

INTRODUCTION AND MAIN CONCLUSIONS

INTRODUCTION

At the request of the Government of the People's Republic of China, an IAEA Pre-Operational Safety Review Team (Pre-OSART) of international experts visited Tianwan Nuclear Power Station (TNPS) from 26 January 2004 to 12 February 2004. 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; Emergency Planning and Preparedness and Commissioning. The plant is under commissioning and the review was focused on the operating organisation including commissioning activities that influence the future safe operation of TNPS. A review of Safety Culture has been integrated into the review, with support of a Safety Culture specialist from IAEA. 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 pursued further.

The Tianwan Pre-OSART mission was the 123rd in the programme, which began in 1982. The team was composed of experts from the United Kingdom, Germany, Czech Republic, Brazil, France, the United States of America, Sweden, Ukraine, together with the IAEA staff members with origin from Canada, Lithuania, Hungary, the United States of America and Sweden, and observers from People's Republic of China and Iran. The collective nuclear power experience of the team was approximately 350 years.

Before visiting the plant, the team studied information provided by the IAEA and the Tianwan 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 Pre-OSART experts and plant personnel was very open, professional and productive. Emphasis was placed on assessing the TNPS readiness to take the plant in safe operation and to review the effectiveness of operational safety aspects rather than simply the content of programmes. The conclusions of the Pre-OSART team are based on the plant's performance compared with IAEA Safety Standards and good international practices.

SAFETY CULTURE REVIEW

The Safety Culture evaluation process is structured in 5 areas, described as safety culture Dimensions. Attributes for each Dimension have been specified by the IAEA and data were collected for these attributes using interview and observation techniques. The results of the evaluation clearly show that JNPC senior management are committed to developing a strong safety culture within their organisation, and this is evident from the high calibre and enthusiasm of the workforce. Although it was concluded that the safety culture is maturing well in many JNPC activities, it is clear that further work needs to be done to bring the plant to the strong level to which they aspire. Foremost amongst these is the need to develop a sense of 'ownership' within the larger workforce.

Although it is recognised that formal ownership of many areas of the plant still rests with the contractors, the Pre-OSART team concluded that the lack of accountability within parts of the JNPC workforce is hindering the development of the authorities that will be required to exert to ensure safety in nuclear operations. It is expected, however, that this problem will be resolved as the JNPC team gain further nuclear operating experience.

A commendable start has also been made towards resolving this issue in actions such as the development of a learning organisation, and efforts such as these, and other initiatives for advancement of practical management skills, should be encouraged. In addition, despite considerable efforts having been made to ensure that the management processes are comprehensively described in policies and procedures, the actual human performance in the field does not always conform to what is required by those policy documents, and so this also remains an area for senior management attention.

MAIN CONCLUSIONS

The Pre-OSART team concluded that the managers of TNPS have adopted the safety messages "Safety First, Quality First" as a tool to continuously improve the operational safety at the plant. The team found good areas of performance, including the following:

- TNPS staff are very well educated and TNPS has taken several impressive steps to gain experience and operating skills from similar plants in Russia and in the People's Republic of China. Tianwan staff are very motivated and have shown a tremendous willingness to learn from the experts throughout this mission
- Furthermore, TNPS has sufficient and stable human resources to provide support for safe and reliable operations
- TNPS has a well documented Management system with policies and procedures and an advanced Information Management system to support the spread of information in the organization,
- The relationship between the plant and the National Nuclear Safety Authority (NNSA) is open minded and cooperative. NNSA also has access to the TNPS Information System.
- TNPS has already developed a long term vision for succession planning of staff
- The team's Safety Culture review found that the current organisation has what can be described as a "maturing" Safety Culture, which is moving in a direction where it is expected to be classifiable as "strong" in the future.

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

- TNPS needs to strengthen and improve the authority and responsibility for controlling commissioning activities to ensure a high level of staff professionalism and ensure high quality of systems and equipment
- Furthermore, there is a need to close the gap between the desired ways of managing processes as described in procedures and actual performance in the field, the most obvious for the team was the poor attention to adherence to Industrial Safety rules and housekeeping.

- There is also a need to strengthen the staff's authority to intervene when unsafe behavior is observed as well as to correct personnel if procedures or programs are not followed.
- The team proposed an introduction of more challenging goals to support TNPS continuous improvement and strengthening the accountability in the organisation.
- The team's review of Safety Culture also confirmed that accountability in the organization needs to be improved.

TNPS 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.