

Appendix A: Consolidated Recommendations

Recommendation No.	Recommendation
3.1.1(1)	The NRC should assemble foreign and domestic information concerning Alloy 600 (and other nickel based alloys) nozzle cracking and boric acid corrosion from technical studies, previous related generic communications, industry guidance, and operational events. Following an analysis of nickel based alloy nozzle susceptibility to stress corrosion cracking (SCC), including other susceptible components, and boric acid corrosion of carbon steel, the NRC should propose a course of action and an implementation schedule to address the results.
3.1.2(1)	The NRC should revise its processes to require short-term and long-term follow-on verification of licensee actions to address significant generic communications (i.e., bulletins and GLs).
3.1.2(2)	The NRC should establish review guidance for accepting owners group and industry resolutions for generic communications and generic issues. Such guidance should include provisions for verifying implementation of activities by individual owners groups and licensees.
3.1.2(3)	The NRC should establish process guidance to ensure that generic requirements or guidance are not inappropriately affected when making unrelated changes to processes, guidance, etc. (e.g., deleting inspection procedures that were developed in response to a generic issue).
3.1.2(4)	The NRC should review industry approaches used by licensees to consider economic factors involved with VHP nozzle inspection and repair. This might include conducting representative cost/benefit analyses of non-visual inspections of VHP nozzles that would consider factors involving dose, cost, and time involved. The NRC should consider this information in the formulation of future positions regarding the performance of non-visual inspections of VHP nozzles.
3.1.2(5)	The NRC should conduct follow-on verification of licensee actions associated with a sample of other significant generic communications, with emphasis on those involving generic communication actions that are primarily programmatic in nature.
3.1.3(1)	The NRC should evaluate, and revise as necessary, the guidance for proposing candidate GLs.
3.1.3(2)	The NRC should conduct follow-on verification of licensee actions pertaining to a sample of resolved GLs.

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3.1.4(1)	The NRC should determine if it is appropriate to continue using the existing SCC models as a predictor of VHP nozzle PWSCC susceptibility given the apparent large uncertainties associated with the models. The NRC should determine whether additional analysis and testing are needed to reduce uncertainties in these models relative to their continued application in regulatory decision making.
3.1.5(1)	The NRC should determine whether PWR plants should install on-line enhanced leakage detection systems on critical plant components, which would be capable of detecting leakage rates of significantly less than 1 gpm.
3.1.6(1)	The NRC should take the following steps to address the effectiveness of its programs involving the review of operating experience: (1) evaluate the agency's capability to retain operating experience information and to perform longer-term operating experience reviews; (2) evaluate thresholds, criteria, and guidance for initiating generic communications; (3) evaluate opportunities for additional effectiveness and efficiency gains stemming from changes in organizational alignments (e.g., a centralized NRC operational experience "clearing house"); (4) evaluate the effectiveness of the Generic Issues Program; and (5) evaluate the effectiveness of the internal dissemination of operating experience to end users.
3.1.6(2)	The NRC should update its operating experience guidance documents.
3.1.6(3)	The NRC should enhance the effectiveness of its processes for the collection, review, assessment, storage, retrieval, and dissemination of foreign operating experience.
3.2.1(1)	The NRC should improve the requirements pertaining to RCS unidentified leakage and RCPB leakage to ensure that they are sufficient to: (1) provide the ability to discriminate between RCS unidentified leakage and RCPB leakage; and (2) provide reasonable assurance that plants are not operated at power with RCPB leakage.
3.2.1(2)	The NRC should develop inspection guidance pertaining to RCS unidentified leakage that includes action levels to trigger increasing levels of NRC interaction with licensees in order to assess licensee actions in response to increasing levels of unidentified RCS leakage. The action level criteria should identify adverse trends in RCS unidentified leakage that could indicate RCPB degradation.

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3.2.1(3)	The NRC should inspect plant alarm response procedure requirements for leakage monitoring systems to assess whether they provide adequate guidance for the identification of RCPB leakage.
3.2.2(1)	The NRC should inspect the adequacy of PWR plant boric acid corrosion control programs, including their implementation effectiveness, to determine their acceptability for the identification of boric acid leakage, and their acceptability to ensure that adequate evaluations are performed for identified boric acid leaks.
3.2.3(1)	The NRC should review a sample of NRC safety evaluations of owners' group submissions to identify whether intended actions that supported the bases of the NRC's conclusions were effectively implemented.
3.2.3(2)	The NRC should develop general inspection guidance for the periodic verification of the implementation of owners groups' commitments made on behalf of their members.
3.2.4(1)	The NRC should assess the scope and adequacy of its requirements governing licensee review of operating experience.
3.2.5(1)	The NRC should develop inspection guidance to assess scheduler influences on outage work scope.
3.2.5(2)	The NRC should revise its inspection guidance to provide assessments of: (1) the safety implications of long-standing, unresolved problems; (2) corrective actions phased in over several years or refueling outages; and (3) deferred modifications.
3.3.1(1)	The NRC should provide training and reinforce expectations to NRC managers and staff members to address the following areas: (1) maintaining a questioning attitude in the conduct of inspection activities; (2) developing inspection insights stemming from the DBNPS event relative to symptoms and indications of RCS leakage; (3) communicating expectations regarding the inspection followup of the types of problems that occurred at DBNPS; and (4) maintaining an awareness of surroundings while conducting inspections. Training requirements should be evaluated to include the appropriate mix of formal training and on-the-job training commensurate with experience. Mechanisms should be established to perpetuate these training requirements.

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3.3.1(2)	The NRC should develop inspection guidance to assess repetitive or multiple TS action statement entries, as well as, the radiation dose implications associated with repetitive tasks.
3.3.2(1)	The NRC should develop inspection guidance for the periodic inspection of PWR plant boric acid corrosion control programs.
3.3.2(2)	The NRC should revise the overall PI&R inspection approach such that issues similar to those experienced at DBNPS are reviewed and assessed. The NRC should enhance the guidance for these inspections to prescribe the format of information that is screened when determining which specific problems will be reviewed.
3.3.2(3)	The NRC should provide enhanced Inspection Manual Chapter guidance to pursue issues and problems identified during plant status reviews.
3.3.2(4)	The NRC should revise its inspection guidance to provide for the longer-term followup of issues that have not progressed to a finding.
3.3.3(1)	As an additional level of assurance, the NRC should identify alternative mechanisms to independently assess plant performance as a means of self-assessing NRC processes. Once identified, the feasibility of such mechanisms should be determined.
3.3.3(2)	The NRC should perform a sample review of the plant assessments conducted under the interim PPR assessment process (1998-2000) to determine whether there are plant safety issues that have not been adequately assessed.
3.3.3(3)	The NRC should continue ongoing efforts to review and improve the usefulness of the barrier integrity PIs. These review efforts should evaluate the feasibility of establishing a PI which tracks the number, duration, and rate of primary system leaks that have been identified but not corrected.

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3.3.4(1)	The NRC should review its inspection guidance pertaining to refueling outage activities to determine whether the level of inspection effort and guidance are sufficient given the typically high level of licensee activity during relatively short outage periods. The impact of extended operating cycles on the opportunity to inspect inside containment and the lack of inspection focus on passive components should be reviewed. This review should also determine whether the guidance and level of effort are sufficient for inspecting other plant areas which are difficult to access or where access is routinely restricted.
3.3.4(2)	The NRC should strengthen its inspection guidance pertaining to the periodic review of operating experience. The level of effort should be changed, as appropriate, to be commensurate with the revised guidance.
3.3.4(3)	The NRC should develop inspection guidance or revise existing guidance, such as IP 71111.08, to ensure that VHP nozzles and the RPV head area are periodically reviewed by the NRC during licensee ISI activities. Such NRC inspections could be accomplished by direct observation, remote video observation, or by the review of videotapes. General guidance pertaining to boric acid corrosion observations should be included in IP 71111.08.
3.3.4(4)	The NRC should revise IMC 0350 to permit implementation of IMC 0350 without first having established that a significant performance problem exists, as defined by the ROP.
3.3.4(5)	The NRC should review the range of NRC baseline inspections and plant assessment processes, as well as other NRC programs, to determine whether sufficient programs and processes are in place to identify and appropriately disposition the types of problems experienced at DBNPS. Additionally, the NRC should provide more structured and focused inspections to assess licensee employee concerns programs and safety conscious work environment.
3.3.4(6)	The NRC should provide ROP refresher training to managers and staff members.
3.3.4(7)	The NRC should reassess the basis for the cancellation of the inspection procedures that were deleted by Inspection Manual Chapter, Change Notice 01-017 to determine whether there are deleted inspection procedures that have continuing applicability. Reactivate such procedures, as appropriate.

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3.3.4(8)	The NRC should encourage ASME Code requirement changes for bare metal inspections of nickel based alloy nozzles for which the code does not require the removal of insulation for inspections. The NRC should also encourage ASME Code requirement changes for the conduct of non-visual NDE inspections of VHP nozzles. Alternatively, the NRC should revise 10 CFR 50.55a to address these areas.
3.3.4(9)	The NRC should review PWR plant TS to identify plants that have non-standard RCPB leakage requirements and should pursue changes to those TS to make them consistent among all plants.
3.3.5(1)	The NRC should maintain its expertise in the subject areas by ensuring that NRC inspector training includes: (1) boric acid corrosion effects and control; and (2) PWSCC of nickel based alloy nozzles.
3.3.5(2)	The NRC should reinforce IMC 0102 expectations regarding regional manager visits to reactor sites.
3.3.5(3)	The NRC should establish measurements for resident inspector staffing, including the establishment of program expectations to satisfy minimum staffing levels.
3.3.5(4)	The NRC should develop guidance to address the impacts of IMC 0350 implementation on the regional organizational alignment and resource allocation.
3.3.7(1)	The NRC should reinforce expectations for the implementation of guidance in the PM handbook for PM site visits, coordination between PMs and resident inspectors, and PM assignment duration. The NRC should reinforce expectations provided to PMs and their supervisors regarding the questioning of information involving plant operation and conditions. Also, the NRC should strengthen the guidance related to the license amendment review process to emphasize the need to consider current system conditions, reliability, and performance data in SERs. In order to improve the licensing decision-making process, the NRC should strengthen its guidance regarding the verification of information provided by licensees.
3.3.7(2)	The NRC should establish guidance to ensure that decisions to allow deviations from agency guidelines and recommendations issued in generic communications are adequately documented.

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3.3.7(3)	The NRC should evaluate the adequacy of analysis methods involving the assessment of risk associated with passive component degradation, including the integration of the results of such analyses into the regulatory decision making process.
3.3.7(4)	The NRC should revise the criteria for the review of industry topical reports to allow for NRC staff review of safety-significant reports that have generic implications but have not been formally submitted for NRC review in accordance with the existing criteria.
3.3.7(5)	The NRC should fully implement Office Letter 900, "Managing Commitments Made by Licensees to the NRC," or revise the guidance if it is determined that the audit of licensee's programs is not required. Further, the NRC should determine whether the periodic report on commitment changes submitted by licensees to the NRC should continue to be submitted and reviewed.
3.3.7(6)	The NRC should determine whether ISI summary reports should be submitted to the NRC, and revise the ASME submission requirement and staff guidance regarding disposition of the reports, as appropriate.
APP. F	The NRC should conduct an effectiveness review of the actions taken in response to past lessons-learned reviews.

APPENDIX B - LIST OF ABBREVIATIONS AND ACRONYMS

The following abbreviations or acronyms were used in this report:

AEOD	NRC Office for Analysis and Evaluation of Operational Data
AIT	Augmented Inspection Team
ANO	Arkansas Nuclear One
ASME	American Society of Mechanical Engineers
B&W	Babcock & Wilcox
B&WOG	Babcock & Wilcox Owners Group
BL	Baseline
CAC	Containment Air Cooler
CE	Combustion Engineering
CR	Condition Report
CRD	Control Rod Drive
CRDM	Control Rod Drive Mechanism
DBNPS	Davis-Besse Nuclear Power Station
DGSNR	General Directorate for Nuclear Safety and Radiological Protection of France
DRP	Division of Reactor Projects
EDO	NRC Executive Director for Operations
EPRI	Electric Power Research Institute
FENOC	FirstEnergy Nuclear Operating Company
FTI	Framatome Technologies, Inc.
GDC	General Design Criteria
GI	Generic Issue
GL	Generic Letter
gpm	Gallons Per Minute
IGA	Intergranular Attack
IMC	Inspection Manual Chapter
IN	NRC Information Notice
INPO	Institute of Nuclear Power Operations
IP	Inspection Procedure
ISEG	Independent Safety Engineering Group
ISI	Inservice Inspection
iwg	Inches Water Gauge
LAR	License Amendment Request
LER	Licensee Event Report
LOCA	Loss of Coolant Accident
MD	Management Directive
NDE	Nondestructive Examination
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
NRR	NRC Office of Nuclear Reactor Regulation
NSSS	Nuclear Steam Supply System
NUMARC	Nuclear Management and Resource Council
ONS	Oconee Nuclear Station
O&M	Operating and Maintenance

PCAQ	Potential Condition Averse to Quality Report
PI	Performance Indicator
PIM	Plant Issues Matrix
PI&R	Problem Identification and Resolution
PM	Licensing Project Manager
PPR	Plant Performance Review
PRG	Project Review Group
PWR	Pressurized Water Reactor
PWSCC	Primary Water Stress Corrosion Cracking
PZR	Pressurizer
QA	Quality Assurance
RCPB	Reactor Coolant Pressure Boundary
RCS	Reactor Coolant System
RES	NRC Office of Nuclear Regulatory Research
RFM	Request for Modification
RFO	Refueling Outage
RG	Regulatory Guide
ROP	Reactor Oversight Process
RPV	Reactor Pressure Vessel
SALP	Systematic Assessment of Licensee Performance
SCC	Stress Corrosion Cracking
SDP	Significance Determination Process
SER	Safety Evaluation Report
SG	Steam Generator
SONGS	San Onofre Nuclear Generating Station
SRI	Senior Resident Inspector
STP	NRC Office of State and Tribal Programs
TI	Temporary Instruction
TM	Temporary Modification
TMI	Three Mile Island
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
VHP	Vessel Head Penetration
WO	Work Order

APPENDIX C - LIST OF DOCUMENTS REVIEWED

NRC Generic Communications

- (1) NRC Information Notice 80-27, "Degradation of Reactor Coolant Pump Studs," 6/11/80.
- (2) NRC Information Notice 82-06, "Failure of Steam Generator Primary Side Manway Closure Studs," 3/12/82.
- (3) NRC Bulletin 82-02, "Degradation of Threaded Fasteners in the Reactor Coolant Pressure Boundary of PWR Plants," 6/2/82.
- (4) NRC Information Notice 86-108, "Degradation of Reactor Coolant System Pressure Boundary Resulting From Boric Acid Corrosion," 12/29/86.
- (5) NRC Information Notice 86-108, Supplement 1, "Degradation of Reactor Coolant System Pressure Boundary Resulting From Boric Acid Corrosion," 4/20/87.
- (6) NRC Information Notice 86-108, Supplement 2, "Degradation of Reactor Coolant System Pressure Boundary Resulting From Boric Acid Corrosion," 11/19/87.
- (7) NRC Information Notice 86-108, Supplement 3, "Degradation of Reactor Coolant System Pressure Boundary Resulting From Boric Acid Corrosion," 1/5/95.
- (8) NRC Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants," 3/17/88.
- (9) NRC Information Notice 90-10, "Primary Water Stress Corrosion Cracking of INCONEL 600," 2/23/90.
- (10) NRC Information Notice 94-63, "Boric Acid Corrosion of Charging Pump Casing Caused by Cladding Cracks," 8/30/94.
- (11) NRC Information Notice 96-11, "Ingress of Demineralizer Resins Increases Potential for Stress Corrosion Cracking of Control Rod Drive Mechanism Penetrations," 2/14/96.
- (12) NRC Generic Letter 97-01, "Degradation of Control Rod Drive Mechanism Nozzle and Other Vessel Closure Head Penetrations," 4/1/97.
- (13) NRC Information Notice 2001-05, "Through-Wall Circumferential Cracking of Reactor Pressure Vessel Head Control Rod Drive Mechanism Penetration Nozzles at Oconee Nuclear Station, Unit 3," 4/30/01 [ADAMS Accession No. ML011160588]
- (14) NRC Bulletin 2001-01, "Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles," 8/3/01 [ADAMS Accession No. ML012080284]
- (15) NRC Information Notice 2002-11, "Recent Experience with Degradation of Reactor Pressure Vessel Head," 3/12/02 [ADAMS Accession No. ML020700556]
- (16) NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity," 3/18/02.
- (17) NRC Information Notice 2002-13, "Possible Indicators of Ongoing Reactor Pressure Vessel Head Degradation," 4/4/02.

NRC Reports/Papers/Briefings

- (18) SECY-98-228, "Proposed Streamlining and Consolidation of AEOD Functions and Responsibilities," 12/98.
- (19) NRC report "Self-Assessment of Operational Safety Data Review Processes," 12/98.
- (20) NRC report "Report of the Review of Operational and Occupational Event Review, Evaluation, and Followup," 8/94.

- (21) NRC Safety Evaluation, "Alloy 600 Control Rod Drive Mechanism (CRDM)/Control Element Drive Mechanism (CEDM) Pressurized Water Reactor Vessel Head Penetration Cracking," 11/19/93.
- (22) NRC "Indian Point 2 Steam Generator Tube Failure Lessons-Learned Report," 10/23/00.
- (23) NRC "Report of the Millstone Lessons Learned Task Group, Part 1: Review and Findings," 9/13/96.
- (24) SECY 97-036, "Millstone Lessons Learned Report, Part 2: Policy Issues," 2/18/97.
- (25) "Task Force Report Concerning the Effectiveness of Implementation of the NRC's Inspection Program and Adequacy of the Licensee's Employee Concerns Program at the South Texas Project," 3/31/95.
- (26) NRC Briefing Package, "Jeffrey Merrifield, Commissioner, U.S. Nuclear Regulatory Commission Visit to Davis-Besse Nuclear Power Station, 4/27/01."
- (27) NRC Internal Foreign Trip Report, dated 11/15/91.
- (28) NRC Event Followup Report 90-01, "Leaking CRDM Flanges Causes Severe Corrosion to the Flange Nut Compression Ring," 12/12/89.
- (29) NRC Safety Evaluation Report for DBNPS License Amendment No. 234, 11/16/99.

NRC Procedures

- (30) NRC Management Directive 6.4, "Generic Issues Program," 12/01.
- (31) NRC Management Directive 8.5, "Operational Safety Data Review," 12/97.
- (32) NRC Management Directive 8.3, "NRC Incident Investigation Program," 3/27/01.
- (33) NRC Inspection Manual Chapter 0102, "Oversight and Objectivity of Inspectors and Examiners at Reactor Facilities," 6/26/99.
- (34) NRC Inspection Manual Chapter 0350, "Oversight of Operating Reactor Facilities in a Shutdown Condition with Performance Problems," 3/6/01.
- (35) NRC Inspection Manual Change Notice 91-010, 8/1/91.
- (36) NRC Inspection Manual Change Notice 01-017, 9/17/01.
- (37) NRC Temporary Instruction 2500/028, "Employee Concerns Program," 7/7/93.
- (38) NRC Inspection Manual Chapter 2515, "Reactor Inspection Program - Operations Phase," 3/9/99.
- (39) NRC Inspection Manual Chapter 2515, "Light Water Reactor Inspection Program - Operations Phase," 1/17/02.
- (40) NRC Inspection Manual Part 9900 Technical Guidance, "On-Line Leak Sealing Guidelines for ASME Code Class 1 and 2 Components," 7/15/97.
- (41) NRC Inspection Procedure 40500, "Effectiveness of Licensee Process to Identify, Resolve, and Prevent Problems," 5/3/99.
- (42) NRC Inspection Procedure 62001, "Boric Acid Corrosion Prevention Program," 8/1/99.
- (43) NRC Inspection Procedure 71111.08, "Inservice Inspection Activities," 10/11/01.
- (44) NRC Inspection Procedure 71152, "Identification and Resolution of Problems," 1/17/02.
- (45) NRC Inspection Procedure 73753, "Inservice Inspection," 6/24/98.
- (46) NRC Inspection Procedure 90700, "Feedback of Operational Experience Information at Operating Power Reactors," 11/15/99.
- (47) NRC Operating Reactor Project Manager's Handbook (the PM Handbook) maintained online by NRR.
- (48) NRC Inspection Procedure 92700, " Onsite Follow-up of Written Reports of Nonroutine Events at Power Reactor Facilities," 12/31/98.
- (49) NRC Inspection Procedure 92902, "Followup - Maintenance," 3/11/99.

- (50) NRC Region III Manual Regional Procedure 0305, "Regional Staff Meetings," 11/16/94.
- (51) NRR Office Instruction, LIC-204, "Interfacing with Owners Groups, Vendors, and NEI."
- (52) NRR Office Instruction, LIC-100, "Control of Licensing Bases for Operating Reactors."
- (53) NRR Office Instruction, LIC-101, Rev. 1, "License Amendment Review Procedures."
- (54) NRR Office Instruction, LIC-403, "Procedures For Handling 10 CFR Part 21 and 10 CFR 50.55(e) Notifications of Deviations, Defects, and Failures to Comply Associated With Substantial Safety Hazards at Nuclear Power Reactors and Their Vendors."
- (55) NRR Office Instruction, LIC-500, "Processing Requests for Reviews of Topical Reports."
- (56) NRR Office Instruction, LIC-503, "Generic Communications Affecting Nuclear Reactor Licensees."
- (57) NRR Office Letter, OL-900, Managing Commitments Made by Licensees to the NRC."

NRC Meeting Summaries

- (58) Summary of the 3/3/93 Meeting Between the NRC and NUMARC AdHoc Advisory Committee for Alloy 600 CRDM Nozzle Cracking, dated 3/31/93.
- (59) Summary of the 12/16/98 Meeting Between the NRC and FENOC.
- (60) Summary of the 3/2/01 Meeting Between the NRC and FENOC.
- (61) Summary of the 11/14/01 Meeting Between the NRC and FENOC, dated 11/19/01.
- (62) Summary of the 1/23/02 Meeting Between the NRC and FENOC.
- (63) Summary of the 11/27/01 Meeting Between the NRC and FENOC, dated 12/12/01.

NRC NUREG Reports

- (64) NUREG 1801, "Generic Aging Lessons Learned (GALL) Report," 4/01.
- (65) NUREG-1430, "Standard Technical Specifications - Babcock and Wilcox Plants,"
- (66) NUREG/CR-6245, "Assessment of Pressurized Water Reactor Control Rod Drive Mechanism Nozzle Cracking," 10/94.
- (67) NUREG/CR-6582, "Assessment of Pressurized Water Reactor Primary System Leaks," 12/98.
- (68) NUREG/CR-5576, "Survey of Boric Acid Corrosion of Carbon Steel Components in Nuclear Plants," 6/90.

NRC Regulatory Guides

- (69) Regulatory Guide 1.181, "Content of the Updated Final Safety Analysis Report in Accordance with 10 CFR 50.71(e)," 9/99.
- (70) Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems," 5/73.

NRC License Amendments

- (71) Davis-Besse Nuclear Power Station, Unit 1 License Amendment 180 issued 9/9/93.
- (72) Davis-Besse Nuclear Power Station, Unit 1 License Amendment 234 issued 11/16/99.

NRC Enforcement Guidance and Actions

- (73) USNRC Office of Enforcement Memorandum EGM 96-005, 10/21/96.
- (74) USNRC Enforcement Manual, 6/4/02.
- (75) General Statement of Policy and Procedure for NRC Enforcement Actions, 12/18/00.
- (76) EA-01-071, NRC Region II Letter to South Carolina Electric & Gas Company, "Virgil C. Summer Nuclear Station – NRC Special Inspection Report No. 50-395/00-08, Exercise of Enforcement Discretion," 3/15/01.
- (77) EA-01-0161, NRC Region II Letter to Duke Energy Corporation, "Oconee Nuclear Station – NRC Integrated Inspection Report 50-269/01-02, 50-270/01-02, and 50-287/01-02 (Exercise of Enforcement Discretion)," 7/30/01.
- (78) EA-97-414, NRC Region IV Letter to Southern California Edison Company, "NRC Inspection Report 50-361/97-15 and Notice of Violation," 9/10/97.
- (79) EA 99-138, NRC Region III Letter to FENOC, "Notice of Violation (NRC Inspection Report 50-346/98021)," 8/6/99.

NRC Inspection Reports

- (80) NRC Inspection Report 50-346/92-18
- (81) NRC Inspection Report 50-346/93-10
- (82) NRC Inspection Report 50-346/93-17
- (83) NRC Inspection Report 50-346/94-10
- (84) NRC Inspection Report 50-346/98-05
- (85) NRC Inspection Report 50-346/98-06
- (86) NRC Inspection Report 50-346/98-07
- (87) NRC Inspection Report 50-346/98-11
- (88) NRC Inspection Report 50-346/98-16
- (89) NRC Inspection Report 50-346/98-18
- (90) NRC Inspection Report 50-346/98-21
- (91) NRC Inspection Report 50-346/99-02
- (92) NRC Inspection Report 50-346/99-03
- (93) NRC Inspection Report 50-346/99-04
- (94) NRC Inspection Report 50-346/99-08
- (95) NRC Inspection Report 50-346/99-09
- (96) NRC Inspection Report 50-346/99-10
- (97) NRC Inspection Report 50-346/99-11
- (98) NRC Inspection Report 50-346/00-03
- (99) NRC Inspection Report 50-346/00-05
- (100) NRC Inspection Report 50-346/01-04
- (101) NRC Inspection Report 50-346/01-05
- (102) NRC Inspection Report 50-346/01-10
- (103) NRC Inspection Report 50-346/01-13
- (104) NRC Inspection Report 50-346/01-14
- (105) NRC Inspection Report 50-346/01-15
- (106) NRC Inspection Report 50-346/01-16
- (107) NRC Inspection Report 50-346/02-03
- (108) NRC Inspection Report 50-313/92-23
- (109) NRC Inspection Report 50-368/92-23

NRC Letters and Memoranda

- (110) NRC memorandum from Ashok Thadani to RES, "RES Office Letter No. 2I - Independent Identification of Operational Events and Conditions That Warrant Further NRC Action (WITS-9800197)," 4/99.
- (111) NRC letter from T.V. Wambach, Sr. to D.C. Shelton (Toledo Edison), "Prevention of Boric Acid Corrosion at Davis-Besse Nuclear Power Plant (Generic Letter 88-05)," 2/8/90.
- (112) NRC letter from J.E. Dyer to G.G. Campbell (FENOC), "Notice of Violation (NRC Inspection Report 50-346/98021)," 8/6/99.
- (113) NRC letter from Wallace E. Norris and Keith R. Wichman to the ASME XI Subgroup Water-Cooled Systems, Task Group on Nickel-Based Alloy Issue for PWRs, 9/26/01.
- (114) NRC letter from S. Bailey to G.G. Campbell (FENOC), "Generic Letter 97-01, 'Degradation of CRDM/CEDM Nozzle and Other Vessel Closure Head Penetrations': Review of the Responses for the Davis-Besse Nuclear Power Station, Unit 1," 11/29/99.
- (115) NRC letter from W.T. Russell to W. Rasin (NUMARC), 11/19/93.
- (116) NRC memorandum from C.Y. Cheng to E.J. Butcher, Jr., "Inspection Procedure for Verifying Implementation of a Boric Acid Corrosion Prevention Program," 4/29/91.
- (117) NRC letter to FENOC, "Generic Letter 97-01, 'Degradation of CRDM/CEDM Nozzle and other Vessel Closure Head Penetrations: Review of the Responses for the Davis-Besse Nuclear Power Station, Unit 1,'" 11/29/99.
- (118) NRC letter to FENOC, "Davis-Besse Nuclear Power Station, Unit No. 1 - Response to Nuclear Regulatory Commission Bulletin 2001-01, 'Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles'," 12/4/01.
- (119) NRC memorandum from the Division of Engineering to the Division of Licensing Project Management, "Plant Specific Closure Letters for the TAC Numbers Opened Under the Multi-plant Actions for Generic Letter 97-01," dated 6/14/99.
- (120) NRC memorandum from the EDO to the Commission, "Issuance of Order Regarding Response to NRC Bulletin 2001-01, Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles," 11/21/01.
- (121) NRC memorandum from the Office of Nuclear Reactor Regulation to the EDO, "Issuance of Orders Regarding Responses to NRC Bulletin 2001-01, Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles," 11/16/01.
- (122) NRC memorandum from the Office of Nuclear Reactor Regulation to the Associate Director for Inspection and Technical Assessment, 12/12/91.
- (123) NRC memorandum from the Materials and Chemical Engineering Branch to the Director, Division of Engineering Technology, "Update of Industry Actions Regarding Primary Water Stress Corrosion Cracking of Inconel 600 Components at Pressurized Water Reactors," 3/24/92.
- (124) NRC memorandum from the Executive Director for Operations to the Commission, "Status Report on Primary Water Stress Corrosion Cracking of PWR Reactor Vessel Head Penetration Cracking," 11/30/93.

Licensee Event Reports (LERs)

- (125) LER 50-313/1986-006, Arkansas Nuclear One, Unit 1, Corrosion of a RCS nozzle and adjacent cold leg, 10/23/86.
- (126) LER 50-313/1989-043, Arkansas Nuclear One, Unit 1, Control rod drive mechanism nut ring halves had corroded approximately 50% and that two of the four bolt holes in the corroded nut ring half were degraded, 12/8/89.
- (127) LER 50-313/1990-021, Arkansas Nuclear One, Unit 1, RCS leak in the area of a pressurizer upper level instrumentation nozzle, 2/22/90.
- (128) LER 50-313/2000-003, Arkansas Nuclear One, Unit 1, RCS hot leg level instrumentation nozzle was found to have been leaking as indicated by boron buildup, 2/15/00.
- (129) LER 50-313/2001-002, Arkansas Nuclear Unit 1, Indication of boric acid crystals were noted in the area of one CRDM nozzle on the RPV, 3/24/01.
- (130) LER 50-368/1987-003, Arkansas Nuclear One, Unit 2, Pressurizer heaters had ruptured resulting in damage to the heater sleeves, causing boric acid induced corrosion damage to the pressurizer carbon steel base metal, 4/24/87.
- (131) LER 50-368/2000-001, Arkansas Nuclear One, Unit 2, Twelve pressurizer heater sleeves and one RCS hot leg resistance temperature detector nozzle were leaking, 7/30/00.
- (132) LER 50-412/2000-003, Beaver Valley Unit 2, RCS leakage into the containment building was an abrupt packing leak on a motor-operated drain insulation valve on the RCS.
- (133) LER 50-317/1994-004, Calvert Cliffs Unit 1, Higher than anticipated corrosion of three nuts on one of the Incore Instrumentation flanges on the Unit 1 RPV head, 2/21/94.
- (134) LER 50-317/1994-003, Calvert Cliffs Unit 1, Pressurizer heater sleeves leaking, 3/21/94.
- (135) LER 50-318/1989-007, Calvert Cliffs Unit 2, Reactor coolant leakage from 28 of the 120 pressurizer vessel heater penetrations and one upper level nozzle, 5/5/89.
- (136) LER 50-318/1994-003, Calvert Cliffs Unit 2, Leak caused by a 150 degree circumferential crack in a weld in the 22A Safety Injection Tank discharge test connection, 7/11/94.
- (137) LER 50-413/1989-020, Catawba Unit 1, Catawba Units 1 and 2 steel containment vessel exterior surfaces corroded by boric acid.
- (138) LER 50-414/2001-002, Catawba Unit 2, Steam generator 2B lower head bowl drain indicated boron residue buildup, 9/19/01.
- (139) LER 50-315/1998-027, Cook Unit 1, Boric acid deposits/blockage in the Unit 1 RHR spray piping, 5/5/98.
- (140) LER 50-302/2001-004, Crystal River Unit 3, CRDM nozzle No. 32 leaking from two axially oriented cracks that were through-wall, 10/1/01.
- (141) LER 50-346/1998-009, Davis-Besse Unit 1, Boric acid leak and corrosion of three fasteners of the pressurizer spray valve, 9/9/98.
- (142) LER 50-346/2002-002, Davis-Besse Unit 1, CRDM nozzles revealed axial indications and leakage on nozzles #1, 2, and 3, and RPV head wastage, 2/27/02.
- (143) LER 50-275/1988-004, Diablo Canyon Unit 1, Leaks in canopy seal welds of the CRDM head adapter plugs, 2/25/88.
- (144) LER 50-275/1990-010, Diablo Canyon Unit 1, leakage through a crack in the positive displacement charging pump suction piping elbow, 7/26/90.

- (145) LER 50-23/1987-023, Diablo Canyon Unit 2, Leaks in Unit 1 and 2 accumulator nozzles, 10/9/87.
- (146) LER 50-285/1980-010, Fort Calhoun Unit 1, Boric acid corrosion of reactor coolant pump casing studs, 5/16/80.
- (147) LER 50-285/1990-028, Ft. Calhoun Unit 1, RCS leakage on spare CRDM housings, 12/14/90.
- (148) LER 50-285/1992-018, Ft. Calhoun Unit 1, Severe corrosion of the carbon steel fasteners on the boric acid pump flanges and piping supports, 3/20/92.
- (149) LER 50-213/1996-019, Haddam Neck Unit 1, Pinhole leak in the body of an eight inch inlet isolation valve (RH-V-791A) to the 'A' RHR heat exchanger, 8/31/96.
- (150) LER 50-309/1995-013, Maine Yankee Unit 1, Seven of eight bonnet retention cap screws parted during attempts to remove them due to boric acid corrosion of the High Pressure Safety Injection Loop 2 Stop valve, 10/16/95.
- (151) LER 50-369/1989-020, McGuire Unit 1, Abnormal degradation of Unit 1 and 2 steel containment vessels because of boric acid corrosion, 7/27/89.
- (152) LER 50-336/1995-023, Millstone Unit 2, Indications on Boric Acid section of the Chemical and Volume Control System fittings and pipe subjected to periodic boric acid leaks over the years from valves, 5/16/95.
- (153) LER 50-336/2002-001, Millstone Unit 2, Two pressurizer heater sleeve penetrations were leaking as evidenced by boron precipitation build up, 2/19/02.
- (154) LER 50-423/1989-031, Millstone Unit 3, Pressurizer safety valve nozzle ring set screw corroded by boric acid, 11/28/89.
- (155) LER 50-423/1994-012, Millstone Unit 3, Leak in ¾-inch socket weld on a 'C' RCS Loop Flow Instrumentation line cause by a circumferential crack approximately, ⅝-inch long, 9/9/94.
- (156) LER 50-423/1995-020, Millstone Unit 3, Leak from the valve stem leak-off pipe for the RHR System, 12/21/95.
- (157) LER 50-339/2001-003, North Anna Unit 2, Through-wall leak on RPV penetration number 63 was identified based on the presence of boric acid, 11/13/01.
- (158) LER 50-269/2000-006, Oconee Unit 1, Boric acid deposits at 8 unused thermocouple nozzles and one CRDM nozzle, 12/4/00.
- (159) LER 50-270/1997-001, Oconee Unit 2, Leak from a crack at the safe end to pipe weld on the High Pressure Injection to RCS cold leg nozzle near Reactor Coolant Pump, 4/21/97.
- (160) LER 50-270/2001-002, Oconee Unit 2, Multiple leaking CRDM nozzles, 4/28/01.
- (161) LER 50-287/1991-008, Oconee Unit 3, Leak from a failed fitting on an instrument line at the top of a steam generator resulted in approximately 87,000 gallons of RCS leakage, 11/23/91.
- (162) LER 50-287/2001-001, Oconee Unit 3, Boric acid deposits were identified around nine (Nos. 3, 7, 11, 23, 28, 34, 50, 56, and 63) of 69 total CRDM nozzles, 2/18/01.
- (163) LER 50-287/2001-003, Oconee Unit 3, Boric acid deposited at the base of seven CRDM nozzles, 11/12/01.
- (164) LER 50-255/1993-011, Palisades Unit 1, Pressurizer upper and lower temperature nozzle penetrations were leaking, 10/9/93.
- (165) LER 50-255/1999-004, Palisades Unit 1, Boric acid deposits on three CRDM seal housings and 30 of the 45 seal housing assemblies contained small circumferential cracks, 11/2/99.

- (166) LER 50-255/2001-002, Palisades Unit 1, 13 CRDM seal housings were not returned to service due to NDE indications, confirmed cracks, or mechanical seal performance deficiencies, 3/31/01.
- (167) LER 50-528/1999-006, Palo Verde Unit 1, Boric acid residue on a reactor coolant system loop 2 hot leg instrument nozzle, 10/2/99.
- (168) LER 50-528/2001-001, Palo Verde Unit 1, Boric acid on an RCS hot let instrument nozzle, 3/31/01.
- (169) LER 50-529/2000-004, Palo Verde Unit 2, Boric acid residue on a RCS pressurizer heater sleeve, 10/4/00.
- (170) LER 50-266/1990-008, Point Beach Unit 1, Reactor coolant was leaking through a canopy seal weld on CRDM I-3 and the upstream weld on B steam generator channel head drain line isolation valve 1RC-526B, 7/20/90.
- (171) LER 50-266/1999-012, Point Beach Unit 1, Through-wall leak in valve 1RC-526A, boric acid crystals on the weld, 11/4/99.
- (172) LER 50-311/1998-007, Salem Unit 2, Leakage indications on the tubing of six RCS instrument lines and on tubing in the pressurizer liquid sample line delay coil, 7/30/98.
- (173) LER 50-361/1992-004, San Onofre Unit 2, Rust and boric acid crystals in the vicinity of the pressurizer vapor space level instrument nozzle, 2/18/92.
- (174) LER 50-361/1998-002, San Onofre Unit 2, Leakage from cracks through instrument nozzles, 1/26/98.
- (175) LER 50-362/1995-001, San Onofre Unit 3, Leakage from pressurizer a level instrumentation nozzle and two RCS hot leg instrument nozzles, 7/22/95.
- (176) LER 50-362/1997-001, San Onofre Unit 3, Leaking instrument nozzles in RCS, 4/12/97.
- (177) LER 50-362/1997-002, San Onofre Unit 3, Leaking RCS nozzles, 7/3/97.
- (178) LER 50-443/1992-026, Seabrook Unit 1, Cover bolts had fractured on multiple valves, 7/14/92.
- (179) LER 50-335/1987-014, St. Lucie Unit 1, Leaking check valve bonnet and a cracked pipe in the heat affected zone on the 1A1 reactor coolant pump (RCP) lower cavity seal nozzle, 10/8/87.
- (180) LER 50-335/2001-003, St. Lucie Unit 1, Through wall RCS leak on a hot leg instrument nozzle, 4/14/01.
- (181) LER 50-389/1994-002, St. Lucie Unit 2, Boric acid on the exterior of the pressurizer steam space instrument nozzles, 3/16/94.
- (182) LER 50-389/1995-004, St. Lucie Unit 2, Instrument nozzle located on the 'B' side RCS hot leg exhibited an apparent boric acid buildup, 10/10/95.
- (183) LER 50-395/2000-008, Summer Unit 1, Boron buildup on the weld between the reactor vessel nozzle and the hot leg pipe, 10/12/00.
- (184) LER 50-280/1998-006, Surry Unit 1, Boric acid build-up on the head of the RCP lower radial bearing resistance temperature detector connection, 3/24/98.
- (185) LER 50-280/1995-007, Surry Unit 1, Boron crystals and corrosion products were discovered on the outside diameter of the reactor vessel for two of the four instrument nozzles, 9/12/95.
- (186) LER 50-281/1992-008, Surry Unit 2, RCS leak had developed near the Low Pressure Letdown Flow Transmitter, 12/15/92.
- (187) LER 50-289/1994-001, Three Mile Island Unit 1, Body-to-bonnet leak from pressurizer spray valve (RC-V1) caused by boric acid degradation of its fasteners, 3/7/94.
- (188) LER 50-289/2001-002, Three Mile Island Unit 1, boric acid buildup around all eight thermocouple nozzles and boric acid buildup around 12 CRDM nozzles, 12/12/01.

- (189) LER 50-382/1992-002, Waterford Unit 3, Packing gland studs on reactor coolant hot leg sample valve failed due to boric acid corrosion, 3/25/92.
- (190) LER 50-382/1992-006, Waterford Unit 3, Packing gland studs on reactor coolant hot leg sample valve failed due to boric acid, 7/11/92.
- (191) LER 50-382/1999-002, Waterford Unit 3, Leakage on pressurizer instrument nozzles and hot leg nozzles, 2/25/99.
- (192) LER 50-382/2000-011, Waterford Unit 3, Leakage at a pressurizer heater sleeve and two cases of leakage on two MNSA clamps, 10/17/00.

DBNPS/FENOC/Centerior Energy/Toledo Edison (General)

- (193) Memorandum from R.E. Donnellon (Centerior Energy) to Distribution (Centerior Energy), "Control Rod Drive Nozzle Cracking," 5/8/96.
- (194) Centerior Energy intra-company memorandum NED-91-20038, "Inconel 600 Evaluation," 1/91.
- (195) FENOC letter 2731, "Response to NRC Bulletin 2001-01, Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles," 9/01.
- (196) FENOC letter 2741, "Responses to Requests for Additional Information Concerning NRC Bulletin 2001-01, Circumferential Cracking of Reactor Pressure Vessel Head Penetrations Nozzles," 10/01.
- (197) FENOC letter 2735, "Supplemental Information in Response to NRC Bulletin 2001-01, Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles," 10/01.
- (198) FENOC letter 2744, "Transmittal of Results of Reactor Pressure Vessel Head Control Rod Drive Mechanism Nozzle Penetration Visual Examinations for the Davis-Besse Nuclear Power Station," 10/01.
- (199) Toledo Edison procedure NG-EN-0324, "Boric Acid Corrosion Control," Revision 00, 9/89.
- (200) Toledo Edison procedure NG-EN-0324, "Boric Acid Corrosion Control," Revision 01, 11/93.
- (201) Toledo Edison procedure NG-EN-0324, "Boric Acid Corrosion Control," Revision 02, 9/99.
- (202) Toledo Edison procedure NG-EN-0324, "Boric Acid Corrosion Control," Revision 02, Change 1, 2/02.
- (203) Toledo Edison procedure NG-EN-0324, "Boric Acid Corrosion Control," Revision 03, 5/02.
- (204) Davis-Besse Operating Experience Reference Guide," Revision 2, 2/00.
- (205) Toledo Edison procedure NG-NA-00305, "Operating Experience Assessment Program," Revision 2, Change 2, 3/01.
- (206) Centerior Energy letter 2439a, "Initial Response to NRC Generic Letter 97-01: Degradation of Control Rod Drive Mechanism Nozzle and Other Vessel Closure Head Penetrations," 4/97.
- (207) Centerior Energy letter 2472, "Response to NRC Generic Letter 97-01: Degradation of Control Rod Drive Mechanism Nozzle and Other Vessel Closure Head Penetrations," 7/97.
- (208) FENOC letter 2569, "NRC Request for Additional Information Regarding the Response to Generic Letter 97-01, Degradation of Control Rod Drive Mechanism Nozzle and Other Vessel Closure Head Penetrations," 11/98.

- (209) FENOC letter 2581, "NRC Request for Additional Information Regarding the Response to Generic Letter 97-01, Degradation of Control Rod Drive Mechanism Nozzle and Other Vessel Closure Head Penetrations (TAC No. M98561)," 1/99.
- (210) Davis-Besse Self-Assessment #2002-0077, Self-Assessment Report Boric Acid Corrosion Control Program," 3/02.
- (211) Memorandum from E.C. Matranga (FENOC) to J.C. Dillich (FENOC), "Station Review Board Action Item 85," 10/2/1991.
- (212) Memorandum from P.K. Goyal (FENOC) to Distribution (FENOC), "Mode 5 Reactor Vessel Head Inspection Recommendation," 6/27/01.
- (213) FENOC letter serial 2669, "ISI Summary Report of the 12th Refueling Outage Activities for the Davis-Besse Nuclear Power Station Unit 1," 8/22/00.
- (214) FENOC document, Revision 7, 4/5/02, "Figure 26. Timeline of Key Events Related to Reactor Vessel Head Boric Acid Corrosion."
- (215) DBNPS Second Ten Year ISI Program, Revision 9, 5/16/02.
- (216) DBNPS Procedure DB-PF-00204, Revision 2, "Section XI Pressure Test," 1/28/99.
- (217) DBNPS Procedure DB-PF-03010, Revision 00, "RCS Leakage and Hydrostatic Test," 4/20/00.
- (218) DBNPS Technical Specifications, (Amendment No. 252).
- (219) DBNPS Updated Final Safety Analysis Report, Revision 11.
- (220) FENOC presentation, "DB/NRC Region III Management Discussion," dated 7/30/99.
- (221) FENOC presentation, "NRC/Davis-Besse Management Meeting," dated 3/2/01.
- (222) FENOC presentation, "Davis-Besse Nuclear Power Station Management Meeting with the USNRC," dated 12/16/99.
- (223) FENOC presentation, Commissioner Merrifield's visit on 4/27/01.
- (224) FENOC letter to NRC, Commitment Change Summary Report, dated 11/15/00.
- (225) FENOC letter to NRC, Response to NRC Bulletin 2001-01, dated 9/4/01.
- (226) FENOC letter to NRC, Supplemental Information in Response to NRC Bulletin 2001-01, dated 10/17/01.
- (227) FENOC letter to NRC, Response to Requests for Additional Information Concerning NRC Bulletin 2001-01, dated 10/30/01.
- (228) FENOC letter to NRC, Transmittal of Results of Reactor Pressure Vessel Head Control Rod Drive Mechanism Nozzle Penetration Visual Examinations, dated 10/30/01.
- (229) FENOC letter to NRC, Supplemental Information Regarding Inspection Plans and Commitments for the Davis-Besse Nuclear Power Station in Response to NRC Bulletin 2001-01, dated 11/30/01.
- (230) DBNPS "Outage Insider" Newsletter, 4/29/00.
- (231) Intra-Company Memorandum from H.W. Stevens (FENOC) to J.H. Lash (FENOC), "ISE RCS Leak Rate Review 1999-0031," 8/16/99
- (232) Intra-Company Memorandum from R.E. Donnellon (FENOC) to Distribution, White Paper on Control Rod Drive Nozzle Cracking, 5/18/96.
- (233) Memorandum from T.S. Cosgrove (FENOC) to L.W. Pearce (FENOC), "Examination of Five Closed Nonconformances Related to the RPV Head," 6/13/02.
- (234) Centerior Energy Memorandum from Robert Rishel (Maintenance Rule Coordinator) to File, "Reactor Coolant Pumps and Reactor Coolant Boundary," 10/14/1997.
- (235) DBNPS Operating and Maintenance Budgets and Capital Improvement Budgets, 1990 to 2001.
- (236) Training records for DBNPS personnel receiving boric acid corrosion control training in November 1999.
- (237) Listing of all DBNPS containment at-power entries from 1996 to 2001.

- (238) Listing of DBNPS collective radiation dose for jobs associated with CAC cleaning, radiation monitor filter change outs, RPV head cleaning and RCS leakage inspections from 1999 to 2002.
- (239) Listing of DBNPS TS and TRM Action Statements associated with CAC cleaning and radiation monitor filter change outs for the period of December 1995 to May 2002.
- (240) Listing of DBNPS system engineer and backup system engineers from 1990 to 2002 for systems containing boric acid.
- (241) DBNPS Refueling Outage Duration Bar Graph (since 1 RFO; Scheduled and Actual data).
- (242) DBNPS Work Scope Changes for 11RFO and 12RFO.
- (243) DBNPS Mode 3/5 walkdown plan for the 1999 Midcycle Outage, 4/27/99.
- (244) 1999 Midcycle Outage Mode 3/5 walkdown results, 4/29/99.
- (245) DBNPS Organization Charts from 1990 to 2002.
- (246) DBNPS 1999 Midcycle Outage Report.
- (247) Listing of DBNPS containment entries by NRC personnel from 1996 to 2002.
- (248) Listing of DBNPS containment entries by DBNPS management personnel from 1996 to 2002.
- (249) DBNPS Annual Dose Bar Graph including 1978-2001 data (Person rem-vs-Year).
- (250) Collective dose for all DBNPS outages from 1996 to 2000.
- (251) DBNPS Dose estimates for 1996, 1998, and 2000 refueling outages.
- (252) DBNPS Neutron dose for at-power containment entries to clean CACs between 1998 and 2001.
- (253) Video tapes of DBNPS RPV head as-found inspections, cleaning, and as-left inspections from the 1996, 1998, and 2000 refueling outages (total of 14 tapes).
- (254) Listing of all DBNPS items removed/ deferred/ canceled/ not completed in 1998 and 2000 refueling outages.
- (255) System Health Reports for the DBNPS RCS from 1990 to 2002.
- (256) System Health Reports for the DBNPS containment radiation monitoring system from 1990 to 2002.
- (257) Boric Acid Corrosion Control Mode 5 Inspection Results for the DBNPS 2002 Refueling Outage.
- (258) DBNPS Self-Assessment Report No. 2002-0077, "Boric Acid Corrosion Control Program," 3/02.
- (259) DBNPS Operations Procedure DB-OP-01200, "RCS Leakage Management," Revision 0.
- (260) DBNPS Nuclear Operating Administrative Procedure, NOP-LP-2003, "Employee Concerns/Ombudsman Program," Revision 1.
- (261) DBNPS DB-OP-01200, "RCS Leakage Management," Revision 0.
- (262) DBNPS DB-OP-01101, "Containment Entry," Revision 00, 5/12/1993.
- (263) DBNPS Maintenance Rule Performance Criteria for the RCS, dated 6/22/02.
- (264) DBNPS Maintenance Rule Status for RCS dated 1/8/99.
- (265) DBNPS Maintenance Rule a(1) and a(2) System Status since 1996.
- (266) DBNPS Boric Acid Corrosion Control Inspection Checklist for RPV Head, dated 4/6/00.
- (267) DBNPS Work Order 00-001846-000, "Clean Boron Accumulation from Top of Reactor Head and on Top of Insulation," 4/00.
- (268) DBNPS Cycle 12 System Engineer's Periodic Assessments for the RCS, 9/1/00.
- (269) Toledo-Edison Regulatory Management System (TERMS) Commitment A19613, "Complete Training to Management and Technical Staff RE: RC-2 Event," 1999.

- (270) TERMS Commitment A19614, "Revise Boric Acid Control Program and Work Process Guidelines," 1999.
- (271) TERMS Commitment A19476, "Complete Evaluations RE: RC-2," 1999.
- (272) TERMS Commitment A16892, "Track BWOOG Response to NRC following May 12, 1992, Meeting," 1992.
- (273) TERMS Commitment O14438, "Implement New Containment Air Cooling Monthly Surveillance Tests," 1986.
- (274) TERMS Commitment O07319, "Procedures Revised to Check Adequate Design Flow of CAC System," 1986.
- (275) Letter from D.C. Shelton (Toledo Edison) to NRC, "Revised Response to Generic Letter 88-05, Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in Pressurized Water Reactor (PWR) Plants," 6/26/89.
- (276) FENOC letter to NRC dated 7/1/99, Response to Inspection Report No. 50-346/98-21 (RC-2 special inspection).
- (277) DBNPS License Amendment Request (LAR) for Amendment No. 180, 5/1/92.
- (278) DBNPS License Amendment Request (LAR) for Amendment No. 234, 7/26/99.
- (279) DBNPS Control Room Reading Operations Tours Daily Logsheet, Revision 5.
- (280) DBNPS Station Log.
- (281) Standing Order No. 01-003, Revision 1, "Containment Kaman RE Filter Changing," 8/2/01.
- (282) DBNPS document, "Containment Air Cooler Pressure Cleaning K1 Powered vs. Electric," not dated.
- (283) Root Cause Analysis Report, Significant Degradation of the Reactor Pressure Vessel Head, 4/15/02.
- (284) DBNPS Self-Assessment Report, SA # 2002-0077, Boric Acid Corrosion Control Program.
- (285) DBNPS Plant Computer Historical Data, "Containment Air Cooler Plenum Pressure."
- (286) DBNPS Operating Experience Evaluation 13441, "Small Accumulation of Boric Acid Found on Rx Vessel Head," 3/02.
- (287) Davis-Besse Operating Experience evaluation SEN 18, "Reactor Vessel Head Corrosion," 8/87.
- (288) Centerior Energy intra-company memorandum QAD-96-70113, "Closeout of SER 20-93 Intergranular Stress Corrosion Cracking in Control Rod Drive Mechanism Penetrations," 2/96.
- (289) DBNPS assessment audit of the Twelfth Refueling Outage (12RFO), "Quality Assessment Audit Report AR-00-OUTAG-01," 7/00.
- (290) DBNPS Company Nuclear Review Board (CNRB) Meeting Minutes for meetings dated 9/2/99; 1/13/2000; 6/1/2000; 10/31/2000; 7/17/2001; 1/15/2002; 3/29/2001; and 7/22/1999.
- (291) DBNPS Project Review Group (PRG) Meeting Minutes for meetings dated 3/7/1995; 4/4/1995; 6/15/1995; 1/7/1997; 2/20/1997; 9/1/1998; 9/17/1998; 9/7/2000; and 2/2/2001.
- (292) DBNPS Joint Project Review Group and Work Scope Committee Meeting Minutes for 9/3/1997 and 10/1997.
- (293) Station Review Board Action Item Log dated 6/7/2002.

DBNPS Condition Reports (CRs)

[Note: refer also to Appendix E, Section 5.]

- (294) CR 1999-1061, "Exceeding Maintenance Rule Performance Criteria for PORV Isolated for greater than 100 hours," 6/15/99.
- (295) CR 1999-1062, "Exceeding Maintenance Rule Performance Measure for RCS Unidentified Leakage Exceeding 0.75 gpm," 6/15/99.
- (296) CR 1999-0998, "Containment Air Temperature Increasing," 6/8/99.
- (297) CR 1999-1300, "Containment Radiation Monitor Filters Clogging with Iron Oxide Particles," 7/30/99.
- (298) CR 2000-0781, "During VT-2 Pressure Test Exam of Reactor Vessel Head, Leakage from the Control Rod Drive Structure Blocked the Visual Exam of the Reactor Vessel Head Bolts," 4/6/00.
- (299) CR 2000-0782, "Boric Acid on Reactor Head Flange from Weep Holes," 4/6/00.
- (300) CR 2000-1037, "Boric Acid Accumulation of Reactor Vessel Head," 4/18/00.
- (301) CR 2000-1547, "Containment Air Cooler Plenum Pressure Drop," 6/2/00.
- (302) CR 2001-1110, "Reactor Coolant System Leakage Detection System Radiation Monitor Sample Point Change," 2001.
- (303) CR 2001-1822, "Reactor Coolant System Leakage Detection System Radiation Monitor Filter Changes," 2001.
- (304) CR 2002-02174, "Results of Boric Acid Corrosion Control Program Self-Assessment, 5/20/02.
- (305) CR 2002-02767, "CAC and RV Head Cleaning Process," 6/02.
- (306) CR 2002-03055, "Recommended Procedure Changes for NG-EN-00324," 7/02.
- (307) CR 2002-03059, "Additions to BACC Procedure List of Principal Leak Locations," 7/02.
- (308) CR 2002-03199, "The BACC Program is too Limited in Scope," 7/02.

DBNPS Potential Conditions Averse to Quality (PCAQs)

[Note: Refer also to Appendix E, Section 5.]

- (309) PCAQ 90-0051, "Reactor Head Vent Leak," 1990.
- (310) PCAQ 92-0072, "Containment Air Cooler Performance Degradation," 2/24/92.
- (311) PCAQ 93-0098, "The Head Vent Flange on Once Through Steam Generator A has Evidence of Boric Acid Corrosion," 3/8/93.
- (312) PCAQ 94-0295, "Review Closure of Commitment A16892," 3/17/94.
- (313) PCAQ 96-0551, "Boric Acid Corrosion Control Program Procedure Steps Not Followed for Reactor Vessel Head Inspection," 4/21/96.
- (314) PCAQ 97-1518, "Potential for Overstress Condition on Pressurizer Relief Valve Nozzles," 1997.
- (315) PCAQ 98-0538, "Boric Acid or Mineral Deposits Identified in Incore Tunnel and Below CFT-1," 4/8/98.
- (316) PCAQ 98-0767, "Boric Acid Discovered on Reactor Head in Area of CRDM Nozzles," 4/25/98.
- (317) PCAQ 98-1980, "Containment Air Cooler Inlet Air Plenum Pressure Decreasing," 11/12/98.

DBNPS Modifications/Quality Assessment Reports

- (318) Request for Modification 90-0012, "Service Structure Access Openings," 1990.
- (319) Request for Modification 94-0025, "Service Structure Access Openings," 1994.
- (320) Request for Modification 94-0004, "Repair of Reactor Head Vent Line," 1994.

- (321) Memorandum from E.R. Dille (S&L) to F.M. Berry (S&L), "Particulates in Containment," 11/5/99.
- (322) Quality Assessment Audit Report AR-00-CORAC-01, 6/29/00.
- (323) Quality Assessment Audit Report AR-00-OUTAG-01, 7/7/00.
- (324) Quality Assessment Audit Report AR-02-OUTAG-01, 5/31/02.
- (325) Temporary Modification 01-0018, "Remove Iodine Filter Cartridge for RE 4597BA," 11/1/01.
- (326) Temporary Modification 98-0036, "Pressurizer Relief Valve Discharge Temporary Modification," 10/16/98.

Other

- (327) Letter from Alex Marion (NEI) to Brian Sheron (NRC) transmitting industry white paper entitled, "Alloy 600 RPV Head Penetration Primary water Stress Corrosion Cracking," 3/5/96.
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- (329) American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 1986 edition.
- (330) American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 1995 edition through 1996 Addenda.
- (331) NEI 99-04, "Guidelines for Managing NRC Commitment Changes"
- (332) UCS Letter dated 6/19/02.
- (333) NEI 98-03, Revision 1 (June 1999), "Guidelines for Updating Final Safety Analysis Reports."
- (334) Duke Power Company, Oconee Nuclear Station Procedure, MP/O/B/1800/132, Evaluation of Boric Acid Leakage on Mechanical, Structural, and Electrical Components, Revision 002.
- (335) Letter from H.B. Tucker (Duke power Company) to USNRC, Subject: Response to Generic Letter 88-05, dated 8/1/88.
- (336) Letter from H.B. Tucker (Duke power Company) to USNRC, Subject: Response to Generic Letter 88-05, dated 5/23/88.
- (337) Letter from M. S. Tuckman (Duke power Company) to USNRC, Subject: Response to Generic Letter 97-01, dated 4/28/97.
- (338) Letter from M. S. Tuckman (Duke power Company) to USNRC, Subject: Response to Generic Letter 97-01, dated 7/30/97.
- (339) Letter from M. S. Tuckman (Duke power Company) to USNRC, Subject: Response to Generic Letter 97-01, dated 11/5/98.
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- (341) CEN-607, "Safety Evaluation of Potential for and consequences of Reactor Vessel Head Penetration Alloy 600 ID-initiated Penetration Cracking," 5/93.
- (342) BAW-1019P, "Safety Evaluation for B&W-Design Reactor Vessel Head Control Rod Drive Mechanism Nozzle Cracking," 5/93.
- (343) Proceedings of International Symposium on Plant Aging and Life Predictions of Corrodible Structures on May 15-18, 1995: "Status of Alloy 600 Components Degradation By PWSCC in France: Incentives and Limitations of Life Predictions as Viewed by a Nuclear Safety Body."
- (344) The EPRI "Boric Acid Corrosion (BAC) Guide Book," 4/95.

- (345) The EPRI "Boric Acid Corrosion (BAC) Guide Book," Revision 1, 11/01.
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- (347) Framatome Technologies letter ESC-96-059, "FTI Job 4110090 - Alloy 600 CRDM Nozzle PWSCC Program (Phase 5 - 1996 and 1997) (SR-92-05)," 1/96.
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