WANO SOER 2013-1 Summary

Operator Fundamentals Weaknesses

Several significant events have occurred that highlight weaknesses in the knowledge, skills, behaviours and practices essential for operators to operate the plant safely and effectively – operator fundamentals. In some cases, individuals caused events during operations activities. In other instances, individuals did not mitigate the effects of power transients. Events include reactor trip, loss of reactor coolant system inventory, unplanned reactivity additions and damage to plant equipment

Past industry efforts to improve operator fundamentals resulted in short-term reductions in the number of significant events and reactor trips caused or complicated by weaknesses in operator fundamental performance. However, these efforts were not sustainable because the actions taken and lessons learned were not well incorporated into operational standards, training, and management systems. As a result, the improvements were not sustainable and events caused by weaknesses in the use of operator fundamentals continue to occur too frequently.

Analysis of recent events and their causes identified several underlying reasons for operator fundamental weaknesses. These reasons include the following:

- Operators are not sufficiently focused on understanding the technical aspects of the task to complement the use of human performance techniques.
- An imbalance exists between 'training on task' implementation and training on integrated system knowledge, the technical basis for procedures, the reasons for operational practices and power plant fundamentals
- Risk recognition and mitigation are not used effectively to supplement the requirement to follow approved processes and procedures and ensure activities are completed event-free.
- Training techniques and needs have not been adjusted to account for operators having fewer opportunities to experience plant transients, safety system operation and other abnormal / unusual evolutions because plants in general are operating more reliably.

This SOER establishes actions to help members to self-assess the effectiveness of operator fundamentals and training programmes at their stations. This SOER also establishes actions to ensure operator fundamentals are well ingrained in and rigorously applied by operators

Recommendations that each WANO member shall address

1. **Conduct a self-assessment for operations training programmes.**

   Conduct a self-assessment of the operations training programmes using 'Self-Assessment Guide: Assessing Training Effectiveness in Addressing Operator Fundamentals', May 2011, to understand fully their effectiveness in training on the subject of operator fundamentals. Develop corrective actions based on the results of the self-assessment to improve the quality of operator fundamentals training.

2. **Perform a self-assessment of operator fundamentals as practiced.**

   Perform a self-assessment of operator fundamentals using 'Self-Assessment Guide to Operator Fundamentals', June 2011, to identify gaps that could cause events or reduce crew effectiveness when responding to a transient. Use the results of the self-assessment to develop corrective action designed to better focus training and coaching of operators on identified weaknesses.

3. Implement effective organisation and leader behaviours.

Implement the following organisation and leader behaviours and practices to establish and reinforce operator fundamentals:

a. Clearly define, communicate and make readily available for operator reference the fundamentals using the 'Your Role in Operator Fundamentals' document.

b. Ensure initial and continuing training for operators provides them with a thorough understanding of plant design, engineering principles and sciences to complement task requirements. Ensure methods such as open-ended questioning, discussions, walkdowns and dynamic learning activities are used to establish, refresh, reinforce and test this knowledge.

c. Actively monitor and engage operators to improve the application of their fundamentals through in-field coaching. Ensure active monitoring includes the following goals and attributes:

- Make changing behaviours the primary objective, with capturing and trending data a secondary, but still important objective.
- Include thorough, probing inquiries or questions as part of any observation to assess the operator's level of attention on the task, thinking process, level of task understanding and state-of-mind. Pre-job briefings provide an excellent opportunity to gauge an operator's knowledge of an upcoming task. In addition, observe visible behaviours, such as having the procedure in-hand, self-checking and placekeeping.
- Promote, reinforce and reward behaviours that support a culture of understanding on how the plant works and why it works that way. Encourage the use of a questioning attitude and reward conservative decision-making.
- Build in follow-up activities to ensure identified gaps are addressed in a timely manner and are shared across crews and departments to promote learning and improvement.

d. Ensure individuals in the operations line of responsibility (for example, shift manager, operations manager, plant manager and site vice president) actively monitor key operator fundamental activities at an appropriate frequency. This would include activities such as reactivity changes, field operator rounds, crew responses to simulated transients, surveillance tests and infrequently performed tasks.

e. Ensure operator performance is closely reviewed after significant plant transients and trips to identify potential weaknesses in behaviours, knowledge and practices.

4. Establish and maintain training and programmes that support effective control room teamwork.

a. Training should include the importance of staying in your assigned role, of challenging other team members who do not meet the intent of their roles or who step out of their role and of working together to control and monitor the plant effectively.

b. Crew composition assignments for each operating team should be structured such that there is a good mix of new and experienced operators on each crew with complementary backgrounds and personalities.

c. Ensure members of a newly constituted crew train together before assuming control room duties, and evaluate personnel returning from lengthy off-shift assignments before they resume control room duties.

d. Ensure the shift manager leads, sets high standards, encourages the crew members to be critical of their performance and develops timely and effective actions to continuously improve crew performance.

5. To ensure sustainability of the above actions, use the corrective actions, performance indicators and self-assessments to identify, track and trend the effective application of operator fundamentals.

IMPLEMENTATION OF THE RECOMMENDATIONS LISTED ABOVE WILL BE EVALUATED DURING WANO PEER REVIEWS BEGINNING SEPTEMBER 2013. A MORE DETAILED DISCUSSION OF THESE ISSUES IS PRESENTED IN THE SOER.