INTRODUCTION AND MAIN CONCLUSIONS

INTRODUCTION

At the request of the Government of Canada, an IAEA Operational Safety Review Team (OSART) of international experts visited Bruce B Power Plant from 30/11/2015 to 17/12/2015. The purpose of the mission was to review operating practices in the areas of Leadership and Management for Safety; Training & Qualification; Operations; Maintenance; Technical Support; Operating Experience feedback; Radiation Protection; Chemistry; Emergency Preparedness and Response; Accident Management; interactions between Human Technology and Organization, and Long Term Operations. 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.

Bruce Nuclear Generating Station is a Canadian nuclear power station located on the eastern shore of Lake Huron, in the community of Tiverton, Ontario. It occupies 932 ha (2300 acres) of land. The facility derives its name from Bruce County in which it is located, in the former Bruce Township. The site's eight CANDU (Canada Deuterium Uranium) units are capable of producing 6,300 MW, which is more than a third of Ontario's electricity. The company employs approximately 4,200 people on a permanent basis. The Bruce B units (5 – 8) with net output of 822 MWe each were commissioned between 1984 and 1987. All nuclear facilities in Canada are federally regulated and licensed by the Canadian Nuclear Safety Commission (CNSC), which is an independent, quasi-judicial body. The Bruce B facility has a license to operate from the CNSC to 31 May 2020.

A commercial agreement with the Provincial Government to operate all units until 2063 was announced by the company management on 03 December 2015. This provided Bruce B a commercial framework to operate and life extend the plant beyond the previous commercial arrangement of 2019/2020. In addition to the power generation, Bruce Power supplies Cobalt 60 to support the medical industry. The Cobalt adjuster rods are irradiated for approximately 2.5 years and are then harvested and put to use for sterilization of single use devices (e.g., blades, forceps), implantable medical devices (e.g., stents, heart valves, orthopaedics), pharmaceuticals and foodstuffs to ensure safety.

The Bruce B OSART mission was the 188th in the programme, which began in 1982. The team was composed of experts from Finland, France, Hungary, India, Romania, Slovakia, Sweden, the United Kingdom, the United States of America and the IAEA staff members. The collective nuclear power experience of the team was approximately 380 years.

Before visiting the plant, the team studied information provided by the IAEA and the Bruce B 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.

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 IAEA Safety Standards.

The following report is produced to summarize the findings in the review scope, according to the OSART Guidelines document. The text reflects only those areas where the team considers that a Recommendation, a Suggestion, Plant Self -Identified Issue, an Encouragement, a Good Practice or a Good Performance is appropriate. In all other areas of the review scope, where the review did not reveal further safety conclusions at the time of the review, no text is included. This is reflected in the report by the omission of some paragraph numbers where no text is required.

MAIN CONCLUSIONS

The OSART team concluded that the managers of Bruce B NPP are committed to improving the operational safety and reliability of their plant. The management team and plant staff during the mission were open, transparent and demonstrated a commitment to continuous improvement. The team found good areas of performance, including the following:

- Development of an effective overall technical strategy and associated long-term plan that includes proactive measures to manage reactor safety, generation and business risk for the Major Component Replacement and Asset Management initiatives to extend the life of the units.
- Use of a wide range of engaging training settings to provide learning and development opportunities, including a fuelling simulator, on-site fire training facility, a crane simulator, a radioactive environment welding mock-up, chemistry sampling simulators, and replicas of power conversion equipment.
- As part of the plant's Fukushima response program, a proven strategy for rapid deployment of plant Emergency Mitigating Equipment has been developed, which allows equipment to be installed on site within 1 hour after a request has been made.
- Innovative communication methods to meet the needs of the extensive varied communities in the region around the facility.

Based on the plant self-assessment completed prior to the mission, the plant has self-identified deficiencies and prepared action plans to further improve safety in two areas, namely management of leaks and plant configuration control. The team confirmed these issues and will review the progress achieved with the implementation of the plant action plans during the follow-up mission.

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

- The plant should include 'without cause' alcohol and drug tests in its fitness for duty programme.
- The plant should establish enhanced measures to ensure that maintenance workers are complying with plant standards for procedure adherence and enforce expectation for use of human performance techniques to prevent events.
- The plant should provide additional protection for the on-site personnel in an emergency situation by implementing additional automated systems.
- The plant should refine its methodology for scoping of systems structures and components for long-term operation to provide a sound basis for performing ageing management review and revalidation of time limited ageing analyses.

Bruce B plant 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.