

Problem Identification and Resolution

The NIST Center for Neutron Research's (NCNR) approach to problem identification and resolution closely tracks the Institute of Nuclear Power Operations (INPO) publication 12-012, *Traits of a Healthy Nuclear Safety Culture*, and the four attributes: identification, evaluation, resolution, and trending.

Identification and Evaluation

Problems are identified by individuals and reported and documented by several means. Each of the mechanisms of reporting given below has methods of evaluation, classification, and prioritization. As part of the corrective actions from the February 3 event, NCNR management is refocusing attention on problem identification and resolution and is encouraging extensive staff involvement and ownership of these systems and holding them accountable for their use as follows:

Trouble Tickets (TTs). Trouble Tickets are the most widely used mechanism for employees to report issues and are used primarily to report items or procedures in need of repair or readjustment. This system allows reporting in categories such as equipment, procedure or program deficiencies, safety, instrumentation and controls, material conditions, and opportunities for improvement. Anyone at NCNR can open a TT, although the system is primarily used by Reactor Operations and Engineering (ROE) staff members and Health Physicists (HP). Once a TT is opened, it is assigned an owner, who will assign a priority to it, from low to critical. Both the owner and priority can be changed by the owner or by management. The owner of the TT is responsible for appropriate and timely resolution and accountable to their supervisor. Corrective actions from the February 3 event include developing and implementing a change management program and enhancing the Aging Reactor Management program. One of the primary duties of the Aging Reactor Manager will be to closely track TTs through completion and close-out, investigate root causes and extent of conditions, report periodically to ROE leadership on the status of open tickets, and periodically provide measures of the effectiveness of the ARM program to ROE leadership.

Engineering Change Requests. Any issue that could involve an engineering change is routed through the Engineering Change Request (ECR) protocol. If the ECR is approved for further investigation, an Engineering Change Notice (ECN) is issued, to provide for engineering evaluations. ECNs are classified according to function and require CROE and NCNR Director approval if elevated to a higher level (Level II) as determined by the CRO or CRE. Resources for resolution of ECRs are allocated according to priority established by the CROE in consultation with the CRO and CRE.

Corrective Action Program (CAP). The Corrective Action Program, described in Administrative Rule (AR) 20.0, was initially implemented in late 2019, primarily to address problems related to reactor safety and reliability, potential regulatory non-compliance, and security. As this program is still in its nascent stages, NCNR management is directing a team of ROE staff members to revise it to clarify its use in conjunction with the programs above and to better assure adequate reporting, prioritization, and tracking of all items. This will include having a low threshold for issuing a Corrective Action Report (CAR). The Aging Reactor Manager will be tasked with tracking the CAP and elevating any issues as appropriate.

System Review Teams. Every major reactor system has an assigned System Review Team (SRT), consisting of operators and engineers that periodically review the status of that system with an

overarching goal of continuous improvement. Leadership of an SRT is assigned by the ARM manager or CRO and is typically given to reactor supervisors or engineering experts in the system. Biannual system health reports are submitted to ROE management. As part of system improvements being implemented in FY22, the SRTs are being reworked to make them more task-oriented and to better clarify resource allocation according to need. In addition to the normal methods of problem reporting, members of the SRT are encouraged to add additional problem identifications by instituting a TT, ECR, or CAR, as appropriate.

Resolution and Trending

All the above mechanisms undergo periodic reviews by the CRO, CRE, and CROE. FY22 improvements will also include reinstating biweekly meetings (temporarily halted due to the event) to review the status of all ECNs, TTs, and CARs. ROE management will evaluate the items and hold personnel accountable in assuring, timeliness in closing and effectiveness in addressing the problem and any extent of conditions. All systems, including the CAP, will be revised to include a review to assess if the corrective actions address the problem identified and would serve to prevent recurrence. A key part of these evaluations will be development of accurate indicators of overall trending, synthesized across systems. The Aging Reactor Manager may convene teams to perform further investigations as necessary on any system or issue that has been identified.

One of the findings of the root cause evaluations is the improvement of communications between Operations and Engineering (MS-CA-4, MS-SPI-3, and MS-SPI-4) The CROE will ensure that a key part of the roles of the CRO, CRE, and ARM manager are to strengthen collaborative interactions between Operations, Engineering, and ARM, that systems modified as described above reflect this need, and that all parties within each group are actively engaged in problem resolution.