to 20 million yuan a year to 100 million yuan. Many enterprises are spending money on education and a pleasing situation of multiple layers, multiple specificiations and multiple forms of training has appeared. The number of students enrolled in the 13 institutions of higher education under the ministry has increased by 66.3 percent over 1980, while the number enrolled in polytechnic schools has risen by 12.1 percent. The number of employees on the job who are engaged in all types of study exceeds 800,000, including more than 20,000 who are participating in higher education.

9. Employee living standards have risen and welfare facilities have been improved. A policy solution to the long-term and unsolved problem of settling the families of mine workers has been solved. City and town residence permits were arranged for the families of 618,000 mine employees in coal mines at the county level and above in China. Outstanding accounts have been settled to different degrees in each mining region for surface living and welfare facilities. Top shelf commodities have entered the homes of mine workers and theri spiritual lives have been enriched.

10. In construction of the "two civilizations," a group of advanced people and collectives with the characteristics of the era have appeared. Over the

past 5 years, a focus on modernized construction in the coal industry has been accompanied by a concern for spiritual civilization and for ideological and political work. Party consolidation has been carried out and education in ideological discipline has been developed. There has been a turn for the better in party working styles and mine working styles on the coal battlefront. The 1982 Labor Model Conference established 110 advanced collectives and 144 labor models. In 1984, some 56 advanced ideological and political workers were named and nearly 500 additional labor models and nearly 200 advanced collectives were chosen. They are the crack troops in construction of socialist material civilization on the coal battlefront and they are the vanguards of construction of socialist spiritual civilization as well.

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CSO: 4013/76

COAL INDUSTRY CHANGES YIELD RESULTS

Beijing ZHONGGUO MEITAN BAO in Chinese 26 Oct 85 p 1

[Article: "Comprehensive Contractual Responsibility Leads to Changes in Five Areas in Unified Distribution Mines--An Important Measure in Reform of Economic Systems in the Coal Industry Gets Results; Raw Coal Output Increased by 18.59 Million Tons; Profits Increased by 140 Million Yuan in Eight Months; Consumption Declined and Coal Quality Improved"]

[Text] Since its implementation at the beginning of 1984, an important measure for reform in economic systems in the coal industry--comprehensive contractual responsibility for inputs and outputs in unified distribution coal mines--has led to universal increases in output, coal quality, profits and work efficiency. Materials consumption has fallen, enterprises are beginning to gain vitality, changes have appeared in five areas and there have been comprehensive improvements in economic results. Leading comrades of the State Council recently gave a good evaluation of comprehensive contractual responsibility for inputs and outputs in unified distribution mines.

There has been a universal improvement in enterprise enthusiasm for increased output. After reaching the various contractual responsibility indices, enterprises make overall plans and no longer have to "flog a fast ox" or worry about frequent changes in plans. Production preparations universally have been completed ahead of schedule. Output quotas have been surpassed during every month of 1985, and quotas were exceeded during February and during July and August with their high temperatures and large amount of precipitation, months that traditionally have seen low output. From January to September, unified distribution mines produced 312.56 million tons of coal, an output increase of 18.59 million tons over the same period in 1984.

Output has increased while the workforce has been reduced, which has solved the problem of depending on increases in the number of workers over the past several years. Comprehensive contractual responsibility has involved implementation of contractual responsibility for wages per ton of coal. Increases or decreases in the workforce do not involve changes in total wage bills, which has caused the enterprises to take the initiative in reducing workforces while increasing output. During 1985,

apart from compensating for natural personnel reductions and taking on returned and transferred military personnel, there basically was no recruitment of employees. Most enterprises reduced the number of personnel in raw coal production and used them to develop the diversified economy. Because of the increased output and reduced personnel, the average work efficiency rate of all personnel in unified distribution mines increased to 0.941 tons between January and September, up by 5.1 percent over the same period in 1984.

Coal quality improved and profits increased. Comprehensive contractual responsibility involves responsibility for output as well as for profits and losses. This has reinforced the concepts of value, markets, competition and capital utilization in the enterprises and caused them to begin orienting toward improvement of economic results. In the past, raw coal accounted for 60 to 70 percent of direct sales in unified distribution mines. All of them now have come to understand raw coal processing and that improved coal quality not only has good social results but also brings in major increases in financial resources for the enterprises which now universally are developing washing, dressing and sifting. During the second quarter, improved coal quality and increased product variety raised the average income per ton of coal by 0.50 yuan compared with the first quarter. Although raw coal output in unified distribution mines had a deficit of 380 million yuan during the first 8 months of 1985, profits from dressing and processing increased to 548 million yuan. Calculations based on comparable diameters showed that profits in unified distribution coal enterprises during the first 8 months increased by 140 million yuan over the same period in 1984.

Enterprise management and administration has improved and [materials] consumption has declined. Comprehensive contractual responsibility has motivated the initiative of enterprises to exploit their internal potential and many enterprises are taking the initiative in extending value projects, goal management, administrative regulation, comprehensive quality management, comprehensive economic accounting and other scientific management methods, and they are digesting enthusiastically materials price increases and other unfavorable factors to lower materials and electric power consumption. From January to August of 1985, pit timber consumption per 10,000 tons of coal in unified distribution mines dropped by 6.9 percent compared with the same period in 1984, steel materials consumption per 10,000 tons dropped by 1.3 percent and electric power consumption per ton of coal fell by 1.6 percent.

Enterprises have increased incomes and their ability for self development has been reinforced. After comprehensive contractual responsibility, the amount of capital owned by the enterprises themselves increased which greatly expanded decision making rights over capital. Some things which in the past enterprises wished to take up but were unable to do so like technical transformation, additional excavation, dressing equipment, improvement of employee welfare and so on now gradually are within their ability to make arrangements. Enterprises have begun to strengthen their self-development capacity.

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CSO: 4013/35

SIGNIFICANCE OF LOCAL COAL MINES UNDERLINED

Beijing ZHONGGUO MEITAN BAO in Chinese 30 Oct 85 p 1

[Text] During the Sixth Five-Year Plan, the state has let go of and invigorated local coal mines and practiced joint advance by the state, collectives and individuals. Large, medium and small coal mines are working together, which has led to rapid development of local coal mines. Output increased by an average of 33.75 million tons over the past 4 years and the degree of output increase has grown each year. Output also grew by 52.65 million tons from January to September of 1985 compared with the same period in 1984 and they have become a new force rich in vitality in the coal industry.

Total output in local coal mines in China reached 394 million tons in 1984, equal to one-half of total coal output nationwide. The development of rural and small town coal mines particularly has attracted attention and they now can be found in 61,800 locations. They produced 216 million tons of coal in 1984, an increase of more than 103 million tons over 1980. This is an average yearly increase of 25.81 million tons and accounted for 76 percent of total growth in local coal mines. Moreover, output from January to September of 1985 increased by more than 43.00 million tons compared with the same period in 1984.

The rapid development of local coal mines not only has improved the layout of the coal industry, promoted development of local and of rural and small town enterprises and increased the income of the masses who are running mines, but it also has led to an obvious increase in the amount of commodity coal being shipped out. In 1984, the state used about 80.00 million tons of local coal in unified distribution, a doubling of the 1980 figure. This was an important contribution to sustained and stable development of the national economy.

Local coal mines also have developed rapidly in the nine coal-short provinces south of the Chang Jiang. Some 325 counties now have set up coal mines and produced 77.56 million tons in 1984, an output increase of 17.73 million tons over 1980. This reduced the pressure on the southward shipment of northern coal and alleviated the serious coal shortage situation in the area south of the Chang Jiang.

Under state policy relaxation and active support, output in local coal mines and quality also has been improved. Continual technical transformations in local state run coal mines have led to gradual changes in the situation of small size and poor quality found during the early period of mine construction, and reliance on scientific and technical progress has brought them into normal production. Of the 2,513 local state run coal mines, 1,500 produce more than 30,000 tons a year and have a production capacity of 170 million tons, and they include 11 sites with annual output in excess of 1 million tons. Most provinces and autonomous regions now have demonstration mines with rather high levels of mechanization, and these demonstration mines are playing a role as models in the extension and utilization of new technologies. All areas and levels have set up a group of local coal mine training centers and the establishment of technical schools continues. They are providing ever greater numbers of personnel training base areas for local coal mines with their serious shortage of specialized personnel.

Local coal mines have opened up capital channels for capital construction, adding a net 110 million tons in production capacity over 5 years and adding reserve strengths for development. During the Sixth Five-Year Plan, local coal mines have been subsidized by state investments. Localities and enterprises are raising their own funds and broadening capital channels to carry out capital construction of mines, coal shipping capacity and so on. Some 614 newly built or transformed local state run mines have been established in 5 years, and the newly added production capacity is 41.22 million tons. Rural and small town coal mines mainly have used self-accumulation and technical transformation of 5,512 small scale conventional mines during the Sixth Five-Year Plan for a net increase of 68.85 million tons in production capacity. In addition, they completed construction of 63 special use local coal mine railways 572 kilometers in length for a newly added yearly shipping capacity of 30.00 million tons. Moreover, they engaged in some highway and water transport construction and built a group of geological teams and mine rescue teams to serve local mines.

Local coal mines in all areas now are striving to adhere to the spirit of the National Party Representative's Congress and making active arrangements for the Seventh Five-Year Plan to make further improvements in the quality of local mines and good reorganization of rural and small town mines, and they are concentrating on safe production, opening up shipping and marketing channels, reinforcing reserve forces for development and striving to increase output during the Seventh Five-Year Plan by an average of 20.00 million tons annually and to surpass the production level of 500 million tons per year.

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CSO: 4013/35

CONSTRUCTION OF PINGSHUO STRIP MINE IN FULL SWING

OW301109 Beijing XINHUA in English 0908 GMT 30 Jan 86

["Year-ender: Construction of China's Largest Joint Venture in Full Swing"--XINHUA headline]

[Text] Beijing, 30 Jan (XINHUA Correspondent Zhang Huchen)--Construction of China's largest joint venture--the Antaibao open-cut coal mine in the Pingshuo area of north China's Shanxi Province--is in full swing, and the mine is expected to be completed and go into full operation in September next year.

Yu Yingzhou, senior engineer of the China National Coal Development Corporation [CNCDC], revealed this in an exclusive interview with XINHUA here today.

More than 10,000 workers are now laboring day and night on a number of pre-production projects in the Pingshuo mining area. At the same time, coal extraction has started at one spot, he said.

This mine is a joint venture between CNCDC, the China International Trust and Investment Corporation (CITIC), Occidental Petroleum Corporation of the United States, and the Bank of China Trust and Consultancy Company (BOCTC).

It has an estimated coal reserve of more than 450 million tons within the contract area of 18.5 sq km and lies about 500 km southwest of Beijing.

According to the contract signed by the partners, the entire project calls for a total investment of more than $649 million, and its designed annual production capacity is 15.33 million metric tons of raw coal--equivalent to some 70 percent of China's total coal output from present open-cut coal mines. The term of the cooperation is 30 years.

With a simple geological structure and thin cover, the contract area has eight coal seams, totaling 25 meters thick. Among them, three major seams are workable, and the coal there has been identified as quality steam coal, the senior engineer said.

Upon completion, it will be the largest of its kind in China and also one of the large-scale open-cut mines equipped with the most advanced surface mining equipment in the world, Yu Yingzhou said.

"Remarkable progress" has been made in the pre-production construction since it started in 1983, the senior engineer said.

Construction of special rail lines totaling 20.6 km, 5.2 km of rail loop and spur lines, 17 railway bridges and 68 culverts has already started. The rail line has [now] reached the industrial square of the mining area and it will be open to traffic in the first quarter of 1987, he expected.

The main highway, totaling 30 km within the mining area, has been opened to traffic and three of the six road accesses in the mining area have been completed.

A 12-km-long 110 kV permanent power supply line has been erected and a temporary power supply line has been completed. A temporary communications system between the residential area, the mine and Beijing has been put into use.

All hydrological exploration, drilling of wells, and water pumping tests have been finished and water supply is believed to be adequate for the mine's consumption, Yu Yingzhou said.

At the industrial site, an 8.25-km [section of] river has been diverted, the construction of the major maintenance shop and warehouse has been completed and 22 oil tanks with a total storage capacity of 12,000 cubic meters have been installed.

Construction of the foundation of the main coal dressing plant building is also finished, and the steel structure erection of two stories of the washing plant and the installation of its equipment are expected to be largely completed before the end of this year.

With a designed annual washing capacity of more than 15 million tons of raw coal, the plant will be one of the largest in the world, the senior engineer said.

At the same time, of the planned apartment buildings with a total floor space of 280,000 square meters, 200,000 square meters have been completed and the rest is expected to be finished by the end of this year. Other affiliated facilities such as primary schools and nurseries have been turned over for use, and an office building and cinema will soon be completed.

By the end of last year, Yu Yingzhou said, a total of some 5 million cubic meters of earth cover had been stripped in several sections of the mine since box-cutting began 1 July 1985.

According to a decision made at the second meeting of the joint management committee held last December, the Chinese and foreign partners will accelerate the removal of the overburden of the mine, and by the end of this year a total of 32.95 million cubic meters of earth will be removed, accounting for 53 percent of the total work that needs to be done during the development phase.

The senior engineer disclosed that equipment-purchase contracts worth a total of $200 million have been signed with manufacturers from the United States,

Canada, the Federal Republic of Germany, Japan, and other countries. The more than 600 major items of equipment to be purchased are the most up-to-date in the world today, he added.

By the end of 1985, Yu Yingzhou said, 200 pieces of equipment ordered had arrived and had been, or will soon be, put into operation.

"The project is a beginning of the long-term cooperation between our two sides, and this good beginning will bring China more economic cooperation with other countries," said senior Chinese leader Deng Xiaoping during a meeting last year with Dr Armand Hammer, chairman of the board of Occidental Petroleum Corporation.

Last September, the president and vice-presidents of the coal project were officially appointed at the first meeting of the joint management committee of the Antaibao mine. Now, 76 senior executives--38 from each side--have assumed office and they are [concentrating] their efforts to speed the construction of this, China's largest joint undertaking, the Chinese senior engineer said.

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CSO: 4010/32

NORTHEAST BEATS 1985 PLAN, PRODUCES OVER 100 MILLION TONS

Beijing RENMIN RIBAO (OVERSEAS EDITION) in Chinese 11 Dec 85 p 1

[Article: "Northeast, Nei Monggol Produce Over 100 Million Tons of Raw Coal, Complete Annual Production Plan One Month Ahead of Schedule"]

[Text] The Northeast-Nei Monggol Joint Coal Industrial Corporation which includes Ningxia, Jilin, Heilongjiang and Nei Monggol, completed their annual coal production plan for 1985 1 month ahead of schedule. It has produced more than 95 million tons of coal, a 7.57 percent increase compared to the same period last year. It is anticipated that the company will break the 100-million-ton mark for the year and exceed the state plan by more than 8 million tons.

There are many types of coal in the Northeast-Nei Monggol region, the resources are abundant and the reserves total 64 billion tons.

An official from the Northeast-Nei Monggol Joint Coal Industrial Corporation told reporters that the Jungar coal mine in Nei Monggol will become China's key coal export base, and its estimated annual production capability is 25 million tons.

According to statistics, the annual raw coal output of this company has increased more than 6 percent a year for the past 2 years, and the increased amount of coal produced has been more than 7 million tons, the largest amount nationwide.

The rapid development of the Northeast-Nei Monggol Joint Coal Industrial Corporation established in 1983 has relieved the shortage of coal in the northeast and has played a key role in stimulating the economy in this region.

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CSO: 4013/65

HEILONGJIANG'S OUTPUT DOUBLES IN 10 YEARS

Harbin HEILONGJIANG RIBAO in Chinese 16 Jan 86, p 1

[Article: "Raw Coal Output in Heilongjiang Doubled in 10 Years--Transformation and New Construction Are Combined, Unified Distribution and Localities Are Synchronized"]

[Text] The Heilongjiang coal industry has adhered to transformation in conjunction with new construction and accelerated coal construction. Raw coal output in 1985 reached 61 million tons, a doubling in 10 yeras. With the exception of the Jixi Mine, the three other large unified distribution mining bureaus have shifted from losses to profits.

Heilongjiang has a history of more than 60 years in developing coal. Basically, scattered slanted shaft mines dominated and technical equipment was rather backward. To change this backward situation, each of the coal mines conformed to the principle of rational centralization of production and formulated a 10 year transformation plan to transform and exploit the potential of old mines. In the past 10 years, the Jixi Mining Bureau transformed 43 small inclined shafts and centralized them into 6 large vertical shafts, 3 centralized belt inclined shafts, 5 skip shafts and 7 large inclined shafts. Output of raw coal increased by 4 million tons and they used only 250 million yuan in investments, a savings of 300 million yuan in investments compared with construction of new shafts. The Hegang Mining Bureau transformed and centralized 15 shafts into 10 shafts and doubled raw coal output. The Qitaihe Mining Bureau transformed 19 small inclined shafts into 4 large centralized belt inclined shafts and saved the state 150 million yuan in investments. Raw coal output leapt from 1.6 million-plus tons to 5.6 million tons in 1985 and it joined the ranks of large bureaus. Local coal mines have transformed almost 20 mines in the past 5 years and raw coal output has increased substantially.

Along with transformation and exploitation of potential in old mines, a large number of new mines have been built over the past 10 years. This is especially true of local areas, where with the exception of mines under provincial, city and county jurisdiction, mines run by local enterprises in more than 50 locations and mines managed by cities and towns, rural land small town collectives and individuals in more than 1,000 locations have been guided by the principle of making use of available resources. Their raw coal output accounts for half of local coal mines.

To speed development of the coal industry, unified distribution mines and local coal mines have striven to transform technical equipment and made great efforts to import comprehensive coal extraction machinery sets to popularize the use of machinery in extraction. In the past 10 years, the degree of mechanization in extraction at the Jixi Mining Bureau has risen from the past figure of 66 percent to the current figure of 92 percent. Hegang has raised it from 16 percent to 51 percent. Monthly output from a unit coal extraction work face rose from 10,000 to 17,000 tons, the highest in the northeast.

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CSO: 4013/76

SHANXI HAS RECORD OUTPUT IN 1985

OW190306 Beijing XINHUA in English 0250 GMT 19 Jan 86

[Text] Taiyuan, 19 Jan (XINHUA)--Coal output reached a record 207 million tons last year in Shanxi province, China's biggest producer, provincial coal office Chief Engineer Ren Binggang said here on Friday.

This surpassed the state plan by 24 million tons. The province met the target for the Sixth Five-Year Plan (1981-1985) 12 months ahead of schedule.

Ren said that since 1979 Shanxi had increased coal output at an annual average of 15 million tons. The province now produces a quarter of China's coal, compared with one-fifth in 1980.

Over the past 5 years, Shanxi moved 550 million tons of coal to other parts of China, and supplied 6 billion kilowatt-hours of electricity to the industrial Beijing-Tianjin-Tangshan area and neighboring provinces.

Ren said the success was due to the development of mines owned by the state, province, and townships. Last year, 4,278 small township mines cut more than 90 million tons of coal, outstripping the output of the 14 large mines owned by the state in the province.

The momentum of increased coal output is expected to continue through the next 15 years. An opencast mine with a designed annual capacity of 15 million tons--a joint venture between Shanxi and Occidental Petroleum of the United States--will go into production early next year.

And another coal field, being developed with the aid of Japanese loans, will produce 16.5 million tons of coking coal a year after construction work is completed in 1992.

Meanwhile, 22 other mines, with a combined annual capacity of 43.75 million tons, are under construction. They are also scheduled to go into production in 1992.

Modernization work at collieries is also being speeded up. So far, 77 percent of work in the state-owned mines has been mechanized.

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CSO: 4010/30

SHANXI TO INCREASE EQUIPMENT IMPORTS FROM U.S., FRG

OW181330 Beijing XINHUA in English 1259 GMT 18 Feb 86

[Text] Taiyuan, 18 Feb (XINHUA)--Shanxi, China's leading coal producer, will produce 400 million tons of coal a year by the end of this century--one-third of the country's total--a leading engineer said today.

To reach this goal, Shanxi will rapidly increase its imports of advanced mining equipment from Federal Germany, Poland, and the United States, according to Song Binggang, chief engineer of the provincial coal industrial bureau.

The province produced 210 million tons of coal last year, one-fourth of China's total.

Since 1974, Shanxi has imported more than 4,000 pieces of fully-mechanized coal cutting euqipment from Austria, Britain, France, Federal Germany, Hungary, Japan, Poland, Sweden, and the United States.

Two-thirds of the additional 19 million tons of coal produced by seven major state-run collieries in the province over the last decade can be attributed to imported technology, according to mining experts.

For instance, one-third of all mining teams in the state-run collieries work with imported mechanical cutters.

Other imports have contributed to safety in the mines. The Yangquan Coal Administration in central Shanxi, for example, uses remote control monitoring systems imported from Great Britain and France to reduce hazards.

Seven major state-run coal mines now employ imported computers to organize daily production, and the Taiyuan mining machinery plant is involved with a British firm in manufacturing advanced coal cutters.

As part of its plans to acquire foreign technology, Shanxi held international coal mining machinery exhibitions in 1983 and 1985.

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CSO: 4010/35

BRIEFS

NEI MONGGOL COAL OUTPUT--Hohhot, 10 Jan (XINHUA)--The Nei Monggol Autonomous Region has spent about 2 billion yuan on colliery construction over the past 5 years, according to the region's Bureau of Industry here today. Nei Monggol boasts of known coal reserves of 194 billion tons, next only to Shanxi Province, China's leading coal producer. Altogether, 34 coal mines--including the Yiminhe and Huolinhe opencast mines, each with an annual production capacity of 4 million tons--have gone into production since 1981. The paper said they had increased the regional coal production capacity by 8.58 million tons, or 7.6 percent, a year since. Inner Mongolia produced 29.53 million tons of coal last year--2.34 times the 1980 figure. [Text] [Beijing XINHUA in English 0957 GMT 10 Jan 86 OW] /8918

NEI MONGGOL DRESSING PLANT--Hohhot, 7 Feb (XINHUA)--Nei Monggol's largest coal-washing plant has gone into trial operation near Wuda City. With an annual processing capacity of 900,000 tons of coal, the plant is located next to a smaller one at Suhaitu Colliery in the west of the autonomous region. The two plants will wash more than a million tons of quality coking coal a year for the Baotou Iron and Steel Company in Nei Monggol, one of China's largest iron and steel complexes. Nei Monggol has verified coal reserves of 200 billion tons, second only to Shanxi Province, China's leading producer. Regional authorities have invested 2 billion yuan in the industry over the past 5 years. [Text] [Beijing XINHUA in English 0644 GMT 7 Feb 86 OW]/6662

HEILONGJIANG 1985 OUTPUT--In 1985, the total raw coal output of Heilongjiang Province reached 61 million tons, an increase of 100 percent over that of 1975. [Summary] [Harbin HEILONGJIANG RIBAO in Chinese 16 Jan 86 p 2 SK]

SICHUAN SIXTH FYP OUTPUT--During the Sixth 5-Year Plan, Sichuan Province continued to increase its raw coal production, mining more than 227 million tons of coal in the 5-year period. Annual output grew at an average of 7 percent. Raw coal production in 1985 alone broke the 50-million-ton mark. /Summary/ /Chengdu SICHUAN RIBAO in Chinese 9 Jan 86 p 2/ 12228

ANHUI MINE OPENS--Today construction officially started on Renlou mine--a local coal mine in Anhui Province. Renlou coal mine is located in southern Suixi County in Huaibei, and it is about 25 km west of the Tianjin-Pukou railroad. Renlou has abundant reserves, including more than 170 million tons of exploitable reserves of gas and rich coal. It plans to produce 1.5 million tons of raw coal annually, and could begin mining in 1985. It is currently Anhui's largest local coal mine and is also the largest local coal mine in the nation. The operation of this mine is the prelude to large scale development and to the construction of a coal base in northern Anhui, and it is extremely significant for giving play to the superiorities of Anhui coal, developing Anhui's industrial and agricultural production and stimulating the economy. [Text] [Hefei ANHUI RIBAO in Chinese 24 Nov 86 p 3] /9274

SICHUAN'S RECORD OUTPUT--Because Sichuan's coal industry implemented comprehensive contract reforms this year, the province's coal output maintained a steady increase. By the end of November, the province had produced a total of 49.12 million tons of raw coal, overfulfilling the state plan. Sichuan also prefulfilled the state plan a month ahead of schedule for the amount of coal dressed and tunnelling footage. [Text] [Chengdu SICHUAN RIBAO in Chinese 19 Dec 85 p 2] /9274

LARGE HEBEI MINE OPERATIONAL--A large modern mine located on the southern basin of Wu'an County--the Wannian No 2 mine, recently started operation. This mine will produce 1.5 million tons of high quality anthracite per year for more than 50 years. [Text] [Shijiazhuang HEBEI RIBAO in Chinese 14 Dec 85 p 1] /9274

NEW HEILONGJIANG FIELD--Shenyang, 25 Dec (XINHUA)--A big coal field has been discovered in Dashiqiao District in the eastern suburb of Jixi City, Heilongjiang Province. With a reserve of some 500 million metric tons of lignite, the coal field covers an area of approximately 60 square kilometers, and the coal seam is 10 meters thick on the average. [Summary] [Beijing XINHUA Domestic Service in Chinese 0032 GMT 25 Dec 85 OW] /12858

SICHUAN COAL SURPLUS--Sichuan achieved a surplus in coal production for the first time last year and sold some coal to other provinces. Output of state-owned coal mines in the province during the year was 54.21 million tons, an increase of 9.11 percent over 1984. Output of small mines operated by township enterprises was 22 million tons, an increase of 21.2 percent over 1984. This new breakthrough has played a positive part in easing the province's energy shortage and meeting the requirements for the Seventh Five-Year Plan. [Summary] [Chengdu Sichuan Provincial Service in Mandarin 2300 GMT 18 Jan 86 HK] /12858

LIAONING COAL DEPOSITS--A new coal mine with total reserves of 50 million tons has been discovered in Jiudaoling of Yixian County in Liaoning Province. After 2 years of prospecting, it was discovered that there are four recoverable coal beds here with a total area of 16 square kilometers and total coal reserves of 50 million tons. The quality of this coal mine was reported good. [Summary] [Shenyang Liaoning Provincial Service in Mandarin 1030 GMT 19 Dec 85 SK] /8918

JILIN COAL OUTPUT--Collieries whose products are covered by the state unified distribution plan throughout Jilin Province have realized more than 13 million tons of raw coal output in 1985, overfulfilling their annual production plan by 14 percent. Thus, they have shown a yearly average increase of 1.45 percent during the Sixth Five-Year Plan. [Excerpts] [Changchun Jilin Provincial Service in Mandarin 2200 GMT 29 Dec 85 SK] /8918

CSO: 4013/74

DAQING EXPECTED TO MAINTAIN HIGH OUTPUT FOR YEARS

HK220818 Beijing ZHONGGUO XINWEN SHE in Chinese 1057 GMT 20 Jan 86

[Text] Beijing, 20 Jan [ZHONGGUO XINWEN SHE]--Does Daqing oil field, China's largest oil base, still have a recoverable reserve despite extensive exploitation over the past 10 years? From the ongoing national economic work conference in Beijing, our reporter has learned that this oil field will be able to maintain its annual output of 50 million tons until 1995.

Daqing oil field, located in northeast China, has an oil output that accounts for about 50 percent of the country's output. It produced 55.28 million tons in 1985. Observers here believe that if the field can continue to maintain a high output, there will be bright prospects for guaranteeing energy for China's effort to invigorate its economy in the 1990's.

In an interview with a responsible person of the Daqing oil field administration in Beijing, it was stated that progress has been made in the exploration of new oil fields. A survey shows that more recoverable deposits have been found in the three new oil fields of Lamagou, Saertu, and Xinshutun, and the deposits amount to that of a large oil field. This has laid the foundation for the sustained growth of production of Daqing in the future. Meanwhile, a number of new oil fields have been exploited at Longhupao, Chaoyanggou, Songfangtun, and Shengping around Daqing.

Daqing, a field exploited by China through its own efforts in the 1960's, has imported a great amount of advanced foreign equipment and technology since the early 1980's. The spokesman told this reporter that the oil field has imported 3,500 sets of modern technical equipment from 17 countries. Furthermore, a number of foreign oil exports work as advisers for the oil field and a U.S. team for forecasting earthquakes and a French drilling team also assist in its development. This has greatly helped Daqing raise its level of exploration and exploitation.

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CSO: 4013/67

KANG SHIEN: 'GREAT' EFFORT NEEDED FOR SHENGLI TO MEET 1990 QUOTA

SK100213 Jinan Shandong Provincial Service in Mandarin 2300 GMT 8 Jan 86

[Text] From 6 to 9 January, after inspecting the Shengli oil field, State Councillor Kang Shien held discussions in Jinan with responsible comrades of the provincial CPC Committee and the provincial government on the development of the Shengli oil field during the Seventh Five-Year Plan.

He pointed out that the Ministry of Petroleum Industry and the Shandong Provincial CPC Committee and Government should strengthen leadership over work in the oil field. The field and the localities should closely cooperate and make a concerted effort to ensure the realization of the grand goal for building Shengli oil field into a second Daqing.

On the morning of 7 January, accompanied by Liang Buting, Li Changan, Su Yiran, and Ma Shizhong, Comrade Kang Shien listened to a report on a plan for developing the Shengli oil field during the Seventh Five-Year Plan delivered by Li Ye, secretary of the Dongying City CPC Committee and secretary of the CPC Committee of the Shengli oil field.

Responsible comrades of the province stated that Shandong is willing to take effective measures for wholeheartedly supporting the development of the Shengli oil field, since the development of the oil field is one of the state key projects for economic development.

Kang Shien said: After inspecting the Shengli oil field for more than 40 days, I came to know that the oil field's situation is very good. The staff and workers of the Shengli oil field are full of confidence in making the field a second Daqing with the achievements realized during the past few years. However, it is rather difficult to attain the annual production target of 50 million tons of crude oil by 1990 on the basis of the 1985 annual production of more than 27 million tons of crude oil. We will not be able to attain this target if we do not make great efforts. Thus, the Ministry of Petroleum Industry and the Shandong Provincial CPC Committee and Government must adopt effective measures for enhancing leadership over the work of the oil field. The localities and the oil field should carry forward the previous fine traditions, further unite with each other, and make concerted efforts to ensure the realization of the grand goal set by Hu Yaobang for making the oil field a second Daqing.

After affirming Shandong's contributions to the development of the Shengli oil field during the past 20 years or more, and pointing out measures for supporting the field's development, Comrade Kang Shien pointed out that the localities may consider setting up organizations to serve the oil field's development. Efforts must be made to closely cooperate with supply departments to ensure supplies of materials for the field's development. At the same time, the field should actively support local economic construction and strive to promote common prosperity and development.

/12858
CSO: 4013/56

ROUNDUP OF PROGRESS MADE IN 1985 IN SOUTH CHINA SEA

HK011258 Beijing ZHONGGUO XINWEN SHE in Chinese 0850 GMT 28 Dec 85

[Article by reporter Zhang Xu [1728 6079]: "A Review of the South China Sea Oil Field in the Past Year"--ZHONGGUO XINWEN SHE headline]

[Text] Guangzhou, 28 Dec (ZHONGGUO XINWEN SHE)--Prospecting work in the South China Sea oil fields was resumed actively this year. In the wake of the drilling of a series of high-yield oil wells in the Zhu Jiang Estuary Basin and the start of preparations for the operation of oil-gas wells in the Beibu Gulf, foreign oil companies are becoming more and more interested in this region.

As the year's end draws nearer and nearer, the "contract signing climax" of the second round of tenders for joint oil drilling projects has arrived. So far, all the joint development lots covered by the four signed contracts are situated in the Pearl River Estuary.

The year 1985 was a good one for the Nanhai East Oil Corporation, which has made important discoveries in three reservoir structures. Early this year, in cooperation with the ACT Group formed by three Italian and American companies, the corporation succeeded in drilling a well which struck oil on the Huizhou 33-1 structure. In April, the U.S. Phillips Petroleum Corporation also succeeded in drilling an oil well with a daily output of more than 1,000 tons of crude on the Xijiang 24-3 structure located 210 kilometers southeast of Guangzhou. In August, the same company succeeded in drilling another high-yield evaluation well on the same structure. In September, the ACT Group reported success in drilling a high-yield well with a daily output of nearly 2,000 tons of crude oil on the Huzhou 21-1 structure.

The high-yield wells successively drilled on these structures have been evidence supporting the deduction that the eastern part of the South China Sea is rich in oil and gas. Chen Sizhong, chief geologist of the Nanhai East Oil Corporation said: "The first zone rich in oil and gas with an area of 6,000 square kilometers has been initially discovered." The assistant general manager of the British Petroleum Development Company Limited pointed out: "The importance of the recent findings lie in the fact that oil wells with a rather high yield have been discovered,

some of which even provide natural gas. This will ensure that the costs for the final exploration of the oil field will be cheaper and the results better." "We are not ruling out the possibility of discovering a medium-sized oil field, but we are looking forward to discovering a large oil field," he added.

While good news kept pouring in from the eastern South China Sea, the Nanhai West Oil Corporation has been making intense preparations for putting the first oil field in the South China Sea into operation.

This oil field, named "Wei 10-3," is located southwest of Weizhou Island in the Beibu Gulf. In 1980 the Nanhai West Oil Corporation and the French Total Company began to jointly prospect for oil in this area. In the past 4 years, they have drilled a total of four test wells, all high-yield wells, two of which gave a daily output of more than 1,000 tons each. The drilling of the first production well was started in January and completed in April this year; the drilling of the five remaining production wells is to be completed in the first quarter of [1986]. The oil field is scheduled to officially go on stream in mid-July [1986].

The four key projects launched by the Nanhai West Oil Corporation as a part of the development program of this oil field, namely, the oil well platform project, the submarine pipeline project, the crude oil transportation project using "single-point mooring", and the oil storage vessel modification project, will be completed in June 1986. It is said that the Chinese and French partners have jointly raised funds totaling 3.6 million to purchase an oil storage vessel with a storage capacity of 90,000 tons. This oil storage vessel, the largest of its kind in China, will be named "Hope of the South China Sea."

Meanwhile, China and ARCO of the United States have also concluded a contract on the exploration and sale of natural gas produced in the Yinggehai. That gas field is situated some 100 kilometers to the south of Hainan Island. The drilling of these wells to figure out the boundary of the gas field was started in early December and the gas field is expected to be put into operation in 1989. It has been revealed that this gas field, with reserves estimated at 90 billion cubic meters, is the largest natural gas field discovered so far in China and can be tapped for 30 years. A decision has been made to lay a gas pipeline linking Sanya on Hainan Island with Guangzhou. In mid and late September, designers of the China National Offshore Oil Corporation made an on-the-spot survey for the construction of this 800-odd-kilometer pipeline project.

According to relevant sources of the South China Oil Service Corporation, the volume of the corporation's offshore service has increased this year by 47 percent over last year, the highest volume recorded in recent years. The corporation is providing more and more complete support

services, with the quality constantly being improved. With regard to telecommunications services, the corporation has newly installed a land-sea wide bandwidth radio system at Shekou and built a marine satellite communications station in Guangzhou, guaranteeing continuous telecommunications services. With regard to daily life services, a new 30-ton cold storage complex has been built. With regard to meteorological services, since the service quality had been proved superior, six foreign companies renewed their contracts with the corporation in the latter half of this year, and even Total, which used to obtain meteorological services from Hong Kong, signed a meteorological service contract with the corporation this year. In the competition for service contracts, more than 90 percent of the bids submitted by the corporation have won the contracts.

In November, the Shenzhen Chiwan Oil Base jointly run by the corporation and its Singapore partner was officially inaugurated. This is the first oil support service base China has jointly run with foreign interests. This base and other bases in Shenzhen, Zhanjiang, Zhuhai, and Sanya have formed a support service network for the development of the South China Sea oil fields.

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CSO: 4013/56

NEW OIL FIND IN PEARL RIVER BASIN

HK250532 Beijing CHINA DAILY in English 25 Jan 86 p 1

[By staff reporter Xu Yuanchao]

[Text] A group of foreign oil companies has struck oil in the Pearl River Mouth Basin of the South China Sea, the China National Offshore Oil Corporation (CNOOC) announced yesterday in Beijing.

The test well is estimated to be able to produce 1,186 tons of crude oil and 100,000 cubic metres of associated gas a day, a CNOOC official told CHINA DAILY. It also produces 98 tons of condensate.

The Huizhou 21-1-2 well, located about 274 kilometers southeast of Guangzhou, is in the 16/08 contract block in the Pearl River Mouth Basin.

The well was drilled by Agip (Overseas) Ltd of Italy in partnership with Chevron Orient Inc of the United States and Texaco Petroleum Naatsch (Netherlands B.V.).

The official said this was the ninth well to hit oil of commercial value in the Pearl River Mouth Basin since China announced cooperation with foreign companies to prospect for offshore oil resources in 1979.

/8918
CSO: 4010/33

EASTERN FIELDS FOCUS OF SEVENTH FIVE-YEAR PLAN

HK230701 Beijing ZHONGGUO XINWEN SHE in Chinese 1345 GMT 20 Jan 86

[Text] Daqing, 20 Jan (ZHONGGUO XINWEN SHE)--China has decided to exploit more oil resources, particularly in its eastern regions during the Seventh Five-Year Plan period. This effort will make up over 90 percent of China's gross annual oil output. This was learned at the oil work conference which opened here today.

In the next 5 years, China will give priority to the six oil fields at Daqing, Dagang, Shengli, Liaohe, Zhongyuan, and Huabei. On the basis of an annual oil output of 55 million tons, Daqing, China's biggest oil field, will continue to make progress in production in the next 10 years. Shengli, second to Daqing will be able to produce 50 million tons of oil a year by 1990. Liaohe will yield 13 million tons of oil by that time, and it will probably become China's third largest oil base if its output exceeds that of Huabei. Zhongyuan oil field will be running neck and neck with Huabei when its output reached 10 million tons. Dagang oil field will increase its output from 3.65 million to 5.5 million tons by 1990.

It is expected that prospecting in China's eastern regions will increase reserves by 50 percent. In the next 5 years, a detailed survey will be made to explore five oil-bearing formations in the Damintun area of Liaohe oil field, Gudong oil field under the No. 5 fixed platform of Shengli oil field, the Dawangzhuang area and Nanbao area in the Bo Hai, and the Wenliu area of the Zhongyuan oil field. In addition, efforts will be made to explore new gas fields at Hailaer, Yilan, and Yitong around the Songliao Basin, at Erlian and Keilu in Nei Mongol, Zhoukou in Henan Province, and the offshore areas of Bo Hai Bay.

It has been learned that China will build 12 new oil pipelines extending more than 2,300 kilometers during the Seventh Five-Year Plan in an effort to improve shipment of oil from the Shengli, Liaohe, and Zhongyuan oil fields.

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CSO: 4013/68

STEAM INJECTION BOOSTS OUTPUT OF THICK CRUDE

OW141956 Beijing XINHUA in English 1512 GMT 14 Feb 86

[Text] Beijing, 14 Feb (XINHUA)--China plans to increase its production capacity of thick oil by 5 million tons in the next 5 years, according to the Ministry of Petroleum Industry today.

Meanwhile, it will build thick oil refineries with an annual capacity of 5 million tons.

Thick oil can be processed into high-quality gasoline and asphalt which is in short supply in China.

In 1985, the country produced more than 1.5 million tons of thick oil.

China has verified thick oil deposits of 1.7 billion tons, most of which is located in the Shengli, Liaohe, and Karamay oil fields.

Three miloion tons of the added production capacity will be produced by Shandong Province's Shengli oil field--China's second largest. It plans to produce a total of 7 million tons of thick oil in the next 5 years.

Liaohe in Liaoning Province and Karamay in Xinjiang have introduced advanced exploitation technology in which steam is injected underground to facilitate the flow of oil.

The technique proved successful at a 1,600-meter well in the Liaohe oil field and passed state appraisal there at the end of last year.

/6662
CSO: 4010/34

QINGHAI CONDUCTS FEASIBILITY STUDY ON OIL FIELD EXPLOITATION

HK101537 Xining Qinghai Provincial Service in Mandarin 2330 GMT 7 Jan 86

[Text] The conference to initially examine the feasibility study on Qinghai oil field exploitation and oil refinery construction, which was recently held in Dunhuang, Gansu concluded that the exploitation and construction of the Gazikule oil field, development of the annual capacity to extract 1.5 million tons of crude oil, construction of the oil pipelines from Huatugou to Golmud, and construction of an oil refinery whose annual capacity of 1 million tons of oil products are completely feasible. Resources are available, technology is basically up-to-date, there are favorable conditions for construction, and economic results and comprehensive social benefits look very good.

In accordance with the arrangements of the Ministry of Petroleum Industry and the provincial people's government, the feasibility study was begun last June to adhere to the principle of regarding the oil field, pipelines, and oil refinery as an entity, to meet the needs of having a coordinated process and of modernized and automatized production, operations, and management. The General Planning and Design Institute of the Ministry of Petroleum Industry is taking the lead, of all relevant units participating. The comrades taking part in the study and design collected on-the-spot data, made an on-the-spot survey, and selected sites in the Gazikule oil field, Huatugou base, Lenghu area, Huatugou-Golmud road, and Golmud City. After that, in regard to the advanced technology at home and abroad and in conjunction with the actual situation in the Qaidam area, they seriously made preliminary selections.

The conference held that with the completion of these items, the energy shortage in Qinghai Province and the Xizang Region will be greatly ameliorated and the development of the petrochemical industry, salt chemical industry, machine-building industry, building materials industry, communications, transport, water resources, electric power, and tertiary industry in the province and region will be promoted and accelerated.

/12858
CSO: 4013/58

ZHONGYUAN OIL FIELD MAPS OUT SEVENTH FIVE-YEAR PLAN

HK180504 Zhengzhou Henan Provincial Service in Mandarin 2300 GMT 14 Jan 86

[Text] Zhongyuan oil field recently mapped out the goals for the Seventh Five-Year Plan. It is prepared to properly carry out all technological work during the Seventh Five-Year Plan so as to become a major oil field in the country by the Eighth Five-Year Plan. This plan, which was formulated after making a scientific analysis of oil and gas reserves in Tongpu'ao County and of the technological ability, equipment, funds, and the quality of staff and workers of the oil field, has been examined and approved by the Ministry of Petroleum Industry.

According to this plan, the geological petroleum reserves to be verified by Zhongyuan oil field in the next 5 years will be double the reserves at the end of 1985. By 1990, the oil field will produce more than 10 million tons of crude oil. During this period, the oil field will focus its exploration work on increasing oil and gas reserves, and expanding the oil-bearing area, and on exploring for natural gas reserves in particular. There are considerable amounts of underground natural gas reserves in the Zhongyuan oil field. After several years of effort, the Zhongyuan oil field will certainly become one of the major bases in China for producing and processing natural gas. According to the Seventh Five-Year Plan, after 5 years of hard work, the crude oil output of Zhongyuan oil field will increase by 150 percent over its output in 1985, and the profits and taxes submitted to the state and the Ministry of Petroleum Industry will be equivalent to 5 times the investment made by the state.

/12858
CSO: 4013/58

JOINT VENTURES DEVELOP SOUTH CHINA SEA GAS

OW222023 Beijing XINHUA in English 1930 GMT 22 Jan 86

[Text] Guangzhou, 22 Jan (XINHUA)--Preparation work is now well under way for developing China's largest offshore gas field, in the South China Sea.

The area is expected to produce 3.25 billion cubic meters of natural gas a year, beginning in 1992, 3 years after it goes into commercial production.

A third well is now being drilled in the area and the fourth is planned to be sunk by the end of this year.

The first two wells were drilled in 1983 and 1984, and produced, respectively, 1.2 million cubic meters and 1.83 million cubic meters of natural gas a day.

Meanwhile, a feasibility study is now being conducted by the China National Offshore Oil Corporation (CNOOC) for the construction of a pipeline to be laid from the Yacheng 13-1 gas field in the Yinggehai to Guangzhou.

Investigations are also being made to choose sites for two power plants, one with a generating capacity of 200,000 kW on Hainan Island, and the other with a capacity of 300,000 kW in Zhanjiang.

A drilling, production, and accommodation platform will be built to ensure a steady gas supply for 20 years, according to an agreement signed in Beijing last September by an international consortium.

Members of the consortium are CNOOC, Atlantic Richfield Company (ARCO) of the United States and Santa Fe Minerals Asia, Inc. (now part of the Kuwait National Oil Corp.).

They discovered the 55-sq-km Yacheng gas field in August 1983. It has an estimated reserve of more than 90 billion cubic meters of natural gas.

CNOOC and the foreign members of the consortium decided to jointly develop the gas field and undertake gas production; the Chinese oil company will undertake the gas utilization projects.

BRIEFS

PRIORITY GIVEN TO NATURAL GAS PRODUCTION--Daqing, 1 Feb (XINHUA)--China plans to find additional natural gas reserves of 810 billion cubic meters in the next 5 years, double its additions of the previous 30 years, Petroleum Ministry officials said here today. Experts estimate that the country has reserves of at least several trillion cubic meters. Natural gas will be the country's top energy priority through to the end of the century, the officials said. China produced 12 billion cubic meters of natural gas last year, 2.5 percent of its energy consumption--compared to an average 20 percent elsewhere in the world, according to ministry statistics. Exploration in recent years has uncovered eight promising natural gas sources, including fields in central and northeast China, and the South China Sea and the East China Sea. [Text] [Beijing XINHUA in English 0121 GMT 1 Feb 86 OW]/12766

CRUDE PRODUCTION TO INCREASE--Harbin, 29 Jan (XINHUA)--China's crude oil production will continue to increase over the next 5 years, according to petroleum officials and specialists attending a national meeting here. They said today they expect output in the 1990's to reach between 150 million and 160 million tons (about 1.1 billion barrels). China produced 124.8 million tons (about 911 million barrels) of crude oil last year, 10 million tons more than in 1984. From 1981 to 1985, the average annual increase of oil output was 5.3 percent. At the meeting, Wang Tao, minister in charge of China's petroleum industry, said exploratory work enabled geological reserves to increase considerably over the past 5 years at the Shengli, central China, north China and Liaohe oil fields. "This has reversed the situation of previous years, when newly discovered reserves trailed increases in output," he said. [Text] [Beijing XINHUA in English 1700 GMT 29 Jan 86 OW]/12766

1985 SHENGLI OUTPUT--In 1985, Shenyang oil field in Shandong Province produced 27.03 million tons of crude oil, an increase of 4 million tons over 1984. This year 1,550 wells had been drilled, of which over 1,100 went into operation. The annual drilling footage reached 3.68 million meters, an increase of 70 percent over 1984. Two oil fields, the Gudong and Niuzhuang, with more than 100 million tons of oil reserves, were successively discovered. [Summary] [Jinan Shandong Provincial Service in Mandarin 2300 GMT 23 Dec 85 SK] /12712

SANYA-SHENZHEN PIPELINE SURVEY--The survey and design of the land gas pipeline project from Nanshan in Sanya (City) to Shenzhen recently started. The South China Sea abounds in natural gas resources. The Yinggehai gas field discovered is the largest gas field in the whole country. The exploitation and use of the natural gas in Yinggehai and the construction of the Sanya-Shenzhen gas pipeline is a project which the State Council has approved. This pipeline will begin in Sanya and pass through Haikou, Zhanjiang, Maoming, and Guangzhou to Shenzhen. Its total length is some 1,000 kilometers. This is a key project for exploiting the natural gas in Yinggehai and is also a facility for using the natural gas in the South China Sea. After the completion of this project, 10 cities along the line, including Sanya, Haikou, Zhanjiang, Maoming, Jiangmen, Zhongshan, Foshan, Guangzhou, Zhuhai and Shenzhen will all use natural gas. [Text] [Guangzhou Guangdong Provincial Service in Mandarin 0400 GMT 31 Dec 85 HK] /12858

NEW HEBEI WELL--The No. 6073 oil prospecting team under the Huabei oil fields, which is carrying out prospecting operations in the southern areas, drilled a new well in Ningjin County that hit high-yield crude oil and gas. It is estimated that its daily crude-oil output may reach 2,172 tons, and its natural gas output 253,500 cubic meters. [Excerpts] [Shijiazhuang Hebei Provincial Service in Mandarin 2300 GMT 17 Dec 85 SK] /12712

JILIN 6TH FYP CRUDE OUTPUT--As of the end of September, Jilin Province had fulfilled the 1985 state crude oil production plan. During the Sixth Five-Year Plan period, this province produced 9.16 million tons of crude oil and handed over 119 million yuan of profits and taxes to the state. In 1985, the province broke the record of producing 2 million tons of crude oil for the first time. [Summary] [Jilin JILIN RIBAO in Chinese 25 Dec 85 p 1 SK] /12712

PRODUCTION BASES FOR NATURAL GAS--China has decided to put the production of natural gas on an equal footing with petroleum production, and will concentrate on the construction of seven large natural gas production regions in the next 5 years, and will increase natural gas production by 810 billion cubic meters. By 1990, China's natural gas reserves will be 1.5 times greater than at the present time, and annual output will reach 16.6 billion cubic meters. During the Seventh 5-Year Plan, China will form a complete /natural gas production region/ out of the Sichuan, Bohai Bay, and Hainan production regions. The Sichuan natural gas region will continue to seek high-yield gas reserves, and will build a special line for transporting natural gas from northern Sichuan. The Bohai natural gas region will rely mainly on the oil fields of the central plains, and together with Huaibei, Shengli, Daqing and Liaohe oil fields as well as the Liaodong Bay region, will continually discover new geological reserves. The Hainan region and Yinggehai region will engage in more exploration. China will also open up the Songliao and the Shaansi-Gansu-Ningxia natural gas production regions, and will also develop natural gas prospecting in Xinjiang's Tarim, Henan's Zhoukou and in Huaibei. [Text] [Beijing RENMIN RIBAO (OVERSEAS EDITION) in Chinese 22 Jan 86 p 1/ /12228

GUANGDONG OFFSHORE WELL--Beijing, 7 Jan (XINHUA)--An oil well recently drilled in the Pearl River mouth basin in the South China Sea is producing a daily average of 1,137 tons (11,950 bbl) of crude oil, China National Offshore Oil Corporation (CNOOC) announced here today. This is the eight oil-producing well since Chinese and foreign oil companies began to search for oil in the basin in November, 1984. The well is located 260 kilometers southeast of Guangzhou, operated by Phillips Petroleum International Corp, Asia. Last year, the company drilled 2 oil wells in the same contract area which produced a daily output of 922 tons (6,730 bbl) and 2,000 tons (14,600 bbl) of crude oil respectively. The new high-yield well shows the bright prospects for oil in the Pearl River mouth basin, CNOOC said. [Text] [Beijing XINHUA in English 1441 GMT 7 Jan 86 OW] /8918

HUABEI OUTPUT CLIMBING--Shijiazhuang 13 Jan (XINHUA)--The Huabei oil field, China's third-largest, produced 72,170,000 bbl of oil last year, an increase of 770,000 bbl over 1984, according to the HEBEI DAILY newspaper. The oil field has produced a total of 840 million bbl over the past decade. Its average annual output accounted for one-tenth of the country's total. Output began to drop in 1980 to 71,400,000 bbl in 1984, compared to 121,310,000 bbl in 1979. Geological prospecting in the area last year discovered 149 wells including 36 containing industrial oil and gas, and built new oil and gas structures with reserves of 420 million bbl of oil and 3 billion cubic meters of gas. The paper said the adoption of the contracted job responsibility system last year has stimulated workers' initiative. [Text] [Beijing XINHUA in English 1506 GMT 13 Jan 86 OW] /12858

JILIN OIL OUTPUT--The Jilin Provincial Oilfield Administrative Bureau has made simultaneous progress in crude oil output and economic results. As of 31 December, the bureau achieved a record total oil output of 2.13 million tons. [Text] [Changchun Jilin Provincial Service in Mandarin 2200 GMT 31 Dec 85 SK] /8918

CSOL 4013/74

DAYA BAY FINANCIAL DETAILS 'SHROUDED IN SECRECY'

HK030623 Hong Kong SOUTH CHINA MORNING POST (BUSINESS NEWS Supplement) in English 3 Feb 86 pp 1, 3

[By Neil Behrmann and Paul Sham]

[Text] Financing details of the U.S.$3.5 billion Daya Bay nuclear power [plant] in Guangdong have remained shrouded in secrecy after senior Bank of China representatives met officials of Midland Bank and the British Export Credit Guarantee Department [ECGD] in London.

Banking observers in the U.K. believe the extraordinary step of protecting financing arrangements for a $250 million agreement signed by Britain's GEC under the Official Secrets Act may have been taken in recognition of the intense competition among British, French, Hong Kong, and other companies in all aspects of the project.

While the plant and equipment for the project will be financed largely by project finance deals, the substantial interest element of the cost will be funded through commercial loans.

Neither Midland Bank nor the ECGD would comment on the deliberations other than to confirm Bank of China officials had arrived in London last week after holding talks in France.

A banker in London said the Official Secrets Act had been invoked for "commercial reasons," but declined to elaborate.

Midland Bank, which is leading a consortium of 10 British banks in financing the U.K. end of the deal, refused to disclose the names of the other banks involved, or any other details on the financing, but sources said further details are likely to be unveiled in March.

The Daya Bay project, dubbed "China's biggest joint venture," will be owned by the Guangdong Nuclear Power Joint Venture Co. Ltd., of which the Guangdong Nuclear Investment Co. Ltd. holds 75 percent and Hong Kong Nuclear Investment Co. Ltd. the remaining 25 percent.

Hong Kong Nuclear Investment Co. Ltd. is a wholly-owned subsidiary of China Light and Power Co. Ltd.

While no contracts have yet been signed, memorandums of agreement have been reached between the Guangdong Nuclear Power Joint Venture Co. Ltd. and the French company Framatome SA for the proposed plant's two reactors; with Electrictie de France for engineering design; and with the GEC Group for generators.

In total, these elements of the contract are believed to be worth about U.S. $1.6 billion, and the remaining costs, approaching U.S.$2 billion, is the prize an assortment of international banks, construction and engineering companies are chasing. Of this sum, at least U.S.$1 billion relates to financing costs, in terms of interest and other charges, which explains the anxiety among banks all over the world to corner a peice of the action.

The Daya Bay plant is expected to be completed in about 7 years, and the period for the principal debt repayment has been set at 20 years by the Bank of China.

The ECGD has said repayment of the GEC loan, amounting to $250 million, would be over 15 years, but repayments will commence only on commissioning, expected in 1991.

London banking sources say normal interest rates for nuclear power business are about 1 percentage point above the "consensus rate," which is now about 9.85 percent for such business in China.

Midland Bank, appointed by the Bank of China as its paying agent, said it would take several months to work out the details before the financial agreement is signed by the ECGD, Bank of China, and the British commercial banks.

The major nationalized French banks will be involved in financing the French side of the project.

Suppliers and bankers in London were reluctant to be identified, but it is clear the Daya Bay project has been marked by cut-throat competition for the business offered to date.

Some sources in London said GEC had slashed its price by about 20 percent to meet China's terms, and there are indications the price will continue to be a primary determinant in future contracts.

GEC had shown "great determination in the pursuit of new contracts," a spokesman for the group said, and to illustrate this had opened an office in Shenzhen, near the power station site, with up to 50 employees on site at various times. GEC's managing director, Mr Bob Davidson, made 29 visits to China during the year-long negotiations, while the group's sales director, Mr Mike Abraham, spent 10 months in the country last year.

Equipment such as the nuclear island and the turbine generators will be financed through export credits, arranged by equipment suppliers, while

interest will be paid through commercial loans, according to sources at the Guangzhou Nuclear Power Joint Venture Co.

A spokesman at the company's head office in Shenzhen said infrastructure work for the plant has largely been completed. The work, which includes site formation and sealing against underground water, was undertaken by Chinese construction firms.

The spokesman said tenders for the civil engineering segment of the project have been received from about five multinational construction groups since July, and the name of the winner will be announced around June.

In compliance with a request from the Chinese Government, the construction consortia were formed by Chinese, French, and Japanese entities in order to combine the advantages of different countries' technology and to offer Chinese companies the opportunity to learn the technology, the spokesman said.

Foreign construction firms bidding for the work include Paisei, Shimucu, Naida, Maeda, Nishimatsu of Japan, Bouygues, Dumez, Spie Batignolles, and SGE of France.

The spokesman said tenders for the installation contract, open to foreign companies, will be called next year, although the exact date has not yet been decided.

While declining to disclose the amount of the two contracts, he said the company will spend over U.S.$100 million on imported equipment such as water pumps and compressors.

Letters of intent covering the Framatome, GEC and EDF segments of the project are expected to be signed next month, with official signing of the contracts likely around September.

The spokesman explained the long duration between initial agreement and contract signing is due to the need for approvals from the respective governments and the huge load of documents waiting for translation into respective languages.

The company's staff size is limited, the spokesman said. To date, he said the company has contacted only Cogema of France to negotiate the purchase deal of nuclear fuel, but will contact other firms if the price is not right. Because of different views toward pricing, the spokesman said initial talks with Cogema last year bore no results.

The next round of talks will be held after March. He said the company is not in a rush to strike any deal in this respect, as the nuclear power plant will not begin operation until 1989. "We still have a lot of time."

The projected purchase of the nuclear fuel will be around 300 tons for the first year, and about 100 tons for subsequent years because about two-thirds of the fuel will remain usable after the first year's operation, he said.

The spokesman said the company is not seeking the transfer of technology to process nuclear fuel from foreign countries since Chinese technology in this area is quite mature.

He confirmed speculation among Hong Kong bankers that the financing element of the whole project will be at least U.S.$1 billion. "In fact, the amount will be more than that," he added, but declined to elaborate.

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CSO: 4010/36

DAYA BAY FUEL COULD BE DOMESTICALLY PRODUCED BY 1993

HK130842 Hong Kong SOUTH CHINA MORNING POST in English 13 Jan 86 p 6

[From the "South China Beat" column, based on research by Albert Chan and compiled by Timothy Jim: "Beijing Aims To Make Own Fuel by 1993"]

[Text] China hopes to produce its own fuel for the Daya Bay nuclear plant in 1993--one year after the plant is to go into operation.

According to the contract with the French reactor manufacturer, Framatome, China is obliged to buy the first load of uranium fuel from Franatone but it is then free to choose its own suppliers.

As about a third of the first load of the French fuel has to be replenished annually, it means theoretically the first load will be consumed in three years. It also means the Daya Bay plant may be using fuel produced on the mainland 12 months after commissioning when the first reloading is scheduled to take place.

A senior Chinese official with the Guangdong Nuclear Power Joint Venture Co says the main advantages of getting nuclear fuel in China are cost and safer transportation. He also said the contract with Framatome stipulates that the first load must come from France to ensure the reactors start up smoothly. This is also necessary because the uranium used for the first load has different properties from regular fuel and the French have years of experience in nuclear plant commissioning.

Another advantage of using French fuel for the first load will be in helping to spotlight trouble during the first couple of years of operation. It will be easier to establish whether any trouble stems from the reactors, the turbine generators or the fuel, if French fuel is used. However, because of cost and risk factors, China hopes to fuel the Daya Bay reactors with its own uranium as soon as feasible.

The Chinese official said that transportation of radioactive fuel from Europe to China involves a much higher risk than shipping it from closer by, Japan for example.

He cited the accident in August 1984 when a French cargo ship, the Mont Louis, which was carrying spent uranium, sank near Belgium. The higher risk would lead to higher insurance premiums and eventually to higher operational costs.

The Chinese official said that although the first reloading will only occur in 1993, a decision on where new fuel should be bought has to be made much earlier, probably three to four years ahead.

The fuel supplied by Framatome comes from another French company, Cogema, which is a nuclear fuel manufacturer that has access to uranium reserves in various places, including African countries and France itself.

China is currently working with Japanese interests to establish reserves of uranium in Tengchong County in the western part of Yunnan Province.

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SUPPLEMENTAL SOURCES

NEED TO DEVELOP METHANOL INDUSTRY STRESSED

Beijing NENG YUAN [JOURNAL OF ENERGY] in Chinese No 5, 25 Oct 85 pp 28-30

[Article by Li Shenggui [2621 3932 6311]: "China Should Develop Its Methane Industry as Rapidly as Possible"]

[Text] All countries of the world have made alternative motor vehicle fuels an important research topic. Based on domestic and foreign research, methanol is currently considered a very promising substitute for gasoline as an automotive fuel. China has extremely rich coal resources and excellent conditions for developing methanol production, and accordingly we should establish and develop the methanol industry.

1. Methanol

Methanol, a hydrocarbon derivative, is similar to gasoline in its physical and chemical properties and thus suitable as a substitute automotive fuel. The main physical and chemical characteristics of methanol and gasoline are given in the table below.

Characteristic	Methanol	Gasoline
Specific gravity at 20°C, kg/l	0.795	0.74
Air required for combustion, theoretical, kg/kg of fuel	6.5	15
Caloric content, kcal/kg	4,680	10,500
Caloric content of flammable mixture with air, kcal/N-m^3	931	911
Latent heat of evaporation, kcal/kg	263	91
Volume increase on combustion of mixture, percent	6.1	5.8
Laboratory octane number	about 110	78-100
Engine octane number	about 92	75-90

It is evident from the table that gasoline has a higher caloric value; but although methanol's caloric value is only about 50 percent that of gasoline, the amount of air needed for combustion of a unit weight of methanol is only about 50 percent that needed by gasoline, so that a combustible methanol-air

mixture has a higher caloric value than combustible gasoline-air mixture. In addition, methanol's octane number is much higher than that of gasoline. Thus, methane basically satisfies engine requirements and thus is usable as a substitute fuel.

The main raw materials for methanol production are natural gas, coal, and municipal garbage. Given China's natural resource situation, coal will be the major raw material for methanol production over the long term.

China's yearly methanol production capacity is 400,000 tons; it is used primarily as a chemical engineering feedstock. The annual worldwide methanol output is about 9-12 million tons. A considerable proportion of the world methanol output is already being used as an alternate automotive fuel.

2. Investigation and Utilization of Methanol Fuel

Methanol and methanol-gasoline mixtures have been studied on a large scale as substitute automotive fuels since the world oil crisis of the 1970's, and their practical use is now beginning. For example, in West Germany a mixed fuel containing 15 percent methanol is used as an automotive fuel; New Zealand, with rich natural gas resources, uses a mixture containing 10 percent methanol and is studying a process for refining gasoline from methanol. Japan uses a methanol-gasoline mixture in traditional motor vehicles, and in addition Japanese automotive manufacturers have developed a new motor vehicle, the NRV-II, that uses methanol as a fuel. Mexico has built a large methanol plant especially for the production of fuel alcohol containing various hydrocarbon derivatives. The Soviet Union began testing the use of 14.5-16.5 percent methanol in No 72 gasoline in 1978. England not only uses methanol fuel in gasoline engines, but has also tested the use of methanol as the main fuel in medium-speed diesel engines, with diesel fuel as the combustion initiator. The results have shown that using methanol as a fuel in diesel engines can produce realistic savings.

Recently many units in China have also studied and tested the use of methanol-gasoline mixtures; they include the Shanxi Province Communications Research Institute, the Xinhua Chemical Engineering Plant in Shanxi, the Sichuan Vinylon Plant, the Jilin Chemical Engineering Company, and the Jilin Industrial College. In general it has been concluded that the use of methanol-gasoline mixtures in certain proportions has no adverse effects on vehicle characteristics. Some units with a source of methanol have always been using methanol-gas mixtures and have obtained excellent results.

Summarizing foreign and domestic research, methanol as a substitute automotive fuel has the following characteristics.

1) It can be used alone or mixed with gasoline in certain proportions. When used in a mixed fuel, no engine modifications are needed.

2) Methanol-gasoline mixtures have good evaporation characteristics, high octane numbers, and good antiknock properties, and thus help increase engine compression ratios.

3) When the proportion of methanol is 20 percent or less, fuel economy is the same as with pure gasoline. Power is increased because methanol's latent heat of evaporation is high and engine heat losses are decreased, making combustion efficiency high. Exploitation of methanol's high octane number to increase engine compression ratios does even more to improve the dynamic characteristics of motor vehicles.

4) It can decrease exhaust pollution. Emissions of carbon monoxide, hydrocarbons, nitrogen oxides and lead are all considerably lower than when pure gasoline is used. Although the concentrations of alcohols and aldehydes in the gases are increased, even with 30-60 percent methanol the amounts of methanol and acetaldehyde in the exhaust gases are still within the permissible ranges for plants producing alcohols and aldehydes.

5) Methanol causes aging of plastic and rubber parts in automotive fuel systems, a problem which can be solved by using different materials.

6) Methanol's adverse effects on human health are far smaller than those of the tetraethyl lead contained in gasoline.

7) Methanol is incapable of spontaneous firing, but its use in diesel engines can increase fuel economy.

Some of the problems in its use are described below.

When the proportion of methanol is 20 percent or less, the main problem in the use of mixed fuels is separation of the methanol and gasoline at low temperatures, decreasing vehicle power and causing unstable low-speed operation and difficulty in starting. This problem can be solved by adding solubility improvers to mixed fuels. The solubility improvers currently used are such higher alcohols n-butanol and isobutanol, as well as MTBE (methyl t-butyl ether) and methanol mother liquor. These substances are themselves combustible. If higher alcohols and MTBE are used, their high price increases the cost of the fuel. Methanol mother liquor functions as a solubility improver, and its use also decreases fuel costs.

From the above foreign and domestic research findings and practical experience, we can see that a certain proportion of methanol can be mixed with gasoline, thus replacing some of the gasoline in automotive fuel, and that there are no insoluble major technical problems.

3. Development Prospects of Methanols as a New Fuel

Whether methanol will be widely used as a substitute for gasoline in motor vehicles depends primarily on the degree to which its use affects transport expenses, i.e., fuel costs. At present, domestically produced methanol is almost all industrial grade (used as an organic chemical feedstock); because of its high purity (99.7 percent or more) it is costly, 750 yuan per ton, while gasoline costs 728 yuan per ton.

Thus although using methanol-gasoline mixtures can conserve gasoline and solve the energy-shortage problem, its economic benefits in motor transport have generally failed to convince people, a fact which does not favor its widespread introduction.

The most basic method of decreasing methanol production costs is the specialized production of fuel-grade methanol. In general, the purity of fuel-grade methanol can be much lower than that of industrial-grade methanol. In addition, without affecting its qualities as a substitute fuel, the production processes can be greatly simplified, causing a large decrease in production costs. Moreover, fuel-grade methanol contains hydrocarbon derivatives with various molecular structures, including the currently used solubility improvers, which may considerably alter the miscibility of methanol and gasoline. Naturally, the amounts of the various compounds in fuel methanol must be specified on the basis of large amounts of research and testing. The production cost of industrial-grade methanol produced from coal is about 400 yuan per ton and the market price is 750 yuan per ton. Some have estimated that in the future the production cost of methanol will fall to 200 yuan per ton and the market price to about 500 yuan per ton, or at least below the price of gasoline, and methanol will thus have an extremely important place as a cheap fuel. In the not too distant future not only will methanol be used as a fuel in mixtures with gasoline, but automobiles burning only methanol will also appear. Methanol will be usable not only in gasoline engines, but in diesel engines as well, and even in power plants, boats, and internal-combustion locomotives. At that time, methanol fuel will play an important role in the efficient utilization of high-energy resources and in improving the energy structure.

In China's long-term plans for substitute fuels, the State Scientific and Technical Commission has already designated the development of M-15 fuel (a methanol-gasoline mixture containing 15 percent methanol) for the market as a special state project and has organized the relevant departments and units for a cooperative effort, which is to be completed in 1985. It is estimated that its use will become practicable in 1990 or later. All motor vehicles on the market in China will then be converted to the use of a methanol-gasoline mixture containing 15 percent methanol. This will be a major improvement in China's energy supply and demand structure.

4. Importance of Developing the Methanol Industry

Based on the above, with a mixture containing 15 percent methanol, China will need 1.16 million tons of methanol fuel a year (and will save an equal amount of gasoline). Including industrial grade methanol, the country's methanol requirement will be about 2 million tons. China's current methanol production capacity is 400,000 tons a year, all of which is used as industrial feedstock. Accordingly, we must expand the use of M-15 fuel everywhere and solve the problems of methanol production.

When methanol is produced from coal, 2 tons of coal will yield 1 ton of methanol. Once the chemical fertilizer plants producing synthetic ammonia

make slight improvements in their processes, they will be able to produce methanol as a by-product. China has extremely rich coal resources and thus has uniquely favorable conditions for developing its methanol industry. Vigorously developing the methanol industry will be of extremely great importance in alleviating the energy shortage and invigorating the economy. The establishment and development of a methanol industry will be of particular importance to Nei Monggol, with its rich resources and economically backward conditions.

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SUPPLEMENTAL SOURCES

VAST GEOTHERMAL RESOURCES VERIFIED IN NORTH CHINA PLAIN

OW141230 Beijing XINHUA in English 1207 GMT 14 Feb 86

[Text] Beijing, 14 Feb (XINHUA)--The North China Plain has verified geothermal resources equal to 900 million tons of standard coal, today's SCIENCE NEWS reported.

The paper said scientists have found 180 billion cubic meters of accessible hot water evenly spread under the plain, which crosses Beijing, Tianjin, and Hebei Province.

Scientists from the Institute of Geology of the Chinese Academy of Sciences began surveying the 200,000-square-kilometer plain in 1980.

Institute researchers have also been testing applications of geothermal energy to agriculture in Hebei Province.

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CSO: 4010/34

ANHUI SUCCESSFUL IN ENERGY CONSERVATION WORK

OW091109 Hefei Anhui Provincial Service in Mandarin 1100 GMT 7 Dec 85

[Text] Anhui Province has earnestly carried out the policy of attaching equal importance to the development of energy resources and energy conservation, and has scored good results in strengthening management of energy conservation work. Since 1984, the province has conserved energy equivalent to 1.34 million metric tons of standard coal. The energy consumption for an output value of 10,000 yuan was 6.2 metric tons of standard coal in the first 9 months of this year, lower than the national average in 1984. The energy consumption stability rate for 46 major products rose 13.3 percent over the same period of last year.

In the course of the reform of the economic structure, the various departments and localities have attached importance to energy conservation as a chief means for vitalizing the enterprises and improving economic results. They have set up energy conservation units and assigned staff to take charge of the work in order to carry out energy conservation on a normal and regular basis. Since 1984, the province has launched 165 technical innovation projects aimed at conserving energy. The total investment for these projects amounted to 32.37 million yuan. Presently, 57 percent of these projects have been completed, enhancing the annual energy conservation capacity to 66,000 metric tons of standard coal. Instruments and meters for measuring energy consumption were installed in 178 enterprises, each with an annual energy consumption of 10,000 metric tons of coal, thereby rectifying the former situation of no fixed quotas for energy consumption and the practice of all eating from the same big pot.

Many localities and trades have promoted new energy conservation technologies, revamped some energy-guzzling equipment and retired some coal-guzzling, power-guzzling, and oil-guzzling equipment. The various localities and departments have also improved the measurement of energy consumption by the civilian sector. The installation of electric and gas meters in the civilian sector has already been completed. Some 60 percent of civilian households have had water meters installed. The provincial urban energy conservation conference held in Hefei 6 December commended 44 advanced enterprises and 77 advanced collectives for outstanding energy conservation work.

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BRIEFS

SHANDONG 6TH FYP RESULTS--Shandong Province saved 7.2 million tons of standard coal in the past 5 years, over fulfilling the Sixth Five-Year Plan target by 38.4 percent. Some 4.3 million tons of standard coal were conserved through technical progress, accounting for 60 percent of the total conserved amount. Some 2.9 million tons were saved through strengthening energy management and readjusting energy utilization plans. Energy consumption for manufacturing 10,000 yuan worth of industrial products dropped from 7.78 tons of coal in 1980 to less than 6 tons in 1985. [Summary] [Jinan Shandong Provincial Service in Mandarin 2300 GMT 12 Jan 86 SK]

HEBEI 1985 CONSERVATION--In 1985, Hebei Province launched a movement for planned energy use and conservation, saving a total of more than 600 million kilowatt-hours, more than 200 million kilowatt-hours more than called for in the State plan. /Text/ /Shijiazhuang HEBEI RIBAO in Chinese 9 Jan 86 p 1/ 12228

CSO: 4013/75

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