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DUKE POWER

April 26, 1989

U. S. Nuclear Regulatory Commission Attention: Document Control Desk Washington, D.C. 20555

Subject: Duke Power Company McGuire Nuclear Station Docket No. 50-369 Unit 1 Restart

This letter documents discussions I and several of my staff members held with D. B. Matthews and other NRC staff members during an April 25, 1989 telephone conference call. The subject of our call was the actions required prior to the restart of McGuire Unit 1 from the March 7, 1989 steam generator B tube rupture event. These actions were also discussed with the NRC on April 13, 1989 at a meeting held in White Flint and confirmed in an NRC letter dated April 19, 1989.

Based upon agreements reached during our April 25 conference call the following response to each of the actions contained the April 19 letter is provided.

(1) Further meetings and reporting regarding cause of the tube failure and integration of these results into effective corrective actions.

<u>Response</u>: We will meet with the NRC staff, again in White Flint, on May 5, 1989 to present and discuss the Unit 1 steam generator B tube report. The restart of Unit 1 is contingent upon receiving your concurrence at this meeting. We would like to do everything possible to facilitate the NRC's ability to support our restart effort. Prior to our meeting, we will talk with E. L. Murphy of the NRC staff daily to keep him informed of the steam generator tube report status. We will attempt to provide Emmett a draft of the report by May 3.

(2) Further meetings regarding tube plugs.

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<u>Response</u>: The report mentioned in Item 1 will contain a section addressing tube plugs in the McGuire steam generators. We will also discuss the plugs during our presentations at the May 5 meeting.

(3) Completion of procedural changes for entry conditions into Emergency Operating Procedures as proposed during the meeting.

<u>Response</u>: We have addressed the procedure related actions from our April 13 meeting as well as the procedure related findings of the April 10, 1989 AIT report. These are hereby attached to this letter for NRC review.

U. S. Nuclear Regulatory Commission Page Two April 26, 1989

(4) Completion of certain items from the NRC's Augmented Inspection Team Report of April 10, 1989 to be determined from your discussions with the Team Leader.

<u>Response</u>: We will coordinate the resolution of these items with the NRC Resident Inspector at McGuire.

We will rely upon the daily telephone calls mentioned in Item 1 to identify any considerations for changing the above schedule. Please let me know if there is any additional information we can provide prior to our May 5 meeting that will assist in expediting the NRC's review of the McGuire Unit 1 restart.

Very truly yours,

Lel B. Thacke

Hal B. Tucker

JSW/353/td

cc: Mr. S. D. Ebneter U. S. Nuclear Regulatory Commission 101 Marietta St., NW Suite 2900 Atlanta, GA 30323

> Mr. D. Hood, Project Manager Office of Nuclear Reactor Reg. U. S. Nuclear Regulatory Commission Washington, DC 20555

Mr. P. K. VanDoorn NRC Resident Inspector McGuire Nuclear Station

McGuire Operations Response To Procedure Concerns and Findings from the AIT Audit

The following are McGuire Operations responses to the procedural concerns and findings addressed in the AIT Report. The concerns and findings will be listed first with the AIT Report page number and then McGuire's response. All responses will address the procedures as Unit 1 procedures but all statements are true for both Unit 1 and Unit 2 procedures.

1. Concern from page 13 and 14

Upon receipt of an alarm on the B steamline radiation monitor, 1-EMF-25, the reactor operator at the controls verified the validity of the alarm before checking other parameters. He then checked the pressurizer level. reactor coolant makeup flow, steam generator levels and main feedwater regulator valve positions. In addition to all these including a condition that the shift referred to as the "classical S/G tube leak symptoms", the "condenser air ejector exhaust high gas radiation" annunciator alarmed. The unit supervisor concluded that the unit was experiencing a S/G tube leak and directed that AP/10 be implemented. Two of the four symptoms listed in that procedure were received: steam line high radiation and air ejector high gaseous radiation. However, the symptoms identified in AP/10 do not include increasing S/G level, decreasing feedwater flow or feedwater valve position, although the shift crew stressed during interviews that these indications were the deciding parameters. The definitive SGTR symptoms which the operator relied on to determine which AP to use, feedwater flow and steam generator level, are included in step 6 of AP/10, well into the procedural instruction. Although this event fell within the intended boundaries of the Westinghouse Owners' Group guidelines for procedures, it was handled by independent operator diagnosis and resultant direct usage of a nonemergency operating procedure.

AP/1/A/5500/10 (NC System Leakage Within the Capacity of Both NV Pumps) has been rewritten and approved and now includes decreasing feedwater flow and feedwater regulation valve position as symptoms for Case I "Steam Generator Tube Leakage". See Attachment 1, AP/1/A/5500/10, page 5 of 41. In addition, it is questionable if this event fell within the intended boundaries of the Westinghouse Owners Groups (WOG) ERG's. The entry conditions for the Safety Injection portion of ERG E-O are the plant specific setpoint or requirement for safety injection have been met, the SI annunciator light lit or SI pumps running. See Attachment 2, pages 2 and 3 of 6. During this transient, none of MNS SI setpoints were reached, the plant specific requirement of pressurizer level less than 5% was not reached and only two out of six SI pumps were running, the normal charging pump and the standby charging pump. In addition, the WOG background document for E-O "Reactor Trip or Safety Injection" has a paragraph explaining that the operators are expected to take manual action for anomalous conditions during power operations. These actions would include taking manual control of the automatic control systems, turning on additional charging pumps, reducing power level, etc. If these types of actions do not alleviate the trend toward a reactor trip or safety injection, the operator is permitted to trip the reactor and, if necessary, actuate safety injection. See Attachment 2, page 4 of 6.

2. Concern from page 14

One of the immediate operator actions after identification of the incident and entry into AP/10 was to reduce electrical load by reducing main generator power. AP/10 does not give direction to accomplish this task. The operators stated that they knew from training that this action should be performed. They did not use any procedure for this action and, therefore, had to ask the unit supervisor to determine the rate at which he wanted the load reduced. The needed rate of load reduction was analyzed and determined by the unit supervisor. This analysis placed additional burden on this individual during response to the event.

AP/1/A/5500/10 did not require a generator load decrease nor did it give a rate for the load decrease. The operators have been trained to perform this task. In the new AP/10, a step to initiate a load decrease to remove the unit off line has been added. This step is prefaced by a note explaining the load reduction rate should be determined based on the leak size and on the ability to remove the unit in a controlled manner. See Attachment 1, pages 6 and 21 of 41.

3. Concern from page 14 and 15

The operators considered initiating SI. They concluded however, it would not be advantageous if SI were initiated. Additional CRO manpower would be required to monitor the successful initiation of SI. In addition, the operators were uneasy regarding the dependability of the RN supply to the unaffected unit due to logic wiring problems experienced in the past. They also considered SI, when not mandatory, to be an unnecessary challenge to safety related equipment (i.e., containment isolation and diesel generator start). This preference not to manually initiate SI is reflected both in their AP and in their training.

Response:

The operators were trying to state Duke's philosophy of not challenging safety systems if they are not needed. In stating this philosophy, the operators were trying to explain that when safety injection is initiated, it is an event unto itself in which hundreds of components are required to start, stop, realign, etc. All of these components must be verified to be functioning properly prior to proceeding with the procedure to mitigate the initial event. The operators gave the AIT Inspectors an example of an event on Unit 1, which was an intermitent ground in the A train solid state protection system cabinet. This intermitent ground gave a partial A train safety injection where only a portion of the A train components realigned and no B train components realigned. This event caused significant operational problems for both the operating unit and the affected unit.

The operators are not uneasy about initiating safety injection if it is required by plant status or procedures. McGuire's procedures and training do not and have not discouraged the operators from initiating safety fraction when required. The difference at McGuire was the threshold or setpoint at which manual safety injection should be initiated. The actuation of automatic safety injection is dictated by the accident analysis and the manual initiation setpoint was more conservative than the automatic setpoint.

4. Concern from page 15

In the "immediate actions" section of AP/10, "response not obtained" for the step that requires the operator to manually initiate SI, there is no guidance to the operator on where to enter the procedure for SI.

Response:

The step in AP/10 which requires the operator to manually initiate safety injection does not identify which step to enter EP/1/A/5000/01 "Safety Injection" because the procedure is entered at the beginning. This concept is a given concept in that if an operator either trips the reactor, initiates safety injection or receives an automatic signal, the operator proceeds to the beginning of either the reactor trip procedure or safety injection procedure.

5. Concern from page 15

Step 3 of AP-10 directed determination of whether S/G blowdown isolation was required based solely on whether 1-EMF-34 (blowdown sample high rad alarm) was lit. Since it was not lit the operator did not verify S/G auto isolation nor manually isolate blowdown from any of the generators.

AP/10 now has a step to isolate blowdown on the ruptured steam generator and does not rely solely on the EMF to isolate blowdown. See Attachment 1 page 7 of 41.

6. Concern from page 15

AP/10 step 3 uses 1-EMF-34 as the sole determinant of whether S/G blowdown isolation is required. Then, in step 7b, after identifying the affected generator, the procedure does not isolate blowdown on the affected generator as part of the generator's isolation. This is similar to McGuire's EP/04 where, after identifying the ruptured generator in step 1, the subsequent steps isolate main steam to the ruptured generator but does not isolate blowdown. This is a significant safety-related deviation from the Westinghouse Owners' Group guideline E-3, SGTR, which requires, after identifying the ruptured generator, that its blowdown be isolated.

Response:

AP/10 now has a step to isolate blowdown on the ruptured steam generator and does not rely solely on the EMF to isolate blowdown. See Attachment 1 page 7 of 41. EP/1/A/5000/04 "Steam Generator Tube Rupture" does not have a specific step to isolate blowdown on the ruptured steam generator because it is done automatically by safety injection and checked by EP/1/A/5000/01, "Safety Injection". The check of the ESF Monitor Light Panel in EP/01 verifies that Containment Phase A Isolation Train A/B have been aligned properly and if the Phase A components have not been aligned the operator manually aligns those misaligned components. The steam generator blowdown valves do get isolated on a Phase A Containment Isolation signal. Therefore this action is done automatically and verified by the operator. See Attachment 3 page 3 of 3. Hence, this is not a safety significant deviation from the WOG guidelines.

7. Concern from page 15

Early in the implementation of AP-10 the shift manager (STA) entered the control room and began monitoring the critical safety functions of SPDS. This was an appropriate action but not specified by the procedure. Also, although the licensee has indicated that they have a fully operational SPDS, there were two parameters that were inaccurately displayed by SPDS during the event because of faulty computer logic. No integrity was being displayed as a "red path" (extreme challenge to this safety function; immediate operator action is required) and, core cooling was being displayed as a "yellow path"; indicating that his critical safety function was in an off-normal state and might require operator attention. The AIT was informed that there were several software problems with the SPDS.

Response:

McGuire's SPDS is operable but the McGuire Operator Aid Computer is not safety related. Operations has an emergency procedure EP/1/A/5000/10, "Critical Safety Function Status Trees" which is the controlling procedure for monitoring Critical Safety Functions which uses SPDS as a convenient aid if the OAC is available. See Attachment 4. In the case where a software problem with the computerized SPDS gives an invalid alarm, the operators would check to see if the alarm is valid utilizing the status trees. If the alarm was invalid as it was in the AIT examples, the operators would ignore it and notify reactor group of the problem as was done in this case.

8. Concern from page 15 and 16

At step 7 of AP/10 the operator was directed to "shut down and cooldown the unit using OP/1/A/6100/02, Controlling Procedure for Unit Shutdown", in conjunction with the remaining steps of AP/10. This OP is about 50 pages long, yet no direction is given to the operator in AP/10 regarding which page or section of the OP to enter. Thus, the operator entered the procedure where he felt it was appropriate.

The last step in AP/10 now has the operator utilize one of the three emergency subprocedures for cooling down the ruptured steam generator EP/1/A/5000/4.1 "SGTR Cooldown Using Steam Dump, EP/1/A/5000/4.2 "SGTR Cooldown Using Backfill" or EP/1/A/5000/4.3 "SGTR Cooldown Using Blowdown". In conjunction, the operator is referred to OP/1/A/6100/02 "Controlling Procedure for Unit Shutdown" Enclosure 4.2 to perform applicable steps. EP/4.1, EP/4.2 and EP/4.3 are entered at the first step so no entry step reference is needed. See Attachment 1, page 14 of 41. There is no consistent way of addressing which step in OP/02 to enter due to the nature of every transient being different and having the plant end up in a slightly different status as far as what components are running, etc. To put this situation in perspective, at this time in the procedure, primary pressure and the ruptured steam generator pressure are equalized and the primary system is cooled down below the saturation temperature and pressure for steam line PORV's or safety reliefs to lift. The immediate transient has been handled and cooldown options are being decided. A licensed operator is capable of deciding where OP/O2 should be entered to match where the plant is currently. In addition, the EP subprocedure is the controlling procedure with the shutdown OP being used for reference.

9. Concern from page 16

After the unit was off line, AP/10 directed the operator to isolate the affected steam generator. AP/10, at step 7b, directs the operator to "Close (main steam) isolation and bypass valves". By training and convention the operator knew this meant to open the by-pass, close the MSIV, then slowly close the by-pass to prevent a pressure transient.

Response:

The operator opened the MSIV bypass valves before closing the MSIV to avoid a pressure transient to prevent a pressure spike which could have

lifted the steamline PORV or Safety Reliefs. Even though this opened another steamline valve the MSIV's and MSIV bypass valves are fail close valves. This action adds approximately 20 seconds to isolating the steamline which is well worth the effort to avoid lifting a steamline PORV or Safety which would cause a direct release to the public. Also, the ruptured steam generator steamline was isolated within 11 minutes of the leak which is well within our safety analysis assumed time of 30 minutes.

10. Concern from page 16

Near the end of AP/10, the operator was directed to "dump steam to condenser by slowly opening steam isolate bypass valve on ruptured generator". Due to the brevity and lack of specificity of this instruction the operator opted to reference EP/4.1 where there was more detailed guidance. One of the difficulties of this procedural transition (or parallel usage) is that the two types of documents may not have a consistent set of definitions. For example, AP/10 step 7d refers to "...faulted S/G pressure..." when referring to the generator with the tube leak and at point 7f of the same page refers to the "ruptured" generator as the one with the tube leak. The EPs carefully use these terms to indicate a generator with a secondary leak as "faulted" whereas "ruptured" is used to refer to a generator with a primary to secondary leak through one or more tubes. Also, the concurrent use of procedures increases the physical and mental burden of the US who performed as the "Procedure Reader".

Response:

The last step in AP/10 now has the operator utilize one of the three steam generator tube rupture cooldown subprocedures. See Attachment 1, page 14 of 41. These procedures offer more detailed guidance on cooling the ruptured steam generator. As far as the concern over the lack of consistent definitions, the one example addressed in the report was an error in our procedure. McGuire Operations strives for consistency not only among our emergency procedures but all of our procedures.

11. Concern from page 17

Step, 7.f.1 of AP/10, listed an alternative to dumping steam from the ruptured generator to the condenser, that alternative would be blowing down through the BB recycle system. Due to the operators lack of confidence in the BB recycle system's Hx integrity they chose to dump steam to the condenser.

kesponse:

This concern was initiated by the Technical Support Center not the operators. The TSC had confidence in the BB recycle Hx integrity for short term use but not long term use. To put this in perspective, long term use would be identified as use for a period of greater than a week. The decision to not use the BB recycle system was based on the fact that the TSC determined blowing down the ruptured steam generator through normal blowdown was a better option. In addition, the ruptured steam generator was not steamed to the condenser after it was isolated. This statement in the AIT Report is in error.

12. Concern from page 16

Step 7.f.1, unlike the step in EP/4.1, makes no reference to performing an offsite dose calculation prior to dumping steam from a ruptured generator to the condenser. EP/4.1 contains a caution indicating that such a calculation should be done. The shift supervisor indicated at the time that he did not intend to have the dose calculation performed prior to steaming because EP/4.1 stated "should" and therefore was not a requirement.

Response:

The last step in AP/10 now has the operator utilize one of the three steam generator tube rupture cooldown subprocedures. If the operator chooses EP/4.1, that subprocedure has always contained the caution that an offsite dose evaluation (not a calculation) should be performed prior to using the procedure. This caution is consistent with the WOG guidelines which state that the evaluation should be done. See Attachment 2, pages 5 and 6 of 6.

13. Concern from page 16 and 17

Cooldown per OP/02 was delayed initially since primary boron sample results were not available until 2 hrs and 44 minutes after the trip (2:30 a.m.). The Boron sample concentration was not high enough to allow cooldown below 200° F so cooldown was not resumed. Boron concentration was high enough to initiate cooldown to an intermediate temperature but the operators were unaware of this option until 3 hrs 34 minutes after the trip. Cooldown was started 5 minutes after this option was realized.

Response:

The shutdown OP and the reactivity balance OP have been changed to clarify the operator's ability to cooldown to intermediate temperatures as long as shutdown margin is maintained for those intermediate temperatures. See Attachment 5.

14. Concern from page 17

After the reactor trip, primary system pressure was maintained above 1000 psig while S/G B pressure decreased to approximately 800 psig. This continued for 4 3/4 hours. This was because step 2.33 of OP/O2 and the cooldown curves require primary system temperature to be below 425° prior to decreasing pressure below 1000 psig (LOCA FSAR requirement). The operators did not become aware of a note immediately before step 2.33 allowing pressure to be reduced to 750 psi with shift supervisor approval under extenuating circumstances.

With the clarification that the cooldown can be initiated to intermediate temperatures, the plant should not get in a position that the cooldown curve requirement at $425^{\circ}F$ and 1000 psig would be a problem. In addition, this incident will be covered in operator requalification to further make the operators aware of the note allowing the shift supervisor to reduce primary pressure to 750 psig under extenuating circumstances.

15. Concern from page 17

Prior to commencing cooldown using S/G backfill (10:15 a.m.), the SRI asked the reactor engineer if shutdown margin projections had been made due to the impending dilution. The engineer indicated that operations personnel had indicated they did not need one but he thought it was a good ideas. He then provided the information.

Response:

Operations personnel in the TSC were well aware of the need for increased boron concentration needs for the impending dilution due to S/G backfill. This was addressed in EP/4.2. Operations personnel apparently failed to communicate this fact to the Reactor Engineer. The Operations personnel were taking the shutdown boron concentration given by the Reactor Engineer and adding the required boron concentration addition.

16. Concern from page 17

The procedure finally selected by the TSC to depressurize the NC System and S/G B was EP/4.2, "SGTR Cooldown Using Backfill". Step 9 if EP/4.2 (checking for void in upper head) contains a sub step (b) that requires the operator to continue monitoring for upper head void while going on to the next step in the procedure. This does not assure that attention is given to monitoring for voids while going on to another major action (i.e., NC system depressurization).

The step in EP/4.2 will be clarified to continue monitoring for upper head voids during the remainder of the procedure. This was understood before but not clearly stated in the procedure.

17. Concern from page 17 and 18

Based on a review of the sequence of events, operator and plant personnel interviews, and a control room walkthrough with members of the operating crew, the AIT concluded that considering the training and procedure impediments the operating crew performed adequately in mitigating this particular event. The crew followed steps prescribed in the station procedures, however, the procedures, were found to have significant weaknesses which could result in unnecessary releases of radioactivity to the environment should future SGTR events occur. The mitigative strategy which McGuire used for coping with this event deviated substantially from the Westinghouse Owners' Group Emergency Response Guidelines.

Rusponse:

The event was handled extremely well by the operating crew. Decisions were made in the TSC over which cooldown option to use for the ruptured steam generator. Procedures needed and have been enhanced but most of the enhancement is in procedure structure. The comment that the mitigative strategy deviated substantially from the WOG guidelines has been addressed by Concern 1.

18. Finding from page 28

The operating crew performed adequately in mitigating this event despite procedural weaknesses which caused the operator to select portions of additional procedures that contained more detailed guidance.

As stated in Concern 17, the operating crew performed outstandingly, not adequately. In addition, Operations personnel realized that enhancements need to be made to some of Operations' procedures and have enhanced or are enhancing procedures from the lessons which were learned from this event.

19. Finding from page 28

Operators failed to promptly identify the magnitude of the reactor coolant leak, to cooldown and to equalize pressure.

Response:

Operations did not identify the magnitude of the leak immediately. Identifying the exact magnitude of a leak while pressurizer level is decreasing due to the leak and primary system cooldown due to a load decrease, charging is being increased, letdown is being decreased and the Volume Control Tank level is changing is difficult. The operators concern was, "Is the leak greater than 50 gpm (Alert Classification) and if greater than 50 gpm can pressurizer level be maintained?" Quantifying whether the leak is a 150 gpm leak or 450 gpm leak is not utmost in the operator's mind nor is it of utmost importance. The operator must first control the plant and then worry about quantifying the exact leakage rate.

The operator did cooldown and depressurize the primary system to the ruptured steam generator pressure promptly. The resultant cooldown to cold shutdown was done in a controlled deliberate manner at the direction of the TSC to minimize possible errors which could result in unnecessarily jeopardizing the plant or the public. In a steam generator tube rupture event, the critical action is to equalize ruptured steam generator pressure with primary pressure. The resultant cooldown can and should be done in a calm, slow, deliberate manner.

20. Finding from page 28

Procedures and training discouraged operators from safety injecting. Although SI was not needed in this event, procedures and training should be reviewed to assure operators will SI when appropriate in the future.

Response:

Procedure and training do not and have not discouraged the operator from initiating safety injection when safety injection is required. Training has been done on our procedures and has supported our procedures. AP/10 is and was one of the most widely and often used procedures during simulator requal training. The difference at McGuire was at which point the operator was required to initiate manual safety injection. McGuire chose to have the operator maximize charging by reducing letdown flow, starting a second charging pump and opening the high head injection line isolation valves. If pressurizer level still decreased to less than 5% level the operator would manually activate safety injection. The revised AP/10 has been written to allow the operator to start the second charging pump, reduce or isolate letdown flow but will not allow manually opening the high head injection line isolation valves. See Attachment 1 pages 5 and 6 of 41.

21. Finding from page 28

Operators lacked confidence that certain systems would function following an SI, also considered unnecessary challenge to safety related equipment.

Response:

Refer to Concern 3.

22. Finding from page 28

The McGuire strategy for coping with this event deviates from the WOG guidelines in several significant aspects. Overall it addresses to an accident which is within the scope of the WOG EOPs. Guidelines for emergency operating procedures as an abnormal event rather than an emergency.

Response:

Refer to Concern 1.

23. Finding from page 28

Some important operator actions required to mitigate the event are not specified in AP/10. Among these are reduction in load, monitoring of critical safety functions, isolation of the affected generator, depressurization by dumping steam to the condenser and offsite dose calculation prior to dumping steam to the condenser from the affected generator.

Response:

Refer to Concerns 2, 5, 6, 8 and 12. Also SPDS is monitored on transfers out of EP/1 "Safety Injection". Since we have changed AP/10 so the high head injection line isolation valves can not be manually opened, for a leak greater than the capacity of the normal charging line safety injection will be manually initiated and the operator is directed to EP/01.

24. Finding from page 29

The transitions from AP/10 to other procedures are lacking in detail or not identified at all. Among these are:

- AP/01, "Rx trip" procedure
- OP/02, "Controlling Procedure for Unit Shutdown"
- EP/4.1, "SGTR Cooldown Using Steam Dump"
- EP/4.2, "SGTR Cooldown Using Backfill"
- EP/4.3, "SGTR Cooldown Using Blowdown"

Refer to Concerns 4 and 8.

25. Finding from page 29

AP/10 and EP/4.3 contain steps directing the operator to use the Blowdown Recycle System which could potentially result in establishing an unmonitored release pathway.

Response:

AP/10 now directs the operator to utilize one of the three steam generator tube rupture subprocedures to cooldown the rupture steam generator. OP/1/A/6250/08 "Steam Generator Blowdown" will be changed to have health physics personnel take grab samples if the BB Recycle Hx is in use. EP/4.3 places the BB Recycle Hx in service per OP/08. The BB Recycle Hx's on both Unit 1 and Unit 2 were taken out of service and red tagged to the Operations Superintendent on 4/21/89. These Hx's will be placed back in service after the procedures are changed. Operations and Radiation Protection procedures will be changed by May 5, 1989.

26. Finding from page 29

AP/10 does not required an assessment of offsite dose prior to dumping steam from the affected generator to the condenser.

See Concern 12.

27. Concern from page 29

System crossties caused increased radiological problems.

Response:

An additional Enclosure, Enclosure 6 "Minimizing Secondary Side Contamination" has been added to AP/10 to minimize (as much as possible) secondary side contamination due to system crossties. See Attachment 1, pages 39, 40 and 41 of 41.

28. Finding from page 29

Operators were not knowledgeable of two important provisions for cooling down and depressurizing in unusual situations. Specifically, these were (1) boron concentration required for intermediate temperature cooldown and, (2) procedural option to depressurize to 750 psi before cooling down.

Response:

See Concerns 13 and 14.

29. Finding from page 29

cP/04 does not isolate blowdown on the ruptured generator. This is a significant safety-related deviation.

See Concern 6.

30. Finding from page 29

The overall mitigative strategy used to deal with this >500 gpm tube rupture deviates substantially from the WOG Emergency Response Guidelines.

Response:

See Concern 1.

In addition to the responses on the AIT Report, the commitment on procedural enhancements from the April 13, 1989 Duke Power presentation to the NRC staff have been included. Attachment 6 has those commitments. The procedure changes which were made previously are in Attachment 5. The procedure enhancement to AP/10 which were scheduled to be completed by May 1, 1989 are done and are shown on Attachment 1. The procedure enhancements which were scheduled for a June 30, 1989 completion are working now.

List of Attachments

- Attachment: 1 Revised AP/1/A/5000/10 "NC System Leakage Within The Capacity of Both MV Pumps"
- Attachment 2 Selected Pages From The Westinghouse Owners' Group Emergency Response"

Attachment 3 - Selected Pages from EP/1/A/5000/01 "Safety Injection

Attachment 4 - EP/1/A/500/10 "Critical Safety Function Status Trees"

- Attachment 5 Selected Pages From OP/1/A/6100/02 "Controlling Procedure for Unit Shutdown" and OP/0/A/6100/06 "Reactivity Balance Calculation"
- Attachment 6 Procedural Commitments Made in the April 13, 1989 Washington, D.C. Duke Power Presentation to the NRC Staff
- Attachment 7 Superceded Copy of AP/1/A/5000/10 and Selected Pages From the Superceded OP/1/A/6100/02

Attachment 1

Revised AP/1/A/5000/10 "NC System Leakage Within The Capacity of Both NV Pumps.

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Form 34731 (R!	LANE GENERAL	D No. AP/1/A/5500/10
	PROCEDURE PROCESS RECORD	Change(s) t Change(s) Incorporate
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(3) Procee	NO Custom Laskage Within The Conscitu of Poth	NV Pumps
(4) Prepar	ed ByLen Firebaugh	Date 3/1/89
(5) Review	BO By Michael Weiner	Date
	Disciplinary Review By	N/R_MN
(6) Tempo	rary Approval (if necessary)	
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Review	Approved By ETQSmw 4/2x/22	Date
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(9) Comm	ents (For procedure reissue indicate whether additional changes, other than previou cluded. Attach additional pages, if necessary.) Additional Changes Included. If Yes	isly approved changes, are in-
(10) Compa	ared with Control Copy	Date
	es change to FSAR not identified in 10CFR50.59 evaluation? Yes ', attach detailed explanation.	
Completion (12) Date(s	n) Performed	
(13) Proceed	dure Completion Verification	
T Yes	N/A Check lists and/or blanks property initialed, signed, dated or filled in N/A or	N/R, as appropriate?
T Yes	DN/A Listed enclosures attached?	
T Yes	N/A Data sheets attached, completed, dated and signed?	
T Yes	N/A Charts, graphs, etc. attached and property dated, identified and marked?	
T Yes	N/A Procedure requirements met?	
Verifie	d By	Date

(15) Remarks (attach additional pages, if necessary)

AP/1/A/5500/10	NC SYSTEM LEAKAGE WITHIN T	HE CAPACITY OF
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Case II NC System Leakage

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Form 34912 (8-82)

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PAGE NO. AP/1/A/5500/10 NC SYSTEM LEAKAGE WITHIN THE CAPACITY OF BOTH NV PUMPS

1 OF 23

A. Purpose

This procedure covers the required operator actions for NC leakage greater than Tech Specs but where the Charging Pumps are capable of maintaining Pzr water level and the Pzr heaters are capable of mainlaining system pressure under the following conditions:

Case I Steam Generator Tube Leakage Case II NC System Leakage

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AP/1/A/	5500/10	E WITHIN CAPACITY OF BOTH NV PUMPS Case I enerator Tube Leakage Case I
	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
В.	Symptoms	ana and for an and a formation of the second s
	• "1EMF 33, Cond Air Eje	t Exh Hi Rad" alarm
	• "1EMF 34, S/G Sample H	Rad" alarm
	 "1EMF 24, 25, 26, 27 S 	/G A, B, C, D Steamline Hi Rad" alarm
	• Increase in frequency	of auto makeup to VCT
	 Feedwater flow and CF S/G. 	Reg valve position indication decreasing in any
c.	Immediate Actions	
1.	Check Pzr level AT OR IN TO PROGRAMMED LEVEL.	CREASING IF level decreasing, THEN perform th following to maintain level:
		 Ensure 1NV-238 (Charging Line Flow Control) opening in "Auto".
		b. Start additional NV Pump.
		 Reduce letdown to 45 GPM orifice or isolate letdown if necessary.
		IF level decreases below 5%, THEN manually trip Reactor and initiate SI. GO TO EP/1/A/5000/01, SAFETY INJECTION.
2.	Check Pzr pressure - AT OF INCREASING TO 2235 PSIG.	IF less than 2210 PSIG, THEM ensure backup heaters on.
		IF pressure approaches 1945 PSIG, THEN trip Reactor.
D.	Subsequent Actions	
CAUT	ION If Pzr level cannot b SI should be manually	maintained, (less than 5% and decreasing) then initiated.

Announce occurrence on paging system.

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n 34913 (8-8	52) 	ng ang pangang	na na ana amin'ny fanana amin'ny fanisa amin'ny fanisa amin'ny fanana amin'ny fanana amin'ny fanisa amin'ny fan	
AP/1/A/	5500/10	NC SYSTEM LEAKAGE WITHI Case Steam Generator		
[ACTION/	EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
2.		level - STABLE OR	IF level decreasing with maximum charging flow, THEN manually trip Reactor and initiate SI. GO TO EP/1/A/5000/01, SAFETY INJECTION.	
NOTE	Load redu ability f	action rate should be det to take the unit off line	ermined based on leak rate flow and on in a controlled manner.	
3.		: load reduction to it off line.		
4.	THEN open	Level" less than 16%, 1NV-221A or 222B (NV t From FWST).		
5.		rgency boration for SDM tions during cooldown 1.		
6.		RP/0/A/5700/00, ATION OF EMERGENCY.		
7.	Identify	ruptured S/G:	Do not proceed until ruptured S/G identified.	is
		S/G levels - ANY ASING IN AN UNCONTROLLED R		
		OR		
	S/G A	1EMF-24, 25, 26, 27, (B, C, D) Steamline Hi onitors - ANY ABOVE L		
		CF Flow - LOWER IN ANY OMPARED TO ALL		
		OR		
	PER O GENER 4.3	P/1/A/6250/08, STEAM ATOR BLOWDOWN, ENCLOSURE		

AP/1/A/5500/10 NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS Case I Steam Generator Tube Leakage				
	ACTION/EXPECTED RESPONSE		RESPONSE NOT OBTAINED	00710002559953
	er unit is off line, isolat w from ruptured S/G:			
a.	Close MSIV and MSIV Bypass valves on ruptured S/G.	a.	Close MSIV and MSIV By on nonruptured S/G. C following to isolate t header:	lose the
			 Condenser and Atmosp Dump valves 	heric
			• 1SM-14 (SM To CSAE)	
			• 15M-15 (SM To 2ND ST	G RHTRS)
			♦ 1AS-12 (SM To AS)	
			✤ 1TL-3 (SM To Stm Sea	l Isol).
			Dispatch operator to 1 close:	ocally
			♦ 1SP-1 (SM To CF Pump	A Isol)
			 ♦ 1SP-2 (SM To CF Pump Isol). 	1B
b.	Close steamline drain on ruptured S/G:			
	 1SM-83, 84, 95, 101(A(SM Line Drain). 	,C,D)		
c.	Isolate blowdown on ruptu S/G.	ed		
d	Dispatch operator to loca close valves on ruptured			
	 1SA-1 (SM 1C To TD CA Manual Isol) and 1SA-7 1C To TD CA Pump Loop Isol) 	(SM		
	 ISA-2 (SM 1B To TD CA Manual Isol) and ISA-7 1B To TD CA Pump Loop Isol). 	(SM		

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Form	24	91	3 1	ж.	871
1 MILLI	2.44	20.1	~ 1	6	100

PAGE NO. NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS 5 OF 23 AP/1/A/5500/10 Case I Steam Generator Tube Leakage RESPONSE NOT OBTAINED ACTION/EXPECTED RESPONSE Maintain ruptured S/G pressure е. - LESS THAN 1125 PSIG: 1) IF SM PORV fails to close at 1) Verify SM PORVs in "Auto" 1092 PSIG, THEN close its SM and closed. PORV Isol valve. 2) IF condenser not available, 2) Open MSIV Bypass valve to THEN verify SM PORV cycles to maintain pressure. prevent opening safety valves. 9. Check ruptured S/G level: a. "S/G NR Lv1" - GREATER THAN 5% a. Maintain feed flow to ruptured S/G until level greater than 5%. b. Stop feed flow to ruptured S/G. 10. Check intact S/G levels: a. "S/G NR Lv1" - GREATER THAN 5%. a. Maintain total feed flow greater than 450 GPM until level greater than 5% in at least one intact S/G. b. Control feed flow to maintain levels - AT NO LOAD.

NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS	34913 (8-82)			nument 1 9 of 41
 CAUTION + Isolation of the ruptured S/G steam lines must be complete before continuing to step 11. Administrative cooldown rate of 50°F/hr may be exceeded during cooldown in step 11. MOTE + Blocking the steamline low pressure SI signal will enable the steamlin pressure rate, main steam isolation signal. Cooldown and depressurization in steps 11 and 12 should be performed concurrently to minimize break flow while maintaining subcooling. 11. Initiate NC System cooldown: Maintain cooldown to ensure NC System stays 20°F subcooled until depressurization in step 12 is completed. Dump steam to condenser from b. Dump steam from intact S/Gs SM poRVs. c. WHEN "P2r Press" less than 1955 PSIG, THEM verify "P-11 Pressurizer S/I Block Permissive" status light is lit. Depress the following "Block" pushbuttons and verify "Blocked" lights - LIT: "P2r SI Trn A (B) Block" "Stm Line SI Trn A (B) 	AP/1/A/5500/10	Case I		PAGE NO. 6 OF 23
 continuing to step 11. Administrative cooldown rate of 50°F/hr may be exceeded during cooldown in step 11. NOTE • Blocking the steamline low pressure SI signal will enable the steamlip pressure rate, main steam isolation signal. Cooldown and depressurization in steps 11 and 12 should be performed concurrently to minimize break flow while maintaining subcooling. 11. Initiate NC System cooldown: a. Maintain cooldown to ensure NC System stays 20°F subcooled until depressurization in step 12 is completed. b. Dump steam to condenser from b. Dump steam from intact S/Gs SM poRVs. c. WHEN "Pzr Press" less than 1955 PSIG, THEN verify "P-11 Pressurizer S/I Block Permissive" status light is 1it. 1) Depress the following "Block" pushbuttons and verify "Blocked" lights - LIT: * "Pzr SI Trn A (B) Block" * "Stm Line SI Trn A (B) 	ACTIO	N/EXPECTED RESPONSE	RESPONSE NOT OBTAINED)
 pressure rate, main steam isolation signal. Cooldown and depressurization in steps 11 and 12 should be performed concurrently to minimize break flow while maintaining subcooling. 11. Initiate NC System cooldown: a. Maintain cooldown to ensure NC System stays 20°F subcooled until depressurization in step 12 is completed. b. Dump steam to condenser from intact S/Gs. c. WHEN "Pzr Press" less than 1955 PSIG, THEN verify "P-11 Pressurizer S/I Block Permissive" status light is lit. 1) Depress the following "Block" pushbuttons and verify "Blocked" lights - LLT: "Pzr SI Trn A (B) Block" "Stm Line SI Trn A (B) 	•	continuing to step 11. Administrative cooldown rate		
<pre>concurrently to minimize break flow while maintaining subcooling. 11. Initiate NC System cooldown: a. Maintain cooldown to ensure NC System stays 20°F subcooled until depressurization in step 12 is completed. b. Dump steam to condenser from intact S/Gs. c. WHEN "Pzr Press" less than 1955 PSIG, THEN verify "P-11 Pressurizer S/I Block Permissive" status light is 1it. 1) Depress the following "Block" pushbuttons and verify "Blocked" lights - LIT:</pre>	pr	essure rate, main steam isola	ation signal.	
 a. Maintain cooldown to ensure NC System stays 20°F subcooled until depressurization in step 12 is completed. b. Dump steam to condenser from intact S/Gs. c. WHEN "Pzr Press" less than 1955 PSIG, THEN verify "P-11 Pressurizer S/I Block Permissive" status light is lit. 1) Depress the following "Block" pushbuttons and verify "Blocked" lights - LIT: * "Pzr SI Trn A (B) Block" * "Stm Line SI Trn A (B) 	co	ncurrently to minimize break		
<pre>intact S/Gs. PORVs. c. WHEN "Pzr Press" less than 1955 PSIG, THEN verify "P-11 Pressurizer S/I Block Permissive" status light is lit. 1) Depress the following "Block" pushbuttons and verify "Blocked" lights - LIT: • "Pzr SI Trn A (B) Block" • "Stm Line SI Trn A (B)</pre>	a. Mai NC unt	ntain cooldown to ensure System stays 20°F subcooled il depressurization in step		
<pre>1955 PSIG, THEN verify "P-11 Pressurizer S/I Block Permissive" status light is lit. 1) Depress the following "Block" pushbuttons and verify "Blocked" lights - LIT:</pre>				t S/Gs SM
<pre>"Block" pushbuttons and verify "Blocked" lights - LIT: "Pzr SI Trn A (B) Block" "Stm Line SI Trn A (B)</pre>	195 Pre Per	5 PSIG, THEN verify "P-11 ssurizer S/I Block missive" status light is		
 "Stm Line SI Trn A (B) 	1)	"Block" pushbuttons and verify "Blocked" lights -		
		• "Stm Line SI Trn A (B)		

Attachment 1

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AP/1/A/5500/10	NC SYSTEM LEAKAGE WITHIN Case I Steam Generator T		7 OF 23
	EXPECTED RESPONSE		RESPONSE NOT OBTAINED
12. Depressur break flo	ize NC System to minimize w:		
a. Norma	1 Pzr spray - AVAILABLE	a.	<u>IF</u> letdown in service, <u>THEN</u> use NV Aux spray.
			IF letdown not in service, THEN use one Pzr PORV.
			<u>IF</u> no Pzr PORVs available, <u>THEN</u> use NV Aux spray.
the f befor	ssurize until any of ollowing are satisfied e continuing with this dure:		
	pressure - LESS THAN PTURED S/G PRESSURE		
	OR		
	ptured S/G level - NSTANT OR DECREASING		
	OR		
	r level - GREATER THAN %.		
c. Close	e spray valves or PORV.	c.	Stop NC Pump in loop with open spray valve or close Pzr PORV Isol valve for any PORV that will not close.

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AP/1/A/5500/10	Case I Steam Generator Tube Leaka	200	6 OF 23

- a. Pzr level GREATER THAN 25% a. Maintain charging flow until AND INCREASING
- b. Reduce charging flow to maintain Pzr level constant.
- 14. Check VCT Makeup Control System:

reduced:

- a. IF started, THEN stop emergency borating when SDM is adequate PER Data Book Table 6.5.
- b. Ensure makeup set for greater than NC System boron concentration.
- c. Ensure "NC Sys M/U Controller" in "Auto" and place "NC System Makeup" switch to "Start".

level greater than 25%.

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AP/1/A/5500/10 NC SYSTEM LEAKAGE WITHIN C Case I Steam Generator To	9 OF 23
Nr / 1/ N/ 0000/ 10	RESPONSE NOT OBTAINED Establish excess letdown: 1. Ensure open: 1. KC-305B (Excess Letdn Hx Sup 0 Otsd Isol) 1 KC-315B (Excess L/D Hx Ret Hdr C/I Otsd) 1 NV-94A and 95B (NC Pmps Seal Ret C/I Inside/Otsd). 2. Place 1NV-27B (Excess L/D Hx Otlt 3-Way Cntrl) to "VCT" rosition. 3. Open 1NV-24B and 25B (C NC Loop To Exs L/D Hx Isol). 4. Slowly open 1NV-26 (Excess L/D Hx Outlet Cntrl) to maintain "Excess L/D Hx Temp" less than 200°F.

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-			-	n .	14	100	mmi
-	01	m	30	54.1		(M.,	82)
	U 1	1.5.1	274	W 1	~	10	Sec. 1.

PAGE NO. NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS 10 OF 23 AP/1/A/5500/10 Case I Steam Generator Tube Leakage RESPONSE NOT OBTAINED ACTION/EXPECTED RESPONSE 16. Maintain stable plant conditions: a. NC pressure - STABLE a. Operate Pzr heaters and sprays. b. Control charging and letdown. b. Pzr level - 25% c. Intact S/G levels - AT NO c. Control feed flow. LOAD d. NC temperatures - STABLE. d. Operate Condenser Dumps. 17. Minimize secondary side contamination: a. If available transfer AS header a. Dispatch operator to locally place Aux Electric Boiler in supply to Unit 2: operation PER OP/1/A/6250/07B, AUX ELECTRIC BOILERS, Enclosure 1) Close 1AS-9 (C Htr Bleed to AS) and 1AS-12 (SM To 4.2, then do the following: AS). 1) Close 1AS-9 (C Htr Bleed to 2) Open 1HM-95 (AS To A & AS) and 1AS-12 (SM To AS). B FWPT). 2) Open 1HM-95 (AS To A & B b. IF B S/G ruptured, dispatch FWPT). operator to locally close 1SM-85 (Stm Line 1B DH Drn Orifice Inlet).

c. REFER TO Enclosure 6.

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AP/1/A/5500/10 NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS Case I Steam Generator Tube Leakage 11 OF 23

	ACTION/EXPECTED RESPONSE PROVIDENCE RESPONSE NOT OBTAINED
CAUTION	 If any NC Pump is running, then the preferred cooldown method is EP/1/A/5000/4.2, SGTR COOLDOWN USING BACKFILL.
	 If water may exist in main steamlines, then EP/1/A/5000/4.1 SGTR COOLDOWN USING STEAM DUMP should not be used.
	 It is strongly recommended that the condenser be available if EP/1/A/5000/4.1, SGTR COOLDOWN USING STEAM DUMP is used. Otherwis an evaluation of using the ruptured S/G SM PORV must be made.
	atinue plant cooldown to cold atdown:
a.	Select cooldown method for ruptured S/G:
	EP/1/A/5000/4.1, SGTR COOLDOWN USING STEAM DUMP
	OR
	 EP/1/A/5000/4.2, SGTR COOLDOWN USING BACKFILL
	OR
	EP/1/A/5000/4.3, SGTR COOLDOWN USING BLOWDOWN.
b.	REFER TO OP/1/A/6100/02, CONTROLLING PROCEDURE FOR UNIT SHUTDOWN, Enclosure 4.2 and perform applicable steps.
	END

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AP/1/A/5500/10		NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS Case II NC System Leakage		
	ACTION/	EXPECTED RESPONSE RESPONSE NOT OBTAINED		
В.	Symptoms			
٠	Increase	in frequency of auto makeup to VCT		
•	 Increased leakrate results from PT/1/A/4150/01B, REACTOR COOLANT LEAKAGE CALCULATIONS 			
٠	Increased	radiation from any of the following:		
	• "1EMF	38 Containment Part Hi Rad" alarm		
	• "1EMF	39 Containment Gas Hi Rad" alarm		
	IEMF	40 Containment Iodine Hi Rad" alarm		
	• "EMF4	1 Aux Bldg Vent Hi Rad" alarm		
	• "1EMF	46 A(B) Train A(B) KC Hi Rad" alarm.		
•	Increased	levels in any of the following:		
	• "Cont	Flr/Eqp Sump A(B) Level"		
	 ND an 	d NS Sump		
	• NCDT			
	RHT			
	 KC Su 	rge Tank		
	• PRT.			
•	Increased	temperatures on any of the following:		
	• "Pzr	PORV Disch Hi Temp" alarm		
	• "Pzr	Safety Discharge Hi Temp" alarm		
	• "Rx V	essel Flange Leak Off Hi Temp" alarm		
	• "Letd	lown Relief Hi Temp" alarm.		
	• PRT			
	• Conta	inment.		
	"NC Pump	A(B,C,D) Thermal Barrier Outlet Hi Flow" computer alarm		
	Letdown or charging line flow or pressure abnormal.			

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PAGE NO. NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS 13 OF 23 Case II AP/1/A/5500/10 NC System Leakage RESPONSE NOT OBTAINED ACTION/EXPECTED RESPONSE С. Immediate Actions 1. Check Pzr level - AT OR INCREASING IF level decreasing, THEN perform the following to maintain level: TO PROGRAMMED LEVEL. a. Ensure 1NV-238 (Charging Line Flow Control) opening in "Auto". b. Start additional NV Pump. c. Reduce letdown to 45 GPM orifice or isolate letdown if necessary. IF level decreases below 5%, THEN manually trip Reactor and initiate SI. GO TO EP/1/A/5000/01, SAFETY INJECTION. IF less than 2210 PSIG, THEN ensure 2. Check Pzr pressure - AT OR INCREASING TO 2235 PSIG. backup heaters on. IF pressure approaches 1945 PSIG, THEN trip Reactor. D. Subsequent Actions CAUTION If Pzr level cannot be maintained, (less than 5% and decreasing) then Safety Injection should be manually initiated. 1. Announce occurrence on paging system. IF level decreasing with maximum 2. Check Pzr level - STABLE OR charging flow, THEN manually trip INCREASING. Reactor and initiate SI. GO TO EP/1/A/5000/01, SAFETY INJECTION. 3. REFER TO RP/0/A/5700/00. CLASSIFICATION OF EMERGENCY. WHEN "VCT Level" less than 16%, 4. THEN open 1NV-221A or 222B (NV Pumps Suct From FWST).

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AP/1/A/	5500/10	(HIN CAPACITY OF BOTH NV PUMPS Case II stem Leakage	14 OF 2
5.		EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
	isolation			
	a. 1EMF 3	38, 39 or 40 - IN ALARM	a. <u>GO TO</u> step 6.	
	b. Stop V	/P Fans.	•	
		any VQ release in progress.		
6.	Check "EMP - IN ALARM	F41 Aux Bldg Vent Hi Rad" M	<u>GO TO</u> step 7.	
	Bypass	y "1ABF-D-3 VA Filter Exh s Dmpr Trn A(B)" closed s - LIT.		
	Bypass	y "2ABF-D-3 VA Filter Exh s Dmpr Train A(B)" closed s - LIT.		
7.	Check "1E ALARM	MF-46 KC Hx Outlet" - IN	<u>GO TO</u> step 8.	
	verif	tch operator to locally y 1KC-122 (KC Surge Tank - CLOSED.		

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PAGE NO. NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS Case II 15 OF 23 AP/1/A/5500/10 NC System Leakage RESPONSE NOT OBTAINED ACTION/EXPECTED RESPONSE Check "NC Pmp A(B, C, D) Therm Bar GO TO step 9. 8. KC Outlet Flow" computer alarm -IN ALARM a. Verify the following valve closes on affected pump: A, 1KC-394A (A NC Pump Therm Bar Otlt) OR B. 1KC-364B (B NC Pump Ther Bar Otlt) OR C. 1KC-345A (C NC Pump) Therm Bar Otlt) OR D, 1KC-413B (D NC Pump Therm Bar Otlt). b. Verify "1A(B, C, D) NC Pump L/B Temp" remains less than b. IF greater than 225°F, THEN trip NC Pump. 225°F. IF required to stop leak, THEN GO TO step 10. 9. isolate letdown: a. Close INV-1A and 2A (NC L/D Isol to Regen Hx) to solate normal letdown. b. Take manual control and reduce b. Verify charging flow -DECREASING TO MINIMUM. charging flow to 32 GPM. c. Establish excess letdown PER OP/1/A/6200/01, CHEMICAL AND VOLUME CONTROL, Enclosure 4.8. d. Power operation may continue as long as NC System activity and chemistry requirements are met.

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	NAME OF CONTRACTORS		System Leakage	
	ACTIC	ON/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	Pathameter
		ired to stop leak, THEN normal charging.	GO TO step 11.	
а	. Iso	late letdown:		
	1)	Close 1NV-1A and 2A (NC L/D Isol To Regen Hx).		
i	. Iso	late charging:		
	1)	Close 1NV-244A and 245B (Charging Line Cont Isol Otsd)		
	2)	Manually throttle 1NV-238 (Charging Line Flow Control to maintain 8 GPM seal injection flow per NC Pump.		
(OP/	tablish excess letdown <u>PER</u> /1/A/6200/01, CHEMICAL AND LUME CONTROL, Enclosure 4.2.		
(as	ver operation may continue long as NC System activity i chemistry requirements are t.		

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PAGE NO. NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS 17 OF 23 Case II AP/1/A/5500/10 NC System Leakage RESPONSE NOT OBTAINED ACTION/EXPECTED RESPONSE 11. Attempt to identify and isolate leak: a. Check "Pzr PORV Disch Hi Temp" a. GO TO step b. - IN ALARM 1) Verify Pzr PORV's - CLOSED 1) Close Pzr PORV's. 2) Determine which valve is leaking by monitoring "PORV Relief Valve Temp" while cycling a PORV isolation and its sample valve one at a time: INC-33A (Pzr PORV Isol) and 270 (Pzr Relief Hrd Sample Isol) INC-35B (Pzr PORV Isol) and 269 (Pzr Relief Hdr Sample Isol) INC-31B (Pzr PORV Isol) and 271 (Pzr Relief Hrd Sample Isol). b. Check "Cold Leg Accumulator b. GO TO step c. Level" - INCREASING 1) Close Accumulator isolation valve OR Drain accumulator PER OP/1/A/6200/09, ACCUMULATOR OPERATION, Enclosure 4.2. c. Check "Pzr Relief Tank Level c. GO TO step d. (Temp)" - INCREASING ABOVE NORMAL 1) Check inputs to PRT PER Enclosure 1.

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per l			en a.	A 4	A 11	n 1	001
pa,	CSF	m	30	91	3 1	M1	82)
	w.,		5.4	Q 1	~ 1	9	SP 65 /

PAGE NO. NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS 18 OF 23 AP/1/A/5500/10 Case II NC System Leakage RESPONSE NOT OBTAINED ACTION/EXPECTED RESPONSE d. Check NCDT level or temperature d. GO TO step e. - INCREASING ABOVE NORMAL 1) Check inputs to NCDT PER Enclosure 2. e. Check "Cont Flr/Eqp Sump A(B) e. GO TO step f. Level" - INCREASING ABOVE NORMAL 1) Check inputs to sumps PER Enclosure 3. f. GO TO step g. f. Check inputs to Aux Building Sumps from NV System PER Enclosure 4. g. Check ND System - IN SERVICE g. GO TO step 12. 1) Check inputs to Aux Building Sumps from ND System PER Enclosure 5. AND unit shutdown is required, IF leak is isolated, THEN consult 12. IF leak can not be isolated Unit 1 Operations Manager for further THEN notify NRC via red phone PER RP/0/A/5700/10, NRC IMMEDIATE actions and end this procedure. NOTIFICATION REQUIREMENTS. NOTE Load reduction rate should be determined based on leak rate flow and on ability to take the unit off line in a controlled manner. 13. Begin unit load reduction to remove unit off line. Start all available NC Pumps PER 14. Check NC Pumps - ALL RUNNING. OP/1/A/6150/02A, NC PUMP OPERATION.

AP/1/A/5	500/	/10	NC S	YSTEM	LEAK		THIN Case stem	II		OF	вотн	NV	PUMPS		AGE 19 0	
	A	CTION/E	PECTED	RESPO	INSE			-	RE	SPON	SE NO		BTAINE	D		1994 - 1995 - 1995
NOTE	•	Blockin									wi11	ena	ble th	he st	eaml	ine
	•	If an exceed						rati	ve co	bloc	own	rate	of 50	0°F/H	IR ma	y b
15.	Begi 2009	n NC S F:	ystem o	ooldo	wn to											
	a.	REFER CONTRO UNIT S and pe	LLING F	ROCED , Enc	URI: FI	OR e 4.2										
	b.	Mainta THAN 1 NC Pum	DO°F/HF	(50°												
	c.	Dump s	team to	cond	enser			c.	Dump	p st	eam	usin	g SM I	PORVs		
	d.	Contro "S/G N	I CA fi R Lv1"													
	e.		tration QUIREM	- GR	EATER	THAN	:									
	f.	Pressu	Pzr Pro THEN vo rizer S light	erify S/I B1	"P-11 ock P			f.	Cont	tinu	e wi	th s	step 1	6.		
		pu	press shbutto locked	ons an	d ver	ify	ock"									
		•	"Pzr	SI Trr	A (B) Bloc	:k"									
		٠	"Stm Block		SI Trn	A (B)	1									

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ACTION/EXPECTED RESPONSE 16. Check if cold leg accumulators should be isolated: a. NC System subcooling - GREATER THAN 0°F AND NC pressure - LESS THAN 1000 PSIG b. Place the following switches to "Enable" and close the respective valve: • "Pwr Discon For 1NI-54A" • "Pwr Discon For 1NI-65B" • "Pwr Discon For 1NI-88B". 1NI-61 (B CL Accum N2 Supply Isol) • 1NI-62 (C L Accum N2 Supply Isol) • 1NI-84 (D CL Accum N2 Supply Isol) • 1NI-83 (CL Accum N2 Supply Isol) • 1NI-84 (D CL Accum N2 Supply Isol) • 1NI-83 (CL Accum N2 Supply Isol) • 1NI-84 (D CL Accum N2 Supply Isol) • 1NI-83 (CL Accum N2 Supply Isol) • 1NI-84 (D CL Accum N2 Supply Isol) • 1NI-83 (CL Accum N2 Supply Isol) • 1NI-84 (D CL Accum N2 Supply Isol) • 1NI-85 (CL Accum N2 Supply Isol) • 1NI-85 (CL Accum N2 Supply Isol) • 1NI-85 (D CL Accum N2 Supply Isol) • 1NI-85 (D CL Accum N2 Supply Isol) • 1NI-85 (D CL Accum N	AP/1/A/5500	/10		WITHIN Case System	II	CITY OF BOTH NV PUMPS PAGE NO. 20 OF 23 age
stopped: a. NC System subcooling - GREATER a. Continue dumping steam. THAN 50°F AND AND AND AND AND AND AND AND	16. Che sho a.	ck if c uld be NC Sys THAN C NC pre 1000 F Place to "Er respec • "Pv • "Pv	cold leg accumulators isolated: tem subcooling - GRE OF AND essure - LESS THAN PSIG the following switch able" and close the ctive valve: or Discon For 1NI-54A or Discon For 1NI-76A or Discon For 1NI-76A	ATER es		Continue with this procedure while monitoring pressure and subcooling. WHEN both conditions are met, <u>THEN</u> do step b. Vent any unisolated accumulator: 1) Open isolation valve on affected accumulator: • 1NI-50 (A CL Accum N2 Supply Isol) • 1NI-61 (B CL Accum N2 Supply Isol) • 1NI-72 (C CL Accum N2 Supply Isol) • 1NI-72 (C CL Accum N2 Supply Isol) • 1NI-84 (D CL Accum N2 Supply Isol) 2) Open 1NI-83 (CL Acc N2 Hdr
b. Both NV Pumps - RUNNING b. GO TO step 19.	a.	Pzr 1	stem subcooling - GRE 50°F AND evel - GREATER THAN 5	ATER		WHEN subcooling greater than 50 AND Pzr level greater than 5% THEN GO TO step b.

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PAGE NO. NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS 21 OF 23 Case II AP/1/A/5500/10 NC System Leakage RESPONSE NOT OBTAINED ACTION/EXPECTED RESPONSE 18. Check NC System conditions: a. Restart NV Pump and continue a. Subcooling - GREATER THAN O°F dumping steam. AND .WHEN NC System subcooling greater Pzr level - GREATER THAN 5% than 75°F AND Pzr level greater than 5% THEN RETURN TO step 17. 19. Adjust charging flow to maintain NC System subcooling and Pzr level during cooldown. Establish excess letdown: 20. Establish letdown: a. Open letdown line isolation 1) Ensure open: valves: 1KC-305B (Excess Letdn Hx Sup Otsd Isol) INV-1A and 2A (NC L/D Iso) To Regen Hx) 1KC-315B (Excess L/D Hx Ret Hdr C/I Otsd) 1NV-7B (Letdown Cont Iso) Outside). 1NV-94A (NC Pumps Seal Ret C/I Inside) b. Place 1NV-124 (Letdown Press 1NV-95B (NC Pumps Seal Ret Control) in "Man" and close. C/I Otsd). c. Crack open 1NV-459A (A L/D 2) Place 1NV-27B (Excess L/D Hx Orif Outlet Flow Cntrl) and Otlt 3-Way Cntrl) to "VCT" adjust 1NV-124 to maintain "L/D Press" at 350 PSIG. position. 3) Open 1NV-24B and 25B (C NC Loop d. WHEN pressure can be maintained without continual adjustment to To Exs L/D Hx Isol). 1NV-124, THEN slightly open 4) Slowly open 1NV-26 (Excess L/D 1NV-459A a little more while Hx Outlet Cntrl). Adjust valve monitoring pressure. to maintain "Excess L/D Hx Temp" less than 200°F. e. Continue above procedure until pressure stabilizes quickly after 1NV-459A adjustments and desired flow is achieved.

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ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED 1. After letdown line is pressurized align letdown valves for desired flowrate:	AP/1/A/5500/10	NC SYSTEM LEAKAGE WITHIN Case NC System	II		PAGE NO. 22 OF 23
 g. Verify "L/D Press" at 350 PSIG and place 1NV-124 in "Auto". 21. Control Pzr pressure: a. Energize Pzr heaters and operate normal spray to maintain pressure within Data Book Curve 1.6. a. IF letdown in service, THEN use 1NV-21A (NV Spray To Pzr Isol). IF letdown not in service, THEN use one Pzr PORV. 22. Maintain NC System subcooling - GREATER THAN 50°F. a. Limit NC System cooldown rate to less than 100°F/HR (50°F/HR if no NC Pumps running). b. Dump steam to condenser OR Dump steam with SM PORVS. IF cooldown is not adequate to restore subcooling, THEM increase NC 	f. After pressu valves * 75 Otl * 45 Otl * Var	letdown line is rized align letdown for desired flowrate: GPM - 1NV-458A (B L/D Orif t Cont Isol) - OPEN/CLOSED GPM - 1NV-457A (C L/D Orif t Cont Isol) - OPEN/CLOSED riable - 1NV-459A (A L/D Orif	-	RESPONSE NOT OBTAINED	
 a. Energize Pzr heaters and operate normal spray to maintain pressure within Data Book Curve 1.6. a. IF letdown in service, THEN use INV-21A (NV Spray To Pzr Isol). IF letdown not in service, THEN use one Pzr PORV. 22. Maintain NC System subcooling - GREATER THAN 50°F. 23. Limit NC System cooldown rate to less than 100°F/HR (50°F/HR if no NC Pumps running). b. Dump steam to condenser OR Dump steam with SM PORVS. IF cooldown is not adequate to restore subcooling, THEN increase NC 	g. Verify	v "L/D Press" at 350 PSIG			
operate normal spray to maintain pressure within Data Book Curve 1.6. 22. Maintain NC System subcooling - GREATER THAN 50°F. 22. Maintain NC System subcooling - GREATER THAN 50°F. 23. Limit NC System cooldown rate to less than 100°F/HR (50°F/HR if no NC Pumps running). b. Dump steam to condenser OR Dump steam with SM PORVs. <u>IF</u> cooldown is not adequate to restore subcooling, <u>THEN</u> increase NC	21. Control P:	zr pressure:			
GREATER THAN 50°F. a. Limit NC System cooldown rate to less than 100°F/HR (50°F/HR if no NC Pumps running). b. Dump steam to condenser OR Dump steam with SM PORVs. <u>IF</u> cooldown is not adequate to restore subcooling, <u>THEN</u> increase NC	operat maint:	te normal spray to ain pressure within	ā.	INV-21A (NV Spray To P: IF letdown not in serv	zr Isol).
 a. Limit NC System cooldown rate to less than 100°F/HR (50°F/HR if no NC Pumps running). b. Dump steam to condenser OR Dump steam with SM PORVs. <u>IF</u> cooldown is not adequate to restore subcooling, <u>THEM</u> increase NC 			Est	ablish 50°F subcooling:	
OR Dump steam with SM PORVs. <u>IF</u> cooldown is not adequate to restore subcooling, <u>THEN</u> increase NC	GREATER T	HAN 50°F.	a.	less than 100°F/HR (50'	
Dump steam with SM PORVs. <u>IF</u> cooldown is not adequate to restore subcooling, <u>THEN</u> increase NC			b.	Dump steam to condense	r
IF cooldown is not adequate to restore subcooling, THEN increase NC				OR	
restore subcooling, THEN increase NC				Dump steam with SM POR	Vs.
			res	tore subcooling, THEN i	

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PAGE NO. NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS 23 OF 23 AP/1/A/5500/10 Case II NC System Leakage **RESPONSE NOT OBTAINED** ACTION/EXPECTED RESPONSE 23. Check if ND System can be placed in service: a. NC hot leg temperatures - LESS a. Continue dumping steam. Do not THAN 350°F proceed until conditions met. AND NC pressure - LESS THAN 385 PSIG b. Place ND System in service PER b. Continue dumping steam while OP/1/A/6200/04, RESIDUAL HEAT trying to place ND System in REMOVAL, Enclosure 4.1. service. 24. Prior to going below 300°F place low temperature over pressure protection system in service: a. NC pressure - LESS THAN 325 PSIG b. Place "PORV Overpress Protection Select 1NC-34A (23B)" switch to "Low Press". c. Verify 1NI-430A and 431B (No To 1NC-34A (32B) From A(B) CL Accum) - OPEN. 25. Use ND System and S/Gs to continue cooldown to less than 200°F. 26. WHEN NC System cooldown complete, THEN stop NC Pumps AND depressurize to stop break flow. 27. Evaluate long term plant status: a. Further actions should be at the discretion of the TSC. END

AP/1/A/	NC SYSTEM LEAKAGE WITHIN CAPACTIY OF BOTH NU Case II - Enclosure 1 Possible NC System Leakage Paths To PF		PAGE NO. 1 OF 2
geologia activita minima ann			Andrew of the Contract of Statistics of Statistics for
Valve Num	ber Nomenclature Pos	sition	Initial
	POSSIBLE NC SYSTEM LEAKAGE PATHS TO PRT	and design and a star of the second second	
	OUTSIDE CONTAINMENT		
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	OUTSTDE CONTAINENT	and shares to an encourse of state of the same and	an alle and a state difference and an alle to a st
1ND-56	ND HX 1A OUTLET TO NI SYSTEM COLD LEG INJECTION SAFETY	RELIEF	
1ND-61	ND HX OUTLET TO NI SYSTEM HOT LEG INJECTION SAFETY RELI	IEF	
1ND-64	ND HX 1B OUTLET TO NI SYSTEM COLD LEG INJECTION SAFETY	RELIEF	
1NS-2	NS PUMP 1B SUCTION SAFETY RELIEF		
1NS-19	NS PUMP 1A SUCTION SAFETY RELIEF	-	
1NI-102	SAFETY INJECTION PUMPS SUCTION HDR SAFETY RELIEF		
1NI-119	SAFETY INJECTION PUMP 1A DISCHARGE SAFETY RELIEF		
1NI-151	SAFETY INJECTION PUMP 18 DISCHARGE SAFETY RELIEF	and the second	
1NI-161	SAFETY INJECTION PUMPS COLD LEG INJECTION HDR SAFETY RE	ELIEF	
1NV-229	CENTRIFUGAL CHARGING PUMPS SUCTION HDR SAFETY RELIEF		The last of the local distance of t
	INSIDE CONTAINMENT		
1NC-1	PZR RELIEF VALVE		
1NC-2	PZR RELIEF VALVE	and the second second second second	-
1NC-3	PZR RELIEF VALVE		
1NC-32B	PZR PORV	n Six discouper total di pardos etteriti da casa antico	enany a facella parte dan di senangan parte
1NC-34A	PZR PORV		
1NC-36B	PZR PORV		
1NC-43	PRESSURIZER #1 VENT		
1NC-119	PRESSURIZER #1 SEAL LOOP DRAIN HEADER		

NC-274B TRN 1B HEAD VENT TO PRT ISOL ND-3 NC LOOP 3 DISCHARGE TO ND SYSTEM SAFETY RELIEF NV-6 LETDOWN LINE SAFETY RELIEF	2 OF 2
VALVE NUMBER NOMENCLATURE NC-272A,C TRN 1A HEAD VENT TO PRT ISOL NC-274B TRN 1B HEAD VENT TO PRT ISOL ND-3 NC LOOP 3 DISCHARGE TO ND SYSTEM SAFETY RELIEF NV-6 LETDOWN LINE SAFETY RELIEF	INITIAL
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NV-6 LETDOWN LINE SAFETY RELIEF	
NV-6 LETDOWN LINE SAFETY RELIEF	
NV-93 NC PUMPS SEAL RETURN HDR SAFETY RELIEF	
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AP/1/A/5	5500/10		ase II	THIN CAPACIT - Enclosure Leakage Pat	2	PUMPS	PAGE NO. 1 OF 1
	Strang and data strands	an a				Manuer ayun, an Adua ayun ay	
VALVE NU	MBER	NOMENCLATURE		VALVE LOCATI	ION	POSITIO	N INITIA
Possible !	NC System	Leakage Paths To	NCDT				
1NV-27B	Excess L,	/D Hx Otlt	RB Pi	pechase 105°)	VCT	
1NI-224	3-Way Cn	trl tor 1A Drain	PR 72	5' 40°	1999 - Lauren Hannes (J. 1997)	Closed	
111-224	Isol	LOF IN DIAIN	<u></u>	5 40			
1NI-226	Desired and exception of the experimentation of a second	tor 1B Drain	RB 72	5' 140°	and a second sec	Closed	
	Isol		nta y anguas antar type, y ananchua				
1 <u>NI-228</u>	Accumula Isol	tor 1C Drain	RB 72	5' 220°	anna an	Closed	
1NI-230		tor 1D Drain	RB 72	5' 317°	nana mana mana mana kaona ana ana ana ana ana ana ana ana ana	Closed	
	Isol						
1 <u>NB-352</u>	Reactor	Makeup Water	and decontractions of an additions	unite del funda comp de la contrata que en esta de la consecutiva			ale access de las remaines des access d'économis de la
	Storage	Tank #1 Outlet		-			
	Relief T	o NCDT					
NC Pump	1A #3 Se	al	4.0000.0000.0000.0000.0000000000000000			anna an tha an	
NC Pump	1A Stand		anders of a state of the state				
NC Pump	1B #3 Se					1 0001 0 00 Pri punto, apressi ante internet	
NC Pump	18 Stand	pipe	anarocountre, acutorismo				

1C #3 Seal

1D #3 Seal

RB valves

1C Standpipe

1D Standpipe

Valve Steam Leakoff from

Rx Vessel Head O Ring Seal

NC Pump

N<u>C</u> Pump

NC Pump

rm 34912 (8-82)	Attachan Page 30	
AP/1/A/5500/10	NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS Case II - Enclosure 3 Possible NC System Leakage Paths to Containment Sumps	PAGE NO. 1 OF 1

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		VALVE CHECKLIST		
VALVE NUM	BER NOMENCLATURE	VALVE LOCATION	POSITION	INITIAL
1NM-67	PZR Sample Hdr Cont Pent	755', 120°		
	Relief			
1NM-68	NC Hot Leg Sample Header			
	Cont Pent Relief		and an a state of the	
1NM-69	NI Accumulators Sample	730', 115°		6
	Hdr Cont Pen Relief			-
1NV-102	Excess Letdown Hx #1	Pipechase 115° 6' up	Closed	A STREET CONTRACTOR OF STREET
	Tube Drain			numerolitik and a subsective designation of the second
1NV-108	Regenerative Hx #1	Pipechase 105° 5' up	Closed	
ok meterden oktoberet i den ber	Overflow			
1NV-110	Regenerative Hx #1	Pipechase 105° 5' up	Closed	
	Drain			
NAME AND ADDRESS OF OTHER ADDRESS				
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AP/1/A/5	5500/10	Cas	AGE WITHIN CAPACITY OF BOTH NV se II - Enclosure 4 tem Leakage Paths in Auxiliary		PAGE NO. 1 OF 6
			VALVE CHECKLIST		niumeren en e
VALVE NUM	BER	NOMENCLATURE	VALVE LOCATION	POSITION	INITIA
		e is to be used a mange in NV System	as a guide. Consideration shown n alignment.	uld be given	n to
Check Sea	l Leakoff	on following valu	ves:		
	ND & NS	ROOMS SUMP		1999 - 1997 - 1997 - 1996 - 1997 -	
AND AND A DESCRIPTION OF A DESCRIPTION					
1NV-95B	NC Pumps	Seal Ret C/I	744' Midget Hole		
	OTSD	Seal Ret C/I Outlet 3-Way Temp			
	OTSD L/D Hx O Cntr1	Dutlet 3-Way Temp			
1NV-127A 1NV-137A	OTSD L/D Hx O Cntr1 NC Filte Cntr1	Dutlet 3-Way Temp	NC FILTER ROOM Outside VCT Rm. So. Wall OTSD S Wall of VCT		
1NV-127A 1NV-137A 1NV-141A	OTSD L/D Hx O Cntr1 NC Filte Cntr1	Outlet 3-Way Temp ers OTLT 3 Way let Isolation	NC FILTER ROOM Outside VCT Rm. So. Wall OTSD S Wall of VCT under grating OTSD SE Wall of VCT		
1NV-127A 1NV-137A 1NV-141A	OTSD L/D Hx O Cntr1 NC Filte Cntr1 VCT Out1 VCT Out1	Outlet 3-Way Temp ers OTLT 3 Way let Isolation let Isol	NC FILTER ROOM Outside VCT Rm. So. Wall OTSD S Wall of VCT under grating		
1NV-127A 1NV-137A 1NV-141A 1NV-142B	OTSD L/D Hx O Cntr1 NC Filte Cntr1 VCT Out1 VCT Out1 PD Pump	Outlet 3-Way Temp ers OTLT 3 Way let Isolation let Isol Outlet Isol	NC FILTER ROOM Outside VCT Rm. So. Wall OTSD S Wall of VCT under grating OTSD SE Wall of VCT under grating		
1NV-127A 1NV-137A 1NV-141A 1NV-142B 1NV-803	OTSD L/D Hx O Cntr1 NC Filte Cntr1 VCT Out1 VCT Out1 VCT Out1 PD Pump PD Pump	Outlet 3-Way Temp ers OTLT 3 Way let Isolation let Isol Outlet Isol Disch Isol	NC FILTER ROOM Outside VCT Rm. So. Wall OTSD S Wall of VCT under grating OTSD SE Wall of VCT under grating 722' S. of PD Pump		
1NV-127A 1NV-137A 1NV-141A 1NV-142B 1NV-803 1NV-219	OTSD L/D Hx O Cntr1 NC Filte Cntr1 VCT Out1 VCT Out1 VCT Out1 PD Pump PD Pump Regen Hx Isol	Outlet 3-Way Temp ers OTLT 3 Way let Isolation let Isol Outlet Isol Disch Isol	NC FILTER ROOM Outside VCT Rm. So. Wall OTSD S Wall of VCT under grating OTSD SE Wall of VCT under grating 722' S. of PD Pump PD Pump Rm 1 722 HH-59 & JJ-60		
1NV-127A 1NV-137A 1NV-141A 1NV-142B 1NV-803 1NV-219 1NV-240	OTSD L/D Hx O Cntr1 NC Filte Cntr1 VCT Out1 VCT Out1 VCT Out1 PD Pump PD Pump Regen Hx Isol Seal Inj	Outlet 3-Way Temp ers OTLT 3 Way let Isolation let Isol Outlet Isol Disch Isol Tube Inlet Cntr i Flow Control K Tube Side Inlt	NC FILTER ROOM Outside VCT Rm. So. Wall OTSD S Wall of VCT under grating OTSD SE Wall of VCT under grating 722' S. of PD Pump PD Pump Rm 1 722 HH-59 & JJ-60 Above BW Pumps		

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	NC SYSTEM LEAKAGE WITHIN CAPAC TY OF BOTH NV PUMPS	PAGE NO.
AP/1/A/5500/10	Case II - Enclosure 4 Possible NV System Leakage Paths in Auxiliary Building	2 OF 6

VALVE NUM	BER NOMENCLATURE	VALVE LOCATION	POSITION	INITIAL
1NV-244A	Charging Line Cont Isol	Above BW Pumps	anananan dar sekstandar operation seksteren ander an and	an a secolution and a secolution of the secoluti
	OTSD		daalaaladayaaadadaalaadaa ahoo waxaa waxaa ahoo ahoo ahoo ahoo ahoo ahoo ahoo	
1NV-245B	Charging Line Cont Isol OTSD	West of BW Pumps		
1NV-431	Seal Water Inj Filters	A Seal Inj Rm		
	Bypass			
1NV-230	Cent Charging Pump B Suct		726' SE of 1B CCP	12'
ADALEPS PART CONTENT OF A		Off floor		
1NV-224	Cent Charging Pump A Suct	.726' HH-57 & JJ-58 W of		
		1B CCP 12' Off Floor		
1NV-804	Cent Charging Pump B	Right of 18 CCP		
	Outlet Isol			
1NV-232	Cent Charging Pump B	724' NW of 18 CCP		
	Disch			-
1NV-226	Cent Charging Pump A	726' NE of 18 CCP		
and the second se	Disch			
1NV-802	Cent Charging Pump A	NE 5' Above 1A CCP		
	Outlet Isol			
1NV-235	Cent Charging Pump B To	NW of 1B CCP	NARAN DE KAN EMBANDAR AT LA SECONTA A VARIA DA LA PRODUCTION DE LA	alanolites and pro Arransomo
	Seal Inj Filter		n maran sa	
1NV-236	Cent Charging Pump A To	NE of 1A CCP		
	Seal Inj Filter	energenetic contention of the and and and and an energy of the content of the second statements of the second statements of the	and a travening over an experiment and quarter starts, quarter a start sector of a travening of a start sector	
1Nº1-237	Cent Charging Pumps Disch	N of PD Pump	and and a later and the state of the	
	To Control Isol	anar ayan dayan da ana ana kana kana kana kana kana k	ana ana amin'ny faritr'o ana amin'ny faritr'o ana amin'ny faritr'o amin'ny faritr'o amin'ny faritr'o amin'ny fa	-
1NV-238	Charging Line Flow	N of PD Pump		
	Control			
1NV-239	Cent Charging Pumps Disch			

AP/1/A/5	500/10	Cas	GE WITHIN CAPACITY OF BOT e II - Enclosure 4 em Leakage Paths in Auxil		PAGE NO. 3 OF 6
VALVE NUM	BER NOMENO	CLATURE	VALVE LOCATION	POSITION	INITIA
	Control Isol	and a local sector of the sect			Annual St. Barrand Cr. Schulers and and
1NV-347	NR System Flow	Control	Seal Inj Filter Room		
1NV-121	ND Letdown Con	trol			
1NV-221A	NV Pumps Suct	From FWST	20' N of BW Pump	an an an a the second	
1 <u>NV-222B</u>	NV Pumps Suct	From FWST	20' N of BW Pump		PARTY REPORTED AND ADDRESS OF A
	RECYCLE HOLDUP	TANK		9716444499999999999999999999999999999999	
1 <u>NV-7B</u>	Letdown Cont I	sol Outside			aar daar oo ah
1 <u>NV-8</u>	L/D Reheat Hx	Tubeside	SE of L/D Hx	***	
erestituses endiate to be boundered	Back pressure	Cntrl Isol		a la provincia esta desi provinci a secondare della della constana della della della della della della della de	
1 <u>NV-9</u>	L/D Reheat Hx	Tubeside	W of L/D Hx		
	Back pressure	Cntrl Isol		a de constante en la sega de la constante en activitation de la constante de la constante de la constante de la	
1 <u>NV-10</u>	L/D Reheat Hx	Tubeside	W of L/D Hx		
	Back Pressure	Internet substantivity of the other sector of the sector o			
1 <u>NV-11</u>	L/D Reheat Hx	Tubeside	SW of L/D Hx		
	Back Pressure	SUCKER PERK, SECONDUCTION POLICY CONTRACTOR	un nationer of any art. But the executive control descendent and executive and a sector of an executive success		Constanting of the second s
1NV-476	LP Letdown Con	trol Inlet	S of L/D Hx		eet ive to the big state of each state of the state of the state
	Isol	n a men ar program de la cara marcananta la			
	Letdown Press	WARRANT WEDBORD TO A CONTRACT OF		an na an a	and an and a state of the state
1 <u>NV-477</u>	LP Letdown Con	trol	L/D Hx Rm		
	Outlet Isol				
Check ven	and drain boun	dary valves	closed:		

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	NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS	PAGE NO.
AP/1/A/5500/10	Case II - Enclosure 4	4 OF 6
	Possible NV System Leakage Paths in Auxiliary Building	

VALVE NU	MBER NOMENCLATURE	VALVE LOCATION	POSITION	INITIAL
NV-184	Letdown Hx Tube Drain To	L/D Hx Rm	CLOSED	
	WDT			
NV-205	Seal Water Filter Drain To WDT	Seal Ret Filter Rm	CLOSED	
NV-272	PD Pump Drain To WDT	Otsd PD Pump Rm	CLOSED	
NV-310	Seal Water Inj Filters Drain To WDT	B Seal Inj Rm	CLOSEP	
NV-299	Charging Pump B Drain To WDT	E of 18 CCP	CLOSED	
LNV-330	NC Filter Drain To WDT	E of B NC Filters	CLOSED	
LNV-356	Mixed And Cation Bed Demin Outlet Line Drain To WDT	A Mixed Bed Rm	CLOSED	922 B 2 4099 B 1996 B 2007
	WASTE EVAPORATOR FEED TAN	IK		
INV-181	Letdown Hx Tube Overflow	L/D Hx Rm	CLOSED	
1 <u>NV-185</u>	Letdown Hx Tube Drain To WEFT	LD Hx Rm	CLOSED	
1NV-145	VCT Outlet Drain	Below VCT	CLOSED	
1 <u>NV-210</u>	Seal Water Hx Tube Overflow		CLOSED	
1 <u>NV-204</u>	Seal Water Filter Drain To WEFT		CLOSED	
1 <u>NV-215</u>	Seal Water Hx Tube Drain TO WEFT	Seal Water Hx Rm	CLOSED	
1NV-309	Seal Water Inj Filters	B Seal Inj Filter Rm	CLOSED	

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Attachment 1 Page 35 of 41

AP/1/A/5500/10	NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS	PAGE NO.
	Case II - Enclosure 4	5 OF 6
	Possible NV System Leakage Paths in Auxiliary Building	

VALVE NU!	MBER NOMENCLATURE	VALVE LOCATION	POSITION	INITIAL
	Drain To WEFT			
NV-329	NC Filters Drain To WEFT	B NC Filter Rm	CLOSED	
NV-335	Mixed Bed Demin A Backflus	ih		
	Drain			
NV-333	Mixed Bed Demin A Backflus	ih	CLOSED	
	Outlet Isol		ana an ang ang ang ang ang ang ang ang a	
LNV-340	Mixed Bed Demin B	B Mixed Bed Rm	CLOSED	
	Backflush Outlet Isol			
NV-373	Mixed Bed Demin B	B Mixed Bed Rm	CLOSED	
	Outlet Line Drain			
INV-365	Cation Bed Demin	733 Pipechase between NR &	CLOSED	
	Sluicing Resin Isol	NV DIM		
1NV-354	Mixed Bed Demin A Outlet	A Mixed Bed Rm	CLOSED	
	Line Drain			
1NV-366	Cation Bed Demin Outlet	Cation Bed Rm	CLOSED	
	Line Drain			anand down they an owned that wanted in the
1NV-357	Mixed & Cation Bed	A Mixed Bed Rm	CLOSED	
ner helter her her her her her her her her her h	Demins Outlet Line Drain			
	To WEFT		energenet Communication, understandigen	
	WASTE EVAPORATOR FEED TAN	K SUMP A		
1NV-296	Charging Pump B Overflow		CLOSED	
1NV-300	Charging Pump B Drain To		CLOSED	
	WEFT Sump A			
1NV-285	Charging Pump & Overflow		CLOSED	
1NV-289	Charging Pump A Drain To		CLOSED	

34912 (8-82	2)			Attachan Page 36	
AP/1/A/	5500/10	Cas	GE WITHIN CAPACITY OF BOTH NV e II - Enclosure 4 em Leakage Paths in Auxiliary		PAGE NO. 6 OF 6
VALVE NU	40.50		VALVE LOCATION	POSITION	ΙΝΊΥΙΑΙ
ANTAL MOL		SIN TANK			101110
1NV-349	Mixed Be	d Demin A Sluicin	q	CLOSED	entere a constant a constant de la c
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LNV-350	AVA CONTRACTOR CONTRACTOR AND ADDRESS	d Demin A Sluicin	q	CLOSED	
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Form 34912 (8-82)

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	NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS	PAGE NO.
AP/1/A/5500/10	CASE II - Enclosure 5	1 OF 2
	Possible ND System Leakage Paths in Auxiliary Building	

VALVE NUM	BER NOMENCLATURE	VALVE LOCATION	POSITION	INITIAL
	ND & NS ROOMS SUMP Check	seal leakoff on following valves		
ND-4B	B ND Pmp Suct From FWST Or NC	Aux 695' FF-59 & GG-60		
ND-19A	A ND Pmp Suct From FWST A Or NC	NUX 695' GG-59 & HH-60		
IND-9	ND Pump B Disch	N of Pump 12' up		
IND-24	ND Pump A Disch	W of Pump 12' up		inder (monskelijistenengen providelen
ND-26	ND Hx A Inlet	E of Hx 6' up		
1ND-14	B ND Hx Outlet	Aux 733' LL-61		
1ND-29	A ND Hx Outlet	Aux 733' LL-60 & MM-61		
1ND-30A	Train 1A ND To Hot Leg Isol	Aux 733' LL-60 & MM-61		
1ND-58A	Train 1A ND To NV & NI Pumps	Aux 733' LL-60 & JJ-61		
1 <u>ND-15B</u>	Train 1B ND To Hot Leg Isol	Aux 733' KK-60 & LL-61		
1ND-35	ND To FWST Isol	15' E of KK-59, 12' up		
	A & B ND Hx Bypass	Aux 733 KK-60 & LL-61		annonat , moltan panantarena antaran
1ND-33	A ND Hx Bypass	Aux 733 LL-60 & MM-61		
1ND-18	8 ND Hx Bypass	Aux 733 KK-60 & LL-61	Salas program to produce at contract and produce and	PF INTERPORTATION FOR THE CONTRACT ALL REPORTS
1ND-11	ND Hx B Inlet	W of Hx 4' up		
1NI-173A	Train 1A ND To A & B CL	Aux 733' FF-59 & GG-60		an an Brethau an Communication and a sta
1NI-178B	Train 18 ND To C&D CL	Aux 733' HH-60 & JJ-61	Des van het der van de service der versenen.	
1NI-184B	RB Sump To Train 1B ND & NS	Aux 716' EE-58 & FF-59		

n 34912 (8-82)					Attachment 1 Page 38 of 41		
AP/1/A/	5500/	/10		KAGE WITHIN CAPACITY OF BO CASE II - Enclosure 5 Vstem Leakage Paths in Auxi	2 OF 2		
	5000-95 000-92 0 20	egeta de constitución					
VALVE NU	MBER		NOMENCLATURE	VALVE LOCATION	POSITION INITIA		
NI-185A		Sump NS	To Train 1A ND	Aux 716' FF-59 & GG-60			
	WAS	STE E	VAPORATOR FEED TA	ANK Check Drain Boundary Va	alves Closed		
ND-52	ND	HX A	Drain Hdr	S of Hx	Closed		
ND-46	ND	Hx B	Drain Hdr	S of Hx	Closed		
D&NSR	OOMS	SUMP	k				
ND-51	ND	Pump	A Drain Hdr	SW of Pump	Closed		
ND-45	ND	Pump	B Drain Hdr	S of Pump	Closed		
ND-69	ND	& NS	System Drain	RB 860' Rx Dome	Closed		

		Andrea on Lindoneville In Data in compose one	anaanaanan, kaanaataraanaan keryanyaanaanaa yayaanaanaa yayaanaa yayaanaa yayaanaa yayaa yayaa yayaa yayaa yay				
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For	n 34912 (8-	.82)			Attachmen Page 39 o	
	AP/1/A	/5500/	/10	NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMP Enclosure 6 Minimizing Secondary Side Contamination	2S	PAGE NO. 1 OF 3
6.		unen an en unitan				
ſ	1.	Notif	fy the	following to initiate their S/G tube leak response	e procedu	ires:
		HP St	hift (4	282)		
		RDW S	Shift (4305)		
		CT La	ab (436	2).		
	2.			aining into Turbine Building Sump by dispatching of form the following:	operator	to
		A) :	Secure	CSAE drains to TB sump as follows:		
		(Open 1C	S-26 (CSAE After Condenser Drn Isol)		
		(Close:	1ZJ-24 (CSAE 1A After Condenser Lo Pt Drn)		
				1ZJ-25 (CSAE 1B After Condenser Lo Pt Drn)		
				1ZJ-26 (CSAE 1C After Condenser Lo Pt Drn).		
1		B)	Align W	Z Sump Pumps to pump to Unit 2 only:		
			1) In	WZ Sump A place Pump A in "Off" and Pump B in "Au	to".	
			2) In	WZ Sump B place Pump A in "Auto" and Pump B in "O	ff".	
			3) <u>IF</u> eno	either Unit 2 pump is out of service, <u>THEN</u> manual bugh water to Unit 1 to keep Hi level alarm cleared	ly pump o d.	only
		C)	Secure	any other components draining into TB Sump.		
				CS-62 (NB + WL Cond To Unit 2 CST) and close 1CS-6 : 1 CST)	1 (NB +)	WL Cond
			Align 1 Turbine contami	CB-197 (Aux Electric Boiler Blowdown 3 Way Divert Building Sump when it has been determined that b inated.) to Unit lowdown	t 2 is not
		F)	Align A	Aux Electric Boiler Feed Pumps miniflow to Unit 2	CST:	
			a. Ope Iso	en 1CB-108 (Aux Electric Blr A and B Feed Pump Min	iflow to	Unit CST

b. Close 1CB-101 (Aux Electric Blr A and B Feed Pump Miniflow to Unit 1 CST Isol).

	Page 40 of 41	
P/1/A/	/5500/	NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS Enclosure 6 Minimizing Secondary Side Contamination PAGE NO. 2 OF 3
Q-Lasting of the last of the	vansennavnets	
	G) A	Align Aux Electric Boiler Feed Pump Suction to Unit 2 UST or YM:
	ä	a. Open 1CB-93 (Unit 2 UST To Any Electric Blr Isol)
		OR
		1CB-135 (Demin Water to Aux Electric Blr Isol)
	ł	b. Close 1CB-91 (Unit 1 UST To Aux Electric Blr Isol).
3	IF Un opera	nit 2 condensate available to supply CA storage tank, THEN dispatch ator to locally perform the following:
	A)	Throttle open 1CA-158 (Unit 2 CM To CA Storage Tank Isol) and close 1CA-157 (Unit 1 CM TO CA Storage Tank Isol).
	B) (Open 1CA-154 (CA Storage Tank Overflow To Unit 2 CST Isol) and close 1CA-153 (CA Storage Tank Overflow To Unit 1 CST Isol).
4.	Close	e 1CA-6 (CA Sup From CA Storage Tank).
CAUT	ION	Constant communication should be maintained with Radwaste Chemistry if pumpover from Turbing Bldg sump to Floor Drain Tank is required.
5.	is in	ump will overflow into hotwell pit. If equipment damage in hotwell pit mminent (Amertap pumps) and before pump out to RC is allowed, then lly realign to pump to Floor Drain Tank as follows:
	A)	Close 1WP-6 (TB Sump Pumps Dis. To WC Isol)
	B)	Verify Radwaste Chemistry has made alignment to FDT and pump over only
		enough volume to prevent equipment damage in hotwell pit.
	c)	enough volume to prevent equipment damage in hotwell pit. When Radwaste Chemistry can no longer receive water to Waste System, stop the pump over from Turbine Bldg. Sump. If pump out to WC is not possible per HP, prepare for flooding of equipment in hotwell sump. (Amertap etc.).

F

Attachment 1

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a para na manana ang kanana na manana na kanana na manana na kanana na manana na manana na manana na manana na	NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS	PAGE NO.
AP/1/A/5500/10	Enclosure 6	3 OF 3
	Minimizing Secondary Side Contamination	

	ACTION/EXPECTED RESPONSE MULTINITY RESPONSE NOT OBTAINED
7.	IF Unit 1 CST is in danger of overflowing or if Unit 2 is in danger of losing condensate, THEN coordinate with HP to pump to Unit 2 CST PER 0P/1/A/6250/01, CONDENSATE AND FEEDWATER, Enclosure 4.10.
8.	Realign the following for normal operation as required after condition is cleared:
	A) CSAE drains to TB sump
	B) WZ Pumps to Auto
	C) TB Sump Pumps
	D) CA Storage Tank supply and overflow to desired unit
	E) Open 1CA-6 (CA Sup From CA Storage Tank).
	F) NB and WL evaporator condensate to desired unit
	G) Aux Electric Boiler to desired unit.

Selected Pages from the Westinghouse Owners' Group Emergency Response Guidelines. Number E-D

Title

REACTOR TRIP OR SAFETY INJECTION

A. PURPOSE

This guideline provides actions to verify proper response of the automatic protection systems following manual or automatic actuation of a reactor trip or safety injection, to assess plant conditions, and to identify the appropriate recovery guideline.

B. SYMPTOMS OR ENTRY CONDITIONS

- The following are symptoms that require a reactor trip, if one has not occurred: [Enter plant specific setpoints and requirements].
- 2) The following are symptoms of a reactor trip:
 - a. Any react trip annunciator lit.
 - b. Rapid decrease in neutron level indicated by nuclear instrumentation.
 - c. All shutdown and control rods are fully inserted. Rod bottom lights are lit.
- 3) The following are symptoms that require a reactor trip and safety injection, if one has not occurred: [Enter plant specific setpoints and requirements].

4) The following are symptoms of a reactor trip and safety injection:

- a. Any SI annunciator lit.
- b. SI pumps running.
- a. [Enter plant specific list].

1. INTRODUCTION

Guideline E-O, REACTOR TRIP OR SAFETY INJECTION, provides actions to verify proper response of the automatic protection systems following manual or automatic actuation of a reactor trip or safety injection, to assess plant conditions, and to identify the appropriate Optimal Recovery Guideline.

Guideline E-O is to be entered when any of the following occur:

- A reactor trip is required as determined by plant specific setpoints or requirements being exceeded.
- A reactor trip has occurred as determined by the plant annunciators, neutron flux instrumentation, and control rod position indicators.
- A safety injection is required as determined by plant specific setpoints or requirements being exceeded.
- A safety injection has occurred as determined by the plant accurciators, SI pump status, or other plant specific means.

Once E-D is entered, it is not exited until there is a direct transition to an Optimal Recovery Guideline (ORG) as directed by the symptoms being monitored in E-D or to a Function Restoration Guideline (FRG) as directed by the Critical Safety Function Status Trees or symptoms being monitored in E-D.

HP-Rev. 1

Attachment 2 Page 4 of 6

2. DESCRIPTION

Guideline E=0, REACTOR TRIP OR SAFETY INJECTION, provides the operator with the necessary guidance to verify that all automatic actions have occurred as designed and presents the diagnostic sequence to be followed in the identification of the appropriate Optimal Recovery Guideline. These include:

- 1. ECA-0.0, LOSS OF ALL AC POWER
- 2. ES-0.1, REACTOR TRIP RESPONSE
- 3. E-1, LOSS D' PEACTOR OR SECONDARY COOLANT
- 4. E-2. FAULT .: STEAM GENERATOR ISOLATION
- 5. E-3, STEAM GENERATOR TUBE RUPTURE
- 6. ES-1.1, SI TERMINATION
- 7 ECA-1.2, LOCA OUTSIDE CONTAINMENT

It is expected that the operator will attempt to take manual actions to correct for anomalous conditions during power operation. Such actions would include taking manual control of the automatic control systems, turning on additional charging pumps, reducing power level, etc. If these types of actions do not alleviate the trend toward a reactor trip or safety injection, the operator is permitted to trip the reactor and, if necessary, actuate safety injection.

The reactor protection equipment is designed to safely shut down the reactor in the event that the anomalous condition cannot be corrected. The safety injection system is designed to provide emergency core cooling water and boration to maintain a safe reactor shutdown condition. The plant safeguards systems operate with offsite electrical power or from onsite emergency diesel-electric power, should offsite power not be available. The operator will enter E=0 on <u>e-reactor trip or safety</u> injection, whether the signal was automatic or a result of manual actuation.

Through symptom-based diagnosis, the operator is directed to the proper Optimal Recovery Guideline to facilitate optimal recovery. Transient descriptions are provided in the appropriate background documents.

HP-Rev. 1

Attachment 2 Page 5 of 6

Number ES-3.3	Title	POST-SGTR COOLDO	OWN USING S	TEAM DUMP	Rev.issue/Date HP-Rev.1A 1 July 1987
STEP	ACT	ION/EXPECTED RES	PONSE	RESPONSE NOT	DBTAINED
	CAUTION	SG 16 water	may exist dose evalu ing this g		ne.
1	Turn On To Satur (SG)s Pr	PRZR Heaters As Nece rate PRZR Water At Ruj essure	essary ptured		
2	Check II Be Isola	f SI Accumulators Shou ted:	ld		
	o RC on TH AL o PR (3)	the following: S subcooling based core exit TCs - GREATE IAN (1) [*] F [(2) [*] F FOR OVERSE CONTAINMENT] ZR level - GREATER THAI % [(4)% FOR ADVERSE INTAINMENT]	R	Go to ECA-3.1, SGTR W LOSS OF REACTOR COOL SUBCOOLED RECOVERY DESIRED, Step 1.	
		power to isolation - AVAILABLE	b.	Restore power to isolation	on valves.
		all SI accumulator ion valves	c.	Vent any unisolated accu	mulators.
3	Verify A	Adequate Shutdown Mar	gin:		
	a. Sampi	e ruptured SG(s)			
	b. Sampl	e RCS			
	c. Shutdo	own margin - ADEQUATE	с.	Borate as necessary.	
an and recommendances around a second		5	of 11		

Attachment 2 Page 6 of 6

STEP DESCRIPTION TABLE FOR ES-3.3 STEP 1 - CAUTION 2

- <u>CAUTION</u>: An offsite dose evaluation should be completed prior to using the guideline.
- PURPOSE: To alert the operator that this guideline will result in releases of radiological effluents. The consequences of this release should be evaluated before using this guideline

BASIS:

Subsequent steps require the release of contaminated steam from the ruptured steam generator. The potential radiological consequences of this action should be evaluated to minimize offsite exposures and demonstrate conformance to 10CFR20 limitations, if possible. This evaluation should consider premevent primary coolant activity, meterological conditions, and steam release path.

ACTIONS:

Alert appropriate plant personnel

INSTRUMENTATION:

N/A

CONTROL/EQUIPMENT:

N/A

KNOWLEDGE :

N/A

PLANT-SPECIFIC INFORMATION:

N/A

Selected Pages from EP/1/A/5000/01 "Safety Injection".

For - 1471 83-87		Page 2 of 3 C	DNO EP/1/A/5000/0 hange(s) 0 to 2 Incorporated
PREPARATION	INFORM TON D		
(2) STATION McGuire Nucles	ar fillen and a	* • • • • • • • • • • • • • • • • • • •	
(3) PROCEDURE TITLE	Safety Injection		
(4) PREPARED BY Len Firebau	gh DA	TE2/24/88	
(5) REVIEWED BY Bill Pis		TE	
Cross-Disciplinary Review By		BP	
(6) TEMPORARY APPROVAL (If Necessary			
Ву			
(7) APPROVED BY	DA	TE	and short to be a second set of the second se
(7) APPROVED BY	J Jawis DA	TE 4/13/80	
(8) MISCELLANEOUS			
Reviewed Approved By ETQS B.	AD Pitero DA	TE_3-30-88	Name and a state design of the state of the
Reviewed/Approved By	DA	TE	
(9) COMMENTS (For procedure reissue indic Attach additional pages, if r	necessary.) ADDITIONAL CH	ANGES INCLUDED.	hanges, are included. Wes INO
(10) COMPARED WITH CONTROL COPY	DA	ATE	
COMPLETION			
(11) DATE(S) PERFORMED	а аналовически и расположение селона и слока и с		
(12) PROCEDURE COMPLETION VERIFIC	ATION		
☐ Yes ☐ N/A Check lists and/or bla	inks properly initialed, signed, dated or	filled in N/A or N R, as as	opropriate?
	iched?		
	completed, dated and signed?		
Yes N/A Charts, graphs, etc. at	tached and properly dated, identified i	and marked?	
☐ Yes ☐ N/A Acceptance criteria m	set?		
VERIFIED BY	D <i>A</i>	TE	
3) PROCEDURE COMPLETION APPROV	ED DA	TE	
(14) REMARKS (Kttach additional pages, if r	necessary.)		

COLOGIES MICHINESS CONTINUES	and a state of the	and discovery the provide state of the state		Page	3 of 3
EP/1/A/5000/01		SAFETY INJECTION			PAGE NO. 3 OF 12
			Anna Britr, ann an		
			-		
 St Ac St 	atus light "E/S Lo tuated Train A" - atus light "E/S Lo	ad Seq LIT ad Seq	Man	ually initiate SI.	
Subseq	uent Actions				
			d prop	erly for other than	initial entr
Check	ESF Monitor Light	Panel:			
a. Gr	oups 1, 2, 5, 7 ~	DARK	a.	Manually align equi required.	ipment as
				THEN check DAC Tech	Spec progra
		•			
b. Gr	oups 3 <u>AND</u> 6 - LIT		b.		
		in	c.	required. IF "Cont Isol Phase	e A Train A/B ally initiate THEN check OA
	ACTION Verify • Sti Act • Sti • Sti Sti Sti • Sti • Sti Sti • Sti • Sti • Sti • Sti • S	ACTION/EXPECTED RESPONSE Verify Load Sequencers a • Status light "E/S Lo Actuated Train A" - • Status light "E/S Lo Actuated Train B" - <u>Subsequent Actions</u> Initiate RP/0/A/5700/01, NOTIFICATION OF UNUSUAL ION Monitor lights may n into this procedure. Check ESF Monitor Light a. Groups 1, 2, 5, 7 -	ACTION/EXPECTED RESPONSE Verify Load Sequencers actuated: • Status light "E/S Load Seq Actuated Train A" - LIT • Status light "E/S Load Seq Actuated Train B" - LIT. <u>Subsequent Actions</u> Initiate RP/0/A/5700/01, NOTIFICATION OF UNUSUAL EVENT. ION Monitor lights may not be aligne into this procedure. Check ESF Monitor Light Panel: a. Groups 1, 2, 5, 7 ~ DARK b. Groups 3 <u>AND</u> 6 - LIT c. Ss and St components in	ACTION/EXPECTED RESPONSE Verify Load Sequencers actuated: Man • Status light "E/S Load Seq Actuated Train A" - LIT • Status light "E/S Load Seq Actuated Train B" - LIT. <u>Subsequent Actions</u> Initiate RP/0/A/5700/01, NOTIFICATION OF UNUSUAL EVENT. ION Monitor lights may not be aligned prop into this procedure. Check ESF Monitor Light Panel: a. Groups 1, 2, 5, 7 - DARK a. b. Groups 3 <u>AND</u> 6 - LIT b. c. Ss and St components in c.	ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED Verify Load Sequencers actuated: Manually initiate SI. • Status light "E/S Load Seq Actuated Train A" - LIT • Status light "E/S Load Seq Actuated Train B" - LIT. <u>Subsequent Actions</u> Initiate RP/0/A/5700/01, NOTIFICATION OF UNUSUAL EVENT. ION Monitor lights may not be aligned properly for other than into this procedure. Check ESF Monitor Light Panel: a. Groups 1, 2, 5, 7 - DARK a. Manually align equi required. IF "Safety Inject 1 THEN check OAC Tect IS OAC is out of se Complete Enclosure b. Groups 3 AND 6 - LIT b. Manually open valves AND/OR close valves required. c. Ss and St components in group 4 - LIT. AND/OR Close valves NOT it, THEN manually AND/OR Isol Phase NOT it, THEN manually AND/OR Close valves NOT it, THEN MANUAL AND/OR CLOS

EP/1/A/5000/10 "Critical Safety Function Status Trees"

Attachment 4 Page 2 of 16

INFORMATION ONLY.

Form 34731 (10-81) (Formerly SPD-1002-1)

	DUKE POWER COMPANY PROCEDURE PREPARATION PROCESS RECORD	
(2)	STATION: McGuire	
(3)	PROCEDURE TITLE: Critical Safety Funct	ion Status Trees
(4)	PREPARED BY: Len Firebaugh	DATE: November 26, 1984
(5)	REVIEWED BY: AD Aller	DATE: 11-30-84
	Cross-Disciplinary Review By:	N/R: *
(6)	TEMPORARY APPROVAL (IF NECESSARY):	
	By:(SRO)	Date:
	By:	Date:
(7)	APPROVED BY: Beogra . Cy	Date: 11/30/04

(8)	MISCELLANEOUS:					
	Reviewed/Approved	Ву:	Date:			
	Reviewed/Approved	By:	Date:			

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Form 34912 (8-82)

EP/1/A/5000/10 CRITICAL SAFETY FUNCTION STATUS TREES 1 OF 5

A. Purpose

To provide guidance on how to monitor the plant safety status by use of logic diagrams that cover the six basic safety functions.

B. Entry Conditions

- EP/1/A/5000/01, SAFETY INJECTION, step 21, when SI cannot be terminated and cause has not been determined
- o On any transition out of EP/1/A/5000/01, SAFETY INJECTION.

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Form 34913 (8-82)

encertaintenent	ACT	ION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	-
С.	Imm	ediate Actions		•
	Non	e		
D.	Sub	sequent Actions		
1.	Cri	tical Safety Functions		
	â.	The six Critical Safety Functions (CSF) and associated procedures in order of priority are:		
		 Subcriticality - EP/1/A/5000/11, SUBCRITICALITY 		
		2) Core Cooling - EP/1/A/5000/12, CORE COOLING		
		3) Heat Sink - EP/1/A/5000/13, SECONDARY HEAT SINK		
		4) Integrity - EP/1/A/5000/14, NC SYSTEM INTEGRITY		
		5) Containment - EP/1/A/5000/15, CONTAINMENT		
		6) Inventory - EP/1/A/5000/16, NC SYSTEM INVENTORY.		
	Þ.	Each CSF has a corresponding status tree to enable the function to be monitored and to warn the operator if a safety parameter is being		

Attachment 4 Page 5 of 16

Form 34913 (8-82)

	ACTION/EXPECTED RESPONSE
2.	The CSF status trees should be monitored as follows:
	a. Normally the CSFs are continuously monitored and displayed in the Control Room by the OAC. Any change in state of the CSF will be alarmed on the computer and the alarm video displays will change color. Tech Spec Programs 21 through 26 should be used to determine which EP to implement.
	b. IF the OAC is unavailable, THEN status trees should be monitored manually as follows:
	 Monitor status trees (Enclosure 1-6) when a SI signal is present and log status on Enclosure 7.
	 Tree scanning should be continuous if any condition is coded higher than yellow or there is a significant change in plant status.
	3) IF no condition is coded higher than yellow, THEN tree scanning intervals should not exceed 10 minutes.
NOTE	Operator discretion is required in use of status trees. It is possible certain accidents might produce non-green status conditions which cannot corrected.
3.	The rules of priority for implementing EPs referenced by the status trees are as follows:

Attachment 4 Page 6 of 16

Form 34913 (8-82)

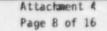
PARTICIPAL PROPERTY AND INCOME.

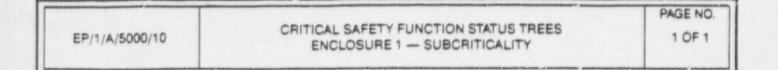
AC	TION/EXPECTED RESPONSE PREMIMAN RESPONSE NOT	OBTAINED
The second se	condition relative to any other condition of the same color is indicated by the order of the trees as given in step la.	
b.	IF a red path is encountered, THEN initiate indicated procedure to defend or recover the challenged CSF:	
	 A red CSF requires immediate attention and departure from any conflicting Emergency Procedure in effect. 	
	 <u>IF</u> during execution of a Tower priority red path procedure, a red path of higher priority arises, <u>THEN</u> address the higher priority red path first. 	
c.	IF an orange path is encountered, THEN note associated procedure AND check remaining trees for a red path. IF NO red path exists THEN initiate appropriate orange path procedure:	
	 An orange CSF requires prompt attention and departure from any conflicting Emergency Procedure in effect. 	
	 When highest priority orange path procedure is complete, scan trees for a red path before going to next orange path procedure. 	
	3) IF during the execution of an orange path procedure, a red path arises, THEN suspend orange AND implement red path procedure.	

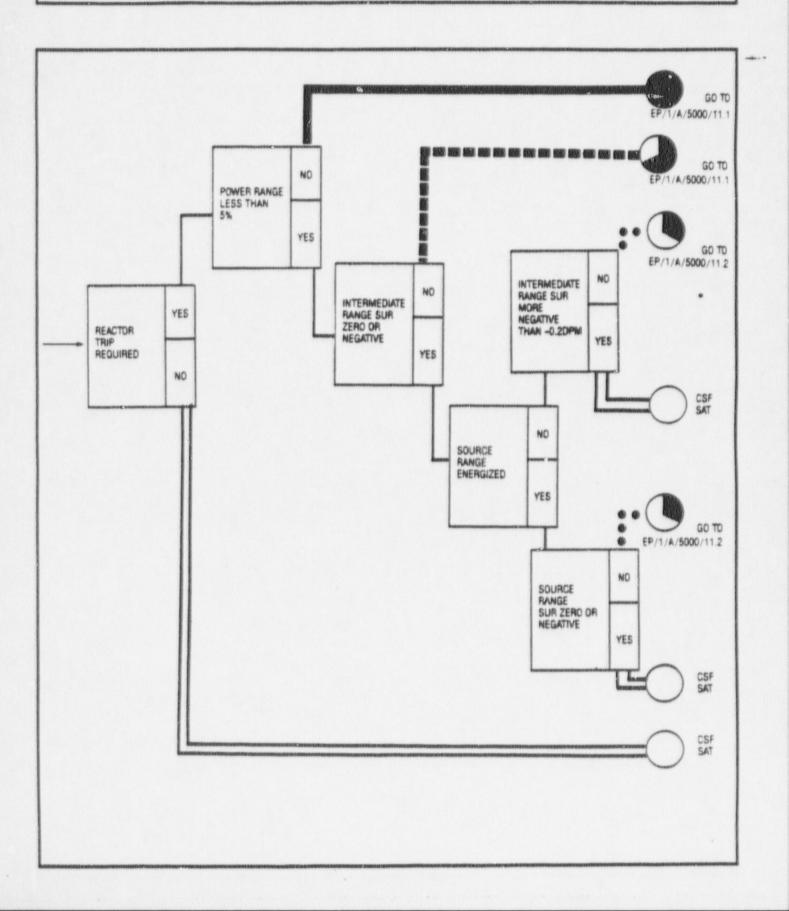
Attachment 4 Page 7 of 16

Form 34913 (8-82)

REV O			
THEN DOI	TED RESPONSE te nature of deficiency of check remaining trees igher priority. actical initiate actions to fully restore indicated	RESPONSE NOT OBTAIN	D
	END		

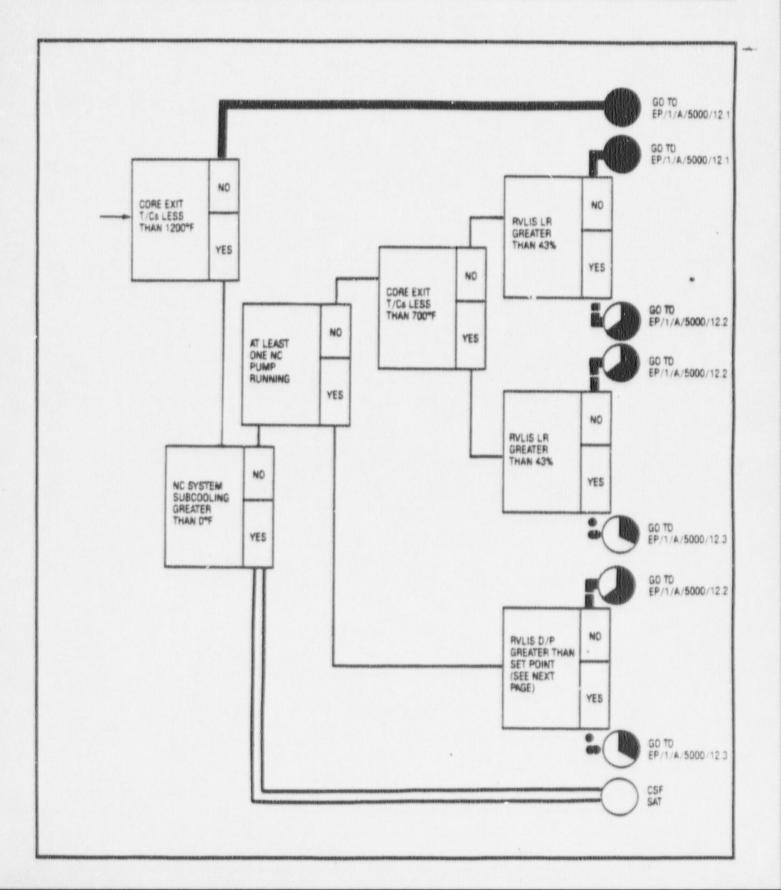






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EP/1/A/5000/10

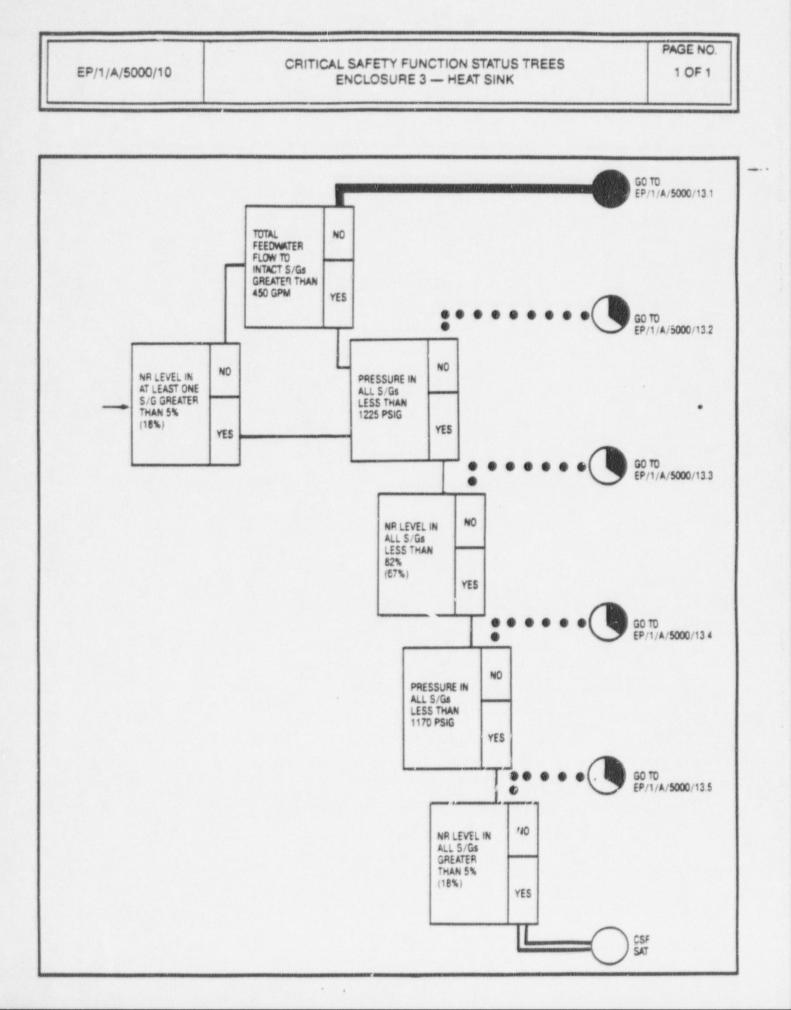
CRITICAL SAFETY FUNCTION STATUS TREES ENCLOSURE 2 -- CORE COOLING

RVLIS D/P SETPOINTS FOR DEGRADED CORE COOLING

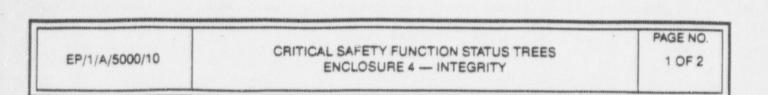
Number of NC Pumps		nnel A C Pump A	Channel B with NC Pump C	
Running	Running	Not Running	Running	Not Running
4	80%		80%	
3	60%	35%	60%	35%
2	45%	23%	45%	23%
1	35%	15%	35%	15% •

.

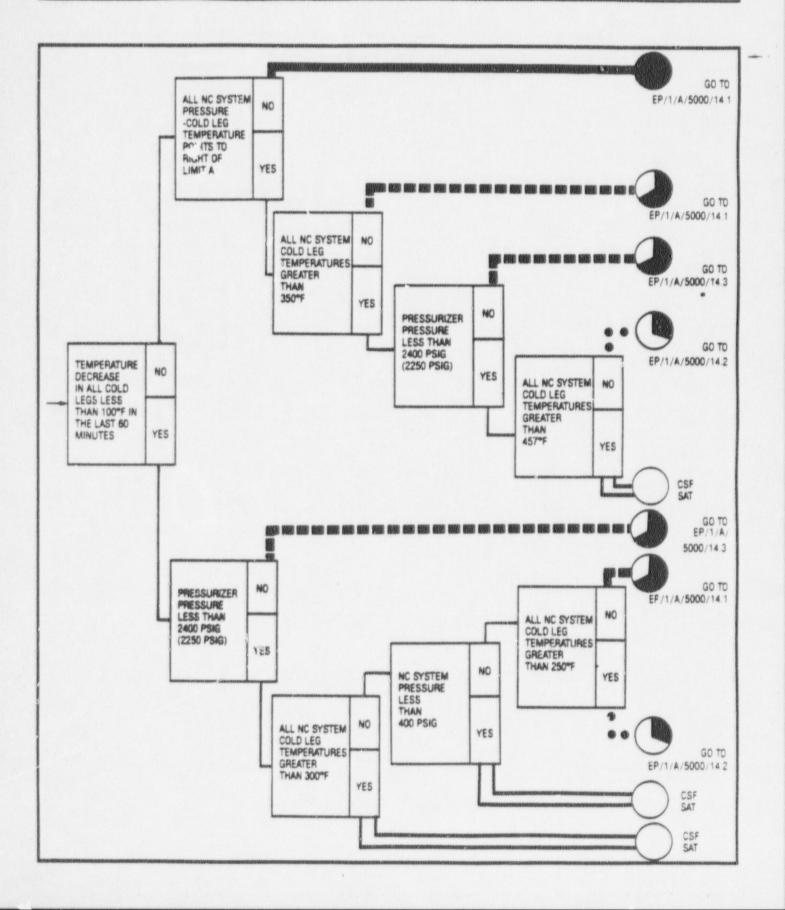
Attachment 4



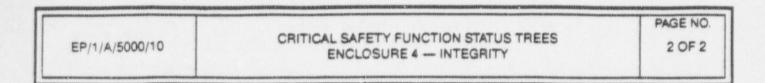
Page 11 of 16

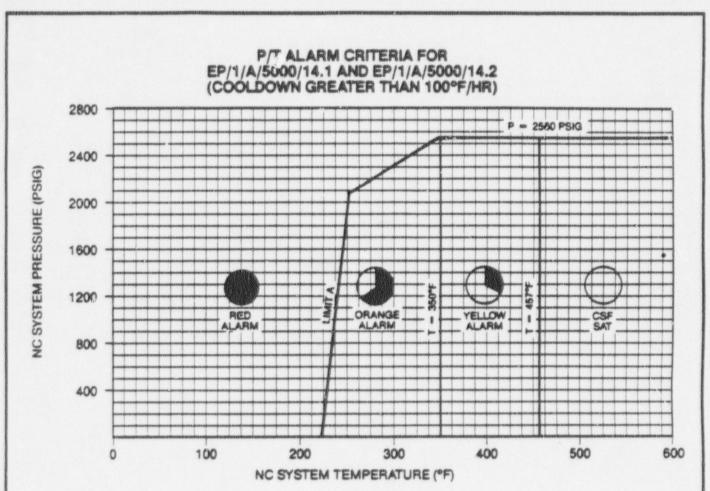


Attachment 4 Page 12 of 16



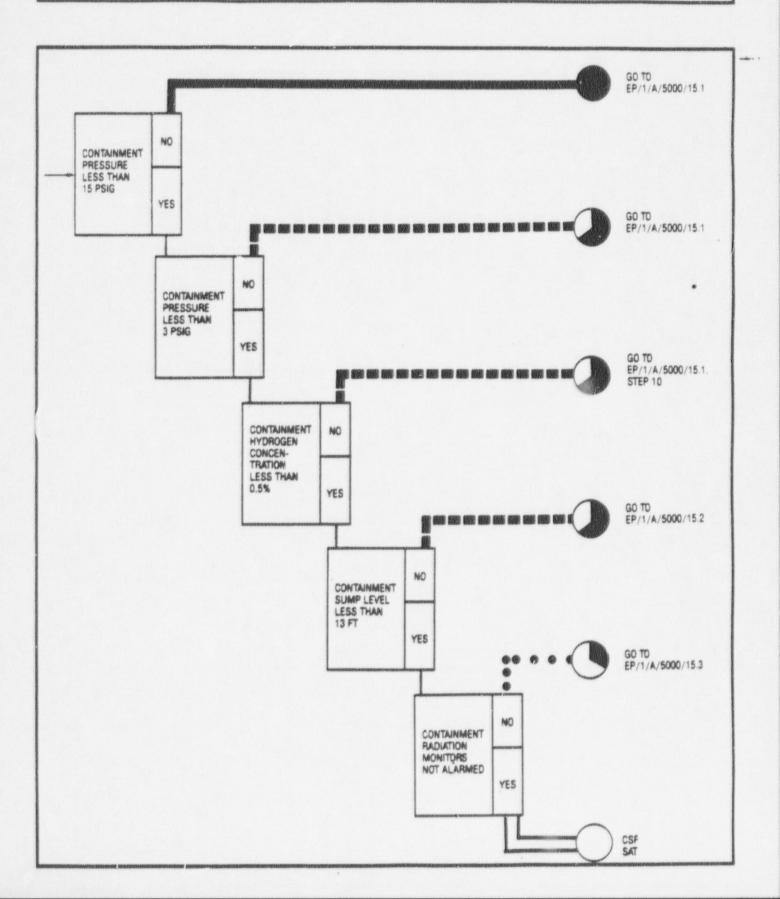
Attachment 4 Page 13 of 16





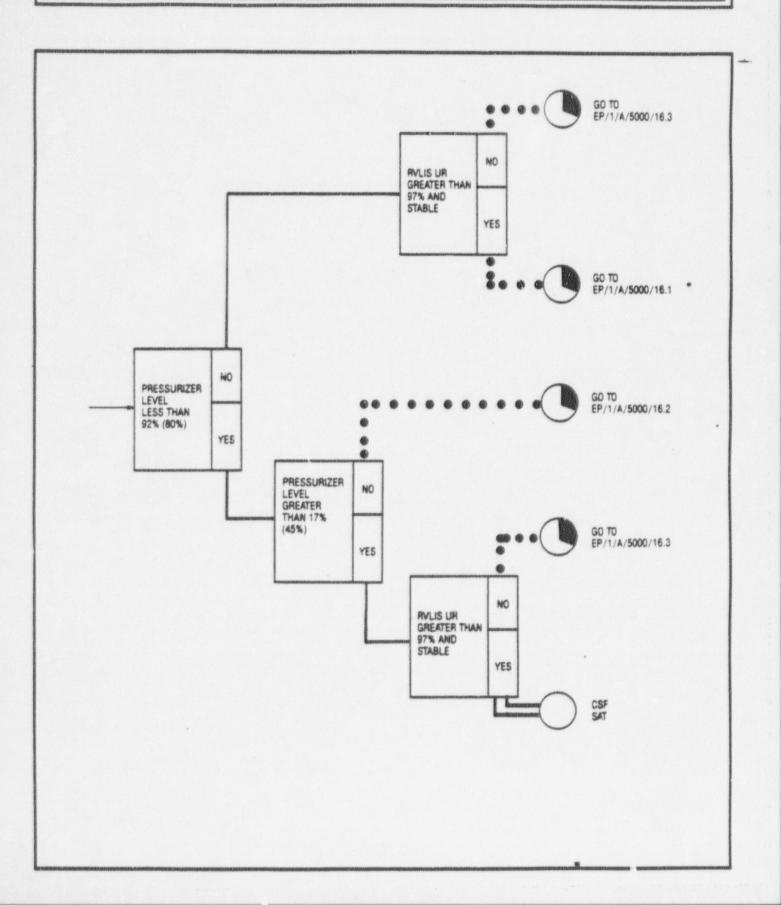
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Attachment 4 Page 14 of 16



Attachment 4 Page 15 of 16





Form 34912 (8-82)

EP/1/A/5000/10 REV 0	CRITIC	E	Y FUNCTION S nclosure 7 tus Tree Log			PAGE NO. 1 OF 1
R - Red	andra summer and a summer and a summer			anna-annananan (, Marananananananan	New Constant of Co	na fan de fan de sin namen oan de gegegen yn de Mei fan de fan
0 - Orange Y - Yellow						1
G - Green	CORE COOLING	HEAT SINK	NC INTEGRITY	CONTAINMENT	NC INVENTORY	INITIAL
						•

Performed by: _____ Date: _____

Attachment 5

Selected Pages From OP/1/A/6100/02 "Controlling Procedure For Unit Shutdown" and OP/0/A/6100/06 "Reactivity Balance Calculation"

Form 34731 (F	35-88)	MASTER FILE	Attachment 5 Page 2 of 12
		Duke Power Company PROCEDURE PROCESS RECORD	(1) ID No. <u>0P/1/A/6100/02</u> Change(s) <u>0</u> to 72 Incorporated
PREPARA (2) Statio		McGuire Nuclear Station	
(3) Proce	dure Titk	controlling Procedure for Unit Shute	down
		Len Firebaugh	
(5) Review	wed By _	gygen	Date 24/3/89
			N/R
(6) Tempo	orary Ap	proval (if necessary)	
Ву			(SRO) Date
Ву		Bome Tieus	Date
(7) Appro	wed By _	Eme (Bull	Date 4/6/89
(8) Miscel	laneous	- 17/	
Review	ved/App	wood by michael Werner	Date 4/4/89
Review	ved/App	rovad By ETRS 90	Date 4/3/P9
(9) Comm	clu	r procedure reissue indicate whether additional changes, other than pre ded. Attach additional pages, if necessary.) ditional Changes Included. IPrres INO	eviously approved changes, are in-
(10) Comp	ared with	Control Copy	Date
		ge to FSAR not identified in 10CFR50.59 evaluation? Yes detailed explanation.	
Completio (12) Date(s		ned	
(13) Proced	lune Con	npletion Verification	
□ Yes	DN/A	Check lists and/or blanks property initialed, signed, dated or filled in N	/A or N/R, as appropriate?
□ Yes	DN/A	Listed enclosures attached?	
🗆 Yes	DN/A	Data sheets attached, completed, dated and signed?	
🗆 Yes	DN/A	Charts, graphs, etc. attached and properly dated, identified and marke	d?
□ Yes	DN/A	Procedure requirements met?	
Verified	1 By		Date
14) Proced	lure Corr	nplesion Approved	Date
15) Reman	ks (attac	h additional pages, if necessary)	

P/1/A/6100/02	Attachment 5
-NCLOSURE 4.2	Page 3 of 12
PAGE 5 OF 24	

2.15.1.1 Ensure the "Operation Selector" for all 6 detectors is in the "Off" position.

- 2.15.1.2 Open and tag the 120 VAC main power breaker on the panel.
- 2.16 Begin boration of the NC System per OP/1/A/6150/09 (Boron Concentration Control) to ensure that the SDM requirements of Data Book Table 6.5 can be maintained during cooldown.
- 2.17 Have IAE do the following:
 - 2.17.1 When the neutron level decays to the normal shutdown counts, verify "High Flux At Shutdown" alarm bistable is set at one-half decade above normal shutdown source counts, and reinstate "High Flux At Shutdown" alarm.
- 2.18 After the "High Flux At Shutdown" alarm has been reinstated, insert the Shutdown Banks per OP/1/A/6150/08 (Rod Control).
- 2.19 Remove both MG sets from service per OP/1/A/6150/08 (Rod Control).
- 2.20 As soon as access to lower containment is possible, close INC-24 (Reactor Vessel Head Gasket Leakoff Drain Manual Block) to prevent NCDT H₂ from escaping to containment during cooldown.
- 2.21 Place Acoustic Emission Leak Monitor in "Manual" to prevent spurious alarms during shutdown.
- 2.22 If required, perform PT/1/A/4250/01A (Main Steam Isolation Valve Movement Test)
- <u>CAUTION</u> Ensure VCT Makeup blended flow boron concentration is adjusted to a value greater than required SDM boron concentration whenever VCT makeup controls are set for normal makeup.

Page 4 of 12 Form 35283 (A5-88) (1) ID NO. 3P/0/A/6100/06 Duke Power Company 35 **Procedure Major Change** Change No. Permanent/Restricted To PROCESS RECORD M'GUIZE (2) Station _ BALANCE SALCULATION KEALTIVITY (3) Procedure Title _ (4) Section(s) of Procedure Affected: Section 4.2. ENCLOSERE 5.5 . Enclosere 5.7 (5) Description of Change: (Attach additional pages, if necessary). A) AFTER THE FOURTH SENTENCE IN THE NOTE AT THE BEGINNING OF SECTION 4.2, ADD " It is permissible to rakulate Shutdown Margin for an intermediate tomater the per Section 4.2.1. However, before rooling down behave this imperature, Shukiown Margin Shull be re-calculated for a new internetiate temperature per Section 4.2.1 or for coolinium talew 200 °F per Section 4.2.3. In either case, Shutlown Mungin must be calculated per Section 4.2.3 prior to cooldown below 200°F. B) ON ENCLOSURE 5.5, "MANCIE "NOTE" to "NUTES" and number existing not is 1). ") Any to NOTES AT TH' OF ENCLOSURE 5.5: 2) This enclosure is to be used to relicitan Shutdown Morris or temperations between 2000F on 557°F. 3) Fruit Le cooling down thelow 200°F, Shutdown Margin muss be rakuland per Enclosure 5.7 D) Ann to Top OF ENCLOSURE 5.7 : MOTE: This enclosure is to be used to colculate Shuldown Morgins prior to Cooling down below 200 F. (6) Reason for Change To clarify the use of Enclosures 5.5 and 5.7 by calculating Shallown Morgin (7) Prepared By Date. (8) 10CFR50.59 Evaluation Attach completed 10CFR50.59 evaluation form. (9) Requires change to FSAR not identified in 10CFR50.59 evaluation?
Yes If "yes", attach detailed explanation. DE NO (10) Reviewed By ____ Date_ 89 Cross-Disciplinary Review By _ N/R (11) Temporary Approval (if necessary) By _ (SRO) Date _ Date By_ (12) Approved By Date _ (13) Miscellaneous Reviewed/Approved By _ Date Reviewed/Approved By _ Date _

Attachment 5 F Page 5 of 12 m 34895 (6-82) ormerly SPD - 1003 - 2A ID No: 00/0/0/00/06 DUKE POWER COMPANY Change No: 35 PROCEDURE MAJOR CHANGE PROCESS RECORD CONTINUATION FORM Page 2 of 2 5/ PINTINUED 12. 95 12. a. AND ADD A. FULLOSURE 5.5 DENUMBER STEP II 2× M Ad 10 400 BRON (incent ibove) 15 655 NIC 1 E Cince trution B ci have) ron <1 1 dames EE7 then shutdown m 15 11 5. Enclosure Der STF? AFTR FI ĩ 5 ADIZ 11 NOTE 1º 01

·	Attachment 5 Page 6 of 12
PROCEDURE PROCESS RÉCORD	I) ID No. <u>0P/0/A/6100/06</u> Change(s) <u>0</u> to <u>33</u> Incorporated
PREPARATION (2) Station McGuire	
(3) Procedure Title <u>Reactivity Balance Calculation</u>	
(4) Prepared By A. Jel Kille	Date 10/20/88
(5) Reviewed By	Date 10/24/88
Cross-Disciplinary Review By	N/R 12/9/88
(6) Temporary Approval (if necessary)	
Ву	(SRO) Date
(7) Approved By Bruce Hamilton	Date
	Date 12/9/88
(8) Miscellaneous	
Reviewed/Approved By M.S.Kitlang	Date 12/9/88
Reviewed/Approved By	Date
(9) Comments (For procedure reissue indicate whether additional changes, other than previ cluded. Attach additional pages, if necessary.) Additional Changes Included. 亿 Yes 디 No	ously approved changes, are in-
(10) Compared with Control Copy	Date
(11) Requires change to FSAR not identified in 10CFR50.59 evaluation? Yes If "yes", attach detailed explanation.	
Completion (12) Date(s) Performed	
(13) Procedure Completion Verification	
□ Yes □ N/A Check lists and/or blanks property initialed, signed, dated or filled in N/A	or N/R, as appropriate?
□ Yes □ N/A Listed enclosures attached?	
Yes N/A Data sheets attached, completed, dated and signed?	
Yes N/A Charts, graphs, etc. attached and properly dated, identified and marked?	?
□ Yes □ N/A Procedure requirements met?	
Verified By	Date
(14) Procedure Completion Approved	Date
(15) Remarks (attach additional pages, if necessary)	

Attachment 5 Page 7 of 12

OP/0/A/6100/06 Page 8 of 15

- 4.1.2./ Determine 557°F rod worth of control rods at their present position from Data Book Curve 6.3.3.
- 4.1.2.8 Obtain maximum reactivity effect of flux redistribution at zero power at any time in core life from note at bottom of Data Book Table 6.3.2.
- 4.1.2.9 Sum values obtained in Steps 4.1.2.5, 4.1.2.6, 4.1.2.7, and 4.1.2.8.
- 4.1.2.10 Determine required shutdown margin by adding value of 4.1.2.4 to 1300 pcm . Value in Step 4.1.2.9 shall be more positive than this value per MNS Technical Specification 3.1.1.1. If value in Step 4.1.2.9 is not more positive than this value, borate per appropriate Station procedure.
- 4.1.2.11 Forward a copy of all completed Enclosure(s) 5.4 to Reactor Unit by next working day.

4.2 Unit Shutdown

CAUTION

Perform all shutdown margin calculations and adjust boron concentration prior to cooling down below 550°F.

NOTE: For temperatures between 200°F and 557°F, shutdown margin calculations should be performed per Section 4.2.1. If temperature will remain between 500°F and 557°F and calculations of Section 4.2.1 show inadequate shutdown margin exists, then shutdown margin may be calculated with credit for xenon included. In this case, perform Section 4.2.2. If cooldown below 200°F is expected, shutdown margin should be calculated per Section 4.2.3. If shutdown banks are to be withdrawn prior to adjusting NC borou concentration adequate shutdown margin exists. Ensure criticality will not occur by completing Section 4.2.4.

Tit is permissible to cakulate 4.2.1 Shutdown Maryin for an intermediate temperature par Section 4.2.1 Konever, before cooling down below this temperature, shutdown Margin shall be re-cakulated for a new intermediate temperature per Section 4.2.1 or for cooldown below 200°F par Section 4.2.3. In either case, Shutdown Margin nugt be calculated per Section 4.2.3 prior to couldown below 200°F. Charge charge

Unit shutdown, Tave > 200°F, No Xeuon Credit included

Complete Enclosure 5.5 as follows:

4.2.1.1 Record unit and cycle.

4.2.1.2 Record cycle burnup from OAC points P1457 and P1458.

	war C	1 6911	cire	
Pa	ge	8	of	12

OP	1	0/	A/	6	1	0	0/	06
Pa	8	e		-		0	f	

ENCLOSURE 5.5

SHUTDOWN MARGIN - UNIT SHUTDOWN, TAVE >200°F, NO XENON CREDIT INCLUDED

NOTE	E: 1) Perform prior to cooling down below 55 2) This enclosure is to be used to colculate Shut 3) Prior to cooling down below 200°F, Shutdown Ma	50°F. Edown Margin for temperatures between 200°F and 55° angin must be calculated per Enclosure 5.7. (4835 MTE 4/0/89	7
1.	Unit Cycle	4/0/89	
2.	Cycle Burnup EFPD MW	/D/MTU	
3.	Lowest Temperature Expected	٥F	
4.	1.3% Shutdown Margin Boron (from tabular data Data Book Curve 6.5 f and temperature 3. above).	or burnup 2. above ppm	
5. NOTE	NC Boron Concentration If one or more rods are known to be in 9. Otherwise mark Steps 6., 7. and 8. proceed to Step 10.	ppm operable, perform Steps 6. through as N/A, mark Step 9. as 0 ppm and	
6.	Number of known inoperable rods	inoperable rods	
7.	Stuck Rod Worth (from Data Book Table 6.3 interpolated to present burnup 2. above)	3.2 line B	
8.	Differential Boron Worth (from Data Book for present burnup 2.above)	Сигve б.2 рст/ррт	
9.	Stuck Rod Penalty (<u>6. above x 7. above</u>) <u>8. above</u>	+ ppm	
10.	Adjusted Shutdown Boron Concentration (4. above + 9. above)	ppm	
	If NC Boron Concentration (5. above) is g Shutdown Boron Concentration (10. above), temperature 3. above.	reater than or equal to Adjusted adequate shutdown margin exists at	
NOTE: A	tenform either 12.a or 12.b		
	If NC Boron concentration (5. above) is 1 Concentration (10. above) and it is desir of 3. above, then NC Boron Concentration greater than 10. above. If NC Boron concentration (5. above) is less than	ed to decrease temperature to thet must be adjusted equal to or adjusted. Shutdown Boron Concentration (10. ubove)	
	and lemperations (2. above) is between 500°F and	1957 F, then Shubburn margin may be recationed	
Chick	Date/T	10e (H#25	
CI	Date/T	ime///	

 Forward a copy of all completed Enclosure(s) 5.5 to Reactor Unit by next working day.

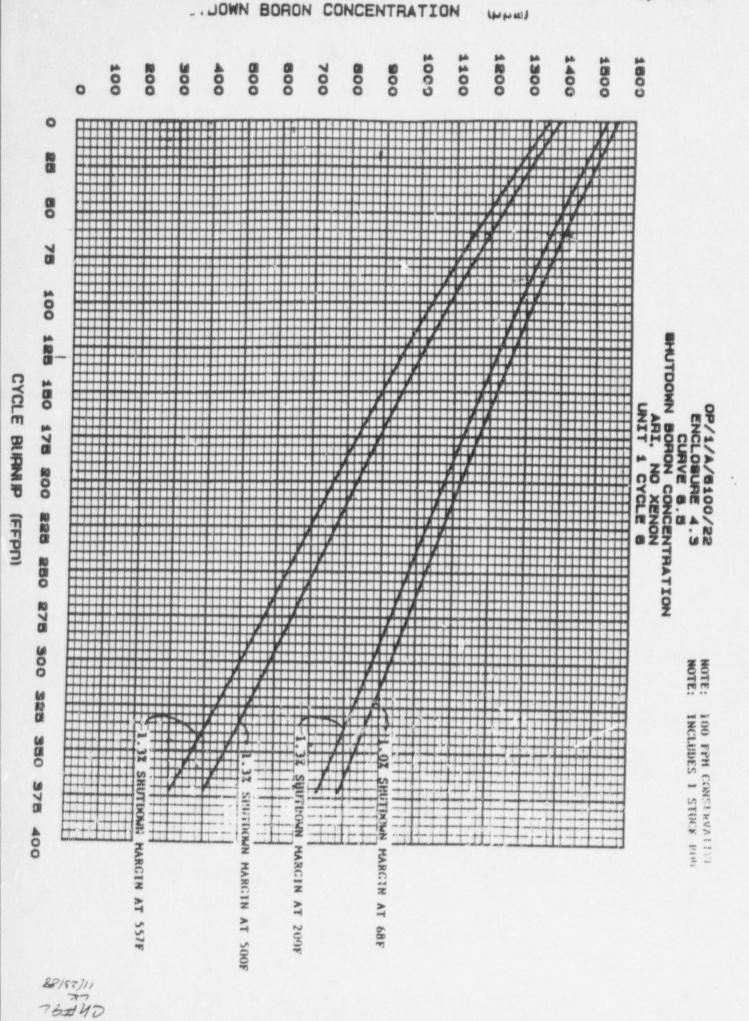
CN14-35 MTX 44 F9

		Page 9 of 12
	ENCLOSURE 5.7 SHUTDOWN MARGIN - UNIT SHUTDOWN, TAVE < 200°F, NO XENON CREDIT INCLUDED	OP/0/A/6100/06 Page 1 of 1
NOTE: This	enclosure is to be used to calculate shutdown Margin prior to	conling duwn below 200°F.
1.	Unit Cycle	716187
2.	Cycle Burnup EFPD MWD/MTU	
3.	NC Boron Concentration	ppm
4.	Shutdown Boron Concentration (from tabular data of Data Book Curve 6.5, 1.0% shutdown at 68°F or 1.3% shutdown at 200°F, whichever is greater)	ppm
NOTE	: If one or more rods are known to be inoperable, perform 8. Otherwise, mark Steps 5., 6. and 7. as N/A, mark St proceed to Step 9.	Steps 5. through ep 8. as 0 ppm and
5.	Number of known inoperable rods	inoperable rods
6.	Stuck Rod Worth (from Data Book Table 6.3.2 line B interpolated to present burnup 2. above)	pcm
7.	Differential Boron Worth (from Data Book Curve 6.2 for present burnup 2. above)	pcm/ppm
8.	Stuck Rod Penalty (<u>5. above x 6. above</u>) 7. above	+ppm
9.	Adjusted Shutdown Boron Concentration (4. above + 8. above)	ppm
10.	If NC Boron Concentration (3. above) is greater than or e Shutdown Boron Concentration (9. above), adequate shutdow cooldown.	

 If NC Boron concentration (3. above) is less than Adjusted Shutdown Boron Concentration (9. above) and it is desired to cooldown below 200°F, then NC Boron Concentration must be adjusted equal to or greater than 9. above.

Calculated	By	NONEY (19) NO-MERINANI INFO INFO	Date/Time	
Checked	By	andalar - sealad it (&r. a. r. 1999) ; samaal zamana valy assessmentalise a tor, in surradam	Date/Time	

12. Forward a copy of all completed Enclosure(s) 5.7 to Reactor Unit by next working day.



Page ef

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nos CONSERVATIVE

NOTE: MOST REACTIVE ROD STUCK OUT

S XE, HO SM

BURNUP (EFPD $\begin{array}{c} 1\,00\\ 1\,20\\ 1\,60\\ 1\,60\\ 2\,00\\ 2\,00\\ 2\,00\\ 2\,200\\ 2\,200\\ 2\,200\\ 2\,200\\ 2\,200\\ 2\,200\\ 3\,200\\ 3\,200\\ 3\,200\\ 3\,400\\ 3\,$ 1421 1373 11239 1197 1197 1156 11156 1076 1037 918 918 878 837 794 900 859 818 775 732 705 882 840 711 684 984 984 799 7156 7156 667 639 905 863 820 777 734 689 643 1013 970 927 884 884 841 798 754 710 664 618 9950 9906 818 818 774 730 685 685 639 591 928 883 839 750 704 658 611 563 533 815 724 678 631 583 583 534 1075 976 929 882 836 790 743 657 657 657 652 602 553 503 905 857 857 857 763 715 668 668 626 571 521 521 979 879 830 930 877 824 772 618 556 556 514 461 351 351 923 869 816 816 763 711 660 608 556 394 303

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Page 3 of

SHUTDOWN BORON CONCENTRATION Enclosure 4.3 CURVE 5.5 ARI, NO XENON

MOGUIRE 1 CYCLE 6

1.3% Shutdown Margin CL#494 9/12/5

CORE AVERGE TEMP. (* F)

NOTE: 100 PPM CONSERVATIVE

NOTE: MOST REACTIVE ROD STUCK OUT

* NO XE, BO SM

2082 2 U:

Attachment 5 Page 12 of 12

SHUTDOWN BORON CONCENTRATION

ARI.

NO XENON

Enclosurs 4.3 CURVE 5.5

10% Shutdows Marsin

01/11/000 9/11/000 MOGUIRE 1 CYCLE 6

Attachment 6

Procedural Committments Made in the April 13, 1989 Washington, D.C. Duke Power Presentation to the NRC Staff

EMERGENCY PROCEDURES

- ERG DEVIATION DOCUMENT
 - Projected Schedule for Completion

Deviation document scheduled completion is June 30, 1989.

It was Duke's opinion that a deviation document did exist and that we shared Catawba's documentation. This was based on the fact that both sites share a common design and similar safety analysis.

Safety Injection Initiation

McGuire has changed the threshold for manual initiation of safety injection. The previous threshold was pressurizer level less than five percent after a second charging pump was started and cold leg injection valves were opened; the new threshold is pressurizer level decreasing after a second charging is started and injecting through the normal charging flow path.

- Other Procedure Enhancements
 - I. Procedure changes already completed
 - A. OP/1,2/A/6100/02, "Controlling Procedure for Unit Shutdown"
 - Revised procedure step to more clearly allow cooldown initiation prior to meeting the Shutdown Margin for Cold Shutdown as long as Shutdown Margin is maintained throughout the cooldown.
 - B. OP/0/A/6100/06, "Reactivity Balance Calculation"
 - Revised procedure step to more clearly allow cooldown initiation prior to meeting the Shutdown Margin for Cold Shutdown as long as Shutdown Margin is maintained throughout the cooldown.
 - II. Procedure changes to be completed by May 1, 1989
 - A. AP/1,2/A/5500/10, "NC System Leckage Within the Capacity of Joth NV Pumps - Case 1 Steam Generator Tube Leakage"
 - Revised procedure to require operator to initiate manual Safety Injection and go to EP/1,2/A/5000/01 instead of manually opening NI-9A and NI-10B (NC Cold Leg Injection from NV) when maximum charging is not maintaining pressurizer level.

- Revised subseque. Lctions to more clearly resemble EP/1,2/A/5000/04, "Steam Generator Tube Rupture".
- Revised the last step to direct the operator to cooldown the ruptured Steam Generator using EP/1,2/A/5000/4.1, "SGTR Cooldown Using Steam Dump", EP/1,2/A/5000/4.2, "SGTR Cooldown Using Backfill" or EP/1,2/A/5000/4.3, "SGTR Cooldown Using Blowdown".
- 4. Added new step to begin unit load reduction.
- 5. Added new step and enclosure to minimize secondary contamination.
- Added Caution to allow operator to exceed 50°F/hr cooldown rate.
- Added step to isolate blowdown on the ruptured steam generator.
- B. AP/1,2/A/5500/10, "NC System Leakage Within the Capacity of Both NV Pumps - Case 2 Reactor Coolant System Leakage"
 - Revised procedure to require operator to initiate manual Safety Injection and go to EP/1,2/A/5000/01, "Safety Injection" instead of manually opening NI-9A and NI-10B (NC Cold Leg Injection from NV) when maximum charging is not maintaining pressurizer level.
 - Revised subsequent actions to more closely resemble EP/1,2/A/5000/2.2, "Post LOCA Cooldown and Depressurization"
- III. Procedure changes to be implemented with the Emergency and Abnormal Procedure total reissue currently scheduled for June 30, 1989 (waiting on simulator for validation)
 - A. EP/1,2/A/5000/04, "Steam Generator Tube Rupture"
 - All Reactor Coolant Fumps are left operating for cooldown.
 - 2. New enclosure for minimizing secondary contamination.
 - E. EF/1,2/A/5000/4.2, "SGTR Cooldown Using Backfill"
 - Revised procedure step to more clearly allow cooldown initiated as long as Shutdown Margin is maintained throughout the cooldown.

- 2. Revised procedure to stop the reactor coolant pump on the ruptured Steam Generator after placing residual heat removal in service. This helps maintain ruptured Steam Generator pressure elevated and hence Reactor Coolant System pressure to allow Reactor Coolant Pumps on the intact steam generators to be operated until the Reactor Coolant System Temperature is less 160°F.
- C. EP/1,2/A/5000/4.3, "SGTR Cooldown Using Blowdown"
 - Revising entire procedure to utilize normal Blowdown instead of the Blowdown Recycle System.
- D. AP/1,2/A/5500/01, "Reactor Trip"
 - Deleting procedure and incorporating Reactor Trip in EP/1,2/A/5000/01, "Safety Injection".

Attachment 7

Superceded Copy of AP/1/A/5000/10 and Selected Pages From the Superceded OP/1/A/6100/02

Form 21731 (R9-86)			hment 7 2 of 34 (1	1) ID No. <u>AP/1/A/5500/</u> Change(s) 0 to 0 Incorporated
PREPARATION	I.	NFORMATION C	NLY	Incorporated
(2) STATION MCGuire Nu	clear	MI DIVINITION		
(3) PROCEDURE TITLE NC	System Leakage With	in Capacity of Bo	th NV Pumps	
(4) PREPARED BY Len		DATE		
(5) REVIEWED BY	-RE	DATE -	3-3-	88
Cross-Disciplinary Review By	/			
(6) TEMPORARY APPROVAL (IF	Necessary)			
Вү		(SRO) DATE		
By		DATE	- / //0	
(7) APPROVED BY	-Travis	DATE	3/4/80	r .
(8) MISCELLANEOUS	· ·			
Reviewed/Approved By		DATE		
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Reviewed/Approved By	ETTS	DATE	38. 4. 58	
(9) COMMENTS (For procedure reis Attach additional		nal changes, other than p ADDITIONAL CHANGE		
(10) COMPARED WITH CONTROL	COPY	DATE		
COMPLETION				
(11) DATE(S) PERFORMED				
12) PROCEDURE COMPLETION V	FRIEICATION			
C. Yes N/A Check lists a		ed, signed, dated or filled	in N/A or N/R.	s appropriate?
Ves N/A Listed enclo				
Ves IN/A Data sheets	attached, completed, dated a	nd signed?		
TYes N/A Charts, graph	hs, etc. attached and properly	dated, identified and ma	irked?	
Yes N/A Acceptance			-*	
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13) PROCEDURE COMPLETION A	PPROVED	DATE		annan 1 anns ann bar News Annan ann ann an ann an ann an ann ann
14) REMARKS (Attach additional s	ages if necessary)			

Form 34912 (8-82)

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AP/1/A/5500/10		AP	/1	/A	/5	50	0/	10
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NC SYSTEM LEAKAGE WITHIN THE CAPACITY OF BOTH NV PUMPS

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AP/1/A/5500/10

NC SYSTEM LEAKAGE WITHIN THE CAPACITY OF DOTH NV PUMPS

PAGE NO. 1 OF 17

A. Purpose

This procedure covers the required operator actions for NC leakage greater than Tech Specs but where the Charging Pumps are capable of maintaining Pzr water level and the Pzr heaters are capable of maintaining system pressure under the following conditions:

Case I Steam Generator Tube Leakage Case II NC System Leakage Case III Letdown Or Charging Line Leakage Case IV Leakage Into KC System.

n 34912 (8-82)		Page 5 of 34
AP/1/A/55		CAPACITY OF BOTH NV PUMPS PAGE NO. 2 OF 17 Tube Leakage
	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Β.	Symptoms	
	• "1EMF-33, Cond AE Exh Hi Gas Ra	d" alarm
	• "lEMF-34, SG Sample Hi Rad" ala	rm
	• "1EMF-24 25 26 27 Steam Line Hi	Rad" alarm
	 Increase in frequency of auto m 	akeup to VCT.
c.	Immediate Actions	
1.	Check Pzr Level - AT <u>OR</u> INCREASING TO PROGRAMMED LEVEL.	IF level decreasing, THEN perform the following to maintain level:
		 a. Ensure #1 PD Pump speed increasing OR 1NV-238 (Charging Line Flow Control) opening.
		b. Start additional NV Pumps
		c. Reduce letdown to 45 GPM orifice.
		IF level decreases below 5%, THEN manually initiate SI AND go to EP/1/A/5000/01, SAFETY INJECTION.
2.	Check Pzr Press - AT <u>OR</u> INCREASING TO 2235 PSIG.	IF less than 2210 PSIG, THEN ensure backup heaters on. IF pressure approaches 1945 PSIG, THEN trip Reactor AND refer to AP/1/A/5500/01, REACTOR TRIP.
D.	Subsequent Actions	

CAUTION If Pzr level cannot be maintained, (less than 5% and decreasing) then SI should be manually initiated.

 Announce occurrence on paging system.

AP/1/A/55	00/10 Cas	THIN CAPACITY OF BOTH NV PUMPS e I tor Tube Leakage
	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2.	Check Pzr Level - STABLE OR INCREASING.	IF level decreasing with maximum charging flow, <u>THEN</u> :
		a. Manually trip Turbine AND Reac
		b. Open 1NI-9A AND 10B (NC Cold L Inj From NV).
		c. Swap charging pump suction to FWST:
		1) Open 1NV-221A AND 222B (NV Pumps Suct From FWST)
		 Close INV-141A AND 142B (VO Outlet Isol).
3.	Check if S/G blowdown isolation required:	
	a. "1EMF-34 S/G Sample Hi Rad" alarm - LIT	a. Go to step 4.
	 b. Verify S/G BB Auto Isol valves - CLOSED: 	b. Manually close valves.
	• S/G A, 1BB-119	
	• S/G 5, 1BB-120	
	• S/G C, 1BB-121	
	• S/G D, 1BB-122.	
4.	Refer to RP/0/A/5700/01, NOTIFICATION OF UNUSUAL EVENT.	
5.	Notify HP to determine activity released from air ejectors.	

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ALCACHMENT / Page 7 of 34 STRUCTURE STREET

OF 17

NC	SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS	PAGE NO.
	Case I	4 OF 1
	Steam Generator Tube Leakage	

Internation Andreas	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6.	Identify affected S/G:	00000000000000000000000000000000000000
	• Decrease in CF flow	
	 Increase in S/G level 	
	 Increase in S/G pressure 	
	 Per OP/1/A/6250/08, STEAM GENERATOR BLOWDOWN. 	
7.	Perform the following steps in conjunction with shutdown and cooldown of unit per OP/1/A/6100/02, CONTROLLING PEOCEDURE FOR UNIT SHUTDOWN:	
	a. IF Unit 2 available to supply AS header, THEN:	a. Supply AS header with Aux Elect Boiler:
	 Ensure the following valves - OPEN: 	 Place boilers in operation per OP/1/B/6250/07B, AUX ELECTRIC BOILER
	 1AS-74 (Unit 1 Aux Stm Hdr Isol) 	2) Ensure open:
	 2AS-74 (Unit 2 Aux Stm Hdr Isol) 	 IAS-74 (Unit 1 Aux Stm Hdr Isol)
	 1AS-253 (Unit 1 And 2 Aux Stm Hdr Crosstie) 	 2AS-74 (Unit 2 Aux Stm Hdr Isol)
	2) Close LAS-9 (C-Htr Bleed to AS) AND LAS-12 (SM To AS)	 1AS-253 (Unit 1 And 2 Au Stm Hdr Crosstie)
	<pre>3) Open 1HM-95 (AS To "A" and "B" FWPT)</pre>	3) Open 1AS-120 (Aux Elec Bir And B To AS Isol)
	 Locally verify proper operation of 2AS-11 (Unit 2 Main Steam To Aux Steam Hdr Control). 	4) Close 1AS-9 (C Htr Bleed to AS) AND slowly throttle clo 1AS-12 (SM To AS)
	Har concroi).	5) Open 1HM-95 (AS To "A" and FWPT).

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	NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS	PAGE NO.
AP/1/A/5500/10	Case I	5 OF 17
	Steam Generator Tube Leakage	

b. Aft	er unit is off line,	
	late affected S/G:	
•	S/G 1A	
	1) Close SM Isol AND Bypass Valves, ISM-7AB, 12	
	 Control feed flow to maintain S/G NR Lvl greater than 38%. 	
•	S/G 18	
	 Close SM Isol AND Bypass Valves, 15M-5AB, 11 	
	 Control feed flow to maintain S/G NR Lv1 greater than 38%. 	
	<pre>3) Locally close ISA-2 (SM To #1 TD CA Pump)</pre>	•
•	S/G 1C	
	 Close SM Isol AND Bypass Valves, 1SM-3AB, 10 	
	 Control feed flow to maintain S/G NR Lvl greater than 38%. 	
	<pre>3) Locally close 1SA-1 (SM To #1 TD CA Pump)</pre>	
	S/G 1D	
	 Close SM Isol AND Bypass Valves, 1SM-1AB, 9 	
	 Control feed flow to maintain S/G NR Lv1 greater than 38%. 	
c. Coo 507	ldown NC System to less than °F.	

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AP/1/A/5500/10

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NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS Case I Steam Generator Tube Leakage 6 OF 17

AC	TION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
d.	Reduce NC System pressure to faulted S/G pressure while blocking SI per shutdown procedure.	
e.	Continue plant cooldown per shutdown procedure.	
f.	Depressurize NC System and ruptured S/G simultaneously:	
	 Dump steam to condenser by slowly opening SM Isol Bypass valve on ruptured S/G. 	
	OR	
	Initiate blowdown to recycle system per OP/1/A/6250/08 S/G BLOWDOWN.	
	 Reduce NC pressure to maintain equal to ruptured S/G pressure. 	

END

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AP/1/A/5	NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH Case II NC System Leakage	NV PUMPS 7 OF 17		
	ACTION/EXPECTED RESPONSE			
В.	Symptoms			
	Increase in frequency of auto makeup to VCT			
•	Increased leakrate results from PT/1/A/4150/01B, R CALCULATIONS	EACTOR COOLANT LEAKAGE		
	Cont Flr/Eqp Sump Level increase			
	"1EMF-38 Containment HI Part Rad" alarm			
	"1EMF-39 Containment HI Gas Rad" alarm			
	"1EMF-40 Containment HI Iod Rad" alarm			
	"Pzr PORV Disch Hi Temp" alarm			
	"Pzr Safety Discharge Hi Temp" alarm			
	PRT temperature increase			
	PRT level increase			
	Containment temperature increase			
	Containment humidity increase			
•	"Rx Vessel Flange Leak Off Hi Temp" alarm			
C.	Immediate Actions			
1.		creasing, <u>THEN</u> perform ng to maintain level:		
	OR INV-	#1 PD Pump speed increas 238 (Charging Line Flow) opening.		

- b. Start additional NV Pumps
- c. Reduce letdown to 45 GPM orifice.

IF level decreases below 5%, THEN manually initiate SI AND go to EP/1/A/5000/01, SAFETY INJECTION.

AP/1/A/5500/10	NC SYSTEM LEAKAGE WITH. Case NC System	II	NV PUMPS 8 OF 1
ACTION/	EXPECTED RESPONSE	RESPONSE	E NOT OBTAINED
	zr Press - AT <u>OR</u> ING TO 2235 PSIG.	IF pressure THEN trip F	approaches 1945 PSIG.
D. Subsequent Ac	tions		
	Pzr level cannot be maint ety Injection should be m		
1. Announc system.	e occurrence on paging		
2. Check P INCREAS	zr Level - STABLE OR ING.	IF level de charging fl	ow, <u>THEN</u> :
		a. Manuall	y trip Turbine AND React
		b. Open 1N Inj Fro	NI-9A AND 10B (NC Cold Le
		c. Swap ch FWST:	erging pump suction to
			n INV-221A AND 222B Pumps Suct From FWST)
			se INV-141A <u>AND</u> 142B (VO Net Isol).
	f Containment ventilation on required:		
a. EMF	38, 39 <u>OR</u> 40 - IN ALARM	a. Go to s	cep 4.
b. Sto	p VP Fans.		
c. Sto	p any VQ release in progr	255.	
	0 RP/0/A/5700/01, ATION OF UNUSUAL EVENT.		

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AP/1/A/5500/10	NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS Case II NC System Leakage	PAGE NO. 9 OF 17
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ACT	ION/EXPECTED RESPONSE		RESPONSE NOT OBTAINED	100000000000000
5. Att lea	empt to identify and isolate k:		nanan kananan kanan k	
а.	Check "Pzr PORV Disch Hi Temp" - IN ALARM	a.	Go to Step b.	
	1) Verify Pzr PORV's - CLOSED		1) Close Pzr PORV's.	
	 Monitor PORV Relief Valve Temp and cycle Pzr PORV Isol AND Relief Hdr Sample valves to determine leak path: 			
	• 1NC-33A AND 270			
	• INC-358 AND 269			
	• INC-31B AND 271.			
b.	Check Cold Leg Accumulator Level - INCREASING	b.	Go to step c.	
	 Close CL Accum Disch Isol Valve 			
	OR			
	Drain accumulator per OP/1/A/6200/09, ACCUMULATOR OPERATION.			
c.	Check Pzr Relief Tank Level OR Temp - INCREASING ABOVE NORMAL	c.	Go to step d.	
	1) Check inputs to PRi per Enclosure 1.			

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	NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS	PAGE NO.
AP/1/A/5500/10	Case II NC System Leakage	10 OF 17

DIVIDENTI	ACTION/EXPECTED RESPONSE		RESPONSE NOT OBTAINED			
Karanan	d. Check NCDT level OR temperature - INCREASING ABOVE NORMAL	d.	Go	to	step	e.
	 Check inputs to NCDT per Enclosure 2. 					
	e. Check Cont Flr/Eqp Sump Level - INCREASING ABOVE NORMAL	e.	Go	to	step	f.
	 Check inputs to sumps per Enclosure 3. 					
	f. Check inputs to Aux Building Sumps from NV System per Enclosure 4.	f.	Go	to	step	g.
-	g. Check ND System - IN SERVICE	g.	Go	to	step	6.
	 Check inputs to Aux Building Sumps from ND System per Enclosure 5. 					
6.	IF unit shutdown is required by Tech Specs, THEN notify NRC via red phone					
	per RP/0/A/5700/10, NRC IMMEDIATE NOTIFICATION REQUIREMENTS.					

END

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AP/1/A/55	500/10	GE WITHIN CAPACITY OF BOTH NV PUMPS Case III r Charging Line Leakage
	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
В.	Symptoms	
	VCT level decrease or abnorm	mal increase in frequency of auto makeup
•	Increase levels in: • ND/NS Sump • NCDT • RHT	
•	"EMF-41 Aux Bldg Hi Gas Rad"	alarm
	"Letdown Relief hi Temp" ala	rm.
	Letdown or charging flows ab	normal.
1.	Check Pzr Level - AT <u>OR</u> INCR TO PROGRAMMED LEVEL.	EASING IF level decreasing, THEN perform the following to maintain level:
±.		the following to maintain level: a. Ensure #1 PD Pump speed increa
		OR INV-238 (Charging Line Flow Control) opening.
		b. Start additional NV Pumps
		c. Reduce letdown to 45 GPM orifi
		IF level decreases below 5%, THEN manually initiate SI AND go to EP/1/A/5000/01, SAFETY INJECTION.
2.	Check Pzr Press - AT <u>OR</u> INCREASING TO 2235 PSIG.	IF less than 2210 PSIG, THEN ensur- backup heaters on. IF pressure approaches 1945 PSIG, THEN trip Reactor AND refer to AP/1/A/5500/01, REACTO TRIP.

AP/1/A/55		g Line Leakage
CAUTI	ACTION/EXPECTED RESPONSE	
1.	Announce occurrence on paging system.	
2.	Check Pzr Level - STABLE OR UNCREASING.	<pre>IF level decreasing with maximum charging flow, THEN: a. Manually trip Turbine AND Reac b. Open 1NI-9A AND 10B (NC Cold L Inj From NV). c. Swap charging pump suction to FWST: 1) Open 1NV-221A AND 222B (NV Pumps Suct From FWST) 2) Close 1NV-141A AND 142B (Vi Outlet Isol).</pre>
3.	 Check "EMF-41 Aux Bldg Hi Gas Rad" IN ALARM a. Verify 1ABF-D-3 VA Filter Exh Bypass Dmpr Trn A/B closed lights - LIT. b. Verify 2ABF-D-3 VA Filter Exh Bypass Dmpr Trn A/B closed lights - LIT. 	Go to step 4.
4.	Refer to RP/0/A/5700/01, NOTIFICATION OF UNUSUAL EVENT.	
5.	Attempt to identify and isolate leak.	

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	NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS	PAGE NO.
/1/A/5500/10	Case III	13 OF 17
	Letdown Or Charging Line Leakage	

L	ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED
_ 6.	Check if letdown should be isolated:
	 Leak on letdown line that can <u>NOT</u> a. Go to step 7. be isolated by any other means
	b. Isolate normal letdown:
	1) Close:
	 INV-1A (NC L/D Isol to Regen Hx)
	 INV-2A (NC L/D Isol to Regen Hx)
	 INV-241 (Seal Inj Flow Control).
	c. Adjust PD Pump speed Control <u>OR</u> Manually throttle 1NV-238 (Charging Line Flow Control) to maintain 8 GPM seal injection flow per NC Pump.
	d. Establish excess letdown per OP/1/A/6200/01, CHEMICAL AND VOLUME CONTROL.
	e. Power operation may continue as long as NC System activity and chemistry requirements are met.

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	NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS	PAGE	NO.	
AP/1/A/5500/10	Case III	14	OF 1	7
	Letdown Or Charging Line Leakage			

 means b. Isolate letdown: Close NC L/D Isol to Regen Hx valves: 1NV-1A 1NV-2A c. Isolate charging: Close Charging Line Cont Isol OTSD valves: 1NV-244A 1NV-245B. Adjust PD Pump speed control OR Manually throttle INV-238 (Charging Line Flow Control) to maintain 8 GPM seal injection flow per NC Pump d. Establish excess letdown per OP/1/A/6200/01, CHEMICAL AND VOLUME CONTROL. e. Power operation may continue as long as NC System activity 	L	TION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
 NOT be isolated by any other means b. Isolate letdown: Close NC L/D Isol to Regen Hx valves: 1NV-1A 1NV-2A c. Isolate charging: Close Charging Line Cont Isol OTSD valves: 1NV-244A 1NV-245B. Adjust PD Pump speed control OR Manually throttle 1NV-238 (Charging Line Flow Control) to maintain 8 GPM seal injection flow per NC Pump d. Establish excess letdown per OP/1/A/6200/01, CHEMICAL AND VOLUME CONTROL. e. Power operation may continue as long as NC System activity			
 Close NC L/D Isol to Regen Hx valves: INV-1A INV-2A Isolate charging: Close Charging Line Cont Isol OTSD valves: INV-244A INV-245B. Adjust PD Pump speed control OR Manually throttle INV-238 (Charging Line Flow Control) to maintain 8 GPM seal injection flow per NC Pump Establish excess letdown per OP/1/A/6200/01, CHEMICAL AND VOLUME CONTROL. Power operation may continue as long as NC System activity 	a.	NOT be isolated by any other	a. <u>IF</u> leak can be isolated, <u>THEN</u> operation may continu
 valves: 1NV-1A 1NV-2A c. Isolate charging: 1) Close Charging Line Cont Isol OTSD valves: 1NV-244A 1NV-245B. 2) Adjust PD Pump speed control OR Manually throttle 1NV-238 (Charging Line Flow Control) to maintain 8 GPM seal injection flow per NC Pump d. Establish excess letdown per OP/1/A/6200/01, CHEMICAL AND VOLUME CONTROL. e. Power operation may continue as long as NC System activity 	b.	Isolate letdown:	
 INV-2A c. Isolate charging: Close Charging Line Cont Isol OTSD valves: INV-244A INV-245B. Adjust PD Pump speed control OR Manually throttle INV-238 (Charging Line Flow Control) to maintain 8 GPM seal injection flow per NC Pump d. Establish excess letdown per OP/1/A/6200/01, CHEMICAL AND VOLUME CONTROL. e. Power operation may continue as long as NC System activity			
 c. Isolate charging: 1) Close Charging Line Cont Isol OTSD valves: INV-244A INV-245B. 2) Adjust PD Pump speed control OR Manually throttle INV-238 (Charging Line Flow Control) to maintain 8 GPM seal injection flow per NC Pump d. Establish excess letdown per OP/1/A/6200/01, CHEMICAL AND VOLUME CONTROL. e. Power operation may continue as long as NC System activity		• 1NV-1A	
 Close Charging Line Cont Isol OTSD valves: INV-244A INV-245B. Adjust PD Pump speed control OR Manually throttle INV-238 (Charging Line Flow Control) to maintain 8 GPM seal injection flow per NC Pump Establish excess letdown per OP/1/A/6200/01, CHEMICAL AND VOLUME CONTROL. Power operation may continue as long as NC System activity 		• 1NV-2A	
 Isol OTSD valves: 1NV-244A 1NV-245B. 2) Adjust PD Pump speed control OR Manually throttle 1NV-238 (Charging Line Flow Control) to maintain 8 GPM seal injection flow per NC Pump d. Establish excess letdown per OP/1/A/6200/01, CHEMICAL AND VOLUME CONTROL. e. Power operation may continue as long as NC System activity 	с.	Isolate charging:	
 INV-245B. Adjust PD Pump speed control OR Manually throttle INV-238 (Charging Line Flow Control) to maintain 8 GPM seal injection flow per NC Pump Establish excess letdown per OP/1/A/6200/01, CHEMICAL AND VOLUME CONTROL. Power operation may continue as long as NC System activity 			
 2) Adjust PD Pump speed control OR Manually throttle 1NV-238 (Charging Line Flow Control) to maintain 8 GPM seal injection flow per NC Pump d. Establish excess letdown per OP/1/A/6200/01, CHEMICAL AND VOLUME CONTROL. e. Power operation may continue as long as NC System activity 		• 1NV-244A	
<pre>control OR Manually throttle INV-238 (Charging Line Flow Control) to maintain 8 GPM seal injection flow per NC Pump d. Establish excess letdown per OP/1/A/6200/01, CHEMICAL AND VOLUME CONTROL. e. Power operation may continue as long as NC System activity</pre>		• 1NV-245B.	
 OP/1/A/6200/01, CHEMICAL AND VOLUME CONTROL. e. Power operation may continue as long as NC System activity 		control OR Manually throttle 1NV-238 (Charging Line Flow Control) to maintain 8 GPM seal	
as long as NC System activity	d.	OP/1/A/6200/01, CHEMICAL AND	
and chemistry requirements are met.	e.	as long as NC System activity and chemistry requirements are	
END		END	

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AP/1/A/55	500/10	NC SYSTEM LEAKAGE WITHIN CA Case IV Leakage Into K	15 OF 1
в.	ACTION	EXPECTED RESPONSE	RESPONSE NOT OBTAINED
•	"EMF-4	se in KC Surge Tank Level 6 Comp Cool Hi Rad" alarm mp Thermal Barrier Outlet Hi	Flow ¹¹ alarm
• C.	Increa	sed frequency of Auto Makeup	
1.	Check	Pzr Level - AT <u>OR</u> INCREASING GRAMMED LEVEL.	IF level decreasing, THEN perform the following to maintain level:
			 a. Ensure #1 PD Pump speed increas OR 1NV-238 (Charging Line Flow Control) opening.
			 b. Start additional NV Pumps c. Reduce letdown to 45 GPM orific
			IF level decreases below 5%, THEN manually initiate SI AND go to EP/1/A/5000/01, SAFETY INJECTION.
2.		Pzr Press - AT <u>OR</u> SING TO 2235 PSIG.	IF less than 2210 PSIG, <u>THEN</u> ensure backup heaters on. IF pressure approaches 1945 PSIG, <u>THEN</u> trip Reactor AND refer to AP/1/A/5500/01, REACTOR TRIP.
D.	Subseq	uent Actions	
1.	Announ	ce occurrence on paging	

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AP/1/A/5500	D/10 NC SYSTEM LEAKAGE WITHIN CAPA Case IV Leakage Into KC	16 OF :
	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	Check Pzr Level - STABLE OR INCREASING.	IF level decreasing with maximum charging flow, THEN:
		a. Manually trip Turbine AND React
		b. Open 1NI-9A AND 10B (NC Cold Le Inj From NV).
		c. Swap charging pump suction to FWST:
		1) Open 1NV-221A AND 222B (NV Pumps Suct From FWST)
		 Close INV-141A AND 142B (VO Outlet Isol).
3. C	Check "EMF-46 KC Hx Outlet" - IN	Go to step 4.
а	Locally verify 1KC-122 (KC Surge Tank Vent) - CLOSED.	
K	heck if any high "NC Pmp Therm Bar C Outlet Flow" computer alarm is n:	Go to step 5.
а	Verify NC Pump Therm Bar Otlt valve closes on affected pump:	
	• A, 1KC-394A	
	• B, 1KC-364B	
	• C, 1KC-345A	
	• D, 1KC-413B.	
b	. Verify NC Pump L/B Temp remains less than 225°F.	 D. IF greater than 225°F, THEN tri NC Pump.
	efer to RP/0/A/5700/01, OTIFICATION OF UNUSUAL EVENT.	

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 AP/1/A/5500/10
 NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS Case IV Leakage Into KC System
 PAGE NO.

1	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6.	IF leak in Letdown Hx, THEN:	nan dan dan dan anan mang. Mana kura dan kari sa daga gan yang kari kari kara dan pertambah kari
	a. Close:	
	 INV-457A, 458A, 459A, (L/D Orif Otlt Cont Isol) 	
	 INV-241 (Seal Inj Flow Control). 	
	 Adjust PD Pump speed control OR Manually throttle 1NV-238 (charging Line Flow Control) to maintain 8 GPM seal injection flow per NC Pump 	
	c. Establish excess letdown per OP/1/A/6200/01, CHEMICAL AND VOLUME CONTROL	
	 Power operation may continue as long as NC System activity and chemistry requirements are met. 	

END

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AP/1/A/5500/10	NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV POMPS Case II - Enclosure 1 Possible NC System Leakage Paths To PRT	PAGE NO. 1 OF 2
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LVE NUMBE	R NOMENCLATURE	INITI
	POSSIBLE NC SYSTEM LEAKAGE PATHS TO PRT	
	OUTSIDE CONTAINMENT	
	OUTSIDE CONTAINMENT	
1ND-56	ND HX 1A OUTLET TO NI SYSTEM COLD LEG INJECTION SAFETY RELIEF	
1ND-61	ND HX OUTLET TO NI SYSTEM HOT LEG INJECTION SAFETY RELIEF	
1ND-64	ND HX 18 OUTLET TO NI SYSTEM COLD LEG INJECTION SAFETY RELIEF	
1NS-2	NS PUMP 1B SUCTION SAFETY RELIEF	
1NS-19	NS PUMP 1A SUCTION SAFETY RELIEF	
1NI-102	SAFETY INJECTION PUMPS SUCTION HDR SAFETY RELIEF	
1NI-119	SAFETY INJECTION PUMP 1A DISCHARGE SAFETY RELIEF	
1NI-151	SAFETY INJECTION PUMP 1B DISCHARGE SAFETY RELIEF	
1NI-161	SAFETY INJECTION PUMPS COLD LEG INJECTION HDR SAFETY RELIEF	
1NV-229	CENTRIFUGAL CHARGING PUMPS SUCTION HDR SAFETY RELIEF	
	INSIDE CONTAINMENT	
1NC-1	PZR RELIEF VALVE	
INC-2	PZR RELIEF VALVE	
1NC-3	PZR RELIEF VALVE	
1NC-32B	PZR PORV	
1NC-34A	PZR PORV	
1NC-368	PZR PORV	
1NC-43	PRESSURIZER #1 VENT	
1NC-119	PRESSURIZER #1 SEAL LOOP DRAIN HEADER	

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AP/1/A/5500/10	NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS Case II - Enclosure 1 Possible NC System Leakage Paths To PRT	PAGE NO. 2 OF 2
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LVE NUMBE	R NOMENCLATURE	INITIA
1NC-272A,	C TRN 1A HEAD VENT TO PRT ISOL	
1NC-274B	TRN 1B HEAD VENT TO PRT ISOL	
IND-3	NC LOOP 3 DISCHARGE TO ND SYSTEM SAFETY RELIEF	
INV-6	LETDOWN LINE SAFETY RELIEF	
1NV-93	NC PUMPS SEAL RETURN HDR SAFETY RELIEF	
anno pai minimum di territatuan s		
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AP/1/A/5500/10	NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS Case II - Enclosure 2 Possible NC System Leakage Paths To NCDT	PAGE NO. 1 OF 1

LVE NUMBE	R NOMENCLATURE	VALVE	LOCATION	POSITION	INITIA
Possible	NC System Leakage Paths T	O NCDT			
1NV-27B	Excess L/D Hx Otlt	RB Pipe	chase 105°	VCT	
	3-Way Cntrl	*****			
1NI-224	Accumulator 1A Drain	RB 725'	40°	Closed	
	Isol				
1NI-226	Accumulator 18 Drain	RB 725'	140°	Closed	
and the feature of the flat of the second second	Isol				
INI-228	Accumulator 1C Drain	RB 725'	220°	Closed	
	Isol				
1NI-230	Accumulator 10 Drain	RB 725'	317°	Closed	
	Isol				
1NB-352	Reactor Makeup Water		naga bilan ng pagangan kan dan ya dan gina na saan wan na maan w	nanan waxa mula ki ƙwalan mangka awatan ata	Balance for the second second second second
	Storage Tank #1 Outlet	anny ny taona balanta et taloutaine varaet			
	Relief To NCDT				
NC Pump	1A #3 Seal	an an a the former and an and a set of a set of		na na se analyza na veze analyza e na kana kana kana kana kana kana kan	and definition of the second
NC Pump	1A Standpipe	1903 1975 1975 1975 1975 1975 1975 1975 1975			
NC Pump	1B #3 Seal	Logalitation and a first large a synaptic data and state			
NC Pump	18 Standpipe	and many many commission in succession in a person of the			
NC Pump	1C #3 Seal				
NC Pump	1C Standpipe	E. BE MATHER ROOM & MILLION & MILLION			
NC Pump	1D #3 Seal	LATE A DE LADARDE VA RESUMERIA (MARINE)			
NC Pump	1D Standpipe	al a main more environ a subscription			
	Valve Steam Leakoff from	m			en velatio directori de la constante
-	RB valves	and the second			
	Rx Vessel Head O Ring S	eal			

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AP/1/A/5500/10	Case	WITHIN CAPACITY OF BOTH NV PUMPS II - Enclosure 3 Leakage Paths to Containment Sumps	PAGE NO. 1 OF 1
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	۷	ALVE CHECKLIST		
VALVE NUMBER	NOMENCLATURE	VALVE LOCATION	POSITION	INITIAL
1NM-67	PZR Sample Hdr Cont Pent Relief	755', 120°	9999 - 9999 - 9999 - 9999 - 9999 - 9999 - 9999 - 9999 - 9999	
1NM-68	NC Hot Leg Sample Header Cont Pent Relief			
1NM-69	NI Accumulators Sample Hdr Cont Pent Relief	730', 115°	na an ann an an an an an ann an ann ann	
1NV-102	Excess Letdown Hx #1 Tube Drain	Pipechase 115° 6' up	Closed	
1NV-108	Regenerative Hx #1 Overflow	Pipechase 105° 5' up	Closed	
1NV-110	Regenerative Hx #1	Pipechase 105° 5' up	Closed	
1NI-336	UHI Check Valve Test Line Safety Relief	RB 750' 236°		
	******		en en en formen en de Aussie gezenen finne das en anderen en este finne de antikeren kan de referen de finderen	
a transformation and a second se				

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AP/1/A/5500/10 Case II	THIN CAPACITY OF BOTH NV PUMPS - Enclosure 4 akage Paths in Auxiliary Building

ALVE NUMBER	NOMENCLATURE	VALVE LOCATION	POSITION	INITIA
NOTE This	Enclosure is to be used a	s a guide. Consideration	should be given	to
any	recent change in NV System	alignment.		
Check Seal	Leakoff on following valv	es:		
	ND & NS ROOMS SUMP			
1NV-95B	NC Pumps Seal Ret C/I OTSD	744' Midget Hole		19-00007050-9 CONSTANTING
1NV-127A	L/D Hx Outlet 3-Way Temp Cntrl	NC FILTER ROOM		
1NV-137A	NC Filters OTLT 3 Way Cntrl	Outside VCT Rm. So. Wall		
1NV-141A	VCT Outlet Isolation	OTSD S Wall of VCT under grating		
1NV-142B	VCT Outlet Isol	OTSD SE Wall of VCT under grating		
1NV-803	PD Pump Outlet Isol	722' S. of PD Pump		
1NV-219	PD Pump Disch Isol			
1NV-240	Regen Hx Tube Inlet Cntrl Isol	722 HH-59 & JJ-60		
1NV-241	Seal Inj Flow Control	Above BW Pumps		
1NV-242	Regen Hx Tube Side Inlt Cntrl Isol	Above BW Pumps		
1NV-243	Regen Hx Tube Side Inlt Cntrl Bypass	Above BW Pumps		

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NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS
Case II - Enclosure 4
Possible NV System Leakage Paths in Auxiliary Building
PAGE NO.
2 OF 6

LVE NUMBER	NOMENCLATURE	VALVE LOCATION	POSITION	INITIA
1NV-244A	Charging Line Cont Isol OTSD	Above BW Pumps		
1NV-2458	Charging Line Cont Isol OTSD	West of BW Pumps		
1NV-431	Seal Water Inj Filters Bypass	A Seal Inj Rm		
1NV-230	Cent Charging Pump B Suct	Off floor	726' SE of 1	B CCP 12
1NV-224	Cent Charging Pump A Suct.	726' HH-57 & JJ-58 W of 18 CCP 12' Off Floor		
1NV-804	Cent Charging Pump B Outlet Isol	Right of 18 CCP		
1NV-232		724' NW of 18 CCP		
1NV-226	Cent Charging Pump A Disch	726' NE of 18 CCP		
1NV-802		NE 5' Above 1A CCP		
1NV-235	Cent Charging Pump B To Seal Ini Filter	NW of 18 CCP		
1NV-236	Cent Charging Pump A To Seal Ini Filter	NE of 1A CCP		
1NV-237	Cent Charging Pumps Disch To Control Isol	N of PD Pump		
1NV-238	Charging Line Flow Control	N of PD Pump		
1NV-239	Cent Charging Pumps Disch			

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AP/1/A/5500/10	NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS Case II - Enclosure 4	PAGE NO. 3 OF 6
	Possible NV System Leakage Paths in Auxiliary Building	

	Control Isol			****
1NV-347	NR System Flow Control	Seal Inj Filter Room		
1NV-121	ND Letdown Control			and an a second decision of the second s
1NV-221A	NV Pumps Suct From FWST	20' N of BW Pump		
1NV-222B	NV Pumps Suct From FWST	augu neuropanaaanse alkan na kana maga angang kananang kanang ang pananang kanang kananang kanang kanang kanang		
	RECYCLE HOLDUP TANK			
1NV-7B	Letdown Cont Isol Outside			
1NV-8	L/D Reheat Hx Tubeside	SE of L/D Hx		indexent av et of society et inde
	Back pressure Cntrl Isol			
1NV-9	L/D Reheat Hx Tubeside	W of L/D Hx		
	Back pressure Cntrl Isol			
1NV-10	L/D Reheat Hx Tubeside	W of L/D Hx		
	Back Pressure Cntrl Isol			
1NV-11	L/D Reheat Hx Tubeside	SW of L/D Hx		
	Back Pressure Cntrl Isol			
1NV-476	LP Letdown Control Inlet	S of L/D Hx	ang tang mini sa kang s	
	Isol			
1NV-124	Letdown Press Control	L/D Hx Rm		NAMES AND A DESCRIPTION OF A DESCRIPTION
1NV-477	LP Letdown Control	L/D Hx Rm		
eć mat anen ti antiji. Manakari in an antiji	Outlet Isol			North Control of State State
Check vent	t and drain boundary valves	closed:		
	WASTE DRAIN TANK			

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AP/1/A/5500/10	NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS Case II - Enclosure 4	PAGE NO. 4 OF 6
	Possible NV System Leakage Paths in Auxiliary Building	

LVE NUMBE	R NOMENCLATURE	VALVE LOCATION	POSITION	INITIA
1NV-184	Letdown Hx Tube Drain To WDT	L/D Hx Rm	CLOSED	
1NV-205	Seal Water Filter Drain	Seal Ret Filter Rm	CLOSED	······
1NV-272	To WDT PD Pump Drain To WDT	Otsd PD Pump Rm	CLOSED	
1NV-310	Seal Water Inj Filters Drain To WDT		CLOSED	
1NV-299	Charging Pump B Drain To WDT	E of 18 CCP	CLOSED	aran ya kutoka ana a
1NV-330	NC Filter Drain To WDT	E of B NC Filters	CLOSED	
1NV-356	Mixed And Cation Bed Demin Outlet Line Drain To WDT		CLOSED	
	WASTE EVAPORATOR FEED TAN	<u>K</u>		
1NV-181	Letdown Hx Tube Overflow	L/D Hx Rm	CLOSED	
1NV-185	Letdown Hx Tube Drain To WEFT	LD Hx Rm	CLOSED	
1NV-145	VCT Outlet Drain	Below VCT	CLOSED	
1NV-210	Seal Water Hx Tube Overflow		CLOSED	
1NV-204	Seal Water Filter Drain To WEFT		CLOSED	
1NV-215	Seal Water Hx Tube Drain TO WEFT	Seal Water Hx Rm	CLOSED	
1NV-309	Seal Water Inj Filters	B Seal Ini Filter Rm	CLOSED	

Form 34912 (8-82) Page 29 of 34 PAGE NO. NC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS AP/1/A/5500/10 Case II - Enclosure 4 5 OF 6 Possible NV System Leakage Paths in Auxiliary Building VALVE NUMBER NOMENCLATURE VALVE LOCATION POSITION INITIAL Drain To WEFT 1NV-329 NC Filters Drain To WEFT B NC Filter Rm CLOSED 1NV-335 Mixed Bed Demin A Backflush Drain 1NV-333 Mixed Bed Demin A Backflush CLOSED Outlet Isol 1NV-340 Mixed Bed Demin B B Mixed Bed Rm CLOSED Backflush Outlet Isol 1NV-373 Mixed Bed Demin B B Mixed Bed Rm CLOSED Outlet Line Drain 1NV-365 Cation Bed Demin 733 Pipechase between NR & CLOSED NV DIM Sluicing Resin Isol 1NV-354 Mixed Bed Demin A Outlet A Mixed Bed Rm CLOSED Line Drain 1NV-366 Cation Bed Demin Outlet Cation Bed Rm CLOSED Line Drain A Mixed Bed Rm CLOSED 1NV-357 Mixed & Cation Bed Demins Outlet Line Drain To WEFT WASTE EVAPORATOR FEED TANK SUMP A CLOSED 1NV-296 Charging Pump B Overflow CLOSED 1NV-300 Charging Pump B Drain To WEFT Sump A Charging Pump A Overflow CLOSED 1NV-285 1NV-289 Charging Pump A Drain To CLOSED WEFT Sump A

Attachment /

m 34912 (8-82)				Attachmment 7 Page 30 of 34		
AP/1/A/550	0/10	NC SYSTEM LEAKAGE W Case II Possible NV System L	- Enclo	sure 4	PUMPS	AGE NO. 6 OF 6
100/h33/00/100/100/100/100/100/100/100/100/10	1 50104581.210 a v 40040					Andreas and a second
VALVE NUMBER		NOMENCLATURE	VALVE	LOCATION	POSITION	INITIA
40000001000000000000000000000000000000	SPENT	RESIN TANK			1997 - Maria Artificia e Secondo - 2004 1997 - Maria Artificia e Secondo - 2004	
1NV-349	Mixed Resin	Bed Demin A Sluicing			CLOSED	nini ka anan kana kana kana kana ka
1NV-350	Mixed	Bed Demin A Sluicing Isol			CLOSED	
			F / 1884-1997-1997-1997-1997-1997-1997-1997-199			
					Same friday to react any other way	

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n an		UT 54
AP/1/A/5500/10	CASE II - Enclosure 5	PAGE NO. 1 OF 2
	Possible ND System Leakage Paths in Auxiliary Building	

LVE NUMBE	R NOMENCLATURE	VALVE LOCATION	POSITION	INITIA
	ND & NS ROOMS SUMP Check	seal leakoff on following	valves	
IND-48	B ND Pmp Suct From FWST Or NC	Aux 695' FF-59 & GG-60		
1ND-19A	A ND Pmp Suct From FWST	Aux 695' GG-59 & HH-60		
1ND-9 ~		N of Pump 12' up		
1ND-24	ND Pump A Disch	W of Pump 12' up		
1ND-26	ND Hx A Inlet	E of Hx 6' up		
1ND-14	B ND Hx Outlet	Aux 733' LL-61		
1ND-29	A ND Hx Outlet	Aux 733' LL-60 & MM-61		
1ND-30A	Train 1A ND To Hot Leg Isol	Aux 733' LL-60 & MM-61		
1ND-58A	Train 1A ND To NV & NI Pumps	Aux 733' LL-60 & JJ-61		
1ND-15B	Train 1B ND To Hot Leg Isol	Aux 733' KK-60 & LL-61	n an Maria any ing	
1ND-35	ND TO FWST Isol	15' E of KK-59, 12' up		and sound construction of the Solid Product
1ND-34	A & B ND Hx Bypass	Aux 733 KK-60 & LL-61		
1ND-33	A ND Hx Bypass	Aux 733 LL-60 & MM-61		
1ND-18	B ND Hx Bypass	Aux 733 KK-60 & LL-61	granes and state of the second sector and a second sector. Consider	
1ND-11	ND Hx B Inlet	W of Hx 4' up		
1NI-173A	Train 1A ND To A & B CL	Aux 733' FF-59 & GG-60		
1NI-178B	Train 18 ND To C&D CL	Aux 733' HH-60 & JJ-61		
1NI-1848	RB Sump To Train 1B ND	Aux 716' EE-58 & FF-59		
Notes a first of the second states of the second	& NS			

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INC SYSTEM LEAKAGE WITHIN CAPACITY OF BOTH NV PUMPS PAGE		
AP/1/A/5500/10 CASE II - Enclosure 5 2 (Possible ND System Leakage Paths in Auxiliary Building	NO. OF 2	2

					PACT TO A	
LVE NUMBE	R	NOM	ENCLATURE	VALVE LOCATION	POSITION	INITIA
1NI-185A	RB S	ump T	o Train 1A ND	Aux 716' FF-59 & GG-60		
	& N	S	an ar an an ann an an ann an an an an an an a		antennet, des all sector and the sector	tanan and the second state of
	WAST	E EVA	PORATOR FEED TA	NK Check Drain Boundary N	Valves Closed	
1ND-52	ND H	XAD	rain Hdr	S of Hx	Closed	anera y andrés (grandine) e da soga
1ND-46	ND H	x B D	rain Hdr	S of Hx	Closed	
ND & NS R	OOMS S	UMP				annen an
1ND-51	ND P	ump A	Drain Hdr	SW of Pump	Closed	
1ND-45	ND P	ump B	Drain Hdr	S of Pump	Closed	
1ND-69	ND &	NS S	ystem Drain	RB 860' Rx Dome	Closed	

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		na a taine ann an Arabh	an man a din secong a terreti den da gen de terreti den de second			
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		PROC	Duke Power Co EDURE PROCE	ESS RECORD	(1) ID No. <u>UP/</u> Change(s) 67	1/A/6100/02 0 to Incorporated
(2) Station		cGuire Nuclear	Station	SUPERCEDE	.0	
(3) Procedu	ure Title	Cor	ntrolling Proce	dure for Unit	Shutdown	******
(4) Preparer	d ByV	erida Bellamy			Date	1/20/89
(5) Reviewe	ed By	Afel	~~		Date	1/20/89
Cross-D	isciplinary Revie	ew By	·		N/R	
(6) Tempora	ary Approval (if)	necessary)				
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Ву		2			Date	
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(9) Comme	cluded. Atta	ure reissue indicate v ich additional pages, changes included.	if necessary.)	anges, other than pr	eviously approved	d changes, are in-
(10) Company	ed with Control	Сору			Date	
	s change to FSA attach detailed	AR not identified in 10 explanation.	0CFR50.59 evaluatio	PHNO		
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(13) Procedu	re Completion	/erification				
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🗆 Yes	N/A Listed e	nciosures attached?				
🗆 Yes	DN/A Data sh	eets attached, comp	weted, dated and sign	ved?		
🗆 Yes	DN/A Charts,	graphs, etc. attached	and properly dated.	identified and marke	ed?	
🗆 Yes	N/A Procedu	ure requirements met	?			
Verified I	Ву				Date	
(14) Procedu	re Completion	Approved			Date	

(15) Remarks (attach additional pages, if necessary)

 Attachment 7

 .NCLOSURE 4.2
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- 2.15.1.1 Ensure the "Operation Selector" for all 6 detectors is in the "Off" position.
- 2.15.1.2 Open and tag the 120 VAC main power breaker on the panel.
- 2.16 Determine required boron concentration to establish greater than or equal to 1.3% Delta k/k shutdown margin at desired temperature per Table 6.5 of OP/1/A/6100/22 (Unit 1 Data Book). If cooldown below 200°F is anticipated, ensure greater than or equal to 1% Delta k/k shutdown margin at 68°F prior to reduction below 200°F.
- <u>CAUTION</u> The following step must be completed and NC System boron concentration verified prior to initiating NC System cooldown.
- 2.17 Borate the NC System per OP/1/A/6150/09 (Boron Concentration Control) or OP/1/A/6200/02 (BTRS) to establish the appropriate shutdown margin.
- 2.18 Have IAE do the following:
 - 2.18.1 When the neutron level decays to the normal shutdown counts, verify "High Flux At Shutdown" alarm bistable is set at one-half decade above normal shutdown source counts, and reinstate "High Flux At Shutdown" alarm.
- 2.19 After the "High Flux At Shutdown" alarm has been reinstated, insert the Shutdown Banks per OP/1/A/6150/08 (Rod Control).
- 2.20 Remove both MG sets from service per OP/1/A/6150/08 (Rod Control).
- 2.21 As soon as access to lower containment is possible, close INC-24 (Reactor Vessel Head Gasket Leakoff Drain Manual Block) to prevent NCDT H₂ from escaping to containment during cooldown.