DEVELOPMENT AND APPLICATION OF AN ADVANCED CONSTRUCTION MANAGEMENT SYSTEM

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DAEWOO had constructed two(2) units of pressurized heavy water reactors at Wolsong site, which is located in the southern part of Republic of Korea, from 1991 to 1999. The capacity factor of the first unit was ranked as a top in the world in 1999. This paper describes development of an advanced construction management system and its applications to the construction of the Wolsong Nuclear Power Plants and other nuclear projects.

Construction of a nuclear power plant is a gigantic project composing of more than 5,000 activities to be monitored through 24 hours a day. It requires about 1,000 management staffs and more than 5,000 laborers at peak time. The total project cost ended up to 2.1 billion US dollars. Therefore, development and application of an advanced construction management system based on collection and analysis of information are prerequisite for such a mega-project.

As for the nuclear power plant construction, the characteristics of the nuclear power plant construction were firstly analyzed. All the implementation works were then checked and recorded completely in every step for the benefit of public safety and clear division of responsibility. For these purposes, DAEOO had developed and applied the state-of-the-art computerized construction management system. Simultaneously, a unique management method called "one-hundred-critical-item-monitoring-system" was applied, which contributed to the successful completion of the project within the targeted construction period.
In addition, DAEWOO utilized 3D CADD system as an effective management tool for the systematical construction management, accumulation of technologies and education for employees. It was proven that 3D CADD system was an efficient tool for such a gigantic project by virtue of the easy communication with the project owner on technical issues and production of objective results.

Major computerized systems implemented in Wolsong Nuclear Power Plant are as follows:

- Quality Assurance/Quality Control (NCR, FCR, Weld Defect Rate Control)
- Planning and Scheduling Control (C&C, Harvard Graphics Control)
- Cost Control (Cost Management as per Construction Package)
- Material Control (Piping Material Tracking System)
- Drawing & Data Control

With the application of these advanced computerized construction management systems, DAEWOO has achieved the shortest construction period in the world among the similar reactor types, the shortest test period and the lowest leakage rate during ILRT. This advanced construction management system has been also implemented in overseas nuclear projects, namely, Qinshan NPP project of China, Lungmen NPP project of Taiwan, and joint constructability study with AECL on the CANDU-9 reactors. The computerized system for NPP construction management with the 3D CADD can be applied to construction management, O&M, and quality control of small and medium sized reactors.