

Reactor Oversight Process Enhancement Project

Baseline Inspection Program

Inspection Area – Maintenance

Background

Inspection Procedures (IPs) Reviewed:

- IP 71111.04, Equipment Alignment
- IP 71111.12, Maintenance Effectiveness
- IP 71111.13, Maintenance Risk Assessments and Emergent Work Control
- IP 71111.19, Post-Maintenance Testing
- IP 71111.22, Surveillance Testing

Other Material Reviewed:

- Near Term Task Force Report
- Inspection Manual Chapter (IMC) 0308, "Reactor Oversight Process (ROP) Basis Document"
- IMC 2515, "Light-Water Reactor Inspection Program-Operations Phase"
- 2004 Office of Inspector General Audit of Baseline Inspection Program
- Comments and Slides presented at July 17, 2013, public meeting
- Inspector input
- ROP Feedback Forms for IPs 71111.04, 71111.12, 71111.13, 71111.19, 71111.22 (open and closed)
- Most recent Inspection procedure analyses for IPs 71111.04, 71111.12, 71111.13, 71111.19, 71111.22 by IP owners

Analysis

The ROP removed emphasis on the observation of maintenance in progress based on risk assumptions that should be revisited. Inspection experience has shown that post-maintenance testing does not identify all problems, and some maintenance errors are subsequently repeated. There may be value in including inspection samples for work in progress.

There is an opportunity to expand the existing maintenance inspections to include a broader portion of the overall maintenance process by adding:

- Vertical slice maintenance inspection samples that utilize the existing maintenance IPs
- Inspections of the commercial dedication process and licensee control of quality parts
- Quality control process verifications

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Enclosure 3

There are opportunities to make improvements that:

- Provide increased focus on field observations of maintenance activities
- Utilize more operating experience in the sample selection process
- Expand surveillance observations to specifically include condition monitoring and aging management program implementation in order to address equipment aging
- Provide Problem Identification and Resolution (PI&R) inspection guidance that is relevant to the specific IP subject
- Provide additional information and technical guidance to selected IPs used by generalist inspectors

Recommendations

(Note: Recommendations in this subject area will require additional development before they can be implemented.)

1. Institute one to two vertical slice reviews per year that inspects an on-line maintenance activity from beginning to end for a risk-significant system (or group of systems). This will allow:
 - performance-based assessment of how the different parts of the maintenance process work together
 - improved efficiency by performing multiple samples from the maintenance inspection procedures during a single maintenance activity
 - enhance the ability to meet the existing goal of assessing maintenance work practices by adding samples involving work in progress

This is expected to involve approximately one sample from each of the maintenance IPs (approximately 28.5 hours per vertical slice), crediting the existing samples assigned with no increase in resources.

This change affects:

- IP 71111.04, Equipment Alignment
 - IP 71111.12, Maintenance Effectiveness
 - IP 71111.13, Maintenance Risk Assessments and Emergent Work Control
 - IP 71111.19, Post-Maintenance Testing
 - IP 71111.22, Surveillance Testing
2. Introduce operating experience samples into applicable maintenance inspection procedures, including aging issues.
 - a. Incorporate Operating Experience Updates as discussed in Enclosure 15.
 - b. Modify the maintenance IPs to utilize operating experience samples based on information provided in the Operating Experience Updates associated with each IP (discussed in more detail in Enclosure 15), licensee internal operating experience, or other existing resources.

The following IPs are recommended for early targeting in the development of the new Operating Experience Updates:

- IP 71111.12, Maintenance Effectiveness
- IP 71111.22, Surveillance Testing

3. Provide specific guidance for performing PI&R reviews in each procedure.

For example, in IP 71111.22:

- a. Perform a review of licensee actions to address measuring and test equipment (M&TE) that fails calibration. Verify that the licensee tracks which surveillance tests used each piece of M&TE, and compares the failed M&TE calibration information to each surveillance test that used that M&TE, then assesses the impact to the operability of the associated system.
- b. Review samples or the condition reporting data base to verify that the licensee is implementing increased frequency testing in accordance with the American Society of Mechanical Engineers (ASME) Code or other requirements when degraded performance is indicated during in-service testing.

IP 71111.04, Equipment Alignment

Background

No additional background.

Analysis

The current scope of IP 71111.04 is suitably performance-based and results in appropriate field inspection. The existing inspection requirement guidance could be enhanced to further improve the results.

The existing IP guidance has limited applicability to the Initiating Events Cornerstone, which should be improved.

Flexibility in conducting inspection samples could be improved by removing quarterly and semi-annual sample requirements and making it an annual sample target (same number of samples over a one year period).

Recommendations

1. Change Objective: Verify that systems removed from service have been appropriately isolated such that it does not impact the performance of other safety trains that were credited as remaining operable. Improve flexibility by specifying sample completion on an annual basis, rather than a quarterly and semi-annual basis.

Change Description:

- a. Require the performance of two to four samples per year on equipment that is currently out of service for maintenance or testing. Provide inspection guidance to review the tagout documentation and verify that the system configuration matches the tagout, and to verify that trains credited as being operable were not rendered inoperable or degraded by the actual alignment. This should include a walkdown of the work to ensure that temporary services, blocked doors, or disassembled components do not have an adverse affect on systems that are required to remain operable during the intended work. This should include consideration of boundaries or features intended to mitigate initiating events that impact areas, such as high-energy line breaks, flooding, fire, and security.
 - b. Revise the level of effort statement to remove reference to quarterly and semi-annual samples and replace with the equivalent number of annual samples.
 - c. Add detail to existing guidance for walkdowns to include the use of system operating procedures' valve, switch, and breaker lineups; piping and instrument diagrams; isometric drawings; and other useful documents. Verify that the documents reflect the correct nomenclature and match plant labeling.
2. Change Objective: Institute a vertical slice review of an on-line maintenance activity for a risk-significant system (or group of systems). This will allow a performance-based assessment of whether the different parts of the maintenance process work together effectively. This will also result in a more detailed understanding of the process compared to the current baseline method of observing samples of isolated portions of the maintenance process. It will also improve efficiency because multiple samples would be credited by reviewing different aspects of a single work activity. This change also enhances the existing goal of assessing maintenance work practices, which currently contains no specific guidance, to add samples involving work in progress.

Procedures to be Revised: IP 71111.04, Equipment Alignment
 IP 71111.12, Maintenance Effectiveness
 IP 71111.13, Maintenance Risk Assessments and
 Emergent Work Control
 IP 71111.19, Post-Maintenance Testing
 IP 71111.22, Surveillance Testing

Change Description: Perform maintenance vertical slice reviews of one to two on-line maintenance activities per year for a safety-significant system (or group of systems if scheduled in the same work window) by performing samples from multiple inspection procedures in a focused manner. This would be expected to involve one sample from each of five maintenance IPs using the applicable hours for each sample from the associated IP (about 28.2 total inspection hours). Inspectors would follow a work window through portions of the planning, implementation, and closeout stages.

IP 71111.12, Maintenance Effectiveness

Background

The current IP 71111.12 started as a review of completed Maintenance Rule evaluations. The scope was later broadened to include a review of work practices. However, the change did not create sample requirements that matched this broader scope. The scope remains primarily focused on Maintenance Rule failure evaluations and does not include guidance to perform routine observations of work in progress.

Analysis

The current scope and focus of IP 71111.12 was based on original ROP assumptions that inspection resources should be assigned to risk assessments and post-maintenance testing, since findings associated with out of service equipment would have no safety significance. However, operating experience has shown that errors introduced during maintenance activities have resulted in latent equipment issues that have existed for some time. Errors identified during in-progress maintenance activities could be assessed to determine if similar errors impact other systems that are in service. Therefore, it is recommended to revise this IP to make it more performance-based by introducing a mechanism to perform inspections of work in progress.

The current approach to inspecting maintenance activities involves inspecting selected portions of an overall complex set of processes. These inspections may occur during unrelated maintenance activities and may limit the inspectors' ability to assess overall maintenance processes and programs. It is possible to combine the current process with limited vertical slice samples to improve the ability to perform assessments and to make the inspections more performance-based and involve more field observations.

Operating experience points to weakening program performance in the control of quality parts and commercial dedication of parts for safety applications. This area has not been a topic of routine inspection for a long time, and should be reintroduced as part of maintenance observations. The PI&R inspection sample that is included in this IP has no specific guidance. IP 71111.12 is ideally suited to multiple forms of trend reviews. Specific guidance should be developed to help focus this part of the IP.

Recommendations

3. Change Objective: Institute a vertical slice review of an on-line maintenance activity for a risk-significant system (or group of systems). This will allow a performance-based assessment of whether the different aspects of the maintenance process work together effectively. This will also result in a more detailed understanding of the process compared to the current baseline method of observing samples of isolated portions of the maintenance process. It will also improve efficiency because multiple samples would be credited by reviewing different aspects of a single work activity. This change also enhances the existing goal of assessing maintenance work practices by adding inspection samples involving work in progress.

Procedures to be Revised: IP 71111.04, Equipment Alignment
 IP 71111.12, Maintenance Effectiveness
 IP 71111.13, Maintenance Risk Assessments and
 Emergent Work Control
 IP 71111.19, Post-Maintenance Testing
 IP 71111.22, Surveillance Testing

Change Description: Perform maintenance vertical slice reviews of one to two on-line maintenance activities per year for a safety-significant system (or group of systems if scheduled in the same work window) by performing samples from multiple inspection procedures in a focused manner. This would be expected to involve one sample from each of five maintenance inspection procedures using the applicable hours for each sample from the associated inspection procedure (about 28.2 total inspection hours). Inspectors would follow a work window through portions of the planning, implementation, and closeout stages.

4. Change Objective: Introduce a performance-based review of the implementation of quality processes during maintenance activities. This includes quality control hold points, commercial grade dedication for parts installed in quality applications, control of quality parts, and control of consumable material.

Change Description: Modify IP 71111.12 to specify completing one to two samples per year reviewing quality control. Samples in this area would involve one or more of the following: (1) reviewing parts installed in safety-significant systems that were purchased as commercial grade parts but were dedicated prior to installation in a quality grade application. The procedure change would include referring to IP 43004, "Inspection of Commercial Grade Dedication;" (2) control of quality parts during the maintenance process, including consumable items (lubricants, cleaners, sealants, etc.). This review should be performed during any field observation of maintenance; (3) quality control verifications are properly specified in accordance with the Quality Assurance Program, and are implemented as specified. This last type of sample would include review of multiple work packages.

5. Change Objective: Provide better guidance for performing PI&R inspection samples.

Change Description: All IPs currently allot a nominal 15 percent of the assigned hours to perform a PI&R review in the specific area of the IP. This resource allocation in most cases does not result in specific documentation of the effort or results, and may limit our ability to determine the effectiveness of the resource utilization. Additionally, most IPs lack specific guidance or examples to help focus this review. The following examples are used to illustrate ways to provide better guidance:

Modify IP 71111.12 to add guidance for performing the following types of reviews (not specific required samples):

- Perform a review of licensee actions to address M&TE that fails calibration. Verify that the licensee tracks which surveillance tests used each piece of M&TE, and compares the failed M&TE calibration information to each surveillance test

that used that M&TE, then assesses the impact to the operability of the associated system.

- For the sample selected, review the maintenance history for indications of repetitive failures, excessive instrument drift, etc. Assess whether the maintenance has been addressing symptoms while missing the real causes. Assess whether the repeat nature of the failure is indicative of greater safety significance.
 - For the sample selected, assess whether the licensee adequately addressed the extent of condition and extent of cause.
6. Change Objective: Introduce operating experience samples into applicable maintenance inspection procedures, including aging issues as discussed in the opening Recommendations section.

Procedures to be Revised: IP 71111.12, Maintenance Effectiveness
IP 17777.22, Surveillance Testing

IP 71111.13, Maintenance Risk Assessment and Emergent Work Control

Background

No additional background.

Analysis

The current scope of IP 71111.13 is performance-based, but is not currently focused on field observations. The existing inspection requirement guidance could be enhanced to further improve the results. In particular, verification of risk management actions over the course of the work should be specified, as well as looking at work implementation to identify unexpected risk caused by the actual work.

The existing IP guidance has limited applicability to the Initiating Events Cornerstone, which should be addressed. The existing IP guidance focuses exclusively on work that is part of the plant's work management process, whether planned or emergent in nature. It does not include other activities outside the plant's work management process that may create plant risk. For example, work in the switchyard or crane lifts and construction activities in the vicinity of equipment that can create an initiating event can occur outside the plant's work management process. It is recommended that the IP should provide guidance for identifying these activities during plant status activities, and documenting them collectively as a single sample each quarter.

Recommendations

7. Change Objective. Revise Maintenance Risk Assessment and Emergent Work Control inspection guidance to include expectations for performing field verifications of risk management actions. Add one sample each quarter to document the observation of field work to ensure that the risk assessment scope and assumptions were valid, and

that work practices do not introduce additional risk elements over the course of the quarter. Additionally, add guidance to specifically look for activities (whether considered by the licensee to be maintenance or not) that may affect plant risk due to their physical proximity or plant implications (e.g., divers, trucks in the switchyard, unusual vehicle traffic or lifting near important plant equipment, spent fuel cask transfers).

Change Description:

- a. Remove guidance that states that this IP only applies to equipment configuration changes for maintenance, and not other reasons. Any configuration change that could affect risk, whether intended or not, can be considered.
 - b. Remove the statement that it is not within the scope of this IP to routinely observe maintenance in progress. Replace with guidance that this IP should be implemented in conjunction with IMC 2515, Appendix D, "Plant Status." During routine plant tours and plant status assessments, inspectors should look for potential activities that may create plant risk that may not have been fully evaluated. While this activity should be performed continuously, document one sample per quarter for the general review effort. The resource estimate should state that the resources for the quarterly verification of work activities are shared with resources applied to "Plant Status."
 - c. Add guidance to verify that risk management actions are effectively implemented in the plant, and remain implemented over the course of the period intended. Verify by walkdowns that work activities do not introduce new risk, such as breaching fire, flooding or security barriers, blocking sprinklers, fire hose stations or security response equipment, or introduce temporary services that create flooding hazards or violate electrical separation, etc.
 - d. Consider removing or significantly simplifying the 15 page appendix.
8. Change Objective: Institute a vertical slice review of an on-line maintenance activity for a risk-significant system (or group of systems). This will allow a performance-based assessment of whether the different aspects of the maintenance process work together effectively. This will also result in a more detailed understanding of the process compared to the current baseline method of observing samples of isolated portions of the maintenance process. It will also improve efficiency because multiple samples would be credited by reviewing different aspects of a single work activity. This change also enhances the existing goal of assessing maintenance work practices by adding inspection samples involving work in progress.

Procedures to be Revised:

- IP 71111.04, Equipment Alignment
- IP 71111.12, Maintenance Effectiveness
- IP 71111.13, Maintenance Risk Assessments and
Emergent Work Control
- IP 71111.19, Post-Maintenance Testing
- IP 71111.22, Surveillance Testing

Change Description: Perform maintenance vertical slice reviews of one to two on-line maintenance activities per year for a safety-significant system (or group of systems if scheduled in the same work window) by performing samples from multiple inspection procedures in a focused manner. This would be expected to involve one sample from each of five maintenance inspection procedures using the applicable hours for each sample from the associated inspection procedure (about 28.5 total inspection hours). Inspectors would follow a work window through portions of the planning, implementation, and closeout stages.

IP 71111.19, Post-Maintenance Testing

Background

No additional background.

Analysis

The current scope of IP 71111.19 is performance-based, but is not currently focused on field observations. The existing inspection is frequently performed as a document review after maintenance and testing are complete. The guidance provided is limited for such a broad subject.

The inspection guidance currently focuses on the Post-Maintenance Testing (PMT) as a function of the planned work scope, without consideration of unintended consequences of work activities, or changes in work scope. Guidance should be added to evaluate for the potential impact of these situations to the PMT scope to verify that the PMT is adequate.

The existing guidance does not recognize that some licensees use a different strategy for performing PMTs at the completion of outages. Typically during online maintenance, work packages are not complete until the PMT is satisfactorily completed. However, during an outage, some licensees close the work documents for non-safety packages when work is complete, then perform the PMTs that credit generic PMT activities toward multiple work packages by doing such things as (1) crediting system startup procedures for system functional tests, (2) doing operational leak checks during large area walkdowns. If a problem is encountered, a new work package is opened, so rework is not always properly tracked. When inspectors recognize that a licensee is closing work packages before completing a PMT, guidance should direct selecting some PMT samples that were treated in this manner. IP 71111.19 should provide specific guidance for selecting PMT samples for equipment within the Maintenance Rule Program or that represent possible trip initiators when licensees utilize such a post-outage PMT strategy.

The most recent inspection procedure analysis shows that 15 percent of findings documented under this IP were in the Initiating Events Cornerstone. IP 71111.19 does not list the Initiating Events Cornerstone as one of the cornerstones covered. There is an opportunity to improve this IP by including the Initiating Events Cornerstone and adding guidance to incorporate this into the inspection scope.

The number of samples appears to be appropriate and allows sufficient flexibility.

Recommendations

9. Change Objective: Provide better guidance for the scope and detail of post-maintenance testing inspections. Also, add guidance for reviewing post-maintenance testing at the conclusion of plant outages, since this may be handled in a different manner than online PMTs.

Procedure to be Revised: IP 71111.19, PMT

Change Description. Add more detailed guidance, such as:

- a. Reinforce the expectation that samples should be performed by field observation, not just as a record review.
 - b. The scope statement should be expanded to include verification that the PMT was sufficient to demonstrate all required safety functions that could have been affected by the maintenance activity are operable. The PMT scope should include consideration of changes to the work scope and possible problems that occurred as a result of the work. System-level functional testing is more likely to identify problems than more limited checks.
 - c. The inspection guidance should be expanded to review the full scope of the work actually performed by reviewing the work order. If the work scope was modified, ensure that the PMT scope was reevaluated by the licensee.
 - d. Verify by walkdown that temporary equipment, such as jumpers, were removed, and that enclosures, seals, and protective features were restored, and that tools, rags and other work implements were removed.
 - e. Verify by reviewing the completed work document that Quality Control hold points were properly implemented, and that second check verifications were performed and documented properly. These quality checks are analogous to the PMT, except that they check quality attributes that cannot be verified later.
 - f. Verify that the licensee appropriately documented start and stop times for functionality and operability for the Maintenance Rule Program.
 - g. Add a new section describing the type of PMT reviews to perform at the conclusion of plant outages. Determine if the licensee closes work packages (most likely non-safety work) before performing PMTs. If so, select samples that represent equipment within the Maintenance Rule Program and possible trip initiators (or triggers for other initiating events) to review the adequacy of the PMT.
10. Change Objective: Institute a vertical slice review of an on-line maintenance activity for a risk-significant system (or group of systems). This will allow a performance-based assessment of whether the different aspects of the maintenance process work together effectively. This will also result in a more detailed understanding of the process compared to the current baseline method of observing samples of isolated portions of

the maintenance process. It will also improve efficiency because multiple samples would be credited by reviewing different aspects of a single work activity. This change also enhances the existing goal of assessing maintenance work practices by adding inspection samples involving work in progress.

Procedures to be Revised: IP 71111.04, Equipment Alignment
 IP 71111.12, Maintenance Effectiveness
 IP 71111.13, Maintenance Risk Assessments and
 Emergent Work Control
 IP 71111.19, Post-Maintenance Testing
 IP 71111.22, Surveillance Testing

Change Description: Perform maintenance vertical slice reviews of 1 to 2 on-line maintenance activities per year for a safety-significant system (or group of systems if scheduled in the same work window) by performing samples from multiple inspection procedures in a focused manner. This would be expected to involve 1 sample from each of 5 maintenance inspection procedures using the applicable hours for each sample from the associated inspection procedure (about 28.2 total inspection hours). Inspectors would follow a work window through portions of the planning, implementation, and closeout stages.

IP 71111.22, Surveillance Testing

Background

No additional background.

Analysis

The current scope of IP 71111.22 is appropriately performance-based. However, the current IP also allows the sample requirements to be met with a review of the test data, which would eliminate the ability to review most of the attributes listed in the inspection activity. Ideally, this IP should always involve performance-based field observations, followed by verification of the surveillance requirement bases and the verification that the proper demonstration of performance supports operability.

The current IP could be improved by expanding the review to place the sample test into context with the regulatory and design requirements it is intended to demonstrate. Performing more detailed reviews, with a fewer number of samples required, would provide an improved level of inspection.

This inspection procedure currently contains limited planning and inspection guidance. The inspection guidance is limited to the selection samples, rather than helping to focus the inspection on specific elements that ensure the testing represents proper equipment performance and that the licensee selected the proper test method and acceptance criteria. There may be a benefit to adding technical guidance for different categories of testing which have unique elements to consider during an inspection. Specific guidance for sample selections during outages should be provided.

The current inspection procedure contains guidance that focuses on tests. However, licensees will increasingly rely on condition monitoring and other inspections that relate to aging management programs and the Maintenance Rule. The inspection guidance and scope should specifically include inspections of condition monitoring and aging management program implementation.

The sample requirement to review reactor coolant leakage monitoring is redundant with other requirements (IP 71152 and IMC 2515, Appendix D, Attachment 1). IP 71111.22 should be modified to require documenting a Reactor Coolant System leakage monitoring sample only if the licensee enters elevated action levels due to increased leakage; otherwise, the other requirements will ensure this function is reviewed regularly.

Recommendations

11. Change Objective: Perform more detailed surveillance reviews and simplify sample requirements. Expand the scope to include verifying that applicable portions of the design basis are being met by the surveillance test. Expand sample lists to include aging management program inspections and condition monitoring inspections. Eliminate the specific sample goals for the different types of samples due to the growing list of sample type, and replace it with guidance to select a wide variety of surveillance activities over the course of the year. Improve the level of detail in the inspection guidance.

Change Description:

Modify the inspection procedure as follows:

- a. Increase the hours per sample by reducing the number of required samples. Recommend changing the range from the current 18 to 26 samples to 15 to 24 samples.
- b. Modify the guidance allowing for review of test data alone, and specify that witnessing the surveillance testing is normally expected.
- c. Eliminate the specific sample goals for in-service testing, containment isolation valve testing, and reactor coolant leakage testing. Replace this with guidance to ensure that a wide variety of surveillance tests should be selected from a list that covers the Mitigating Systems and Barrier Integrity Cornerstones, as well as observing the performance of different work groups.
- d. Provide inspection guidance to review the basis for the surveillance (Technical Specification Bases, Updated Final Safety Analysis Report), and the technical bases for the acceptance criteria (design bases, setpoint calculations, Technical Specification Bases, etc.) to verify that the test procedure correctly reflects these requirements.
- e. Review the performance trend for the last several completed tests. Verify that trends are appropriately documented and addressed. If testing indicates excessive setpoint drift, verify that the licensee evaluated detector replacement

and/or increased frequency testing. For performance test results that demonstrate degradation, verify that the licensee appropriately implements increased frequency testing.

- f. For cases where the licensee credits multiple surveillance tests to satisfy a surveillance requirement (i.e., piece-wise testing), verify by document review that the collection of the surveillance test procedures accomplish the entire scope of the surveillance requirement.
- g. For local leak rate testing, verify that inside and outside containment isolation valves are each tested with pressure in the correct direction for expected accident conditions. Verify that the licensee updates the total containment leak rate data with the new measured value, and that the overall leak rate is still within program limits. Verify that the licensee schedules the valve for maintenance if administrative limits are exceeded. Verify that the penetration is declared inoperable if acceptance criteria are exceeded.
- h. For motor operated valve testing, verify that the licensee is meeting their commitments made in their Generic Letter 89-10, "Availability of Program Descriptions" program, including verifying stroke time, stem factor, developed torque, and torque switch settings. Verify that testing is performed under conditions that closely simulate accident conditions.
- i. For pump in-service tests, verify that the licensee established system operating conditions that reflect limiting operational conditions, and are sufficiently repeatable to allow performance trending. Review sufficient test performance history to verify that there is not a degrading trend. Verify that the current acceptance criteria match the most recent reference test data.
- j. Expand the review of the measuring and test equipment used to assess whether specified instruments are part of the measuring and test equipment program, are in calibration, and are appropriate for the selected activity (e.g. instrument accuracy). Review the applicable setpoint calculation to obtain information about setpoint, required test accuracy, test frequency, and allowable setpoint drift.
- k. Provide guidance that during plant outages, sample selection should focus on infrequent surveillance tests, particularly large-scale actuation tests and full-flow engineered safety features pump testing, as well as inspections of normally inaccessible structures, systems, and components (e.g., containment sump inspections, refueling water storage tank or condensate storage tank internal inspections).
- l. Add guidance that specifically includes observation of aging monitoring program activities for plants that have received a renewed license (to start upon approval, as many of the important activities take place before the original license expires). This should be performed by reviewing the commitments made during the license renewal application.

- m. Revise the guidance to credit performance of surveillance sample for reactor coolant system leakage only if leakage has reached an increased action level. Otherwise, leakage monitoring is performed as part of plant status reviews specified in MC 2515 Appendix D. The guidance should specifically require evaluation of whether the licensee made a reasonable attempt to rule out pressure boundary leakage.
12. Change Objective: Introduce operating experience samples into applicable maintenance inspection procedures, including aging issues as discussed in the opening Recommendations section.

Procedures to be Revised: IP 71111.12, Maintenance Effectiveness
IP 71111.22, Surveillance Testing

13. Change Objective: Provide better guidance for performing PI&R inspection samples.

Change Description: All IPs currently allot a nominal 15 percent of the assigned hours to perform a PI&R review in the specific area of the IP. This resource allocation in most cases does not result in specific documentation of the effort or results, and may limit our ability to determine the effectiveness of the resource utilization. Additionally, most IPs lack specific guidance or examples to help focus this review. The following examples are used to illustrate ways to provide better guidance:

- Perform a review of licensee actions to address M&TE that fails calibration. Verify that the licensee tracks which surveillance tests used each piece of M&TE, and compares the failed M&TE calibration information to each surveillance test that used that M&TE, then assesses the impact to the operability of the associated system.
- Review samples or condition reporting data base to verify that the licensee is implementing increased frequency testing in accordance with the ASME Code or other requirements when degraded performance is indicated during in-service testing.

14. Change Objective: Institute a vertical slice review of an on-line maintenance activity for a risk-significant system (or group of systems). This will allow a performance-based assessment of whether the different aspects of the maintenance process work together effectively. This will also result in a more detailed understanding of the process compared to the current baseline method of observing samples of isolated portions of the maintenance process. It will also improve efficiency because multiple samples would be credited by reviewing different aspects of a single work activity. This change also enhances the existing goal of assessing maintenance work practices by adding inspection samples involving work in progress.

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