

INTRODUCTION AND MAIN CONCLUSIONS

INTRODUCTION

At the invitation of the Government of Pakistan a three-week Operational Safety Review Team (OSART) mission was conducted at Chashma Nuclear Power Plant (CHASNUPP) from 12 to 29 January 2004. The plant is located in the North of Pakistan in Mianwali district near a small town named Kundian on the Jehlum Link Canal of the Indu River. The site contains one single 300 MW PWR unit of Chinese design. The Unit was first connected to the grid in June 2000. One more nuclear power plant, similar to CHASNUPP, is planned at the Chashma site. Approximately 2% of the electrical generation produced in Pakistan comes from nuclear power.

The CHASNUPP OSART mission was the 122nd in the programme, which began in 1982. The team was composed of experts from Canada, Slovakia, United Kingdom, France, Sweden, Czech Republic, Germany, Republic of Korea, together with three IAEA staff members and a host plant peer from CHASNUPP. In addition, one observer from China was part of the team. The collective nuclear power experience of the team was more than 300 years.

The team traveled to Chashma on Friday, 9 January 2004. Saturday and Sunday were spent in team training activities. Following the entrance meeting, which took place on Monday, 12 January; the team conducted the OSART review, completed initial reports and presented its findings at an exit meeting on Wednesday, 28 January.

In addition to senior managers and staff from CHASNUPP and Pakistan Atomic Energy Commission (PAEC) representatives from the Pakistan Nuclear Regulatory Authority (PNRA) attended the exit meeting. The team presented its finding at a meeting with senior management of PAEC and PNRA on Thursday 29 January in Islamabad. Both PAEC and PNRA chairmen and IAEA Deputy Director General for Nuclear Safety and Security, Mr. Taniguchi, attended the meeting.

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, chemistry and emergency planning. During this mission, the NPP's operational experience feedback (OEF) system was given an extended review using the recently developed OEF module. In addition an exchange of technical experience and knowledge took place between the experts and their plant counterparts on how the improvements in operational safety could be further pursued.

Before visiting the plant, the team studied information provided by the IAEA and the CHASNUPP to familiarise themselves with the plant's main features and operating performance, staff organization and responsibilities, important programmes and procedures and IAEA Safety Standards relevant to the mission. 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, PNRA staff and off-site authorities.

Throughout the review, the exchange of information between the OSART team members 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 best international practices.

MAIN CONCLUSIONS

The OSART team concluded that the managers and staff at CHASNUPP are enthusiastic in their commitment to improve the operational safety of the plant. The team found good areas of performance, including the following:

- High education level and strong technical background of engineers and managers who are fully dedicated to their company
- Good training center, its full utilization can bring lot of benefit for safe operation of CHASNUPP
- Training and Retraining process of Main Control Room Staff
- Use of LAN network to share the information and learn

The plant has embarked in a serious programme to improve operational safety with IAEA support. The team encourages PAEC and plant management to continue to give high priority and adequate resources for the continuation of these improvements. With this purpose, the team offered proposals for further improvements in operational safety. The most significant proposals include the following:

- Management should develop and implement their management role as delegation & control, development and coaching of human resources, improvement of the organization efficiency and focus to the long term performance
- Management should set and enforce high standards of nuclear, radiation and industrial safety, operation and safety culture
- Management should ensure strong technical support for safe operation
- Management should develop an appropriate strategic plan to give orientations and targets for the company. This strategic plan should be further transformed into department's action plans
- Management should ensure that an effective experience feedback programme is effectively implemented and functioning to support plant safe operation
- Management should accelerate the development and revision of procedures in most areas.

CHASNUPP has difficulty due to isolation from the rest of the nuclear industry. IAEA technical support project for safe operational enhancement can significantly help in this regard. CHASNUPP 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.

SAFETY CULTURE REVIEW

An important element of the OSART review is the identification of those findings that exhibit positive and negative attributes 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 Guidelines to assess various aspects of safety culture at the CHASNUPP.

The safety culture review was integrated on a daily basis into the OSART review process. The results of the safety culture review are based on the team member's daily observations

and interviews with the CHASNUPP staff, review of the material condition and housekeeping of the plant and evaluation of the programmes, processes and procedures used at the plant.

The Safety Culture review included the following steps:

- Safety culture training for mission experts, based on IAEA safety standards and other IAEA documents
- Safety culture observations by team members discussed at each daily team meeting
- A questionnaire, at the completion of the review, asking each team member to prioritize the most significant plant and staff strengths, weaknesses and safety culture indications observed during the review
- Consensus by the team on the results of the safety culture review.

The safety culture programme evaluation was done as part of the Management, Organization and Administration review. The IAEA Deputy Team Leader was responsible for co-ordination and evaluation of observations by the team.

EVALUATION AND CONCLUSION OF SAFETY CULTURE

Observations and interviews were conducted with various levels of workers, including senior managers, middle managers, line managers, control room staff, technicians and field workers. The most significant positive attributes visible to the team were observed in;

- Willingness to improve the performance and programmes
- Engineers and managers are very open minded, transparent and willing to share experience

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

- Management commitment toward safety culture
- Adherence to procedures and rules including radiation protection
- The acceptance of low standards and practices
- Management presence in the field and enforcement of expectations and high standards
- Management Safety Committee at corporate level should be established. The function of the Operational Safety Review Committee at the plant should be enhanced.
- Adherence to industrial safety rules and preventing industrial safety hazards.

The team concluded that there is a commitment to nuclear safety by the management and staff at CHASNUPP. The CHASNUPP team who contributed to the good preparation for the OSART mission are encouraged to continue with their efforts for sustaining the momentum to make continuous plant improvements. Senior managers are also encouraged to continue with their initiative to develop a safety culture environment in accordance with developments identified in this area by IAEA and other world organizations. The implementation of the OSART recommendations and suggestions will contribute to management's support to improve the safe operation of the plant.