World Nuclear Association Annual Symposium
7-9 September 2005 - London

Developing Nuclear Industry in China

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Respected Mr. Chairman, Ladies and Gentlemen,

It is a great pleasure for me to attend the annual conference of WNA. On behalf of the China National Nuclear Corporation (CNNC), I would like to extend my warm congratulations on the convening of this conference.

Entering the 21st century, the world greets the revival of nuclear power. In Western Europe, North America, particularly in Asia, the large number of nuclear power plants under construction and to be constructed has the aroused intensive attention of the whole world. It is widely acknowledged across the world that nuclear energy, as a safe and clean energy resource, plays an indispensable role in the energy structure.

With the rapid and steady development of China's national economy, the Chinese government has adopted an energy strategy of adjusting energy structure and "advancing nuclear power development actively". A target for a long-term development has also been proposed by the State that, by 2020, the nuclear power installed capacity will reach 40 GWe, which will account for 4% of total electric power. The ambitious programming of nuclear power development in China has presented a bright future for nuclear power and related industries.

CNNC has evolved a complete industrial system of nuclear science and technology of its own. CNNC undertakes the major tasks of engineering design and scientific R&D. It is also the major investor of all nuclear power plants in operation and under construction in China, and the only enterprise providing high-quality nuclear fuels, reprocessing spent fuel and disposing radioactive wastes. There are nearly 100 industrial enterprises and scientific research and design institutes affiliated to CNNC, undertaking R&D on nuclear power and nuclear fuels, design, construction, operation, technical services and partial equipment supply. CNNC assumes the responsibility and has the capability to achieve the goal under the leadership of the Chinese government.

Through 20 years' restless efforts, CNNC has made tremendous progress in nuclear power and fuels R&D, construction, and operation.

The 300 MWe Qinshan PWR unit, self-designed and constructed by CNNC in the 1980s, has been in safe operation for 15 years. In the last three successive fuel cycles since 2002, it achieved consecutive full-power operations for 331, 443 and 448 days respectively, which created the best records among the contemporary nuclear power plants.

The 2 × 600 MWe PWR units in Qinshan Phase II were designed, constructed and operated by CNNC's own strength. Its final completion in May 2004 marked a big step forward towards nuclear power localization. Currently, the two units are in smooth operation.

The 2 × 700 MWe PHWR units in Qinshan Phase III, of which CNNC is one of the shareholders, went into commercial operation in July 2003, 112 days ahead of schedule. It created a record of the shortest construction period as compared with other PHWRs across the world, which marked that China advanced its nuclear power projects management up to a new level.

The 2 × 1060 MWe AES-91 PWR units in Tianwan are now under construction. Unit 1 is expected to be connected to the grid by the end of this year.

The four 1000 MWe-class PWR units in Guangdong Daya Bay and Ling Ao have achieved good operational performance since they went into commercial operation.

In order to advance nuclear power development actively, meet the need of engineering construction, and develop our own nuclear power brand with intellectual property, CNNC adopts a "three-line" strategy. The first line is to conduct duplicate projects of two 650 MWe units in Qinshan Phase II and two 1000 MWe units in Ling Ao by making full use of the existing conditions and making necessary technical renovations. The second line is to "start from a high point", to introduce the third generation technologies through international bidding for the construction of Sanmen NPP, in Zhengjiang Province, and Yangjiang NPP in Guangdong. While carrying out self-dependence supporting projects, advanced nuclear power technologies shall be absorbed and mastered. The third line is to make improvements to the second generation technology in compliance with the principle of "mainly relying on our own while pursuing Sino-foreign cooperations", so as to meet the basic needs of mass construction during the construction and operational verification of the third generation nuclear power projects. At present, CNNC has finished the preliminary design of CNP1000.

The rapid development of nuclear power in China pours vigor to the nuclear fuel technology and industry, and brings along new demands for nuclear fuels. CNNC has established a complete nuclear fuel system, covering uranium exploration, mining and milling, conversion, enrichment, fuel element fabrication, spent fuel reprocessing, radioactive wastes treatment and disposal, and has developed the capability of R&D, design, operation and management in these sectors. After years of efforts, great technical progress has been made in China's nuclear fuel industry, with production capacity enlarged and technical process upgraded in some key sectors. The capability in uranium exploration has been improved through technical renovation of uranium geological equipments. Continuous breakthroughs have been achieved in exploring *in situ* leachable sandstone uranium ores. A new type of production system dominated by *in situ* leaching, heap leaching, and explosive leaching has been formed in natural uranium

production so that the resources availability is increased while production cost declined. Advanced technical processes have been adopted for uranium isotope separation so that production capacity has been enhanced and the cost of separated work decreased. The production and quality of nuclear fuels are up to the international level.

The secured supply of uranium lays an important foundation for nuclear power development in China. As estimated, natural uranium demand will be greatly increased by 2020. CNNC has made proper deployment for natural uranium development to meet such need. China is comparatively rich in uranium resources, with large potential uranium reserves in addition to the proven ones. At present, the input in uranium exploration has been increased to accelerate the uranium exploration and exploitation. In particular, considerable achievements have been made in the exploration of *in situ* leachable sandstone uranium. In respect of natural uranium production, technical renovation and extension have been strengthened in old mines, with a batch of new uranium mining and milling projects established. All the natural uranium yielded will be used to meet domestic needs. We are willing to further the cooperation and exchanges with colleagues worldwide in the fields of natural uranium production and technologies so as to increase the availability and decrease the cost, and to better supply raw materials for nuclear energy development.

For further integration into the world economy, CNNC also actively raises funds to take part in foreign uranium exploitation. So far, CNNC has contacted several countries and companies in this regard, and certain progress has been made. We hope to cooperate with foreign producers with all sincerity to jointly exploit world uranium resources to achieve a "win-win" situation.

China's stable political and economic environment creates a safe and reliable natural uranium market, which is a great appeal to world uranium suppliers (producers). As the exclusive natural uranium trader in China, CNNC is willing to open China's natural uranium market to the world. We hope to establish steady relations and carry out long-term cooperation with world suppliers (producers).

CNNC is the exclusive agent in natural uranium business in the Chinese mainland as well. In the past few years, we both sold and bought certain amounts of natural uranium according to international market conditions to balance the domestic demands, and we will still adhere to this policy. CNNC is now paying close attention to the world uranium price.

With the present nuclear power development and the changes in demand and supply of natural uranium, the uranium price will go up. From the end of 2002 to June 2005, the uranium price tripled to US$29.5/lbU. The very high price with startling rising speed has never been seen since the end of 1980s.

Obviously, the present high price is appealing to investment in uranium exploration, mining and milling. However, the price should conform to the basic market principle of supply and demand. The irrational high price surely has a short-term stimulating effect, while only a rational price will give impetus to long-term and stable exploration and exploitation, facilitate the establishment of a stable nuclear fuel system worldwide, and ensure favourable conditions for nuclear power in competition with other energy sources.

In order to meet the demands of nuclear fuel in support of developing nuclear power in China, CNNC will further upgrade the technical level and promote the production capacity of the nuclear fuel cycle system, make good use of "two recourses" and "two markets", improve the service quality, efficiency and security, and try its best to meet the need of nuclear fuel required by China's nuclear power industry.

Ladies and gentlemen, the vigorous development of world nuclear power provides an unprecedented good opportunity for all of us. CNNC will continue to devote itself to developing China's nuclear power and fuels industries, increasing exchanges and cooperation with the world nuclear community, making joint efforts to improve the technical level of nuclear power and fuels, and benefiting mankind in a more extensive and intensive way.

Thanks for your attention.