FINANCING FOR NUCLEAR POWER IN DEVELOPING COUNTRIES: CASE STUDY OF CHINA

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Abstract

This paper describes the Chinese experience in financing the construction of its nuclear power plants. The key issue was utilization of a specific combination of export credit and commercial loans on both the international and domestic financial market.

1. INTRODUCTION

The development of nuclear power in developing countries meets many difficulties and an important one is financing. But, utilizing a combination of export credit from the supplier country and commercial loans in the international finance market, in addition to domestic bank loans or credit, may supply the necessary resources. In China, the financing framework for building Daya Bay NPP (2 x 900 MWe PWR) and Qinshan Phase 3 project (2 x 700 MWe CANDU) is based on that approach. This paper describes financing of Qinshan Phase 3 project as an example.

2. QUINSHAN PHASE 3

Qinshan phase 3 is a turn-key project. Atomic Energy of Canada, Limited (AECL) is the main contractor, who subcontracted the Balance of Plant (BOP) package and turbine generator sets to American Bechtel and Japanese Hitachi, and subcontracts civil works and installation works to Chinese construction companies.

In the commercial negotiation of Qinshan phase 3 project, AECL, Bechtel and Hitachi made commitments that their export credit agencies would provide credit. The State Development Bank of China (SDB), entrusted by the utility, negotiated financing with Export Development Corporation of Canada (EDC), Export-Import Bank of the US (US EXIM Bank), and the Export-Import Bank of Japan (JEXIM Bank), and signed export credit agreements with them. Around 71% of total costs are offered by the three export credit agencies; about 70% comes from EDC, 16% from US EXIM Bank and 14% from JEXIM Bank.

The main parameters of export credit are:
- Interest rate — under OECD guideline;
- Interest during construction — capitalized;
- Grace period of first repayment — six months after provisional acceptance of second unit;
- Period of repayment — 15 years, equal payable semi-annually.

Besides this, the State Development Bank of China (SDB) was entrusted by the utility to secure a commercial loan about 22% of total cost from the international finance market.

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The framework of external financing is shown in Figure 1.

![Diagram of external financing]

**FIG. 1. Framework of external financing.**

The remainder, about 7% of total cost will be funded internally by the utility itself as a domestic expenditure.

The framework of total financing is shown in Figure 2.

![Diagram of total financing]

**FIG. 2. Framework of total financing.**
3. FINAL REMARKS

Finally, we would like to say, developing countries could adopt this diversified approach for financing the development of nuclear power. This paper is intended only as an example, for reference.