

INTRODUCTION AND MAIN CONCLUSIONS

INTRODUCTION

At the request of the Government of Brazil, an IAEA Operational Safety Review Team (OSART) of international experts visited Angra 1 Nuclear Power Plant from 30 June to 17 July 2003. 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; Radiation protection; and Chemistry. The scope of the mission did not include Emergency Planning and Preparedness as this area was reviewed less than one year ago during the OSART mission to Angra 2. Also the scope of review for Radiation Protection and Chemistry was reduced as some activities in these areas are performed in the similar way as those reviewed during the Angra 2 OSART. One reviewer was, therefore, assigned to these two areas. A similar approach was applied to the Training and Qualification area allowing more time to be devoted to information exchange. 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 Angra 1 OSART mission was the 119th in the programme, which began in 1982. The team was composed of experts from USA, Germany, France, Bulgaria, UK, and the Czech Republic together with three IAEA staff members and a host plant peer from Brazil. The collective nuclear power experience of the team was approximately 260 man-years.

Before visiting the plant, the team studied information provided by the IAEA and the Angra 1 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 IAEA Safety Standards and good international practices.

MAIN CONCLUSIONS

The OSART team concluded that the managers of Angra 1 NPP are committed to improving the operational safety and reliability of their plant. The team identified a number of commendable features at Angra 1 NPP, including the following:

- The people working at the plant are very dedicated, experienced, and professional
- The team was impressed by the cleanliness of the plant and the good housekeeping
- The plant is open to international and external reviews, and has an impressive plan that confirms that the plant will continue this approach.

Furthermore, the team identified a number of good practices.

The team also offered a number of proposals for improvement in operational safety. The most significant proposals include the following:

- The plant should more clearly define their long-term staffing programme, reduce the reliance on contractors, and ensure that vital plant knowledge is transmitted to new staff.
- The plant should more aggressively reduce its backlog of all kinds and in all domains
- The plant should improve their standards in installing temporary modifications and enhance the control of temporary modifications
- Some programmes and policies need to be more formalized to ensure continuity and consistency, especially as newer staff will replace experienced retired contracted staff.

Although not the subject of a specific proposal in the report, several observations by the team could be addressed by a stronger questioning attitude. These include; identifying and reporting deficiencies, following implemented processes for foreign material exclusion and temporary modifications, and improving plant material conditions, as well as taking care of ageing equipment.

SAFETY CULTURE REVIEW CONCLUSION.

An important element of the OSART review is the identification of those findings that exhibit positive and negative aspect of safety culture. The OSART team used the guidance provided in INSAG-4, INSAG-13, INSAG-15, IAEA Safety Reports Series No.11, IAEA-TECDOC-1321 and 1329 and draft SCART Guideline to assess various aspects of safety culture at the Angra 1 nuclear power plant. A safety culture review has been integrated in the OSART review of Angra 1 NPP, which included the following steps:

- Safety culture training for mission experts, based on IAEA safety standards
- Safety culture observations were part of daily reviews reported during team meetings
- During the OSART, 31 interviews on safety culture were performed with Angra 1 staff from different organizational levels.
- A questionnaire was filled out by all team members
- The safety culture program evaluation was part of Management, Organization and Administration review
- The IAEA assistant team leader was responsible for co-ordination and evaluation of observations and interviews

Interviews evaluation:

Interviews were conducted with various levels of workers, including senior managers, middle managers, line managers, control room staff, technicians and field workers.

All interviewees considered safety a high priority which is most visible in; communication and commitment, training, good safety performance and procedure adherence.

As to the question, “what do you think could be improved at the Angra 1 plant”, the staff suggested several areas where more training could be provided and they listed a variety of other desires for new equipment and information.

Team members evaluation:

The team members were very impressed with a number of positive safety culture aspects observed in the Angra 1 plant. Most often mentioned were:

- The openness to new ideas and desire to exchange international experience

- Their self assessment exercises and process
- Cleanliness and housekeeping
- Communications and training

The team also recognized the pride of the workers and managers in their nuclear power plant and was impressed with the staff's professionalism.

The team also identified several areas where management and staff of the plant are encouraged to enhance safety culture:

- Improving the questioning attitude and striving for excellence
- Decrease the acceptance of deficiencies
- Provide greater detail in the analysis of human performance

During the review, the team observed that safety culture requirements are incorporated in several guidelines and the plant is encouraged to continue this effort in accordance with developments identified in this area by IAEA and other organizations.