

EXECUTIVE SUMMARY

This report describes the results of the OSART mission conducted at Civaux Nuclear Power Plant in France from 30 September to 17 October 2019.

The purpose of an OSART mission is to review the operational safety performance of a nuclear power plant against the IAEA safety standards, make recommendations and suggestions for further improvement and identify good practices that can be shared with NPPs around the world.

This OSART mission reviewed eleven areas; Leadership and Management for Safety; Training and Qualification; Operations; Maintenance; Technical Support; Operating Experience Feedback; Radiation Protection; Chemistry; Emergency Preparedness and Response; Accident Management; and Human, Technology and Organization Interactions.

The mission was coordinated by an IAEA Team Leader and Deputy Team Leader and the team was composed of experts from Argentina, Bulgaria, Czech Republic, Hungary, Korea Republic of, Romania, Sweden, the United Arab Emirates, the United Kingdom, the United States of America and two IAEA staff members. The collective nuclear power experience of the team was 376 years.

The team identified 18 issues, resulting in 4 recommendations and 14 suggestions. 6 good practices were also identified.

Several areas of good performance were noted:

- The plant has implemented ultraviolet treatment of cooling tower drain water with the purpose of limiting releases of amoeba,
- The use of smoke simulation masks to enhance the realism and safety of fire-fighting exercises,
- EDF, in association with CGN in China and EDF Energy in the United Kingdom, have jointly created and made available TMI, Chernobyl and Fukushima major accident showrooms for the young nuclear generation in order to develop a Strong and Nuclear Safety Culture.

The most significant areas of improvement were:

- The plant should establish and implement a system to ensure that operator aids used by plant personnel are authorized and controlled,
- The plant should enhance the processes and practices to manage modifications,
- The plant should enhance the effectiveness and timeliness of corrective actions implementation and use of operating experience.

Civaux NPP management expressed their commitment to address the issues identified and invited a follow up visit in about eighteen months to review the progress.

INTRODUCTION AND MAIN CONCLUSIONS

INTRODUCTION

At the request of the government of France, an IAEA Operational Safety Review Team (OSART) of international experts visited Civaux Nuclear Power Plant (NPP) from 30 September to 17 October 2019. The purpose of the mission was to review operating practices in the areas of Leadership and management for safety, Training and qualification; Operations; Maintenance; Technical support; Operating experience feedback, Radiation protection; Chemistry, Emergency preparedness and response, Accident management and Human, technology and organization interaction. 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 Civaux NPP OSART mission was the 208th in the programme, which began in 1982. The team was composed of experts from Argentina, Bulgaria, Czech Republic, Hungary, Korea Republic of, Romania, Sweden, United Arab Emirates, United Kingdom, the United States of America and the IAEA. The collective nuclear power experience of the team was 376 years.

Before visiting the plant, the team studied information provided by the IAEA and the Civaux NPP 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.

Civaux NPP is in the French Nouvelle Aquitaine administrative region, 35km south west of Poitiers. The main plant comprises two pressurised water reactors of France's 'N4' design each driving a single turbine generator with a nominal output of 1450 MW electrical. The only other units of the same design are at Chooz B near the French-Belgian border. Construction of Civaux NPP started in 1988, Unit 1 was connected to the French electricity grid in 1998 and Unit 2 in 1999. Both units are flexible in operation according to the needs of the grid operator and can ramp from 30% to 95% of full power in only 30 minutes. The control rooms of the N4 plants are highly automated and take account of lessons learned from the Three Mile Island accident in the USA. The Human-Machine-Interface is designed to assist the control room operators through enhanced clarity of information and on-screen diagnostic information.

The plant is located on the Vienne river whose flow varies significantly over the year. This resulted in constraints on the interactions of the plant with the river in terms of water extraction, discharges and river water temperature. Additional effluent storage tanks allow the plant to continue operating when river flow is low. The main circulating water system is cooled using natural draught cooling towers. Civaux is also equipped with 10 days of autonomous cooling capability for the Essential Service Water Systems. These systems are air cooled with make-up water drawn from the river.

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 of Civaux NPP are committed to improving the operational safety and reliability of their plant. The team found good areas of performance, including the following:

- The plant has implemented ultraviolet treatment of cooling tower drain water with the purpose of limiting releases of amoeba
- The use of smoke simulation masks to enhance the realism and safety of fire-fighting exercises
- The use of participative showrooms (in association with CGN in China and EDF Energy in the United Kingdom), to help the young nuclear generation to develop an effective Nuclear Safety Culture.

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

- The plant should establish and implement a system to ensure that operator aids used by plant personnel are authorized and controlled.
- The plant should enhance the processes and practices to manage modifications,
- The plant should enhance the effectiveness and timeliness of corrective actions implementation and use of operating experience

Civaux NPP 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.