INTRODUCTION AND MAIN CONCLUSIONS

INTRODUCTION

At the request of the government of the USA, an IAEA Operational Safety Review Team (OSART) of international experts visited Clinton Power Station (CPS) from 11 – 28 August 2014. The purpose of the mission was to review operating practices in the areas of Management, Organization and Administration; Training & Qualification; Operations; Maintenance; Technical Support; Operating Experience; Radiation Protection; Chemistry; Emergency Planning and Preparedness; and Severe Accident Management. In addition, an exchange of technical experience and knowledge took place between the experts and their station counterparts on how the common goal of excellence in operational safety could be further pursued.

The Clinton OSART mission was the 177th in the programme, which began in 1982. The team was composed of experts from Canada, Czech Republic, Belgium, Finland, Hungary, Mexico, the Netherlands, Slovakia, Sweden, United Kingdom and the IAEA staff members. The collective nuclear power experience of the team was approximately 370 years.

Clinton Power Station is located in Harp Township, DeWitt County approximately six miles east of the city of Clinton in east-central Illinois. The site is located between the cities of Bloomington and Decatur to the north and south, respectively, and Lincoln and Champaign-Urbana to the west and east, respectively. Clinton Power Station is a single unit station with a Boiling Water Reactor (BWR) nuclear steam supply system with 624 fuel assemblies as designed and supplied by the General Electric Company and designated as a BWR6 unit. The containment system designed by Sargent & Lundy employs the drywell/pressure suppression features of the BWR-Mark III containment concept. The containment is a cylindrical, reinforced concrete, steel-lined pressure vessel with a hemispherical dome. Rated at a licensed power level of 3473 MWt, the unit is designed to operate at a gross electrical power output of 1138.5 MWe. The operating license was issued in September 1986 and commercial operation commenced in April 1987. Clinton’s current 40-year operating license expires in 2026.

Before visiting the plant, the team studied information provided by the IAEA and the Clinton Power Station 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 safety 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, 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 and the staff of Clinton Power Station are committed to improving the operational safety and reliability of their station. There is clear evidence that the station has gained benefit from the OSART process. The IAEA Safety Standards, OSART guidelines, benchmarking activities with other power stations and a comprehensive self-assessment were used during the preparation for the OSART mission.

The team found good areas of performance, including the following:

- The Exelon Nuclear Management Model (NMM), coupled with strong inter-site and corporate support allows credible cross-site comparisons to be drawn and leverages the efficient use of company resources
- A mentor programme for students in initial training programmes in all departments as well as crew training mentors for license requalification training crews
- Cross-discipline review and ownership process regarding the control of Temporary Modifications
- Fuel failure prevention policy including a strong Foreign Material Exclusion programme
- Tools to ensure Root Cause Analyses are completed in a timely, consistent and deliberate manner to guarantee the high quality of the investigation and report
- Use of remote-monitoring technology, cameras and robots for radiation exposure reduction
- The station has a department chemical control representative (DCCR) in all its departments. DCCR acts as a point of contact for the station chemical control coordinator when problems involving chemical product use, storage, labelling, or disposal arise and assists in resolving these problems
- The station in coordination with other nuclear power plants in the Exelon fleet decided to harmonize the approaches used and to acquire standard (primary and backup) equipment for each plant of the fleet for mitigation of severe accident damage.

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

- Consistently assess and reduce, where achievable, safety hazards from storage of equipment and transient materials and consistently demarcate storage areas
- Improve the backlog management tool and methodology so as to ensure timely completion of maintenance work orders even for lower priority work
- Improve the efficiency and configuration control of the modification process used for phased implementation of changes, including the replacement of obsolete plant items
- Improve the robustness of its external OE screening process and ensuring learning opportunities from international experience are not missed
- Update the procedure for validation of the Severe Accident Guidelines (SAGs) and also complete the existing generic information by plant specific analysis of representative severe accidents as an input for the next validation of SAGs and for staff training.

Clinton 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.