

## EXECUTIVE SUMMARY

This report describes the results of the OSART mission conducted for Kalinin Nuclear Power Plant, Russian Federation from 8 to 25 November 2021.

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 nine areas: Leadership and Management for Safety, Training and Qualification, Operations, Maintenance, Technical Support, Operating Experience Feedback, Radiation Protection, Chemistry, and Accident Management.

The mission was coordinated by an IAEA Team Leader and Deputy Team Leader and the team was composed of experts from Czech Republic, France, Germany, Slovakia, South Africa, Sweden, United Kingdom, the United States of America, IAEA staff members, and three observers from Slovakia and Russian Federation. The collective nuclear power experience of the team was 340 years.

The team identified eight issues, one of them was a recommendation, and seven of them were suggestions. Two good practices were also identified.

Several areas of good performance were noted:

- The plant uses hydrogen generators for the operation of gas chromatographs equipped with a flame ionization detector for analyses of hydrocarbons, furan derivatives, and additives in samples of oils;
- The plant has always two psychologists present to assess the behaviour of the personnel responsible for determining the severe accident management actions;
- The plant initiated the project of safety culture ambassadors. The project promotes the development of a safety culture in departments by communicating information and receiving feedback on the identified deficiencies in safety culture.

The most significant issues identified were:

- The Operating Experience Feedback (OEF) programme guidance does not always ensure that the correct root causes are identified or effective corrective actions are set to prevent recurrence of significant events;
- Preventive Maintenance arrangements for some important non-safety equipment is not effective in preventing unplanned equipment failures or maintenance;
- Key Performance Indicators (KPIs) and the plant radiological protection programme targets for occupational exposure, radioactive waste, and discharges are not always challenging enough to ensure continuous improvement.

Kalinin 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 the Russian Federation, an IAEA Operational Safety Review Team (OSART) of international experts visited Kalinin Nuclear Power Plant from 8 to 25 November 2021. 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, and Accident Management. 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 Kalinin Nuclear Power Plant is located in the northern part of Tver region, 330 km from Moscow, the capital city of the Russian Federation. The operating organization for Kalinin NPP is Rosenergoatom Concern JSC with its central office in Moscow. The Kalinin plant consists of 4 Units with VVER-type light water reactors with reference output of 1000 MWe each.

The Kalinin OSART mission was the 212<sup>th</sup> in the programme, which began in 1982. The team was composed of experts from Czech Republic, France, Germany, Slovakia, South Africa, Sweden, United Kingdom, the United States of America, IAEA staff members, and three observers from Slovakia and Russian Federation. The collective nuclear power experience of the team was 340 years.

Before visiting the plant, the team studied information provided by the IAEA and the Kalinin 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 insightful 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 of the Kalinin 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 uses hydrogen generators for the operation of gas chromatographs equipped with a flame ionization detector for analyses of hydrocarbons, furan derivatives, and additives in samples of oils;
- The plant has always two psychologists present to assess the behaviour of the personnel responsible for determining the severe accident management actions;
- The plant initiated the project of safety culture ambassadors. The project promotes the development of a safety culture in departments by communicating information and receiving feedback on the identified deficiencies in safety culture.

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

- The OEF programme guidance does not always ensure that the correct root causes are identified or effective corrective actions are set to prevent recurrence of significant events;
- Preventive Maintenance arrangements for some important non-safety equipment is not effective in preventing unplanned equipment failures or maintenance;
- KPIs and the plant radiological protection programme targets for occupational exposure, radioactive waste, and discharges are not always challenging enough to ensure continuous improvement.

Kalinin 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.