Enclosure 2
Meeting Summary Handouts
of the September 21, 2011
ROP Public Meeting
Dated October 13, 2011

REACTOR OVERSIGHT PROCESS (ROP)
MONTHLY PUBLIC MEETING AGENDA

September 21, 2011; 9:00 AM – 2:00 PM; The Legacy Hotel in the Salon I, 1775 Rockville Pike, Rockville, MD 20851

9:00 – 9:10 AM	Introduction and Purpose of Meeting
9:10 – 9:25 AM	Operating Experience Branch Topics 1. General operating experience topics of interest 2. Discussion of recent staff study on Ineffective Use of Vendor Technical Recommendations 3. Opportunity for public comment
9:25 – 9:40 AM	Inspection Branch Topics 1. General inspection topics of interest 2. Opportunity for public comment
9:40 – 10:15 AM	Performance Assessment Branch Topics 1. General assessment topics of interest 2. SDP Phase 2 Pilot and Implementation 3. Security Reintegration 4. Opportunity for public comment
10:15 – 11:00 AM	Discussion of Performance Indicator (PI) Topics 1. MSPI topics 2. Opportunity for public comment
11:00 – 11:30 AM	Lunch
11:30 – 2:15 PM	Discussion of Open and New PI Frequently Asked Questions (FAQs) *Note: Topic may be moved up if meeting is ahead of schedule. The latest draft FAQs is located on the public web at: http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/draft_faqs.pdf. This list is subject to change the day before the meeting based on availability of new draft FAQs provided by the Nuclear Energy Institute. Public comments will be addressed on FAQs following the discussion.*
2:15 – 2:30 PM	Future Meeting Dates, Action Items, Future Agenda Topics

Breaks will be taken as needed

REVIEW OF THE IMPLEMENTATION OF THE INDUSTRY INITIATIVE TO CONTROL DEGRADATION OF UNDERGROUND PIPING AND TANKS

CORNERSTONE: INITIATING EVENTS, MITIGATING SYSTEMS AND PUBLIC RADIATION SAFETY

APPLICABILITY: This temporary instruction (TI) applies to all holders of operating licenses for nuclear power reactors, except plants that have permanently ceased operations.

2515/182-01 OBJECTIVES

The objective of this TI is to determine whether licensees are implementing the industry initiative on underground piping and tank integrity and to gather information that will enable the staff of the U.S. Nuclear Regulatory Commission (NRC) to assess whether the initiative provides reasonable assurance of the structural and leakage integrity of buried piping and underground piping and tanks. The information collected using this TI will be used to determine the extent of the industry's implementation of the voluntary initiative and to aid in evaluating whether additional NRC regulatory actions are warranted.

2515/182-02 BACKGROUND

Leakage from buried and underground pipes caused by corrosion has resulted in recent ground water contamination incidents. Some of these leaks resulted in ground water contamination incidents with associated heightened NRC and public interest. The NRC conducted inspections using TI 2515/173, "Review of the Implementation of the Industry Ground Water Protection Voluntary Initiative" to assess licensee response to these incidents and determine the extent of the industry's voluntary ground water protection initiative. Subsequently, the industry communicated its plan to address buried piping integrity in its November 2009 letter "Industry Initiative on Buried Piping Integrity" (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML093350034 and ML093350035). The scope of this first underground piping initiative only addressed piping that was buried and in direct contact with soil or concrete. However, because operating experience which revealed that leakage of tritiated water

from underground piping in vaults or chases (but not in contact with soil) could also lead to ground water contamination, the industry expanded the scope of its first initiative to include underground piping not in direct contact with the soil and selected underground tanks. Its September 2010 letter "Industry Initiative on Underground Piping and Tanks Integrity" (ADAMS Accession No. ML102730367) describes its revised commitments. This second initiative contains all of the requirements and objectives from the first initiative but adds underground piping and tanks that are outside of a building and below grade (whether or not they are in direct contact with the soil) if they are safety-related or contain licensed material or are known to be contaminated with licensed material. Also, an owner's piping located outside the owner controlled area is considered to be within the scope of the underground piping and tanks integrity initiative if it is safety-related or contains licensed material.

The industry issued a guidance document, Nuclear Energy Institute (NEI) 09-14, "Guideline for the Management of Buried Piping Integrity" (ADAMS Accession No. ML1030901420) to describe a licensee's goals and required actions (commitments made by the licensee) resulting from this underground piping and tank initiative. NEI later issued NEI 09-14, Revision 1, "Guidance for the Management of Underground Piping and Tank Integrity," on December 31, 2010 (ADAMS Accession No. ML110700122). An Electric Power Research Institute (EPRI) document "Recommendations for an Effective Program to Control the Degradation of Buried and Underground Piping and Tanks" (ADAMS Accession No. ML11075A011) provides additional details on the buried pipe and tank initiative elements and attributes to incorporate into a licensee's buried pipes and tanks program. This TI derives some of the inspection attributes from this EPRI guidance document. Under the underground piping and tanks Integrity Initiative, each site is to develop and implement either site-specific or company program for buried piping and underground piping and tanks.

This purpose of this TI is to gather information related to the industry's implementation of the underground piping and tank integrity initiative. Because the TI has a duration that is shorter than the initiative, not all aspects of the initiative will be inspected at this time. In the future the staff may decide to create an additional TI to address longer term actions.

2515/182-03 INSPECTION REQUIREMENTS AND GUIDANCE

General Guidance:

The NRC inspection staff shall assess whether the licensee has successfully completed the commitments described in NEI 09-14. Section 3.3, "Initiative Actions" of NEI 09-14, Revision 1, discusses specific actions to successfully comply with the Underground Piping and Tank Integrity Initiative (Note: These are not regulatory commitments as defined in NRC RIS 2000-17 and NEI 99-04).

This TI is to be completed in two phases. In phase one, inspectors should familiarize themselves with the licensee programs being developed in order to comply with their commitments made in NEI 09-14 and as described in sections 03.01 through 03.03 of this TI. Inspection verification during phase one will be to identify and document in an inspection report any deviations taken by the licensee to the industry commitments described in "Initiative Actions" of NEI 09-14. Phase I should be completed by June 30, 2013.

In phase two, inspectors should verify that the licensees plan to comply or have complied with all parts of the "Initiative Actions (Section 3.3A and B of NEI 09-14 revision 1)." Additionally, in phase two, inspectors should document selected information gathered during the inspection by reporting the information to Robert.Hardies@nrc.gov. Phase two should be completed by June 30, 2014.

03.01 Review of Licensee's Procedures and Oversight. The inspector should review the licensee's programs and procedure for the following.

a. Original Buried Piping Integrity Initiative.

   Although the specific elements detailed below for the buried piping integrity program and implementing procedures are not commitments made by the industry, a successful program should contain many or all of these elements and are recommended by EPRI in its document "Recommendations for an Effective Program to Control the Degradation of Buried Pipe" (EPRI guidance document).

   1. Did the licensee approve and issue buried piping integrity program documents and implementing procedures by June 30, 2010?

   2. Has the licensee taken any deviations to initiative actions? If so, what is the basis for these deviations?

   3. Does the licensee's buried pipe integrity program contain the following elements?

      (a) objectives for safe and reliable operation of buried pipe systems
      (b) list the licensee programs and procedures which address risk ranking, inspection planning, inspection procedures and asset management.
      (c) defined roles and responsibilities for the program manager; inspection organization; engineering organization for risk ranking and fitness-for-service evaluations; organizations for modifications, repairs and preventive maintenance.
      (d) requirement to have an onsite buried piping program manager (owner) and/or staff (also, obtain information regarding 1) the number of buried piping program owners since January 1, 2010 and 2) the number of other site programs assigned to the buried piping program owner)

(e) discussion of training requirements or expectations
(f) schedule for completion of major milestones and actions
(g) discussion of any reporting and trending requirements, including requirements to enter any identified deficiencies into the licensee's corrective action program.
(h) discussion of how program deficiencies should be corrected.
(i) description of any periodic documentation requirements to capture program performance, such as system health reports and performance indicators.
(j) feedback and continuous improvement (e.g., whether the licensee's program addresses benchmarking and self-assessment).

4. Does the licensee have implementing procedures that describe the following areas of the buried pipe program?

   (a) risk ranking process and methods
   (b) inspection techniques, implementation of inspections, scope expansion, fitness-for-service assessment and trending, storage and retrieval of results
   (c) fitness-for-service calculation methods and margins
   (d) repair options
   (e) prevention methods, rehabilitation and leak detection techniques

5. Does the licensee describe clear roles and responsibilities, including senior level accountability for the buried pipe integrity program, inspection organization, engineering organization for risk ranking and fitness for service evaluations, organizations for modifications, repairs and preventive maintenance in their site procedures?

b. Underground Piping and Tanks Integrity Initiative.

1. Has the licensee approved and issued underground piping and tanks initiative program documents and implementing procedures by December 31, 2011?

2. Has the licensee taken any deviations to initiative actions? If so, what is the basis for these deviations?

3. Has the licensee identified piping and tanks that should be added to the initial scope of its buried piping program? Did the licensee revise existing programs and procedures or developed new ones, if needed, to ensure that the scope of the program now includes the leakage and structural integrity of any newly identified components (piping or tanks)?

   Also, its programs and processes should reflect any new roles and responsibilities or changes to them.

4. Have the licensee established clear roles and responsibilities, including senior level accountability for the implementation of the underground piping and tank integrity initiative?

5. Is there a program to ensure chase and vault areas are monitored for or protected against accumulation of leakage for the underground piping and tanks that contain radioactive or other materials deemed by the licensee to be hazardous?

03.02 Review of Risk Ranking The inspector shall review the licensee's process for risk ranking the buried piping segments and tanks for the following:

a. Original Buried Piping Integrity Initiative.

   1. Did the licensee complete risk ranking of buried piping segments by December 31, 2010?

   2. Does the licensee have a program or procedure to confirm the as-built location of buried and underground piping and tanks at the plant? Licensee's program employs a combination of walkdowns, excavations, non-destructive evaluation or other means to confirm as-built locations. A set of as-built drawings were assembled showing the route of buried pipes, including their locations relative to other buried structures and components and above ground buildings. Identify any situations in which the licensee excluded buried piping from this initiative because the piping is owned or controlled by companies other than the licensee (e.g., buried natural gas piping)

   3. Did the licensee confirm through field surveys the buried pipe routes and adjacent buried components? Field surveys are various inspection methods used to confirm location of buried pipes and adjacent buried components. Appendix E of EPRI document titled ""Recommendations for an Effective Program to Control the Degradation of Buried Pipe" describes some of the field inspection techniques such as ground penetration radar and alternating current attenuation.

   4. Did the licensee provide sufficient justification for buried piping segments that were removed from the scope of the buried piping initiative? Were scope exclusions documented and approved by both engineering and operations departments?

   5. Did the licensee collect and compile line-specific data (line specific data is described in Table 2-1 through 2-3 of the EPRI guidance document) for use in risk ranking, inspection planning and fitness-for-service assessment? Piping should be subdivided into segments of similar characteristics.

Based on the data collected from records, the buried pipe should be subdivided into a series of segments. The piping in each segment should have similar characteristics resulting in similar likelihood and consequences of failure. A new segment should be started where there is a change to the likelihood or consequences variables identified in Tables 2-1 through 2-3 of the EPRI guidance document.

6. Does the licensee have a program or procedure in place to monitor the coating integrity or cathodic protection (CP) system functionality for the piping segments credited with corrosion resistant coatings or cathodic protection system?

7. Does the licensee have programs or procedure for maintenance, monitoring and surveys of cathodic protection systems and do these procedures require the use of National Association of Corrosion Engineers (NACE) certified personnel (any level of certification)?

8. Have the licensee conducted periodic over-the-line surveys to help assess the likelihood of external corrosion? Appendix E of the EPRI guidance document describes various over-the-line surveys.

9. Have the licensee evaluated fluid-side corrosion and fouling of buried pipe to determine the likelihood of pipe failure?

10. Did the licensee determine the likelihood of failure (e.g., low, medium, high or assigned numerical failure likelihood values) for each segment of the buried pipe system for each failure mode?

11. Did the licensee determine the consequence of failure for each pipe segment and each failure mode?

    The consequence of failure of a buried pipe should address environmental, safety and health consequences and costs. The parameters that should be considered in the consequence assessment include the following:

    - the failure mode (leak, break, occlusions, mechanical damage).
    - the ability to detect the failure (leak or break) or degradation in a timely manner.
    - the ability to isolate or by-pass the failure.
    - the consequence in terms of safety, environmental damage and costs.
    - direct damage to the buried pipe and collateral damage to nearby structures and components.

12. Review the licensee's basis for the risk ranking for one segment of high risk and one segment of low risk piping. Specifically, determine if the licensee appropriately considered the factors influencing initiation and consequence for the risk evaluation in accordance with the NEI guidelines.

13. Did the licensee risk rank each pipe segment using the likelihood and consequence of failure for each failure mode? Inspections or other failure preventive measures should be prioritized based on this risk ranking.

14. Is risk ranking required to be periodically reviewed and updated as necessary?

15. Did the licensee estimate the extent (e.g., how many feet) of buried piping ranked in the highest risk ranking category?

16. Did the licensee estimate the extent (e.g., how many feet) of buried piping is included in the program? If so document this amount. If not identify why not.

17. For 1-3 piping or tank segments, review condition report records and work orders related to these pipe segments issued since January 1, 2009 to determine if leakage has occurred. If leakage has occurred, find out whether the licensee determined the cause of the leakage, the size of leaks and what the licensee did to correct these leaks including extent of condition reviews.

18. Has the licensee identified and the inspection methods determined for the buried and underground pipe segments that have been inspected by direct and indirect nondestructive examination (NDE) methods in the past 2 years, as well as those planned for inspection?

b. Underground Piping and Tanks Integrity Initiative. Did the licensee prioritize the underground piping and tanks initiative by June 30, 2012? The prioritization process used for underground piping and tanks should be similar to the one developed for the original buried piping integrity initiative. Risk ranking for underground piping and tanks was completed in a similar manner as for the original buried piping initiative. Use the inspection requirements stated in paragraph 03.02.a, as appropriate, as a guide when determining the adequacy of risk ranking performed for underground piping and tanks.

03.03 Review of Inspection Plan/Condition Assessment Plans:

a. Original Buried Piping Integrity Initiative. Did the licensee complete inspection plan by June 30, 2011? The inspection plan should have the following key attributes:

- identification of piping segments to be inspected
- potential inspection techniques
- inspection schedule for buried piping segments based on risk ranking

- assessment of cathodic protection, if applicable

Determine whether the licensee has performed or plans to perform excavations to support the inspection of buried piping.

List any major maintenance or modification activities performed on cathodic protection systems at the site since January 1, 2009. Do not include routine maintenance or periodic system monitoring activities. Include anode and transformer replacements, additions, or retirements and also, transformer cleaning. Provide a brief (one to two sentences) description of the activity.

b. Underground Piping and Tanks Integrity Initiative. Did the licensee develop or identify existing condition assessment plans that will provide reasonable assurance of the integrity of components within the additional scope of the underground piping and tanks integrity initiative by December 31, 2012? These plans shall include the following key attributes:

- identification of underground piping and tanks to be assessed
- potential assessment techniques
- assessment schedules that take into account the relative priority of the components. This schedule should be coordinated with the schedule developed for the original Buried Piping Integrity Initiative to ensure that the components with the highest overall priority are addressed first.
- assessment of cathodic protection, if applicable

03.04 Review of Plan Implementation

a. Original Buried Piping Integrity Initiative.

1. Has the licensee accomplished scheduled milestones in accordance with their inspection plan? These milestones should include action(s) that begins on or before June 30, 2012.

2. Has the licensee completed or is scheduled to complete condition assessment of buried piping containing radioactive material (if applicable) by June 30, 2013?

3. For piping which were inspected, did the licensee select piping segments inspected based on their risk ranking? If not explain licensee basis for their selection.

4. For a sample of buried piping/tanks that have been uncovered, has the licensee inspected the coating using an inspector qualified in accordance with the program requirements? Additionally, determine if the licensee documented the piping coating condition in photographic records.

5. Does the licensee have a site procedure that addresses the use of guided wave inspection methodology? If so, check that the site procedure describes how to properly assess the inspection results.

6. List any excavations performed for the purpose of inspecting buried or underground piping and tanks or for the purpose of repairing leaks or significant degradation of underground piping and tanks since January 1, 2010. Provide a brief (one to two sentences) description of the activity, including month, year, and purpose of the work.

7. Are annual surveys being conducted for the licensee with installed cathodic protection systems? Is the system being annually evaluated by a NACE certified cathodic protection specialist? Is the system being operated in a manner that provides adequate protection to the piping system that is to be protected? If not describe deviations.

8. What is the technical basis for concluding that buried piping integrity (e.g., ASME Code minimum wall or leaktight) can be maintained without fully functional cathodic protection for the licensee who does not have fully functional cathodic protection systems installed?

9. Does the licensee's inspection require documentation of the as-found coating condition, cathodic protection, backfill type and other relevant parameters?

10. Did the licensee compile and categorize their inspection results? A projection of future damage should be estimated based on current inspection results and the time to the next planned inspection or repair.

    Review a sample of issue reports, work orders, nonconformance reports or deficiency reports issued since January 1, 2009 associated with a high risk underground piping/tank segment, to compare with the conclusions of licensee system health reports.

11. Does the licensee's inspection procedure or corrective action procedure stipulate what conditions need to be reported in the corrective action process?

12. Does site management review licensee self-assessment reports, nonconformance reports, or deficiency reports associated with the underground piping program or system health reports to determine the condition of buried piping and tanks?

13. Review corrective action or causal analysis reports for <u>one to three</u> incidents of leakage or significant degradation of buried or underground piping that

occurred after January 1, 2011. For each incident, list whether the corrective action included addressing the cause of the degradation (minimum sample size of one).

14. Did the licensee perform self-assessment of its buried piping program? If not, determine if any self-assessment of its buried piping program is scheduled to be performed.

15. Document direct or indirect NDE activities which were either observed or for which records were reviewed. Determine whether the licensee's procedure was adequate to detect potential piping degradation for direct NDE methods used. Additionally, determine whether the licensee's procedure was adequate to gather actionable information for assessment of buried pipe integrity (i.e., ASME Code minimum wall or leaktight) for indirect NDE methods used.

16. Document whether the licensee dispositioned direct or indirect NDE results in accordance with their procedural requirements.

b. Underground Piping and Tanks Integrity Initiative. Did the licensee complete condition assessment plan for underground piping and tanks by June 30, 2013 and that the licensee completed these condition assessments by June 30, 2014.

03.05 Review of Asset Management

a. Original Buried Piping Integrity Initiative. Did the licensee use the program inspection results as an input to the development of an asset management plan for buried piping? Did the licensee issue an approved asset management plan on or before December 31, 2013?

b. Underground Piping and Tanks Integrity Initiative. Did the licensee use the Inspection results as an input to the development of asset management plans for components within the scope of the underground piping and tanks integrity initiative? Did the licensee have plans in place by December 31, 2014?

2515/182-04 REPORTING REQUIREMENTS

04.01 Documentation Requirement for Phase I:

Completion of the phase one inspection is to be documented in an inspection report as follows:

- State the following for plants which plan to comply or have complied with all parts of the "Initiative Actions (Section 3.3A and B of NEI 09-14 revision 1)."

"Licensee plan to comply or have complied with all parts of the "Initiative Actions" and no deviations from the "Initiative Actions" as described in NEI 09-14, revision 1, were found."

- State the following for plants which cannot or will not implement any part of the Initiative Actions.

  "With the exception of the following, the licensee plan to comply or have complied with all parts of the "Initiative Actions." Licensee cannot or will not (choose one or the other) comply with (state the commitment to which they cannot or will not comply with) because (state justification for the deviation)."

There are no other documentation required in an inspection report other than the statement(s) above for phase one.

04.02 Documentation Requirement for Phase II:

In phase two, inspectors should verify that the licensees plan to comply or have complied with all parts of the "Initiative Actions." Additionally, in phase two, inspectors should document selected information gathered during the inspection by reporting the information to Robert.Hardies@nrc.gov using the spreadsheet identified at the following website:

http://portal.nrc.gov/edo/nrr/dirs/irib/Inspection%20Manual%20Forms%20Templates%20Attachments/Forms/AllItems.aspx

The staff of NRR/Division of Component Integrity shall make the spreadsheets received from inspectors publically available.

Completion of the phase two inspection is to be documented in an inspection report as follows:

- State the following for plants which plan to comply or have complied with all parts of the "Initiative Actions (Section 3.3A and B of NEI 09-14 revision 1)."

  "Licensee plan to comply or have complied with all parts of the "Initiative Actions" and no deviations from the "Initiative Actions" as described in NEI 09-14, revision 1, were found."

- State the following for plants which cannot or will not implement any part of the Initiative Actions.

  "With the exception of the following, the licensee plan to comply or have complied with all parts of the "Initiative Actions." Licensee cannot or will not

(choose one or the other) comply with (state the commitment to which they cannot or will not comply with) because (state justification for the deviation)."

The level of detail needed to document the results of this TI will vary on the reporting requested but in general, only a brief paragraph (several sentences) is required. More information may be provided by the inspector(s) when approved by regional management and as situation dictates. The inspectors should consider the inspection attributes identified in sections 03.01 through 03.05 to be included, when applicable, in the scope of the inspection, but other than identified deviations from initiative requirements, only information related to the inspection attributes listed in the reporting requirements section (2515/182-04) needs to be documented and reported.

2515/182-05 COMPLETION SCHEDULE

This TI is to be initiated June 30, 2011 and completed by June 30, 2014. Complete as many required inspection items as possible based on allocated inspection resources, inspection scheduling constraints and the licensee's schedule for accomplishing their commitments. Milestones past June 30, 2014 may be assessed if they are complete.

2515/182-06 EXPIRATION

This TI will remain in effect for about 3 years. This includes a time period between, June 30, 2014 and December 31, 2014 during which regions can document the inspections completed through June 30, 2014. The TI will expire on December 31, 2014.

2515/182-07 CONTACT

Any technical questions regarding this TI should be addressed to Robert Hardies at 301-415-5802 or robert.hardies@nrc.gov.

2515/182-08 STATISTICAL DATA REPORTING

All direct inspection effort expended on this TI is to be charged to 2515/182 with an IPE code of TI. All indirect inspection effort expended on this TI for preparation and documentation should be attributed to activity codes TIP and TID respectively.

2515/182-10 RESOURCE ESTIMATE

The estimated average time to complete the TI inspection requirements is 32 to 64 hours.

2515/182-11 TRAINING

Specialized training on the Underground Piping and Tanks Integrity Initiative will be provided by DCI prior to implementation of this TI.

END

ATTACHMENT 1

Revision History for TI 2515/182

REVIEW OF THE IMPLEMENTATION OF THE INDUSTRY INITIATIVE ON UNDERGROUND PIPING AND TANKS

Commitment Tracking Number	Issue Date	Description of Change	Training Needed	Training Completion Date	Comment Resolution Accession Number
N/A	XX/XX/XX	This is a new document issued for inspections related to the industry initiative on Underground Piping and Tanks Integrity.	Yes	8/25/2011	ML11158A221

Plant Name:
Docket Number:
Inspection Period:

			Responses (Yes/No)	Additional Comments:
1	03.01.a.1	Did the licensee approve and issue buried piping integrity program documents and implementing procedures by June 30, 2010?		
2	03.01.a.2	Has the licensee taken any deviations to initiative actions? If so, what is the basis for these deviations?		
3	03.01.a.3(b)	List the licensee programs and procedures which address risk ranking, inspection planning, inspection procedures and asset management.		
4	03.01.a.3(d)	Requirement to have an onsite buried piping program manager (owner) and/or staff (also, obtain information regarding 1) the number of buried piping program owners since January 1, 2010 and 2) the number of other site programs assigned to the buried piping program owner)		
5	03.01.a.3(i)	Description of any periodic documentation requirements to capture program performance, such as system health reports and performance indicators.		
6	03.01.b.1	Has the licensee approved and issued underground piping and tanks initiative program documents and implementing procedures by December 31, 2011?		
7	03.01.b.2	Has the licensee taken any deviations to initiative actions? If so, what is the basis for these deviations?		
8	03.01.b.5	Is there a program to ensure chase and vault areas are monitored for or protected against accumulation of leakage for the underground piping and tanks that contain radioactive or other materials deemed by the licensee to be hazardous?		
9	03.02.a.1	Did the licensee complete risk ranking of buried piping segments by December 31, 2010?		
10	03.02.a.2	Does the licensee have a program or procedure to confirm the as-built location of buried and underground piping and tanks at the plant? Licensee's program employs a combination of walkdowns, excavations, non-destructive evaluation or other means to confirm as-built locations.		
11	03.02.a.6	Does the licensee have a program or procedure in place to monitor the coating integrity or cathodic protection (CP) system functionality for the piping segments credited with corrosion resistant coatings or cathodic protection system?		
12	03.02.a.7	Does the licensee have programs or procedure for maintenance, monitoring and surveys of cathodic protection systems and do these procedures require the use of National Association of Corrosion Engineers (NACE) certified personnel (any level of certification)?		
13	03.02.a.12	Review the licensee's basis for the risk ranking for one segment of high risk and one segment of low risk piping. Specifically, determine if the licensee appropriately considered the factors influencing initiation and consequence for the risk evaluation in accordance with the NEI guidelines.		
14	03.02.a.15	Did the licensee estimate the extent (e.g., how many feet) of buried piping ranked in the highest risk ranking category?		
15	03.02.a.16	Did the licensee estimate the extent (e.g., how many feet) of buried piping is included in the program? If so document this amount. If not identify why not.		
16	03.02.a.17	For 1-3 piping or tank segments, review condition report records and work orders related to these pipe segments issued since January 1, 2009 to determine if leakage has occurred. If leakage has occurred, find out whether the licensee determined the cause of the leakage, the size of leaks and what the licensee did to correct these leaks including extent of condition reviews.		
17	03.02.b	Did the licensee prioritize the underground piping and tanks initiative by June 30, 2012?		
18	03.03.a	Did the licensee complete inspection plan by June 30, 2011?		
19	03.03.a	Determine whether the licensee has performed or plans to perform excavations to support the inspection of buried piping.		
20	03.03.a	List any major maintenance or modification activities performed on cathodic protection systems at the site since January 1, 2009. Do not include routine maintenance or periodic system monitoring activities. Include anode and transformer replacements, additions, or retirements and also, transformer cleaning. Provide a brief (one to two sentences) description of the activity.		
21	03.03.b	Did the licensee develop or identify existing condition assessment plans that will provide reasonable assurance of the integrity of components within the additional scope of the underground piping and tanks integrity initiative by December 31, 2012?		
22	03.04.a.1	Has the licensee accomplished scheduled milestones in accordance with their inspection plan? These milestones should include action(s) that begins on or before June 30, 2012.		
23	03.04.a.2	Has the licensee completed or is scheduled to complete condition assessment of buried piping containing radioactive material (if applicable) by June 30, 2013?		
24	03.04.a.6	List any excavations performed for the purpose of inspecting buried or underground piping and tanks and for the purpose of repairing leaks or significant degradation of underground piping and tanks since January 1, 2010. Provide a brief (one to two sentences) description of the activity, including month, year, and purpose of the work.		
25	03.04.a.7	Are annual surveys being conducted for the licensee with installed cathodic protection systems? Is the system being annually evaluated by a NACE certified cathodic protection specialist? Is the system being operated in a manner that provides adequate protection to the piping system that is to be protected? If not describe deviations.		
26	03.04.a.8	What is the technical basis for concluding that buried piping integrity (e.g., ASME Code minimum wall or leaktight) can be maintained without fully functional cathodic protection for the licensee who does not have fully functional cathodic protection systems installed?		
27	03.04.a.13	Review corrective action or causal analysis reports for <u>one to three</u> incidents of leakage or significant degradation of buried or underground piping that occurred after January 1, 2011. For each incident, list whether the corrective action included addressing the cause of the degradation (minimum sample size of one).		
28	03.04.a.15	Document direct or indirect NDE activities which were either observed or for which records were reviewed. Determine whether the licensee's procedure was adequate to detect potential piping degradation for direct NDE methods used. Additionally, determine whether the licensee's procedure was adequate to gather actionable information for assessment of buried pipe integrity (i.e., ASME Code minimum wall or leaktight) for indirect NDE methods used.		
29	03.04.a.16	Document whether the licensee dispositioned direct or indirect NDE results in accordance with their procedural requirements.		

TEMPORARY INSTRUCTION XXXX/XXX

INSPECTION OF PROCEDURES AND PROCESSES FOR RESPONDING TO POTENTIAL AIRCRAFT THREATS

XXXX/XXX -01 OBJECTIVE

The objective of this TI is to support the review of licensees' implementation procedures and processes required by Title 10 of the *Code of Federal Regulations* (CFR), Part 50.54(hh)(1), which provides requirements for responding to a potential aircraft threat (Ref 1). The review will verify that the necessary procedures and processes are in place to reasonably ensure the requirements specified are being addressed. This review will use, in part, guidance provided to the industry in Regulatory Guide 1.214, "Response Strategies for Potential Aircraft Threats," (Ref 2). As an ancillary benefit, this TI promotes information gathering to help the Nuclear Regulatory Commission (NRC) staff identify and shape possible future regulatory positions, generic communications, and rulemaking.

XXXX/XXX -02 APPLICABILITY

This temporary instruction applies to all holders of operating licenses for nuclear power reactors, except nuclear power reactors that have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel.

XXXX/XXX -03 BACKGROUND

The Final Rule for 10 CFR 50.54(hh)(1), was published March 27, 2009 (Federal Register/Vo. 74, No. 58) and went into effect March 31, 2010.

The NRC issued Regulatory Guide 1.214 in July 2009 which describes approaches acceptable to the U.S. Nuclear Regulatory Commission (NRC) staff for conforming with nuclear power reactor requirements associated with airborne threats as stated in 10 CFR 50.54(hh)(1).

This TI provides inspection requirements and guidance for the review of licensee processes and procedures for implementing the requirements of 10 CFR 50.54(hh)(1) by verifying the licensee has developed, implemented and maintained procedures that describe how they will address the following areas if notified of a potential aircraft threat:

a. verification of the authenticity of threat notifications;
b. maintenance of continuous communication with threat notification sources;
c. contacting all onsite personnel and applicable offsite response organizations;
d. onsite actions necessary to enhance the capability of the facility to mitigate the consequences of an aircraft impact;
e. measures to reduce visual discrimination of the site relative to its surroundings or individual buildings within the protected area;
f. dispersal of equipment and personnel, as well as rapid entry into the site protected area for essential onsite personnel and offsite responders who are necessary to mitigate the event; and
g. recall of site personnel.

The inspection should conclude that the licensee has procedures and processes in place to reasonably assure proper implementation of 10 CFR 50.54(hh)(1) and that the licensee has demonstrated the ability to successfully implement these procedures.

XXXX/XXX-04 INSPECTION REQUIREMENTS

04.01 General Provisions.

Prior to completing Section 04.02 or 04.03 in this TI, verify policies and procedures are in place which address the following requirements specified in 10 CFR 50.54(hh)(1):

a. Confirm that the licensee has procedures in place that provide direction for the following:

1. **Verification of the authenticity of threat notifications** – The licensee should validate all potential aircraft threat notifications with the NRC Headquarters (HQ) Operations Center, regardless of who originally notified the licensee. An authentication code is the preferred method for verifying information between the NRC HQ Operations Center and the licensee. However, the licensee may use other methods, such as maintaining an open line and using another phone line to call the NRC HQ Operations Center. If authentication codes are used, confirm the licensee has an effective process for maintaining the codes in a readily accessible location within the control room(s) to prevent delays in transferring information, while simultaneously ensuring only site personnel with an official need to know have access to the codes.

2. **Maintenance of continuous communication with threat notification sources**[1] – Validate the licensee's procedures:

[1] The continuous communication requirement is more stringent than a requirement to maintain an open line, and it applies to licensees only with respect to aircraft threat notification sources. The purpose of requiring the licensee to establish and maintain an active, continuous communication capability for potential aircraft threats is to enable the licensee to receive information on a rapidly evolving threat from notification sources and to use that information to make timely decisions regarding whether to cease, continue or accelerate mitigative actions.

a. require continuous communication with original threat notification sources (e.g., Federal Aviation Administration, North American Aerospace Defense Command, law enforcement agencies, NRC),

b. direct the licensee to establish continuous communication with the NRC HQ Operations Center at the earliest practical time when the original threat notification source is not NRC,

c. address circumstances during which the licensee may be maintaining continuous communication with multiple threat notification sources,

d. identify whether and how (if applicable) the licensee will discontinue continuous communication with the NRC HQ Operations Center, and

e. contain direction to reestablish communication with the NRC HQ Operations Center as soon as practical after an onsite aircraft impact or within 5 minutes after the anticipated impact time if no impact occurs.

3. **Contacting all onsite personnel and applicable offsite response organizations** – Verify the licensee procedures have pre-established public address announcements that are specific to aircraft threats and consistent with the licensee's decision making tool (see Ref 2, Sections 7.2 and 7.3). The public address announcements need to inform onsite personnel of 1) the nature of the threat, 2) the threat's estimated time of arrival to the site, 3) necessary personnel protective measures (e.g., shelter in place, evacuate), and 4) instructions to specific site teams or departments (e.g., fire brigade assembly, critical personnel dispersal, health physics relocation). Confirm the licensee has identified applicable offsite response organizations and incorporated their names and primary and alternate emergency contact information in the applicable licensee procedures. Ensure the procedures direct periodic updates on the status of the threat to onsite personnel and offsite response organizations.

4. **Onsite actions necessary to enhance the capability of the facility to mitigate the consequences of an aircraft impact** – Verify the licensee has identified and proceduralized appropriate operations-related mitigative actions for each aircraft threat type (see Ref 2, Glossary). Determine the extent to which, if any, the licensee has incorporated actions related to aircraft threat mitigation into its daily facility operations. (See Ref 2, Section 5 and Appendix A.)

5. **Measures to reduce visual discrimination of the site relative to its surroundings or individual buildings within the protected area** – Confirm the licensee has completed an analysis, identified the site-specific lighting that needs to be extinguished (if any), and incorporated the results into the appropriate procedures. Verify the licensee utilizes centralized lighting

controls, when possible, to extinguish lighting in accordance with the site-specific analysis. If the licensee does not have centralized lighting controls, ensure it has identified prioritized routes and responsible personnel that are appropriate for each aircraft threat type. Examine any satellite imagery or aerial photographs the licensee used for its lighting analysis or to evaluate the effectiveness of its actions to extinguish the appropriate lighting.

6. **Dispersal of equipment and personnel, as well as rapid entry into the site protected area for essential onsite personnel and offsite responders who are necessary to mitigate the event** – Validate the licensee's procedures include a list of equipment and personnel that are critical for accomplishing post-impact mitigation and identify a suitable location(s) outside the power block, vital islands or protected area to which that equipment and personnel can be repositioned to increase their survivability. Ensure the licensee's procedures include a decision making tool or another method to justify personnel protective actions for each aircraft threat type, as well as specific measures to facilitate rapid protected access for critical onsite personnel or offsite responders who are essential for mitigating an aircraft impact (see Ref. 2, Section 7.4).

7. **Recall of site personnel** – Ensure the licensee's procedures contain a process to recall off-shift personnel who possess skills critical to mitigating an onsite aircraft impact and to direct those personnel to designated assembly areas that are outside the power block, vital islands or protected area.

04.02 Exercise.

Completion of Section 04.02 is preferred, however not required, in order to complete this TI, although it would provide valuable insight into the licensee's capability to implement these actions in a timely and effective manner.

Verify the effectiveness of the licensee procedures by conducting a tabletop or control room simulator exercise and plant walk-through, and asking follow-up questions:

a. Assess whether the licensee understood the aircraft threat type and entered its procedures using the appropriate entry condition.

b. Evaluate the effectiveness of the licensee's processes for verifying the authenticity of potential aircraft threat notifications.

c. Verify the licensee has sufficient control room staff or equipment to maintain continuous communication with threat notification sources and that it sends and receives information in a timely manner. Confirm whether and how the licensee contacts the NRC HQ Operations Center as soon as practical when NRC is not

the original threat notification source[2]. Assess the licensee's actions and determine if they are appropriate for, and responsive to, the threat. Evaluate whether the licensee provides the required confirmations to the NRC HQ Operations Center before ceasing continuous communication.

d. Evaluate the effectiveness of the licensee's processes and equipment for communicating with onsite personnel to maximize personnel safety and plant survivability.

e. Evaluate the effectiveness of the licensee's processes and equipment for providing the initial notification to, and periodic status updates with, offsite response organizations. Determine whether the licensee included offsite response organizations in the planning, development, training and testing for its aircraft threat procedure(s) to give those organizations the opportunity to establish mutual aid assistance agreements, plan the near-site mustering of offsite firefighting and medical assistance, or create and implement personnel mobilizations for volunteer organizations or hospital staffs, when appropriate.

f. Evaluate the effectiveness of the licensee's processes and equipment for recalling appropriate off-shift personnel. Determine whether the licensee coordinated assembly area locations with offsite response organizations to align onsite and offsite response plans and minimize the possibility of off-shift licensee personnel being unnecessarily prevented from reaching the site.

g. Conduct a plant walk-through of licensee procedures related to reducing visual discrimination of the site and evaluate the effectiveness of the procedures, availability of resources, priority of actions, and capabilities for implementation within the constraints of the expected pre-event notification period. Ensure the responsible licensee staff is aware of its site-specific lighting actions, is proficient in performing those actions within the available time indicated in the procedures, and is not assigned duties during the event that would prevent them from accomplishing those actions.

h. Evaluate the effectiveness of the licensee's procedures and resources for actions during the pre-event notification period that enhance the capability of the facility to mitigate the consequences of an aircraft impact (See Ref 2, Section 5.3 and Appendix A).

i. Conduct a plant walk-through of licensee procedures designed to ensure protection of vital resources and key personnel that are critical for accomplishing post-impact mitigating actions. Evaluate how the licensee calculated the

[2] The licensee can cease continuous communication with non-NRC threat notification sources if the licensee first establishes continuous communication with the NRC HQ Operations Center and determines the Operations Center is providing the same threat information.

estimated protected area evacuation time(s) used in its onsite protective actions decision making tool.

04.03 Alternate Performance Evaluation.

If the licensee decides not to demonstrate its performance during a tabletop or control room simulator exercise, verify the effectiveness of licensee procedures by interviewing a sample of at least site management and staff in the areas of operations, security and emergency preparedness who would be expected to implement the licensee's procedure(s) for potential aircraft threats and conducting a plant walk-through for elements described for items a. thru i. in Section 04.02. If the inspector(s) concludes, based on these interviews and the plant walk-through, the licensee has successfully implemented the requirements of 10 CFR 50.54(hh)(1), it is not necessary to conduct further interviews. Conversely, if concerns are identified, the inspector(s) should expand the sample size or scope of the inspection as necessary to come to a conclusion as to the adequacy of the licensee's procedures and processes.

04.04 Procedure Controls.

Verify the licensee has a review process in place to maintain procedures required by 10 CFR 50.54(hh)(1):

a. Confirm that the licensee has a process in place to conduct an effectiveness review of its processes and procedures associated with response strategies for potential aircraft threats in accordance with site administrative controls.

b. Confirm that the licensee has a process to track corrective actions associated with problems identified with its response strategies for potential aircraft threats.

04.05 Training.

Verify the licensee's training programs have objectives that cover the implementation of site procedures associated with response to potential aircraft threats:

a. Confirm the licensee's licensed operator requalification and initial license training programs contain objectives that ensure that licensed operators have the necessary training for responding to the initial threat notification and coordinating the licensee's response to the threat. Determine whether the licensee requires recurring proficiency drills or exercises using its control room simulators, and if so, the nature of those demonstrations.

b. Confirm the licensee's training programs, to the extent practical, include training for personnel who may be called on to respond to a potential aircraft threat (e.g., fire brigade, health physics, security and maintenance departments). Determine whether the licensee includes appropriate offsite response organization representatives in its preparations for potential aircraft threats.

XXXX/XXX-05 REPORTING REQUIREMENTS

05.01 Inspection Guidance

The results of this Temporary Instruction should be included in Section 4OA5 of an integrated inspection report and should be forwarded to NRR/DIRS/IRIB, Attention: XXXXXXXXXXXXXX. Mr. XXXXXXXX can also be reached by telephone at (301) 415-XXXX.

Inspectors should briefly describe the areas reviewed (i.e., provide a summary documenting that the inspection was completed) and any findings in Section 4OA5, "Other," of the resident inspector's quarterly integrated inspection report.

Any findings identified during this inspection will be processed and documented in accordance with NRC Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports." Additionally, these findings may be processed through a panel to ensure issues are evaluated in a consistent manner. Significance of inspection findings should be evaluated in accordance with applicable appendices of IMC 0609, "Significance Determination Process." Any noncompliance resulting from this inspection will be evaluated and documented in accordance with the NRC Enforcement Policy (NUREG-1600) and the NRC Enforcement Manual.

Minor performance deficiencies may be documented in Section 4OA5 at the discretion of the inspector in accordance with IMC 0612 requirements. The intent of documenting these minor deficiencies is for the program office to evaluate the Program issues for improvements in the inspection program guidance.

XXXX/XXX-06 COMPLETION SCHEDULE

This TI should be completed by XXXX, 20XX.

XXXX/XXX-07 EXPIRATION

This TI will expire on XX/XX/20XX.

XXXX/XXX-08 CONTACT

For questions regarding the performance of this TI and emergent issues, contact: Lou Cubellis at 301-415-7114 or Louis.Cubellis@nrc.gov; Chris Cowdrey at 301-415-2758 or Christian.cowdrey@nrc.gov; or Timothy Kobetz at 301-415-1932 or Timothy.Kobetz@nrc.gov.

XXXX/XXX-09 STATISTICAL DATA REPORTING

All direct inspection effort expended on this TI is to be charged to XXXX/XXX with an IPE code of TI. Indirect inspection effort for preparation and documentation are to be charged to the inspection report number where the results of the inspection are documented, with an IPE code of TIP and TID respectively.

XXXX/XXX-10 ORIGINATING ORGANIZATION INFORMATION

10.01 Organizational Responsibility.

This TI was prepared by the Operator Licensing and Training Branch (NRR/DIRS/IOLB), and issued by the Reactor Inspections Branch (NRR/DIRS/IRIB).

10.02 Resource Estimate.

The estimated direct inspection effort to perform this TI is 40 hours per site. This TI should be performed by an inspection team that coordinates with the Headquarters Operations Officers (HOOs) for the purposes of the tabletop or control room simulator exercise.

10.03 Inspector Training.

The inspectors should be given familiarization training for the actions that the on-shift HOO would take in an aircraft threat situation. The inspectors should be familiar with the information provided in Section 10.04, References.

10.04 References.

1. 10 CFR 50.54(hh)(1)

2. Regulatory Guide 1.214, “Response Strategies for Potential Aircraft Threats,” (ADAMS ML091740646)

END

Attachment 1
Revision History Page

Commitment Tracking Number	Issue Date	Description of Change	Training Needed	Comment Resolution Accession Number
N/A	XX/XX/XXXX	This TI was created to provide inspection guidance related to inspection of licensees' implementation processes and procedures for 10 CFR 50.54(hh)(1).	N/A	N/A

NRC Staff White Paper on
Performance Indicator Validity during
Extended Shutdown and Start-Up Conditions

Purpose

This white paper proposes to incorporate guidance into the current revision of NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," for determining performance indicator (PI) validity for plants in extended shutdown conditions, the start-up of plants that were in extended shutdown conditions, and the start-up of new plants for which the PIs in NEI 99-02 will be applicable.

Guidance in NEI 99-02 for determining PI validity would support the ROP objectives of being objective, understandable, and predictable, as well as the NRC objectives of being open and effective. Such guidance would provide a publicly available decision-making framework for determining PI validity during extended shutdowns and plant start-ups. This framework would result in predictable NRC actions and improved effectiveness in communicating PI results to stakeholders and in developing inspection plans for plants.

NEI 99-02 currently provides guidance for determining the applicability or validity of some PIs under certain conditions. However, NEI 99-02 does not provide guidance for determining the validity for other PIs and plant conditions. NRC inspection manual chapters (IMCs) do not provide such guidance. Plant conditions that would need such determinations include: an extended shutdown, which IMC 0608, "Performance Indicator Program," defines as a condition where the reactor has been subcritical for at least 6 months; the start-up of a plant from an extended shutdown; and the start-up of new plants for which the PIs in NEI 99-02 will be applicable.

Discussion

IE01: Unplanned Scrams per 7,000 Critical Hours

This indicator measures the rate of unplanned scrams over the previous four quarters. The indicator value is the number of unplanned scrams while critical in the previous four quarters times the ratio of 7,000 hours to the total number of hours critical in the previous four quarters.

NEI 99-02, Revision 6, page 10, lines 25 – 27, states: "If there are fewer than 2,400 critical hours in the previous four quarters the indicator value is displayed as N/A ["Not Applicable"] because rate indicators can produce misleadingly high values when the denominator is small. The data elements (unplanned scrams and critical hours) are still reported." This guidance is sufficient for determining validity of this indicator for when a plant enters an extended shutdown. However, additional guidance is needed for determining exactly when the PI becomes valid for start-up from an extended shutdown and for new plant start-ups.

For plants starting up from an extended shutdown, the NRC staff proposes that the indicator becomes valid the quarter in which the total number of critical hours within the past four quarters, regardless of the plant operating status during those four quarters, reaches 2400. For new plants, the indicator should become valid when 2400 critical hours are reached and after the ROP takes effect at a new plant. For new plant start-ups, a total of four quarters after start-up would not need to elapse in order for the data to be valid; data can be valid prior to completing four quarters after start-up. The data example on page 12 of NEI 99-02 should be revised to reflect this guidance; otherwise, it could be misinterpreted to mean that the indicator is not valid until four quarters after 2400 critical hours are reached.

Recommended Changes to NEI 99-02, Revision 6:

Page 10, lines 25 – 27 (red text is proposed new text):
If there are fewer than 2,400 critical hours in the previous four quarters the indicator value is displayed as N/A because rate indicators can produce misleadingly high values when the denominator is small. The data elements (unplanned scrams and critical hours) are still reported. For plants starting up from an extended shutdown, the indicator becomes valid the quarter in which the total number of critical hours within the past four quarters, regardless of the plant operating status during those four quarters, reaches 2400. For new plants for which this PI will be applicable, the indicator becomes valid when 2400 critical hours are reached and after the ROP takes effect at a new plant.

Page 12, data example and corresponding change to the graph:

Unplanned Scrams per 7,000 Critical Hours *** indicates quarter of new reactor start-up and assumes ROP is already in effect**											
	2Q97*	**3Q97**	**4Q97**	**1Q98**	**2Q98**	**3Q98**	**4Q98**	~~**Prev. Qtr**~~ **1Q99**	**2Q99**	**3Q99**	**4Q99**
# of Scrams critical in qtr	1	0	0	1	1	1	2	2	0	0	0
Total Scrams ~~overwithin~~ 4 qtrs	1	0	0	2	2	3	5	6	5	4	2
# of Hrs Crit in qtr	1500	1000	2160	2136	2160	2136	2136	1751	0	0	0
Total Hrs Critical in 4 qtrs	1500	2500	4660	6796	7456	8592	8568	8183	6023	3707	1751
		3Q97	**4Q97**	**1Q98**	**2Q98**	**3Q98**	**4Q98**	~~**Prev. Q**~~ **1Q99**	**2Q99**	**3Q99**	**4Q99**
Indicator value	N/A	2.8	1.5	2.1	1.9	2.4	4.1	5.1	5.8	7.55	N/A

IE03: Unplanned Power Changes per 7000 Critical Hours

This indicator measures the rate of unplanned power changes over the previous four quarters. The indicator value is the number of unplanned power changes in the previous four quarters times the ratio of 7,000 hours to the total number of hours critical in the previous four quarters.

NEI 99-02, Revision 6, page 13, lines 35 – 38 state: "If there are fewer than 2,400 critical hours in the previous four quarters the indicator value is displayed as N/A ["Not Applicable"] because rate indicators can produce misleadingly high values when the denominator is small. The data elements (unplanned power changes and critical hours) are still reported." This guidance is sufficient for determining validity of this indicator for when a plant enters an extended shutdown. However, additional guidance is needed for determining exactly when the PI becomes valid for start-up from an extended shutdown and for new plant start-ups.

For plants starting up from an extended shutdown, the NRC staff proposes that the indicator becomes valid the quarter in which the total number of critical hours within the past four quarters, regardless of the plant operating status during those four quarters, reaches 2400. For new plants, the indicator should become valid when 2400 critical hours are reached and after the ROP takes effect at a new plant. For new plant start-ups, a total of four quarters after start-up would not need to elapse in order for the data to be valid; data can be valid prior to completing four quarters after start-up. The data example on page 17 of NEI 99-02 should be revised to reflect this guidance; otherwise, it could be misinterpreted to mean that the indicator is not valid until four quarters after 2400 critical hours are reached.

Recommended Changes to NEI 99-02, Revision 6:

Page 13, lines 35 – 38 (red text is proposed new text):

If there are fewer than 2,400 critical hours in the previous four quarters the indicator value is displayed as N/A because rate indicators can produce misleadingly high values when the denominator is small. The data elements (unplanned scrams and critical hours) are still reported. For plants starting up from an extended shutdown, the indicator becomes valid the quarter in which the total number of critical hours within the past four quarters, regardless of the plant operating status during those four quarters, reaches 2400. For new plants for which this PI will be applicable, the indicator becomes valid when 2400 critical hours are reached and after the ROP takes effect at a new plant.

Page 17, data example and conforming change to the graph:

	2Q97*	3Q97	4Q97	1Q98	2Q98	3Q98	4Q98	~~Prev. Qtr~~ 1Q99	2Q99	3Q99	4Q99
# of Power Changes in previous qtr	1	0	0	1	2	2	1	3	0	0	0
Total Power Changes in previous 4 qtrs	1	1	1	2	3	5	6	8	6	4	3
# of Hrs Critical in qrtr	1500	1000	2160	2136	2160	2136	2136	1751	0	0	0
Total Hrs Critical in previous 4 qtrs	1500	2500	4660	6796	7456	8592	8568	8183	6023	3707	1751
	2Q97	**3Q97**	**4Q97**	**1Q98**	**2Q98**	**3Q98**	**4Q98**	**~~Prev. Q~~ 1Q99**	**2Q99**	**3Q99**	**4Q99**
Indicator value	N/A	2.8	1.5	2.1	2.8	4.1	4.9	6.8	7.0	7.6	N/A
*** indicates first quarter of new reactor start-up and assumes ROP is in effect**											

IE04: Unplanned Scrams with Complications (USwC)

This indicator measures the number of unplanned scrams with complications while the reactor was critical during the past four quarters. NEI 99-02 does not provide guidance for determining PI validity for extended shutdown conditions or for start-ups. The data example on page 24 of NEI 99-02 could be misinterpreted to mean that the indicator is not valid until four quarters have elapsed after start-up. For plants that are in extended shutdown conditions, the NRC staff believes the PI should become invalid when the reactor has not been critical for two full quarters. The staff chose two quarters because of the IMC 0608 definition of an extended shutdown and because any scrams that occurred prior to the shutdown would have caused the indicator to reach its maximum value for assessment purposes. If a transient initiates from a sub-critical condition that terminates in a scram after the reactor becomes critical, then the scram would be counted in this indicator, and the PI would become valid again. For a plant restart from an extended shutdown, the PI should be valid the first quarter a reactor becomes critical because the indicator value is not dependent on the number of hours the reactor has been critical. For new plant start-ups, the PI should be valid the quarter in which the reactor becomes critical and after the ROP takes effect.

Recommended Changes to NEI 99-02, Revision 6:

Page 19, between current guidance at lines 3 and 5:
For plants that are in extended shutdown conditions, the PI becomes invalid (i.e., displayed as "Not Applicable") when the reactor has not been critical for two full quarters. If a transient initiates from a sub-critical condition that terminates in a scram after the reactor becomes critical, then the scram would be counted in this indicator, and the PI becomes valid again the quarter containing the scram. For plants starting up after an extended shutdown, the PI will be valid the first quarter the reactor becomes critical and will include data from the past four quarters in the indicator value. For new plants for which this PI will be applicable, the PI will be valid the quarter in which the reactor becomes critical and after the ROP takes effect.

Page 24, data example and conforming change to the graph:

	1Q05*	2Q05	3Q05	4Q05	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07**	3Q07
# of Scrams with complications	0	1	0	0	1	0	1	0	0	1	0
in prev qtr											
Total over 4 quarters	0	1	1	1	2	1	2	2	1	2	1
	1Q05	2Q05	3Q05	4Q05	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07	3Q07
Indicator value	0	1	1	1	2	1	2	2	N/A	2	1
* indicates 1st quarter criticality is reached and assumes the ROP is in effect for that plant. ** In this example, the reactor was shut down in the middle of 3Q06 and restarted in 2Q07.											

MS05: Safety System Functional Failures

This indicator monitors the number of events or conditions that prevented or could have prevented the fulfillment of the safety function of structures or systems in the previous four quarters. NEI 99-02 does not provide explicit guidance for determining PI validity for extended shutdown conditions or for start-ups. This indicator remains valid during an extended shutdown. The data example on page 30 of NEI 99-02 could be misinterpreted to mean that the indicator is not valid until four quarters have elapsed after a start-up. The indicator should remain valid upon start-up from an extended shutdown. For a new plant, the PI should become valid the quarter in which 10 CFR 50.73 becomes applicable and after ROP is in effect for that plant.

Recommended Changes to NEI 99-02:

Page 29, beginning a new line at 34:
For plants that are in extended shutdown conditions, the PI remains valid. For a subsequent start-up from an extended shutdown, the PI continues to be valid, and the total SSFFs from the previous four quarters continue to be reported data elements and included in the indicator value. For new plants for which this PI will be applicable, the PI will be valid the first quarter in which 10 CFR 50.73 becomes applicable and after ROP is in effect for that plant.

Page 30, data example and conforming change to the graph:

Quarter	2Q98*	3Q98	4Q98	1Q9~~89~~	2Q9~~89~~**	3Q9~~89~~	4Q9~~89~~	~~Prev. Q~~ 1Q00**	2Q00
SSFF in ~~the previous~~that qtr	1	3	2	1	1	2	0	1	0
	2Q98	3Q98	4Q98	1Q9~~89~~	2Q9~~89~~	3Q9~~89~~	4Q9~~89~~	~~Prev. Q~~ 1Q00	2Q00
Indicator: Number of SSFFs over 4 Qtrs	1	4	6	7	7	6	4	4	3
* indicates 1st quarter in which both 10 CFR 50.73 and ROP are both in effect for that plant. ** In this example, the reactor was shut down in 2Q99 and restarted in 1Q00.									

MS06, MS07, MS08, MS09, MS10: Mitigating System Performance Index (MSPI)

These PIs monitor the performance of selected systems based on their ability to perform risk-significant functions. The MSPI is the sum of the changes in a simplified core damage frequency evaluation resulting from differences in unavailability and unreliability relative to industry standard baseline values. The MSPI is supplemented with system component performance limits. An unavailability index (UAI), unreliability index (URI), and a determination as to whether a system exceeded its component performance limits are reported data elements.

NEI 99-02 currently does not provide guidance for determining MSPI validity during extended shutdowns, start-ups from extended shutdowns, or for new plant restarts. The UAI is dependent on the number of critical hours over a 12-quarter period. Both the UAI and URI consider the past 12 quarters of data.

Proposed guidance will be provided in a supplement to this white paper at a later date.

BI01: Reactor Coolant System (RCS) Specific Activity

This indicator monitors the maximum monthly RCS activity in accordance with Technical Specifications (TS) and is expressed as a percentage of the TS limit. The indicator is determined by multiplying 100 by the ratio of the maximum monthly value of calculated activity to the TS limit. The indicator is not dependent on the number of critical hours. A plant's TS specify the modes in which the specific activity shall be within limits.

Current NEI 99-02 Guidance for PI Validity: NEI 99-02, Revision 6, page 38, lines 27 – 29 state, "If in the entire month, plant conditions do not require RCS activity to be calculated, the data field is left blank for that month and the status "Final – N/A" is selected." The staff believes the current guidance in NEI 99-02 is sufficient for determining PI validity for extended shutdown conditions. The data example on page 39 of NEI 99-02 could not be interpreted to mean that the indicator is invalid until a certain time has elapsed after start-up; therefore, the staff believes the current guidance is sufficient for determining that the PI remains valid as a plant starts up from extended shutdown conditions. For a new plant, the PI should become valid when the ROP is in effect for that plant and the applicable modes for the RCS specific activity TS requirements are entered.

The staff does not believe that additional guidance is not needed in NEI 99-02 for extended shutdown conditions or subsequent start-ups; however, a clarifying note on page 38 of NEI 99-02 should be added at line 29 that states, "For a new plant for which this PI is applicable, the PI becomes valid when the ROP is in effect for that plant and the applicable modes for the RCS specific activity TS requirements are entered."

BI02: Reactor Coolant System Leakage

This indicator monitors the maximum monthly RCS leakage in accordance with Technical Specifications (TS) and is expressed as a percentage of the TS limit. The indicator is determined by multiplying 100 by the ratio of the maximum monthly value of identified (or total) leakage to the TS limit. The indicator is not dependent on the number of critical hours. A plant's TS specify the modes in which the leakage shall be within limits.

NEI 99-02, Revision 6, page 40, lines 37 – 39, states, "If in the entire month, plant conditions do not require RCS leakage to be calculated, the data field is left blank for that month and the status "Final – N/A" is selected[.]" The staff believes the current guidance in NEI 99-02 is sufficient for determining PI validity for extended shutdown conditions. The data example on page 42 of NEI 99-02 could not be interpreted to mean that the indicator is invalid until a certain time has elapsed after start-up; therefore, the staff believes the current guidance is sufficient for determining that the PI remains valid as a plant starts up from extended shutdown conditions. For a new plant, the PI should become valid when the ROP is in effect for that plant and the applicable modes for the RCS leakage TS requirements are entered.

The staff does not believe that additional guidance is not needed in NEI 99-02 for extended shutdown conditions or subsequent start-ups; however, a clarifying note on page 40 of NEI 99-02 should be added at line 39 that states, "For a new plant for which this PI will be

applicable, the PI becomes valid when the ROP is in effect for that plant and the applicable modes for the RCS leakage TS requirements are entered."

EP01: Drill/Exercise Performance

Proposed guidance will be provided in a supplement to this white paper at a later date.

EP02: Emergency Response Organization (ERO) Drill Participation

Proposed guidance will be provided in a supplement to this white paper at a later date.

EP03: Alert and Notification System Reliability

Proposed guidance will be provided in a supplement to this white paper at a later date.

OR01: Occupational Exposure Control Effectiveness

This indicator sums the number of occurrences for each of the following three data elements over the previous four quarters at the site.

- The number of TS high radiation area occurrences during the previous quarter
- The number of very high radiation area occurrences during the previous quarter
- The number of unintended exposure occurrences during the previous quarter

This indicator does not depend on the operational status of the plant (e.g., critical hours) and is intended to be valid during extended shutdowns and subsequent start-ups. The current guidance is sufficient for extended shutdown conditions. For start-ups after extended shutdowns and for new plant start-ups, a total of four quarters after start-up would not need to elapse in order for the data to be valid; data can be valid prior to completing four quarters after start-up. The data example on page 66 of NEI 99-02 should be revised to reflect this; otherwise, it could be misinterpreted to mean that the indicator is not valid until four quarters after start-up have elapsed.

Recommended Changes to NEI 99-02:

Page 65, line 28:
For a new plant for which this PI will be applicable, this PI becomes valid the quarter the ROP is applicable to the plant.

Page 66, data example and conforming changes to the graph:

Quarter	3Q95*	4Q95	1Q96	2Q96	3Q96	4Q96	1Q97	2Q97	3Q97	4Q97	…	…
Number of TS HRA occurrences during the quarter	0	0	3	0	0	0	0	0	0	0	…	…
Number of very HRA occurrences during the quarter	0	0	0	0	0	0	1	0	1	0	…	…
Number of unintended exposure occurrences during the quarter	1	0	0	0	0	0	0	0	0	0	…	…
Reporting Quarter	3Q95	4Q95	1Q96	2Q96	3Q96	4Q96	1Q97	2Q97	3Q97	4Q97	…	…
Total # of occurrences in the previous 4 qtrs	1	1	4	4	3	3	1	1	2	2	…	…
* indicates 1st quarter in which indicator becomes valid.												

PR01: REST/ODCM Radiological Effluent Occurrence

This indicator calculates the number of RETS/ODCM radiological effluent occurrences (dose rates from liquid and gaseous effluents that exceed rates listed in NEI 99-02) per site in the previous four quarters. This indicator is independent of the operational status of the plant (e.g., critical hours) and is intended to be valid during extended shutdowns and subsequent start-ups. The current guidance is sufficient for extended shutdown conditions. For start-ups after extended shutdowns and for new plant start-ups, a total of four quarters after start-up would not need to elapse in order for the data to be valid; data can be valid prior to completing four quarters after start-up. The data example on page 69 of NEI 99-02 should be revised to reflect this; otherwise, it could be misinterpreted to mean that the indicator is not valid until four quarters after start-up have elapsed.

Recommended Changes to NEI 99-02:

Page 68, line 17:
For a new plant for which this PI will be applicable, this PI becomes valid the quarter the ROP is applicable to the plant.

Page 69, data example, conforming changes to the graph, and thresholds table:

RETS/ODCM Radiological Effluent Indicator							
Quarter	**3Q97***	**4Q97**	**1Q98**	**2Q98**	**3Q98**	**4Q98**	**Prev. Q**
Number of RETS/ODCM occurrences in the qtrs	1	0	0	1	0	0	1
Reporting Quarter	**3Q97**	**4Q97**	**1Q98**	**2Q98**	**3Q98**	**4Q98**	**Prev. Q**
Number of RETS/ODCM occurrences in the previous 4 qtrs	1	1	1	2	1	1	2
*** indicates 1st quarter in which indicator becomes valid.**							

Thresholds	
Green	≤ 1
White	> 1
Yellow	> 3
Red	N/A

PP01: Protected Area (PA) Security Equipment Performance Index

This indicator monitors the availability of security equipment. The PI value is the sum of two indices divided by two. The two indices are the number of compensatory hours (the hours a guard needs to be posted because of the unavailability of security equipment) in the previous four quarters divided by the product of a normalization factor and 8760 hours. This indicator is independent of the operating mode of the plant and is intended to be valid during extended shutdowns and subsequent start-ups. The current guidance is sufficient for extended shutdown conditions. For start-ups after extended shutdowns and for new plant start-ups, a total of four quarters after start-up would not need to elapse in order for the data to be valid; data can be valid prior to completing four quarters after start-up. The data example on page 77 of NEI 99-02 should be revised to reflect this; otherwise, it could be misinterpreted to mean that the indicator is not valid until four quarters after start-up have elapsed.

Recommended Changes to NEI 99-02:

Page 76, line 37:
PI Validity: For a new plant for which this PI will be applicable, this PI becomes valid the quarter the ROP is applicable to the plant.

Page 77, data example, conforming changes to the graph, and thresholds table:

Quarter	2Q97*	3Q97	4Q97	1Q98	2Q98	3Q98	4Q98	Prev. Q
IDS Compensatory Hours in the qtr	36	48	96	126	65	45	60	55
CCTV Compensatory Hours in the qtr	24	36	100	100	48	56	53	31
IDS Compensatory Hrs in previous 4 qtrs	36	84	180	306	335	332	296	225
CCTV Compensatory Hrs in previous 4 qtrs	24	60	160	260	284	304	257	188
IDS Normalization Factor	1.05	1.05	1.05	1.05	1.1	1.1	1.1	1.1
CCTV Normalization Factor	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3
IDS Unavailability Index	0.003914	0.009132	0.01957	0.033268	0.034765	0.034454	0.030718	0.02335
CCTV Unavailability Index	0.002283	0.005708	0.01522	0.024734	0.024939	0.026695	0.022568	0.016509
Reporting Quarter	2Q97	3Q97	4Q97	1Q98	2Q98	3Q98	4Q98	Prev. Q
Indicator Value	0.00	0.01	0.02	0.03	0.03	0.03	0.03	0.02
* indicates 1st quarter in which indicator becomes valid.								

Thresholds	
Green	≤0.08
White	>0.08
Yellow	N/A
Red	N/A

Changes to NEI 99-02, Appendix B, to account for N/A values

To be determined at a later date.