From: Robert Haag
To: Joelle Starefos; LLTF
Date: 6/20/02 12:55PM
Subject: Grp 1 inspection/rerview plan

. Attached is the lasted version of the grp 1 review plan It is maintained of the EDO/Davis-Besse/Group 1 directory. I still be to make to first cut at assignment for the many review areas. I'll send that out later today.

H-52

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ASSESSMENT AREAS FOR GROUP 1 TO ACCOMPLISH CHARTER ITEMS 1 and 2 (Parts)

DB LLTF Group 1 should address the following areas:

a. *Reactor Oversight Process Issues - evaluate the underlying causes of the Davis-Besse reactor vessel head degradation, and assess whether enhancements to the NRC's reactor oversight process are warranted.*

b. *Regulatory Process Issues - evaluate ... enforcement, allegations, reporting, and industry operating expenence/ generic communication ... to determine whether enhancements are warranted in light of the recent discovery of reactor vessel head degradation at Davis-Besse*

1. Evaluate the adequacy of the DB boric acid corrosion (BAC) program and other related programs to determine why they failed to identify reactor head degradation earlier and prevent significant damage to head.

a. *Were their processes adequate to manage BAC?*

Assessment Objective:

- **Did the BAC program adequately implement GLs 88-05 and 97-01?**
- **Was OE information on BAC properly factored into the program?**
- **Determine if commitments documented in the submittals and any relevant Information from NRC SERs were incorporated into the licensee's program**
- **Determine if BAC items were captured within the commitments program**
- **Did any process existed to ensure that NRC commitments were implemented.**
- **Was DB aware of the practice of radionuclide sampling for boron deposits to determine active nozzle cracks? How about the rest of industry?**

Pre-Identified Issues:
- Changes made to the BAC program in response to RC-2 enforcement

Documents:
- GL 88-05 and 97-01
- FENOC responses to the Gls
- NRC SERs or similar documents addressing FENCO's response to GLs
- NG-EN-00324, Boric Acid Corrosion Control, Rev. 0 and 1.
- Any additional OE on BA corrosion
- Licensee's commitment tracking database
- NUREG/CR-5576

Interviews:
- Engineering and other personnel involved with developing and maintaining the BAC program. Question areas to include RCS penetrations in addition to VHPs (THot RTDs, pressurizer instruments and heaters) and insulation removal considerations.

- QA/QC and licensing personnel involved with NRC commitments

b. *Were individuals adequately implementing program requirements?*

Assessment Objective (BAC program implementation):

- **Was the BA corrosion program properly implemented when accepting BA deposits on the head and not verifying actual surface condition?**
- **Were other cases of BA on plant equipment properly dealt with?**
- **Determine rigor of inspection, i.e., level of effort expended on RCS penetrations to observe bare metal**
- **Determine if BAC program implementation was principally focused on packing and seal leaks**
- **Did the 1996 allegation have any connection to BAC or CRDM nozzle cracking?**
- **What were the results of DB VT-2 boric acid exams? Were they adequate?**
- **What were results of corrosion identified on hot leg?**

Pre-Identified Issues:

- Licensee repeatedly allowed BA to remain on Rx head
- The licensee recognized continuing carbon steel corrosion in the containment (via rad monitor filter analysis) and stated that containment would be thoroughly inspected in 2000 outage
- 1996 allegation dealing with CRDMs
- CR 2000-1037 states that boron was removed btwn the head and insulation after cleaning and no damage to head surfaces was noted during subsequent inspections. Is this the condition identified in the video tape?
- Laboratory analysis of the rad monitor filter identified ferrous oxide originating from a steam leak in lieu of surface rust Was the significance of this information recognized and by whom?

Documents:

- BAC related pictures and videos
- All condition reports (or other corrective action documents) related to BAC
- Operability evaluation related to BAC
- CR 2000-1037 and related WO 00-00-1846
- Applicable system health reports
- Maintenance records for CRDM flange leaks and other borated water leakage
- Scope and results of 2000 outage inspections for sources of corrosion
- 1996 allegation file dealing with CRDM
- Laboratory results for rad monitor filter
- -VT-2 BA exam results

Interviews:

- Applicable engineering and BAC program implementing personnel.
- Individuals involved with 2000 containment inspections
- Individuals reviewing 4 CRs specified in DB root cause analysis

Assessment Objective (implementing other programs):

- **Were corrective action documents written when appropriate?**
- **Were BAC corrective actions timely, appropriate and effective?**
- **Determine level of rigor applied to corrective action closeouts**
- **Review CA process and method for determining significance of conditions and determining scope of corrective actions**
- **Determine if scope of corrective actions or operability assessments accounted for cross-discipline impacts.**
- **Were QA/QC audits of the BAC program performed (if No why not)**
- **Were QA/QC assessments accurate?**
- **Were there QA/QC audit/surveillance plans equivalent to NRC IP 62001**
- **Assess the processing and sharing of industry events information.**
- **Did engineering personnel "talk" to each other. Both for "backup" system engineers, cross-discipline/interconnecting system effects, design vs. systems engineering**

Pre-Identified Issues:

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Documents:
- Logs, system health reports, etc. which may identify BAC
- Any QA/QC audits that reviewed the BAC program or related areas
- Condition reports and other CA documents involving BAC
- Operability assessments involving BAC

Interviews:
- QA/QC personnel
- Engineering and maintenance personnel involved with repair activities
- In-house events assessment personnel
- CARB members to determine if reviews fostered synergism

Assessment Objective (management involvement):

- **Was management oversight and involvement in the BAC program appropriate and IAW program guidance?**
- **Based on interaction with NRC staff is there evidence that DB management was aware of BA on head**
- **Was there too much emphasis placed on outage schedules, production goals?**
- **Were budget constrains at DB that may have influenced CRDM flange repairs, mod to service structure, or cleaning of head?**

Pre-Identified Issues:
- Correspondence regarding Dec 2001 shutdown for head inspection indicated head was clean ***(Art thinks there are 3 licensee letters related to these discussions)***
- HQ stated that in their interaction with DB, BA on the head was not identified

Review:
- CA document, meeting summaries, records of conversations, e-mails, etc., related to level of management involvement ***(provide as input to Group 2 for licensing review)***
- Correspondence with NRC on subject (Response to BL 2001-01 and any add'l information exchange regarding plant shutdown in 12/01 verses Spring 2002
- Outage schedules vrs actual outage duration
- O&M and capital improvements since 1990

Interview:
- Management and individuals who might collaborate managements involvement
- HQ personnel (PM, PD, Project Director, Bill Bateman, Allan Hiser, etc.) involved with CRDM nozzle issues and planned shutdown ***(Group 2 to collect this information)***
- R III personnel (Jack Grobe, Jeff Grant, RA, DRA, DRP and DRS branch chiefs, etc.) involved with CRDM nozzle issues and planned shutdown
- Outage schedulers (to understand management direction for maintaining outage schedules)

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2. Determine if Previous 2515 Inspection Program (Core and regional Initiative) was adequate to identified and recognize the significance of BA on Rx head and effect change in licensee's handling of condition. Was the Previous 2515 Inspection Program properly implemented?

- *Core Inspections:*

- Assessment Objective:
  - **Is there adequate guidance in core procedures to inspect for BA corrosion and resulting corrective actions**
  - **Review actual inspections that were performed in this area and assess if results were consistent with known conditions**
  - **Determine if appropriate inspection followup actions were taken (i.e.,**

should an IFI been opened for reviewing the licensee's corrosion inspection results?)

- **Did RIII followup on licensee containment inspections to determine source of corrosion during the 2000 refueling outage**
- **Did inspector training adequately address BAC, CRDM nozzle cracking and RCS leakage?**
- **Were the inspectors involved with DB properly trained and qualified?**
- **At the time of RC-2 EA, was the staff aware of the CAC and rad monitor filter clogging? Did the inspectors recognize the significance of the CACs and filter clogging?**
- **Did the NRC review the relief valve temp mod and was the BAC implication recognized and inspected?**
- **Was IP 73753, Section 02.03e ever used for CRDM welds or were other Class 1 pressure boundary welds (particularly in RB with ALARA considerations)**
- **Was IP 73753 routinely used during refueling outages**

Pre-Identified Issues:
- IR 99-009 and 99-010 discusses clogging of rad monitor filters under IP 71707 and 37551 reviews. They mention that licensee testing revealed the particulate was primarily iron oxide, but that the source was unknown and the licensee planned to perform thorough inspections of containment during the next refueling outage (in addition we were told that the lab analysis stated a steam leak was associated w/ the corrosion)
- Containment Air Cooler (CAC) flow indication meter in the control room provide indication for low flow conditions. Were the residents aware of this and what was their response?

Review.
- Inspection procedures 71707, 62707, 73753 (ISI), and 40500.
- Inspection Reports with reference to BA corrosion
- Control room logs for CACs and containment rad monitors, equipment out of service logs, TS entry log, etc.
- Plant status sheets from POD or other meetings in which equipment degradations are discussed
- Laboratory analysis for rad monitor filter
- Resident and regional inspector training requirements (IMC 1245). Were the residents fully qualified? Number of previous sites they have inspected at and how many other PWR containments have they been in? Review their training and qualification records
- Resident demographics
- Any records of licensee discussion with NRC regarding CRDM nozzle cracking and BAC

Interview:
- SRIs, RIs, PEs, applicable DRS inspectors, Branch chiefs, and Deputy and Div. Directors
- Licensee individuals having discussions with the NRC on CRDM nozzle cracking and BAC

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- Regional Initiative (RI) Inspections, including open item followup, and LER followup

Assessment Objective:

- **Was there adequate guidance in RI procedures to technically assess the adequacy of BA corrosion given there was a need to pursue this area**
- **Do followup procedures provide guidance to ensure F/U inspections verify that licensee actions are sufficient**
- **Review any regional initiative and followup inspections that were performed in this area and assess if results were consistent with known conditions**
- **Determine if regional initiative inspection were performed when needed, specifically what criteria did RIII use for initiating use of IP 62001. Since it was used at Cook, there was knowledge of its existence.**
- **Were there lessons learned, commitments or other insights from the 1985 events that are relative to the Rx head degradation**

Pre-Identified Issues:
- IP 62001 had not been used at DB even with EA on RC-2
- Only 35 hours charged to IP 62001 from 1995 to 9/01
- Licensee response to RC-2 EA included to changes/improvements to their BAC program. Were these implemented and did the NRC followup on the NOV.
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Review:
- Any regional initiative inspections, whether directed by SALP, QPPR, or other means
- Inspection procedures 62001, 92901 and 93702
- Inspection Reports with reference to BA corrosion
- Review condition reports, LERs, etc. (to identify issues/ events where regional initiative inspections should have been performed
- Art and Bob to obtain MIPS results for IP62001 use in R II and IV for period, 8/91-1995
- MIPS data provided by RIII
- RIII inspection reports documenting IP 62001 implementation
- Documents related to 1985 event, including NUREG, licensee commitments, etc.

Interview:
- SRIs, RIs, PEs, applicable DRS inspectors, Branch chiefs, and Deputy and Div. Directors.
- Discuss with Individuals having oversight of Cook the factors that caused the use of 62001

-Reactive Inspections (SIT/AIT/IIT), Safety Issue Inspections, and Team inspections

Assessment Objective:

- **Are program instructions associated with these efforts adequate to perform effective reviews of BAC issues/ events?**

- **Review the adequacy of any additional inspection guidance that may exist**
- **For any of these types of inspections performed, did they review issues related to BAC and make appropriate conclusions**
- **For GLs 88-05 and 97-01, what followup was performed by the NRC and the industry**
- **For GLs 88-05 and 97-01, were the decisions not to perform Temporary Instructions correct**

Pre-Identified Issues:
- Special Inspection for RC-2
- Did GLs 88-05 have associated TIs (not sure at this time, we have no data that identified TIs)
- SONSs RCS nozzle cracking was pursued with EA and the IP 62001 was utilized. Review case for lessons learned

Review:
- MD 8.3
- Applicable inspection reports
- RC-2 episode (case study discussed below)
- HQ files dealing with GL 88-05 and 97-01
- Licensee files addressing GL 88-05 and 97-01
- SONGs nozzle cracking related documents

Interviews:
- Individuals involved with RC-2 special inspection
- Individuals involved with GLs 88-05 and 97-01

- *SALP and QPPR*

Assessment Objective:
- **Was there adequate guidance for SALP and QPPR to recognize the continuing problem with BA on Rx head and the lack of effective corrective actions?**
- **Did DB SALPs and QPPRs thoroughly review applicable plant information and were assessments on target given the information that was available on Rx head BA.**
- **Did DB have any SALP Level 3 scores that required increase in inspection/ frequencies, such as 73051 (Inservice inspection - Program review)**

Review:
- SALP and QPPR reports

Interview:
- members and staff associated with SALPs and QPPRs.

RC-2 Case Study

Assessment Objective:

- Was the staff aware of CAC and rad monitor clogging while RC-2 EA was issued
- Was there a Open Item for RC-2 EA NOV and was the item closed?
- Where the corrective actions specified in the LER as commitments review and verified by the NRC?
- What risk significance would the ROP assign to this issue?

3. Determine if ROP provides adequate guidance to identified and recognize the significance of BA on Rx head and effect changes in the licensee's handling of the condition Were ROP inspections, risk reviews, and performance assessments

- *Baseline (BL) and Supplemental Inspections*

Assessment Objective:

- **Do BL procedure provide adequate instructions to review licensee BAC program implementation and identify situations were BAC is not properly controlled? Is additional guidance needed look at BAC control for other locations, i.e., bottom of head, RCS nozzle *(Coordinate w/ Joe & Ed)***
- **Were BL inspection properly implemented with respect to BAC?**
- **Are supplemental procedures adequate to evaluate BAC type issues?**
- **Does Appendix B contain adequate technical guidance to assist in supplemental inspections?**
- **Is the ROP too restrictive and focused on number on inspection activities**
- **Would the ROP look at BAC indications such as CAC and rad monitor clogging**
- **Did the NRC review licensee corrective actions for cleaning BA from the head**
- **For ISI inspections, did we review any RCS leakage conditions/ issues**
- **Did BL program at DB review TS logs and containment entries? Was there any insights gained from these reviews?**
- **Was there a safety culture problem at DB? Can the ROP ID and deal with it**
- **Was ALARA overly emphasized at DB and how does the NRC address this**
- **Did the ROP de-emphasize inspection of plant hardware**
- **Does the ROP not focus on potential risk significant issues because they are not modeled by the PRA**
- **How does RIII handoff issues to DRS**
- **How does RIII followup on potential issues from the daily standup meeting**
- **Were there unintended consequences on ALARA NUREG data collection and dissemination**
- **Were the residents reviewing CRs daily? Did they review CR 1037?**

Pre-Identified Issues:

- Cancellation of IP 62001: Understand considerations/ basis for deletion, did they understand that IP was issued due to GL 88-05
- Specific inspection guidance for BAC is not included in BL inspection procedures
- Inspection Report 01-013 discusses a temporary modification review of the bypassing of rad monitor charcoal filter

Reviews:

- BL inspection procedures which have general guidance that could apply to review BAC
- ROP bases documents which justify why RCS corrosion is NOT included in ROP
- TS logs, containment entry lists

- Any discussions in DRP branch mtg, standup mtg, or inspection debriefs that mentioned status of BA on head or CAC or rad monitor clogging

Interviews:
- RIs, SRIs, and other inspectors who inspected DB in areas that may apply to BAC
- Branch chiefs and Deputy and Divisions Directors for these inspectors
- SRIs, RIs, PEs, applicable DRS inspectors, Branch chiefs, and Deputy and Div. Directors with knowledge on regional conduct
- Gerry Klingler, NRR
- ROP inspection development team members who are available

- Generic Safety Issues, Special, and Infrequent Inspections

Assessment Objective:
- **Are program instructions associated with these efforts adequate to perform effective reviews of BAC issues/ events?**
- **Did the TI for BL 2001-01 address BAC or was it too focused on nozzle cracking**
- **Are inspectors appropriately trained to perform inspection specified within the a TI?**

Pre-Identified Issues:
- No specific BAC guidance exist with cancellation of 62001

Reviews:
- Supplemental Insp Procedures, 95001,
- IMC 1245 on guidance for training on new topics, such as TIs

Interviews:
- IMC 1245 lead/ responsible individuals

-SIT/AIT/IIT

Assessment Objective:
- **Was the decision to perform an AIT for reactor head degradation correct**
- **Is the guidance in MD8.3 prescriptive enough to obtain a predicable and repeatable decision on level of event response**
- **Are instructions adequate for to perform an SIT/AIT/IIT review for BAC type occurrences**

Pre-Identified Issues:
- An AIT was performed for DB head degradation, some staff members stating that regional and HQ views differed on whether the inspection should be a SIT, AIT, or IIT

Review:
- MD 8.3

Interviews:

- HQ and regional decision maker regarding DB AIT
- R. Wessman (IRO)

- *PI&Rs*

Assessment Objective:

- **Is IP 71152 guidance adequate to identify BAC problems which may not have resulted in component failures but have reduced safety margins**
- **Was information available for the PI&R inspection to assess and recognize the continuing problem with BA on the reactor head?**
- **Did previous DB PI&R draw accurate conclusions?**
- **Were there licensee self assessments/ audits of BAC or nozzle cracking**
- **Can our processes (PI&R, allegations, etc) assess safety culture issues without direct regulations in this area**
- **Are there human performance issues or safety conscious work environment issues at DB that the ROP/PI&R did not properly assess**
- **Does RIII use standard bagman lists for PI&R or other major inspections? Did that capture the 5 CRs of interest?**

Pre-Identified Issues:
- PI&R report 01-005 concluded that, "Corrective action specified appropriate matched the identified causes and were effective in preventing recurrence of significant conditions adverse to quality".
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Reviews:
- Previous PI&R inspection report 01-005 and any others
- Data that the PI&R reviewed to understand the scope of their review

Interviews
- PI&R team members

- *Performance Indicators*

Assessment Objective:

- **Assess the adequacy of Barrier Integrity PI for detecting potential BAC conditions**
- **Did DB Barrier Integrity PI provide any insights into head BA condition?**

Pre-Identified Issues:
- All DB performance indicators since ROP inception have been Green
-

Reviews:
- Bases documents related to Barrier Integrity PI

Interviews:

- Individuals involved with PI program to understand PI limitations and any future changes

-*Significance Determination Process*

Assessment Objective:

- **Can the SDP provide meaningful insights for BAC conditions or is it too dependent on actual loss of function, e.g., failure?**
- **Can consistent and accurate risk assessment be performed for CRDM nozzle cracking**
- **Is the SDP task group reviewing BAC and the ability to assess these types of conditions**
- **What would be the risk assessment under SDP for RC-2**

Pre-Identified Issues:
- Risk assessments for previous CRDM nozzle cracking has not been consistent
- Determining the initiating frequency for failure of the head cladding has been very difficult. This is consistent with assessment of other issues in which actual failure hasn't occurred but margin to safety is reduced

Reviews:
- Previous cases that have disposition CRDM nozzle cracking and other RCS boundary leakage
- Current results of head degradation assessment
- Other SDP results for BAC issues

Interviews:
- OE
- SRA or reviewer performing the DB risk assessment
- Other individuals with knowledge on limitations or problems for SDPs involving BAC
- SDP task group leader
- SRA to question what risk results would be for RC-2

- *Action Matrix:*

Assessment Objective:

- **Can the Action Matrix provide proper agency direction for BAC issues?**
- **If BAC type problems don't have significant enough risk assessment yet are indicative of overall decreases in licensee performance, can the NRC provide appropriate levels of regulatory oversight?**

Pre-Identified Issues:
- Under the ROP DB has had ALL Green Pis and only Green findings
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Reviews:
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Interviews:

4. Determine if the generic communication and industry operating experience programs have focused proper attention to BAC. Were the industry's and NRC's safety significant views on BAC at the proper level? If not, was the manner in which previous BAC experience was presented at fault?

-Generic Communications Process: Lloyd

Review Areas:

- Procedure used to develop and issue GCs
- Expectations for GCs (NRC & Industry)
- Followup of Gcs
- Inspector training

Review Objectives:

- Determ if GC development and followup process cause inadequate attention to
- BAC/head degradation
- Determ if inspectors are trained on Generic issues (initial and continuing)

Pre-Identified Issues:

- What NRC guidance is there relative to implementing GCs
- Was more than a GC required to address BAC (e.g., rule)
- Was long-term attention/followup to Gcs deficient
- GL 88-05 and GDC enforceability

Documents:

- AEC Letter, dated Jan 18, 1972, to Yankee Atomic Electric Company
- IN 86-108
- GL 88-05, 97-01
- IN 96-11
- BL 2001-01, 2002-01
- NRR memo Guidance on Generic Communications Development, July 29,1999
- IMC 1245

Interviews:

- IMC 1245 lead/responsible individuals

- *Industry Operating Experience*: Lloyd

Review Areas:

- Translation to BWRs
- Related ASP/AOs/AO items of interest
- Operating experience reported within the industry and to the NRC
- Availability of information
- Calvert cliffs LER on BAC with signs of wetted conditions
- Is the issue with CE plants having higher than other average RCS nozzle

cracking being adequately addressed?

Review Objectives:

- Determ what insights industry operating experience offers rel to BAC/RPVHD
- Is this a new phenom./Could condition have been foreseen
- Determ degree to which that information was available to industry and the NRC
- Determ how that information was used/dispositioned within the NRC HQ organizations
- Did ROP change effort to assess industry operating experience?
- Assess NUMARC 93-01. 9.3.1 and related 11/19/93 NRC letter to NUMARC to assess NRC and industry safety views on nozzle cracking.

Pre-Identified Issues:

- How does NRR monitor operational data to verify licensee corr actions
- Are the nozzle cracking outliers by NSSS design
- Could the condition have been foreseen?
- What assumptions were used in determining how operating experience information would be dispositioned?

Documents:

INPO SOERs
Vendor Notices
Boric Acid Guidebook?
LERs
MD 8.5 operational Safety Data Review
NUMARC 93-01
NRC letter to NUMARC dated 11/19/93

Interviews:

Former AEOD staff members
NRR/DE
NRR/DSSA
NRR/DLPM
NRR/DRIP
RES
INPO
NEI

5. How did the Allegation, Enforcement, and Reportability processes contribute to the industry's and NRC's recognition of the significance of BAC? Were allegation and enf. cases involving BAC properly dispositioned? Have licensees properly reported conditions of RSC boundary leakage?

-Allegation

Assessment Objective:

- **Determ if previous allegation cases provided information regarding**

condition of DB head and/or problems with BAC
- **Were these cases properly dispositioned**

Pre-Identified Issues:
- 1996 case in RIII dealing with CRDMs, determine its applicability to head BA
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Reviews
- 1996 case
- Index of 1990 -2002 RIII allegations

Interviews:
- Individuals knowledgeable with 1996 case and RIII's allegation processing

-*Enforcement*

Assessment Objective:

- **Has enforcement of BAC and CRDM nozzle cracking issues been IAW agency policy?**
- **Did enforcement (or lack of) contribute to the safety significance applied to BAC**
- **Were there any management meeting or enf conferences in which precursors or related issues were discussed**
- **Was the lack of earlier enforcement for RCS leakage an inadvertent safety significant message to the industry**
- **Is SONGs view expressed at 1997 enf conference (EA 97-414) indicative of industry views?**

Pre-Identified Issues:
- LER search identified a number of BAC examples, however corresponding enforcement is questionable
- Recent enforcement of CRDM cracking has been inconsistent
- EA issued for SONGs on RCS nozzle though wall cracking
- RC-2 EA action (see case study)

Reviews:
- Previous if enf cases files to identify issues with BAC
- Regional practices with enforcement at the NCV or SL IV range (Art and Bob to review for RII and RV)
-SONGs EA 97-414

Interviews:
- Dave Nelson
- RIII enforcement officer

- *Reportability*

Assessment Objective:

- Determ licensees were properly reporting RCS leakage per 50.72 and/or 50.73
- If utilities were not meeting reportability requirements, why didn't the staff identify this noncompliance with regulations?
- For cases where BAC was reported, did the NRC followup with the appropriate actions

Pre-Identified Issues:
- While a number of LER exist related BAC, very few report where made for RCS boundary leakage

Reviews:
- Summer and Oconee LERs to see if they reported RCPB leakage

Interviews
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Other Topics

INES Rating: Was the final "3" rating accurate for the situation/ conditions that we are aware of? **(Lloyd)**