PWROG
PWR Owners Group

Program Management Office
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PA-MSC-0563
Project Number 694

February 21, 2011

OG-11-68

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555-0001

Attention: Matthew Mitchell, Chief
Vessels & Internals Integrity Branch
Division of Component Integrity
Office of Nuclear Reactor Regulation

Subject: PWR Owners Group
For Information Only – "PWR Owners Group Materials Subcommittee Interim Strategy for Identifying Outside Diameter Initiated Stress Corrosion Cracking (ODSCC) of Stainless Steel Systems", 51-9152699-000, PA-MSC-0563

Reference: **1. Updated Interim Strategy – "PWR Owners Group Materials Subcommittee Interim Strategy for Identifying Outside Diameter Initiated Stress Corrosion Cracking (ODSCC) of Stainless Steel Systems", 51-9152699-000, NEI 03-08 Good Practice Recommendation and Implementation Date, OG-11-67, PA-MSC-0563**

This letter transmits two (2) copies of PWROG document 51-9152699-000: "PWR Owners Group Materials Subcommittee Interim Strategy for Identifying Outside Diameter Initiated Stress Corrosion Cracking (ODSCC) of Stainless Steel Systems" (Enclosure 1). This document was developed by AREVA, Westinghouse and utility members of the MSC Stainless Steel Core Team members under PWROG program PA-MSC-0563 "SCC of Stainless Steel Material Issues Industry Participation and Strategic Planning Support 2010-2011". This document is being submitted for information only. No safety evaluation (SE) is expected and therefore, no review fees should be incurred.

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This interim strategy is intended to:

- Ensure a consistent and minimum level of awareness is communicated to the appropriate site organizations regarding recent ODSCC Operating Experience (OE).
- Provide a consistent and minimum set of attributes for identifying ODSCC for consideration by plants.

The Interim Strategy was issued to the PWROG member utilities under OG-11-67 (Reference 1) with the "Good Practice" recommendations documented in that letter.

Correspondence related to this transmittal should be addressed to:

Mr. W. Anthony Nowinowski, Manager
Owners Group, Program Management Office
Westinghouse Electric Company
1000 Westinghouse Drive, Suite 380
Cranberry Township, PA 16066

If you have any questions, please do not hesitate to contact me at (704) 382-8619 or Mr. W. Anthony Nowinowski of the Owners Group, Program Management Office at (412) 374-6855.

Sincerely yours,

Melvin L. Arey, Jr.

Melvin L. Arey, Jr., Chairman
PWR Owners Group

MLA:JPM:las

Enclosures:

1. Two (2) copies of PWROG document "PWR Owners Group Materials Subcommittee Interim Strategy for Identifying Outside Diameter Initiated Stress Corrosion Cracking (ODSCC) of Stainless Steel Systems, 51-9152699-000

cc:
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PWROG Steering Committee
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Document No.: 51 - 9152699 - 000

PWR Owners Group Materials Subcommittee Interim Strategy for Identifying Outside Diameter Initiated Stress Corrosion Cracking (ODSCC) of Stainless Steel Systems

PWR Owners Group Materials Subcommittee Interim Strategy for Identifying Outside Diameter Initiated Stress Corrosion Cracking (ODSCC) of Stainless Steel Systems

Safety Related? ☐ YES ☒ NO

Does this document contain assumptions requiring verification? ☐ YES ☒ NO

Does this document contain Customer Required Format? ☐ YES ☒ NO

Signature Block

Name and Title/Discipline	Signature	P/LP, R/LR, A/A-CRF, A/A-CRI	Date	Pages/Sections Prepared/Reviewed/ Approved or Comments
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Note: P/LP designates Preparer (P), Lead Preparer (LP)
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Record of Revision

Revision No.	Pages/Sections/ Paragraphs Changed	Brief Description / Change Authorization
000	All	Original Submittal

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1.0 PURPOSE

The interim strategy described herein is intended to 1) ensure a consistent and minimum level of awareness is communicated to the appropriate site organizations regarding recent outside diameter initiated stress corrosion cracking (ODSCC) operating experience (OE) and 2) provide a consistent and minimum set of attributes for identifying ODSCC for consideration by plants.

NEI 03-08 GOOD PRACTICE: Sites should communicate the information contained in the Interim Strategy Slides [Appendix A] to the appropriate organizations at their plants, as identified in the Section 4.1 of this document, and review the interim strategy for applicability to their facilities and consider actions as appropriate. Section 4.1 provides actions for the identification of ODSCC in stainless steel (SS) systems. Section 4.1.1 is referenced in Section 4.1 and is also therefore part of the good practice recommendation.

Section 4.2 is for information only and is not included in the NEI 03-08 good practice recommendation.

2.0 ISSUE SUMMARY

ODSCC of stainless steel piping has been observed at several nuclear power plants around the world, most recently at Callaway, Wolf Creek, San Onofre and Salem. Most of the ODSCC incidents reported in the industry have been the result of chloride contamination. The sources of chlorides have been varied, and have included chlorides from seacoast atmosphere, tapes, marking fluids, threaded joint compounds, and insulation. Industry experience with ODSCC demonstrates that austenitic stainless steels are susceptible to chloride induced SCC, even if not sensitized, and at moderate temperature with relatively low applied stress.

3.0 BACKGROUND

The following OE events at Callaway, Wolf Creek and San Onofre culminated in an increased industry awareness and response by the PWR Owners Group (PWROG) in the spring 2010. The chronology of OE events is presented here for historical information.

In the fall of 2008, the Callaway Nuclear Plant experienced a through-wall leak in the pressurizer auxiliary spray line beneath support clamps as a result of ODSCC [1] . Based on this information, Wolf Creek inspected the pressurizer auxiliary spray line beneath support clamps in fall 2009 refueling outage [2]. Wolf Creek discovered axial indications under a number (12 of 14 locations) of piping support clamps. The indications are observed to be ODSCC that may have developed from chlorides that concentrated under piping support clamps.

San Onofre performed similar inspections in the fall 2009. At both San Onofre units, indications were found in the piping from the refueling water storage tanks to the charging pumps [3]. Small boric acid deposits were found at four locations along the stagnant schedule 10 stainless steel piping from the refueling water storage tanks to the charging pumps of both units. The small leaks were in the heat affected zones of welds, which were sensitized by the welding process. The leaks were not

consequential because the leak rates were too small to quantify, and the flaws were stable and acceptable based on an analysis. Similar leaks were later discovered on the safety injection suction lines. The observed leakage was due to through wall ODSCC and was accompanied by pitting corrosion.

Since the issuance of the white paper by the PWROG, an additional OE event occurred.

In the summer of 2010, Salem Unit 1 identified a boric acid deposit on the upstream side of a reactor coolant pump seal injection return line isolation valve [4]. Indications were found in the valve body, the weld and the adjacent piping. The affected piping is 4-inch diameter schedule 10 stainless steel Type 304. The apparent cause evaluation concluded the failure mechanism to be ODSCC induced by external chloride contamination originating from historical service water leakage from the containment fan coil units and associated piping. An extent of condition evaluation was performed to identify potentially susceptible areas and visual inspections of these areas identified no evidence of boron deposits.

PWROG White Paper - Overview of Conclusions

The white paper was submitted to the PWROG through Letter OG-10-268 in August 2010. The purpose of the white paper is to perform an evaluation of the recently observed occurrences of ODSCC of stainless steel piping components in the PWR industry to make a preliminary assessment of the issue. The ODSCC phenomena observed in austenitic stainless steel piping are not a safety concern in the near term because crack growth is generally slow, the piping material has a high resistance to fracture and the ability to easily identify cracks while they are small and tight allows sufficient time to react before crack size becomes structurally significant. The existing inspection requirements in each plant's boric acid corrosion control (BACC) program and ASME Section XI are adequate for addressing the ODSCC of stainless steel in the near term because the current requirements provide a reasonable cross section of the data and the phenomenon is not an immediate safety concern. Experience has demonstrated these visual inspections to be effective in identifying OD-initiated cracks or associated leaks long before the crack is of structural significance.

4.0 INTERIM STRATEGY FOR ODSCC OF SS

Section 4.1 provides actions for the identification of ODSCC in stainless steel systems and is a good practice recommendation per NEI 03-08. Section 4.1.1 is referenced in Section 4.1 and is also therefore part of the good practice recommendation. Section 4.2 is for information only and is not included in the NEI 03-08 good practice recommendation.

4.1 Actions for the identification of ODSCC

Under existing inspection requirements, stainless steel piping undergoes visual, surface and volumetric inspections for cracks, active leaking of coolant and boric acid deposits. Inspections are performed indirectly by each plant's BACC program and directly by ASME B&PV Code Section XI (e.g. pressure testing, ISI plan) or a Risk Informed In-service Inspection (RI-ISI) program.

The existing BACC Program inspections at each PWR should already contain the necessary requirements and actions to adequately characterize and address any boric acid deposit identified.

In light of the recent ODSCC OE, the following actions are provided for consideration by all operating PWRs to enhance the awareness of the potential for ODSCC of SS piping at each plant and to help increase the likelihood of detecting ODSCC should it be present:

a. Operating PWRs should communicate the ODSCC of SS operating experience (Section 4.1.1) to the various organizations involved with NDE visual inspections (e.g. pressure test inspections), BACC walk downs, BACC maintenance/repair/cleaning activities, BACC evaluations, System Engineer walkdowns, Operator rounds and other applicable site groups, as to be determined by each site. The other groups could include those involved in equipment inspection and maintenance, component modifications and repair, etc. This includes groups that perform walkdowns of portions of non-borated SS systems deemed critical by the individual plant. Increasing awareness of the recent ODSCC OE can be accomplished via pre-outage training, pre-job briefs, plan of the day meetings, department meetings, plant health committee meetings, memorandums to the staff or a combination of the above. The following checklist should be used in documenting the OE for communication to the appropriate organizations:

    i. To ensure an understanding of the recent OE with respect to the potential for ODSCC of stainless steel to occur regardless of plant location or existing cleanliness controls.

    ii. If there is any evidence of boric acid (or indication of leakage on a non-borated system) on insulated piping/components or near a clamp or other obstruction, do not make any assumptions about its potential origin, source or age.

    iii. Any boric acid deposit (or indication of leakage on a non-borated system) on insulated piping/components or near a clamp or other obstruction should be investigated in accordance with the plant's BACC program procedure or other applicable governing procedures.

b. When performing outage and non-outage visual inspections PWRs should take into consideration the potential sources of ODSCC-initiating contaminants or chlorides at and in their plant. This will vary from plant to plant depending on:

    i. Whether the plant is located in a coastal (salt water/air) environment, or not.

    ii. Whether the plant has a history of service water leaks or spills that could have resulted in chloride-containing water coming into contact with SS piping or components.

c. During the course of routine and non-routine BACC inspections, when boric acid deposits are identified on an insulated component or near a pipe clamp or other obstruction, they should be investigated to identify the source of leakage. This may require removal of insulation, pipe clamp or other obstruction.

d. During the course of routine and non-routine walk downs and inspections of non-borated systems, evidence of leakage should be investigated.

4.1.1 Potential sites for ODSCC based upon industry OE

Over the last 5 years, several occurrences of ODSCC in stainless steel systems have been observed. These instances can be separated into three categories based on the cause of concentrated chlorides: 1) marine atmosphere, 2) contamination event, or 3) concentration of aggressive species over time. The locations of ODSCC occurrences over the last 5 years are listed below for each category:

- Marine atmosphere
  - Component cooling water backup nitrogen system piping weld heat affected zone (HAZ) [5]
  - Emergency core cooling system (ECCS) suction piping weld HAZ [3,6]
  - Alternate boration gravity feed to charging line weld HAZ [3]
  - ECCS mini flow return line to refueling water storage tank (RWST) in weld HAZ [3]
  - Top head of emergency diesel generator air start tank in bend radius [7]
- Contamination event
  - Reactor coolant pump (RCP) instrument tubing at point contact with pressure plate [8]
  - RCP instrument tubing weld base metal tube bend and base metal straight segment [9]
  - Accumulator fill line base metal [10]
  - Residual heat removal (RHR) system piping discharge nozzle in HAZ of weld to reinforcement plate [11]
  - RCP seal injection return line containment isolation valve and piping weld HAZ [4]
  - Containment spray piping base metal [12]
- Concentration mechanism
  - SG ASME code safety valve nozzle in crevice between the valve body and the nozzle OD [13]
  - Pressurizer auxiliary spray line under support clamps [1,2]

Some coastal plants have experienced ODSCC of stainless steel piping in contact with the marine atmosphere since the 1990s. Given this history, some plants have addressed the issue by increasing the inspection frequency and scope of stainless steel piping in select areas.

Indoors in a controlled environment, levels of chlorides high enough to cause cracking are commonly due to a contamination event. Possible chloride contamination events include use of vinyl chloride tape, spills of high chloride containing substances, use of chloride containing insulation and exposure to water containing chlorides.

A concentration mechanism can cause levels of chlorides high enough to cause cracking indoors in a controlled environment. Components that have crevices, heat tracing or are alternately wetted/dried can cause trace chlorides to accumulate on the surface over time. Trace chlorides can be present in service water, leaked primary coolant and building humidity.

4.2 Contingency planning for ODSCC (For Information Only; Not Part of Good Practice (GP) Recommendation)

Plants should use their existing processes and procedures for determining contingency planning needs. The need for and degree of contingency planning will differ from plant to plant depending on various technical and non-technical (i.e., business case, risk, etc.) variables. It is not the intent of this interim strategy to specify the need for contingency planning or to provide specific contingency planning recommendations. However, contingency planning could include the selection and/or use of non-visual NDE techniques to characterize visual evidence of leakage, determination of repair options or replacement options.

5.0 REFERENCES

1. "Outside Diameter Stress Corrosion Cracking (ODSCC) was found on the auxiliary spray line and charging lines," INPO database, OE 31274.

2. "Pressurizer Auxiliary Spray Line Indications Outside Diameter Stress Corrosion Cracking," INPO database, OE 30001.

3. "Boric Acid Leak Deposits on Stagnant Schedule 10 Stainless Steel Suction Piping to Charging Pumps and Safety Injection," INPO database, OE 30296.

4. "Leak in Reactor Coolant Pump Seal Injection Return Line due to Outside Diameter Stress Corrosion Cracking," INPO database, OE 32011.

5. "Linear Cracks Discovered During Component Cooling Water Backup Nitrogen System Piping Inspection," INPO database, OE 21779.

6. "ECCS Piping Repairs: Application of NRC GL 91-18, NRC GL 90-05, and AMSE Code Case N-513 for Moderate Energy Class 3 Piping to Class 2 ECCS Suction Piping," INPO database, OE 10050.

7. "Emergency Diesel Generator Air Start Tank Leaks," INPO database, OE 30824.

8. "Reactor Coolant Instrument Line Through-Wall Leak," Salem Unit 2, INPO database, LER 311-05002.

9. "Reactor Coolant System Instrument Tubing Leaks Caused by External Chloride Attack," INPO database, OE 23672.

10. "A through-wall leak was discovered in a 1-inch pipe section," INPO database, OE 20677.

11. "Unacceptable Surface Indications on Residual Heat Removal Heat Exchanger Reinforcement Plates," INPO database, OE 25921.

12. "Containment Spray Piping Through-Wall Leaks," INPO database, OE 23629.

13. "Longitudinal Surface Cracking and Pitting Identified on Crosby Main Steam Code Safety Valve Nozzle," INPO database, OE 30351.

APPENDIX A: INTERIM STRATEGY FOR IDENTIFYING ODSCC OF STAINLESS STEEL SYSTEMS (PRESENTATION SLIDES)

A.1 Presentation Slides

The power point version of the presentation was an attachment to letter OG-10-390 and can be obtained from the PWROG website.

Note that Slide 20 is for information only and is not part of the NEI 03-08 "good practice" recommendation.

PWR Owners Group
Materials Subcommittee Meeting

Interim Strategy for Identifying ODSCC of Stainless Steel Systems (PA-MSC-474/PA-MSC-563)

December 2010

Ryan Hosler, Technical Lead, AREVA NP

Slide 1

PWR Owners Group
Materials Subcommittee Meeting

ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

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PWR Owners Group
Materials Subcommittee Meeting

ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

- **Purpose:**
  - To provide the PWROG membership with a suggested interim strategy for identifying ODSCC of stainless steel systems over the near term, until industry I&E guidelines are developed (~2015)
  - This interim strategy is intended to:
    - Ensure a consistent and minimum level of awareness is communicated to the appropriate site organizations regarding recent ODSCC OE
    - Provide a consistent and minimum set of attributes for identifying ODSCC for consideration by plants
- Note: Sites should communicate the information contained in these slides to the appropriate organizations, review for applicability to their facilities and consider actions as appropriate

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Materials Subcommittee Meeting

ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

- **Proposed actions:**
  - Operating PWRs should communicate the information contained in these slides to the appropriate site organizations
  - At a minimum, these organizations should include those involved in:
    - NDE and visual inspections (e.g., pressure test)
    - BACC walkdowns
    - BACC maintenance/repair/cleaning activities
    - BACC evaluations
    - System engineer walkdowns
    - Operator rounds
    - Equipment inspection and maintenance
    - Component modification and repair
  - This includes groups that perform walkdowns of portions of non-borated SS systems deemed critical by the individual plant

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Materials Subcommittee Meeting

ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

- **Proposed actions (Cont.):**
  - Some suggested methods of communicating ODSCC interim guidance are as follows:
    - pre-outage training
    - pre-job briefs
    - plan of the day meetings
    - department staff meetings
    - plant health committee meetings
    - memorandums to the staff

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Materials Subcommittee Meeting

ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

- **Issue Summary:**
  - ODSCC of SS piping observed at several nuclear power plants around the world
    - Most recently: Callaway, Wolf Creek, San Onofre and Salem
  - Most reported ODSCC the result of the presence of chlorides
  - OE demonstrates that austenitic stainless steels are susceptible to chloride induced SCC
    - Even if non-sensitized, at moderate temperature and relatively low applied stress

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ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

- **Background and Operating Experience:**
  - Callaway (OE 31274)
    - During outage preparation work in fall of 2008, BA deposits found on PZR aux. spray line
    - ODSCC found beneath piping support clamps
    - Replaced affected piping, replaced or cleaned affected insulation
  - Wolf Creek (OE 30001)
    - In response to Callaway OE, BA deposits found on PZR aux. spray line in fall 2009
    - ODSCC found beneath piping support clamps
    - Replaced affected piping, expanded visual inspections of potentially affected systems

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ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

- **Background and Operating Experience (Cont.):**

  - SONGS Units 2&3 (OE 30296)
    - During equipment inspection in 2009. BA deposits found on:
      - alternate boration gravity feed to charging line
      - ECCS suction piping
    - Chloride induced ODSCC due to marine atmosphere
    - Affected piping will be replaced (likely with Sch. 40)
    - Expanded inspections found ODSCC in ECCS mini flow return to RWST at Unit 3
    - Inspections of PZR aux. spray line found no BA deposits

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Materials Subcommittee Meeting

ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

- **Background and Operating Experience (Cont.):**

  - Callaway (OE 31274)
    - In fall 2010, inspections in response to Wolf Creek's expanded inspection scope (OE 30001)
    - ODSCC found beneath additional piping support clamps for PZR Aux. spray line
    - Replaced affected piping, replaced or cleaned affected insulation, expanded inspections for future outages
  - Salem (OE 32011)
    - In July 2010, walkdown found BA deposits on RCP seal injection return line containment isolation valve
    - Destructive examination found ODSCC in valve body and piping
    - Replaced affected valve and piping, inspected other potentially susceptible locations with no issues identified

  Note: New OE should be included in communications to appropriate site groups as it becomes available.

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ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

Summary of Recent ODSCC OE (All Type 304 SS standard carbon)

Site	Location	ASME Class	Nominal Size	Sensit.	Temp.	Moisture	Contaminant	Stress Source
Callaway (2x)	PZR Aux Spray Line	1 & 2	2" NPS Sch. 160	No	~100F, 500F when in use	Building humidity	Chlorides concentrated in crevice	Stress concentration in pits & operational
Wolf Creek	PZR Aux Spray Line	2	2" NPS Sch. 160	No	~100F, 500F when in use	Building humidity	Chlorides concentrated in crevice	Stress concentration in pits & operational
SONGS Unit 2&3	ECCS Suction Piping	2	24" Sch. 10	Yes	60-80F	Open tunnel, marine atm.	Chlorides: marine atm.	Stress conc. In pits, weld residual & operational
SONGS Unit 2&3	Alt. BA gravity feed to charge line	?	6" Sch. 10	Yes	60-80F	Open tunnel, marine atm.	Chlorides: marine atm.	Stress conc. In pits, weld residual & operational
SONGS Unit 3	ECCS mini flow return to RWST	?	10" Sch. 10	Yes	60-80F	Marine atm.	Chlorides: marine atm.	Stress conc. In pits, weld residual & operational
Salem	RCP seal injection return CIV & piping	2	4" Sch. 10	Yes	150F	Historic service water leakage	Chlorides: service water leakage, concentrated by alternate wet/dry	Weld residual & operational

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ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

- **PWROG ODSCC White Paper (Letter OG-10-268 Aug. 2010):**
  - Purpose
    - Requested by PWROG membership to provide a preliminary assessment of the issue
  - Conclusions
    - Existing inspection requirements are adequate for addressing ODSCC of stainless steel in the near term
      - Current requirements provide a reasonable cross section of the data
      - Phenomenon is not an immediate safety concern
  - White paper submitted to NRC, INPO, MRP, BWRVIP in October 2010

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ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

- **Potential sites for ODSCC based upon recent OE:**
  - The recent occurrences of ODSCC in SS systems fit into three general categories:
    1. Marine atmosphere
    2. Contamination event
    3. Concentration of aggressive species over time

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Materials Subcommittee Meeting

ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

- **Potential sites for ODSCC based upon recent OE (Cont.):**

1. **Marine Atmosphere – Typically Coastal Plants**
   - Potential for relatively high background chloride levels to contaminate OD surfaces of SS pipe and components
   - Can affect gas or fluid systems or components
   - Marine Atmosphere Recent OE
     - Component cooling water backup nitrogen system piping weld HAZ (OE 21779)
     - ECCS suction piping weld HAZ (OE 30296 & OE 10050)
     - Alternate boration gravity feed to charging line weld HAZ (OE 30296)
     - ECCS mini flow return line to RWST in weld HAZ (OE 30296)
     - Top head of emergency diesel generator air start tank in bend radius (OE 30824)
   - Some coastal plants with past experience have addressed issue as follows:
     - Increased inspection frequency & inspection scope of SS piping in select areas

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PWR Owners Group
Materials Subcommittee Meeting

ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

- **Potential sites for ODSCC based upon recent OE (Cont.):**

2. Contamination event

- Common sources: vinyl chloride tape, spills of high chloride containing substances, use of chloride containing insulation and exposure to water containing chlorides
- Contamination Event Recent OE
  - RCP instrument tubing at point contact with pressure plate (LER 311-05002)
  - RCP instrument tubing weld HAZ, base metal tube bend and base metal straight segment (OE 23672)
  - Accumulator fill line base metal (OE 20677)
  - RHR system piping discharge nozzle in HAZ of weld to reinforcement plate (OE 25921)
  - RCP seal injection return line containment isolation valve and piping weld HAZ (OE 32011)
  - Containment spray piping base metal (OE 23629)

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Materials Subcommittee Meeting

ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

- **Potential sites for ODSCC based upon recent OE (Cont.):**

3. **Concentration mechanism**
   - Mechanism: Trace chlorides concentrated over time
   - Common locations/conditions: crevices, heat tracing or alternate wet/dry conditions
   - Trace chloride sources: service water, leaked primary coolant, and humidity

   - Concentration Mechanism Recent OE
     - Steam Generator ASME code safety valve nozzle in crevice between the valve body and the nozzle OD (OE 30351)
     - Pressurizer auxiliary spray line under support clamps (OE 31274, OE 30001)

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Materials Subcommittee Meeting

ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

- **Interim Strategy for identification of ODSCC:**

  - **Recommended minimum attributes – Make No Assumptions:**
    - ODSCC of SS can occur regardless of plant location or existing cleanliness controls
    - If there is any evidence of boric acid (or indication of leakage on a non-borated system) on insulated piping/components or near a clamp or other obstruction
      - *Do not make any assumptions about its potential origin, source or age*
    - Boric acid deposits (or indications of leakage on a non-borated system) on insulated piping/components or near a clamp or other obstruction
      - *Should be investigated in accordance with the plant's BACC program procedure or other applicable governing procedures*

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ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

- **Proposed actions for identification of ODSCC (Cont.):**

  - When performing outage and non-outage visual inspections take into consideration the potential sources of ODSCC-initiating contaminants or chlorides at and in your plant
  - This will vary from plant to plant depending on:
    - Location
      - coastal (salt water/air) environment
      - Inland
    - History
      - Service water leaks or spills that could have resulted in chloride-containing water coming into contact with SS piping or components

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Materials Subcommittee Meeting

ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

- **Proposed actions for identification of ODSCC (Cont.):**

  - During the course of routine and non-routine BACC inspections:
    - If boric acid deposits are identified on an insulated component or near a pipe clamp or other obstruction
      - *Investigate to identify the source of leakage*
        - This may require removal of insulation, pipe clamp or other obstruction
      - ***Make No Assumptions about the possible source of the deposit***

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ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

- **Proposed actions for identification of ODSCC (Cont.):**

  - During the course of routine and non-routine walk downs and inspections of non-borated systems
    - Evidence of leakage should be investigated

❖ *Make No Assumptions about the possible source of the deposit*

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ODSCC Interim Strategy (PA-MSC-474/PA-MSC-563)

- **Contingency Planning for ODSCC (For Information Only; Not part of GP Recommendation):**
  - Plants should use their existing processes and procedures for determining contingency planning needs
  - The need for and degree of contingency planning will differ from plant to plant depending on various technical and non-technical (i.e., business case, risk, etc.) variables
  - It is not the intent of this interim strategy to specify the need for contingency planning or to provide specific contingency planning recommendations
    - Some considerations:
      - Selection and/or use of non-visual NDE techniques to characterize visual evidence of leakage
      - Determination of repair options or replacement options

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PWR Owners Group
Materials Subcommittee Meeting

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