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SOER

HOW TO REVIEW

SOER | 2013-1

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How to Review SOER 2013-1

Operator Fundamentals Weaknesses

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SOER | 2013-1
Operator Fundamentals Weaknesses

CONTENTS

SOER | 2013-1
How to Review

Summary

The following information is provided for use in reviewing WANO SOER 2013-1, 'Operator Fundamentals Weaknesses.' It is primarily intended for use by WANO peer review teams as a tool to guide the team's evaluation of the effectiveness of SOER recommendation implementation. However, stations can also use this document as a self-assessment tool to help ensure that all aspects of each SOER recommendation have been considered and that actions to implement the recommendations are appropriate.

NOTE: This information is not intended as an auditing tool or checklist, and the details provided should not be considered as requirements for satisfactory implementation of the SOER recommendation. Stations should strive to meet the intent of the SOER guidance and use this information to identify possible methods to prevent events at their stations.

Additional insights identified by peer reviewers or stations should be forwarded to the WANO operating experience central team for incorporation into this guidance at **OECT@wano.org**

SOER 2013-1 '*Operator Fundamentals Weaknesses*' describes an adverse trend in operator fundamentals that may be a precursor to events of greater consequence. This document provides recommendations that require both immediate attention and on-going actions.

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

SOER | 2013-1
Recommendations

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

Basis

Recent events indicate our industry is experiencing a decline in the application of operator fundamentals during plant operational activities and transient situations. Industry efforts to focus on operator fundamentals had a short-term positive influence on the number and severity of operator fundamentals-related events. However, since 2009 these types of events began to recur with increasing frequency and severity.

Scope and Intent

This document provides guidance for performing a station self-assessment of the implementation and effectiveness of training associated with operator fundamentals.

Training programs to be self-assessed by each station are the six areas associated with the following:

- Non-licensed Operators
- Reactor Operators
- Senior Reactor Operators
- Shift Managers
- Continuing Training for Licensed Personnel
- Shift Technical Advisors or their equivalent

While it is recognized that the titles above may vary from station to station, the self-assessment's focus should be on the responsibilities and knowledge of the respective positions.

Special Considerations for Evaluations

As a minimum, each station self-assessment is expected to assess the following areas:

- How does training incorporate operator fundamentals into training program design, development of training materials and methods used for the conduct of training? Does a process/procedure govern this? Does training material reflect integration of operator fundamentals?
    - How are operator fundamentals reflected (where appropriate) in lesson materials for all operator disciplines? (Scenario guides, lesson plans, JPMs, OJT/TPE, and other training and qualification materials)
    - What are training management's expectations for instructors to include operator fundamentals in lesson materials? How do training supervisors verify/reinforce the inclusion of operator fundamentals when reviewing/approving lesson materials?
    - Are specific learning objectives used for operator fundamentals knowledge, skill, ability and behaviors in lesson/training material?
    - What is the process used to select/target the retraining of a specific operator fundamental(s) in continuing training? How is a specific fundamental topic area determined?

  - How does operator performance influence the selection of operator fundamentals for continuing training?

- How are operator fundamental knowledge, skills, abilities and behaviours measured? How are weaknesses identified? Do training processes/procedures govern this activity?

  - What diagnostic tools are used to trend performance in operator fundamentals?
  - How do training oversight committees focus on operator fundamentals and are operator fundamentals discussed during training oversight meetings?
  - Are targeted observations of operator fundamentals performed during training? Who does them? How often?
  - How do instructors know what to "look for" with respect to operator fundamentals? How do simulator instructors reinforce operator fundamentals during training? What tools/techniques are used?
  - How are deficiencies in operator fundamentals documented and trended?
  - How is the corrective action program data reviewed and trended by training personnel for knowledge, skill, ability and behaviour weaknesses associated with the operator fundamentals?
  - How are acceptance criteria (standards) for performance of operator fundamentals established? Is operations line management involved in setting these standards? How and when is remediation performed for sub-standard operator fundamental performance?
  - Are operator fundamentals considered in post-training evaluation of student performance?

- How is operator fundamental performance assessed during simulator crew evaluations?

  - Review crew performance documentation and management observations for evaluated crew performance for the last 24 months of operator training. How do comments indicate that operator fundamentals are being evaluated?
  - Does performance documentation of crew evaluations support the information needs of operations and training management in area of operator fundamentals?

- How does the operations line organization actively support and engage in training topic selection and in the subsequent training for operator fundamentals reinforcement?

- How are instructors trained on expectations for the teaching of operator fundamentals? How are simulator instructors trained to identify and effectively convey gaps in operator fundamentals during training and evaluation activities?

- How are operator fundamentals covered/addressed/reinforced during Just-In-Time-Training (JITT)?

Determining Overall Recommendation Status

- Monitoring the Plant (attentiveness)

  - What techniques are used by instructors to verify/evaluate that the parameter monitoring expected of the students is occurring during simulator training?
  - How are line trainers and evaluators trained on expectations for monitoring of plant parameters? How do qualification processes measure and assure appropriate plant monitoring is demonstrated by the student during qualification activities?
  - How are non-licensed operators (NLOs) trained on expected plant parameter monitoring during transient or power manoeuvre conditions? How are critical parameters identified and trained on for NLO field activities? How do NLOs know what diverse indications are available

for a situation/action/component? Does training material, such as knowledge items in OJT guides or lesson plans, contain this information?

- Do training materials/methods for students specifically teach expected parameter monitoring and validation of indications through independent means? Are critical parameters trained on for various conditions and transients?
- How is the use of diverse/redundant indications addressed and instructed? For example, loss of computer systems, instrument buses and annunciators/alarm panels, and so forth.
- How is balancing the use of technology, such as computer trending, integrated with the use of "hands, eyes, and ears" during training? How do we train to maximize the benefits of both? What training is done on electronic rounds equipment and expectations for review of the data collected?
- What training methods are used to reinforce desired NLO watch standing skills (tactile senses, abnormality recognition, unusual vibrations, unexpected pipe deflection and so forth) associated with equipment monitoring? Are these type of skills taught in continuing training or just once in initial training?
- How do instructors maintain know-how of NLO rounds methods and expectations? Does instructor in-plant time include activities to refresh the instructor on expectations and techniques expected for monitoring of the plant in the field?

- Controlling the Plant (deliberate)

  - Are clear standards for precise plant control behaviours established such that training can instruct/observe performance?
  - How do instructors impart station management team philosophy and expectations for precise parameter control in training?
  - How do instructors monitor and reinforce precise reactivity manipulation and positive control of plant activities that potentially affect reactivity during training?
  - What training materials, settings and techniques are used to train and evaluate on expected precise parameter control?

    - in the classroom
    - in the simulator
    - JPMs, OJT, TPE
    - Mockups/flow loops/labs?

  - How are Tech Spec and design limits, and their bases, taught in a manner that supports precise plant control well-within these bases and limits?

- Conservative Bias (Judgment)

  - How do instructors impart the station management team's philosophy and expectations for conservative bias in training?
  - What training materials, settings, and techniques are used to train and evaluate on expected conservative bias (judgment)? (attributes such as placing plant in a safe condition, conservative decisions, not proceeding in the face of uncertainty, questioning unusual conditions, having contingent actions ready)

    - In the classroom
    - In the simulator
    - JPMs, OJT, TPE
    - Mockups/flow loops/labs

    - Are clear standards for conservative bias behaviours established such that instructors can teach and observe performance? How are these standards and expected behaviours conveyed to the instructors?

- Crew Performance (teamwork)

    - How do instructors train and evaluate on expected crew performance (teamwork) in the simulator? Are scenarios sometimes designed to specifically challenge crew teamwork behaviours and the ability of the crew to stay in their role?
    - How do instructors evaluate/measure how well the operating crew in the simulator stay in their role:

        - The shift manager maintains oversight.
        - The control room supervisor (CRS) maintains command and control.
        - The shift technical advisor (STA) or equivalent provides technical oversight.
        - The reactor operator (RO) and other control board operators monitor and control the plant.

- How well do scenarios challenge the crew to prioritize competing actions? How do evaluators and instructors evaluate a crew's prioritization skills?

- How are NLOs integrated into control room crew teamwork-focused training?

- Are crews evaluated in normal crew compliments or is training often conducted with multiple extras to get the required operating licensed requirement satisfied? Are senior reactor operators (SROs) sometimes evaluated in other operations positions that they may be required to fill at times? Are other plant positions, such as reactor engineers, chemistry, radiological protection and radwaste operators sometimes incorporated into operator training? How do training personnel select when to do this and how do they evaluate and capture results from this type of training?

- Is teamwork training provided to operating crews – particularly when new crews or significantly reconstructed crews occur?

- How are instructors deployed to ensure evaluation /assessment of crew performance and teamwork (instructor-to-crew ratios and coverage methods)? How are new instructors trained in protocols and expectations (standards) for crew roles with respect to teamwork?

- What techniques are used during training critiques / post-scenario interactions to engage crew members and to provide constructive feedback on teamwork attributes? How do instructors solicit crewmember input on their teamwork performance?

- Knowledge of Plant Design, Engineering Principles and Sciences

    - How are knowledge of plant design, engineering principles, and sciences in various settings and training programs evaluated during continuing training? Are scenarios sometimes designed to specifically challenge operator fundamental knowledge of plant design, engineering principles, and sciences?

    - What training methods are used to establish operator knowledge levels of the above operator fundamentals?

    - How are plant design, engineering principles and sciences material addressed in continuing training for all disciplines (classroom lectures, quizzes, diagnostic exams and simulator diagnostic scenarios)? Is there a planned approach to this, such as incorporated into basic schedules?

- How are results rolled-up and analysed? Who reviews the results?
- Does the simulator modelling/capability support training on reactivity fundamentals, reactor theory, mechanics of core cooling, system interlocks and so forth, for the following:
    - Various times in core life
    - Varying moderator temperature coefficients
    - Different seasonal operations
    - Credible electrical system losses and line-ups
- Does the STA or equivalent training program highlight and reinforce fundamental knowledge and skill associated uniquely to this position?

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

Basis

Although nuclear industry performance had gradually improved, recent events indicate a decline in the application of operator fundamentals. There are five aspects of operator fundamentals in this SOER. These aspects are as follows:

- Monitor plant indications and conditions closely.
- Control plant evolutions precisely.
- Establish a bias for a conservative approach to plant operations.
- Work effectively as a team.
- Have a solid understanding of plant design and systems interrelationships.

Key contributors to shortfalls in operator fundamentals include the following:

- Incomplete approach to task performance

  Some operators have approached using human performance tools by focusing solely on the technique or practice, without the appropriate focus on the task at hand. Although the human performance tools that have been developed in the industry over the years are very useful and effective, a lack of operator concentration or focus on the task at hand while using these tools could cause errors and plant events. The operator who applies solid fundamentals uses the appropriate human performance tools and maintains a high level of concentration and awareness of the task at hand.

- Insufficient or ineffective training

  The focus on operator understanding for procedure bases, system design and operation and plant interrelationships has been reduced in some training programs. Contributors to these shortfalls include less time in training and standardized lesson plans, simulator scenarios and testing. The use of training techniques, such as oral boards, plant walkdowns and simulator scenarios that more closely resemble actual plant operation, has also been reduced.

- Overreliance on processes

Detailed processes have improved industry performance dramatically. Processes, such as work management, reactivity management and corrective action, have improved planning and equipment reliability, enhancing operator ability to monitor and control the plant. However, in some cases, operators have become too dependent on these processes, believing that following the process alone will ensure the task is completed event free. Similar to the use of human performance tools described above, operators with solid fundamentals implement these processes with a high level of concentration and awareness of their actions. Therefore, problems or conditions that are not covered by the processes or errors made in the processes are more likely to be identified by the operator.

- Actual plant operating experience is lower

  Since the latter half of the 1990s, actual plant transients, reactor shutdowns and reactor startups have decreased. This has reduced the level of sensitivity about what could go wrong if the plant is not monitored and controlled closely.

Scope and Intent

Perform a self-assessment of operator fundamentals 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 actions designed to better focus training and coaching of operators on identified weaknesses

Special Considerations for Evaluations

- Pre-assessment Activities
  - Review the high-level plant event history and corrective action documents to determine if the plant has experienced events in which operator fundamentals weaknesses possibly contributed to initiation of the event or the outcome. This population should be the most consequential events and will provide a representative sampling of operator performance.
  - Review performance indicators to determine if the plant has experienced events in which knowledge weaknesses possibly contributed to initiation of the event or the outcome.
  - Review self-assessments, independent oversight reports and other reports to identify operator performance shortfalls or operator-related events that may not have been captured. The intent is to identify potential operator performance shortfalls, not to check the effectiveness of oversight or the corrective action program.
  - Identify common themes of the above items. Separate the items into the five categories of operator fundamentals, and develop focus areas for the assessment. Pick the most important focus areas. Avoid being too process oriented, such as ensuring that each category has a focus area. Some categories may have more than one focus area, while others may have none.
  - In either this assessment or one on operations training, determine if station management is emphasizing operator fundamentals sufficiently in training. Review the two-year training plan, objectives, lesson plans, scenario guides, appropriate testing practices and copies of tests and results to obtain information related to the methods of evaluating and training on operator fundamentals. The intent is not to bypass the systematic approach to training, but to verify that operator fundamentals are presented sufficiently to maintain operator proficiency.

- Assessment Activities
  - Apply the focus areas from the information review to activities, while ensuring that all aspects of operator fundamentals are assessed. Activities should focus on the practical

application of the fundamentals. Operators should understand why they are performing all activities.

- Perform control room and in-field observations. Observe personnel making decisions, and determine the degree to which they openly use fundamental knowledge. Ask operators to explain what indications mean. Focus on integrated plant operations. Look for briefings and other activities to explicitly anticipate plant response. Are operators monitoring indications thoroughly and are they focused on understanding indications or are they merely scanning panels?
- Observe evaluated simulator scenarios. Use information from the simulator scenarios, such as how well operators anticipate plant response when controlling parameters during transients, to identify fundamental weaknesses. Use predetermined questions to identify operator knowledge gaps. Consider starting with questions on integrated plant response, then questions specific to individual systems and then lastly questions on theory.
- During area rounds with non-licensed operators, observe monitoring techniques and ask questions to evaluate the practical application of fundamentals, integrated plant and design basis knowledge. Examples include:

    - Naming four ways to increase pump flow
    - Identifying the impact of component failures on the plant
    - Identifying flow paths

- Interview specific individuals involved in events to determine if fundamental knowledge weaknesses were a contributor. Ask probing questions to try and get a good understanding of the level of concentration the individuals had during the event. For example, were there knowledge weaknesses, and did the individuals fully understand the task?
- Observe a couple of crews respond to simulator scenarios, to identify possible weaknesses in fundamentals. For example, reactor startup, low power, and secondary upset scenarios are transients that can cause the crews to use fundamental concepts/knowledge to analyse and respond to the transients.
- Review procedures, plant design specifics and so forth; and develop interview questions on the basis of key steps, transition points, integrated systems response, interlocks and other areas, to discuss with operators and to assess their understanding of fundamentals. A review of reactor theory and other engineering/science subjects may be needed to prepare for this assessment.

- Assessment Conclusion

    - The results of the assessment of operator fundamentals should enable station management to answer the following questions:

        - Do the operators monitor plant conditions closely?
        - Have the crews been effective in controlling plant evolutions?
        - Have the crews exhibited a bias toward making conservative decisions?
        - Do the operating crews work effectively as teams?
        - Do the operators have a solid understanding of plant design and the theory of operation?

    - Focus the conclusion on the specific problem. For example, if a performance gap exists in operator monitoring of plant conditions, what are the specific shortfalls? For example, is it control room board monitoring, in-field rounds, reactivity control or water plant management? Avoid being too process oriented. Focus on the most important conclusions that relate to safe operation of the plant.

- Determine the key causes of the performance gap. Consider shortfalls in standards, training, supervisory engagement and so forth. Look at management contributors. Identify the most value-adding causes. Focus on identifying the 20 percent of the causes that will solve 80 percent of the problems.
- Develop a focused corrective action plan. These actions should be specific. Ensure the actions are targeted to address the causes identified in the previous step. Avoid establishing actions that are off target or that would be "nice to do." The most effective action plans are simple and are focused on the most important causes.

Sample Questions

Sample questions useful for performing the above assessment can be found in the linked reference documents in the SOER itself.

3. Implement effective organisation and leader behaviours

Basis

Managers and supervisors must effectively communicate and continuously monitor and reinforce operator fundamentals. Lack of focus on operator fundamentals can allow the standard for individual and crew behaviours and practices to decline. If this happens, undesirable or improper standards can become ingrained

Intent

Implement the following organization 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.

Special Considerations for Reviews:

- Perform operator interviews to understand how well the fundamentals are understood by the operators and how the fundamentals are being reinforce on a routine basis.
- Review station documents for references to operator fundamentals, such as inclusion in the conduct of operations document.
- Review simulator documents, simulator exercise evaluation guides and critiques to ensure operator fundamentals are included in routine exercises.
- Look for displayed evidence of the importance of operator fundamentals, (i.e. poster in operating areas and station meeting rooms).

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.

Special Considerations for Reviews:

- Verify applicable site operation personnel receive specific training and are appropriately evaluated on plant design, engineering principle.

- Review the analysis conducted by line and training personnel of the required knowledge of operators on plant design and engineering principle for comprehensiveness. Attributes of the gaps described in recommendation 3 should be addressed by reviewing pre-existing station training materials to determine whether the materials contain the right level of detail, are provided at the right periodicity, in the right setting, and to the right population of to address the gaps. For those materials that are found to be adequate, the station needs to have an established method that ensures the detail is not inadvertently removed over time. For those materials that are deemed lacking, confirm that the process was proper to design, develop, implement and evaluate training that meets the intent of the SOER recommendation.

- Check the deficiencies noted during walkdowns by plant managers? Do they contain observations on operator fundamentals?

- Check for any documents/procedure for walkdowns. Do these documents contain how to reinforce operator fundamentals or how to observe gaps?

- Confirm the plant evaluates or verifies the training and/or qualification of operators on plant design and engineering principle.

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 place keeping.
- 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.

Special Considerations for Reviews:

- During control room and in-field observations, observe personnel making decisions, and determine the degree to which they openly use fundamental knowledge and how the fundamentals are reinforced by the supervisory team.

- Ask questions during observations to verify understanding of fundamentals and the mindset of the operators performing tasks.

- Are the supervisors promoting fundamentals at briefings and other activities to explicitly anticipate plant response?

  - Are questions being asked at the briefings and during the evolution to explain what indications they will receive and what do they mean? Place a focus on integrated plant operation and how the task or evolution impacts the overall operation of the station.
  - Is the supervisor asking questions to ensure a "walk away" confidence that the operator is prepared and focused to perform the task?

- Interview supervisors and operators to determine how they use fundamental principles and knowledge tools as reinforcement for the operators. Do the supervisors have a reward system for positive fundamental behaviours? Are there follow-up activities for gaps identified in crew performance when fundamentals are challenged or not used?

- Look for operators monitoring indications thoroughly:

  - Are they focused on understanding indications, or are they merely scanning panels?
  - Do they anticipate the indications that are going to change when the next step is taken?
  - Are they prepared to recognize and respond if the expected conditions are not received?

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.

Special Considerations for Reviews:

- Conduct interviews to get a perspective on effectiveness of observations and engagement of station leaders with operating crews. The interviews should be conducted with operations, training management, nuclear oversight and key station leaders.

- Determine if a systematic review of operator tasks was performed to determine the level and frequency tasks should be observed by the operations leadership team and the station leadership team. Are those observations scheduled and structured to meet the station expectation?

- Perform control room observations during periods of increased activity to understand the normal amount of oversight in the control room on a daily basis.

- Determine if station senior leadership is observing performance in the simulator with a focus on operator fundamentals and ensuring personnel stay in their roles.

- Observe senior leaders control room visits to determine if they just focused on plant status or do they stay and observe the crew providing critical feedback?

- Review observation rollup reports on shift management performance performed by senior plant leadership to understand trends and whether effective action plans exist to correct performance shortfalls.

- Review if observation feedback related to operations training describes crew performance from a senior station leadership perspective and does it discuss the effectiveness of training as it relates to operator fundamentals.

- Observe crews in the control room and simulator to evaluate the health of oversight behaviours, including reinforcement of standards by the senior leaders as they perform control room, plant and simulator observations.

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

Special Considerations for Reviews:

- Review the procedures and processes for performing an event response review. Are there questions to address gaps in fundamental performance or understanding by the operators involved?

- Review a set of historical event review documents to see if potential fundamental weaknesses occurred, if they were identified and if the corrective actions included follow-up to close identified fundamental performance gaps.

- Interview specific individuals involved in events to determine if fundamental knowledge weaknesses were a contributor. Ask probing questions to try and get a good understanding of the level of concentration the individuals had during the event. For example, were there knowledge weaknesses, and did the individuals fully understand the task?

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

Basis

Initial and continuing training insufficiently challenges or reinforces operator fundamentals. 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. 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.

Intent

Training program should develop operator fundamentals. It should include the importance of individual roles and working as a team. Consideration should be given for crew composition and inducting new crew member into crew.

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.

Special Considerations for Reviews:

- Review the operator training modules, to ensure, station positions and its responsibility are well defined. The importance of staying in assigned role is emphasized during the training process.

- Is the staff encouraged to bring to notice to senior management the shortfalls in other operator fundamentals?

- Check how the operators are trained to work as team?

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.

Special Considerations for Reviews:

- Review the process for determining crew composition and experience, both at the plant and at other locations. Is there a mix of experience levels? Is there more than one engineering degree on a crew?

- Perform interviews to determine if the crew works well together. Are there gaps in performance based on crew interactions or teamwork?
- Conduct time in position checks for all crews.
- Review the event reports for contributing causes to events with underlying themes surrounding teamwork or crew composition.

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.

Special Considerations for Reviews:

- Is there a process to determine what is considered a reconstituted crew and what level of crew member substitution results in this determination?
- Review the process for adding members to a crew and for individuals returning from off shift assignments if a process exists.
- If training is not performed for a new or reconstituted crew, what additional actions are taken to reinforce fundamentals for such a crew?
- Perform interviews of a recent returnee to shift and a crew with a recent change. Determine if any specific actions were taken to provide additional training or development exercises for the members of the crew.

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

Special Considerations for Reviews:

- Review what actions are taken on an on-going basis to develop the shift managers help identify operator fundamentals weaknesses.
- Review what actions are taken by shift managers on an on-going basis to develop, mentor and coach the crew members.
- Ensure the station has a policy or procedure for performing a crew review of performance on a regular basis. The format of the meeting should be documented including areas to address, specifically operator fundamentals.
- Verify that the process requires some attendance by senior station leadership outside of the operations manager's reporting chain.
- Determine that feedback received through observations and coaching is shared with operations personnel and plans exist with clearly assigned actions to address any problems.
- Observe a crew review meeting and observe senior leader feedback to determine if it is aligned toward operator fundamentals.

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.

Basis

Past industry efforts to improve operator fundamentals resulted in short-term reductions in the number and significance of events, such as 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.

Intent

The intent of this recommendation is to ensure sustainability towards improvement of operator fundamentals. Self-assessment should be performed to determine areas where the station has weaknesses in operator fundamentals. These weaknesses can then be addressed to improve performance. Periodic reassessment will help the station determine the status of operator fundamentals, have they declined, improved or remained static. The entire organization should be proactive in identifying weaknesses in operator fundamentals and quickly reporting them. Following identification of a weakness, personnel should feel ownership for the timely resolution of the issue and not rely solely on processes or programs to eventually correct the weakness. Personnel should be encouraged to elevate issues to senior management without fear of retribution, particularly when they believe that corrective action processes are not satisfactorily addressing the issue.

Special Considerations for Reviews

- Review the station corrective action plans to ensure that they contain improvements for operator fundamentals.
- Review the station's self-assessment plan(s) to ensure that they are sufficiently broad in scope to address operator fundamentals and that personnel conducting the self-assessment have the requisite experience. Consider the following:
    - Plan includes use of a self-assessment guide, such as 'Self-Assessment Guide: Assessing Training Effectiveness in Addressing Operator Fundamentals', May 2011.
    - Expertise of the individuals conducting the assessment is sufficiently broad to allow them to effectively evaluate operator fundamentals.
    - The assessment should include some participation from outside the station and company to gain industry perspective.
- Review self-assessment reports and results to determine the effectiveness of the assessment. Review them for the following:
    - Have the results been reviewed by senior plant and executive managers?
    - Have strengths and weaknesses been clearly identified?
    - Have the weaknesses been documented in corrective actions and the appropriate priority assigned for resolution?
    - Are corrective actions defined and assigned to an individual with a due date?
    - Are corrective actions on track for completion?
    - Have the self-assessment results been clearly communicated to the station staff?
- Interview managers and workers to determine if the strengths and weaknesses identified by self-assessments appear to be accurate.
- Review the station's self-assessment guidance document and plans for future assessments to determine if on-going self-assessments incorporate similar objectives.

- Review the station's and section's performance indicators to determine if operator fundaments is considered when evaluating plant performance.

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