

INTRODUCTION AND MAIN CONCLUSIONS

INTRODUCTION

At the request of the Government of People's Republic of China, an IAEA Operational Safety Review Team (OSART) of international experts visited Qinshan III Nuclear Power Plant from 7 to 23 March 2005. The purpose of the mission was to review operating practices in the areas of Management Organization and Administration; Training and Qualification; Operations; Maintenance; Technical Support; Operating Experience Feedback; Radiation Protection; Chemistry; and Emergency Planning and Preparedness. In addition, an exchange of technical experience and knowledge took place between the experts and their plant counterparts on how the common goal of excellence in operational safety could be further pursued.

The Qinshan OSART mission was the 130th in the programme, which began in 1982. The team was composed of experts from Brazil, Bulgaria, Canada, France, Romania, Slovakia, Sweden, USA, together with the IAEA staff members and an observer from RINPO China. The collective nuclear power experience of the team was approximately 280 years.

Before visiting the plant, the team studied information provided by the IAEA and the Qinshan III plant to familiarize themselves with the plant's main features and operating performance, staff organization and responsibilities, and important programmes and procedures. During the mission, the team reviewed many of the plant's programmes and procedures in depth, examined indicators of the plant's performance, observed work in progress, and held in-depth discussions with plant personnel.

Third Qinshan Nuclear Power Company, Limited (TQNPC) as the owner of a nuclear power plant consisting of two 700 MW CANDU units was founded on Jan 31, 1997. It was co-invested by 5 state owned group companies and stock controlled by China National Nuclear Corporation (CNNC).

TQNPC is administrated by its General Manager with overall responsibility under the leadership of its Board of Directors. At present, Mr. Wang Sen is the General Manager.

The plant is situated at Tanglangshan, in Haiyan County, Zhejiang Province, the People's Republic of China, adjacent to Qinshan Phase I and Qinshan Phase II Nuclear Power Plants.

The two CANDU unit project is the largest joint project between China and Canada. In November 1994, Chinese and Canadian government signed an Agreement between Chinese and Canadian Government regarding the peaceful use of nuclear energy. Two years later, CNNC and Atomic Energy of Canada Limited (AECL) signed the main contract of Qinshan Phase III CANDU project.

The construction of the project began in June 1998. After 5 years of construction, the two units were put into commercial operation commenced on December 31, 2002 and July 24, 2003 respectively.

The design nominal output of the units is 728 Mwe. The type of reactor is a CANDU 6 pressurized heavy water reactor and use heavy water as moderator. The fuel is Uranium natural dioxide pellets.

The team travel to Shanghai on Friday, 4th of March 2005. Saturday and Sunday were spent in team training activities. Following the entrance meeting, which took place on Monday, 7th of

March, the team conducted the OSART review, completed initial reports and presented the findings at an exit meeting on Wednesday, 23rd March.

Throughout the review, the exchange of information between the OSART experts and plant personnel was very open, professional and productive. Emphasis was placed on assessing the effectiveness of operational safety rather than simply the content of programmes. The conclusions of the OSART team were based on the plant's performance compared with the best international practices.

MAIN CONCLUSIONS

The OSART team concluded that the managers and staff at Qinshan III NPP are committed to improving the operational safety and reliability of their plant. The team found good areas of performance, including the following:

- The management and the plant staff are open and eager to learn from international experience. The team found a positive attitude and especially the counterparts who appeared to be extremely franc, sincere and honest and always jointly looking for deficiencies.
- The team was pleased to notice that safety meetings are organized at the management and group level: each section, group or shift conducts a weekly safety meeting using experience gained in the plant and other NPPs on events and near misses. In the maintenance department, contractors attend this meeting.
- Everywhere in working areas posters address safety commitments and expectations for example: “No work is so important or urgent that it can not be done safely”.
- Management from General Manager to middle managers has a clear understanding of the nuclear safety and the importance of communicating a nuclear safety message. The management showed high commitment to safety and is very reactive.

A number of proposals for improvements in operational safety were offered by the team. The most significant proposals include the following:

- The industrial safety policies, programmes and procedures and the reporting of deviation should be improved.
- The management should have close attention to the worker weak practices to collect, report, track and trend them on the field during organized management walkdown.
- The team recognizes that advanced programmes has been developed in the Operation's area, nevertheless the implementation of the Systematic Approach to Training (SAT) process need to be further re-enforced in maintenance and technical support domains. Areas for improvement exist for contractors training.
- The plant should re-enforce the respect to the radiation protection rules regarding the potential spreading of contamination paying more attention to worker's behaviors.
- Labelling, lighting, doors, cleanliness and house-keeping should be a daily concern, reported during efficient and comprehensive operator rounds.

- The system performance monitoring program should be regularly re-evaluated notably for the System Engineers.
- Modifications of procedures as well as modification of the installation should always be done with close attention to the safety limits and respect to the basis principles.
- The management of chemicals, especially the flammable substances, should be in accordance with the best international good practices, and ALARA principle.
- And finally, integrated and systematic low level event programme should be re-evaluated to reach consistency between departments in the full analysis of the events.

Qinshan III management expressed a determination to address the areas identified for improvement and indicated a willingness to accept a follow up visit in about eighteen months.