FENOC

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May 16, 2008

L-08-161

10 CFR 50.90

ATTN: Document Control Desk
United States Nuclear Regulatory Commission
Washington, D. C. 20555-0001

SUBJECT:
Davis-Besse Nuclear Power Station, Unit 1
Docket No. 50-346, License No. NPF-3
Copy of Applicable Portions of the U.S. Nuclear Regulatory Commission and Davis-Besse Nuclear Power Station Improved Technical Specifications Conversion Website – Sections 3.0, 3.1, 3.2, 3.4, and 3.6 and Chapter 4.0, TAC No. MD6398

By letter dated August 3, 2007, as supplemented by letter dated May 16, 2008, FirstEnergy Nuclear Operating Company (FENOC) submitted an application and supplement to amend the Technical Specifications of Davis-Besse Nuclear Power Station, Unit 1 (DBNPS), revising the current Technical Specifications (CTS) to the Improved Technical Specifications (ITS) consistent with the Improved Standard Technical Specifications (ISTS) as described in NUREG-1430, "Standard Technical Specifications Babcock and Wilcox Plants," Revision 3.1, and certain generic changes to the NUREG.

The purpose of this letter is to provide a copy of applicable portions of the U.S. Nuclear Regulatory Commission (NRC) and DBNPS ITS Conversion Website (Enclosure) suitable for posting on the DBNPS docket, Docket No. 50-346. This information was provided by FENOC on the NRC and DBNPS ITS Conversion Website. This information was used by FENOC in development of the Davis-Besse ITS supplemental submittal letter dated May 16, 2008, and documents the NRC review process for approving the requested amendments to the DBNPS Facility Operating License. The Attachment is arranged by section, and each section is arranged chronologically by the dates of the original NRC questions, and includes the applicable NRC questions, FENOC response, and any attached electronic documentation, with the exception of the draft ITS submittal markup pages. These pages are not included since the changes have subsequently been provided in the Davis-Besse ITS supplemental submittal letter dated May 16, 2008 . This letter provides the questions for only those Volumes included in the May 16, 2008 letter:

A001
NRR

Volume 5, Section 3.0 – LCO [Limiting Condition for Operation] and SR [Surveillance Requirement] Applicability, Revision 1;
Volume 6, Section 3.1 – Reactivity Control Systems, Revision 1;
Volume 7, Section 3.2 – Power Distribution Limits, Revision 1;
Volume 9, Section 3.4 – Reactor Coolant System (RCS), Revision 1;
Volume 11, Section 3.6 – Containment Systems, Revision 1; and
Volume 15, Chapter 4.0 – Design Features, Revision 1.

The applicable portions of the NRC and DBNPS ITS Conversion Website for the remaining Volumes will be provided in a future submittal.

As part of the NRC review of the Davis-Besse ITS submittal dated August 3, 2007, NRC questions were provided using the NRC and DBNPS ITS Conversion Website. The NRC and DBNPS ITS Conversion Website was developed specifically to expedite NRC review and minimize the time delay between review and posting of NRC questions, development and posting of FENOC responses, and acceptance and closure of each identified NRC question by the responsible NRC reviewer. As agreed to between the NRC and FENOC, entry of NRC questions and FENOC responses to the NRC and DBNPS ITS Conversion Website was protected so that only the NRC reviewers and FENOC staff can enter information into the associated database fields for each item. In addition, only the NRC reviewers and FENOC staff can attach additional electronic documentation associated with an NRC question or FENOC response. However, the public could fully access all information on the NRC and DBNPS ITS Conversion Website at any time during the NRC review process up until issuance of the NRC Safety Evaluation, including NRC questions, FENOC response, and any attached electronic documentation.

This letter makes no new commitments or changes to any existing commitments.

If there are any questions or if additional information is required, please contact Mr. Thomas A. Lentz, Manager – Fleet Licensing, at (330) 761-6071.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on May 16th, 2008

Sincerely,

Barry S. Allen

Barry S. Allen, Vice President-Nuclear

Attachment: Applicable Portions of the U.S. Nuclear Regulatory Commission (NRC) and Davis-Besse Nuclear Power Station (DBNPS) Improved Technical Specification (ITS) Conversion Website.

cc: (all w/o Attachment)
NRC Region III Administrator
NRR Project Manager
NRC Resident Inspector
Executive Director, Ohio Emergency Management Agency,
State of Ohio (NRC Liaison)
Utility Radiological Safety Board

Section 3.0 RAIs

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NRC ITS TRACKING

NRC Reviewer

ID	**200712101458** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.0 Carl Schulten** ITS Number: **None** TB POC: OSI: **None** JFD Number: **None** DOC Number: **L.1** Page Number(s): Bases JFD Number: **None**
Comment	**Section 3.0** **Volume 5, Page 5 and 9 of 62 DOC L01** **DOC L01 is used to justify changes to CTS that result from the addition of 3 new paragraphs to LCO 3.0.4. DOC L01 consists of two paragraphs that begin on page 23 of 62 and end on page 26 of 62. Revise DOC L01 to clarify how the addition of the new paragraphs will change the operation of the plant as compared to current TS requirements.**
Issue Date	**12/10/2007**
Close Date	**04/01/2008**

Responses

Licensee Response by Jerry Jones on 01/04/2008	The last sentence of the first paragraph states that the CTS is changed by allowing entry into a MODE or other specified condition of the Applicability when an LCO is not met. The remainder of the first paragraph states what the CTS currently requires and what the ITS will allow. Furthermore, this description is consistent with the requirements of the CLIIP that incorporated TSTF-359 into the ISTS. Therefore, Davis-Besse believes that the description in the first paragraph, followed by the complete description of what the new LCO 3.0.4 requires, fully describes how operation of the plant is affected.
NRC Response by Carl Schulten on 01/30/2008	DOC L.01 contains two paragraphs. I understand the first paragraph. The second paragraph is over 2 pages long. If all the TSTF-359 model application requirements are contained in DOC L.01 as stated in your response, then I will attempt to analyze DOC L.01 for the information needed by the NRC staff for review of the TSTF-359 risk informed TS changes. Without the TSTF-359 model license application submittal information, the TS changes permitted by TSTF-359 may not be approved in part or in their entirety.

Licensee Response by Bryan Kays on 03/20/2008	See the Davis-Besse second response for question 200712101459.

Date Created: 12/10/2007 02:58 PM by Carl Schulten
Last Modified: 04/01/2008 09:33 AM

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NRC ITS TRACKING

NRC Reviewer

ID	**200712101459** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.0 Carl Schulten**; TB POC: ; JFD Number: **None**; Page Number(s): **7**; ITS Number: **None**; OSI: **None**; DOC Number: **L.1**; Bases JFD Number: **None**
Comment	**Section 3.0** **Volume 5, Page 7 of 62 DOC L01, INSERT 4** **LCO 3.0.4 and SR 3.0.4 are revised per TSTF-359 by L01. Adopting the TSTF changes requires submittal of the content of the CLIIP TSTF Model Application and Model Safety Evaluation in accordance with Federal Register Notice (67FR 50475, August 2, 2002) (ADAMS ML030900056) before these changes to CTS can be processed. To efficiently process the incoming license amendment applications, the staff requests each licensee applying for the changes addressed by TSTF-359, Revision 8, as modified, using the CLIIP to include bases for the proposed technical specification consistent with the bases proposed in the TSTF-359, Revision 8, as modified by staff responses to public comments 8 and 20 in the stated FRN. Identify and submit documentation for all differences between the content of DOC L01 and the content of a license application submittal required by the TSTF-359 CLIIP.**
Issue Date	**12/10/2007**
Close Date	**04/01/2008**

Responses

Licensee Response by Jerry Jones on 01/04/2008	The CLIIP application is based on a plant that has already adopted the ISTS. Thus, the model application is providing justification from changing LCO 3.0.4 and SR 3.0.4 from the pre-TSTF-359 version of the ISTS to the TSTF-359 version. Davis-Besse has to justify changes from our current Technical Specifications to the ISTS version, including the allowances of TSTF-359. Davis-Besse followed the guidance of the CLIIP, and believes that the proposed Discussion of Change L01 (Volume 5, Pages 23 through 26 of 62) includes all the requirements specified by the CLIIP. Furthermore, the Davis-Besse DOC L01 was consistent a previous plant conversion that also adopted TSTF-359 as part of the conversion (Monticello ITS conversion).

	In addition, the version of the ISTS used as the template for the Davis-Besse is revision 3.1, which includes the changes required by the referenced Federal Register Notice.
NRC Response by Carl Schulten on 01/30/2008	DOC L.01 contains two paragraphs. I understand the first paragraph. The second paragraph is over 2 pages long. If all the TSTF-359 model application requirements are contained in DOC L.01 as stated in your response, then I will attempt to analyze DOC L.01 for the information needed by the NRC staff for review of the TSTF-359 risk informed TS changes. Without the TSTF-359 model license application submittal information, the TS changes permitted by TSTF-359 may not be approved in part or in their entirety.
Licensee Response by Bryan Kays on 03/20/2008	Based on further discussion with the NRC reviewer, Davis-Besse has modified Discussion of Change L01 (Volume 5, Pages 23 through 26) to include the information required from the CLIIP for this change. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.

Date Created: 12/10/2007 02:59 PM by Carl Schulten
Last Modified: 04/01/2008 09:34 AM

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NRC ITS TRACKING

NRC Reviewer

ID	**200712101502** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.0 Carl Schulten** TB POC: JFD Number: **None** Page Number(s): **8** ITS Number: **None** OSI: **None** DOC Number: **M.2** Bases JFD Number: **None**
Comment	**Section 3.0** **Volume 5, Page 8 of 62 DOC M02** **LCO 3.0.8 is added to CTS per TSTF-372, Revision 4 by M02. Adopting the TSTF changes requires submittal of the content of the CLIIP TSTF Model Application and Model Safety Evaluation in accordance with Federal Register Notice (69 FR 68412, November 24, 2004) (ADAMS ML051160013) before these changes to CTS can be processed. To efficiently process the incoming license amendment applications, the staff requests each licensee applying for the changes addressed by TSTF-3372, Revision 4, as modified, using the CLIIP to include bases for the proposed technical specification consistent with the bases proposed in the TSTF-372, Revision 4 as stated FRN. Identify and submit documentation for all differences between the content of DOC M02 and the content of a license application submittal required by the TSTF-372 CLIIP.**
Issue Date	**12/10/2007**
Close Date	**04/09/2008**

Responses

Licensee Response by Jerry Jones on 01/04/2008	The CLIIP application is based on a plant that has already adopted the ISTS. Prior to TSTF-372, the ISTS did not include any snubber requirements - they were to be relocated to a plant-controlled document. Thus, for an ITS plant to adopt TSTF-372, they would have to justify the allowances provided in ITS LCO 3.0.8. Furthermore, the CLIIP discussed this issue specifically, in that it stated that prior to ITS development, old CTS already had most of the allowances provided by ITS LCO 3.0.8, and that the TSTF was just adding them back into the ITS since they appeared to be lost when a plant adopted the ITS and relocated the old CTS requirements to plant controlled documents. Davis-Besse has not relocated the current snubber

	Techncial Specification, CTS 3.7.7, to a plant controlled document. Thus, in order to adopt the ITS LCO 3.0.8, Davis-Besse only has to justify the differences from the CTS requirements to the ITS requirements. The allowances provided in ITS LCO 3.0.8 are all more restrictive that what is allowed in CTS 3.7.7. Since the allowances provided in LCO 3.0.8 are all more restrictive than what is allowed by the Actions of CTS 3.7.7, Davis-Besse does not believe that a plant specific evaluation to justify the current 72 hour time (as is required by the CLIIP) is required. This manner of adopting LCO 3.0.8 is also consistent with a previously approved ITS conversion, Monticello, which adopted TSTF-372 as part of the conversion. Furthermore, the NRC asked a similar question, and did not require any changes to the more restrictive Discussion of Change submitted as part of the Monticello conversion. The question is still viewable on the EXCEL website (question 200512151125).
NRC Response by Carl Schulten on 01/30/2008	LCO 3.0.8 is a risk-informed TS. The three tiered approach for assessing the acccetability of risk-informed TS changes are dicussed in RG 1.177. The submittal information contained in the model application for TSTF-372 which follows the 3-tiered approach has not been provided to the NRR staff for review. There are conditions and speCific limitions to be met to adopt the allowances of TSTF-372. The shortest path to revising the Davis Besse licensing basis to incorporate LCO 3.0.8 risk-informed allowances is to submit the TSTF-372 CLIIP model application for staff review.
Licensee Response by Bryan Kays on 02/15/2008	As stated in the NRC Model Safety Evaluation for TSTF-372, Section 2.0, LCO 3.0.8 was added into the ISTS because of a difference of interpretation as to whether or not the 72 hour delay to enter the actions for the supported equipment in the old CTS Snubber Technical Specification could be applied after the Snubber Technical Specification had been relocated to a licensee-controlled document as part of a licensee's conversion to the ISTS. The Safety Evaluation states that the NRC's position is that after relocation, the 72 hour delay cannot be used if the inoperable snubber also results in inoperability of the supported system. Thus, plants that had already converted to ISTS and had relocated the Snubber Technical Specification to a licensee-controlled document needed an allowance to delay entry into the supported systems when a required snubber is inoperable. TSTF-372 and the NRC CLIIP provided the requirements for these plants to adopt a new delay time for when a required snubber is inoperable. However, this CLIIP requirement on how to justify a new 72 hour delay time is only for plants that have already adopted the ISTS and relocated the old CTS Snubber Technical Specification. Davis-Bess currently has a 72 hour delay time in CTS 3.7.7. We have not, as yet, relocated the Snubber Technical Specification to a licensee-controlled document. Therefore, Davis-Besse does not believe that we have to re-justify the currently allowed 72 hour delay time to adopt LCO 3.0.8. The times and requirements of LCO 3.0.8 are all equal to or more restrictive than the current actions provided in CTS 3.7.7 when a snubber is inoperable. Davis-Besse provided a More Restrictive DOC to justify the changes from the CTS to ITS LCO 3.0.8, with respect to the actions to take when a required snubber is inoperable. This More Restrictive DOC is consistent with a previously approved ITS conversion, specifically, Monticello Nuclear Generating Plant. The NRC approved the adoption of LCO 3.0.8 from their current Snubber LCO, which is similar to the Davis-Besse Snubber LCO. Furthermore, the NRC asked a similar question (i.e., requesting that Monticello do the requirements listed in the CLIIP); however, the question was resolved and closed without Monticello having to adopt the CLIIP requirements. The Monticello ITS submittal CTS markup and DOC, the Monticello NRC question, and the NRC SER pages

	applicable to this change are provided as an attachment. Based on the above, Davis-Besse believes that one of the two options provided below are available to resolve this issue: 1. Davis-Besse will adopt LCO 3.0.8 using the NRC precedent set for Monticello. The currently provided M DOC will be sufficient to justify the adoption of LCO 3.0.8 and the adoption will not be considered a beyond scope issue. Furthermore, Davis-Besse has reviewed the additional provisions discussed in the CLIIP's Model Safety Evaluation, Section 3.2, and will commit to ensuring appropriate plant procedures and administrative controls will be used to implement the applicable Tier 2 Restrictions. Specifically: a) at least one EFW train (including a minimum set of supporting equipment required for its successful operation) not associated with the inoperable snubber(s) must be available when LCO 3.0.8.a is used; b) at least one EFW train (including a minimum set of supporting equipment required for its successful operation) not associated with the inoperable snubber(s), or some alternative means of core cooling must be available when LCO 3.0.8.b is used; and c) every time the provisions of LCO 3.0.8 are used, Davis-Besse will confirm that at least one train of systems supported by the inoperable snubbers would remain capable of performing their required safety or support functions for postulated design loads other than seismic loads. In addition, a record of the design function of the inoperable snubber (i.e., seismic vs. non-seismic), implementation of any applicable Tier 2 restrictions, and the associated plant configuration shall be available on a recoverable basis for NRC staff inspection. These Tier 2 Restrictions are also more restrictive than what is currently required by the Davis-Besse CTS. 2. Davis-Besse will maintain Current Licensing Basis with respect to the Snubber Technical Specification 3.7.7. This will require Davis-Besse to generate a new TS that is not currently in the ISTS, and not adopt LCO 3.0.8. It should be noted that the current delay times and Action requirements are less restrictive than what is currently required by LCO 3.0.8.
Licensee Response by Bryan Kays on 04/01/2008	Based on further discussion with the NRC reviewer, Davis-Besse has modified Discussion of Change M02 (Volume 5, Pages 22 and 23) to include the information required from the CLIIP for this change. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment. Furthermore, Davis-Besse has reviewed the additional provisions discussed in the CLIIP's Model Safety Evaluation, Section 3.2, and will commit to ensuring appropriate plant procedures and administrative controls will be used to implement the applicable Tier 2 Restrictions. Specifically: a) at least one EFW train (including a minimum set of supporting equipment required for its successful operation) not associated with the inoperable snubber(s) must be available when LCO 3.0.8.a is used; b) at least one EFW train (including a minimum set of supporting equipment required for its successful operation) not associated with the inoperable snubber(s), or some alternative means of core cooling must be available when LCO 3.0.8.b is used; and c) every time the provisions of LCO 3.0.8 are used, Davis-Besse will confirm that at least one train of systems supported by the inoperable snubbers would remain capable of performing their required safety or support functions for postulated design loads other than seismic loads. In addition, a record of the design function of the inoperable snubber (i.e., seismic vs. non-seismic), implementation of any applicable Tier 2 restrictions, and the associated plant configuration shall be available on a recoverable basis for NRC staff inspection. These Tier 2 Restrictions are also more restrictive than what is currently required by the Davis-Besse CTS.
NRC Response by Carl Schulten	Your stated option 1 will be accceptable, provided the response to this comment

on 04/01/2008	restates Option 1, in its entirety, as the Davis Besse ITS conversion commitment for incorporating LCO 3.0.8 and resolving ID 200712101502.
Licensee Response by Bryan Kays on 04/07/2008	Based on the NRC reviewer's posting on 4/1/2008, Option #1 from the Davis-Besse 2/15/2008 response is acceptable, provided it is restated in its entirety as the commitment for incorporating LCO 3.0.8. During a phone call with the NRC reviewer on 4/7/08, the NRC reviewer stated that the Tier 2 Restrictions should be stated in the Discussion of Change (DOC) as documentation of the commitment. The following response supersedes the Davis-Besse response and draft markup posted on 4/1/08: Davis-Besse will adopt LCO 3.0.8 using the NRC precedent set for Monticello. The currently provided DOC M02 (Volume 5, Pages 22 and 23) will be sufficient to justify the adoption of LCO 3.0.8 and the adoption will not be considered a beyond scope issue. Furthermore, Davis-Besse has reviewed the additional provisions discussed in the CLIIP's Model Safety Evaluation, Section 3.2, and will modify DOC M02 (Pages 22 and 23) to clearly state that the Tier 2 Restrictions will be complied with. DOC M02 will include a discussion that Davis-Besse will ensure appropriate plant procedures and administrative controls will be used to implement the applicable Tier 2 Restrictions. Specifically: a) at least one EFW train (including a minimum set of supporting equipment required for its successful operation) not associated with the inoperable snubber(s) must be available when LCO 3.0.8.a is used; b) at least one EFW train (including a minimum set of supporting equipment required for its successful operation) not associated with the inoperable snubber(s), or some alternative means of core cooling must be available when LCO 3.0.8.b is used; and c) every time the provisions of LCO 3.0.8 are used, Davis-Besse will confirm that at least one train of systems supported by the inoperable snubbers would remain capable of performing their required safety or support functions for postulated design loads other than seismic loads. In addition, a record of the design function of the inoperable snubber (i.e., seismic vs. non-seismic), implementation of any applicable Tier 2 restrictions, and the associated plant configuration shall be available on a recoverable basis for NRC staff inspection. These Tier 2 Restrictions are also more restrictive than what is currently required by the Davis-Besse CTS. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Carl Schulten on 04/09/2008	The response submitted 04/01/2008 stated Davis-Besse will commit to ensuring appropriate plant procedures and administrative controls will be used to implement the applicable Tier 2 Restrictions. The specific commitments given in the 04/01/2008 response to 200712101502 need to be added to DOC M.2 (Section 3.0) to complete the record of the commitment in the Davis-Besse ITS license amendment application and finalize the response to 200712101502. The text that should be added to DOC M.2, which is in the 04/01/2008 response, is as follows: "Davis-Besse has reviewed the additional provisions discussed in the CLIIPS Model Safety Evaluation, Section 3.2, and will commit to ensuring appropriate plant procedures and administrative controls will be used to implement the applicable Tier 2 Restrictions. Specifically: a) at least one EFW train (including a minimum set of supporting equipment required for its successful operation) not associated with the inoperable snubber(s) must be available when LCO 3.0.8.a is used; b) at least one EFW train (including a minimum set of supporting equipment required for its successful operation) not associated with the inoperable snubber(s), or some alternative means of core cooling must be available when LCO 3.0.8.b is used; and c) every time the provisions of LCO 3.0.8 are used, Davis-Besse will confirm that at

	least one train of systems supported by the inoperable snubbers would remain capable of performing their required safety or support functions for postulated design loads other than seismic loads. In addition, a record of the design function of the inoperable snubber (i.e., seismic vs. non-seismic), implementation of any applicable Tier 2 restrictions, and the associated plant configuration shall be available on a recoverable basis for NRC staff inspection."

Date Created: 12/10/2007 03:02 PM by Carl Schulten
Last Modified: 04/09/2008 11:17 AM

Monticello Rev 1 Submittal pages

A.1

ITS

3.0 LIMITING CONDITIONS FOR OPERATION	4.0 SURVEILLANCE REQUIREMENTS
H. Snubbers	H. Snubbers

3.0 LIMITING CONDITIONS FOR OPERATION

H. Snubbers

1. Except as permitted below, all safety related snubbers shall be operable whenever the supported system is required to be Operable.

LCO 3.0.8

2. With one or more snubbers made or found to be inoperable for any reason when Operability is required, within 72 hours:

   a. Replace or restore the inoperable snubbers to Operable status and perform an engineering evaluation or inspection of the supported components, or

   b. Determine through engineering evaluation that the as-found condition of the snubber had no adverse effect on the supported components and that they would retain their structural integrity in the event of design basis seismic event, or

   c. Declare the supported system inoperable and take the action required by the Technical Specifications for inoperability of that system.

INSERT 12 M.3

4.0 SURVEILLANCE REQUIREMENTS

H. Snubbers

The following surveillance requirements apply to all safety related snubbers.

1. Visual inspections:

   Snubbers are categorized as inaccessible or accessible during reactor operation. Each of these categories (inaccessible or accessible) may be inspected independently according to the schedule determined by Table 4.6-1. The visual inspection interval for each type of snubber shall be determined based upon the criteria provided in Table 4.6-1. The initial inspection interval for new types of snubbers shall be established at 18 months +25%.

See CTS 3/4.6.H

Attachment 1, Volume 5, Rev. 1, Page 11 of 69

M.3

INSERT 12

LCO 3.0.8 When one or more required snubbers are unable to perform their associated support function(s), any affected supported LCO(s) are not required to be declared not met solely for this reason if risk is assessed and managed, and:

a. The snubbers not able to perform their associated support function(s) are associated with only one subsystem of a multiple subsystem supported system or are associated with a single subsystem supported system and are able to perform their associated support function within 72 hours; or

b. The snubbers not able to perform their associated support function(s) are associated with more than one subsystem of a multiple subsystem supported system and are able to perform their associated support function within 12 hours.

At the end of the specified period the required snubbers must be able to perform their associated support function(s), or the affected supported system LCO(s) shall be declared not met.

Attachment 1, Volume 5, Rev. 1, Page 12 of 69

DISCUSSION OF CHANGES
ITS SECTION 3.0, LCO AND SR APPLICABILITY

M.2 CTS 4.0.B states, in part, "Specific time intervals between tests may be extended up to 25% of the surveillance interval." ITS SR 3.0.2 includes a similar requirement, but adds the following restriction: "For Frequencies specified as "once," the above interval extension does not apply." This changes the CTS by adding a restriction that Frequencies specified as "once" do not receive a 25% extension.

The purpose of the 1.25 extension allowance to Surveillance Frequencies is to allow for flexibility in scheduling tests. This change is acceptable because Frequencies specified as "once" are typically condition-based one-time only Surveillances in which the performance demonstrates the acceptability of the current condition and are not required to be repeated until the condition again applies. Such demonstrations should be accomplished within the specified Frequency without extension in order to avoid operation in unacceptable conditions. This change is designated as more restrictive because an allowance to extend Frequencies by 25% is eliminated from some Surveillances.

M.3 CTS 3.6.H.2 provides the actions for inoperable snubbers, and requires one of the following (a, b, or c) within 72 hours when one or more snubbers are inoperable: a) replace or restore the inoperable snubbers to OPERABLE status and perform an engineering evaluation or inspection of the supported components; b) determine through an engineering evaluation that the as-found condition of the snubber had no adverse effect on the supported components and that they would retain their structural integrity in the event of design basis seismic event; or c) declare the supported system inoperable and take the action required by the Technical Specifications for inoperability of that system. In the ITS, the actions for inoperable snubbers are incorporated into ITS LCO 3.0.8. When one or more required snubbers are unable to perform their associated support function(s), any affected supported LCO(s) are not required to be declared not met solely for this reason if risk is assessed and managed, and either: a) the snubbers not able to perform their associated support function(s) are associated with only one subsystem of a multiple subsystem supported system or are associated with a single subsystem supported system and are able to perform their associated support function within 72 hours; or b) the snubbers not able to perform their associated support function(s) are associated with more than one subsystem of a multiple subsystem supported system and are able to perform their associated support function within 12 hours. At the end of the specified period (i.e., 12 hours or 72 hours) snubbers must be able to perform their associated function(s), or the affected system LCO(s) shall be declared not met. This changes the CTS by requiring the risk associated with inoperable snubbers to be assessed and managed and requires the snubbers to restored to OPERABLE status in all cases, and in certain cases within a more restrictive Completion Time.

The purpose of CTS 3.6.H.2 is to provide a short time (72 hours) prior to requiring the affected systems to be declared inoperable, to either restore or replace inoperable snubbers or to perform an engineering analyses to assess whether the inoperable snubbers affect the OPERABILITY of the supported components. ITS LCO 3.0.8 requires the risk associated with inoperable required snubbers to be assessed and managed in all instances of snubber inoperability. ITS LCO 3.0.8 also requires all "required" inoperable snubbers to be restored to OPERABLE status within the specified Completion Times. It does not provide an explicit option to perform an engineering evaluation to assess whether the as-found condition of the snubber had no adverse effect on supported components. However, the wording of ITS LCO 3.0.8 (i.e., one or more "required" snubbers) continues to allow this evaluation to be performed. ITS LCO 3.0.8.a applies when one or more snubbers are not capable of providing their associated support function(s) to a single subsystem of a multiple subsystem supported system or to a single subsystem supported system. ITS LCO 3.0.8.a allows 72 hours to restore the snubber(s) before declaring the supported system inoperable, provided only a single subsystem is affected. This 72 hour time is consistent with the CTS. However, ITS LCO 3.0.8.b applies when one or more snubbers are not capable of providing their associated support function(s) to more than one subsystem of a multiple subsystem supported system, and allows 12 hours to restore the snubber(s) before declaring the supported system inoperable. This 12 hour time is more restrictive than the CTS. The 12 hour Completion Time is acceptable based on the low probability of a seismic event concurrent with an event that would require operation of the supported system occurring while the snubber(s) are not capable of performing their associated support function. Furthermore, ITS LCO 3.0.8 requires that risk be assessed and managed. This risk assessment is not required in all cases in the CTS. The Bases for ITS LCO 3.0.8 provides guidance on how the risk must be assessed. Industry and NRC guidance on the implementation of 10 CFR 50.65(a)(4) (the Maintenance Rule) does not address seismic risk. However, use of ITS LCO 3.0.8 should be considered with respect to other plant maintenance activities, and integrated into the existing Maintenance Rule process to the extent possible so that maintenance on any unaffected train or subsystem is properly controlled, and emergent issues are properly addressed. The risk assessment need not be quantified, but may be a qualitative awareness of the vulnerability of systems and components when one or more snubbers are not able to perform their associated support function. This change is designated as more restrictive because inoperable snubbers must be restored to OPERABLE status under certain conditions within a more restrictive Completion Time and the risk associated with inoperable snubbers must always be assessed and managed.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA.1 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS 4.0.B states that the purpose of the 25% extension of the specified surveillance interval is "to accommodate normal test schedule." ITS SR 3.0.2 does not include this detail. This changes the CTS by moving details of the purpose of the 25% surveillance time interval extension from the CTS to the ITS Bases.

Monticello RAI Question

Assign | New Response | Close

NRC ITS TRACKING

NRC Reviewer

ID	**200512151125** Conference Call Requested? **No**
Category	**Discussion**
ITS Information	ITS Section: **None** ITS Number: **None** DOC Number: **None** JFD Number: **None** Bases JFD Number: **None** Page Number(s): **1**
NRC Owner	**David Roth**
Comment	**Please provide details of any recently-approved TSTFs to be incorporated into ITS.**
Issue Date	**12/15/2005**

Close Date	**03/28/2006** Resolution requires change to: None Docket Response Required? **No**

Responses

Licensee Response by Jerry Jones on 01/20/2006	TSTF-372, Rev. 4 has been approved since the cut-off date specified in the Monticello ITS submittal transmittal letter, dated 6/29/05. This TSTF will be incorporated into the Monticello ITS as shown in the attachment to this response.
Licensee Response by Jerry Jones on 01/05/2006	The NRC Technical Specifications Branch Chief (T. H. Boyce) informed the Technical Specifications Task Force (TSTF), by letter dated 12/6/05, that TSTF-343, TSTF-479, TSTF-482, and TSTF-485 would be incorporated into revision 3.1 of the Improved Standard Technical Specifications (ISTS). Monticello has reviewed and evaluated these approved TSTFs. TSTF-343, Rev. 1: This TSTF will not be adopted in the Monticello Improved Technical Specifications (ITS) as it is not applicable to the Monticello design (Monticello does not have pre-stressed concrete containment tendons in the primary containment, as stated in ITS 5.5, Justification For Deviations (JFD) 7 (Attachment 1, Volume 17, Rev. 0, Page 97 of 143). TSTF-479, Rev. 0: This portion of the TSTF concerning the change from Boiler and Pressure Vessel Code, Section XI to Operation and Maintenance (OM) Code has already been incorporated into the Monticello ITS. While the

	wording in the Monticello ITS is not identical to the TSTF, Monticello has changed the applicable references from ASME Boiler and Pressure Vessel Code, Section XI to the ASME OM Code. Therefore, changes provided by this TSTF related to the OM Code are not required in the Monticello ITS. However, the portion of the change related to Improved Standard Technical Specifications (ISTS) 5.5.7.b (ITS 5.5.5.b), i.e., the modification to when SR 3.0.2 applies, is not currently in the Monticello ITS. Therefore, the Monticello ITS submittal will be revised to include this part of the TSTF, as shown in the attachment to this response. TSTF-482, Rev. 0: This TSTF will be adopted. It should be noted that the second and third changes provided by the TSTF are already incorporated into the Monticello ITS with a JFD (JFD 3) that states that a typographical/grammatical error has been corrected (Attachment 1, Volume 5, Rev. 0, Page 49 of 63). The Monticello ITS submittal will be revised to include the first change of the TSTF, and a new justification for all three changes. The changes are provided in the attachment to this response. TSTF-485, Rev. 0: This TSTF will be incorporated into the Monticello ITS. The changes are provided in the attachment to this response.
NRC Response by David Roth on 02/09/2006	Please be aware the TSTF-479 reviews are currently (as of 02/06/2006) suspended to clarify the Traveler's applicability to greater-than-two-year (that is 5-year and 10-year) frequencies. Suggest not incorporating TSTF-479 at this time to avoid any associated delays.
Licensee Response by Jerry Jones on 02/13/2006	As stated in the first Monticello response to this RAI (Monticello response on 1/5/06), Monticello had already adopted the change from Boiler and Pressure Vessel Code, Section XI to Operation and Maintenance (OM) Code, based on our current licensing basis. Furthermore, our response stated that the portion of the Technical Specifications Task Force (TSTF) -479 change related to Improved Standard Technical Specifications (ISTS) 5.5.7.b (ITS 5.5.5.b), i.e., the modification to when SR 3.0.2 applies, is not currently in the Monticello ITS and that it would be added into the ITS. The appropriate changes were provided in the attachment to the first Monticello response. However, after Monticello provided the first response and appropriate changes to adopt TSTF-479, the NRC recommended that Monticello not incorporate this part of the TSTF since it might delay the approval of the ITS. Based on this NRC recommendation, Monticello will not adopt the TSTF-479 change associated with ISTS 5.5.7.b (ITS 5.5.5.b). Therefore, last five pages of the attachment to the Monticello response of 1/5/06, which are all related to TSTF-479 (and are stamped at the top left as being "TSTF-479 related"), will not be included in the future revision to the Monticello ITS submittal. These five pages show the change to ITS 5.5.5.b and associated Current Technical Specifications Markup, Discussion of Changes, and Justification for Deviations changed pages.
NRC Response by David Roth	For TSTF-372, Rev. 4, note that it has been CLIIPED and a model

on 02/28/2006	application posted on the NRC's website at http://www.nrc.gov/reactors/operating/licensing/techspecs/changes-issued-for-adoption.html Please fill in the blanks in the TSTF-372 Rev. 4 CLIIP model and submit it as a response to this question. At a minumum, fill in this section: 2.0 ASSESSMENT 2.1 Applicability of Published Safety Evaluation [LICENSEE] has reviewed the safety evaluation dated [DATE] as part of the CLIIP. This review included a review of the NRC staff?s evaluation, as well as the supporting information provided to support TSTF-372. [LICENSEE] has concluded that the justifications presented in the TSTF proposal and the safety evaluation prepared by the NRC staff are applicable to [PLANT, UNIT NOS.] and justify this amendment for the incorporation of the changes to the [PLANT] TS. 2.2 Optional Changes and Variations [LICENSEE] is not proposing any variations or deviations from the TS changes described in the TSTF-372 Revision 4 or the NRC staff?s model safety evaluation dated [DATE].

Date Created: 12/15/2005 11:25 AM by David Roth
Last Modified: 03/28/2006 08:19 AM

Monticello SER Pages

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 146 TO FACILITY OPERATING LICENSE NO. DPR-22

NUCLEAR MANAGEMENT COMPANY, LLC

MONTICELLO NUCLEAR GENERATING PLANT

DOCKET NO. 50-263

1.0 INTRODUCTION

By application dated June 29, 2005, as supplemented by the three letters discussed below, the Nuclear Management Company (NMC, or the licensee), requested changes to the technical specifications (TSs) for the Monticello Nuclear Generating (MNGP), to convert the current TSs (CTSs) to improved TSs (ITSs).

The supplemental letters to the application provided the following information for the proposed ITS conversion:

- Letter from John T. Conway, Site Vice President, Monticello Nuclear Generating Plant, to U.S. Nuclear Regulatory Commission Document Control Desk dated April 25, 2006 (ADAMS Accession No. ML061230549), which supplements the licensee's application and provides the revisions to the TS changes in the application, additional technical information, and proposed license conditions for the implementation of this amendment.

- Letter from John T. Conway, Site Vice President, Monticello Nuclear Generating Plant, to U.S. Nuclear Regulatory Commission Document Control Desk, dated April 25, 2006 (ADAMS Accession No. ML061180108), which provides a copy of Nuclear Regulatory Commission (NRC) requests for additional information (RAIs) and the licensee's responses to the RAI questions that were on the NRC-MNGP ITS Conversion web page discussed below. The information being provided does not include licensee acknowledgments or RAI status tracking.

- Letters dated May 4 (ADAMS Accession No. ML061290457) and 12 (ADAMS Accession No. ML061350038), 2006, which provide the retyped copy of TS pages to be issued in this amendment.

On April 7, 2006, the NRC provided the licensee with a preliminary draft safety evaluation (SE) (ADAMS Accession No. ML060950548). The licensee's comments have been incorporated in this final SE.

ENCLOSURE

4.0 EVALUATION

In its review of the MNGP ITS application, the NRC staff evaluated five kinds of CTS changes as defined by the licensee. The NRC staff's review also included an evaluation of whether existing regulatory requirements are adequate for controlling future changes to requirements that are removed from the CTSs and placed in licensee-controlled documents. The following are the five types of CTS changes:

A Administrative - Changes to the CTSs that do not result in new requirements or change operational restrictions and flexibility.

M More Restrictive - Changes to the CTSs that result in added restrictions or reduced flexibility.

L Less Restrictive - Changes to the CTSs that result in reduced restrictions or added flexibility.

LA Removed Details - Changes to the CTSs that eliminate detail and relocate the detail to a licensee-controlled document. Typically, this involves details of system design and system description including design limits, description of system operation, procedural details for meeting TS requirements or reporting requirements, and cycle-specific parameter limits and TS requirements redundantly located in other licensee-controlled documents.

R Relocated Specifications - Changes to the CTSs that relocate the requirements that do not meet the selection criteria of 10 CFR 50.36(c)(2)(ii).

The ITS application included a justification for each proposed change to the CTSs in a numbered discussion of change (DOC), using the above letter designations as appropriate. In addition, the ITS application included an explanation of each difference between ITS and ISTS requirements in a numbered justification for deviation.

The changes to the CTSs, as presented in the ITS application, are listed and described in the following five tables (for each ITS section) provided as Attachments 2 through 6 to this SE:

- Table A - Administrative Changes
- Table M - More Restrictive Changes
- Table L- Less Restrictive Changes
- Table LA - Removed Detail Changes
- Table R - Relocated Specifications

These tables provide a summary description of the proposed changes to the CTSs, references to the specific CTS requirements that are being changed, and the specific ITS requirements that incorporate the changes. The tables are only meant to summarize the changes being made to the CTSs. The details as to what the actual changes are and how they are being made to the CTSs or ITSs are provided in the licensee's application and supplemental letter.

	ITS LCO 3.0.3 states "When an LCO is not met and the associated ACTIONS are not met, an associated ACTION is not provided, or if directed by the associated ACTIONS, the unit shall be placed in a MODE or other specified condition in which the LCO is not applicable. Action shall be initiated within 1 hour to place the unit, as applicable, in: a. MODE 2 within 7 hours; b. MODE 3 within 13 hours; and c. MODE 4 within 37 hours. Exceptions to this Specification are stated in the individual Specifications. Where corrective measures are completed that permit operation in accordance with the LCO or ACTIONS, completion of the actions required by LCO 3.0.3 is not required. LCO 3.0.3 is only applicable in MODES 1, 2, and 3." This changes the CTS by adding ITS LCO 3.0.3.		
3.0 M.2	CTS 4.0.B states, in part, "Specific time intervals between tests may be extended up to 25% of the surveillance interval." ITS SR 3.0.2 includes a similar requirement, but adds the following restriction: "For Frequencies specified as "once," the above interval extension does not apply." This changes the CTS by adding a restriction that Frequencies specified as "once" do not receive a 25% extension.	SR 3.0.2	4.0.B
3.0 M.3	CTS 3.6.H.2 provides the action for inoperable snubbers, and requires one of the following be performed within 72 hours when one or more snubbers are inoperable: a) replace or restore the inoperable snubbers to OPERABLE status and perform an engineering evaluationor inspection of the supported components; b) determine through an engineering evaluation that the as-found condition of the snubber had no adverse effect on the supported components and that they would retain their structural integrity in the event of a design basis seismic event; or c) declare the supported system inoperable and take the action required by the Technical Specifications for inoperability of that system. In the ITSs, the actions for inoperable snubbers are incorporated into ITS LCO 3.0.8. When one or more required snubbers are unable to perform their associated support function(s), any affected supported LCO(s) are not required to be declared not met soley for this reason if the risk is assessed and managed, and either: a) the snubbers not able to perform their associated support function(s) are associated with only one subsystem or are associated with a single subsystem supported system and are able to perform their associated support function within 72 hours; or b) the snubbers not able to perform their associated support function(s) are associated with more than one subsystem of a multiple subsystem supported system and are able to perform their associated support function within 12 hours. At the end of the specified period (i.e. 12 hours or 72 hours), snubbers must be able to perform their associated function(s) or the affected system LCO(s) shall be declared not to be met. This changes the CTSs by requiring the risk associated with inoperable snubbers to be assessed and managed, and requires the snubbers be restored to OPERABLE status in all cases, and in certain cases within a more restrictive Completion Time.	LCO 3.0.8	3.6.H.2
3.1.1 M.1	CTS 4.3.A.1 states, in part, reactivity margin of "0.25 per cent Δk" is required. ITS LCO 3.1.1 states SDM shall be: a. ≥ 0.38% Δk/k, with the highest worth control rod analytically determined; or b. ≥ 0.28% Δk/k, with the highest worth control rod determined by test. This changes the CTS by replacing the existing SDM limit with two new limits.	LCO 3.1.1	4.3.A.1
3.1.1 M.2	CTS 3.3.A.1 states, in part, that core loading shall be limited to that which can be made subcritical in the most reactive condition during the operating cycle. CTS 4.3.A.1 states, in part, that a test shall be performed to demonstrate that the core can be made subcritical at any time in	3.1.1 Applicability	3.3.A.1, 3.3.G.1, 3.3.G.2

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NRC ITS TRACKING

NRC Reviewer

ID	**200712101505** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.0 Carl Schulten**; TB POC: ; JFD Number: **None**; Page Number(s): **29**; ITS Number: **None**; OSI: **None**; DOC Number: **None**; Bases JFD Number: **3**
Comment	**Section 3.0** **Volume 5:** **page 29 of 62, LCO 3.0.4 JFD 3** **Revise the ITS to include the deleted ISTS Bases.** **JFD 3 states "The words "changes in" in LCO 3.0.4 has been changed to "entry into" to be consistent with the terminology used in SR 3.0.4." JFD 3 does not contain a justification for the change to LCO 3.0.4. The proposed changes would exclude applying LCO 3.0.4 when "leaving" a mode and represents a deviation to B&W Plant, Westinghouse Plant, General Electric Plant and Combustion Engineering Plant STS.**
Issue Date	**12/10/2007**
Close Date	**02/22/2008**

Responses

Licensee Response by Jerry Jones on 01/31/2008	Davis-Besse changed the words in ISTS LCO 3.0.4 (Volume 5, Page 29) to match with the words in ISTS SR 3.0.4 (Page 32). The first sentence of ISTS LCO 3.0.4 states "When an LCO is not met, entry into a MODE or other specified condition in the Applicability shall only be made:" The next three numbered paragraphs provide the exceptions. The next sentence in ISTS LCO 3.0.4 states "This LCO shall not prevent changes in MODES or other specified conditions in the Applicability..." The words were changed to be consistent not only with similar words in ISTS SR 3.0.4, but also to match with the first sentence. Davis-Besse does not believe that changing the words "changes in" to "entry into" to match the identical words in the first paragraph is a technical change. It does not necessarily exclude applying LCO 3.0.4 when "leaving" a MODE. If the unit is leaving a MODE and entering another MODE specified in the Applicability, then LCO 3.0.4 applies. However, nothing in

	LCO 3.0.4 prohibits leaving a MODE in which the LCO is applicable and entering a MODE in which the LCO is not applicable. As stated above, ISTS SR 3.0.4 uses the term "entry into" in both the lead-in sentence and in the last sentence. Thus, it appears that the two terms "changes to" and "entry into" are synonymous. Therefore, for consistency within the ISTS LCO 3.0.4 and SR 3.0.4, Davis-Besse believes that the change in wording is editorial in nature and makes the Specification more clear and understandable. Furthermore, this change was approved by the NRC during the ITS conversion for Monticello, a plant conversion approved in 2005. In addition, NRC question 200712101512 discussed the similar change made to the ISTS Bases for LCO 3.0.4 and SR 3.0.4. Davis-Besse believes that the changes to the Bases is consistent with the above discussion and no changes are necessary.

Date Created: 12/10/2007 03:05 PM by Carl Schulten
Last Modified: 02/22/2008 03:36 PM

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NRC ITS TRACKING

NRC Reviewer

ID	**200712101507** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.0 Carl Schulten** TB POC: JFD Number: **None** Page Number(s): **35** ITS Number: **None** OSI: **None** DOC Number: **None** Bases JFD Number: **1**
Comment	**Section 3.0** **Volume 5:** **Page 35 of 62, LCO Bases JFD 1** **Revise the ITS to include the deleted ISTS Bases.** **JFD 3 states "The words "changes in" in LCO 3.0.4 has been changed to "entry into" to be consistent with the terminology used in SR 3.0.4." JFD 3 does not contain a justification for the change to LCO 3.0.4. The proposed changes would exclude applying LCO 3.0.4 when "leaving" a mode and represents a deviation to B&W Plant, Westinghouse Plant, General Electric Plant and Combustion Engineering Plant STS.**
Issue Date	**12/10/2007**
Close Date	**01/30/2008**

Responses

Licensee Response by Bryan Kays on 01/20/2008	Davis-Besse requests additional information to clarify the question. The question refers to Justification for Deviation (JFD) 1, but the question states JFD 3. Furthermore, the specified page (Volume 5, Page 35) does contain a JFD 1 change, but does not contain a JFD 3. No answer has been provided. Please provide clarification.
NRC Response by Carl Schulten on 01/30/2008	See Item Number 200712101521. Below is the replacement Comment for 200712101507. Revise the ITS to remove the JFD1 changes. Change has no editorial merit, but could call into question Administrative Controls references to LCO Applicabilities and SR Applicabilities.
NRC Response by Carl Schulten on 01/30/2008	Item 200712101507 is the JFD1 issue on page 35 of 47. Item 200712101521 addresses the same JFD1 issue for page 47 of 62 and the response to 200712101521

	addresses the issue on both page 35 and page 47. Therefore, item 200712101507 is closed with no further licensee repsonse required.

Date Created: 12/10/2007 03:07 PM by Carl Schulten
Last Modified: 01/30/2008 11:43 AM

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NRC ITS TRACKING

NRC Reviewer

ID	**200712101512** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.0 Carl Schulten**; TB POC: ; JFD Number: **None**; Page Number(s): ; ITS Number: **None**; OSI: **None**; DOC Number: **None**; Bases JFD Number: **10**
Comment	**Section 3.0** **Volume 5:** **Page 41, 53 of 62, LCO 3.0.4 Bases; JFD 10** **Revise the ITS to include the deleted ISTS Bases.** **JFD 3 states "The words "changes in" in LCO 3.0.4 has been changed to "entry into" to be consistent with the terminology used in SR 3.0.4." JFD 3 does not contain a justification for the change to LCO 3.0.4. The proposed changes would exclude applying LCO 3.0.4 when "leaving" a mode and represents a deviation to B&W Plant, Westinghouse Plant, General Electric Plant and Combustion Engineering Plant STS.**
Issue Date	**12/10/2007**
Close Date	**02/22/2008**

Responses

Licensee Response by Jerry Jones on 01/31/2008	See the Davis-Besse response to 200712101505.

Date Created: 12/10/2007 03:12 PM by Carl Schulten
Last Modified: 02/22/2008 03:36 PM

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NRC ITS TRACKING

NRC Reviewer

ID	**200712101518** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.0 Carl Schulten**; TB POC: ; JFD Number: **None**; Page Number(s): **41**; ITS Number: **None**; OSI: **None**; DOC Number: **None**; Bases JFD Number: **3**
Comment	**Section 3.0** **Volume 5: page 41 of 62, LCO 3.0.5 Bases; JFD 3 -** **Revise the ITS to include the changed ISTS Bases** **The change creates LCO 3.0.5 Bases that do not reflect LCO 3.0.5.**
Issue Date	**12/10/2007**
Close Date	**01/30/2008**

Responses

Licensee Response by Bryan Kays on 01/20/2008	The change presented in Justification for Deviation (JFD) 3 (Volume 5, Page 41), for the exclusion of the word "either", has been removed and the ISTS wording has been retained. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.

Date Created: 12/10/2007 03:18 PM by Carl Schulten
Last Modified: 01/30/2008 11:35 AM

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Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200712101520** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.0 Carl Schulten**; TB POC: ; JFD Number: **None**; Page Number(s): **43**; ITS Number: **None**; OSI: **None**; DOC Number: **None**; Bases JFD Number: **None**
Comment	**Section 3.0** **Volume 5:** **Page 43 of 62, LCO 3.0.6 Bases; TSTF-494T** **Revise the ITS to remove the proposed TSTF-494T changes.** **TSTF-494T is not a precedent that is reviewed and approved by the NRC staff. Establishing a generic TS position is a beyond scope issue for adopting ISTS.**
Issue Date	**12/10/2007**
Close Date	**02/21/2008**

Responses

Licensee Response by Jerry Jones on 02/07/2008	TSTF-494T is a change to the LCO 3.0.6 Bases and has been approved by the Industry representatives. It fixes incorrect statements concerning the examples. Specifically: 1) Example B 3.0.6-1 (Volume 5, Page 43) is changed from "If System 2 of Train A is inoperable and System 5 of Train B is inoperable, a loss of safety function exists in supported System 5" to "If System 2 of Train A is inoperable and System 5 of Train B is inoperable, a loss of safety function exists in Systems 5, 10, and 11." Examining Figure B 3.0-1, it is clear that if there is a loss of safety function in System 5, there is also a loss of safety function in the systems supported by System 5, i.e., Systems 10 and 11. This relationship is explicitly listed in Example B 3.0.6-3 and to not do so here is inconsistent and confusing as it leads the reader to believe that Systems 10 and 11 do not have a loss of safety function. Furthermore, System 5 of Train B is not a supported System of System 2 of Train A, since they are in different trains. Thus, the word "supported" has been deleted. 2) Example B 3.0.6-2 (Page 43) is changed from "If System 2 of Train A is inoperable, and System 11 of Train B is inoperable, a loss of safety function exists in System 11

	which is in turn supported by System 5" to "If System 2 of Train A is inoperable, and System 11 of Train B is inoperable, a loss of safety function exists in System 11." The phrase "which in turn is supported by System 5" is confusing. System 5 is not inoperable and does not lead to the loss of safety function. Examples B 3.0.6-1 and B 3.0.6-3 do not discuss OPERABLE support systems. This phrase adds no value and leads the reader to believe there is some special relationship with System 5 which does not exist. Davis-Besse needs to make these changes since the current wording in the ISTS 3.0.6 Bases are not correct. Furthermore, a plant-specific JFD will be provided, using the justification provided above, in lieu of referencing TSTF-494T. This change does not affect the application of LCO 3.0.6, therefore, it is not a beyond scope change. A draft markup regarding these changes is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.

Date Created: 12/10/2007 03:20 PM by Carl Schulten
Last Modified: 02/21/2008 11:45 AM

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RAI Screening Required: No

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This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted) **Yes**

Status: Approval Not Required

This document will not be relied upon by staff for disposition of the LAR

NRC ITS TRACKING

NRC Reviewer

ID	**200712101521**		Conference Call Requested? **No**	
Category	**In Scope**			
ITS Information	ITS Section: **3.0 Carl Schulten** ITS Number: **None**	TB POC: OSI: **None**	JFD Number: **None** DOC Number: **None**	Page Number(s): **47** Bases JFD Number: **1**
Comment	**Section 3.0** **Volume 5: Page 47 of 62, SRs Bases; JFD1** **Revise the ITS to remove the JFD1 changes.** **Change has no editorial merit, but could call into question Administrative Controls references to LCO Applicabilities and SR Applicabilities.**			
Issue Date	**12/10/2007**			

Close Date	**01/30/2008**

Responses

Licensee Response by Bryan Kays on 01/20/2008	The change presented in Justification for Deviation (JFD) 1 (Volume 5, Page 47) has been removed and the ISTS wording has been retained. Additionally, the same type of change made to the LCO section of the Bases (Page 35) has also been deleted. Furthermore, JFD 3 (Page 54) has been deleted. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.

Date Created: 12/10/2007 03:21 PM by Carl Schulten
Last Modified: 01/30/2008 11:36 AM

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RAI Screening Required: No

Status: Approval Not Required

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This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted) **Yes**

NRC ITS TRACKING

NRC Reviewer

ID	**200712101524** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.0 Carl Schulten**; TB POC: ; JFD Number: **None**; Page Number(s): **47**; ITS Number: **None**; OSI: **None**; DOC Number: **None**; Bases JFD Number: **8**
Comment	**Section 3.0** **Volume 5: Page 47 of 62, SRs Bases; JFD8** **Revise the ITS to retain the changes proposed for deletion by JFD8.** **Changes to delete established Bases precedent for crediting unplanned tests as fulfilling the performance of the SR would establish a generic TS position that is unreviewed by the NRC staff and is therefore, a beyond scope issue for adopting ISTS.**
Issue Date	**12/10/2007**
Close Date	**02/22/2008**

Responses

Licensee Response by Jerry Jones on 01/31/2008	The ISTS SR 3.0.1 Bases (Volume 5, Page 47) states "Unplanned events may satisfy the requirements (including applicable acceptance criteria) for a given SR. In this case, the unplanned event may be credited as fulfilling the performance of the SR. This allowance includes those SRs whose performance is normally precluded in a given MODE or other specified condition." The last sentence was not included in the Davis-Besse ITS and was deleted with Justification for Deviations (JFD) 8 (Page 54). JFD 8 states "The ITS SR 3.0.3 (Note - should be 3.0.1) Bases allows credit to be taken for unplanned events that satisfy Surveillances. The Bases further states that this allowance also includes those SRs whose performance is normally precluded in a given MODE or other specified condition. This portion of the allowance has been deleted. As documented in Part 9900 of the NRC Inspection Manual, Technical Guidance - Licensee Technical Specifications Interpretations, and in the Bases Control Program (ITS 5.5.10), neither the Technical Specifications Bases nor Licensee generated interpretations can be used to change the Technical Specification requirements. Thus, if the Technical Specifications preclude

	performance of an SR in certain MODES (as is the case for some SRs in ITS Section 3.8), the Bases cannot change the Technical Specifications requirement and allow the SR to be credited for being performed in the restricted MODES, even if the performance is unplanned." Based on the NRC reviewers comment, Davis-Besse has re-reviewed the proposed deletion in the Davis-Besse ITS and has concluded the allowance is not necessary. The deleted sentence is basically providing an example of a type of SR for which credit could be taken during an unplanned event. If the sentence is not included, then a "precluded" SR (for example, an SR that cannot normally be performed in MODE 1 because it could cause a trip of the unit) could still be credited during an unplanned event. That is, deletion of the sentence does not result in Davis-Besse not being able to credit an unplanned event in MODE 1 from meeting an SR that cannot normally be performed in MODE 1. The allowance still exists as specified in the first two sentences. Davis-Besse deleted the last sentence to prevent confusion and misunderstanding as to what "precluded" actually means. Furthermore, "prohibited" SRs, like those in ITS 3.8.1 (those that have Notes that say they cannot be performed in certain MODES), are not allowed to use the SR 3.0.1 allowance, unless specifically stated in the applicable Notes to the ITS 3.8.1 SRs. Certain Surveillances in ITS 3.8.1 (SR 3.8.1.9, SR 3.8.1.10, SR 3.8.1.11, SR 3.8.1.12, SR 3.8.1.13, and SR 3.8.1.15) (Volume 14, Pages 38, 40, 42, 44, 45, and 48) and ITS 3.8.4 (SR 3.8.4.3) (Page 168) include a Note that restricts the normal performance of the associated Surveillance in specific MODES. These are the only Notes in the Davis-Besse ITS that restricts SRs from being performed in specific MODES or conditions. However, the same Note also includes the following statement, "Credit may be taken for unplanned events that satisfy this SR." Therefore, the deleted phrase in the ISTS SR 3.0.1 Bases is not necessary for these types of SRs. Thus, since the Bases cannot change the Technical Specification requirements, and the Bases words being deleted would allow a Surveillance that had a note precluding its performance to actually be performed and credited, these words are not correct and should not be included in the Davis-Besse ITS Bases. In addition, this change is consistent with a similar change allowed by the NRC during the Monticello ITS conversion. Furthermore, the NRC reviewer also questioned the deletion of this sentence in NRC Question 200510031651, which can be found on the same website that is hosting this Davis-Besse RAI database. The NRC found the response acceptable and allowed the Bases words to be deleted. In addition, during the development of the Davis-Besse response to this question, it was noted that JFD 8 incorrectly stated it was discussing the ITS SR 3.0.3 Bases. It should have stated it was discussing the ITS SR 3.0.1 Bases. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.

Date Created: 12/10/2007 03:24 PM by Carl Schulten
Last Modified: 02/22/2008 03:37 PM

Section 3.1 RAIs

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RAI Screening Required: Yes

This Document will be approved by: **Greg Cranston**

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Status: Closed

Regulatory Basis must be included in Comments section of this Form

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200712030851**		Conference Call Requested? **No**	
Category	**BSI - Beyond Scope Issue**			
ITS Information	ITS Section: **3.1 Gerald Weig** ITS Number: **3.1.9**	TB POC: OSI: **17**	JFD Number: **None** DOC Number: **LA.2**	Page Number(s): **3** Bases JFD Number: **None**
Comment	**For item LA02 under Current Technical Specification (CTS) Markup and Discussion of Changes (DOCS) section, proposed LCO 3.1.9.d states "The SHUTDOWN MARGIN shall be not within limits specified in the COLR." The staff believes that it should state "within limits specified in the COLR" according to the Standard TSs. The staff requests the licensee to justify the change in wording from the Standard TSs.**			
Issue Date	**12/03/2007**			
Close Date	**01/16/2008**			

Responses

Licensee Response by Jerry Jones on 12/05/2007	The NRC reviewer is correct. The proposed ITS LCO 3.1.9.d (Volume 6, Page 201) should not include the word "not" in the CTS Markup. An editorial correction is required, and no technical change is intended. Therefore, this change is not a beyond scope change and does not affect any application of the Required Actions. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.

Date Created: 12/03/2007 08:51 AM by Jason Paige
Last Modified: 01/16/2008 10:37 AM

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RAI Screening Required: Yes

Status: Closed

This Document will be approved by: **Greg Cranston**

Regulatory Basis must be included in Comments section of this Form

This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted)

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200712030856** Conference Call Requested? **No**
Category	**BSI - Beyond Scope Issue**
ITS Information	ITS Section: **3.1 Gerald Weig**; TB POC: ; JFD Number: **4**; Page Number(s): **1**; ITS Number: **3.1.9**; OSI: **17**; DOC Number: **None**; Bases JFD Number: **None**
Comment	**In the Justification for Deviation section, Item 4, deletion of proposed SR 3.1.9.3, "Verify nuclear overpower trip setpoint is ≤ 25% RTP," suggests that this SR is not necessary anymore based on the performance of the equipment. The information provided is not sufficient for the staff to make a decision that would support the proposal. This proposed change is a departure from the TSTF-467, provide a more detailed justification, including any plant-specific influences that would support the removal of the SR.**
Issue Date	**12/03/2007**
Close Date	**01/16/2008**

Responses

Licensee Response by Jerry Jones on 12/05/2007	CTS 4.10.2.2 (Volume 6, Page 200) requires a CHANNEL FUNCTIONAL TEST of the High Flux Channel within 24 hours prior to initiating PHYSICS TESTS. This Surveillance ensures that the setpoint of the High Flux Channel is set at less than or equal to 25% RTP, as specified in CTS 3.10.1.b (Page 200). ITS SR 3.1.9.1 (Page 210) was added to ensure this current licensing basis CHANNEL FUNCTIONAL TEST requirement is maintained. Justification for Deviation (JFD) 4 (Page 211) states that ITS SR 3.1.9.1 is being maintained consistent with the current licensing basis. This SR is not in the ISTS. In lieu of this CHANNEL FUNCTIONAL TEST requirement, the ISTS includes SR 3.1.9.3 (Page 209), a verification that the nuclear overpower (i.e., high flux) trip setpoint is less than or equal to 25% RTP every 8 hours.

	Due to the addition of a specific CHANNEL FUNCTIONAL TEST requirement on the same instrument, there is no need to perform an additional surveillance on the high flux channel. A single CHANNEL FUNCTIONAL TEST 24 hours prior to performing a PHYSICS TEST is sufficient to ensure the trip setpoint is properly set. Normally, this high flux instrument has a CHANNEL FUNCTIONAL TEST required every 92 days (as part of the CHANNEL CALIBRATION requirement), as shown in CTS Table 4.3-1 (Volume 8, Page 12). Thus, since during normal operations in MODE 1, a 92 day Frequency for verifying the high flux setpoint is adequate, a one time performance of the CHANNEL FUNCTIONAL TEST prior to performing a PHYSICS TEST (which will not last as long as 92 days) is sufficient. This is what the words in JFD 4 (based on the performance of the equipment) are meant to cover. Furthermore, since this change is consistent with the current licensing basis, Davis-Besse does not believe that it is a beyond scope change.

Date Created: 12/03/2007 08:56 AM by Jason Paige
Last Modified: 01/16/2008 10:38 AM

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Status: Approval Not Required

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Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200801221206** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.1** TB POC: **Gerald Weig/Ravinder Grover** OSI: **None** ITS Number: **3.1.1** JFD Number: **None** DOC Number: **None** Page Number(s): **17** Bases JFD Number: **8**
Comment	**Insert 1A on page 17 of 307 would be clearer if you add the word "fully" to the insert. ...CONTROL RODS are verified fully inserted by two independent means... As it is worded it could be interpreted that "verified inserted" could mean the control rod is inserted some amount from full out.**
Issue Date	**01/22/2008**
Close Date	**01/28/2008**

Responses

Licensee Response by Bryan Kays on 01/27/2008	ITS 3.1.1 Bases (Volume 6, Page 17) INSERT 1A has been changed to verify that all CONTROL RODS are fully inserted by two independent means. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 01/28/2008	Requested change has been made. No further questions at this time. This item is closed.

Date Created: 01/22/2008 12:06 PM by Timothy Kolb
Last Modified: 01/28/2008 08:58 AM

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RAI Screening Required: No

Status: Approval Not Required

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This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted)

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200801221315** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.1 Gerald Weig/Ravinder Grover** ITS Number: **3.1.1** TB POC: OSI: **None** JFD Number: **None** DOC Number: **None** Page Number(s): **16** Bases JFD Number: **2**
Comment	**The last paragraph on this page where you are adding the words "When the unit is in MODES 5 and 6, the SDM requirements are met....", the "MODES 5 and 6" needs to be changed to "MODE 5" and delete the reference to MODE 6. The LCO is only applicable in MODES 3,4 and 5. There are no SDM requirements in MODE 6.**
Issue Date	**01/22/2008**
Close Date	**01/28/2008**

Responses

Licensee Response by Bryan Kays on 01/27/2008	The ITS 3.1.1 Bases (Volume 6, Page 16) has been revised to more closely align to the ISTS wording. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 01/28/2008	Requested change has been made. No further questions at this time. This item is closed.

Date Created: 01/22/2008 01:15 PM by Timothy Kolb
Last Modified: 01/28/2008 09:01 AM

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RAI Screening Required: No

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Status: Approval Not Required

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Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200801221334** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.1 Gerald Weig/Ravinder Grover** ITS Number: **3.1.1** TB POC: OSI: **None** JFD Number: **None** DOC Number: **None** Page Number(s): **21** Bases JFD Number: **2**
Comment	**In the first paragraph where you add the statement "SDM for an RCS average temperature of < or = to 280 F is achieved" you need to remove the = sign. Since you must borate to exit the applicability then you must go < 280 F because MODE 3 is defined as > or = 280 F.**
Issue Date	**01/22/2008**
Close Date	**01/28/2008**

Responses

Licensee Response by Bryan Kays on 01/27/2008	ITS 3.1.1 Bases (Volume 6, Page 21) for ACTIONS A.1 has been changed so that Reactor Coolant System (RCS) boration will continue until the Shutdown Margin (SDM) for an RCS average temperature of < 280°F is achieved. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 01/28/2008	Requested change has been made. No further questions at this time. This item is closed.

Date Created: 01/22/2008 01:34 PM by Timothy Kolb
Last Modified: 01/28/2008 09:03 AM

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RAI Screening Required: No

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This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted) **Yes**

Status: Approval Not Required

This document will not be relied upon by staff for disposition of the LAR

NRC ITS TRACKING

NRC Reviewer

ID	**200801241318** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.1 Gerald Weig/Ravinder Grover** ITS Number: **3.1.3** TB POC: OSI: **None** JFD Number: **None** DOC Number: **M.2** Page Number(s): **53** Bases JFD Number: **None**
Comment	**Doc M02 states "This change is designated as more restrictive because it expands the conditions for MTC." Suggest stating "This change is designated as more restrictive because it expands the applicability for MTC."**
Issue Date	**01/24/2008**
Close Date	**01/28/2008**

Responses

Licensee Response by Bryan Kays on 01/27/2008	ITS 3.1.3 Discussion of Change (DOC) M02 (Volume 6, Page 53) has been changed to show that the change expands the Applicability for moderator temperature coefficient (MTC). Additionally, a typo has been corrected on the markup (Page 51). The DOC at the bottom of Page 51 should have been M02 instead of M01. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 01/28/2008	Requested change has been made. No further questions at this time. This item is closed.

Date Created: 01/24/2008 01:18 PM by Timothy Kolb
Last Modified: 01/28/2008 09:07 AM

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RAI Screening Required: No

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Status: Approval Not Required

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Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200801241338** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.1 Gerald Weig/Ravinder Grover** ITS Number: **3.1.3** TB POC: OSI: **None** JFD Number: **3** DOC Number: **None** Page Number(s): **56** Bases JFD Number: **6**
Comment	**Retain current wording in SR 3.1.3.2 NOTE which states "Shutdown must occur prior to exceeding the minimum allowable boron concentration at which MTC is projected to exceed the lower limit." This also applies to the bases statement (pg 63). JFD #3 states that this is for clarification. Since this is not in CTS then the ISTS wording should be maintained as much as possible. This change is unnecessary.**
Issue Date	**01/24/2008**
Close Date	**01/28/2008**

Responses

Licensee Response by Bryan Kays on 01/27/2008	The note for ITS SR 3.1.3.2 (Volume 6, Page 56) has been revised to the ISTS wording. Additionally, Discussion of Change (DOC) A03 (Page 52) and the ITS 3.1.3 Bases (Page 63) has been corrected. Furthermore, the specification Justification for Deviation (JFD) 3 (Page 57) and the Bases JFD 6 (Page 64) have been deleted. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 01/28/2008	Requested change has been made. No further questions at this time. This item is closed.

Date Created: 01/24/2008 01:38 PM by Timothy Kolb
Last Modified: 01/28/2008 09:10 AM

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RAI Screening Required: No

Status: Approval Not Required

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Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200801241341** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.1 Gerald Weig/Ravinder Grover** ITS Number: **3.1.5** TB POC: OSI: **None** JFD Number: **None** DOC Number: **M.3** Page Number(s): **109** Bases JFD Number: **None**
Comment	**DOC M03 incorrectly references ITS 3.2.4 ACTION B in the middle of the first paragraph. Change to ITS 3.1.5 ACTION B.**
Issue Date	**01/24/2008**
Close Date	**01/28/2008**

Responses

Licensee Response by Bryan Kays on 01/27/2008	ITS 3.1.5 Discussion of Change (DOC) M03 (Volume 6, Page 109) has been changed to correct the typographical error. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 01/28/2008	Requested change has been made. No further questions at this time. This item is closed.

Date Created: 01/24/2008 01:41 PM by Timothy Kolb
Last Modified: 01/28/2008 09:12 AM

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RAI Screening Required: No

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Status: Approval Not Required

This document will not be relied upon by staff for disposition of the LAR

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200801241344** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.1** TB POC: **Gerald Weig/Ravinder Grover** OSI: **None** ITS Number: **3.1.5** JFD Number: **None** DOC Number: **L.1** Page Number(s): **111** Bases JFD Number: **None**
Comment	**In last paragraph it says "This ensures that prior to entering the Applicability the shutdown rods....."** **This should be revised to "This ensures that prior to entering the Applicability the safety rods...."**
Issue Date	**01/24/2008**
Close Date	**01/28/2008**

Responses

Licensee Response by Bryan Kays on 01/27/2008	ITS 3.1.5 Discussion of Change (DOC) L01 (Volume 6, Page 111) has been changed to correct the wording in the second paragraph. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 01/28/2008	The requested change has been made. No further questions at this time. This item is closed.

Date Created: 01/24/2008 01:44 PM by Timothy Kolb
Last Modified: 01/28/2008 09:13 AM

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RAI Screening Required: No

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This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted)

Status: Approval Not Required

This document will not be relied upon by staff for disposition of the LAR

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200801280945** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.1** TB POC: **Gerald Weig/Ravinder Grover** JFD Number: **None** Page Number(s): **206** OSI: **None** DOC Number: **L.3** Bases JFD Number: **None** ITS Number: **3.1.9**
Comment	**In the middle of the second paragraph it reads "CTS 3.1.1.4 (ITS 3.4.2) requires the RCS lowest operating loop temperature to be > or = 525 F." Revise is to say "CTS 3.1.1.4 (ITS 3.4.2) requires the RCS lowest operating loop average temperature to be > or = 525 F."**
Issue Date	**01/28/2008**
Close Date	**01/30/2008**

Responses

Licensee Response by Jerry Jones on 01/30/2008	Davis-Besse has changed the statement to be identical to the CTS 3.1.1.4 statement. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 01/30/2008	Requested item has been changed. No further questions at this time. This item is closed.

Date Created: 01/28/2008 09:45 AM by Timothy Kolb
Last Modified: 01/30/2008 02:28 PM

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RAI Screening Required: No

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This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted)

Status: Approval Not Required

This document will not be relied upon by staff for disposition of the LAR

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200801281012** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.1 Gerald Weig/Ravinder Grover** ITS Number: **3.1.9** TB POC: OSI: **None** JFD Number: **None** DOC Number: **None** Page Number(s): **201** Bases JFD Number: **None**
Comment	**The added wording indicated to replace > or = 1% k/k per Doc LA02 should remove the word "not" such that the LCO reads "The SHUTDOWN MARGIN shall be within limits specified in the COLR."**
Issue Date	**01/28/2008**
Close Date	**01/30/2008**

Responses

Licensee Response by Jerry Jones on 01/29/2008	See the response for question 200712030851; this same question has already been asked, answered, and closed by the NRC reviewer in 200712030851.
NRC Response by Timothy Kolb on 01/30/2008	Licensee is correct. The issue has been corrected. This item is closed.

Date Created: 01/28/2008 10:12 AM by Timothy Kolb
Last Modified: 01/30/2008 06:57 AM

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RAI Screening Required: No

This is a Non RAI Dialogue

This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted) **Yes**

Status: Approval Not Required

This document will not be relied upon by staff for disposition of the LAR

NRC ITS TRACKING

NRC Reviewer

ID	**200801281501** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.1** ITS Number: **3.1.9** TB POC: **Gerald Weig/Ravinder Grover** OSI: **None** JFD Number: **None** DOC Number: **None** Page Number(s): **209** Bases JFD Number: **None**
Comment	**It appears that deleted ISTS surveillance SR3.1.9.2 to verify nuclear overpower trip setpoint is < or = 25% RTP every 8 hours is associated with TSTF-467 by the way the documentation is shown. Remove the reference to TSTF-467 since deleting this SR is not associtated with that TSTF.**
Issue Date	**01/28/2008**
Close Date	**02/12/2008**

Responses

Licensee Response by Jerry Jones on 02/11/2008	There are two changes associated with ISTS SR 3.1.9.2 (Volume 6, Page 209). The first one changes the SR number from SR 3.1.9.2 to SR 3.1.9.3. This is the change associated with TSTF-497. The second change is deleting the SR entirely. This is associated with Justification for Deviation (JFD) 4. Both the TSTF and the JFD are annotated against the SR, with the TSTF change identified first since it is the first change applied to the SR. This is the manner in which two or more changes to a single item are identified in the ISTS Markups. Therefore, no change to the ISTS markup appears necessary.
Licensee Response by Jerry Jones on 02/11/2008	There are two changes associated with ISTS SR 3.1.9.2 (Volume 6, Page 209). The first one changes the SR number from SR 3.1.9.2 to SR 3.1.9.3. This is the change associated with TSTF-497. The second change is deleting the SR entirely. This is associated with Justification for Deviation (JFD) 4. Both the TSTF and the JFD are annotated against the SR, with the TSTF change identified first since it is the first change applied to the SR. This is the manner in which two or more changes to a single item are identified in the ISTS Markups. Therefore, no change to the ISTS markup appears necessary.

NRC Response by Timothy Kolb on 02/12/2008	Agree with licensee comment. No further questions on this issue. This item is closed.

Date Created: 01/28/2008 03:01 PM by Timothy Kolb
Last Modified: 02/12/2008 07:12 AM

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Status: Closed

This Document will be approved by: **Greg Cranston**

Regulatory Basis must be included in Comments section of this Form

This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted) **Yes**

NRC ITS TRACKING

NRC Reviewer

ID	**200802281048** Conference Call Requested? **No**
Category	**BSI - Beyond Scope Issue**
ITS Information	ITS Section: **3.1 Gerald Weig/Ravinder Grover** ITS Number: **3.1.9** TB POC: OSI: **17** JFD Number: **2** DOC Number: **None** Page Number(s): **208** Bases JFD Number: **None**
Comment	**In the Justification for Deviation section, Item 2, LCO 3.1.9e, "RCS lowest loop average temperature is greater than or equal to 520 F" has been added. The staff requests the licensee to evaluate the effect, if any, this item would have upon the minimum shutdown margin, particularly with respect to the no-load steam line break analysis.**
Issue Date	**02/28/2008**
Close Date	**03/19/2008**

Responses

Licensee Response by Jerry Jones on 03/10/2008	ISTS 3.4.9 (Volume 6, Page 208) allows LCO 3.4.2, "RCS Minimum Temperature for Criticality," to be suspended during performance of a MODE 2 Physics Test. The ISTS Bases, Applicable Safety Analyses section (Page 214) (which has been maintained in the Davis-Besse ITS Bases) explains that: "Shutdown capability is preserved by limiting maximum obtainable THERMAL POWER and maintaining adequate SDM, when in MODE 2 PHYSICS TESTS. In MODE 2, the Reactor Coolant System (RCS) temperature must be within the narrow range instrumentation for plant control. The narrow range temperature instrumentation goes on scale at 520°F. Therefore, it is considered safe to allow the minimum RCS temperature to decrease to 520°F during MODE 2 PHYSICS TESTS, based on the low probability of an accident occurring and on prior operating experience." The Applicable Safety Analyses section of the Bases for ISTS 3.4.2 (Volume 9, Page 35) states that there are no accident analyses that dictate the minimum temperature for criticality. Furthermore, the ISTS 3.4.2 Bases Background section states that the reactor coolant moderator temperature coefficient used in core operating and accident analysis are defined for the normal operating temperature range. It also

	states that Safety and operating analyses for lower temperatures have not been made. Davis-Besse has maintained the above information in the ITS Bases (it has all been placed in the Applicable Safety Analyses section), and has also included the following information: Compliance with the LCO ensures that the reactor will not be made or maintained critical at a temperature significantly less than the hot zero power (HZP) temperature, which is assumed in the safety analysis (Ref. 1). Failure to meet the requirements of this LCO may produce initial conditions inconsistent with the initial conditions assumed in the safety analysis." Therefore, as shown above, the ISTS Bases acknowledges that there are no safety analyses that assume a minimum temperature for criticality (MTC). The allowance to go below the normal limit in LCO 3.4.2 (525 degrees F) is acceptable, as stated in ISTS 3.1.9 Bases, based on the low probability of an accident occurring and on prior operating experience. Thus, Davis-Besse does not believe that any special evaluation is required to adopt the allowance to go below the 525 degree F MTC limit of LCO 3.4.2, since the ISTS does not base the allowance on any special evaluation. Furthermore, the ISTS 3.1.9 lower limit for the MTC was previously only stated in the Bases. TSTF-467T is correcting an error in the ISTS, in that the minimum limit must be specified in the Technical Specifications; it cannot only be specified in the Bases since the Bases cannot change the requirements of the Technical Specification (and ISTS 3.1.9, as written, specifically exempts the requirements of LCO 3.4.2).

Date Created: 02/28/2008 10:48 AM by Jason Paige
Last Modified: 03/19/2008 07:26 AM

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Status: Approval Not Required

This document will not be relied upon by staff for disposition of the LAR

NRC ITS TRACKING

NRC Reviewer

ID	**200801281544** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.1 Gerald Weig/Ravinder Grover**; ITS Number: **None**; TB POC: ; OSI: **None**; JFD Number: **None**; DOC Number: **R.1**; Page Number(s): **236**; Bases JFD Number: **None**
Comment	**Revise statement in R01 Doc which currently states "This change is acceptable because CTS 3/4.1.2.2 does not meet..." to "This change is acceptable because CTS 3/4.1.2.1 does not meet..."**
Issue Date	**01/28/2008**
Close Date	**01/31/2008**

Responses

Licensee Response by Bryan Kays on 01/30/2008	CTS 3/4.1.2.1 Discussion of Change (DOC) R01 typographical error has been corrected. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 01/31/2008	Requested action has been performed. No further questions at this time. This item is closed.

Date Created: 01/28/2008 03:44 PM by Timothy Kolb
Last Modified: 01/31/2008 06:55 AM

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RAI Screening Required: Yes

Status: Closed

This Document will be approved by: **Carl Schulten; Gerald Waig**

Regulatory Basis must be included in Comments section of this Form

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Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200801291531** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.1 Gerald Weig/Ravinder Grover** ITS Number: **None** TB POC: OSI: **None** JFD Number: **None** DOC Number: **L.1** Page Number(s): **291** Bases JFD Number: **None**
Comment	**Revise submittal for removing CTS LCO 3.1.3.8 from being an L-DOC to an R-DOC. Category L01 is inappropriate for removing an entire LCO requirement. It is more than a relaxation of LCO requirements. This change must be justified to not meet the 4 criteria to remain in Tech Specs and may be relocated to a licensee controlled document.** **Per NEI 96-06 the following is applicable: RELOCATED (designated "R"): requirements which are LCOs which do not meet the 10 CFR 50.36 selection criteria and may be relocated to licensee controlled documents. LESS RESTRICTIVE (designated "L") are requirements that are relaxed, or those where new flexibility is provided.** **This is also supported by the Commissions Policy Statement (58 FR 39132).**
Issue Date	**01/29/2008**
Close Date	**03/04/2008**

Responses

Licensee Response by Jerry Jones on 02/11/2008	The use of an "R" Discussion of Change (DOC) to remove an entire LCO requirement from the Current Technical Specifications is for those LCOs that do not meet any of the 4 criteria of 10 CFR 50.36(d)(2)(ii). These LCOs are either generic type LCOs that are discussed in the B&W Owners Group Technical Report 47-1170689-00 (See Volume 1, Page 9, Reference 2) and approved for relocation by the NRC (See Volume 1, Page 9, Reference 3) or those that are plant specific LCOs not covered by the Technical Report above. Other LCOs can be deleted from the Technical Specifications using either an "LA" DOC, an "M" DOC, or an "L" DOC. For example, in this Section, CTS 3/4.1.1.2 and 3/4.1.3.8 (generic type LCOs) are deleted using an "L" DOC, and CTS 3/4.10.3 and CTS 3/4.10.4 (generic type LCOs) are deleted using an "M" DOC. In other Sections, certain generic type LCOs

	are deleted using "LA" DOCs. This has occurred in many ITS conversions and is documented in the associated NRC Safety Evaluations. For example, in the DC Cook ITS conversion, CTS 3/4.1.1.2 deleted in its entirety using an "L" DOC, not an "R" DOC in the NRC Safety Evaluation (Safety Evaluation dated June 1, 2005, ADAMS Accession No. ML050620034). Thus, entire LCOs that are being deleted from the Technical Specifications can be deleted using any number of types of DOCs, not just an "R" DOC. Davis-Besse did not use an "R" DOC for the deletion of CTS 3/4.1.3.8 because Davis-Besse cannot state that it does not meet any of the 4 criteria. Furthermore, during a recent phone conversation with the NRC reviewer concerning this issue, the NRC reviewer concurred that it was not clear as to whether or not the NRC considered this LCO met any of the 4 criteria in the Reference 3 document above. DOC L01 (Volume 6, Page 292) states the following: CTS 3.1.3.8 provides the ability to prevent excessive power peaking by transient xenon at RATED THERMAL POWER. Originally, operating restrictions were imposed on all the Babcock and Wilcox units due to power peaking resulting from transient xenon. The restrictions, known as the "power level cutoff," represented a tradeoff between wider operational envelopes and achievable power level during xenon transients. The power level cutoff temporarily reduced the maximum power level for operation as power was increased during a xenon transient. The peaking considerations from transient xenon are now implicitly included in the Davis-Besse reload safety evaluation analysis, so that the power level cutoff has been raised to 100% RTP. This effectively eliminates the operational restrictions due to transient xenon. CTS 3.1.3.8 contains the power level cutoff requirements; however, the regulating rod insertion figures (required by CTS 3.1.3.6 and ITS 3.2.1) show the value has been increased to 100% RTP. Therefore, this change is acceptable since improvements in core maneuvering analysis techniques have resulted in the restrictions of this Specification no longer being necessary to support core power peaking and rod insertion limits. Thus, the LCO at one time did protect certain limits, but it is not needed any longer since the peaking considerations are now included in the reload safety evaluation analysis. Also, this change was previously reviewed by the NRC as part of the Safety Evaluation relating to a B&W Topical Report BAW-10179P, Safety Criteria and Methodology for Acceptable Cycle Reload Analyses. The Safety Evaluation concluded that it was acceptable to eliminate the hold to the power level cutoff value if the reload safety analysis shows that the increase in peaking due to transient xenon without the temporary hold is no greater than the xenon factor. The applicable portions of the Safety Evaluation and the Topical Report are attached. Therefore, Davis-Besse believes that the "L" DOC classification is correct and should not be changed to an "R" DOC.
NRC Response by Timothy Kolb on 02/21/2008	Please provide the current applicable COLR limits for review.
Licensee Response by Bill Bentley on 03/04/2008	Requested pages from the COLR are attached with names redacted.
NRC Response by Timothy Kolb on 03/04/2008	Verified that other TS conversions deleted CTS specifications using L Docs. Additional documentation supports removing this CTS TS by 1) COLR shows power cutoff value of 100%, 2) COLR referenced in Admin Section of ISTS, 3) STS do not contain this specification, and 4) STS 3.2.1 provides adequate protection for regulating rod insertion limits. No further questions at this time. This item is closed.

Date Created: 01/29/2008 03:31 PM by Timothy Kolb
Last Modified: 03/04/2008 12:14 PM

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

March 16, 1993

Mr. Joseph D. McCarthy, Chairman
BWOG Core Performance Committee
1700 Rockville Pike, Suite 525
Rockville, MD 20852

Dear Mr. McCarthy:

SUBJECT: ACCEPTANCE FOR REFERENCING OF LICENSING TOPICAL REPORT BAW-10179P, "SAFETY CRITERIA AND METHODOLOGY FOR ACCEPTABLE CYCLE RELOAD ANALYSES" (TAC NO. M80189)

The staff has reviewed the topical report submitted by the B&W Owners Group by letter dated February 8, 1991. The report is acceptable for referencing in license applications to the extent specified and under the limitations stated in the enclosed report and U.S. Nuclear Regulatory Commission (NRC) evaluation. The evaluation defines the basis for acceptance of the report.

The staff will not repeat its review of the matters described in the report and found acceptable when the report appears as a reference in license applications, except to assure that the material presented applies to the specific plant involved. NRC acceptance applies only to the matters described in the report. In accordance with procedures established in NUREG-0390, the NRC requests that B&W publish accepted versions of the report, proprietary and non-proprietary, within 3 months of receipt of this letter. The accepted versions shall incorporate this letter and the enclosed evaluation between the title page and the abstract and an -A (designating accepted) following the report identification symbol.

If the NRC's criteria or regulations change such that its conclusions as to the acceptability of the report are invalidated, the B&W Owners Group and/or the applicants referencing the topical report will be expected to revise and resubmit their respective documentation, or submit justification for the continued applicability of the topical report without revision of their respective documentation.

Sincerely,

Ashok C. Thadani, Director
Division of Systems Safety and Analysis

Enclosure:
BAW-10179P Evaluation

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATING TO TOPICAL REPORT BAW-10179P
SAFETY CRITERIA AND METHODOLOGY
FOR ACCEPTABLE CYCLE RELOAD ANALYSES

1. INTRODUCTION

In a letter of February 8, 1991, from R. E. Sund to the U. S. Nuclear Regulatory Commission, the Babcock and Wilcox (B&W) Owners Group submitted Topical Report BAW-10179P for NRC review. The topical report describes the safety criteria that are applied to the fuel (mechanical), nuclear, thermal-hydraulic, and safety analyses for the reload fuel currently supplied by B&W Fuel Company (BWFC) for the B&W-designed 177-fuel-assembly class of plants. The methodologies for determining that the specific criteria are met are also described. The parameters that are monitored and controlled to prevent violation of the design criteria are specified and those operating limits that are cycle specific may be placed in a core operating limits report (COLR).

2. SUMMARY OF TOPICAL REPORT

Chapter 1.0 gives a general introduction to the safety criteria and methodology used by BWFC for acceptable cycle reload analyses. Reference is made to NRC Generic Letter 88-16 (Ref. 1) which allows cycle-dependent variables to be removed from Technical Specifications (TS) and placed in a COLR. The various parts of Title 10 of the Code of Federal Regulations which detail the safety criteria considered for plant design are given in Chapter 2.0 and the various conditions of operation and transients used by BWFC and the NRC are categorized there. Chapter 3.0 describes the reference fuel for the BWFC Mark-B design and the mechanical safety and design criteria are given in Chapter 4.0. The nuclear design appears in Chapter 5.0 along with analysis methods and acceptance criteria. Core thermal-hydraulic design criteria and analysis methods are described in Chapter 6.0. Chapter 7.0 discusses the reactor protection system (RPS) trip setpoints, and the accident analysis is covered in Chapter 8.0.

3. TECHNICAL EVALUATION OF REPORT

The evaluation of BAW-10179P was based mainly on an assessment of the general methodology presented, the scope and applicability of the methods discussed, the bounding analysis concept, and the role of key safety parameters. Much of the information references previously accepted topical reports. Therefore, the staff considered the information presented in the topical report

Axial power shaping rods (APSRs) are incorporated to prevent or damp shifts in axial power distribution caused by xenon oscillations. This addresses the criterion of GDC 12 requiring the reactor core and the associated coolant system to be designed to ensure that power oscillations which can result in conditions exceeding SAFDLs are not possible or can be reliably and readily detected and suppressed. Early studies of simulated xenon transients showed that the increase in power peaking could be limited by implementing a temporary hold at reduced power. This reduced allowable power limit, which was required by TS, was called the power level cutoff. The NRC has approved eliminating the hold at the power level cutoff if the reload safety analysis shows that the increase in peaking due to transient xenon without the temporary hold is no greater than the xenon factor. Xenon factors are applied to steady-state power distributions to simulate the effect of transient xenon on core peaking.

The safety evaluations performed for accidents in the Final Safety Analysis Report (FSAR), or any updates or revisions, assume bounding values for the various neutronic parameters. In order to determine that the safety analyses remain valid for a reload cycle, the cycle-specific values of these bounding parameters are evaluated. If the reload calculations show that the values of these parameters fall within the bounds of the reference safety analyses, then the FSAR results will continue to be applicable. The nuclear parameters reviewed are the maximum and minimum values of the Doppler and moderator coefficients, soluble boron worths, control rod worths, critical boron concentrations, kinetic parameters, and transient peaking conditions. Since the appropriate nuclear parameters have been considered, this is an acceptable method for evaluating reload safety analyses.

Thermal-Hydraulic Design

In the evaluation of the core thermal-hydraulics, the departure from nucleate boiling ratio (DNBR) safety criterion used by B&W is that there shall be at least a 95-percent probability at a 95-percent confidence level that the hot fuel rod in the core does not experience DNB during normal operation or AOOs. This criterion is met by ensuring that the minimum predicted DNBR is not less than the DNB design limit based on an approved critical heat flux (CHF) correlation (Refs. 12, 13). Since NRC-approved CHF correlations are used for each fuel design type being analyzed, with their corresponding approved computer codes (Refs. 14, 15, 16, 17), this is acceptable.

These approved codes are used to account for the effects of core power distribution, engineering hot channel factors, reactor core coolant flow, core inlet flow distribution, fuel rod bowing, and fuel densification effects, as well as such fuel assembly hydraulics as fuel assembly lift and core pressure drop. In

The stability index is the time constant in the transcendental equation fit to the imbalance oscillation. If the stability index is negative, then the oscillation is naturally damped. If the stability index is positive, the oscillation is divergent, and the regulating rods are used to damp it.

5.2.4 Power Level Cutoff Hold Removal

The effects of peaking due to transient xenon are included in the power distribution analysis either by direct simulation of limiting power distributions from cycle-specific xenon transients or by the use of xenon factors. Xenon factors, which are applied to power distributions simulated at steady-state operation, can be defined to give an adequate representation of the impact of transient xenon on core peaking. A large xenon factor may be used to compensate for the entire magnitude of the increased peaking due to xenon, but its use may require restrictive operating limits (rod insertion or axial imbalance limits). Less restrictive operating limits may result from the use of a smaller xenon factor. However, the smaller factor may not compensate for the total magnitude of the peaking increase, so that power level restrictions may be required during recovery from xenon transients. The power level cutoff hold was originated in the licensing analysis to allow the use of a less restrictive xenon factor; hence, less restrictive operating limits for full power operation.

Earlier studies of peaking due to transient xenon behavior showed that the increase in peaking due to transient xenon could be correlated to xenon concentration. Consequently, the allowable power level during a xenon transient was restricted for a period of time during the xenon redistribution following a power increase. The length of time was chosen to allow the xenon concentration to return to within 10% of its equilibrium value, which was found to ensure that the peaking due to transient xenon had decreased to a value bounded by the xenon factor used in the analysis. Further analyses of simulated xenon transients showed that the increase in power peaking from an equilibrium distribution could be limited acceptably by implementing a two hour hold at reduced power. The reduced allowable power limit required by the technical specifications was called the power level cutoff.

5.2.4.1 Acceptance Criteria

If it can be shown in the reload safety evaluation that the increase in peaking due to transient xenon without the temporary hold at reduced power is no greater than the xenon factor, then the hold at the power level cutoff can be eliminated. The applicable safety criteria are the power peaking-based criteria stated in Section 5.2.2.2. The analysis criterion is stated as follows:

(1) The xenon factor, when used to augment the power peaking from equilibrium xenon power distributions, shall provide bounding LOCA and initial condition DNB peaking margins when compared to those from transient xenon power distributions.

5.2.4.2 Analysis Methods

Elimination of the power level cutoff hold is justified on a cycle-specific basis by comparing peaking during the simulated design transients to the steady-state peaking augmented by the xenon factor. This comparison, performed on a cycle-by-cycle basis, verifies the continued removal of the power level cutoff hold and also verifies the applicability of the xenon factor used in the analysis.

5.2.5 Overcooling Transient

Overcooling events cause a reduction in reactor coolant inlet temperature. The potential temperature-induced measurement error in the indicated excore neutron power (utilized by the reactor protection system) for some overcooling transients may exceed the value assumed in the safety analysis. Such a condition could cause the actual thermal power level to exceed 112% without causing a reactor trip, resulting in the potential for centerline fuel melting or DNB.

5.2.5.1 Acceptance Criteria

The applicable safety criteria are prevention of centerline fuel melting and steady-state DNB, as specified in Section 5.2.1.2. To ensure that the power distribution limits will preserve the safety criteria, the following analysis criterion is applied in the power distribution analysis:

CFM and steady-state DNB peaking margins from power distributions that simulate the overcooling transient shall not violate the CFM and

FIRSTENERGY NUCLEAR OPERATING COMPANY

DAVIS-BESSE UNIT 1

CYCLE 16

CORE OPERATING LIMITS REPORT

Prepared by [redacted] 1/17/2008

Reviewed by [redacted] 1/18/2008

Approved by [redacted] 1/18/2008

LIST OF EFFECTIVE PAGES

Page C-1 through C-31 Rev. 0

Technical Specification/COLR Cross-Reference

Technical Specification	COLR Figure/Table	
3.1.3.6 and 3.1.3.8	Figure 1a	Regulating Group Position Operating Limits, 0 to 300 ±10 EFPD, Four RC Pumps, 2772 MWt
3.1.3.6 and 3.1.3.8	Figure 1b	Regulating Group Position Operating Limits, After 300 ±10 EFPD, Four RC Pumps, 2772 MWt
3.1.3.6 and 3.1.3.8	Figure 1c	Regulating Group Position Operating Limits, 0 to 300 ±10 EFPD, Three RC Pumps, 2772 MWt
3.1.3.6 and 3.1.3.8	Figure 1d	Regulating Group Position Operating Limits, After 300 ±10 EFPD, Three RC Pumps, 2772 MWt
3.1.3.7	Figure 2	Control Rod Core Locations and Group Assignments
3.1.3.9	Figure 3	APSR Position Operating Limits, 2772 MWt
3.2.1	Figure 4a	AXIAL POWER IMBALANCE Operating Limits, 0 to 350 ±10 EFPD, Four RC Pumps, 2772 MWt
3.2.1	Figure 4b	AXIAL POWER IMBALANCE Operating Limits, 350 ±10 to 600 ±10 EFPD, Four RC Pumps, 2772 MWt
3.2.1	Figure 4c	AXIAL POWER IMBALANCE Operating Limits, After 600 ±10 EFPD, Four RC Pumps, 2772 MWt
3.2.1	Figure 4d	AXIAL POWER IMBALANCE Operating Limits, 0 to 350 ±10 EFPD, Three RC Pumps, 2772 MWt
3.2.1	Figure 4e	AXIAL POWER IMBALANCE Operating Limits, 350 ±10 to 600 ±10 EFPD, Three RC Pumps, 2772 MWt

FIRSTENERGY NUCLEAR OPERATING COMPANY

DAVIS-BESSE UNIT 1

CYCLE 16

CORE OPERATING LIMITS REPORT

1.0 Core Operating Limits

This CORE OPERATING LIMITS REPORT for DB-1 Cycle 16 has been prepared in accordance with the requirements of Technical Specification 6.9.1.7. The Core Operating Limits have been developed using the methodology provided in reference 2.0 (1). The licensed length of Cycle 16 is 741.8 EFPDs (based on a reactor thermal rating of 2772 MWt which is equivalent to 730 EFPDs at 2817 MWt).

The following cycle-specific core Operating Limits, Protective Limit and Flux -Δ Flux/Flow Reactor Protection System Allowable Values are included in this report:

1) Regulating Group Position Alarm Setpoints (error adjusted Operating Limits) and Xenon reactivity "power level cutoff"

2) Rod program group positions (Control Rod Core locations and group assignments)

3) Axial Power Shaping Rod Alarm Setpoints (error adjusted Operating Limits)

4) AXIAL POWER IMBALANCE Alarm Setpoints (error adjusted Operating Limits)

5) AXIAL POWER IMBALANCE Protective Limits

6) Flux-ΔFlux/Flow (or Power/Imbalance/Flow) Allowable Values

7) QUADRANT POWER TILT limits

8) Negative Moderator Temperature Coefficient limit

9) Nuclear Heat Flux Hot Channel Factor, F_Q and

10) Nuclear Enthalpy Rise Hot Channel Factor, $F^N_{\Delta H}$

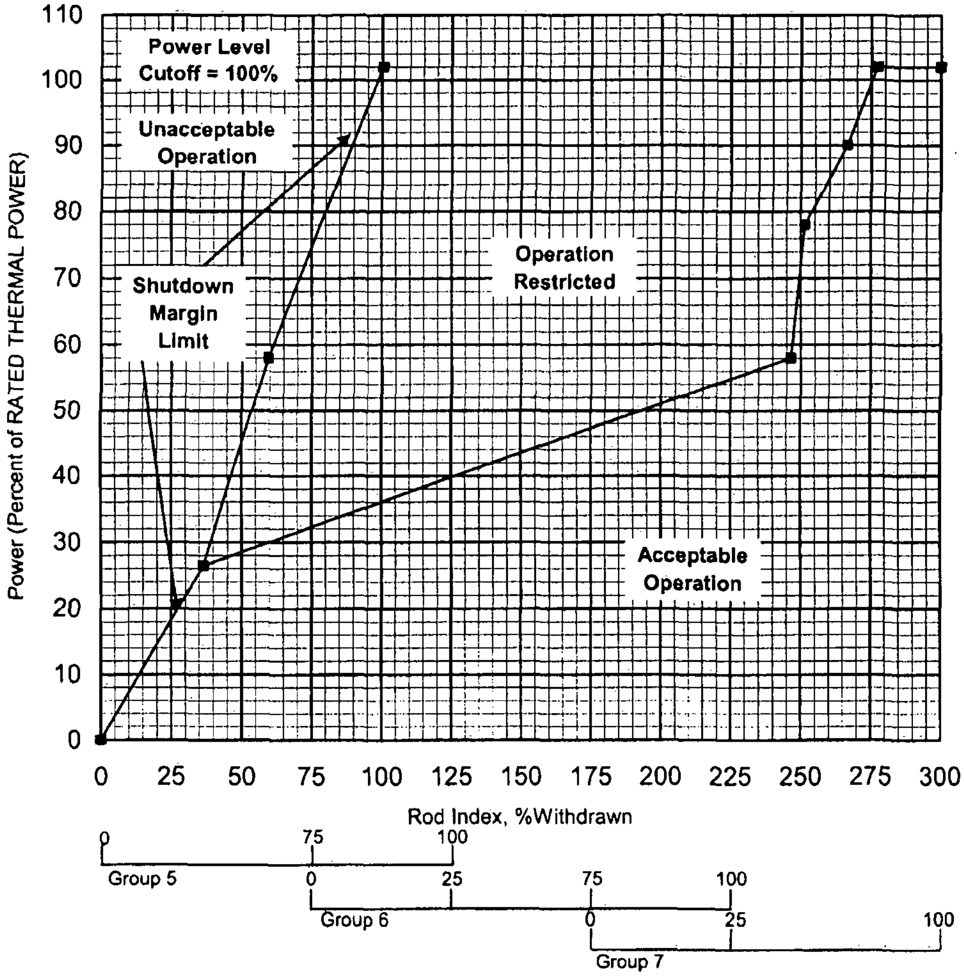
2.0 References

1) BAW-10179P-A, Rev. 6, "Safety Criteria and Methodology For Acceptable Cycle Reload Analyses", August, 2001.
2) BAW-10164P-A, Rev. 6, "RELAP5/MOD2-B&W – An Advanced Computer Program for Light Water Reactor LOCA and Non-LOCA Transient Analysis", June, 2007.

3) BAW-10243P-A, "Statistical Fuel Assembly Hold Down Methodology", September, 2005.

Figure 1a Regulating Group Position Operating Limits
0 to 300 ±10 EFPD, Four RC Pumps--2772 MWt RTP
Davis-Besse 1, Cycle 16

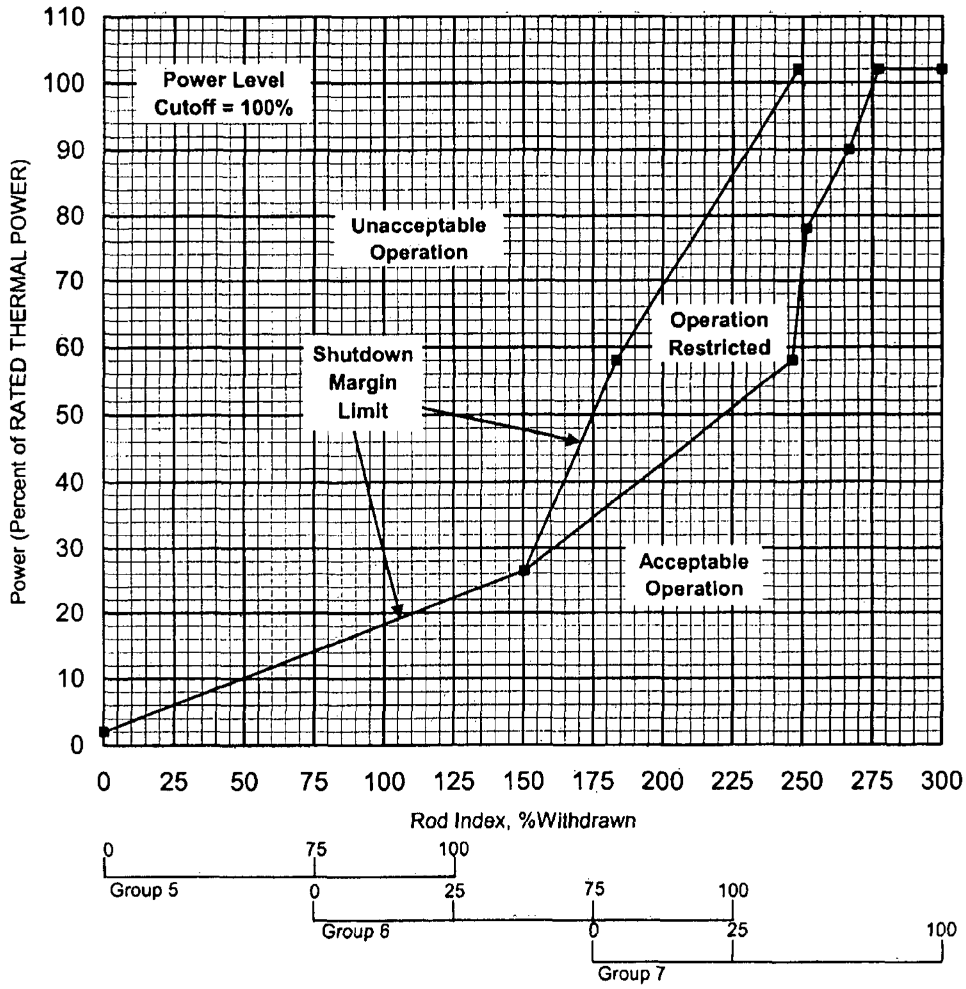
This Figure is referred to by Technical Specifications 3.1.3.6 and 3.1.3.8



Note 1: A Rod Group overlap of 25 +/- 5% between sequential withdrawn groups 5 and 6, and 6 and 7, shall be maintained.
Note 2: Instrument error is accounted for in these Operating Limits.

Figure 1b Regulating Group Position Operating Limits
After 300 ±10 EFPD, Four RC Pumps –2772 MWt RTP
Davis-Besse 1, Cycle 16

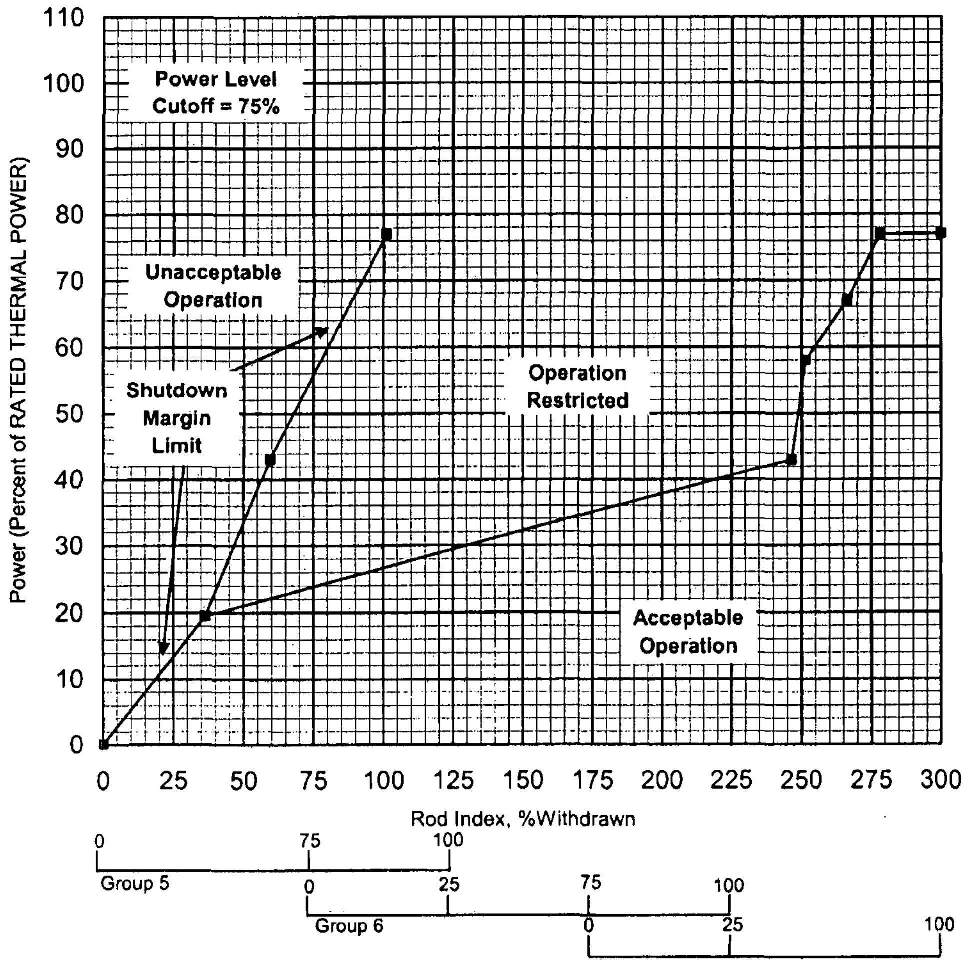
This Figure is referred to by Technical Specifications 3.1.3.6 and 3.1.3.8



Note 1: A Rod Group overlap of 25 ±5% between sequential withdrawn groups 5 and 6, and 6 and 7, shall be maintained.
Note 2: Instrument error is accounted for in these Operating Limits.

Figure 1c Regulating Group Position Operating Limits
0 to 300 ±10 EFPD, Three RC Pumps–2772 MWt RTP
Davis-Besse 1, Cycle 16

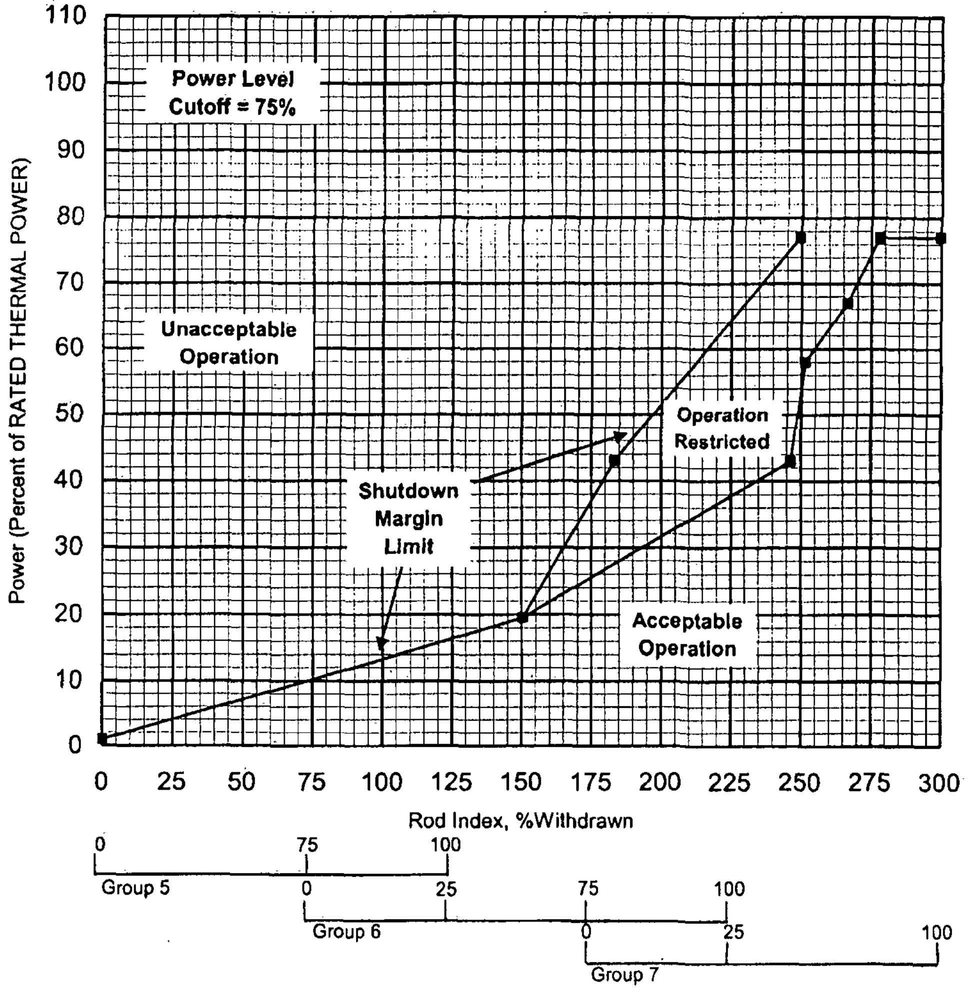
This Figure is referred to by Technical Specifications 3.1.3.6 and 3.1.3.8



Note 1: A Rod Group overlap of 25 +/- 5% between sequential withdrawn groups 5 and 6, and 6 and 7, shall be maintained.
Note 2: Instrument error is accounted for in these Operating Limits.

Figure 1d Regulating Group Position Operating Limits
After 300 ±10 EFPD, Three RC Pumps --2772 MWt RTP
Davis-Besse 1, Cycle 16

This Figure is referred to by Technical Specifications 3.1.3.6 and 3.1.3.8



Note 1: A Rod Group overlap of 25 ±5% between sequential withdrawn groups 5 and 6, and 6 and 7, shall be maintained.
Note 2: Instrument error is accounted for in these Operating Limits.

Section 3.2 RAIs

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RAI Screening Required: Yes

This Document will be approved by: **Greg Cranston**

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Status: Closed

Regulatory Basis must be included in Comments section of this Form

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200710031426** Conference Call Requested? **No**
Category	**BSI - Beyond Scope Issue**
ITS Information	ITS Section: **3.2 Gerald Weig**; TB POC: ; JFD Number: **1**; Page Number(s): **17**; ITS Number: **3.2.1**; OSI: **None**; DOC Number: **L.1**; Bases JFD Number: **None**
Comment	**In Section 3.2.1, "Regulating Rod Insertion Limits," Action A in the Standard TSs states "once per" and "from discovery of failure to meet the LCO" in the completion times. In the proposed Improved TSs for Davis Besse, Action C does not have the same wording of "once per" and "from discovery of failure to meet the LCO" in the completion times. Action C was formed from Action A and the staff believes that the wording in the completion times should remain the same. The staff requests the licensee to clarify the Action C wording and provide justification why the Action A Completion Time wording is omitted.**
Issue Date	**10/03/2007**
Close Date	**01/24/2008**

Responses

Licensee Response by Jerry Jones on 10/12/2007	ISTS 3.2.1 ACTION A (Volume 7, Page 16) provides actions for when the regulating rods are not within the insertion limits, the sequence limits, and the overlap limits. ISTS 3.2.1 Required Action A.2 allows up to 24 hours to restore the regulating rods to within limits. Thus, the Completion Time of ISTS 3.2.1 Required Action A.1 makes sense, since it requires SR 3.2.5.1 to be performed every 2 hours during this 24 hour period. However, in the Davis-Besse ITS, ITS 3.2.1 ACTION A provides the actions for when the insertion limits are not met and ITS 3.2.1 ACTION C (Page 17) provides the actions for when the sequence and overlap limits are not met. ITS 3.2.1 Required Action C.2 requires the sequence and overlap limits to be met within 4 hours. ITS 3.2.1 Required Action C.1 is required to be performed within 2 hours. The "once per" Completion Time is not necessary since the next time the SR could be required assuming it needs to be performed every 2 hours (at time 4 hours), the limits must be met or a shutdown would be required by ITS 3.2.1 ACTION E (Page 18). The wording "from discovery of failure to meet the LCO" is

	normally used in the ISTS if there is a possibility of entering and exiting multiple ACTIONS and never meeting the LCO requirements. This was previously described in Example 1.3-3 in NUREG-1430, Rev. 2, Section 1.3. However, these words were deleted from NUREG-1430, Rev 3 as part of TSTF-439. These words should have been deleted from ISTS 3.2.1 ACTION A also, since they do not provide any additional requirements. ISTS 3.2.1 ACTION A is entered when the Condition A is met, and LCO 3.0.2 requires the Required Actions of the associated Completion Time to be met upon the discovery of a failure to meet the LCO. Therefore, the wording "from discovery to meet the LCO" is redundant to the wording in LCO 3.0.2. Thus, the words were not added to ITS 3.2.1 Required Action C.2 Completion Time and should be deleted from ITS 3.2.1 Required Action A.2 Completion Time. A draft markup regarding these changes is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.

Date Created: 10/03/2007 02:26 PM by Jason Paige
Last Modified: 01/24/2008 01:59 PM

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RAI Screening Required: Yes

This Document will be approved by: **Carl Schulten**

This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted)

Status: Closed

Regulatory Basis must be included in Comments section of this Form

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200801211620** Conference Call Requested? **No**
Category	**BSI - Beyond Scope Issue**
ITS Information	ITS Section: **3.2 Gerald Weig/Ravinder Grover** ITS Number: **3.2.1** TB POC: **Gerald Waig** OSI: **None** JFD Number: **1** DOC Number: **None** Page Number(s): **19** Bases JFD Number: **None**
Comment	**Question:** **Explain why proposed ITS, LCO 3.2.1, ACTION C, Completion Time (CT) does not include the wording "... from discovery of failure to meet the LCO" as contained in STS, ACTION A, from which it is taken.** **Discussion:** **As explained in the JFD, the proposed ITS, LCO 3.2.1, ACTION C was added to the ITS and proposes 4 hours (CT) to restore the regulating rod groups to within sequence and overlap limits. The ITS and STS, ACTION A, CT include the additional wording "...from discovery of failure to meet the LCO." Since the ITS, LCO 3.2.1, ACTION C is taken from STS, LCO 3.2.1, ACTION A, explain why this wording is not included in the proposed ITS, LCO 3.2.1, ACTION C CT.** **Regulatory Reference:** **10 CFR 50.36(d)(1)(ii)(A)**
Issue Date	**01/21/2008**
Close Date	**01/28/2008**

Responses

Licensee Response by Bryan Kays on 01/24/2008	This question appears to be a duplicate of 200710031426. See the response for question 200710031426.

Date Created: 01/21/2008 04:20 PM by Gerald Waig
Last Modified: 01/28/2008 09:11 AM

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Status: Approval Not Required

This document will not be relied upon by staff for disposition of the LAR

This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted)

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200802211310** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.2 Gerald Weig/Ravinder Grover** TB POC: ITS Number: **3.2.4** OSI: **None** JFD Number: **None** DOC Number: **None** Page Number(s): **87** Bases JFD Number: **None**
Comment	**This item is created to allow licensee to provide additional information pertaining to ITS 3.2.4, Action A.1.2.2. This information will be reviewed as an update to the ITS submittal. This was requested by licensee per e-mail dated 2/20/2008.**
Issue Date	**02/21/2008**
Close Date	**03/13/2008**

Responses

Licensee Response by Jerry Jones on 02/21/2008	ITS 3.2.4 Required Action A.1.2.2 (Volume 7, Page 87) has been changed to require a reduction in the High Flux trip setpoint and Flux-ΔFlux-Flow trip setpoint to less than or equal to 2% for each 1% of QPT in excess of the steady state limit, in lieu of the current requirement of 2% from the ALLOWABLE THERMAL POWER for each 1% of QPT in excess of the steady state limit. This change is consistent with the current licensing basis (Page 78), consistent with the Bases wording for Required Action A.1.2.2 (Page 98), and consistent with similar Required Actions in ITS 3.2.5 (Page 119). Additionally, without this change, Operators must know that they have to reduce power even further after completing Required Action A.1.2.1. Otherwise, when they comply with Required Action A.1.2.2, they will end up lowering the trip setpoints to the same power level stipulated by Required Action A.1.2.1 and cause a reactor trip.
NRC Response by Ravinder Grover on 03/13/2008	Have received all the required information for review. No further information is necessary at this time.

Date Created: 02/21/2008 01:10 PM by Ravinder Grover
Last Modified: 03/13/2008 11:22 AM

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RAI Screening Required: Yes

This Document will be approved by: **Greg Cranston**

This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted)

Status: Closed

Regulatory Basis must be included in Comments section of this Form

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200801111025** Conference Call Requested? **No**
Category	**BSI - Beyond Scope Issue**
ITS Information	ITS Section: **3.2 Gerald Weig/Ravinder Grover** TB POC: OSI: **16** ITS Number: **3.2.5** JFD Number: **None** DOC Number: **L.2** Page Number(s): **115** Bases JFD Number: **None**
Comment	**In the Less Restrictive Changes section, L02, justifies changing the Completion Time from 4 hours to 10 hours by stating "this change is acceptable because the Completion Time is consistent with safe operation under the specified Condition, considering the OPERABILITY status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the allowed Completion Time." The submittal continues to state "the revised Completion Time of 10 hours is considered reasonable based upon the number of steps required to complete the action and the low probability of an accident occurring during the Completion Time that would require the associated trips to function." The information provided is not sufficient for the staff to make a decision that would support the proposal of increasing the Completion Time to 10 hours. This increase is 2 hours more than the NUREG (8 hours). The staff requests the licensee to provide more technical justification for increasing the Completion Time from 4 hours to 10 hours and justify why 2 additional hours are needed from the NUREG. 10 CFR 50.36(c)(2)(ii)(B)**
Issue Date	**01/11/2008**
Close Date	**03/19/2008**

Responses

Licensee Response by Bryan Kays on 01/24/2008	The Completion Times for ISTS 3.2.5 Required Action A.2 and B.2 (Volume 7, Pages 119 and 120) have been changed from 8 hours to 10 hours. The proposed Completion Times are consistent with the Completion Time for an identical action in ISTS 3.2.4 Required Action A.1.2.2 (Page 87). There is no technical basis for one action having 2 less hours than the other. Note also that ISTS 3.2.4 Required Action

	C.2 and D.2 (Page 88) provide 10 hours. In these actions, only the High Flux Trips are being adjusted (not the Flux/DeltaFlux/Flow trips). Therefore, for consistency, we applied 10 hours for Action A.2 and B.2.
NRC Response by Jason Paige on 02/11/2008	Regarding your statement "the completion times for ISTS 3.2.5 Required Action A.2 and B.2 have been changed from 8 hours to 10 hours" is not valid. Looking at NUREG-1430, "B&W Plants," the Completion Times for LCO 3.2.5 Required Actions A.2 and B.2 are still 8 hours and have not changed. Also, to state that "consistency" is the justification for change is not acceptable and the staff believes that the licensees response does not provide adequate technical justification. The staff requests the licensee to clarify it's response and provide more technical justification. If more detailed discussion is needed, we can discuss during the Wednesday call.
Licensee Response by Bill Bentley on 02/25/2008	The response on 1/24/08 was meant to communicate the fact that as part of the ITS Conversion, the 8 hours in ISTS 3.2.5 Required Action A.2 and B.2 was changed to 10 hours. We were not attempting to state that the times had been changed in the NUREG. This question and 200712030914 were discussed with the reviewer during a phone call on 2/22/08 to clarify the Davis-Besse position with regards to consistency of completion times for actions that adjust RPS High Flux and Flux/Delta Flux/Flow trip setpoints.

Date Created: 01/11/2008 10:25 AM by Jason Paige
Last Modified: 03/19/2008 07:27 AM

Section 3.4 RAIs

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RAI Screening Required: Yes

Status: Closed

This Document will be approved by: **Greg Cranston**

Regulatory Basis must be included in Comments section of this Form

This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted) **Yes**

NRC ITS TRACKING

NRC Reviewer

ID	**200712030902**		Conference Call Requested? **No**	
Category	**BSI - Beyond Scope Issue**			
ITS Information	ITS Section: **3.4 Tim Kolb**	TB POC:	JFD Number: **None**	Page Number(s): **2**
	ITS Number: **3.4.1**	OSI: **3**	DOC Number: **M.1**	Bases JFD Number: **None**
Comment	**General Design Criteria 35, 36, and 37 as they relate to the ECCS being designed to provide an abundance of core cooling to transfer heat from the core at a rate so that fuel and clad damage will not interfere with continued effective core cooling, to permit appropriate periodic inspection of important components, and to permit appropriate periodic pressure and functional testing. With the higher pressure setpoint, the staff requests the licensee to explain if the ECCS systems will continue to inject coolant at a flow rate that will provide adequate protection to the fuel and remove excessive heat. Also, the staff requests the licensee to explain, if any, the affects of the proposed changes to the ECCS response time.**			
Issue Date	**12/03/2007**			
Close Date	**02/08/2008**			

Responses

Licensee Response by Bryan Kays on 01/20/2008	See the attachment for the response.

Date Created: 12/03/2007 09:02 AM by Jason Paige
Last Modified: 02/08/2008 02:59 PM

200712030902 Response

There is no change to a pressure setpoint, but rather a change to the minimum pressure criterion for DNB protection for LCOs. The minimum pressure criterion is based on the minimum pressure drop from the core outlet to the hot leg pressure tap. The fuel vendor previously identified that the calculated minimum pressure drop from the core outlet to the hot leg pressure tap, upon which the CTS Table 3.2-2 (Volume 9, Page 6) minimum pressure criterion is based, was not correctly factored into the minimum pressure criterion. Therefore the CTS reactor coolant pressure parameters listed in CTS Table 3.2-2 (Page 6) are slightly non-conservative. In order to offset this slight non-conservatism, a DNB penalty has been assessed in the past against the retained DNB margin in the reload licensing analyses. Once the proposed changes are made for ITS, this offset will no longer be necessary for future core reload analyses. Since the proposed values are more conservative than the current values, there is no adverse effect on nuclear safety.

With four reactor coolant pumps (RCPs) operating:

Normal Operating Pressure for Transient Initiation = 2200 psia
Psia to psig conversion = - 14.7 psi
Pressure uncertainty Included in the DNB Analysis = - 65 psi
Minimum Pressure Drop from the Core Outlet to the pressure Tap = - 55.5 psi
New Criterion = 2064.8 psig

With three reactor coolant pumps (RCPs) operating:

Normal Operating Pressure for Transient Initiation = 2200 psia
Psia to psig conversion = - 14.7 psi
Pressure uncertainty Included in the DNB Analysis = - 65 psi
Minimum Pressure Drop from the Core Outlet to the pressure Tap = - 59.5 psi
New Criterion = 2060.8 psig

USAR Table 15.1-2, Parameters Applicable to All Accidents in the Accident Analysis, specifies the Initial RC system pressure as 2200 psia. USAR Section 4B, Cycle 15 – Reload Report contains Table 6-1, Limiting Thermal-Hydraulic Design Conditions, Cycles 14 and 15, specifies Minimum core exit pressure as 2135psia. (Normal Operating Pressure for Transient Initiation of 2200 psia minus pressure uncertainty included in the DNB analysis of 65 psi.)

The minimum pressures specified in LCO 3.4.1 (Page 12) are the corresponding values in the reactor coolant loop as measured at the hot leg pressure tap. No change is being made to the ECCS performance capabilities. The ECCS systems will continue to inject water at a flow rate that will provide adequate protection to the fuel and remove excessive heat. There is no change to the ECCS response time.

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RAI Screening Required: Yes

Status: Closed

This Document will be approved by: **Greg Cranston**

Regulatory Basis must be included in Comments section of this Form

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Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200712030904**		Conference Call Requested? **No**	
Category	**BSI - Beyond Scope Issue**			
ITS Information	ITS Section: **3.4 Tim Kolb**	TB POC:	JFD Number: **None**	Page Number(s): **2**
	ITS Number: **3.4.1**	OSI: **3**	DOC Number: **M.1**	Bases JFD Number: **None**
Comment	**With the increased pressure setpoint, the flow rate from the reactor during a LOCA will increase. The staff requests the licensee to demonstrate that the current LOCA analyses are still acceptable with the increased pressure setpoint.**			
Issue Date	**12/03/2007**			
Close Date	**02/08/2008**			

Responses

Licensee Response by Bryan Kays on 01/20/2008	See response for 200712030902. There is no change to a pressure setpoint, but rather a change to the minimum pressure criterion for DNB protection for LCOs. The flow rate from a LOCA will not increase. The current LOCA analyses are not affected and are still acceptable.

Date Created: 12/03/2007 09:04 AM by Jason Paige
Last Modified: 02/08/2008 02:54 PM

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RAI Screening Required: Yes

This Document will be approved by: **Greg Cranston**

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Status: Closed

Regulatory Basis must be included in Comments section of this Form

NRC ITS TRACKING

NRC Reviewer

ID	**200712030906** Conference Call Requested? **No**
Category	**BSI - Beyond Scope Issue**
ITS Information	ITS Section: **3.4 Tim Kolb**; TB POC: ; JFD Number: **None**; Page Number(s): **1**; ITS Number: **3.4.1**; OSI: **3**; DOC Number: **A.3**; Bases JFD Number: **None**
Comment	**In the submittal, A03 states that "Davis Besse does not use lumped burnable poison rod assemblies. Therefore, the reason for the measured RCS flow rate limit values currently in the CTS is not correct." The staff requests the licensee to confirm that the proposed RCS flow rate limit values are correct and to clarify how the flow rate limit was obtained.**
Issue Date	**12/03/2007**
Close Date	**02/08/2008**

Responses

Licensee Response by Bryan Kays on 01/20/2008	The proposed RCS flow rate limits are correct. Insight into how the flow rate limits have changed over time and why can be found in License Amendments 11, 33, 91, 123, and 135. Also see Discussion Of Change (DOC) A03 (Volume 9, Page 7). Note (3) for Table 3.2-2 (Page 6) was developed for Mk B8A fuel. The Mk B10 FA design all have orificed control rod guide tubes that are designed to minimize core bypass flow, even without BPRAs. Core bypass flow reduces the flow provided to the heated fuel rods (i.e. in the sub-channels) to maintain adequate margin to DNB. The Technical Specification value for minimum measured flow value is relevant to the maximum calculated core bypass flow and not to the number of BPRAs. The DNB analyses were performed with a minimum flow assumption of 380,000 gpm. See USAR Section 4B, Cycle 15 – Reload Report.

Date Created: 12/03/2007 09:06 AM by Jason Paige
Last Modified: 02/08/2008 03:00 PM

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RAI Screening Required: Yes

Status: Closed

This Document will be approved by: **Tim Kobetz**

Regulatory Basis must be included in Comments section of this Form

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Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200712031021** Conference Call Requested? **No**
Category	**BSI - Beyond Scope Issue**
ITS Information	ITS Section: **3.4 Tim Kolb** ITS Number: **3.4.1** TB POC: **Kulin Desai** OSI: **None** JFD Number: **None** DOC Number: **None** Page Number(s): **5** Bases JFD Number: **None**
Comment	**BSI#6 (Submitted for Kulin Desai)** **SR 3.4.1.4 The Reactor Coolant System total flow rate shall be determined to be within its limit by measurement at least once per 18 months.** **NOTE: Not required to be performed until seven days after stable thermao conditions are established at greater than or equal to 70% TRP.** **Regarding the above SR: Provide recent experience of power ascension testing schedules after refueling and exampls of plant stability data to demonstrate that you need seven days to achieve plant stable conditions to perform the RCS flow measurement.** **10 CFR50.36(d)(3) specifies that surveillance requirements assure that the limiting conditions for operation will be met.**
Issue Date	**12/03/2007**
Close Date	**02/21/2008**

Responses

Licensee Response by Jerry Jones on 02/11/2008	The ITS SR 3.4.1.4 Note (Volume 9, Page 13) has been revised to allow 24 hours after stable thermal power conditions are established at 70 % RTP before the verification of RCS total flow rate is required to be performed. This change was made to match the allowance provided in NUREG-1431 (WOG ISTS) and NUREG-1432 (CEOG ISTS) for the same Surveillance Requirement. Additionally, the CTS 4.2.5.2 Markup (Page 5), Discussion of Change L02 (Page 9), the Technical Specification Justification for Deviation 4, and INSERT 3 of the Bases (Page 21) have been changed to reflect the revision to ITS SR 3.4.1.4. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb	Needed information has been supplied. No further questions at this time. This item

on 02/21/2008	is closed.

Date Created: 12/03/2007 10:21 AM by Timothy Kolb
Last Modified: 02/21/2008 09:16 AM

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RAI Screening Required: Yes

This Document will be approved by: **Tim Kobetz**

Status: Closed

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NRC ITS TRACKING

NRC Reviewer

ID	**200712031031**		Conference Call Requested? **No**	
Category	**BSI - Beyond Scope Issue**			
ITS Information	ITS Section: **3.4 Tim Kolb** ITS Number: **3.4.1**	TB POC: **Kulin Desai** OSI: **None**	JFD Number: **None** DOC Number: **None**	Page Number(s): **5** Bases JFD Number: **None**
Comment	**BSI#6 (Submitted for Kulin Desai)** **Describe the plant operating history of performing a heat balance and its duration. This informatin is necessary to validate that the 7 days for reaching steady state conditions is necessary.** **10 CFR50.36(d)(3) specifies that surveillance requirements assure that the limiting conditions for operation will be met.**			
Issue Date	**12/03/2007**			
Close Date	**02/21/2008**			

Responses

Licensee Response by Jerry Jones on 02/11/2008	See the response and markups for question 200712031021.
NRC Response by Timothy Kolb on 02/21/2008	Licensee is revising the 7 day period to allow for stable plant conditions to 24 hours, consistent with NUREG 1431 and 1432. Needed information has been supplied. No further questions at this time. This item is closed.

Date Created: 12/03/2007 10:31 AM by Timothy Kolb
Last Modified: 02/21/2008 09:19 AM

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Status: Approval Not Required

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NRC ITS TRACKING

NRC Reviewer

ID	**200712031038** Conference Call Requested? **No**
Category	**BSI - Beyond Scope Issue**
ITS Information	ITS Section: **3.4 Tim Kolb**; TB POC: **Kulin Desai**; JFD Number: **None**; Page Number(s): **5**; ITS Number: **3.4.1**; OSI: **None**; DOC Number: **None**; Bases JFD Number: **None**
Comment	**BSI#6 (Submitted for Kulin Desai)** **Does this proposed change have any impact on any other Tech Specs?**
Issue Date	**12/03/2007**
Close Date	**12/04/2007**

Responses

Licensee Response by Bill Bentley on 12/03/2007	BSI #6 concerns a change that added a note to SR 3.4.1.4. The note stipulates a specific time frame and power level for the establishment of stable thermal conditions. It is not believed that this change affects any other technical specifications.
NRC Response by Timothy Kolb on 12/04/2007	Licensee response has been reviewed by K. Desai and he has no further questions at this time. The item is closed.

Date Created: 12/03/2007 10:38 AM by Timothy Kolb
Last Modified: 12/04/2007 09:14 AM

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RAI Screening Required: No

Status: Approval Not Required

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This document will not be relied upon by staff for disposition of the LAR

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Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200710231302**		Conference Call Requested? **No**	
Category	**In Scope**			
ITS Information	ITS Section: **3.4 Tim Kolb** ITS Number: **3.4.11**	TB POC: OSI: **None**	JFD Number: **None** DOC Number: **None**	Page Number(s): **220** Bases JFD Number: **None**
Comment	**The CTS markup for the LCO description indicates the LCO wording as "When not isolated, the pressurizer pilot operated relief valve". That's where it ends. Add words that say "shall be OPERABLE" with a tie to a DOC.**			
Issue Date	**10/23/2007**			
Close Date	**10/30/2007**			

Responses

Licensee Response by Jerry Jones on 10/25/2007	The CTS LCO 3.4.3 statement (Volume 9, Page 220) included the OPERABILITY requirements for the Pressurizer power operated relief valve (PORV) as a trip setpoint and an allowable value. These two requirements were relocated as described in Discussion of Changes (DOC) LA01 and LA02 (Pages 222 and 223). The words "shall be OPERABLE" were not added into the CTS LCO statement, since in the CTS markup the words are not normally verbatim with respect to the words in the ISTS markup. Furthermore, DOC A01 at the top of the CTS Markup page covers all format type changes, which would cover the addition of the words "shall be OPERABLE" in the proposed ITS LCO (Page 225). However, for clarity, the words "shall be OPERABLE" will be added to the CTS markup page. However, no new DOC will be written - DOC A01 at the top of the page will cover this change. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 10/30/2007	Proposed change is acceptable. No further actions required.

Date Created: 10/23/2007 01:02 PM by Timothy Kolb
Last Modified: 10/30/2007 09:59 AM

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RAI Screening Required: No

This is a Non RAI Dialogue

This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted) Yes

Status: Approval Not Required

This document will not be relied upon by staff for disposition of the LAR

NRC ITS TRACKING

NRC Reviewer

ID	**200712271037**		Conference Call Requested? **No**	
Category	**In Scope**			
ITS Information	ITS Section: **3.4 Tim Kolb**	TB POC:	JFD Number: **None**	Page Number(s): **230**
	ITS Number: **3.4.11**	OSI: **None**	DOC Number: **None**	Bases JFD Number: **None**
Comment	**Revise the third sentence of Insert 1 to the Bases to read "BAW-1890,September 1985 (Ref 3), identified that..." This will make it consistent with the rest of the Bases.**			
Issue Date	**12/27/2007**			
Close Date	**01/10/2008**			

Responses

Licensee Response by Bryan Kays on 01/10/2008	ITS 3.4.11 Bases Insert 1 (Volume 9, Page 230), the beginning of the third sentence, has been revised to read "BAW-1890, September 1985 (Ref. 3), identified that" instead of "Reference 3 identified that," as requested by the reviewer. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 01/10/2008	The response has been reviewed. No further questions at this time. This item is closed.

Date Created: 12/27/2007 10:37 AM by Timothy Kolb
Last Modified: 01/10/2008 10:05 AM

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RAI Screening Required: Yes

This Document will be approved by: **Tim Kobetz**

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Status: Closed

Regulatory Basis must be included in Comments section of this Form

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200710231546** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.4 Tim Kolb** ITS Number: **3.4.12** TB POC: OSI: **None** JFD Number: **1** DOC Number: **LA.1** Page Number(s): **240** Bases JFD Number: **None**
Comment	**Remove the discussion in doc LA1 related to removing power from DH-11 and DH-12 at the MCC if control power is discovered to not be removed and make this an L doc. CTS specifically requires removing power from the valves at the MCC and ITS is changing that requirement to require the control power to be removed within 1 hour if control power is discovered to not be removed. JFD 1 states that the CTS requirements have been maintained. This is not the case. This is changing more than just details of how to meet the requirements. 10CFR50.36 requires the LCO to be met or required actions to take to exit the applicability. Also see pages 243,247,254,264,266**
Issue Date	**10/23/2007**
Close Date	**11/02/2007**

Responses

Licensee Response by Jerry Jones on 10/25/2007	CTS LCO 3.4.2 (Volume 9, Page 240) requires the Reactor Coolant System (RCS) to Decay Heat removal (DHR) System isolation valves to be open with control power to their valve operators removed. Normally, this is accomplished by removing the control power using switches in the control room, as is described in the ISTS Bases Insert 3 (Page 264). If control power is not removed, CTS 3.4.2 Action C (Page 240) requires power to be removed at the Motor Control Centers (MCCs) within 1 hour. This CTS Action presupposes that the reason control power is not already removed is because the control room switches are not functioning. However, the removal of power from the MCCs is not required if power is removed using the control room switches. That is, once the LCO statement is met, the requirement in Action C (to remove power via the MCCs) is not required, as stated in CTS LCO 3.0.2 (and ITS 3.0.2). Thus, the specific removal of the MCCs from CTS Action C is not a "Less Restrictive (L)" change, but a "Removed Detail

	Change (LA)." ITS 3.4.12 Required Action B.1 (Page 247) requires that control power be removed from the RCS to DHR System isolation valves. The ISTS Bases Insert 3 (Page 264) describes that one way to remove power from the RCS to DHR System isolation valves is at the MCC (by removing fuses, opening breakers, or racking breakers out). Therefore, Davis-Besse believes that the change is properly categorized and no change is necessary.
NRC Response by Timothy Kolb on 11/02/2007	Agree with licensee that removing control power by any means will exit the condition in CTS, therefore it is acceptable to characterize the change as an LA doc. No further questions and issue is closed.

Date Created: 10/23/2007 03:46 PM by Timothy Kolb
Last Modified: 11/02/2007 08:55 AM

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NRC ITS TRACKING

NRC Reviewer

ID	**200710231615** Conference Call Requested? **Yes**
Category	**In Scope**
ITS Information	ITS Section: **3.4 Tim Kolb**; TB POC: ; JFD Number: **None**; Page Number(s): **247**; ITS Number: **3.4.12**; OSI: **None**; DOC Number: **None**; Bases JFD Number: **None**
Comment	**From my review of the CTS to ITS conversion for this spec it seems to me that the ITS is more restrictive in the conditions and required actions. In CTS if you find DH-11 or DH-12 closed then you have 1 hour to open the bypass valves. If you don't meet that then what do you do? I would think that you would declare the relief valve inoperable and have 8 hours to make the valve Operable. If you can't make the valve operable in 8 hours then take the additional actions which allows 1 hour to disable the HPI pumps and 8 hours for the additional items. In ITS space if you find DH-11 or DH-12 closed then you have 1 hour to open the bypass valves and if that can't be done then you take actions for the HPI pumps and additional actions as specified. You don't have the option to call the relief valve inoperable and have the extra 8 hours to fix the problem. Anyway, could we have a conference call to discuss this since it is hard to do this in writing. If it ends up to be a problem with the way the spec is written or you want to keep it this way then I will put in another RAI so that it goes through the proper review channels. I will also document the phone call discussion with an additional comment on this question.**
Issue Date	**10/23/2007**
Close Date	**12/04/2007**

Responses

Licensee Response by Jerry Jones on 11/02/2007	CTS 3.4.2 Actions B and C (Volume 9, Page 240) provide compensatory measures if DH-11 or DH-12 is not open and control power removed. These actions are associated with restoration of the relief path to the relief valve. CTS Action A applies to the relief valve, and is a separate and distinct action from those for the relief path. ITS 3.4.12 ACTIONS A and B (Page 247) provide similar compensatory measures as CTS 3.4.2 Actions B and C when DH-11 or DH-12 is not open and control power removed. With DH-11 or DH-12 not open or control power not

	removed, a 1 hour restoration time is provided for restoration of the relief path. ITS ACTION C provides a similar compensatory measure as CTS 3.4.2 Action A.1, and when the DHR System relief valve is inoperable, an 8 hour restoration time is provided. However, the CTS provides no default action for non compliance with either CTS 3.4.2 Action B or C. Furthermore, since the unit is already in a shutdown condition, CTS LCO 3.0.3 (and ITS LCO 3.0.3) would also not apply. While noncompliance with Action B or C is not a realistic occurrence, for consistency with the format of the ITS, Davis-Besse believed that a default action should be provided if CTS 3.4.2 Action B or C is not met. Davis-Besse believed that it would not be appropriate to apply the 8 hour completion time for the inoperable relief valve action to the completion times for an inoperable relief path. However, a default condition equivalent to CTS 3.4.2 Action A.2 was applied for the situation where a noncompliance occurred with either CTS 3.4.2 Action B or C, since none was present in the CTS. Davis-Besse continues to believe that this default condition should be applied for consistency with the ITS format, and that the Actions in ITS 3.4.12 ACTION D (Page 248) are the appropriate Actions to take if the relief path is not restored within the 1 hour Completion Time allowed by ITS 3.4.12 ACTIONS A and B. Based on the NRC reviewer's comment, Davis-Besse will also provide a new More Restrictive Discussion of Change justifying this new Action for the relief path. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 11/05/2007	My question has been adequately addressed. With the addition of the M02 doc this clearly supports the addition of ITS Action D if the completion time of Action A or B is not met. The licensee conservatively didn't allow the option to declare the relief valve inoperable if Action A or B could not be met and provide an additional 8 hours to take compensatory actions. If Action D is entered then compensatory actions are required to be taken as specified in the CTS 3.4.2 Actions A2a and A2b. No further questions at this time.

Date Created: 10/23/2007 04:15 PM by Timothy Kolb
Last Modified: 12/04/2007 09:16 AM

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NRC ITS TRACKING

NRC Reviewer

ID	**200712200849** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.4 Tim Kolb** TB POC: JFD Number: **None** Page Number(s): **290** ITS Number: **3.4.13** OSI: **None** DOC Number: **None** Bases JFD Number: **2**
Comment	**Discuss in more detail why you are deleting details in parenthesis relating to definition of "steady state". Also see pages 291 and 292. The parameters being deleted could affect the surveillance results if not in a steady state condition.**
Issue Date	**12/20/2007**
Close Date	**12/26/2007**

Responses

Licensee Response by Jerry Jones on 12/24/2007	The reactor coolant system (RCS) is in a steady operating condition when power, Tave and pressurizer level are constant. The details being deleted are not necessary to describe a steady RCS operating condition. If the items being deleted from the ISTS Bases (Volume 9, Page 290) were not in steady state, they would cause other measured parameters to not be in steady state. For example, if letdown and makeup flow are not balanced, this will be evident with changes to Pressurizer level or makeup tank level. If the RCP seal injection and seal return flows are not balanced, this will show up in higher RCP leakoff indication. On Page 292 of the ITS Bases, it is stated "The accuracy of the results will be impacted if any measured parameter used to calculate the RCS LEAKAGE is not in a steady state condition." These words were added in place of the deleted words "and makeup tank levels, makeup and letdown, [and RCP seal injection and return flows]." The new ITS Bases description is therefore more accurate, and is also in agreement with the Davis-Besse surveillance test for Operational Leakage. A page from the surveillance test with certain limits and precautions highlighted is attached for information.
NRC Response by Timothy Kolb on 12/26/2007	No further questions at this time. This item is closed.

Date Created: 12/20/2007 08:49 AM by Timothy Kolb
Last Modified: 12/26/2007 08:36 AM

2.1.6 When it is necessary to perform a water inventory balance during a Xenon transient, axial power imbalance shall be monitored to ensure it remains inside Technical Specification limits.

2.1.7 This test shall be terminated if holding steady state conditions will result in exceeding Technical Specification Limits or if steady state conditions can not be maintained. Steady-state conditions exist when T_{ave}, Pressurizer Level, and Reactor Power are maintained between the increment specified in Step 2.1.10 above.

2.1.8 Before classifying RCS leakage as 'Other Identified Leakage', the leakage shall be determined by timing its rate of accumulation and documented by a Leakage Impact Evaluation in accordance with EN-DP-01171, Engineering Implementation of RCS Integrated Leakage Program.

2.1.9 Performance of this test does not render any system inoperable or unavailable per the Maintenance Rule.

2.1.10 The accuracy of the test is dependent on steady state plant conditions. Any measured parameters that are not in a steady-state condition will adversely affect the accuracy of results, and should therefore be minimized. The table that follows demonstrates the approximate impact that each parameter would have on the calculated RCS leak rate, if it were the ONLY variable to change during a one hour inventory balance.

Maintain containment temperature and pressure stable. Changes in containment pressure or temperature may affect leak rate or upset Pressurizer Quench Tank equilibrium.

The RCS Leakrate Algorithm will compensate for changes in these variables by relating all of the parameters to their effect on the Mass of the RCS. This table shows the relative sensitivity of each variable.

MEASURED PARAMETER	AMOUNT OF CHANGE	EFFECT ON LEAKRATE
T_{ave}	+ 1.0° F	+ 1.7 gpm
Quench Tank Level	+ 0.1 inch	+ 0.9 gpm
MU Tank Level	- 1.0 inch	+ 0.5 gpm
Pressurizer Level	- 1.0 inch	+ 0.2 gpm
Reactor Power	- 1.0 %	+ 0.05 gpm
MU Tank Temperature	+ 1° F	+ 0.01 gpm
RCP Leakoff	+ 1 count	+ 0.004 gpm
RCS Pressure	+ 1 psi	+ 0.0008 gpm

2.1.9 This procedure includes Improved Technical Specifications (**[ITS]**) information that is NOT applicable to Current Technical Specifications (**[CTS]**) and **[CTS]** information that is NOT applicable in **[ITS]**. The **[CTS]** information shall be used prior to the **[ITS]** effective date. The **[ITS]** information shall be used on or after the **[ITS]** effective date.

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RAI Screening Required: Yes

This Document will be approved by: **Tim Kobetz**

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Status: Closed

Regulatory Basis must be included in Comments section of this Form

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200712181530** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.4 Tim Kolb**; TB POC: ; JFD Number: **None**; Page Number(s): **301**; ITS Number: **3.4.14**; OSI: **None**; DOC Number: **A.4**; Bases JFD Number: **None**
Comment	**Provide justification for not incorporating CTS note # as specified in CTS Table 3.3-3 Action 13 (page 302 of submittal).** **CTS note # (which is not in the markups for change to ITS 3.4.14) states "The provisions of specification 3.0.4 are not applicable." Since this note is not in ITS then a DOC needs to be written to justify not carrying it forward or revise the submittal to incorporate the note.** **10 CFR 50.36(d)(2) states that Limiting Conditions for Operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. This allowance provides allowances to not meet a specification and is needed to justify this change to the CTS.**
Issue Date	**12/18/2007**
Close Date	**01/10/2008**

Responses

Licensee Response by Bryan Kays on 01/10/2008	The CTS note # as specified in CTS Table 3.3-3 Action 13 (Volume 9, Page 302) should have a justification written for not incorporating it into ITS 3.4.14. A new Discussion of Change will be added (DOC A05) to discuss why CTS note # is not included in the ITS. Additionally, a new page (CTS 3/4 3-12) will be added to the markups for ITS 3.4.14. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 01/10/2008	I have reviewed the new Doc A05 and have no further questions at this time. This item is closed.

Date Created: 12/18/2007 03:30 PM by Timothy Kolb
Last Modified: 01/10/2008 09:08 AM

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Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200712191509** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.4 Tim Kolb**; TB POC: ; JFD Number: **5**; Page Number(s): **318**; ITS Number: **3.4.14**; OSI: **None**; DOC Number: **None**; Bases JFD Number: **None**
Comment	**The plant supplied number for SR 3.4.14.2 is testing the RCS PIV at a pressure of 2155 psig. It appears to be an oversite to remove the greater than or equal to sign. The SR is meant to be performed at normal operating pressure. Verify if this is what you want.**
Issue Date	**12/19/2007**
Close Date	**01/24/2008**

Responses

Licensee Response by Bryan Kays on 01/13/2008	SR 3.4.14.2 (Volume 9, Page 318) states that the leakage is equivalent to less than 5.0 gpm at a pressure of 2155 psig. This means that whatever the test pressure for a given valve is, the leakage will be corrected to a pressure of 2155 psig. This is the current value in plant procedures for this test. Thus, the current 2155 psig value is correct.
NRC Response by Timothy Kolb on 01/24/2008	Licensee response answers my question and I have no further questions on this issue. This item is closed.

Date Created: 12/19/2007 03:09 PM by Timothy Kolb
Last Modified: 01/24/2008 01:08 PM

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RAI Screening Required: Yes

Status: Closed

This Document will be approved by: **Gerald Waig; Tim Kobetz**

Regulatory Basis must be included in Comments section of this Form

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Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200712261451**		Conference Call Requested? **No**	
Category	**In Scope**			
ITS Information	ITS Section: **3.4 Tim Kolb**	TB POC:	JFD Number: **1**	Page Number(s): **314**
	ITS Number: **3.4.14**	OSI: **None**	DOC Number: **None**	Bases JFD Number: **None**
Comment	**Revise the Applicability to clearly specify that the Mode 4 exception applies to PIV leakage only or explain why it doesn't apply to the interlock function. By adding the DHR interlock function to the LCO portion of the Tech Specs and keeping the wording for the Mode 4 exception in the Applicability this means that this exception applies to the DHR Interlock function also. Since the interlock is associated with the DHR Valves then if in the DHR Mode then the system could be at any pressure in Mode 4 and still meet the LCO. This then means that Condition C would not have to be entered since the LCO is met as stated in JFD#1. The exception was clearly meant to only apply to PIV leakage since the valves were being opened or were open. This is needed to ensure the LCO meets the lowest functional capability or perfomance levels of equipment required for safe operation of the facility per 10 CFR.36.**			
Issue Date	**12/26/2007**			
Close Date	**03/20/2008**			

Responses

Licensee Response by Jerry Jones on 02/13/2008	The addition of the LCO statement concerning the DHR System interlock function (Volume 9, Pages 314 and 315) did not change the Applicability of the interlock or the PIVs; it only clarified that the DHR System interlock function is not a PIV. The ISTS wording included an ACTION for the interlock (Page 316) and Surveillances (Page 320). Thus, the current ISTS 3.4.14 Applicability does cover the ACTION and Surveillances. Davis-Besse believes that the Applicability exception to MODE 4 applies to both the PIV leakage for the DHR valves, and the interlock function. That is, the DHR interlock function includes the DHR valves in the flow path; therefore, the interlock function is exempted since if the valves will not close, the overall interlock function is not OPERABLE. This appears to be supported by the

	fact that ISTS SR 3.4.14.2 and SR 3.4.14.3 both include Notes that state the interlock requirement is not required to be met when it is disabled in accordance with LCO 3.4.12. In addition, the DHR System is normally placed in service when in MODE 4. Furthermore, the current Davis-Besse Applicability for the interlock function in CTS Tables 3.3-3 and 4.3-2 Functional Unit 5.a, 4.5.2.d.1.a, and 4.5.2.d.1.b is only MODES 1, 2, and 3; the CTS does not require the interlock function in MODE 4. Therefore, the Applicability for ITS 3.4.14 is correct and consistent with the ISTS 3.4.14 Applicability. However, Davis-Besse concurs that it is possible to misinterpret the ISTS wording in the Applicability and think it does not apply to the entire interlock function, since the interlock function includes instrumentation as well as the valves. Therefore, Davis-Besse proposes to modify the second Applicability (Page 314) to state "MODE 4, except the DHR System interlock function and valves in the DHR flow path when in, or during transition to or from, the DHR mode of operation." Appropriate changes to other parts of ITS 3.4.14 will be made to support this change. A draft markup regarding these changes is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 02/15/2008	The proposed change clarifies the applicability of the interlock function. After further review it appears that more changes are needed. 1) DOC A04 discusses the CTS requirements for the interlock function being combined into a single LCO. The CTS interlock function is only required in Mode 1,2 and 3. Now it is required in Mode 4. Should this be an M DOC? 2)The way the applicability is worded the interlock function is required in Mode 4 when not in the DHR Mode. If it becomes inoperable then the action is to deactivate the valves. Is this what you want?
Licensee Response by Jerry Jones on 03/20/2008	1) The proposed Applicability of the interlock function is only MODES 1, 2, and 3, as shown in the proposed markup attached to the first response; it does not include MODE 4. Since the proposed Applicability is consistent with the proposed Applicability, a new M DOC is not needed. 2) The proposed Applicability excludes the valves in the DHR flow path when in, or during transition to or from the DHR mode and the DHR System Interlock function when in MODE 4. This is the intent of the Applicability. For further clarity, the DHR System interlock will be added to the end of the Applicability exception. A draft markup regarding these changes is attached and supersedes the previous markup. This change will be reflected in the supplement to this section of the ITS Conversion amendment.
NRC Response by Timothy Kolb on 03/20/2008	Additional changes to clarify that interlock function is not required in Mode 4 has been reviewed. No further qustions at this time.

Date Created: 12/26/2007 02:51 PM by Timothy Kolb
Last Modified: 03/20/2008 03:19 PM

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NRC ITS TRACKING

NRC Reviewer

ID	**200712271134** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.4 Tim Kolb**; TB POC: ; JFD Number: **None**; Page Number(s): **307**; ITS Number: **3.4.14**; OSI: **None**; DOC Number: **M.2**; Bases JFD Number: **None**
Comment	**Does the addition of the Channel Calibration discussed in DOC M02 result in any physical change to the plant to allow this calibration to be performed? If so, then please describe the changes to plant equipment.**
Issue Date	**12/27/2007**
Close Date	**01/14/2008**

Responses

Licensee Response by Bryan Kays on 01/13/2008	Discussion of Change M02 (Volume 9, Pages 307 and 308) justified adding a new SR, ITS SR 3.4.14.5 (Page 321), which requires performance of a CHANNEL CALIBRATION of the Decay heat Removal System interlock channels every 24 months. No physical changes to the plant are required to perform this Surveillance. Davis-Besse has data packages and plant procedures already in place for calibration of the pressure switch.
NRC Response by Timothy Kolb on 01/14/2008	No further questions on this topic at this time. This item is closed.

Date Created: 12/27/2007 11:34 AM by Timothy Kolb
Last Modified: 01/14/2008 07:42 AM

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NRC ITS TRACKING

NRC Reviewer

ID	**200712270928**		Conference Call Requested? **No**	
Category	**In Scope**			
ITS Information	ITS Section: **3.4 Tim Kolb**	TB POC:	JFD Number: **2**	Page Number(s): **374**
	ITS Number: **3.4.16**	OSI: **None**	DOC Number: **None**	Bases JFD Number: **None**
Comment	**Retain the convention set up in STS for TS 3.4.16 Condition C. Condition A and B deals specifically with Dose Equivalent I-131. Condition C deals with Gross specific activity. These items should remain seperated and not lumped together as shown in proposed Condition B. Every effort should be made to adopt the STS convention.**			
Issue Date	**12/27/2007**			
Close Date	**02/13/2008**			

Responses

Licensee Response by Jerry Jones on 02/11/2008	Davis-Besse incorporated ISTS 3.4.16 Condition C (Volume 9, Page 375) into Condition B (Page 374) since the Required Actions for the two Conditions were identical. This was done to minimize the total Conditions in the Specification, as well as to be consistent with the change approved by the NRC during the DC Cook ITS conversion. The NRC approved a similar change, as shown in the attached pages. In addition, this change is consistent with the manner in which other Technical Specifications Conditions that have similar Required Actions are handled. For instance, ISTS 3.4.13 includes three different issues - a Required Action of a previous Condition not met, pressure boundary leakage not within limit, and primary to secondary leakage not within limit - in one Condition (Page 283). Thus, it is not necessary for the items to remain separated. Furthermore, TSTF-490 has been approved by the NRC and, when adopted by Davis-Besse, will delete the ISTS 3.4.16 Condition C in its entirety.
NRC Response by Timothy Kolb on 02/13/2008	Agree with licensee response. Although, there are instances where this convention is not used (i.e., 3.1.4, 3.4.9). Since TSTF 490 is approved then I have no further questions at this time. This item is closed.

Date Created: 12/27/2007 09:28 AM by Timothy Kolb
Last Modified: 02/13/2008 10:46 AM

CTS

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.16 RCS Specific Activity

LCO 3.4.8

LCO 3.4.16 The specific activity of the reactor coolant shall be within limits.

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS average temperature (T_{avg}) ≥ 500°F.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. DOSE EQUIVALENT I-131 > 1.0 μCi/gm.	- NOTE - LCO 3.0.4 is not applicable. .c	
	A.1 Verify DOSE EQUIVALENT I-131 within the acceptable region of Figure 3.4.16-1.	Once per 4 hours
	AND	
	A.2 Restore DOSE EQUIVALENT I-131 to within limit.	48 hours
~~B. Gross specific activity of the reactor coolant not within limit.~~	~~B.1 Be in MODE 3 with T_{avg} < 500°F.~~	~~6 hours~~

Action a, Action c

TSTF-359

1

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION		COMPLETION TIME	
Actions a and b (MODES 1, 2, and 3) Action a (MODE 1, 2, 3, 4, and 5) Action b	B ~~C~~. Required Action and associated Completion Time of Condition A not met. OR DOSE EQUIVALENT I-131 in the unacceptable region of Figure 3.4.16-1. INSERT 1	B ~~C~~.1	Be in MODE 3 with T_{avg} < 500°F.	6 hours	1 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
4.4.8 Table 4.4-4	SR 3.4.16.1	Verify reactor coolant gross specific activity ≤ 100/Ē μCi/gm.	7 days
4.4.8 Table 4.4-4	SR 3.4.16.2	- NOTE - Only required to be performed in MODE 1. Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 1.0 μCi/gm.	14 days AND Between 2 and 6 hours after a THERMAL POWER change of ≥ 15% RTP within a 1 hour period

1

INSERT 1

OR

Gross specific activity of the reactor coolant not within limit.

JUSTIFICATION FOR DEVIATIONS
ITS 3.4.16, RCS SPECIFIC ACTIVITY

1. ISTS 3.4.16 ACTION B has been deleted and incorporated in ISTS 3.4.16 ACTION C (ITS 3.4.16 ACTION B) because the Required Actions are identical (be in MODE 3 with T_{avg} < 500°F). In NUREG-1431, Rev. 1, ISTS 3.4.16 ACTION B contained an additional Required Action. This Required Action was deleted in NUREG-1431, Rev. 2, as a result of approved TSTF-28. ACTION B should have been deleted as a result of the application of TSTF-28, but was not. This changes the ISTS to be consistent with other Specifications where ACTION Conditions are combined when the same Required Actions apply.

2. The CNP reactor coolant DOSE EQUIVALENT I-131 specific power limit verses percent of RATED THERMAL POWER curve is substituted for the curve provided for illustration in the ISTS.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.16 RCS Specific Activity

LCO 3.4.16 The specific activity of the reactor coolant shall be within limits.

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS average temperature (T_{avg}) ≥ 500°F.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. DOSE EQUIVALENT I-131 > 1.0 µCi/gm.	------------------NOTE------------------ LCO 3.0.4.c is applicable. ---	
	A.1 Verify DOSE EQUIVALENT I-131 within the acceptable region of Figure 3.4.16-1.	Once per 4 hours
	AND	
	A.2 Restore DOSE EQUIVALENT I-131 to within limit.	48 hours
B. Required Action and associated Completion Time of Condition A not met. OR DOSE EQUIVALENT I-131 in the unacceptable region of Figure 3.4.16-1. OR Gross specific activity of the reactor coolant not within limit.	B.1 Be in MODE 3 with T_{avg} < 500°F.	6 hours

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NRC ITS TRACKING

NRC Reviewer

ID	**200712271033** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.4 Tim Kolb** TB POC: JFD Number: **3** Page Number(s): **403** ITS Number: **3.4.17** OSI: **None** DOC Number: **None** Bases JFD Number: **None**
Comment	**Reference 7 has been added to the Bases but is not addressed in any portion of the Bases. Either remove the reference or discuss it in the appropriate area of the Bases.**
Issue Date	**12/27/2007**
Close Date	**01/10/2008**

Responses

Licensee Response by Bryan Kays on 01/10/2008	Reference 7 listed in the ITS 3.4.17 Bases (Volume 9, Page 403) is not addressed in any portion of the ITS 3.4.7 Bases. Therefore, Reference 7 (Page 403) and the Justification for Deviation (JFD) 3 (Page 404) have been deleted. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 01/10/2008	Licensee response has been reviewed and there are no further questions at this time. This item is closed.

Date Created: 12/27/2007 10:33 AM by Timothy Kolb
Last Modified: 01/10/2008 10:10 AM

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Status: Approval Not Required

This document will not be relied upon by staff for disposition of the LAR

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200710041037**		Conference Call Requested? **No**	
Category	**In Scope**			
ITS Information	ITS Section: **3.4 Tim Kolb** ITS Number: **3.4.2**	TB POC: **None** OSI: **None**	JFD Number: **None** DOC Number: **None**	Page Number(s): **37** Bases JFD Number: **1**
Comment	**Also see page 36 Insert 1** **You have revised the UFSAR reference to indicate section 15.2.1. Please provide the particular discussion or assumption in the Safety Analysis that talks about minimum temperature at HZP.**			
Issue Date	**10/04/2007**			
Close Date	**10/05/2007**			

Responses

Licensee Response by Bill Bentley on 10/04/2007	The USFAR makes references to hot pressurized conditions using various terms. Examples include: Hot Zero Power (HZP), Hot Shutdown, Hot Standby, etc. Throughout the UFSAR, the RCS Temperature that corresponds to this condition is given as 532 F. Attached is one page from the UFSAR that displays this direct correlation.
Licensee Response by Bill Bentley on 10/04/2007	
Licensee Response by Bill Bentley on 10/04/2007	Attempts to attach the referenced page were not successful. Emailed page from the UFSAR to reviewer. Asked EXCEL to look into the problem.
Licensee Response by Bill Bentley on 10/05/2007	File referred to in the first response is attached with this response.
NRC Response by Timothy Kolb on 10/05/2007	Information provided is acceptable. No further information is required. Item closed.

Date Created: 10/04/2007 10:37 AM by Timothy Kolb
Last Modified: 10/05/2007 05:16 PM

Case II - No loss of offsite power

Sequence of Events	Elapsed Time	
Steam line break	0 sec	16
SFAS setpoint reached	10 sec	
SFAS time delay/HPI pump starts	15 sec	
HPI pump accelerates to speed/HPI pump discharge valve opens	25 sec	21
		16
Total Elapsed Time	25 sec	
(Time after SFAS setpoint reached)	(15 sec)	

7. The boron injection is assumed to be perfectly mixed with all the reactor coolant before entering the core, although the injection occurs at the reactor vessel inlet and so would have the highest concentration in the core region.

8. Perfect heat transfer is assumed in the affected steam generator after the initial part of the transient; that is, the time constant for heat transfer is zero with no stored energy accounted for.

The steam line rupture causes an increase in the heat transfer from the reactor coolant to the feedwater. As Figures 15.4.4-1 through 15.4.4-3 show, this initiates a cooldown of the Reactor Coolant System, such that the reactor trips on low pressure at about 1.13 sec after the rupture (includes a total trip delay of 0.6 second). A main steam pressure reduction to 600 psig trip point initiates an isolation signal that actuates valves isolating both the steam side and the feedwater side of both steam generators. For the cooldown part of the calculations, it is assumed that the main feedwater flow (at 135 percent of rated flow) continues to the affected steam generator. With the above assumptions, the resulting coolant system temperature decrease causes high pressure injection actuation at 35 seconds after the steam line break. This injection of boron will keep the core subcritical during cooldown below 550°F.

15.4.4.2.6.7 Moderator Coefficient Evaluation

Although the Steam Line Break Event is initiated from Hot Full Power (HFP) conditions, it immediately produces a reactor trip which results in the reactor being at least one percent shutdown when Hot Zero Power (HZP) (532°F) conditions are reached. Therefore, since it is the continuing cooldown below HZP conditions that is of concern, the value of moderator coefficient at HZP and colder conditions will determine the reactor response to the Steam Line Break.

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RAI Screening Required: Yes

This Document will be approved by: **Tim Kobetz**

This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted)

Status: Closed

Regulatory Basis must be included in Comments section of this Form

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200710041523** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.4 Tim Kolb**; TB POC: **None**; JFD Number: **None**; Page Number(s): **43**; ITS Number: **3.4.3**; OSI: **None**; DOC Number: **A.5**; Bases JFD Number: **None**
Comment	**See also page 49** **Revise the category from an Administrative change (A doc) to a Less Restrictive change (L doc) associated with Category 5 - Deletion of a surveillance requirement. Include in the justification why this surveillance is no longer required by 10 CFR 50.36.** **The proposal is to remove a CTS surveillance requirement and consider it an administrative change since the surveillance is required by another section of the CFR (i.e., 10 CRR 50, App H). Regardless of whether it is required somewhere else, you are proposing removing a current surveillance requirement from Tech Specs. This should be a less restrictive change. 10 CFR 50.36 requires Surveillance Requirements to verify the Limiting Conditions for Operation are met.**
Issue Date	**10/04/2007**
Close Date	**10/30/2007**

Responses

Licensee Response by Bill Bentley on 10/12/2007	CTS 4.4.9.1.2 (Volume 9, Page 43) requires performance of the reactor vessel material irradiation surveillance specimens. This Surveillance Requirement has been removed from the CTS as described in ITS 3.4.3, Discussion of Change (DOC) A05 (Volume 9, Page 49). DOC A05 is classified as administrative because it is duplicative of a regulatory requirement in 10 CFR 50 Appendix H. The Davis Besse Facility Operating License (Part 1.C) includes a requirement that the facility will operate in conformance with the rules and regulations of the Commission, which includes 10 CFR 50. The Technical Specifications are also part of the Facility Operating License. Thus, CTS 4.4.9.1.2, while being removed from the Technical Specifications, is still required to be met by the Davis Besse Facility Operating License. This classification is also consistent with the classification of the same type

	change in both the North Anna ITS Conversion, as documented in the NRC Safety Evaluation for North Anna Units 1 and 2, License Amendments 231 and 212, dated April 11, 2002, and in the DC Cook ITS Conversion, as documented in the NRC Safety Evaluation for DC Cooks Units 1 and 2, License Amendments 287 and 269, dated June 1, 2005. Therefore, Davis Besse believes that the Administrative classification of this change is correct.
NRC Response by Timothy Kolb on 10/22/2007	IAW NEI 96-06 the definition of Administrative Change is as follows - ADMINISTRATIVE (designated "A") changes are purely editorial in nature and are associated with reformatting, restructuring, interpreting, and complex rearranging of requirements, and other changes not revising the technical requirements contained in the existing document. This change is revising the technical requirements in the existing document. Having the requirement still specified by 10 CFR 50 App. H is a good justification for deleting it from the tech specs. It may have been approved by earlier safety evaluations for other plants but I need to justify it as an "L" change in my safety evaluation.
Licensee Response by Jerry Jones on 10/28/2007	Based on the NRC reviewer's request, Davis-Besse will delete the ITS 3.4.3 Discussion of Change (DOC) A05 (Page 43) and will replace it with an "L" DOC (DOC L01) (Page 51). A draft markup regarding this change is attached. This change will be reflected in the supplement to this section in the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 10/30/2007	Proposed changes are acceptable. No further actions required.

Date Created: 10/04/2007 03:23 PM by Timothy Kolb
Last Modified: 10/30/2007 09:55 AM

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RAI Screening Required: Yes

This Document will be approved by: **Tim Kobetz**

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Status: Closed

Regulatory Basis must be included in Comments section of this Form

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200710011404** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.4 Tim Kolb** ITS Number: **3.4.4** TB POC: **None** OSI: **None** JFD Number: **2** DOC Number: **M.1** Page Number(s): **69** Bases JFD Number: **5**
Comment	**Vol.9, pg 69-71,74-76 of 415** **Assess the need to revise Condition B to include specific guidance addressing "IF Completion Time of Condition A not met THEN be in MODE 3 within 6 hours."** **The proposed addition to the ISTS wording for the new proposed Condition A along with the modification to proposed Condition B do not provide appropriate action to take if the new Condition A is not met. There is no guidance if the 10 hours to complete Condition A is not met. This is needed to provide guidance for actions to take to exit the mode of applicability if required actions cannot be met. The proposed conditions do not adequately provide this guidance.** **Per 10 CFR 50.36(c)(2) the Tech Specs shall contain LCO's which provide remedial actions that shall be taken until the condition can be met.**
Issue Date	**10/01/2007**
Close Date	**10/09/2007**

Responses

Licensee Response by Bryan Kays on 10/08/2007	Condition B has been assessed as requested, and a revision is needed as follows: ITS 3.4.4, Condition B (Volume 9, Page 74) should provide the actions when ACTION A is not met. The Condition will be revised to include a new first Condition "Required Action and associated Completion Time of Condition A not met." The current Condition will remain unchanged and follow the new condition (connected with an OR). Furthermore, Justification for Deviations (JFD) 2, which describes the addition of ITS 3.4.4 ACTION A, will be revised to clearly state that ITS 3.4.4 ACTION B covers both of the above conditions. In addition, Discussion of Change (DOC) M01 (Page 70) will be revised to annotate that ITS 3.4.4 ACTION "B" includes the action to be in MODE 3. DOC M01 incorrectly stated

	that ACTION A was the shutdown action. The CTS Markup (Page 69) is correct and no changes are necessary. A draft markup regarding these changes is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 10/09/2007	Proposed changes attached from licensee acceptable. No further comments for this issue.

Date Created: 10/01/2007 02:04 PM by Timothy Kolb
Last Modified: 10/09/2007 12:48 PM

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RAI Screening Required: Yes

Status: Closed

This Document will be approved by: **Greg Cranston**

Regulatory Basis must be included in Comments section of this Form

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Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200712030914** Conference Call Requested? **No**
Category	**BSI - Beyond Scope Issue**
ITS Information	ITS Section: **3.4 Tim Kolb**; TB POC: ; JFD Number: **2**; Page Number(s): ; ITS Number: **3.4.4**; OSI: **4**; DOC Number: **None**; Bases JFD Number: **None**
Comment	**For Item #2 in the Justification for Deviations section, justifies increasing the completion time to 10 hours to shift from four RCP operation to three RCP operation by stating "the trip setpoints for the reactor protection system instrumentation automatically adjust based on RCP configuration. This is described in the ISTS Bases, Background section, last paragraph. The Davis Besse design does not include this automatic setdown feature for the High Flux trip setpoints - the setpoints must be manually adjusted." The staff requests the licensee to explain the procedure for manually shifting from four RCP operation to three.**
Issue Date	**12/03/2007**
Close Date	**03/19/2008**

Responses

Licensee Response by Bill Bentley on 12/21/2007	Increasing the time allowed to reduce the high flux trip setpoints from 4 hours to 10 hours is addressed in Discussion of Change L01, page 71 and 72 of Volume 9. While Justification for Deviation #2 also refers to the change in time from 4 hours to 10 hours, JFD #2 was not written to justify the change from 4 hours to 10 hours. The purpose of JFD #2 was to justify the changes to ISTS 3.4.4 that were needed in order to align with the Davis-Besse current license basis. The procedure to reduce the high flux trip setpoints is performed on all 4 Reactor Protection System (RPS) channels. From a basic overview, the procedure for any one channel is: (1) Place associated Anticipatory Reactor Trip System (ARTS) channel in bypass. (2) Place RPS channel in bypass. (3) Determine the setpoint voltage value that is equivalent to the 3 RCP allowable value (4) The setpoint on the High Flux Trip bistable is adjusted (calibrated) to the lower required setpoint voltage. (5) A Functional Test is performed to make sure that the High Flux function trips within the required setpoint value. (6) Restore the ARTS and RPS Channel.

Licensee Response by Bill Bentley on 01/22/2008	For additional information, ITS 3.4.4 Required Action A.1 requires resetting the RPS High Flux Trips. This action is equivalent to ISTS 3.2.4 Action C.2 and D.2, both of which have 10 hour completion times. 10 hours was chosen for consistency.

Date Created: 12/03/2007 09:14 AM by Jason Paige
Last Modified: 03/19/2008 07:28 AM

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RAI Screening Required: No

Status: Approval Not Required

This is a Non RAI Dialogue

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Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200710191308** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.4 Tim Kolb**; TB POC: ; JFD Number: **None**; Page Number(s): **125**; ITS Number: **3.4.6**; OSI: **None**; DOC Number: **None**; Bases JFD Number: **2**
Comment	**Insert #3 states that a DHR Loop is considered OPERABLE if it can be manually aligned (locally or remotely)to the DHR mode. Do you have procedure guidance to address aligning the system both locally and remotely?**
Issue Date	**10/19/2007**
Close Date	**10/23/2007**

Responses

Licensee Response by Bill Bentley on 10/19/2007	System Operating procedure DB-OP-06012, Decay Heat and Low Pressure Injection System Operating Procedure, provides the guidance for operation of the Decay Heat System. Depending on the alignment changes for the system, there may be both remote (control room) and local alignments required. The procedure provides the guidance for all alignments, local or remote.
NRC Response by Timothy Kolb on 10/22/2007	Please attach a copy of DB-OP-06012, Decay Heat and Low Pressure Injection System Operating Procedure, for my review.
Licensee Response by Bill Bentley on 10/22/2007	A copy of the requested procedure is attached.
NRC Response by Timothy Kolb on 10/23/2007	No further questions on this issue. Acceptable to close.

Date Created: 10/19/2007 01:08 PM by Timothy Kolb
Last Modified: 10/23/2007 08:50 AM

Davis-Besse Nuclear Power Station

SYSTEM PROCEDURE

DB-OP-06012

DECAY HEAT AND LOW PRESSURE INJECTION SYSTEM OPERATING PROCEDURE

REVISION 28

Prepared by: [redacted]

Procedure Owner: Superintendent - Nuclear Operations

Effective Date: OCT 17 2006

LEVEL OF USE:
STEP-BY-STEP

DECAY HEAT AND LOW PRESSURE INJECTION SYSTEM OPERATING PROCEDURE

TABLE OF CONTENTS

1.0 PURPOSE

To provide guidance for operating the DH System during Normal, Infrequent or Special, and Emergency Operations.

2.0 LIMITS AND PRECAUTIONS

2.1 Administrative

2.1.1 When the RCS has been shutdown and depressurized, the BWST should be isolated from the DH system to prevent the RCS being flooded by the BWST due to the elevation difference. This is accomplished either by closing DH 7A and DH 7B, or closing and depowering DH 2733 and DH 2734.

2.1.2 In Modes 4 or 5, with the DH Suction Line Relief, PSV (DH) 4849 NOT operable; perform the following:

a. Verify automatic transfer of MU 3971 and MU 6405 is disabled.

b. Maintain MU tank level less than 73 inches, and RCS pressure and pressurizer level to within the acceptable region of Figure 3.4-2a (Mode 4) or Figure 3.4-2b (Mode 5) of TS 3.4.2.

2.1.3 To provide RCS overpressure protection while in Modes 4 and 5, Isolation Valves DH 11 and DH 12 shall be open with control power removed from their valve operators; OR DH 21 and DH 23 shall be open. During startup and power operation, power is removed from DH 11 and DH 12.

2.1.4 Whenever the waterproof seal is broken on the DH Valve Pit, DB-SP-03135, DH Valve Pit Leak Test, shall be performed. This test requires sealing the vent on the pit, which cannot be done during power operation. Therefore, the plant must be shutdown before the seal is broken. However, the inspection port of the DH Valve Pit may be opened to perform inspections without performing the leak test. After use the inspection port must be verified as closed in its correct position. The applicable portion of DB-OP-03004, Locked Valve Verification, must be performed prior to sealing the DH Valve Pit.

2.1.5 The RCS flowrate through the core shall be ≥2800 gpm whenever a reduction in RCS boron concentration is being made, in all modes. Refer to TS 3.1.1.2 for exceptions to this surveillance.

2.1.6 Prior to removing the DH System from service with the RV head removed and the refueling canal filled (Mode 6), the following conditions should exist:

a. Provisions should be made to monitor the temperature of the water above the reactor vessel.

b. The rate of any temperature increase of the refueling canal should be monitored to allow adequate time to restore cooling prior to reaching saturation temperature.

2.1.7 When the plant is in MODE 6, the DH Pumps may be stopped for up to 1 hour per 8 hour period during the performance of core alterations provided the following conditions are met:

a. No operations involving boron concentration reduction to the RCS are permitted.

b. Core Outlet Temperature is maintained less than or equal to 140°F.

2.1.8 The DSA switch for AC 112 (DH Pump 1) shall be in the normal position to ensure that SFAS signals are not isolated from DH Pump 1.

2.1.9 The DSB switch for AC 112 (DH Pump 1) shall be in the normal position to ensure that all Control Room indications and controls are available to DH Pump 1.

2.1.10 When a suction flowpath to a Decay Heat Removal Pump is NOT available, the close power fuses for that pump should be pulled to prevent inadvertent pump starts and subsequent pump damage.

2.1.11 Whenever the LPI System is inoperable, IL 4804, LPI SYS, shall be turned on. This light is to remain illuminated as long as the system is inoperable.

2.1.12 If an SFAS signal to ESF equipment is blocked (i.e., overridden), that equipment is incapable of responding to either any subsequent automatic actuation signal or the SFAS system-level manual actuate TRIP pushbutton on Panel C5717. Before an operator blocks any SFAS signal, he must assure that the safety function of that equipment is no longer needed. Afterward the operator is totally responsible for the proper operation of that equipment, including actuation if required, until the "block" is removed.

Reactuation, subsequent to a block, can be accomplished two ways. First, at the equipment level, blocked equipment will respond to the individual control switches for that piece of equipment. Second, at the SFAS system level, operation of the system-level RESET pushbutton on Panel C5717 will clear any output logic blocks in the system (output logic Blocks are the block switches next to the SAM light and on the output modules). The equipment will then respond to the system-level manual actuate TRIP pushbutton and to automatic actuation signals.

2.1.13 If an operator blocks an SFAS signal and changes the status of the actuated equipment, he is responsible for assuring proper equipment operation and reinitiation if required until the SFAS is reset.

2.1.14 The DH System shall be isolated from the RCS when the following conditions exist:

a. RCS Pressure is greater than 266 psig, increasing, as read on PI RC2A6.

b. RCS temperature is greater than 350°F.

2.1.15 The preferred method of water addition while on DH is via MU and Purification System, if it is in service, and RCS Pressure is low enough to allow flow. If water must be added from the BWST, flow must be limited to less than 100 gpm to prevent thermally stressing the pressurizer surge line. Pressurizer level must be monitored to ensure proper water addition and flow. If this flow is exceeded it is better to maintain a continuous flow, once started, than to stop and restart, even at a slower rate.

2.1.16 Maintain DH System pressure less than 100 psig and temperature less than 130°F when using the MU and Purification System or the SFP Cooling System for RCS Purification, to prevent damaging the demineralizer resins, or lifting the relief at 125 psig.

2.1.17 Plant operation with RCS back leakage into the DH System through both DH to RCS Check valves will cause a reduction in the boron concentration of the DH System inventory. Placing a DH Loop in service containing lower borated water may result in an undesired reactivity addition. Therefore, to ensure the DH Loop boron concentration is equalized, the affected DH Loop shall be recirculated to the BWST prior to placing it in service on the RCS.

2.1.18 CFT back leakage to DH/LPI lines may cause formation of N_2 voids in DHR system piping which may result in gas binding and has the potential to render portions of the DH/LPI system inoperable. If symptoms of intersystem leakage exist (computer point P548) consideration should be given to performing portions of DB-SP-03212, Venting of ECCS Piping. Additionally, if a decrease in pressurizer level is noted when placing the DHR system in service, Operations Management and Plant Engineering should be contacted.

2.1.19 Radiation Protection shall be notified prior to breaking any system boundary, and prior to any venting or draining and when DH trains are swapped so that radiation levels can be monitored.

2.1.20 DHR Cooler outlet temperature should be maintained greater than or equal to 65°F. Additionally, in Mode 6, a maximum temperature limit of 140°F is also imposed. Refer to TS 4.9.8.1.b.

2.1.21 Decay heat valves associated solely with Refueling Canal operations are controlled by DB-OP-06023, Fill, Drain and Purification of the Refueling Canal.

2.1.22 Consideration should be given to limit the time the RCS is lined up to both SFP Purification and MU and Purification through a DH Loop. This lineup would normally be used only during Forced Oxidation (Crud burst) cleanup initiated at the start of an outage. This will minimize erosion of DH 70 which is throttled to control purification flowrate.

2.1.23 If the need arises while at Reduced Inventory to transition to DH 21 and DH 23 (DH 11 and DH 12 Bypass Valves), the running DH Pump suction pressure should be closely monitored. It is expected that DH Loop flow will have to be lowered to prevent exceeding the minimum suction pressure limits of CC6.2 or CC6.4 of DB-PF-06703, Miscellaneous Operation Curves, during the transition. Once the transition is complete the Operation at Reduced Inventory Subsection should be referenced to re-establish steady state DH Loop flow.

2.1.24 Certain subsections of this procedure make the affected DH Loop incapable of performing its intended function. The following should be referenced to evaluate operability:

Technical Specifications:

- 3.1.2.1 BA Flowpath - Shutdown (Modes 5,6)
- 3.1.2.2 BA Flowpath - Operating (Modes 1-4)
- 3.1.2.5 DH Pump - Shutdown (Modes 4,5,6 RCS Pressure <150 psig)
- 3.4.1.2 Reactor Coolant System (Modes 4,5,6)
- 3.4.2 Safety Valves - Shutdown (Modes 4,5)
- 3.5.2 ECCS Subsystems T_{AVE} ≥280°F (Modes 1-3)
- 3.5.3 ECCS Subsystems T_{AVE} less than 280°F (Modes 4)
- 3.9.8.1 Refueling (Mode 6 Water level ≥23 ft above irradiated fuel assemblies)
- 3.9.8.2 Refueling (Mode 6 Water level <23 ft above irradiated fuel assemblies)

TRM Specifications:

- 3.1.2.8 Borated Water Sources - Shutdown (Modes 5,6)
- 3.1.2.9 Borated Water Sources - Operating (Modes 1-4)

2.1.25 Engineering analysis has determined the allowable leakage from a DH Pump inboard or outboard bearing reservoir is as follows:

- At high level mark in the sightglass – 0.93 drops/hr (0.00195 oz/hr)
- < high level mark but ≥ low level mark – 0.47 drops/hr (0.00099 oz/hr)

Based on the small amount of acceptable leakage, any leakage in excess of wicking resulting in a small oil film around the immediate gasket area and the housing should be considered a degraded condition, and reported to Operations Management and Plant Engineering for evaluation.

2.1.26 Monitor CF30, CFT 2 TO RX CHECK VALVE, for abnormal noise when DH injection line 2 is in-service. The physical orientation of the valve allows the disc come off the backseat causing excessive noise at normal (3000 GPM) flow rates. Adjusting DH13A, DH14A*, and/or DH1A** maybe required to minimize the noise.

2.1.27 When the BA pumps are credited for the minimum boric acid flow to the RCS during Decay Heat pump operation the BA pumps ability to pump against RCS pressure limits their ability to deliver the required flow. Assuming 11,000 ppmB in the BAAT; a BA Pump can deliver the required flow up to a maximum RCS pressure of 45 psig

2.1.28 Industry Operating Experience indicates that gas intrusion may result from inadequate restoration measures following completion of maintenance activities that involve draining system piping and instrumentation sensing lines. Piping isometrics should be consulted to ensure that the associated piping and instrumentation lines have been adequately vented following the completion of maintenance activities that have drained piping or instrumentation sensing lines.

2.2 Equipment

2.2.1 Decay Heat System Temperature Limits

	ALARM (°F)		MAX	COMPUTER POINTS	
	LOW	HIGH	LIMIT (°F)	PMP 1	PMP 2
DH PMP 1 (2) M/E BRG OT	40	160	170	T364	T371
DH PMP 1 (2) O/B BRG OT	40	160	170	T368	T375
DH PMP 1 (2) MTR O/B BRG OT	40	180	190	T365	T372
DH PMP 1 (2) MTR P/E BRG OT	40	180	190	T366	T373
DH PMP 1 (2) MTR STATOR TEMP	40	256	266	T367	T374

2.2.2 Decay Heat Pump Motors

a. The following starting duties apply to the DH Pump motors:

- (2) starts in succession allowing the motor to coast to a stop with motor initially at ambient temperature.
- (1) start if initially at rated temperature.
- Additional starts should be minimized and shall not be performed until motor temperature is less than the MAX listed in 2.2.1.

b. Maximum time for a locked rotor without damage at 100% rated voltage, is 12 seconds.

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

2.2.3 Decay Heat System Flow Limits

a. Maximum DH Flow through each DH Cooler is 4300 gpm.

b. Pump runout for each DH Pump is 4300 gpm.

c. When DH System suction is through DH 21 and DH 23, total DH System flow is limited to 4000 gpm.

d. Minimum recirculation flow is 80 gpm per pump.

e. When injecting water from the BWST (LPI mode), no throttling of DH 14A or DH 14B is required due to mechanical stops limiting flow through each valve.

2.2.4 Air shall not be restored to DH 13A, DH 13B, DH 14A, or DH 14B while the manual handwheel is engaged. This may cause damage to the valve actuator.

2.2.5 When stroking open DH7B, either manually or electrically, to relieve a known void downstream DH7B due to a previously drained condition, ensure the BWST Recirc Pump is shutdown. This is of because the BWST Recirc Pump takes suction on top of the pipe directly upstream of DH7B and can become airbound if running.

2.2.6 ECCS Room Sump Pumps are credited for mitigating the effects of ECCS system leakage and certain high energy line-break events. Refer to DB-OP-06272, Station Drainage and Discharge System for operability requirements.

2.2.7 Pressurizer Heaters are interlocked with valves DH11 and DH12, REACTOR COOLANT TO DECAY HEAT SYSTEM, via SFAS Channels 1 and 4.

- Pressurizer Heaters PIC RC2, HIS RC2-B, and HIS RC 2-4 are disabled when either DH11 or DH12 is open, and SFAS Channel 4 301 psi bi-stable is reset.

- Pressurizer Heaters HIS RC2-A, HIS RC2-2, and HIS RC 2-3 are disabled when either DH11 or DH12 is open, and SFAS Channel 1 301 psi bi-stable is reset.

2.2.8 Purification of the RCS using both the MU and Purification System and the SFP Purification System shall not be used while draining the RCS. Reverse flow of the SFP Purification System may occur and introduce resin beads into the MU and Purification System.

2.2.9 DH Pump #2 outboard bearing oil level may read high when ECCS Room #2 air cooler is running.

3.0 NORMAL OPERATIONS

3.1 Fill and Vent DH Loop 1

INITIALS Prerequisites

_______ 3.1.1 A pre-evolution briefing has been conducted covering the performance of this subsection.

_______ 3.1.2 Verify adequate BWST inventory is available for fill.

_______ 3.1.3 Verify Attachment 3, Checklist for Valves Common to Both DH Loops is current.

_______ 3.1.4 Verify Attachment 19, Decay Heat Pit Valve Checklist is current.

Prerequisites completed by ______________________________ Date ___________

Procedure

_______ 3.1.5 Verify the CLOSE power fuses are removed from AC 112, DECAY HT PUMP 1-1 MP-421.

3.1.6 Verify the following valves are closed:

_______ • DH 1B*, DH PUMP 1 DISCHARGE TO RCS

_______ • DH 2733*, DH PUMP 1 SUCTION FROM BWST OR EMER SUMP

_______ • DH 1517, DH PUMP 1 SUCTION FROM RCS

_______ • DH 10*, DH PUMP 1 MINIMUM COOLDOWN ISOLATION

_______ • DH 73, DH PUMP 1 DISCHARGE LINE LEAK TEST CONN

3.1.7 Open the following breakers:

_______ • BE 1106 (E11A), MV DH01B LP INJ 1 VLV.

_______ • BE 1121 (E11A), MV 2733 DH PMP 1 SUCT VLV FRM BWST

_______ • BE 1126 (E11D), MV 1517 DH NORM SUCT LINE 1 ISO VLV.

_______ 3.1.8 Verify Attachment 1, DH Loop 1 Normal Lineup Valve Checklist is current.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.1.9

The following steps require two operators: one at DH 2733* handwheel, and one to monitor system venting.

CAUTION 3.1.9

- Shift Manager permission is required prior to declutching DH 2733*.
- When declutching and engaging the manual actuator for DH 2733*, be aware that excessive force may result in damage to the valve and/or the actuator.

_______ 3.1.9 Manually crack open DH 2733*, DH PUMP 1 SUCTION FROM BWST OR EMER SUMP, to gravity fill DH Loop 1 from the BWST.

_______ 3.1.10 Press AUTO for DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIS DH 13B.

_______ 3.1.11 Open DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

NOTE 3.1.12

Venting from DH 164B, DH 165, and DH 166 will have to be performed again if DB-SP-03212, Venting of ECCS Piping, is required in Step 3.1.17.

3.1.12 Vent DH Loop 1 discharge piping at the following points:

_______ • DH 57, DH PUMP 1 CASING VENT

_______ • DH 165, DH PUMP 1 DISCHARGE LINE VENT

_______ • HP115, HIGH PRESSURE INJECTION PUMP 1 ALTERNATE MINIMUM FLOW LINE VENT

_______ • DH 164B, DECAY HEAT PUMP 1 SUCTION LINE FROM EMERGENCY SUMP VENT

_______ • DH 166, DH PUMP 1 OUTLET TO HPI PUMP VENT

_______ • DH 27, DH PUMP 1 SUCTION FROM RCS LEAK TEST

_______ • DH 73, DH PUMP 1 DISCHARGE LINE LEAK TEST

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.1.13

The Decay Heat suction flowpath from RCS is isolated when DH 11, DH 12, DH 21*, and DH 23* are closed.

3.1.13 IF the Decay Heat suction flowpath from RCS is isolated, THEN perform the following:

________ a. Verify DH 26*, DH PUMP 2 MINIMUM COOLDOWN ISOLATION, is closed.

CAUTION 3.1.13.b

- Shift Manager permission is required prior to declutching DH 1517.
- When declutching and engaging the manual actuator for DH 1517, be aware that excessive force may result in damage to the valve and/or the actuator.

________ b. Manually crack open DH 1517, DH PUMP 1 SUCTION FROM RCS.

________ c. Vent at DH 173, DH PUMPS SUCTION FROM RCS VENT.

________ d. Close DH 1517, DH PUMP 1 SUCTION FROM RCS.

________ 3.1.14 Close DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

3.1.15 IF RCS pressure is less than 40 psig, THEN perform the following:

________ a. Close DH77*, DH PUMP 1 DISCHARGE TO REACTOR COOLANT SYSTEM STOP CHECK.

b. Open DH 1B*, DH PUMP 1 DISCHARGE TO RCS, as follows:

________ 1. Close BE 1106 (E11A), MV DH01B LP INJ 1 VLV.

NOTE 3.1.15.b.2

Computer point Z560 will indicate TRBL until DH 1B is fully open and the control power is removed.

________ 2. Place control power on DH 1B* using HIS DH1B-2.

________ 3. Open DH 1B*, DH PUMP 1 DISCHARGE TO RCS, using HIS DH1B.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

________ 4. Remove control power from DH 1B* using HIS DH1B-2.

________ c. Vent DH Loop 1 piping at DH177**/DH177A**, DH PUMP 1 DISCHARGE TO REACTOR COOLANT SYSTEM VENT.

________ d. Close DH 2733*, DH PUMP 1 SUCTION FROM BWST OR EMER SUMP, to prevent inadvertent water addition to the RCS.

________ e. Open DH77*, DH PUMP 1 DISCHARGE TO REACTOR COOLANT SYSTEM STOP CHECK.

3.1.16 IF DH 1B*, DH PUMP 1 DISCHARGE TO RCS, is closed, THEN open DH 1B*, as follows:

________ a. Close BE 1106 (E11A), MV DH01B LP INJ 1 VLV.

________ b. Place control power on DH 1B* using HIS DH1B-2.

NOTE 3.1.16.c

Computer point Z560 will indicate TRBL until DH 1B is fully open and the control power is removed.

________ c. Open DH 1B*, DH PUMP 1 DISCHARGE TO RCS, using HIS DH1B.

________ d. Remove control power from DH 1B* using HIS DH1B-2.

NOTE 3.1.17

DB-SP-03212, Venting of ECCS Piping, requires that RCS pressure be greater than or equal to 40 psig to support the venting evolution.

________ 3.1.17 IF DB-SP-03212, Venting of ECCS Piping, is required to be performed, THEN GO TO DB-SP-03212 and perform the applicable steps.

________ 3.1.18 Verify DH 2733*, DH PUMP 1 SUCTION FROM BWST OR EMER SUMP, is closed.

________ 3.1.19 IF Decay Heat Loop 1 is to be aligned in the Decay Heat Mode, THEN GO TO Subsection 3.5, Place DH Loop 1 in Standby DH Mode.

________ 3.1.20 IF Decay Heat Loop 1 is to be aligned in the LPI Mode, THEN GO TO Subsection 3.3, Place DH Loop 1 in Standby LPI Mode.

Subsection 3.1 completed by ______________________________ Date ____________

**Controlled per DB-OP-00009, Operation and Control of Capped Valves
*Controlled per DB-OP-00008, Operation and Control of Locked Valves

3.2 Fill and Vent DH Loop 2

________ 3.2.1 A pre-evolution briefing has been conducted covering the performance of this subsection.

________ 3.2.2 Verify adequate BWST inventory is available for fill.

________ 3.2.3 Verify Attachment 3, Checklist for Valves Common to Both DH Loops is current.

________ 3.2.4 Verify Attachment 19, Decay Heat Pit Valve Checklist is current.

Prerequisites completed by ____________________________________ Date ______________

Procedure

________ 3.2.5 Verify the CLOSE power fuses are removed from AD 112, DECAY HT PUMP 1-2 MP-422.

3.2.6 Verify the following valves are closed:

- ________ DH 1A*, DH PUMP 2 DISCHARGE TO RCS
- ________ DH 2734*, DH PUMP 2 SUCTION FROM BWST OR EMER SUMP
- ________ DH 1518, DH PUMP 2 SUCTION FROM RCS
- ________ DH 26*, DH PUMP 2 MINIMUM COOLDOWN ISO
- ________ DH 158, DH PUMP 2 DISCHARGE LINE VENT
- ________ DH 176, DH PUMP 2 SUCTION FROM RCS VENT

3.2.7 Open the following breakers:

- ________ BF 1136 (F11C) MV DH01A, L.P. INJ 2 VLV
- ________ BF 1134 (F11C) MV 2734, DH PMP 2 SUCT VLV FRM BWST
- ________ BF 1129 (F11C) MV 1518, DH NORM SUCT LINE 2 ISO VLV

________ 3.2.8 Verify Attachment 2, DH Loop 2 Normal Lineup Valve Checklist is current.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.2.9

The following steps require two operators: one at DH 2734* handwheel, and one to monitor system venting.

CAUTION 3.2.9

- Shift Manager permission is required prior to declutching DH 2734*.
- When declutching and engaging the manual actuator for DH 2734*, be aware that excessive force may result in damage to the valve and/or the actuator.

_______ 3.2.9 Manually crack open DH 2734*, DH PUMP 2 SUCTION FROM BWST OR EMER SUMP, to gravity fill DH Loop 2 from the BWST.

_______ 3.2.10 Press AUTO for DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIS DH 13A.

_______ 3.2.11 Open DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

NOTE 3.2.12

Venting from DH 158 and DH 161 will have to be performed again if DB-SP-03212, Venting of ECCS Piping, is required in Step 3.2.17.

3.2.12 Vent DH Loop 2 piping at the following points:

- _______ DH 56, DH PUMP 2 CASING VENT.
- _______ DH 164, DH PUMP 2 SUCTION FROM CTMT EMERG SUMP VENT
- _______ DH 161, DH PUMP 2 DISCHARGE LINE VENT
- _______ DH 72, DH PUMP 2 DISCHARGE LINE LEAK TEST
- _______ DH 158, DH PUMP 2 DISCHARGE LINE VENT
- _______ DH 176, DH PUMP 2 SUCTION FROM RCS VENT
- _______ DH 174, DH PUMP 2 SUCTION FROM RCS LEAK TEST
- _______ DH154, ECCS TRAIN 2 COMMON SUCTION LINE VENT.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.2.13

The Decay Heat suction flowpath from RCS is isolated when DH 11, DH 12, DH 21*, and DH 23* are closed.

3.2.13 IF the Decay Heat suction flowpath from RCS is isolated, THEN perform the following:

______ a. Verify DH 10*, DH PUMP 1 MINIMUM COOLDOWN ISOLATION, is closed.

CAUTION 3.2.13.b

- Shift Manager permission is required prior to declutching DH 1518.
- When declutching and engaging the manual actuator for DH 1518, be aware that excessive force may result in damage to the valve and/or the actuator.

______ b. Manually crack open DH 1518, DH PUMP 2 SUCTION FROM RCS.

______ c. Vent at DH 173, DH PUMPS SUCTION FROM RCS VENT.

______ d. Close DH 1518, DH PUMP 2 SUCTION FROM RCS.

______ e. IF in MODE 1, 2, or 3, THEN Lock open DH 10*, DH PUMP 1 MINIMUM COOLDOWN ISOLATION.

______ 3.2.14 Close DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

3.2.15 IF RCS pressure is less than 40 psig, THEN perform the following:

______ a. Close DH76*, DH PUMP 2 DISCHARGE TO REACTOR COOLANT SYSTEM STOP CHECK.

b. Open DH 1A*, DH PUMP 2 DISCHARGE TO RCS, as follows:

______ 1. Close BF 1136 (F11C), MV DH01A LP INJ 2 VLV.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.2.15.b.2

Computer point Z564 will indicate TRBL until DH 1A is fully open and the control power is removed.

_______ 2. Place control power on DH 1A* using HIS DH1A-2.

_______ 3. Open DH 1A*, DH PUMP 2 DISCHARGE TO RCS, using HIS DH1A.

_______ 4. Remove control power from DH 1A* using HIS DH1A-2.

_______ c. Vent DH Loop 2 piping at DH74**/DH74A**, DH PUMP 2 DISCHARGE TO REACTOR COOLANT SYSTEM VENT.

_______ d. Close DH 2734*, DH PUMP 2 SUCTION FROM BWST OR EMER SUMP, to prevent inadvertent water addition to the RCS.

_______ e. Open DH76*, DH PUMP 2 DISCHARGE TO REACTOR COOLANT SYSTEM STOP CHECK.

3.2.16 IF DH 1A*, DH PUMP 2 DISCHARGE TO RCS, is closed, THEN open DH 1A*, as follows:

_______ a. Close BF 1136 (F11C), MV DH01A LP INJ 2 VLV.

_______ b. Place control power on DH 1A* using HIS DH1A-2.

NOTE 3.2.16.c

Computer point Z564 will indicate TRBL until DH 1A is fully open and the control power is removed.

_______ c. Open DH 1A*, DH PUMP 2 DISCHARGE TO RCS, using HIS DH1A.

_______ d. Remove control power from DH 1A* using HIS DH1A-2.

NOTE 3.2.17

DB-SP-03212, Venting of ECCS Piping, requires that RCS pressure be greater than or equal to 40 psig to support the venting evolution.

_______ 3.2.17 IF DB-SP-03212, Venting of ECCS Piping, is required to be performed, THEN REFER TO DB-SP-03212 and perform the applicable steps.

_______ 3.2.18 Verify DH 2734*, DH PUMP 2 SUCTION FROM BWST OR EMER SUMP, is closed

**Controlled per DB-OP-00009, Operation and Control of Capped Valves
*Controlled per DB-OP-00008, Operation and Control of Locked Valves

________ 3.2.19 <u>IF</u> Decay Heat Loop 2 is to be aligned in the Decay Mode,
<u>THEN</u> <u>GO TO</u> Subsection 3.6, Place DH Loop 2 in Standby DH Mode.

________ 3.2.20 <u>IF</u> Decay Heat Loop 2 is to be aligned in the LPI Mode,
<u>THEN</u> <u>GO TO</u> Subsection 3.4, Place DH Loop 2 in Standby LPI Mode.

Subsection 3.2 completed by ______________________________ Date __________

3.3 Place DH Loop 1 in Standby LPI Mode

INITIALS

Prerequisites

_________ 3.3.1 A pre-evolution briefing has been conducted covering the performance of this subsection which makes DH Loop 1 incapable of performing its intended function. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_________ 3.3.2 IF entering this subsection from DB-OP-06900, Plant Heatup, THEN GO TO Subsection 3.12, Place Decay Heat Loop 1 in Standby LPI Mode During Plant Heatup.

_________ 3.3.3 Verify DH Loop 1 has been filled and vented. Refer to Subsection 3.1, Fill and Vent DH Loop 1.

_________ 3.3.4 Verify CCW is available to DH Loop 1. Refer to DB-OP-06262, Component Cooling Water System Procedure.

_________ 3.3.5 Verify Attachment 4, DH Loop 1 Breaker Checklist is current.

_________ 3.3.6 Verify Attachment 6, DH Loop 1 Instrument Checklist is current.

Prerequisites completed by ________________________________ Date ____________

Procedure

_________ 3.3.7 The following step makes DH Loop 1 inoperable. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_________ 3.3.8 Remove the CLOSE power fuses from AC 112, DECAY HT PUMP 1-1 MP-421.

_________ 3.3.9 Verify DH 2733*, DH PUMP 1 SUCTION FROM BWST OR EMERG SUMP, is closed.

_________ 3.3.10 Verify DH 1517, DH PUMP 1 SUCTION FROM RCS, is closed.

_________ 3.3.11 Open DH 2733*, DH PUMP 1 SUCTION FROM BWST OR EMERG SUMP.

_________ 3.3.12 Verify DH 1B*, DH PUMP 1 DISCHARGE TO RCS ISO, is open.

_________ 3.3.13 Verify Attachment 8, DH Pump 1 Prestart Checklist, is current.

_________ 3.3.14 Verify the CLOSE power fuses for AC 112, DECAY HT PUMP 1-1 MP-421, are installed.

_________ 3.3.15 Notify the Shift Manager DH Loop 1 is in Standby LPI Mode AND to perform an operability evaluation. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_________ 3.3.16 Set DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, to 65% open using HIC DH 14B.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

_______ 3.3.17 Press OPEN on HIS DH14B.

_______ 3.3.18 Close DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH13B.

_______ 3.3.19 Press CLOSE on HIS DH13B.

_______ 3.3.20 Within 4 hours locally verify DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, indicates 30.5 – 34.5 % open.

_______ 3.3.21 Record in the Unit Log DH 14B* verified open locally to mechanical stop.

_______ 3.3.22 Verify DH 59, DH PUMP 1 DISCHARGE SAMPLE ISOL, is open.

_______ 3.3.23 Verify Operational Information Tags hung in Subsection 3.5 are removed.

Subsection 3.3 completed by ______________________________ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

3.4 Place DH Loop 2 in Standby LPI Mode

INITIALS Prerequisites

________ 3.4.1 A pre-evolution briefing has been conducted covering the performance of this subsection which makes DH Loop 2 incapable of performing its intended function. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

________ 3.4.2 IF entering this subsection from DB-OP-06900, Plant Heatup, THEN GO TO Subsection 3.13, Place Decay Loop 2 in Standby LPI Mode during Plant Heatup.

________ 3.4.3 Verify DH Loop 2 has been filled and vented. Refer to Subsection 3.2, Fill and Vent DH Loop 2.

________ 3.4.4 Verify CCW is available to DH Loop 2. Refer to DB-OP-06262, Component Cooling Water System Procedure.

________ 3.4.5 Verify Attachment 5, DH Loop 2 Breaker Checklist is current.

________ 3.4.6 Verify Attachment 7, DH Loop 2 Instrument Checklist is current.

Prerequisites completed by ____ Date ______________

Procedure

________ 3.4.7 The following step makes DH Loop 2 inoperable. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

________ 3.4.8 Remove the CLOSE power fuses from AD 112, DECAY HT PUMP 1-2 MP-422.

________ 3.4.9 Verify DH 2734*, DH PUMP 2 SUCTION FROM BWST OR EMERG SUMP, is closed.

________ 3.4.10 Verify DH 1518, DH PUMP 2 SUCTION FROM RCS, is closed.

________ 3.4.11 Open DH 2734*, DH PUMP 2 SUCTION FROM BWST OR EMERG SUMP.

________ 3.4.12 Verify DH 1A*, DH PUMP 2 DISCHARGE TO RCS ISO, is open.

________ 3.4.13 Verify Attachment 9, DH Pump 2 Prestart Checklist is current.

________ 3.4.14 Verify the CLOSE power fuses for AD 112, DECAY HT PUMP 1-2 MP-422, are installed.

________ 3.4.15 Notify the Shift Manager DH Loop 2 is in Standby LPI Mode AND to perform an operability evaluation. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

________ 3.4.16 Set DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, to 67% open using HIC DH14A.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

________ 3.4.17 Press OPEN on HIS DH14A.

________ 3.4.18 Close DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH13A.

________ 3.4.19 Press CLOSE on HIS DH13A.

________ 3.4.20 Within 4 hours locally verify DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, indicates 37 – 41 % open.

________ 3.4.21 Record in the Unit Log DH 14A* verified open locally to mechanical stop.

________ 3.4.22 Verify DH 60, DH PUMP 2 DISCHARGE SAMPLE ISOL, is open.

________ 3.4.23 Verify Operational Information Tags hung in Subsection 3.6 are removed.

Subsection 3.4 completed by ____ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

3.5 Place DH Loop 1 in Standby DH Mode

INITIALS Prerequisites

______ 3.5.1 A pre-evolution briefing has been conducted covering the performance of this subsection which makes DH Loop 1 incapable of performing its intended function. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

3.5.2 Verify Operational Information Tags for the breakers and switches listed below have been prepared, indicating their position, and referencing this procedure subsection. Refer to DB-OP-00016, Temporary Configuration Control.

______ • BE 1121 (E11A), MV 2733 DH PMP 1 SUCT VLV FRM BWST

______ • BE 1126 (E11D), MV 1517 DH NORM SUCT LINE 1 ISO VLV

______ • BE 1187 (E11E), MV DH64 LPI-HPI CROSS CONN ISO VLV 1

______ • HIS 2733, DH PUMP 1 LPI SUCT DH 2733

______ • HIS 1517, DH 1517

______ • HIS DH64, DHR CLR 1 OUTLET TO HPI PMP 1 SUCT DH64

NOTE 3.5.3

One train of DH shall remain in an LPI lineup until RCS temperature is less than 200°F.

3.5.3 IF DH Loop 1 is in Standby LPI Mode,
THEN N/A this step.
OTHERWISE perform the following:

______ a. Verify DH Loop 1 has been filled and vented. Refer to Subsection 3.1, Fill and Vent DH Loop 1.

______ b. Verify Attachment 4, DH Loop 1 Breaker Checklist, is current.

______ c. Verify Attachment 6, DH Loop 1 Instrument Checklist, is current.

Prerequisites completed by ______________________ Date __________

Procedure

______ 3.5.4 The following step makes DH Loop 1 inoperable. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

______ 3.5.5 Verify the CLOSE power fuses for AC 112, DECAY HT PUMP 1-1 MP-421, are removed.

NOTE 3.5.6

DH 64, DH PUMP 1 DISCH TO HPI PMP 1 SUCTION, is not designed to operate against the ΔP possible if the DH pump is running with a suction from the RCS.

_______ 3.5.6 Verify BE 1187 (E11E), MV DH64 LPI-HPI CROSS CONN ISO VLV 1, is open.

_______ 3.5.7 Verify the Operational Information Tag prepared in Step 3.5.2 is placed on BE 1187 (E11E), MV DH64 LPI-HPI CROSS CONN ISO VLV 1.

_______ 3.5.8 Verify the Operational Information Tag prepared in Step 3.5.2 is placed on HIS DH64, DHR CLR 1 OUTLET TO HPI PMP 1 SUCT DH64.

_______ 3.5.9 Close DH 2733*, DH PUMP 1 SUCTION FROM BWST OR EMERGENCY SUMP.

_______ 3.5.10 Open BE 1121 (E11A), MV 2733 DH PUMP 1 SUCT VLV FRM BWST.

_______ 3.5.11 Verify the Operational Information Tag prepared in Step 3.5.2 is placed on BE 1121 (E11A), MV 2733 DH PMP 1 SUCT VLV FRM BWST.

_______ 3.5.12 Verify the Operational Information Tag prepared in Step 3.5.2 is placed on HIS 2733, DH PUMP 1 LPI SUCT DH 2733.

_______ 3.5.13 Close DH 10*, DH PUMP 1 MINIMUM COOLDOWN ISOLATION.

NOTE 3.5.14

DH 11 AND DH 12 or DH 21* AND DH 23* flowpath valve position should be entered in Unit Log.

3.5.14 Verify Decay Heat suction flowpath from RCS is lined up by performing either a. OR b. (N/A flowpath not used)

a.

_______ • Verify DH 11, RCS to DH, is open with control power removed.

_______ • Verify DH 12, RCS to DH, is open with control power removed.

OR

b.

_______ • Verify DH 21*, RCS TO DECAY HEAT BYPASS, is open.

_______ • Verify DH 23*, RCS TO DECAY HEAT BYPASS, is open.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

CAUTION 3.5.15

CFT leakage may cause formation of N_2 voids in DH System piping. If Pressurizer level drops when placing the DH System in Service, Operations Management and Plant Engineering should be contacted for resolution prior to continuing in this procedure.

________ 3.5.15 Open DH 1517, DH PUMP 1 SUCTION FROM RCS, using HIS 1517.

3.5.16 IF Pressurizer level decreases,
THEN perform the following:

________ a. Close DH 1517, DH PUMP 1 SUCTION FROM RCS, using HIS 1517.

________ b. Inform Operations Management and Plant Engineering of the Pressurizer level drop when DH 1517 was opened.

________ 3.5.17 Open BE 1126 (E11D), MV 1517 DH NORM SUCT LINE 1 ISO VLV.

________ 3.5.18 Verify the Operational Information Tag prepared in Step 3.5.2 is placed on BE 1126 (E11D), MV 1517 DH NORM SUCT LINE 1 ISO VLV.

________ 3.5.19 Verify the Operational Information Tag prepared in Step 3.5.2 is placed on HIS 1517, DH 1517.

________ 3.5.20 Verify Attachment 8, DH Pump 1 Prestart Checklist, is current.

________ 3.5.21 Press AUTO for DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIS DH 14B.

________ 3.5.22 Press AUTO for DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIS DH 13B.

________ 3.5.23 Close DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIC DH 14B.

________ 3.5.24 Close DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

________ 3.5.25 Verify the CLOSE power fuses for AC 112, DECAY HT PUMP 1-1 MP-421, are installed.

________ 3.5.26 Notify the Shift Manager DH Loop 1 is in Standby DH Mode AND to perform an operability evaluation. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

_______ 3.5.27 IF the plant was operated with back leakage from the RCS into the DH System *via the DH to RCS discharge check valves,*
THEN recirculate DH Loop 1 to the BWST for a minimum of 10 minutes at 3000 gpm prior to placing it in service. REFER TO Subsection 4.5, Placing the BWST on Recirc using DH Pump 1 in the DH Mode.

Subsection 3.5 completed by ____________________________________ Date ______________

3.6 Place DH Loop 2 in Standby DH Mode

INITIALS

Prerequisites

_______ 3.6.1 A pre-evolution briefing has been conducted covering the performance of this subsection which makes DH Loop 2 incapable of performing its intended function. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

3.6.2 Verify Operational Information Tags for the breakers and switches listed below have been prepared, indicating their position, and referencing this procedure subsection. Refer to DB-OP-00016, Temporary Configuration Control.

_______ • BF 1134 (F11C), MV 2734 DH PUMP 2 SUCT VLV FRM BWST

_______ • BF 1129 (F11C), MV 1518 DH NORM SUCT LINE 2 ISO VLV

_______ • BF 1195 (F11E), MV DH63 LPI-HPI CROSS CONN ISO VLV 2

_______ • HIS 2734, DH PUMP 2 LPI SUCT

_______ • HIS 1518, DH 1518

_______ • HIS DH63, DHR CLR 2 OUTLET TO HPI PMP 2 SUCT DH63

NOTE 3.6.3

One train of DH shall remain in an LPI lineup until RCS temperature is less than 200°F.

3.6.3 IF DH Loop 2 is in Standby LPI Mode,
THEN N/A this step.
OTHERWISE perform the following:

_______ a. Verify DH Loop 2 has been filled and vented. Refer to Subsection 3.2, Fill and Vent DH Loop 2.

_______ b. Verify Attachment 5, DH Loop 2 Breaker Checklist, is current.

_______ c. Verify Attachment 7, DH Loop 2 Instrument Checklist, is current.

Prerequisites completed by ______________________________ Date ___________

Procedure

_______ 3.6.4 The following step makes DH Loop 2 inoperable. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 3.6.5 Verify the CLOSE power fuses for AD 112, DECAY HT PUMP 1-2 MP-422, are removed.

NOTE 3.6.6

DH 63, DH PUMP 2 DISCH TO HPI PMP 2 SUCTION, is not designed to operate against the ΔP possible if the DH pump is running with a suction from the RCS.

_______ 3.6.6 Verify BF 1195 (F11E), MV DH63 LPI-HPI CROSS CONN ISO VLV 2, is open.

_______ 3.6.7 Verify the Operational Information Tag prepared in Step 3.6.2 is placed on BF 1195 (F11E), MV DH63 LPI-HPI CROSS CONN ISO VLV 2.

_______ 3.6.8 Verify the Operational Information Tag prepared in Step 3.6.2 is placed on HIS DH63, DHR CLR 2 OUTLET TO HPI PMP 2 SUCT DH63.

_______ 3.6.9 Close DH 2734*, DH PUMP 2 SUCTION FROM BWST OR EMERGENCY SUMP.

_______ 3.6.10 Open BF 1134 (F11C), MV 2734 DH PMP 2 SUCT VLV FRM BWST.

_______ 3.6.11 Verify the Operational Information Tag prepared in Step 3.6.2 is placed on BF 1134 (F11C), MV 2734 DH PUMP 2 SUCT VLV FRM BWST.

_______ 3.6.12 Verify the Operational Information Tag prepared in Step 3.6.2 is placed on HIS 2734, DH PUMP 2 LPI SUCTION DH 2734.

_______ 3.6.13 Close DH 10*, DH PUMP 1 MINIMUM COOLDOWN ISOLATION.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.6.14

DH 11 AND DH 12 or DH 21* AND DH 23* flowpath valve position should be entered in Unit Log.

3.6.14 Verify Decay Heat suction flowpath from the RCS is lined up by performing either of the following: (N/A flowpath not used)

_______ • Verify DH 11, RCS TO DH, is open with control power removed.

_______ • Verify DH 12, RCS TO DH, is open with control power removed.

OR

_______ • Verify DH 21*, RCS TO DECAY HEAT BYPASS, is open.

_______ • Verify DH 23*, RCS TO DECAY HEAT BYPASS, is open.

CAUTION 3.6.15

CFT leakage may cause formation of N_2 voids in DH System piping. If Pressurizer level drops when placing the DH System in Service, Operations Management and Plant Engineering should be contacted for resolution prior to continuing in this procedure.

_______ 3.6.15 Open DH 1518, DH PUMP 2 SUCTION FROM RCS, using HIS 1518.

3.6.16 IF Pressurizer level decreases,
THEN perform the following:

_______ a. Close DH 1518, DH PUMP 2 SUCTION FROM RCS, using HIS 1518.

_______ b. Inform Operations Management and Plant Engineering of the Pressurizer level drop when DH 1518 was opened.

_______ 3.6.17 Open BF 1129 (F11C), MV 1518 DH NORM SUCT LINE 2 ISO VLV.

_______ 3.6.18 Verify the Operational Information Tag prepared in Step 3.6.2 is placed on BF 1129 (F11C), MV 1518 DH NORM SUCT LINE 2 ISO VLV.

_______ 3.6.19 Verify the Operational Information Tag prepared in Step 3.6.2 is placed on HIS 1518, DH 1518.

_______ 3.6.20 Verify Attachment 9, DH Pump 2 Prestart Checklist, is current.

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

_______ 3.6.21 Press AUTO for DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIS DH 14A.

_______ 3.6.22 Press AUTO for DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIS DH 13A.

_______ 3.6.23 Close DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH 14A.

_______ 3.6.24 Close DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

_______ 3.6.25 Verify the CLOSE power fuses for AD 112, DECAY HT PUMP 1-2 MP-422, are installed.

_______ 3.6.26 Notify the Shift Manager DH Loop 2 is in Standby DH Mode
AND to perform an operability evaluation. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 3.6.27 IF the plant was operated with back leakage from the RCS into the DH System via the DH to RCS discharge check valves,
THEN recirculate DH Loop 2 to the BWST for a minimum of 10 minutes at 3000 gpm prior to placing it in service. REFER TO Subsection 4.7, Placing the BWST on Recirc using DH Pump 2 in the DH Mode.

Subsection 3.6 completed by ______________________________ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.7

- One Train of the DH system shall remain in an LPI Lineup until the RCS is less than 200°F.
- Pressurizer auxiliary spray capability is not available when using DH Loop 1 for RCS Cooldown.
- DB-OP-06903, Plant Shutdown and Cooldown provides alternate means to depressurize if Auxiliary Pressurizer Spray Flow is not available.
- DB-PF-06703, Miscellaneous Operation Curves, CC 6.2 provides additional guidance for DH Pump operation.

3.7 Starting DH Pump 1 for RCS Cooling

INITIALS

Prerequisites

________ 3.7.1 Verify CCW System is in service to supply Essential Header 1. Refer to DB-OP-06262, Component Cooling Water System Procedure.

________ 3.7.2 Verify DH Loop 1 in Standby DH Mode. Refer to Subsection 3.5, Place DH Loop 1 in Standby DH Mode.

________ 3.7.3 Notify Chemistry DH Loop 1 will be placed in service.

________ 3.7.4 Notify Radiation Protection DH Loop 1 will be placed in service.

Prerequisites completed by ______________________________ Date ____________

Procedure

NOTE 3.7.5

If CCW Non-essential Header is being supplied from CCW Loop 1, high flow conditions may exist when CC 1467 is opened.

________ 3.7.5 Verify CC 1467, CC OUTLET FROM DH COOLER 1, is open.

3.7.6 IF CCW non-essential header is being supplied from CCW Loop 1, THEN perform the following:

_______ a. Check running CCW loop 1 pump flow.

_______ b. IF CCW loop 1 flow is greater than 7800 gpm, THEN REFER TO DB-OP-06262, Component Cooling Water System Procedure, to reduce CCW flow during Decay Heat Removal Operations.

3.7.7 WHEN directed by DB-OP-06903, Plant Shutdown and Cooldown OR as directed by the Shift Manager, THEN perform the following:

_______ a. Station an operator at DH Pump 1.

_______ b. Start DH Pump 1 using HIS DH6B.

NOTE 3.7.7.c

DH flow should be maintained at approximately 3000 gpm on FYI DH2B, DH 1 FLOW.

CAUTION 3.7.7.c

When DH System suction is through DH 21* and DH 23*, total DH system flow is limited to 4000 gpm.

_______ c. Position the following valves as necessary to obtain the desired flowrate:

- DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIC DH 14B.
- DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

_______ d. Verify DH 59, DH PUMP 1 DISCHARGE SAMPLE ISOL, is open.

_______ e. Close DH 60, DH PUMP 2 DISCHARGE SAMPLE ISOL.

_______ f. Verify DHR SPDS Display is in service, AND updated for DH Loop 1 in service.

Subsection 3.7 completed by ______________________________ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.8

- One Train of the DH system shall remain in an LPI Lineup until the RCS is less than 200°F.
- DB-PF-06703, Miscellaneous Operation Curves Curve CC 6.2 provides additional guidance for DH pump operation.

3.8 Starting DH Pump 2 for RCS Cooling

INITIALS

Prerequisites

_______ 3.8.1 Verify CCW System is in service to supply Essential Header 2. Refer to DB-OP-06262, Component Cooling Water System Procedure.

_______ 3.8.2 Verify DH Loop 2 in Standby DH Mode. Refer to Subsection 3.6, Place DH Loop 2 in Standby DH Mode.

_______ 3.8.3 Notify Chemistry DH Loop 2 will be placed in service.

_______ 3.8.4 Notify Radiation Protection DH Loop 2 will be placed in service.

Prerequisites completed by ______________________________ Date __________

Procedure

NOTE 3.8.5

If CCW Non-essential Header is being supplied from CCW Loop 2, high flow conditions may exist when CC 1469 is opened.

_______ 3.8.5 Verify CC 1469, CC OUTLET FROM DH COOLER 2, is open.

3.8.6 IF CCW non-essential header is being supplied from CCW Loop 2, THEN perform the following:

_______ a. Check running CCW loop 2 pump flow.

_______ b. IF CCW loop 2 flow is greater than 7800 gpm, THEN REFER TO DB-OP-06262, Component Cooling Water System Procedure, to reduce CCW flow during Decay Heat Removal Operations.

3.8.7 WHEN directed by DB-OP-06903, Plant Shutdown and Cooldown, OR as directed by the Shift Manager, THEN perform the following:

_______ a. Station an operator at DH Pump 2.

_______ b. Start DH Pump 2 using HIS DH6A.

NOTE 3.8.7.c

- DH flow should be maintained at approximately 3000 gpm on FYI DH2A, DH 2 FLOW.
- Flow adjustment may be required to minimize disc movement in CF30, CFT 2 TO RX CHECK VALVE.

CAUTION 3.8.7.c

When DH System suction is through DH 21* and DH 23*, total system flow is limited to 4000 gpm.

_______ c. Position the following valves as necessary to obtain the desired flowrate:

- DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH 14A.
- DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

_______ d. Verify DH 60, DH PUMP 2 DISCHARGE SAMPLE ISOL, is open.

_______ e. Close DH 59, DH PUMP 1 DISCHARGE SAMPLE ISOL.

_______ f. Verify DHR SPDS Display is in service AND updated for DH Loop 2 in service.

Subsection 3.8 completed by ________________________________ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

3.9 Add Water to the RCS using the Batch Controller

INITIALS Prerequisites

_______ 3.9.1 Verify Decay Heat Removal is aligned for purification of the RCS using the MU and Purification System. Refer to Subsection 4.12, Purification of the RCS using MU and Purification System.

_______ 3.9.2 IF the CWRTs are the source of water,
THEN verify the Clean Liquid Waste System is lined up to deliver water from the CWRTs to the MU and Purification System. Refer to DB-OP-06101, Clean Liquid Radwaste System.

_______ 3.9.3 IF the BAATs are the source of water,
THEN verify the Boric Acid Addition Tanks are lined up to provide boric acid to the MU and Purification System. Refer to DB-OP-06031, Boric Acid Addition Tank Operating Procedure.

Prerequisites completed by ______________________________ Date ____________

Procedure

NOTE 3.9.4

Surveillance Requirement 4.1.1.2 requires verification (Unit Log entry) of Reactor Coolant System flow greater than or equal to 2800 gpm within one hour prior to the start of and at least once per hour during a reduction in RCS boron concentration by either:

- Verifying at least one RCP in operation,

OR

- Verifying at least one Decay Heat pump is in operation supplying greater than or equal to 2800 gpm.
- For exceptions to this surveillance refer to T.S. 3.1.1.2, Boron Dilution.

CAUTION 3.9.4

If the minimum RCS flow rate is NOT met, the deboration operation shall be suspended immediately.

3.9.4 IF a reduction in RCS boron concentration is to be made, THEN verify the following:

_______ a. RCS flow is greater than or equal to 2800 gpm,

OR

b. The plant is in MODE 5 or 6
AND either one of the following conditions are met.

_______ 1. The water to be added to the RCS has a boron concentration greater than the refueling concentration determined by TS 3.9.1 for Mode 6.

OR

_______ 2. The water to be added to the RCS has a boron concentration equal to or greater than the SDM requirement of T.S. 3.1.1.1, Shutdown Margin, for Mode 5.

NOTE 3.9.5

Step 3.9.5 and 3.9.6/3.9.7 should be performed concurrently while the Batch addition is in progress.

________ 3.9.5 Add the desired fill water to the suction of the operating DH pump. REFER TO DB-OP-06001, Boron Concentration Control, for Batching operations.

________ 3.9.6 IF DH Loop 1 is in service,
THEN throttle DH 61, DH PUMP 1 DISCHARGE TO MU & PURIF AND SFP DEMIN ISO,
OR
Batch Controller fill flow as necessary to maintain less than 100 psig on P719, RC LETDOWN PRESSURE.

________ 3.9.7 IF DH Loop 2 is in service,
THEN throttle DH 62, DH PUMP 2 DISCHARGE TO MU & PURIF & SFP DEMIN ISO,
OR
Batch Controller fill flow as necessary to maintain less than 100 psig on P719, RC LETDOWN PRESSURE.

Subsection 3.9 completed by ____________________________________ Date __________

NOTE 3.10

DB-PF-06703, Miscellaneous Operation Curves, Curve CC 6.2, provides additional guidance for DH pump operation.

3.10 Swap from DH Loop 2 to DH Loop 1 for RCS Cooling

INITIALS

Prerequisites

_______ 3.10.1 Verify DH Loop 1 is in Standby DH Mode. Refer to Subsection 3.5, Place DH Loop 1 in Standby DH Mode.

_______ 3.10.2 Verify CCW System is in service to supply Essential Header 1. Refer to DB-OP-06262, Component Cooling Water System Procedure.

_______ 3.10.3 Verify the RCS water level is greater than or equal to Reactor Vessel Flange Level.

_______ 3.10.4 Notify Chemistry DH Loop 1 will be placed in service.

_______ 3.10.5 Notify Radiation Protection DH Loop 1 will be placed in service.

Prerequisites completed by ______________________________ Date __________

Procedure

3.10.6 IF the DH Loop 2 is aligned for purification using the MU and Purification System,
THEN perform the following:

_______ a. Close DH 62, DH PUMP 2 DISCHARGE TO MU & PURIF & SFP DEMIN ISO.

_______ b. Close DH 32, DH PUMP 2 SUCTION FROM MU&P DEMIN.

_______ c. IF DH Loop 1 will be aligned for purification using the MU and Purification System,
THEN open DH 33, DH PUMP 1 SUCTION FROM MU & PURIF DEMIN.

3.10.7 IF the DH Loop 2 is aligned for purification using the SFP Purification System,
THEN perform the following:

_______ a. Close DH 62, DH PUMP 2 DISCHARGE TO MU & PURIF & SFP DEMIN ISO.

_______ b. Close DH 28, DH PUMP 2 SUCTION FROM SFP DEMIN.

_______ c. IF DH Loop 1 will be aligned for purification using the SFP Purification System,
THEN open DH 29, DH PUMP 1 SUCTION FROM SFP DEMIN.

________ 3.10.8 Verify DH 1B*, DH PUMP 1 DISCHARGE TO RCS, is open.

________ 3.10.9 IF CCW non-essential header is being supplied from Loop 1, THEN REFER TO DB-OP-06262, Component Cooling Water System Procedure, to reduce CCW flow during decay heat removal operations.

NOTE 3.10.10

If CCW Non-essential Header is being supplied from CCW Loop 1, high flow conditions may exist when CC 1467 is opened.

________ 3.10.10 Verify open CC 1467, CC OUTLET FROM DH COOLER 1, using HIS 1467.

________ 3.10.11 Station an operator at DH Pump 1.

________ 3.10.12 Start DH Pump 1 using HIS DH6B.

NOTE 3.10.13 and 3.10.14

Steps 3.10.13 and 3.10.14 need to be performed concurrently to allow DH Loop transfer.

CAUTION 3.10.13

When DH Pump Suction is through DH 21* and DH 23*, total DH flow is limited to 4000 gpm.

________ 3.10.13 Position the following valves as necessary to slowly raise DH Loop 1 flow as observed on FYI DH2B:

- DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIC DH 14B.
- DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

_______ 3.10.14 Position the following valves as necessary to reduce DH Loop 2 flow as observed on FYI DH2A, until all DH System flow is through DH Loop 1:

- DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH 14A.
- DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

_______ 3.10.15 Stop DH Pump 2 using HIS DH6A.

_______ 3.10.16 Close CC 1469, CCW OUTLET FROM DH COOLER 2, using HIS 1469.

_______ 3.10.17 IF transfer of Non-Essential CCW loads is desired, THEN REFER TO DB-OP-06262, Component Cooling Water System Procedure.

3.10.18 IF desired, THEN re-establish full CCW flow through the DH Cooler by verifying open the following valves:

_______ a. CC 171*, CCW FROM DH CLR 1 OUTLET.

_______ b. CC 172*, CCW FROM DH CLR 1 OUTLET ISO.

NOTE 3.10.19
DH 61 should be opened slowly to prevent lifting DH 2797, DH TO PURIFICATION SYSTEM RELIEF.

_______ 3.10.19 IF restoration of purification using MU and Purification System is desired, THEN throttle open DH 61, DH PUMP 1 DISCHARGE TO MU & PURIF AND SFP DEMIN ISO, AND maintain 25-140 gpm on FI MU7 or F717, RC LETDOWN FLOW, AND less than 100 psig on P719, RC LETDOWN PRESSURE.

_______ 3.10.20 IF purification using MU and Purification System is NOT desired at this time AND DH was aligned for purification using MU and Purification System, THEN verify purification flow has been properly isolated. REFER TO Subsection 4.13, Restoration from Purification of the RCS using the MU and Purification System.

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.10.21

This step requires 3 operators; one at DH 61, another at FIS 1616 to monitor SFP Purification flow, and a third at PI 1634 to monitor SFP Purification pressure.

_______ 3.10.21 IF restoration of purification using SFP Purification System is desired, THEN throttle open DH 61, DH PUMP 1 DISCHARGE TO MU & PURIF AND SFP DEMIN ISO, to maintain 80-100 gpm on FIS 1616, SFP FLT OUT, AND less than 100 psig on PI 1634, SFP DEMINERALIZER INLET.

_______ 3.10.22 IF purification using SFP Purification System is NOT desired at this time AND DH was aligned for purification using SFP Purification System, THEN verify purification flow is properly isolated. REFER TO Subsection 4.15, Restoration of Purification of the RCS using the SFP Purification System.

_______ 3.10.23 Verify DH 59, DH PUMP 1 DISCHARGE SAMPLE ISOL, is open.

_______ 3.10.24 Verify DH 60, DH PUMP 2 DISCHARGE SAMPLE ISOL, is closed.

NOTE 3.10.25

DH Loop 2 is in Standby DH Mode with DH 14A AND DH 13A fully closed.

_______ 3.10.25 Update DHR SPDS Display for DH Loop 1 in service.

NOTE 3.10.26

If DH Loop 2 will not be placed back in service for an extended period of time, then the Hotspot Reduction Program promotes recirc of the formerly running DH Loop to the BWST. This should minimize the development of hot spots in stagnant DH piping by flushing crud to the BWST.

_______ 3.10.26 IF desired by the Shift Manager, THEN place DH Loop 2 on recirc to the BWST, REFER TO Subsection 4.7, Placing the BWST on Recirc using DH Pump 2 while RCS is on DH Cooling.

_______ 3.10.27 IF the Decay Heat Pump Suction Pressure Camera is in service, THEN verify the Decay Heat Pump Suction Pressure Camera has been swapped to DH Loop 1.

Subsection 3.10 completed by ______________________________ Date __________

NOTE 3.11

DB-PF-06703, Miscellaneous Operation Curves, Curve CC 6.2 provides additional guidance for DH Pump operation.

3.11 Swap from DH Loop 1 to DH Loop 2 for RCS Cooling

INITIALS

Prerequisites

________ 3.11.1 Verify DH Loop 2 is in Standby DH Mode. Refer to Subsection 3.6, Place DH Loop 2 in Standby DH Mode.

________ 3.11.2 Verify the CCW System is in service to supply Essential Header 2. Refer to DB-OP-06262, Component Cooling Water System Procedure.

________ 3.11.3 Verify the RCS water level is greater than or equal to Reactor Vessel Flange Level.

________ 3.11.4 Notify Chemistry DH Loop 2 will be placed in service.

________ 3.11.5 Notify Radiation Protection DH Loop 2 will be placed in service.

Prerequisites completed by ______________________________ Date ____________

Procedure

3.11.6 IF the DH Loop 1 is aligned for purification using the MU and Purification System,
THEN perform the following:

________ a. Close DH 61, DH PUMP 1 DISCHARGE TO MU & PURIF AND SFP DEMIN ISO.

________ b. Close DH 33, DH PUMP 1 DH PUMP 1 SUCTION FROM MU & PURIF DEMIN.

________ c. IF DH Loop 2 will be aligned for purification using the MU and Purification System,
THEN open DH 32, DH PUMP 2 SUCTION FROM MU&P DEMIN.

3.11.7 IF the DH Loop 1 is aligned for purification using the SFP Purification system,
THEN perform the following:

________ a. Close DH 61, DH PUMP 1 DISCHARGE TO MU & PURIF AND SFP DEMIN ISO.

________ b. Close DH 29, DH PUMP 1 SUCTION FROM SFP DEMIN.

________ c. IF DH Loop 2 will be aligned for purification using the SFP Purification System,
THEN open DH 28, DH PUMP 2 SUCTION FROM SFP DEMIN.

______ 3.11.8 Verify DH 1A*, DH PUMP 2 DISCHARGE TO RCS, is open.

______ 3.11.9 IF CCW non-essential header is being supplied from Loop 2, THEN REFER TO DB-OP-06262, Component Cooling Water System Procedure, to reduce CCW flow during decay heat removal operations

> NOTE 3.11.10
>
> If CCW Non-essential Header is being supplied from CCW Loop 2, high flow conditions may exist when CC 1469 is opened.

______ 3.11.10 Verify open CC 1469, CC OUTLET FROM DH COOLER 2, using HIS 1469.

______ 3.11.11 Station an operator at DH Pump 2.

______ 3.11.12 Start DH Pump 2 using HIS DH6A.

> NOTE 3.11.13 and 3.11.14
>
> - Steps 3.11.13 and 3.11.14 need to be performed concurrently to allow DH Loop transfer.
> - Flow adjustment may be required to minimize disc movement in CF30, CFT 2 to RX Check Valve.

> CAUTION 3.11.13
>
> When DH Pump suction is through DH 21* and DH 23*, total DH flow is limited to 4000 gpm.

______ 3.11.13 Position the following valves as necessary to slowly raise DH Loop 2 flow as observed on FYI DH2A:

- DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH 14A.
- DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

________ 3.11.14 Position the following valves as necessary to reduce DH Loop 1 flow as observed on FYI DH2B, until all DH System flow is through DH Loop 2:

- DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIC DH 14B.
- DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

________ 3.11.15 Stop DH Pump 1 using HIS DH6B.

________ 3.11.16 Close CC 1467, CC OUTLET FROM DH COOLER 1, using HIS 1467.

________ 3.11.17 IF transfer of Non-Essential CCW loads is desired, THEN REFER TO DB-OP-06262, Component Cooling Water System Procedure.

3.11.18 IF desired, THEN re-establish full CCW flow through the DH Cooler by verifying open the following valves:

________ a. CC 173*, CCW FROM DH CLR 2 OUTLET.

________ b. CC 174*, CCW FROM DH CLR 2 OUTLET ISO.

NOTE 3.11.19

DH 62 should be opened slowly to prevent lifting DH 2797, DH TO PURIFICATION SYSTEM RELIEF.

________ 3.11.19 IF restoration of purification using MU and Purification System is desired, THEN throttle open DH 62, DH PUMP 2 DISCHARGE TO MU & PURIF & SFP DEMIN ISO, AND maintain 25-140 gpm on FI MU7 or F717, RC LETDOWN FLOW, AND less than 100 psig on P719, RC LETDOWN PRESSURE.

________ 3.11.20 IF purification using MU and Purification System is NOT desired at this time AND DH was aligned for purification using MU and Purification System, THEN verify purification flow has been properly isolated. REFER TO Subsection 4.13, Restoration from Purification of the RCS using the MU and Purification System.

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.11.21

This step requires 3 operators; one at DH 62, another at FIS 1616 to monitor SFP Purification flow, and a third at PI 1634 to monitor SFP Purification pressure.

________ 3.11.21 IF restoration of purification using SFP Purification System is desired, THEN throttle open DH 62, DH PUMP 2 DISCHARGE TO MU & PURIF & SFP DEMIN ISO, to maintain 80-100 gpm on FIS 1616, SFP FLT OUT, AND less than 100 psig on PI 1634, SFP DEMINERALIZER INLET.

________ 3.11.22 IF purification using SFP Purification System is NOT desired at this time AND DH was aligned for purification using SFP Purification System, THEN verify purification flow is properly isolated. REFER TO Subsection 4.15, Restoration of Purification of the RCS using the SFP Purification System.

________ 3.11.23 Verify DH 60, DH PUMP 2 DISCHARGE SAMPLE ISOL, is open.

________ 3.11.24 Verify DH 59, DH PUMP 1 DISCHARGE SAMPLE ISOL, is closed.

NOTE 3.11.25

DH Loop 1 is in Standby DH Mode with DH 14B AND DH 13B fully closed.

________ 3.11.25 Update DHR SPDS Display for DH Loop 2 in service.

NOTE 3.11.26

If DH Loop 1 will not be placed back in service for an extended period of time, then the Hotspot Reduction Program promotes recirc of the formerly running DH Loop to the BWST. This should minimize the development of hot spots in stagnant DH piping by flushing crud to the BWST.

________ 3.11.26 IF desired by Shift Manager, THEN place DH Loop 1 on recirc to the BWST, REFER TO Subsection 4.5, Placing the BWST on recirc using DH Pump 1 while RCS is on DH cooling.

________ 3.11.27 IF the Decay Heat Pump Suction Pressure Camera is in service, THEN verify the Decay Heat Pump Suction Pressure Camera has been swapped to DH Loop 2.

Subsection 3.11 completed by ______________________________ Date __________

3.12 Place Decay Heat Loop 1 in Standby LPI Mode During Plant Heatup

INITIALS Prerequisites

______ 3.12.1 DB-OP-06900, Plant Heatup, has directed Decay Heat Loop 1 to be placed in Standby LPI Mode.

______ 3.12.2 Verify DH Loop 1 is in Standby DH Mode. Refer to Subsection 3.5, Place DH Loop 1 in Standby DH Mode.

______ 3.12.3 A pre-evolution briefing has been conducted covering the performance of this subsection which makes DH Loop 1 incapable of performing its intended function. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

Prerequisites completed by ______________________ Date __________

Procedure

______ 3.12.4 Verify DH Pump 1 is stopped using HIS DH6B.

______ 3.12.5 Verify DH Loop 1 is NOT aligned for MU and Purification. Refer to Subsection 4.13, Restoration from Purification of the RCS using the MU and Purification System.

______ 3.12.6 Verify DH Loop 1 is NOT aligned for SFP Purification. Refer to Subsection 4.15, Restoration of Purification of the RCS using the SFP Purification System.

______ 3.12.7 Close CC 1467, CC OUTLET FROM DH COOLER 1, using HIS 1467.

NOTE 3.12.8

Steps 3.12.8 through 3.12.23 have some independent verifications. IVs may be performed after the first pass is complete. All IVs shall be complete prior to proceeding to Step 3.12.24.

______ 3.12.8 Verify DH 831*, DH COOLER 1/2 X-CONN, is closed.

______
IV

______ 3.12.9 Verify DH 830*, DH COOLER 2/1 X-CONN, is closed.

______
IV

______ 3.12.10 Verify DH 2735*, DH AUX SPRAY, is closed.

______
IV

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

______ 3.12.11 Verify DH 2736*, DH AUX SPRAY, is closed.

______
IV

______ 3.12.12 Verify DH 1B*, DH PUMP 1 DISCHARGE TO RCS, is open.

______
IV

______ 3.12.13 Verify DH 1B* control power is removed using HIS DH1B-2.

______
IV

______ 3.12.14 Verify DH 7B*, BWST LINE 1 ISO, is open.

______
IV

______ 3.12.15 The following step makes DH Loop 1 inoperable. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

______ 3.12.16 Remove the CLOSE power fuses from AC 112, DECAY HT PUMP 1-1 MP-421.

______ 3.12.17 Close BE 1126 (E11D), MV 1517 DH NORM SUCT LINE 1 ISO VLV.

______ 3.12.18 Close DH 1517, DH PUMP 1 SUCTION FROM RCS.

______
IV

______ 3.12.19 Close BE 1187 (E11E), MV DH64 LPI-HPI CROSS CONN ISO VLV 1.

______ 3.12.20Verify DH 64, DH PUMP 1 DISCH TO HPI PMP 1 SUCTION, is closed.

______
IV

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.12.21

PI 1507A, DH & LP INJ PUMP 1-1 SUCTION PRESSURE INDICATOR, (range 0-60 PSIG) is normally isolated. Any of the following instruments may be used to check DH Pump 1 suction pressure:

- PI 1507, DH PUMP 1 SUCT PRESSURE
- PI DH5B, DH PUMP 1 DISCH PRESS
- Computer Point P548, LP INJ VLV IN PRESS, ("NORMAL" indicates pressure less than 60 PSIG in both LP Injection Headers).

3.12.21 IF DH Pump 1 suction pressure is greater than 70 psig, THEN perform the following to bleed off pressure trapped between DH 1517 and DH 2733 so the suction relief is not challenged:

_________ a. Verify DH 65*, DH PUMP 2 DISCH TO BWST/RF CANAL/SFP COOLING SYS, is closed.

_________ b. Crack open DH 66*, DH PUMP 1 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

_________ c. IF suction pressure remains greater then 70 psig, THEN crack open DH 68, DH PUMPS DISCHARGE TO BWST.

_________ d. Verify DH Pump 1 suction pressure less than 70 psig.

_________ e. Close AND lock DH 66*, DH PUMP 1 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

_________ f. Verify DH 68, DH PUMPS DISCHARGE TO BWST, is closed.

_________ 3.12.22 Close BE 1121 (E11A), MV 2733 DH PMP 1 SUCT FROM BWST.

_________ 3.12.23 Open DH 2733*, DH PUMP 1 SUCTION FROM BWST OR EMER SUMP.

____
IV

Independent Verification ______________________________ Date ____________

_________ 3.12.24 Verify the CLOSE power fuses for AC 112, DECAY HT PUMP 1-1 MP-421, are installed.

3.12.25 IF this is the final DH Loop being placed in LPI mode,
THEN perform the following:

________ a. Verify DH 21*, RCS TO DECAY HEAT BYPASS, is closed.

________ b. Verify DH 23*, RCS TO DECAY HEAT BYPASS, is closed.

NOTE 3.12.25.c

The Decay Heat suction flowpath from RCS is isolated when DH 11, DH 12, DH 21*, and DH 23* are closed.

________ c. IF the Decay Heat suction flowpath from RCS is isolated, THEN verify DH 10*, DH PUMP 1 MINIMUM COOLDOWN ISOLATION, is locked open.

________ 3.12.26 Notify the Shift Manager DH Loop 1 is in Standby LPI Mode AND to perform an operability evaluation. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

________ 3.12.27 Set DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, to 65% open using HIC DH 14B.

________ 3.12.28 Press OPEN on HIS DH 14B*.

________ 3.12.29 Close DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

________ 3.12.30 Press CLOSE on HIS DH 13B.

________ 3.12.31 Within 4 hours locally verify DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, indicates 30.5 – 34.5% open.

________ 3.12.32 Record in the Unit Log DH14B* verified open locally to mechanical stop.

________ 3.12.33 Verify DH 59, DH PUMP 1 DISCHARGE SAMPLE ISOL, is open.

NOTE 3.12.34

This action is in response to Generic Letter 96-06 dealing with thermally induced over pressurization.

________ 3.12.34 IF this is the final DH Loop being placed in LPI mode, THEN REFER TO Subsection 4.29, Creating a Void Between DH 2735 and DH 2736.

________ 3.12.35 Verify all Operational Information Tags hung in Subsection 3.5 are removed.

Subsection 3.12 completed by ____________________________ Date __________

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

3.13 Place Decay Heat Loop 2 in Standby LPI Mode During Plant Heatup

INITIALS

Prerequisites

________ 3.13.1 DB-OP-06900, Plant Heatup, has directed Decay Heat Loop 2 to be placed in Standby LPI Mode.

________ 3.13.2 Verify DH Loop 2 is in Standby DH Mode. Refer to Subsection 3.6, Place DH Loop 2 in Standby DH Mode.

________ 3.13.3 A pre-evolution briefing has been conducted covering the performance of this subsection which makes DH Loop 2 incapable of performing its intended function. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

Prerequisites completed by ______________________________ Date __________

Procedure

________ 3.13.4 Verify DH Pump 2 is stopped using HIS DH6A.

________ 3.13.5 Verify DH Loop 2 is NOT aligned for MU and Purification. Refer to Subsection 4.13, Restoration from Purification of the RCS using the MU and Purification System.

________ 3.13.6 Verify DH Loop 2 is NOT aligned for SFP Purification. Refer to Subsection 4.15, Restoration of Purification of the RCS using the SFP Purification System.

________ 3.13.7 Close CC 1469, CC OUTLET FROM DH COOLER 2, using HIS 1469.

NOTE 3.13.8

Steps 3.13.8 through 3.13.22 have some independent verifications. IV's may be performed after the first pass is complete. All IV's shall be complete prior to proceeding to Step 3.13.24.

________ 3.13.8 Verify DH 830*, DH COOLER 2/1 X-CONN, is closed.

____
IV

________ 3.13.9 Verify DH 831*, DH COOLER 1/2 X-CONN, is closed.

____
IV

________ 3.13.10 Verify DH 2735*, DH AUX SPRAY, is closed.

____
IV

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

______ 3.13.11 Verify DH 2736*, DH AUX SPRAY, is closed.

______
IV

______ 3.13.12 Verify DH 1A*, DH PUMP 2 DISCHARGE TO RCS, is open.

______
IV

______ 3.13.13 Verify DH 1A* control power is removed using HIS DH 1A-2.

______
IV

______ 3.13.14 Verify DH 7A*, BWST LINE 2 ISO, is open.

______
IV

______ 3.13.15 The following step makes DH Loop 2 inoperable. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

______ 3.13.16 Remove the CLOSE power fuses from AD 112, DECAY HT PUMP 1-2 MP-422.

______ 3.13.17 Close BF 1129 (F11C), MV 1518 DH NORM SUCT LINE 2 ISO VLV.

______ 3.13.18 Close DH 1518, DH PUMP 2 SUCTION FROM RCS.

______
IV

______ 3.13.19 Close BF 1195 (F11E), MV DH63 LPI-HPI CROSS CONN ISO VLV 2.

______ 3.13.20 Verify DH 63, DH PUMP 2 DISCH TO HPI PUMP 2 SUCTION, is closed.

______
IV

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.13.21

PI 1538A, DH & LP INJ PUMP 1-2 SUCTION PRESSURE INDICATOR, (range 0-60 PSIG) is normally isolated. Any of the following instruments may be used to check DH Pump 2 suction pressure:

- PI 1538, DH PUMP 2 SUCT PRESSURE
- PI DH5A, DH PUMP 2 DISCH PRESS
- Computer Point P548, LP INJ VLV IN PRESS, ("NORMAL" indicates pressure less than 60 PSIG in both LP Injection Headers).

3.13.21 IF DH Pump 2 suction pressure is greater than 70 psig, THEN perform the following to bleed off pressure trapped between DH 1518 and DH 2734 so the suction relief is not challenged:

_________ a. Verify DH 66*, DH PUMP 1 DISCH TO BWST/RF CANAL/SFP COOLING SYS, is closed.

_________ b. Crack open DH 65*, DH PUMP 2 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

_________ c. IF suction pressure remains greater then 70 psig, THEN crack open DH 68, DH PUMPS DISCHARGE TO BWST.

_________ d. Verify DH Pump 2 suction pressure less than 70 psig.

_________ e. Close AND lock DH 65*, DH PUMP 2 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

_________ f. Verify DH 68, DH PUMPS DISCHARGE TO BWST, is closed.

_________ 3.13.22 Close BF 1134 (F11C), MV 2734 DH PMP 2 SUCT FROM BWST.

_________ 3.13.23 Open DH 2734*, DH PUMP 2 SUCTION FROM BWST OR EMER SUMP.

____
IV

Independent Verification _________________________________ Date ____________

_________ 3.13.24 Verify the CLOSE power fuses for AD 112, DECAY HT PUMP 1-2 MP-422, are installed.

3.13.25 IF this is the final DH Loop being placed in LPI mode,
THEN perform the following:

_______ a. Verify DH 21*, RCS TO DECAY HEAT BYPASS, is closed.

_______ b. Verify DH 23*, RCS TO DECAY HEAT BYPASS, is closed.

NOTE 3.13.25.c

The Decay Heat suction flowpath from RCS is isolated when DH 11, DH 12, DH 21*, and DH 23* are closed.

_______ c. IF the Decay Heat suction flowpath from RCS is isolated, THEN verify DH 10*, DH PUMP 1 MINIMUM COOLDOWN ISOLATION, is locked open.

_______ 3.13.26 Notify the Shift Manager DH Loop 2 is in Standby LPI Mode AND to perform an operability evaluation. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 3.13.27 Set DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, to 67% open using HIC DH 14A.

_______ 3.13.28 Press OPEN on HIS DH 14A.

_______ 3.13.29 Close DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

_______ 3.13.30 Press CLOSE on HIS DH 13A.

_______ 3.13.31 Within 4 hours locally verify DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, indicates 37 – 41 % open.

_______ 3.13.32 Record in the Unit Log DH 14A* verified open locally to mechanical stop.

_______ 3.13.33 Verify DH 60, DH PUMP 2 DISCHARGE SAMPLE ISOL, is open.

NOTE 3.13.34

This action is in response to Generic Letter 96-06 dealing with thermally induced over pressurization.

_______ 3.13.34 IF this is the final DH Loop being placed in LPI mode, THEN REFER TO Subsection 4.29, Creating a Void Between DH 2735 and DH 2736.

_______ 3.13.35 Verify all Operational Information Tags hung in Subsection 3.6 are removed.

Subsection 3.13 completed by ______________________________ Date __________

3.14 Drain DH Loop 1 for Maintenance

INITIALS

Prerequisites

NOTE 3.14.1
In Mode 6, TS 3.9.8.2 requires two operable DH Loops if less than 23 ft. of water is available over the fuel assemblies. Refer to TS 3.9.8.2.
In Modes 3, 4, 5; SG operability may affect the required number of operable DH Loops. Refer to TS 3.4.1.2.

________ 3.14.1 A pre-evolution briefing has been conducted covering the performance of this subsection which makes DH Loop 1 incapable of performing its intended function. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

________ 3.14.2 If draining DH Loop 1, an approved safety tagging clearance has been written to establish the outermost boundary valves in accordance with NOP-OP-1001, Clearance/Tagging Program.

Clearance Number ________________

________ 3.14.3 Verify RCDT and pumps are in service. Refer to DB-OP-06101, Clean Liquid Radwaste.

________ 3.14.4 Verify DH Loop 1 is NOT aligned for MU and Purification. Refer to Subsection 4.13, Restoration of Purification of the RCS using the MU and Purification System.

________ 3.14.5 Verify DH Loop 1 is NOT aligned for SFP Purification. Refer to Subsection 4.15, Restoration of Purification of the RCS using the SFP Purification System.

________ 3.14.6 Direct Radiation Protection to place a temporary pump in the desired location.

3.14.7 IF a second temporary drain pump will be used,
THEN perform the following:

________ a. Direct Radiation Protection to place a second temporary drain pump in the desired location.

________ b. Verify a WO is available to remove the blank flange from DH 37, DH PUMP 1 SUCTION FLUSH CONN, and install a hose connection.

________ 3.14.8 Direct Chemistry to perform a Grade B cleanliness inspection of temporary pump(s) and hoses. Refer to DB-CH-01662, Plant Systems Cleanliness Inspection.

Prerequisites completed by ________________________________ Date ____________

Procedure

_______ 3.14.9 The following step makes DH Loop 1 inoperable. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 3.14.10 Verify the CLOSE power fuses for AC 112, DECAY HT PUMP 1-1 MP-421 are removed.

3.14.11 IF a second temporary drain pump will be used,
THEN contact Mechanical Maintenance to perform the following:

_______ a. Remove the blank flange on DH 37, DH PUMP 1 SUCTION FLUSH CONN.

_______ b. Install a hose connection in place of the blank flange on DH 37, DH PUMP 1 SUCTION FLUSH CONN.

NOTE 3.14.12

Step 3.14.12 is generic in nature does not include all the tagging points required to isolate DH Loop 1 for draining. The actual tagging points could vary, and should be controlled by NOP-OP-1001, Clearance/Tagging Program or DB-OP-00016, Temporary Configuration Control.

3.14.12 Verify the following valves are closed:

_______ • DH 1B*, DH PUMP 1 DISCHARGE TO RCS.

_______ • DH 1517, DH PUMP 1 SUCTION FROM RCS.

_______ • DH 2733*, DH PUMP 1 SUCTION FROM BWST OR EMERG SUMP.

_______ • DH 10*, DH PUMP 1 MINIMUM COOLDOWN ISOLATION.

_______ • DH 64, DH PUMP 1 OUTLET TO HPI PMP 1 SUCTION.

_______ • DH 66*, DH PUMP 1 X-CONN TO BWST/RF CANAL/SFP COOLING SYS.

_______ • DH 55*, DH PUMP 1 RECIRC LINE STOP VALVE

_______ 3.14.13 Press AUTO for DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIS DH 14B.

_______ 3.14.14 Press AUTO for DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIS DH 13B.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

________ 3.14.15 Open DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIC DH14B.

________ 3.14.16 Open DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH13B.

3.14.17 Lineup the first temporary pump by performing the following:

________ a. Connect a hose to DH 80, DH COOLER 1 OUTLET LINE DRAIN (Rm 113), and the suction of the first temporary pump.

________ b. Connect a second hose to the discharge of the first temporary pump and RC 158, MU SYSTEM TO RC DRAIN TANK DRAIN VALVE (above DH 68 in Rm 105).

3.14.18 IF a second temporary pump will be used,
THEN perform the following:

________ a. Connect a hose to RC 95, CTMT DRAIN HEADER LLRT CONNECTION (Rm 225), and the discharge of the second temporary pump.

________ b. Connect a second hose to DH 37, DH PUMP 1 SUCTION FLUSH CONN (Rm 105), and the suction of the second temporary pump.

NOTE 3.14.19

The following steps require (3) operators:

(1) operator to control the drain rate with DH 80 and/or DH 37, or by adjusting temporary pump operation. This operator should periodically monitor RC 158 when the hose is connected, and monitor the temporary pump(s) when running.

(1) operator to monitor RC 95 when the hose is connected. This operator will also monitor for adequate venting at DH 73, and any other vent points used.

The Control Room operator should closely monitor RCS level and RCDT indications during the drain evolution. O_2 level increasing in the RCDT could indicate the DH Loop is empty, or a vacuum problem is preventing proper flow to the RCDT.

________ 3.14.19 Verify communications between all operators involved in the drain and the CTRM.

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.14.20

Steps 3.14.20 and 3.14.21 should be performed concurrently if the second temporary pump is used.

3.14.20 Begin draining by performing the following:

_______ a. Open RC 158, MU SYSTEM TO RC DRAIN TANK DRAIN VALVE.

_______ b. Open DH 80, DH COOLER 1 OUTLET LINE DRAIN.

_______ c. Throttle open DH 73, DH PUMP 1 DISCHARGE LINE LEAK TEST CONN.

_______ d. IF desired,
THEN throttle open any other selected vent points.

_______ e. Start the first temporary pump.

3.14.21 IF the second temporary pump will be used,
THEN perform the following:

_______ a. Verify RC 1773B, CTMT DRAIN HEADER ISO VALVE, is closed.

_______ b. Verify RC 115, CTMT DRAIN HEADER TO RCDT ISO VALVE, is open.

_______ c. Open RC 95, CTMT DRAIN HEADER LLRT CONNECTION.

_______ d. Open DH 37, DH PUMP 1 SUCTION FLUSH CONN.

_______ e. Start the second temporary pump.

NOTE 3.14.21.f

- Additional vents should be used if the second temporary drain pump is used. This will prevent pumping large quantities of air into the RCDT, or drawing a vacuum on system piping.
- Venting from DH 164B is only necessary when DH 2733*, DH PUMP 1 SUCTION FROM BWST OR EMERG SUMP is open.

f. IF necessary for adequate venting,
THEN throttle open additional vents as necessary. (N/A vents NOT used)

_______ • DH 164B, DECAY HEAT PUMP 1 SUCTION LINE FROM EMERGENCY SUMP VENT

_______ • DH 166, DH PUMP 1 OUTLET TO HPI PUMP VENT.

_______ • DH 165, DH PUMP 1 DISCHARGE LINE VENT.

_______ • DH 57, DH PUMP 1 CASING VENT.

NOTE 3.14.22

Steps 3.14.22 and 3.14.23 should be performed concurrently if the second temporary pump is used.

3.14.22 WHEN it is desired to stop draining,
THEN perform the following:

_______ a. Stop the first temporary pump.

_______ b. Close DH 80, DH COOLER 1 OUTLET LINE DRAIN.

_______ c. Close RC 158, MU SYSTEM TO RC DRAIN TANK DRAIN VALVE.

_______ d. Verify any vent valves opened in steps 3.14.20.d AND 3.14.21.f are closed.

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

3.14.23 <u>IF</u> the second temporary pump was used,
<u>THEN</u> perform the following:

_______ a. Stop the second temporary pump.

_______ b. Close DH 37, DH PUMP 1 SUCTION FLUSH CONN.

_______ c. Close RC 95, CTMT DRAIN HEADER LLRT CONNECTION.

_______ d. Verify RC 1773B, CTMT DRAIN HEADER ISO VALVE, is closed.

_______ e. Verify RC 115, CTMT DRAIN HEADER TO RCDT ISO VALVE, is open.

_______ 3.14.24 <u>IF</u> it is desired to retain a residual drain flowpath,
<u>THEN</u> open DH 80, DH COOLER 1 OUTLET LINE DRAIN, and direct the hose to the DH Cooler Room (Rm 113) floor drain.
<u>OTHERWISE</u> disconnect the hose between DH 80, DH COOLER 1 OUTLET LINE DRAIN, and the suction of the temporary pump.

_______ 3.14.25 Disconnect the hose between RC 158, MU SYSTEM TO RC DRAIN TANK DRAIN VALVE, and the discharge of the temporary pump.

3.14.26 <u>IF</u> the second temporary drain pump was used,
<u>THEN</u> perform the following:

_______ a. Disconnect the hose between RC 95, CTMT DRAIN HEADER LLRT CONNECTION, and the discharge of the temporary pump.

_______ b. Disconnect the hose between DH 37, DH PUMP 1 SUCTION FLUSH CONN, and the suction of the temporary pump.

_______ 3.14.27 Contact Radiation Protection to remove the temporary pump(s).

3.14.28 <u>IF</u> the second temporary drain pump was used,
<u>THEN</u> contact Mechanical Maintenance to perform the following:

_______ a. Remove the hose connection in place of the blank flange on DH 37, PUMP 1 SUCTION FLUSH CONN.

_______ b. Re-install the blank flange on DH 37, PUMP 1 SUCTION FLUSH CONN.

Subsection 3.14 completed by ______________________________ Date __________

3.15 Drain DH Loop 2 for Maintenance

INITIALS Prerequisites

NOTE 3.15.1

- In Mode 6, TS 3.9.8.2 requires two operable DH Loops if less than 23 ft. of water is available over the fuel assemblies. Refer to TS 3.9.8.2.
- In Modes 3, 4, 5; SG operability may affect the required number of operable DH Loops. Refer to TS 3.4.1.2.

_______ 3.15.1 A pre-evolution briefing has been conducted covering the performance of this subsection which makes DH Loop 2 incapable of performing its intended function. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 3.15.2 If draining DH Loop 2, an approved safety tagging clearance has been written to establish the outermost boundary valves in accordance with NOP-OP-1001, Clearance/Tagging Program.

Clearance Number ________________

_______ 3.15.3 Verify RCDT and pumps are in service. Refer to DB-OP-06101, Clean Liquid Radwaste.

_______ 3.15.4 Verify DH Loop 2 is NOT aligned for MU and Purification. Refer to Subsection 4.13, Restoration of Purification of the RCS using the MU and Purification System.

_______ 3.15.5 Verify DH Loop 2 is NOT aligned for SFP Purification. Refer to Subsection 4.15, Restoration of Purification of the RCS using the SFP Purification System.

_______ 3.15.6 Direct Radiation Protection to place a temporary pump in the desired location.

3.15.7 IF a second temporary drain pump will be used, THEN perform the following:

_______ a. Direct Radiation Protection to place a second temporary pump in the desired location.

_______ b. Verify a WO is available to remove the blank flange from DH 36, DH PUMP 2 SUCTION FLUSH CONN, and install a hose connection.

_______ 3.15.8 Direct Chemistry to perform a Grade B cleanliness inspection of temporary pump(s) and hoses. Refer to DB-CH-01662, Plant Systems Cleanliness Inspection.

Prerequisites completed by ______________________________ Date ____________

Procedure

_______ 3.15.9 The following step makes DH Loop 2 inoperable. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 3.15.10 Verify the CLOSE power fuses for AD 112, DECAY HT PUMP 1-2 MP-422 are removed.

3.15.11 IF a second temporary drain pump will be used,
THEN contact Mechanical Maintenance to perform the following:

_______ a. Remove the blank flange on DH 36, DH PUMP 2 SUCTION FLUSH CONN.

_______ b. Install a hose connection in place of the blank flange on DH 36, DH PUMP 2 SUCTION FLUSH CONN.

NOTE 3.15.12

Step 3.15.12 is generic in nature does not include all the tagging points required to isolate DH Loop 2 for draining. The actual tagging points could vary, and should be controlled by NOP-OP-1001, Clearance/Tagging Program or DB-OP-00016, Removal and Restoration of Station Equipment.

3.15.12 Verify the following valves are closed:

_______ • DH 1A*, DH PUMP 2 DISCHARGE TO RCS.

_______ • DH 1518, DH PUMP 2 SUCTION FROM RCS.

_______ • DH 2734*, DH PUMP 2 SUCTION FROM BWST OR EMERG SUMP.

_______ • DH 26*, DH PUMP 2 MINIMUM COOLDOWN ISOLATION.

_______ • DH 63, DH PUMP 2 OUTLET TO HPI PMP 2 SUCTION.

_______ • DH 65*, DH PUMP 2 X-CONN TO BWST/RF CANAL/SFP COOLING SYS.

_______ • DH 54*, DH PUMP 2 RECIRC LINE STOP VALVE

_______ 3.15.13 Press AUTO for DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIS DH 14A.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

______ 3.15.14 Press AUTO for DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIS DH 13A.

______ 3.15.15 Open DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH14A.

______ 3.15.16 Open DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH13A.

3.15.17 Lineup the first temporary pump by performing the following:

______ a. Connect a hose to DH 160, DH COOLER 2 OUTLET LINE DRAIN (Rm 113), and the suction of the first temporary pump.

______ b. Connect the second hose to the discharge of the first temporary pump and RC 158, MU SYSTEM TO RC DRAIN TANK DRAIN VALVE (above DH 68 in Rm 105).

3.15.18 IF a second temporary pump will be used,
THEN perform the following:

______ a. Connect a hose to RC 95, CTMT DRAIN HEADER LLRT CONNECTION (Rm 225), and the discharge of the second temporary pump.

______ b. Connect a second hose to DH 36, DH PUMP 2 SUCTION FLUSH CONN (Rm 115), and the suction of the second temporary pump.

NOTE 3.15.19

The following steps require (3) operators:

(1) operator to control the drain rate with DH 160 and/or DH 36, by adjusting temporary pump operation. This operator should periodically monitor RC 158 when the hose is connected, and monitor the temporary pump(s) when running.

(1) operator to monitor RC 95 when the hose is connected. This operator will also monitor for adequate venting at DH 158, and any other vent points used.

The Control Room operator should closely monitor RCS level and RCDT indications during the drain evolution. O_2 level increasing in the RCDT could indicate the DH Loop is empty, or a vacuum problem is preventing proper flow to the RCDT.

______ 3.15.19 Verify communications between all operators involved in the drain and the CTRM.

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.15.20

Steps 3.15.20 and 3.15.21 should be performed concurrently if the second temporary pump is used.

3.15.20 Begin draining by performing the following:

________ a. Open RC 158, MU SYSTEM TO RC DRAIN TANK DRAIN VALVE.

________ b. Open DH 160, DH COOLER 2 OUTLET LINE DRAIN.

________ c. Throttle open DH 158, DH PUMP 2 DISCHARGE LINE VENT.

________ d. IF desired,
THEN throttle open any other selected vent points.

________ e. Start the first temporary pump.

3.15.21 IF the second temporary pump will be used,
THEN perform the following:

________ a. Verify RC 1773B, CTMT DRAIN HEADER ISO VALVE, is closed.

________ b. Verify RC 115, CTMT DRAIN HEADER TO RCDT ISO VALVE, is open.

________ c. Open RC 95, CTMT DRAIN HEADER LLRT CONNECTION.

________ d. Open DH 36, DH PUMP 2 SUCTION FLUSH CONN.

________ e. Start the second temporary pump.

NOTE 3.15.21.f

- Additional vents should be used if the second temporary drain pump is used. This will prevent pumping large quantities of air into the RCDT, or drawing a vacuum on system piping.
- Venting from DH 164 is only necessary when DH 2734*, DH PUMP 2 SUCTION FROM BWST OR EMERG SUMP is open.

f. IF necessary for adequate venting,
THEN throttle open additional vents as necessary.
(N/A vents NOT used)

_______ • DH 164, DH PUMP 2 SUCTION FROM CTMT EMERG SUMP VENT

_______ • DH 72, DH PUMP 2 DISCHARGE LINE LEAK TEST CONN.

_______ • DH 161, DH PUMP 2 DISCHARGE LINE VENT.

_______ • DH 56, DH PUMP 2 CASING VENT.

NOTE 3.15.22

Steps 3.15.22 and 3.15.23 should be performed concurrently if the second temporary pump is used.

3.15.22 WHEN it is desired to stop draining,
THEN perform the following:

_______ a. Stop the first temporary pump.

_______ b. Close DH 160, DH COOLER 2 OUTLET LINE DRAIN.

_______ c. Close RC 158, MU SYSTEM TO RC DRAIN TANK DRAIN VALVE.

_______ d. Verify that any vent valves opened in steps 3.15.20.d AND 3.15.21.f are closed.

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

3.15.23 IF the second temporary pump was used,
THEN perform the following:

_______ a. Stop the second temporary pump.

_______ b. Close DH 36, DH PUMP 2 SUCTION FLUSH CONN.

_______ c. Close RC 95, CTMT DRAIN HEADER LLRT CONNECTION.

_______ d. Verify RC 1773B, CTMT DRAIN HEADER ISO VALVE, is closed.

_______ e. Verify RC 115, CTMT DRAIN HEADER TO RCDT ISO VALVE, is open.

_______ 3.15.24 IF it is desired to retain a residual drain flowpath,
THEN open DH 160, DH COOLER 2 OUTLET LINE DRAIN, and direct the hose to the DH Cooler Room (Rm 113) floor drain.
OTHERWISE disconnect the hose between DH 160, DH COOLER 2 OUTLET LINE DRAIN, and the suction of the first temporary pump.

_______ 3.15.25 Disconnect the hose between RC 158, MU SYSTEM TO RC DRAIN TANK DRAIN VALVE, and the discharge of the first temporary pump.

3.15.26 IF the second temporary drain pump was used,
THEN perform the following:

_______ a. Disconnect the hose between RC 95, CTMT DRAIN HEADER LLRT CONNECTION, and the discharge of the second temporary pump.

_______ b. Disconnect the hose between DH 36, DH PUMP 2 SUCTION FLUSH CONN, and the suction of the second temporary pump.

_______ 3.15.27 Contact Radiation Protection to remove the temporary pump(s).

3.15.28 IF the second temporary drain pump was used,
THEN contact Mechanical Maintenance to perform the following:

_______ a. Remove the hose connection in place of the blank flange on DH 36, PUMP 2 SUCTION FLUSH CONN.

_______ b. Re-install the blank flange on DH 36, PUMP 2 SUCTION FLUSH CONN.

Subsection 3.15 completed by ______________________________ Date __________

3.16 Jog Start of DH Pump 1 to Ensure Operability

INITIALS

Prerequisites

_______ 3.16.1 The Shift Manager has determined a jog start of DH Pump 1 is required to ensure:

DH Loop 1 is operable.

OR

DH Loop 1 is functional per the Maintenance Rule.

_______ 3.16.2 A pre-evolution briefing has been conducted covering the performance of this subsection, specifically discussing the following:

- Minimize the time DH Pump 1 is running with only DH 55*, DH PUMP 1 RECIRC LINE STOP VALVE, providing minimum flow protection.
- DH Pump 1 should be shutdown when the motor inrush current drops to the steady state value, and pump discharge pressure stabilizes.

_______ 3.16.3 IF DH Loop 1 is aligned in the Standby DH Mode, THEN verify Subsection 3.5, Place DH Loop 1 in Standby DH Mode, is current.

_______ 3.16.4 IF DH Loop 1 is aligned in the Standby LPI Mode, THEN verify Subsection 3.3, Place DH Loop 1 in Standby LPI Mode OR Subsection 3.12, Place DH Loop 1 in Standby LPI Mode During Plant Heatup, is current.

_______ 3.16.5 Notify Radiation Protection a jog start of DH Pump 1 will be performed.

Prerequisites completed by ______________________________ Date __________

Procedure

_______ 3.16.6 Station an operator at DH Pump 1.

> NOTE 3.16.7
>
> It is acceptable to start and run the DH Pump with only minimum recirc flow for short periods of time.

_______ 3.16.7 Start DH Pump 1 using HIS DH6B.

_______ 3.16.8 WHEN the motor inrush current drops to the steady state value, AND DH Pump 1 discharge pressure stabilizes, THEN stop DH Pump 1 using HIS DH6B.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

________ 3.16.9 Notify the Shift Manager DH Pump 1 jog start is complete, AND to perform an operability evaluation. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

Subsection 3.16 completed by ____ Date _________

3.17 Jog Start of DH Pump 2 to Ensure Operability

INITIALS

Prerequisites

_______ 3.17.1 The Shift Manager has determined a jog start of DH Pump 2 is required to ensure:

DH Loop 2 is operable.

OR

DH Loop 2 is functional per the Maintenance Rule.

_______ 3.17.2 A pre-evolution briefing has been conducted covering the performance of this subsection, specifically discussing the following:

- Minimize the time DH Pump 2 is running with only DH 54*, DH PUMP 2 RECIRC LINE STOP VALVE, providing minimum flow protection.
- DH Pump 2 should be shutdown when the motor inrush current drops to the steady state value, and pump discharge pressure stabilizes.

_______ 3.17.3 IF DH Loop 2 is aligned in the Standby DH Mode,
THEN verify Subsection 3.6, Place DH Loop 2 in Standby DH Mode, is current.

_______ 3.17.4 IF DH Loop 2 is aligned in the Standby LPI Mode,
THEN verify Subsection 3.4, Place DH Loop 2 in Standby LPI Mode
OR Subsection 3.13, Place DH Loop 2 in Standby LPI Mode During Plant Heatup, is current.

_______ 3.17.5 Notify Radiation Protection a jog start of DH Pump 2 will be performed.

Prerequisites completed by ______________________________ Date __________

Procedure

_______ 3.17.6 Station an operator at DH Pump 2.

NOTE 3.17.7
It is acceptable to start and run the DH Pump with only minimum recirc flow for short periods of time.

_______ 3.17.7 Start DH Pump 2 using HIS DH6A.

_______ 3.17.8 WHEN the motor inrush current drops to the steady state value,
AND DH Pump 2 discharge pressure stabilizes,
THEN stop DH Pump 2 using HIS DH6A.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

_______ 3.17.9 Notify the Shift Manager DH Pump 2 jog start is complete <u>AND</u> to perform an operability evaluation. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

Subsection 3.17 completed by ______________________________ Date __________

3.18 Transition to DH 21 and DH 23 with DH Loop 1 in Service

INITIALS Prerequisites

_______ 3.18.1 The Shift Manager has determined it is necessary to transition to DH 21*, RCS TO DECAY HEAT BYPASS, and DH 23*, RCS TO DECAY HEAT BYPASS.

_______ 3.18.2 IF RCS level is less than RV Flange level (78-82 inches), THEN obtain Manager-Operations permission to perform this subsection.

_______ 3.18.3 A pre-evolution briefing has been conducted covering the performance of this subsection discussing the following:

- DH Pump minimum suction pressure requirements while a pump is in service. Guidance is found in DB-PF-06703, Miscellaneous Operation Curves, CC 6.2 and 6.4.

- Actions for Loss of DH Flowpath, REFER TO DB-OP-02527, Loss of Decay Heat Removal.

Prerequisites completed by ______________________________ Date ____________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

Procedure

NOTE 3.18.4

- Curves CC 6.2 and CC 6.4 of DB-PF-06703, Miscellaneous Operation Curves provide guidance for maintaining DH Pump minimum suction pressure.
- RCS temperature should be monitored continuously to ensure that reduced DH Loop 1 flow is still adequate to maintain desired RCS temperature.
- As long as RCS level is initially at RV Flange level or greater experience has shown that reducing DH Loop 1 flow to 2500-2600 gpm will ensure DH Pump 1 minimum suction pressure will not be lost during the transition to DH 21* and DH 23*.

________ 3.18.4 IF RCS Level is greater than or equal to RV Flange level (78-82 inches), THEN position the following valves as necessary to reduce DH Loop 1 flow to 2500-2600 gpm. REFER TO DB-PF-06703, Miscellaneous Operation Curves, CC 6.2 and 6.4.

- DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIC DH 14B.
- DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.18.5

- With RCS Level initially less than RV Flange level, DH Loop 1 flow should be reduced to the minimum required to maintain RCS temperature. This will ensure DH Pump 1 minimum suction pressure is not lost during the transition to DH 21* and DH 23*.
- A reduction of approximately 500 gpm or more from the current DH Loop flow may be required.
- It is acceptable for the RCS to heatup slightly during this transition.

_______ 3.18.5 IF RCS Level is less than RV Flange level (78-82 inches), THEN position the following valves as necessary to reduce DH Loop 1 flow to the minimum flow required to maintain RCS temperature.

- DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIC DH 14B.
- DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

_______ 3.18.6 Record the following:

DH Loop 1 Flow ______________ gpm

DH Pump 1 Suction Pressure ____________ psig

_______ 3.18.7 Open DH 21*, RCS TO DECAY HEAT BYPASS.

_______ 3.18.8 Open DH 23*, RCS TO DECAY HEAT BYPASS.

3.18.9 IF closing DH 11, RCS TO DH ISO is desired, THEN perform the following:

_______ a. Place control power on DH 11 using HIS DH11A.

_______ b. Close DH 11, RCS TO DH ISO, using HIS DH11.

c. IF there is an unexpected drop in DH Pump 1 suction pressure, THEN restore suction pressure by performing ONE of the following:

_______ • Throttle DH 14B* closed using HIC DH 14B.

OR

_______ • Throttle DH 13B closed using HIC DH 13B.

OR

_______ • Open DH 11, RCS TO DH ISO, using HIS DH11.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

________ d. Remove control power from DH 11 using HIS DH11A.

3.18.10 IF closing DH 12, RCS TO DH ISO, is desired,
THEN perform the following:

________ a. Place control power on DH 12 using HIS DH12A.

________ b. Close DH 12, RCS TO DH ISO, using HIS DH12.

c. IF there is an unexpected drop in DH Pump 1 suction pressure,
THEN perform ONE of the following:

________ • Throttle DH 14B* closed using HIC DH 14B,

OR

________ • Throttle DH 13B closed using HIC DH 13B.

OR

________ • Open DH 12, RCS TO DH ISO, using HIS DH12.

________ d. Remove control power from DH 12 using HIS DH12A.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.18.11

DH flow should be maintained at approximately 3000 gpm on FYI DH2B, DH 1 FLOW.

CAUTION 3.18.11

When DH System suction is through DH 21* and DH 23*, total DH system flow is limited to 4000 gpm.

________ 3.18.11 IF desired to raise DH Loop 1 flow,
THEN position the following valves as necessary to raise DH Loop 1 flow to the desired flowrate allowed for the current RCS level.
REFER TO DB-PF-06703, Miscellaneous Operation Curves, CC 6.2 and 6.4.

- DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIC DH 14B.
- DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

________ 3.18.12 Record the following:

DH Loop 1 Flow____________ gpm

DH Pump 1 Suction Pressure ______________ psig

Subsection 3.18 completed by ____ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

3.19 Transition to DH 21 and DH 23 with DH Loop 2 in Service

INITIALS Prerequisites

_______ 3.19.1 The Shift Manager has determined it is necessary to transition to DH 21*, RCS TO DECAY HEAT BYPASS, and DH 23*, RCS TO DECAY HEAT BYPASS.

_______ 3.19.2 IF RCS level is less than RV Flange level (78-82 inches), THEN obtain Manager-Operations permission to perform this subsection.

_______ 3.19.3 A pre-evolution briefing has been conducted covering the performance of this subsection discussing the following:

- DH Pump minimum suction pressure requirements while a pump is in service. Guidance is found in DB-PF-06703, Miscellaneous Operation Curves, CC 6.2 and 6.4.

- Actions for Loss of DH Flowpath, REFER TO DB-OP-02527, Loss of Decay Heat Removal.

Prerequisites completed by ______________________________ Date ___________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

Procedure

NOTE 3.19.4

- Curves CC 6.2 and CC 6.4 of DB-PF-06703, Miscellaneous Operation Curves provide guidance for maintaining DH Pump minimum suction pressure.
- RCS temperature should be monitored continuously to ensure that reduced DH Loop 2 flow is still adequate to maintain desired RCS temperature.
- As long as RCS level is initially at RV Flange level or greater experience has shown that reducing DH Loop 2 flow to 2500-2600 gpm will ensure DH Pump 2 minimum suction pressure will not be lost during the transition to DH 21* and DH 23*.

______ 3.19.4 IF RCS Level is greater than or equal to RV Flange level (78-82 inches), THEN position the following valves as necessary to reduce DH Loop 2 flow to 2500-2600 gpm. REFER TO DB-PF-06703, Miscellaneous Operation Curves, CC 6.2 and 6.4.

- DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH 14A.
- DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

NOTE 3.19.5

- With RCS Level initially less than RV Flange level, DH Loop 2 flow should be reduced to the minimum required to maintain RCS temperature. This will ensure DH Pump 2 minimum suction pressure is not lost during the transition to DH 21* and DH 23*.
- A reduction of approximately 500 gpm or more from the current DH Loop flow may be required.
- It is acceptable for the RCS to heatup slightly during this transition.

______ 3.19.5 IF RCS Level is less than RV Flange level (78-82 inches), THEN position the following valves as necessary to reduce DH Loop 2 flow to the minimum flow required to maintain RCS temperature.

- DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH 14A.
- DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

________ 3.19.6 Record the following:

DH Loop 2 Flow ________________ gpm

DH Pump 2 Suction Pressure ______________ psig

________ 3.19.7 Open DH 21*, RCS TO DECAY HEAT BYPASS.

________ 3.19.8 Open DH 23*, RCS TO DECAY HEAT BYPASS.

3.19.9 IF closing DH 11, RCS TO DH ISO is desired,
THEN perform the following:

________ a. Place control power on DH 11 using HIS DH11A.

________ b. Close DH 11, RCS TO DH ISO, using HIS DH11.

c. IF there is an unexpected drop in DH Pump 2 suction pressure,
THEN restore suction pressure by performing ONE of the following:

________ • Throttle DH 14A* closed using HIC DH 14A.

OR

________ • Throttle DH 13A closed using HIC DH 13A.

OR

________ • Open DH 11, RCS TO DH ISO, using HIS DH11.

________ d. Remove control power from DH 11 using HIS DH11A.

3.19.10 IF closing DH 12, RCS TO DH ISO, is desired,
THEN perform the following:

________ a. Place control power on DH 12 using HIS DH12A.

________ b. Close DH 12, RCS TO DH ISO, using HIS DH12.

c. IF there is an unexpected drop in DH Pump 2 suction pressure,
THEN perform ONE of the following:

________ • Throttle DH 14A* closed using HIC DH 14A.

OR

________ • Throttle DH 13A closed using HIC DH 13A.

OR

________ • Open DH 12, RCS TO DH ISO, using HIS DH12.

________ d. Remove control power from DH 12 using HIS DH12A.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.19.11

- DH flow should be maintained at approximately 3000 gpm on FYI DH2A, DH 2 FLOW.
- Flow adjustment may be required to minimize disc movement in CF30, CFT 2 to RX Check Valve.

CAUTION 3.19.11

When DH System suction is through DH 21* and DH 23*, total DH system flow is limited to 4000 gpm.

_______ 3.19.11 IF desired to raise DH Loop 2 flow,
THEN position the following valves as necessary to raise DH Loop 2 flow to the desired flowrate allowed for the current RCS level.
REFER TO DB-PF-06703, Miscellaneous Operation Curves, CC 6.2 and 6.4.

- DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH 14A.
- DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

_______ 3.19.12 Record the following:

DH Loop 2 Flow ________________gpm

DH Pump 2 Suction Pressure ____________ psig

Subsection 3.19 completed by ______________________________________ Date __________

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

3.20 Transition to DH 11 and DH 12 with DH Loop 1 in Service

INITIALS Prerequisites

______ 3.20.1 The Shift Manager has determined it is necessary to transition to DH 11, RCS TO DH ISO, and DH12, RCS TO DH ISO.

______ 3.20.2 IF RCS level is less than RV Flange level (78-82 inches), THEN obtain Manager-Operations permission to perform this subsection.

______ 3.20.3 A pre-evolution briefing has been conducted covering the performance of this subsection discussing the following:

- DH Pump minimum suction pressure requirements while a pump is in service. Guidance is found in DB-PF-06703, Miscellaneous Operation Curves, CC 6.2 and 6.4.
- Actions for Loss of DH Flowpath, REFER TO DB-OP-02527, Loss of Decay Heat Removal.

Prerequisites completed by ______________________ Date __________

Procedure

NOTE 3.20.4

A drop in DH Pump suction pressure is not expected when transitioning to DH 11 and DH 12.

3.20.4 WHEN it is desired to open DH 11, RCS TO DH ISO, THEN perform the following:

______ a. Place control power on DH 11 using HIS DH11A.

______ b. Open DH 11, RCS TO DH ISO, using HIS DH11.

______ c. Remove control power from DH 11 using HIS DH11A.

3.20.5 WHEN it is desired to open DH 12, RCS TO DH ISO, THEN perform the following:

______ a. Place control power on DH 12 using HIS DH12A.

______ b. Open DH 12, RCS TO DH ISO, using HIS DH12.

______ c. Remove control power from DH 12 using HIS DH12A.

_______ 3.20.6 Record the following:

DH Loop 1 Flow ________________gpm

DH Pump 1 Suction Pressure ____________ psig

_______ 3.20.7 Close DH 21*, RCS TO DECAY HEAT BYPASS.

_______ 3.20.8 Close DH 23*, RCS TO DECAY HEAT BYPASS.

NOTE 3.20.9
• DH flow should be maintained at approximately 3000 gpm on FYI DH2A, DH 2 FLOW.

_______ 3.20.9 IF desired to change DH Loop 1 flow,
THEN position the following valves as necessary to adjust DH Loop 1 flow to the desired flowrate allowed for the current RCS level.
REFER TO DB-PF-06703, Miscellaneous Operation Curves, CC 6.2 and 6.4.

- DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIC DH 14B.
- DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

_______ 3.20.10 Record the following:

DH Loop 1 Flow ________________gpm

DH Pump 1 Suction Pressure ____________ psig

Subsection 3.20 completed by ____ Date ________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

3.21 Transition to DH 11 and DH 12 with DH Loop 2 in Service

INITIALS

Prerequisites

_______ 3.21.1 The Shift Manager has determined it is necessary to transition to DH 11, RCS TO DH ISO, and DH12, RCS TO DH ISO.

_______ 3.21.2 IF RCS level is less than RV Flange level (78-82 inches), THEN obtain Manager-Operations permission to perform this subsection.

_______ 3.21.3 A pre-evolution briefing has been conducted covering the performance of this subsection discussing the following:

- DH Pump minimum suction pressure requirements while a pump is in service. Guidance is found in DB-PF-06703, Miscellaneous Operation Curves, CC 6.2 and 6.4.
- Actions for Loss of DH Flowpath, REFER TO DB-OP-02527, Loss of Decay Heat Removal.

Prerequisites completed by ______________________________ Date __________

Procedure

NOTE 3.21.4

A drop in DH Pump suction pressure is not expected when transitioning to DH 11 and DH 12.

3.21.4 WHEN it is desired to open DH 11, RCS TO DH ISO, THEN perform the following:

_______ a. Place control power on DH 11 using HIS DH11A.

_______ b. Open DH 11, RCS TO DH ISO, using HIS DH11.

_______ c. Remove control power from DH 11 using HIS DH11A.

3.21.5 WHEN it is desired to open DH 12, RCS TO DH ISO, THEN perform the following:

_______ a. Place control power on DH 12 using HIS DH12A.

_______ b. Open DH 12, RCS TO DH ISO, using HIS DH12.

_______ c. Remove control power from DH 12 using HIS DH12A.

_______ 3.21.6 Record the following:

DH Loop 2 Flow ________________gpm

DH Pump 2 Suction Pressure _____________ psig

_______ 3.21.7 Close DH 21*, RCS TO DECAY HEAT BYPASS.

_______ 3.21.8 Close DH 23*, RCS TO DECAY HEAT BYPASS.

<u>NOTE 3.21.9</u>

- DH flow should be maintained at approximately 3000 gpm on FYI DH2A, DH 2 FLOW.
- Flow adjustment may be required to minimize disc movement in CF30, CFT 2 to RX Check Valve.

_______ 3.21.9 <u>IF</u> desired to change DH Loop 2 flow,
<u>THEN</u> position the following valves as necessary to adjust DH Loop 2 flow to the desired flowrate allowed for the current RCS level.
<u>REFER TO</u> DB-PF-06703, Miscellaneous Operation Curves, CC 6.2 and 6.4.

- DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH 14A.
- DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

_______ 3.21.10 Record the following:

DH Loop 2 Flow ________________gpm

DH Pump 2 Suction Pressure _____________ psig

Subsection 3.21 completed by ____ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

3.22 One Hour Shutdown of DH Pump 1 To Support Core Alterations

INITIALS

Prerequisites

________ 3.22.1 Obtain Manager-Operations permission to perform this subsection.

________ 3.22.2 A pre-evolution briefing has been conducted covering the performance of this subsection, specifically discussing the following:

- Provisions made to monitor the temperature of the water above the reactor vessel (i.e. Temporary Incores).
- The rate of any temperature increase of the Refueling Canal shall be monitored to allow adequate time to restore DH Cooling prior to reaching saturation temperature.
- Refueling Canal/ RCS temperature shall be maintained less than or equal to 140°F.
- No operations involving boron concentration reduction to the RCS are permitted while the DH Pump is shutdown.

________ 3.22.3 Verify Temporary Incore monitoring is available AND operating correctly.

________ 3.22.4 Verify no evolutions are in progress that could cause an inadvertent reduction of RCS boron concentration.

________ 3.22.5 Notify Radiation Protection DH Loop 1 will be shutdown for up to one hour to support Core Alterations.

________ 3.22.6 Notify the Fuel Handling Director DH Loop 1 will be shutdown for up to one hour to support Core Alterations.

________ 3.22.7 IF DH Cooling was previously shutdown to support Core Alterations, THEN verify 8 hours has elapsed since DH Cooling was restored.

Prerequisites completed by ______________________________ Date __________

Procedure

________ 3.22.8 Record the following:

DH Loop 1 Flow ______________gpm

DH Cooler 1 outlet temperature __________

Temporary Incore temperature __________ °F (highest)

________ 3.22.9 Stop DH Pump 1 using HIS DH6B.

________ 3.22.10 Record the date and time DH Pump 1 is stopped.

Time/Date: ________/________

_______ 3.22.11 Close DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIC DH 14B.

_______ 3.22.12 Close DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

NOTE 3.22.13

Technical Specification 3.9.8.1 allows the DH Loop to be removed from service for up to one hour per 8 hour period during the performance of CORE ALTERATIONS in the vicinity of the reactor pressure vessel (hot) legs.

_______ 3.22.13 Add (1) hour to the time in step 3.22.10 to determine when DH Pump 1 must be restarted.

Time/Date: _________/_________

CAUTION 3.22.14

The rate of temperature increase in the Refueling Canal/RCS shall be monitored to allow adequate time to restore DH Cooling prior to reaching saturation temperature.

3.22.14 WHEN the highest Temporary Incore temperature approaches but does NOT exceed 140°F,
OR
Prior to exceeding the (1) hour time limit listed in step 3.22.13
THEN perform the following:

_______ a. Station an operator at DH Pump 1.

_______ b. Start DH Pump 1 using HIS DH6B AND note the date and time.

_______ c. Record the date and time DH Pump 1 is started.

Time/Date: _________/_________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.22.14.d

DH flow should be maintained at approximately 3000 gpm on FYI DH2B, DH 1 FLOW.

CAUTION 3.22.14.d

When DH System suction is through DH 21* and DH 23*, total DH system flow is limited to 4000 gpm.

_______ d. Position the following valves as necessary to obtain the desired flowrate:

- DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIC DH 14B.
- DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

_______ 3.22.15 Record the following:

DH Loop 1 Flow ______________ gpm

DH Cooler 1 outlet temperature __________ °F

Temporary Incore temperature _________ °F (highest)

_______ 3.22.16 Notify the Fuel Handling Director DH Pump 1 has been restarted.

_______ 3.22.17 Notify Radiation Protection DH Pump 1 has been restarted.

_______ 3.22.18 Verify DHR SPDS Display is in service AND updated for DH Loop 1 in service.

Subsection 3.22 completed by ______________________________ Date ________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

3.23 One Hour Shutdown of DH Pump 2 To Support Core Alterations

INITIALS Prerequisites

________ 3.23.1 Obtain Manager-Operations permission to perform this subsection.

________ 3.23.2 A pre-evolution briefing has been conducted covering the performance of this subsection, specifically discussing the following:

- Provisions made to monitor the temperature of the water above the reactor vessel (i.e. Temporary Incores).
- The rate of any temperature increase of the Refueling Canal shall be monitored to allow adequate time to restore DH Cooling prior to reaching saturation temperature.
- Refueling Canal/ RCS temperature shall be maintained less than or equal to 140°F.
- No operations involving boron concentration reduction to the RCS are permitted while the DH Pump is shutdown.

________ 3.23.3 Verify Temporary Incore monitoring is available AND operating correctly.

________ 3.23.4 Verify no evolutions are in progress that could cause an inadvertent reduction of RCS boron concentration.

________ 3.23.5 Notify Radiation Protection DH Loop 2 will be shutdown for up to one hour to support Core Alterations.

________ 3.23.6 Notify the Fuel Handling Director DH Loop 2 will be shutdown for up to one hour to support Core Alterations.

________ 3.23.7 IF DH Cooling was previously shutdown to support Core Alterations, THEN verify 8 hours has elapsed since DH Cooling was restored.

Prerequisites completed by____________________________________ Date ____________

Procedure

________ 3.23.8 Record the following:

DH Loop 2 Flow ________________gpm

DH Cooler 2 outlet temperature ____________

Temporary Incore temperature __________ °F (highest)

________ 3.23.9 Stop DH Pump 2 using HIS DH6A.

________ 3.23.10 Record the date and time DH Pump 2 is stopped.

Time/Date: _________/_________

________ 3.23.11 Close DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH 14A.

________ 3.23.12 Close DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

> <u>NOTE 3.23.13</u>
>
> Technical Specification 3.9.8.1 allows the DH Loop to be removed from service for up to one hour per 8 hour period during the performance of CORE ALTERATIONS in the vicinity of the reactor pressure vessel (hot) legs.

________ 3.23.13 Add (1) hour to the time in step 3.23.10 to determine when DH Pump 2 must be restarted.

Time/Date: _________/_________

> <u>CAUTION 3.23.14</u>
>
> The rate of temperature increase in the Refueling Canal/RCS shall be monitored to allow adequate time to restore DH Cooling prior to reaching saturation temperature.

3.23.14 <u>WHEN</u> the highest Temporary Incore temperature approaches but does NOT exceed 140°F,
<u>OR</u>
Prior to exceeding the (1) hour time limit listed in step 3.23.13
<u>THEN</u> perform the following:

________ a. Station an operator at DH Pump 2.

________ b. Start DH Pump 2 using HIS DH6A <u>AND</u> note the date and time.

________ c. Record the date and time DH Pump 2 is started.

Time/Date: _________/_________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 3.23.14.d

- DH flow should be maintained at approximately 3000 gpm on FYI DH2A, DH 2 FLOW.
- Flow adjustment may be required to minimize disc movement in CF30, CFT 2 TO RX CHECK VALVE.

CAUTION 3.23.14.d

When DH System suction is through DH 21* and DH 23*, total DH system flow is limited to 4000 gpm.

_______ d. Position the following valves as necessary to obtain the desired flowrate:

- DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH 14A.
- DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

_______ 3.23.15 Record the following:

DH Loop 2 Flow ______________ gpm

DH Cooler 2 outlet temperature ______________

Temporary Incore temperature ___________ °F (highest)

_______ 3.22.16 Notify the Fuel Handling Director DH Pump 2 has been restarted.

_______ 3.22.17 Notify Radiation Protection DH Pump 2 has been restarted.

_______ 3.23.18 Verify DHR SPDS Display is in service AND updated for DH Loop 2 in service.

Subsection 3.23 completed by ________________________________ Date ____________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.0 INFREQUENT OR SPECIAL OPERATIONS

4.1 Placing the BWST on Recirc using DH Pump 1 in the LPI Mode

NOTE 4.1

- This Subsection can only be performed in Mode 4 if RCPs are still running. One DH Loop must remain operable in the LPI Mode per Technical Specification 3.5.3.
- It is preferable to use a CTMT Spray Pump to recirculate the BWST, instead of the Standby DH Loop.

INITIALS

Prerequisites

_______ 4.1.1 A pre-evolution briefing has been conducted covering the following:

- The performance of this subsection which makes DH Loop 1 inoperable. DH Loop 1 will be unavailable in Modes 1 and 2, and available with operator action in Mode 3.
- The performance of this subsection which makes HPI loop 1 inoperable but available with operator action.
- Actions required to restore the LPI function if necessary.
- Operator responsibilities if the LPI function if required.

_______ 4.1.2 Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 4.1.3 Verify the CCW System is in service to supply Essential Loop 1. Refer to DB-OP-06262, Component Cooling Water System Procedure.

_______ 4.1.4 IF DH 11 AND DH 12, RCS TO DH ISO, are open
OR DH 21* AND DH 23* RCS TO DH BYPASS, are open,
THEN GO TO Subsection 4.5, Placing the BWST on Recirc using DH Pump 1 while the RCS is on DH Cooling.

_______ 4.1.5 Verify DH Loop 1 in Standby LPI Mode. Refer to Subsection 3.3, Place DH Loop 1 in Standby LPI Mode.

_______ 4.1.6 Verify DH Loop 2 is NOT providing SFP cooling. Refer to Subsection 4.24, Restoration from DH System Cooling of the SFP using DH Pump 2.

Prerequisites completed by ______________________________ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

Procedure

_______ 4.1.7 Verify DH Pump 1 is stopped.

_______ 4.1.8 Verify DH 1517, DH PUMP 1 SUCTION FROM RCS, is closed.

_______ 4.1.9 Close DH 1517A*, DH PUMP 1 SUCTION EQUALIZING VALVE.

_______ 4.1.10 Verify DH 2733*, DH PUMP 1 SUCTION FROM BWST OR EMERG SUMP, is open.

_______ 4.1.11 Verify DH 7B*, BWST ISOLATION VALVE LINE 1, is open.

_______ 4.1.12 Verify DH 831*, DH COOLER 1/2 DISCHARGE X-CON, is closed.

_______ 4.1.13 The following step(s) makes DH Loop 1 inoperable. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 4.1.14 IF in Modes 1-3,
THEN DH 1B*, DH PUMP 1 DISCH TO RCS ISO, may be positioned either open or closed as determined by Shift Manager.

4.1.15 IF in Mode 4,
THEN perform the following:

_______ a. Place control power on DH 1B using HIS DH1B-2.

_______ b. Close DH 1B*, DH PUMP 1 DISCHARGE TO RCS, using HIS DH1B.

_______ c. Remove control power from DH 1B using HIS DH1B-2.

_______ 4.1.16 Verify DH 65*, DH PUMP 2 DISCH TO BWST/RF CANAL/SFP COOLING SYS, is closed.

NOTE 4.1.17

DH 66 and DH 68 are opened in Attachment 10. The LPI and HPI train are both inoperable. LPI Train 1 is unavailable with the recirc flow path is aligned to the BWST in Modes 1 and 2. LPI Train 1 is available with operator action in Mode 3. The HPI train is considered available with operator action.

_______ 4.1.17 The following step renders LPI train 1 and HPI train 1 inoperable and LPI train 1 is unavailable.

_______ 4.1.18 Perform Attachment 10, Recirculate the BWST using DH Pump 1.

_______ 4.1.19 Verify Attachment 8, DH Pump 1 Prestart Checklist, is current.

_______ 4.1.20 Press AUTO for DH14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIS DH14B.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

_______ 4.1.21 Press AUTO for DH13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, is closed using HIC DH13B, using HIS DH13B.

_______ 4.1.22 Verify DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, is closed using HIC DH14B.

_______ 4.1.23 Verify DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, is closed using HIC DH13B.

_______ 4.1.24 Station an operator at DH Pump 1.

_______ 4.1.25 Start DH Pump 1 using HIS DH6B.

_______ 4.1.26 Position the following valves as necessary to obtain the desired flowrate:

- DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIC DH 14B.
- DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

Subsection 4.1 completed by ______________________________ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.2 Removing the BWST from Recirc using DH Pump 1 and Placing DH Pump 1 in Standby LPI Mode

INITIALS

Prerequisites

None

Procedure

> CAUTION 4.2.1
>
> Isolation of the flow test line should be completed prior to performing other valve lineups.

_______ 4.2.1 Stop DH Pump 1 using HIS DH6B.

_______ 4.2.2 Close AND lock DH 66*, DH PUMP 1 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

_______ 4.2.3 Close DH 68, DH PUMPS DISCHARGE TO BWST.

_______ 4.2.4 Open DH 1517A*, DH PUMP 1 SUCTION EQUALIZING VALVE.

_______ 4.2.5 Verify DH 1B*, DH PUMP 1 DISCH TO RCS ISO, is open.

4.2.6 Perform the following to return DH Pump 1 to Standby LPI Mode:

_______ a. Set DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, to 65% open using HIC DH14B.

_______ b. Press OPEN on HIS DH14B.

_______ c. Within 4 hours locally verify DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, indicates 30.5 – 34.5% open.

_______ d. Record in the Unit Log DH 14B* verified open to mechanical stop.

_______ e. Close DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH13B.

_______ f. Press CLOSE on HIS DH13B.

_______ g. IF DH Pump 2 is in the LPI Mode, THEN open DH 10*, DH PUMP 1 MINIMUM COOLDOWN ISOLATION.

4.2.7 Notify the Shift Manager DH Loop 1 is in Standby LPI Mode AND to perform operability evaluation for the following systems: Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ • HPI Loop 1

_______ • DH Loop 1.

Subsection 4.2 completed by ______________________________ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.3 Placing the BWST on Recirc using DH Pump 2 in the LPI Mode

NOTE 4.3

- This Subsection can only be performed in Mode 4 if RCPs are still running. One DH Loop must remain operable in the LPI Mode per Technical Specification 3.5.3.
- It is preferable to use a CTMT Spray Pump to recirculate the BWST, instead of the Standby DH Loop.

INITIALS Prerequisites

________ 4.3.1 A pre-evolution briefing has been conducted covering the following:

- The performance of this subsection which makes DH Loop 2 inoperable. DH Loop 2 will be unavailable in Modes 1 and 2, and available with operator action in Mode 3.
- The performance of this subsection which makes HPI loop 2 inoperable but available with operator action.
- Actions required to restore the LPI function if necessary.
- Operator responsibilities if the LPI function if required.

________ 4.3.2 Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

________ 4.3.3 Verify the CCW System is in service to supply Essential Loop 2. Refer to DB-OP-06262, Component Cooling Water System Procedure.

________ 4.3.4 IF DH 11 AND DH 12, RCS TO DH ISO, are open
OR DH 21* AND DH 23*, RCS TO DH BYPASS are open,
THEN GO TO Subsection 4.7, Recirculation of the BWST using DH Pump 2 while the RCS is on DH Cooling.

________ 4.3.5 Verify DH Loop 2 in Standby LPI Mode. Refer to Subsection 3.4, Place DH Loop 2 in Standby LPI Mode.

________ 4.3.6 Verify DH Loop 1 is NOT providing SFP cooling. Refer to Subsection 4.21, Restoration from DH System Cooling of the SFP using DH Pump 1.

Prerequisites completed by ______________________________ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

Procedure

_______ 4.3.7 Verify DH Pump 2 is stopped.

_______ 4.3.8 Verify DH 1518, DH PUMP 2 SUCTION FROM RCS, is closed.

_______ 4.3.9 Close DH 1518A*, DH PUMP 2 SUCTION EQUALIZING VALVE.

_______ 4.3.10 Verify DH 2734*, DH PUMP 2 SUCTION FROM BWST OR EMERG SUMP, is open.

_______ 4.3.11 Verify DH 7A*, BWST ISOLATION VALVE LINE 2, is open.

_______ 4.3.12 Verify DH 830*, DH COOLER 2/1 DISCHARGE X-CON, is closed.

_______ 4.3.13 The following step(s) makes DH Loop 2 inoperable. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 4.3.14 IF in Modes 1-3,
THEN DH1A*, DH PUMP 2 DISCH TO RCS ISO, may be positioned either open or closed as determined by Shift Manager.

4.3.15 IF in Mode 4,
THEN perform the following:

_______ a. Place control power on DH 1A using HIS DH1A-2.

_______ b. Close DH 1A*, DH PUMP 2 DISCHARGE TO RCS, using HIS DH1A.

_______ c. Remove control power from DH 1A using HIS DH1A-2.

_______ 4.3.16 Verify DH 66*, DH PUMP 1 DISCH TO BWST/RF CANAL/SFP COOLING SYS, is closed AND locked.

NOTE 4.3.17

DH 65 and DH 68 are opened in Attachment 11. The LPI and HPI train are both inoperable. LPI Train 2 is unavailable with the recirc flow path is aligned to the BWST in Modes 1 and 2. LPI Train 2 is available with operator action in Mode 3. The HPI train is considered available with operator action.

_______ 4.3.17 The following step renders LPI train 2 and HPI train 2 inoperable and LPI train 2 is unavailable.

_______ 4.3.18 Perform Attachment 11, Recirculate the BWST using DH Pump 2.

_______ 4.3.19 Verify Attachment 9, DH Pump 2 Prestart Checklist, is current.

_______ 4.3.20 Press AUTO for DH14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIS DH14A.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

________ 4.3.21 Press AUTO for DH13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIS DH13A.

________ 4.3.22 Verify DH14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, is closed using HIC DH14A.

________ 4.3.23 Verify DH13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, is closed using HIC DH13A.

________ 4.3.24 Station an operator at DH Pump 2.

________ 4.3.25 Start DH Pump 2 using HIS DH6A.

________ 4.3.26 Position the following valves as necessary to obtain the desired flowrate:

- DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH 14A.
- DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

Subsection 4.3 completed by ______________________________ Date ________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.4 Removing the BWST from Recirc using DH Pump 2 and Placing DH Pump 2 in Standby LPI Mode

INITIALS

Prerequisites

None

Procedure

CAUTION 4.4.1

Isolation of the flow test line should be completed prior to performing other valve lineups.

_______ 4.4.1 Stop DH Pump 2 using HIS DH6A.

_______ 4.4.2 Close AND lock DH 65*, DH PUMP 2 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

_______ 4.4.3 Close DH 68, DH PUMPS DISCHARGE TO BWST.

_______ 4.4.4 Open DH 1518A*, DH PUMP 2 SUCTION EQUALIZING VALVE.

_______ 4.4.5 Verify DH 1A*, DH PUMP 2 DISCH TO RCS ISO, is open.

4.4.6 Perform the following to return DH Pump 2 to Standby LPI Mode:

_______ a. Set DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, to 67% open using HIC DH14A.

_______ b. Press OPEN on HIS DH14A.

_______ c. Within 4 hours locally verify DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, indicates 37 – 41 % open.

_______ d. Record in the Unit Log DH 14A* verified open to mechanical stop.

_______ e. Close DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH13A.

_______ f. Press CLOSE on HIS DH13A.

4.4.7 Notify the Shift Manager DH Loop 2 is in Standby LPI Mode AND to perform an operability evaluation for the following systems: Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ • HPI Loop 2

_______ • DH Loop 2.

Subsection 4.4 completed by ______________________________ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

> NOTE 4.5
>
> It is preferable to use a CTMT Spray Pump to recirculate the BWST, instead of the Standby DH Loop.

4.5 Placing the BWST on Recirc using DH Pump 1 in the DH Mode

INITIALS Prerequisites

_______ 4.5.1 A pre-evolution briefing has been conducted covering the performance of this subsection which makes DH Loop 1 incapable of performing its intended function. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 4.5.2 Verify CCW System is in service to supply Essential Header 1. Refer to DB-OP-06262, Component Cooling Water System Procedure.

_______ 4.5.3 Verify DH Loop 1 is in Standby DH Mode. Refer to Subsection 3.5, Place DH Loop 1 in Standby DH Mode.

Prerequisites completed by ______________________________ Date __________

Procedure

_______ 4.5.4 Verify DH Pump 1 is stopped.

_______ 4.5.5 The following step makes DH Loop 1 inoperable. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 4.5.6 Remove the CLOSE power fuses for AC 112, DECAY HT PUMP 1-1 MP-421.

_______ 4.5.7 Verify BE 1126 (E11D), MV 1517 DH NORM SUCT LINE 1 ISO VLV, is closed.

_______ 4.5.8 Close DH 1517, DH PUMP 1 SUCTION FROM RCS.

_______ 4.5.9 Close DH 1517A*, DH PUMP 1 SUCTION EQUALIZING VALVE.

_______ 4.5.10 Verify DH 1B* DH PUMP 1 DISCH TO RCS, is closed.

_______ 4.5.11 Verify BE 1121 (E11A), MV 2733 DH PMP 1 SUCT VLV FRM BWST, is closed.

_______ 4.5.12 Verify DH 2733*, DH PUMP 1 SUCTION FROM BWST OR EMERG SUMP, is closed.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.5.13 IF DH Pump 1 suction pressure is greater than 70 psig,
THEN perform the following to bleed off pressure trapped between DH 1517 and DH 2733 so the suction relief is not challenged:

_______ a. Verify DH 65* DH PUMP 2 DISCH TO BWST/RF CANAL/SFP COOLING SYS, is closed AND locked.

_______ b. Crack open DH 66*, DH PUMP 1 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

_______ c. IF suction pressure remains greater then 70 psig,
THEN crack open DH 68, DH PUMPS DISCHARGE TO BWST.

_______ d. Verify DH Pump 1 suction pressure less than 70 psig.

_______ e. Close AND lock DH 66*, DH PUMP 1 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

_______ f. Verify DH 68, DH PUMPS DISCHARGE TO BWST, is closed.

_______ 4.5.14 Verify DH 65*, DH PUMP 2 DISCH TO BWST/RF CANAL/SFP COOLING SYS, is closed AND locked.

_______ 4.5.15 Perform Attachment 10, Recirculate the BWST using DH Pump 1.

_______ 4.5.16 Open DH 2733*, DH PUMP 1 SUCTION FROM BWST OR EMERG SUMP.

_______ 4.5.17 Verify BE 1157 (E11A), MV DH07B BWST OUT VLV B, is closed.

_______ 4.5.18 Verify DH 7B*, BWST ISOLATION VALVE LINE 1, is open.

_______ 4.5.19 Verify Attachment 8, DH Pump 1 Prestart Checklist, is current.

_______ 4.5.20 Verify the CLOSE power fuses for AC 112, DECAY HT PUMP 1-1 MP-421, are installed.

_______ 4.5.21 Press AUTO for DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIS DH 14B.

_______ 4.5.22 Press AUTO for DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIS DH 13B.

_______ 4.5.23 Close DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIC DH 14B.

_______ 4.5.24 Close DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

_______ 4.5.25 Station an operator at DH Pump 1.

_______ 4.5.26 Start DH Pump 1 using HIS DH6B.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

________ 4.5.27 Position the following valves as necessary to obtain the desired flowrate:

- DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIC DH 14B.
- DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE using HIC DH 13B.

Subsection 4.5 completed by ______________________________ Date ____________

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.6 Removing the BWST from Recirc using DH Pump 1 and Returning DH Pump 1 to Standby DH Mode

INITIALS

Prerequisites

None

Procedure

_______ 4.6.1 Verify DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, is closed using HIC DB14B

_______ 4.6.2 Verify DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, is closed using HIC DH13B.

_______ 4.6.3 Stop DH Pump 1 using HIS DH6B.

> CAUTION 4.6.4
>
> Isolating the flow test line should be done prior to performing other valve lineups.

_______ 4.6.4 Close AND lock DH 66*, DH PUMP 1 DISCH TO BWST/RF CANAL/ SFP COOLING SYS.

_______ 4.6.5 Close DH 68, DH PUMPS DISCH TO BWST.

_______ 4.6.6 Open DH 1517A*, DH PUMP 1 SUCTION EQUALIZING VALVE.

_______ 4.6.7 Remove the CLOSE power fuses for AC 112, DECAY HT PUMP 1-1 MP-421.

_______ 4.6.8 Place DH Pump 1 in Standby DH Mode, REFER TO Subsection 3.5, Place DH Loop 1 in Standby DH Mode.

_______ 4.6.9 Place control power on DH 1B* using HIS DH1B-2.

> NOTE 4.6.10
>
> Computer point Z560 will indicate TRBL until DH 1B is fully open and the control power is removed.

_______ 4.6.10 Open DH 1B*, DH PUMP 1 DISCHARGE TO RCS, using HIS DH1B.

_______ 4.6.11 Remove control power from DH 1B* using HIS DH1B-2.

_______ 4.6.12 IF desired by the Shift Manager,
THEN close DH 7B*, BWST ISOLATION VLV LINE 1.

Subsection 4.6 completed by ______________________________ Date ___________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

> NOTE 4.7
>
> It is preferable to use a CTMT Spray Pump to recirculate the BWST, instead of the Standby DH Loop.

4.7 Placing the BWST on Recirc using DH Pump 2 in the DH Mode

INITIALS

Prerequisites

_______ 4.7.1 A pre-evolution briefing has been conducted covering the performance of this subsection which makes DH Loop 2 incapable of performing its intended function. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 4.7.2 Verify CCW System is in service to supply Essential Header 2. Refer to DB-OP-06262, Component Cooling Water System Procedures.

_______ 4.7.3 Verify DH Loop 2 is in Standby DH Mode. Refer to Subsection 3.6, Place DH Loop 2 in Standby DH Mode.

Prerequisites completed by ______________________________ Date __________

Procedure

_______ 4.7.4 Verify DH Pump 2 is stopped.

_______ 4.7.5 The following step makes DH Loop 2 inoperable. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 4.7.6 Remove the CLOSE power fuses for AD 112, DECAY HT PUMP 1-2 MP-422.

_______ 4.7.7 Verify BF 1129 (F11C), MV 1518 DH NORM SUCT LINE 2 ISO VLV, is closed.

_______ 4.7.8 Close DH 1518, DH PUMP 2 SUCTION FROM RCS.

_______ 4.7.9 Close DH 1518A*, DH PUMP 2 SUCTION EQUALIZING VALVE.

_______ 4.7.10 Verify DH1A* DH PUMP 2 DISCHARGE TO RCS, is closed.

_______ 4.7.11 Verify BF 1134 (F11C), MV 2734 DH PMP 2 SUCT VLV FRM BWST, is closed.

_______ 4.7.12 Verify DH 2734*, DH PUMP 2 SUCTION FROM BWST OR EMERG SUMP, is closed.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.7.13 IF DH Pump 2 suction pressure is greater than 70 psig,
THEN perform the following to bleed off pressure trapped between DH 1518 and DH 2734 so the suction relief is not challenged:

_______ a. Verify DH 66*, DH PUMP 1 DISCH TO BWST/RF CANAL/SFP COOLING SYS, is closed AND locked.

_______ b. Crack open DH 65*, DH PUMP 2 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

_______ c. IF suction pressure remains greater then 70 psig,
THEN crack open DH 68, DH PUMPS DISCHARGE TO BWST.

_______ d. Verify DH Pump 2 suction pressure less than 70 psig.

_______ e. Close AND lock DH 65*, DH PUMP 2 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

_______ f. Verify DH 68, DH PUMPS DISCHARGE TO BWST, is closed.

_______ 4.7.14 Verify DH 66*, DH Pump 1 DISCH to BWST/REFUELING CANAL/SFP COOLING SYS, is closed AND locked.

_______ 4.7.15 Perform Attachment 11, Recirculate the BWST using DH Pump 2.

_______ 4.7.16 Open DH 2734*, DH PUMP 2 SUCTION FROM BWST OR EMERG SUMP.

_______ 4.7.17 Verify BF 1148 (F11B), MV DH07A BWST OUT VLV A, is closed.

_______ 4.7.18 Verify DH 7A*, BWST ISOLATION VALVE LINE 2, is open.

_______ 4.7.19 Verify Attachment 9, DH Pump 2 Prestart Checklist, is current.

_______ 4.7.20 Verify the CLOSE power fuses for AD 112, DECAY HT PUMP 1-2 MP-422, are installed.

_______ 4.7.21 Press AUTO for DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIS DH 14A.

_______ 4.7.22 Press AUTO for DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIS DH 13A.

_______ 4.7.23 Close DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH 14A.

_______ 4.7.24 Close DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

_______ 4.7.25 Station an operator at DH Pump 2.

_______ 4.7.26 Start DH Pump 2 using HIS DH6A.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

_______ 4.7.27 Position the following valves as necessary to obtain the desired flowrate:

- DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH 14A.
- DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

Subsection 4.7 completed by ______________________________ Date __________

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.8 Removing the BWST from Recirc using DH Pump 2 and Returning DH Pump 2 to Standby DH Mode

INITIALS

Prerequisites

None

Procedure

________ 4.8.1 Verify DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, is closed using HIC DH 14A.

________ 4.8.2 Verify DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, is closed using HIC DH 13A.

________ 4.8.3 Stop DH Pump 2 using HIS DH 6A.

CAUTION 4.8.4

Isolating the flow test line should be done prior to performing other valve lineups.

________ 4.8.4 Close AND lock DH 65*, DH PUMP 2 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

________ 4.8.5 Close DH 68, DH PUMPS DISCH TO BWST.

________ 4.8.6 Open DH 1518A*, DH PUMP 2 SUCTION EQUALIZING VALVE.

________ 4.8.7 Remove the CLOSE power fuses for AD 112, DECAY HT PUMP 1-2 MP-422.

________ 4.8.8 Place DH Pump 2 in Standby DH Mode, REFER TO Subsection 3.6, Place DH Loop 2 in Standby DH Mode.

________ 4.8.9 Place control power on DH 1A* using HIS DH1A-2.

NOTE 4.8.10

Computer point Z564 will indicate TRBL until DH 1A is fully open and the control power is removed.

________ 4.8.10 Open DH 1A*, DH PUMP 2 DISCHARGE TO RCS, using HIS DH1A.

________ 4.8.11 Remove control power from DH 1A* using HIS DH1A-2.

________ 4.8.12 IF desired by the Shift Manager,
THEN close DH 7A*, BWST ISOLATION VLV LINE 2.

Subsection 4.8 completed by ______________________________ Date ____________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 4.9

The MU and Purification System is the preferred method of water addition to the RCS, provided RCS pressure is low enough to permit flow.

4.9 Add Water to the RCS using DH Pump 1 From the BWST

INITIALS

Prerequisites

________ 4.9.1 A pre-evolution briefing has been conducted covering the performance of this subsection which makes DH Loop 1 incapable of performing its intended function. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

________ 4.9.2 Verify CCW System is in service to supply Essential Header 1. Refer to DB-OP-06262, Component Cooling Water System Procedure.

________ 4.9.3 Verify DH Pump 2 is in service for RCS Decay Heat Removal. Refer to Subsection 3.8, Starting DH Pump 2 for RCS Cooling.

________ 4.9.4 Verify DH Pump 1 is in Standby DH Mode. Refer to Subsection 3.5, Place DH Loop 1 in Standby DH Mode.

NOTE 4.9.5

Surveillance Requirement 4.1.1.2 requires verification (Unit Log entry) of Reactor Coolant System flow greater than or equal to 2800 gpm within one hour prior to the start of and at least once per hour during a reduction in RCS boron concentration by either:

- Verifying at least one RCP in operation,

  OR

- Verifying at least one Decay Heat pump is in operation supplying greater than or equal to 2800 gpm.

- For exceptions to this surveillance refer to T.S. 3.1.1.2, Boron Dilution.

CAUTION 4.9.5

If the minimum RCS flow rate is NOT met, the deboration operation shall be suspended immediately.

4.9.5 IF a reduction in RCS boron Concentration is to be made, THEN verify the following:

_______ a. RCS flow is greater than or equal to 2800 gpm ,

OR

b. The plant is in MODE 5 or 6 AND either one of the following conditions are met.

_______ 1. The water to be added to the RCS has a boron concentration greater than the refueling concentration determined by TS 3.9.1 for Mode 6.

OR

_______ 2. The water to be added to the RCS has a boron concentration equal to or greater than the SDM requirement of T.S. 3.1.1.1, Shutdown Margin, for Mode 5.

Prerequisites completed by ______________________________ Date ____________

Procedure

_______ 4.9.6 Verify DH Pump 1 is stopped.

_______ 4.9.7 Press AUTO for DH 14B* using HIS DH 14B.

_______ 4.9.8 Press AUTO for DH 13B using HIS DH 13B.

_______ 4.9.9 Close DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIC DH 14B.

_______ 4.9.10 Close DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

_______ 4.9.11 The following step makes DH Loop 1 inoperable. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 4.9.12 Remove the CLOSE power fuses for AC 112, DECAY HT PUMP 1-1 MP-421.

_______ 4.9.13 Close BE 1126 (E11D), MV 1517 DH NORM SUCT LINE 1 ISO VLV.

_______ 4.9.14 Close DH 1517, DH PUMP 1 SUCTION FROM RCS, using HIS 1517.

4.9.15 <u>IF</u> DH Pump 1 suction pressure is greater than 70 psig, <u>THEN</u> perform the following to bleed off pressure trapped between DH 1517 and DH 2733 so the suction relief is not challenged:

_______ a. Verify DH 65*, DH PUMP 2 DISCH TO BWST/RF CANAL/SFP COOLING SYS, is closed.

_______ b. Crack open DH 66*, DH PUMP 1 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

_______ c. <u>IF</u> suction pressure remains greater then 70 psig, <u>THEN</u> crack open DH 68, DH PUMPS DISCHARGE TO BWST.

_______ d. Verify DH Pump 1 suction pressure is less than 70 psig.

_______ e. Close <u>AND</u> lock DH 66*, DH PUMP 1 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

_______ f. Verify DH 68, DH PUMPS DISCHARGE TO BWST, is closed.

_______ 4.9.16 Close BE 1121 (E11A), MV 2733 DH PMP 1 SUCT VLV FRM BWST.

_______ 4.9.17 Open DH 2733*, DH PUMP 1 SUCTION FROM BWST OR EMERGENCY SUMP, using HIS 2733.

_______ 4.9.18 Verify DH 7B*, BWST ISOLATION VALVE LINE 1, is open.

_______ 4.9.19 Install the CLOSE power fuses for AC 112, DECAY HT PUMP 1-1 MP-421.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 4.9.20

- Pressurizer level must be monitored to determine approximate flowrate and proper water addition.
- Monitor flowrate using F593, LP INJ 1 FLOW, on the DHR SPDS display.
- Monitor count rate and boronometer (if on purification) when changing RCS Boron concentration.
- Leakage past DH13B and DH14B* may be adequate for water addition.

CAUTION 4.9.20

Water addition should be made at 80-100 gpm to limit thermal stress on the surge line. If this flow is exceeded, it is better to maintain a continuous flow, once started, than to stop and restart, even at a slower rate.

_______ 4.9.20 Station an operator at DH Pump 1.

_______ 4.9.21 Start DH Pump 1 using HIS DH6B.

_______ 4.9.22 IF a greater flow rate is necessary,
THEN throttle open DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH13B, to add the desired amount of water to the RCS.

_______ 4.9.23 WHEN the water addition is complete,
THEN stop DH Pump 1 using HIS DH6B.

_______ 4.9.24 Close DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH13B.

_______ 4.9.25 Remove the CLOSE power fuses for AC 112, DECAY HT PUMP 1-1 MP-421.

_______ 4.9.26 Close DH 2733*, DH PUMP 1 SUCTION FROM BWST OR EMERGENCY SUMP.

_______ 4.9.27 Open BE 1121 (E11A), MV 2733 DH PMP 1 SUCT VLV FRM BWST.

_______ 4.9.28 Open DH 1517, DH PUMP 1-1 SUCTION FROM RCS, using HIS 1517.

_______ 4.9.29 Open BE 1126 (E11D), MV 1517 DH NORM SUCT LINE 1 ISO VLV.

_______ 4.9.30 Install the CLOSE power fuses for AC 112, DECAY HT PUMP 1-1 MP-421.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

_______ 4.9.31 IF desired by Shift Manager,
THEN close DH 7B*, BWST ISOLATION VALVE LINE 1.

_______ 4.9.32 Notify the Shift Manager DH Loop 1 is in Standby DH Mode AND to perform an operability evaluation. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 4.9.33 Direct Chemistry to sample the RCS and check for proper Boron concentration.

Subsection 4.9 completed by ____ Date __________

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 4.10

The MU and Purification System is the preferred method of water addition to the RCS, provided the RCS pressure is low enough to permit flow.

4.10 Add Water to the RCS using DH Pump 2 From the BWST

INITIALS

Prerequisites

_______ 4.10.1 A pre-evolution briefing has been conducted covering the performance of this subsection which makes DH Loop 2 incapable of performing its intended function. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 4.10.2 Verify the CCW System is in service to supply Essential Header 2. Refer to DB-OP-06262, Component Cooling Water System Procedure.

_______ 4.10.3 Verify DH Pump 1 is in service for RCS Decay Heat Removal. Refer to Subsection 3.7, Starting DH Pump 1 for RCS Cooling.

_______ 4.10.4 Verify DH Pump 2 is in Standby DH Mode. Refer to Subsection 3.6, Place DH Loop 2 in Standby DH Mode.

NOTE 4.10.5

Surveillance Requirement 4.1.1.2 requires verification (Unit Log entry) of Reactor Coolant System flow greater than or equal to 2800 gpm within one hour prior to the start of and at least once per hour during a reduction in RCS boron concentration by either:

- Verifying at least one RCP in operation,

  OR

- Verifying at least one Decay Heat pump is in operation supplying greater than or equal to 2800 gpm .

- For exceptions to this surveillance refer to T.S. 3.1.1.2, Boron Dilution.

CAUTION 4.10.5

If the minimum RCS flow rate is NOT met, the deboration operation shall be suspended immediately.

4.10.5 IF a reduction in RCS boron Concentration is to be made, THEN verify the following:

_______ a. RCS flow is greater than or equal to 2800 gpm ,

OR

b. The plant is in MODE 5 or 6 AND either one of the following conditions are met:

_______ 1. The water to be added to the RCS has a boron concentration greater than the refueling concentration determined by TS 3.9.1 for Mode 6.

OR

_______ 2. The water to be added to the RCS has a boron concentration equal to or greater than the SDM requirement of T.S. 3.1.1.1, Shutdown Margin, for Mode 5.

Prerequisites completed by ______________________________ Date ____________

Procedure

_______ 4.10.6 Verify DH Pump 2 is stopped.

_______ 4.10.7 Press AUTO for DH 14A* using HIS DH 14A.

_______ 4.10.8 Press AUTO for DH 13A using HIS DH 13A.

_______ 4.10.9 Close DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH14A.

_______ 4.10.10 Close DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE , using HIC DH13A.

_______ 4.10.11 The following step makes DH Loop 2 inoperable. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 4.10.12 Remove the CLOSE power fuses for AD 112, DECAY HT PUMP 1-2 MP-422.

_______ 4.10.13 Close BF 1129 (F11C), MV 1518 DH NORM SUCT LINE 2 ISO VLV.

_______ 4.10.14 Close DH 1518, DH PUMP 2 SUCTION FROM RCS, using HIS 1518.

4.10.15 IF DH Pump 2 suction pressure is greater than 70 psig, THEN perform the following to bleed off pressure trapped between DH 1518 and DH 2734 so the suction relief is not challenged:

_______ a. Verify DH 66*, DH PUMP 1 DISCH TO BWST/RF CANAL/SFP COOLING SYS, is closed.

_______ b. Crack open DH 65*, DH PUMP 2 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

_______ c. IF suction pressure remains greater then 70 psig, THEN crack open DH 68, DH PUMPS DISCHARGE TO BWST.

_______ d. Verify DH Pump 2 suction pressure is less than 70 psig.

_______ e. Close AND lock DH 65, DH PUMP 2 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

_______ f. Verify DH 68, DH PUMPS DISCHARGE TO BWST, is closed.

_______ 4.10.16 Close BF 1134 (F11C), M2734 DH PUMP 2 SUCT VLV FRM BWST.

_______ 4.10.17 Open DH 2734*, DH PUMP 2 SUCTION FROM BWST OR EMER SUMP, using HIS 2734.

_______ 4.10.18 Verify DH 7A*, BWST ISOLATION VALVE LINE 2, is open.

_______ 4.10.19 Install the CLOSE power fuses for AD 112, DECAY HT PUMP 1-2 MP-422.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 4.10.20

- Pressurizer level must be monitored to determine approximate flowrate and proper water addition.
- Monitor flowrate using F592, LP INJ 2 FLOW, on the DHR SPDS display.
- Monitor count rate and boronometer (if on purification) when changing RCS Boron concentration.
- Leakage past DH 13A and DH14A may be adequate for water addition.

CAUTION 4.10.20

Water addition should be made at 80-100 gpm to limit thermal stress on the surge line. If this flow is exceeded, it is better to maintain a continuous flow, once started, than to stop and restart, even at a slower rate.

_______ 4.10.20 Station an operator at DH Pump 2.

_______ 4.10.21 Start DH Pump 2 using HIS DH6A.

_______ 4.10.22 IF a higher flowrate is necessary,
THEN throttle open DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH13A, to add the desired amount of water to the RCS.

_______ 4.10.23 WHEN the water addition is complete,
THEN stop DH Pump 2 using HIS DH6A.

_______ 4.10.24 Close DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

_______ 4.10.25 Remove the CLOSE power fuses for AD 112, DECAY HT PUMP 1-2 MP-422.

_______ 4.10.26 Close DH 2734*, DH PUMP 2 SUCTION FROM BWST OR EMERGENCY SUMP, using HIS 2734.

_______ 4.10.27 Open BF 1134 (F11C), MV 2734 DH PMP 2 SUCT VLV FRM BWST.

_______ 4.10.28 Open DH 1518, DH PUMP 2 SUCTION FROM RCS, using HIS 1518.

_______ 4.10.29 Open BF 1129 (F11C), MV 1518 DH NORM SUCT LINE 2 ISO VLV.

_______ 4.10.30 Install the CLOSE power fuses for AD 112, DECAY HT PUMP 1-2 MP-422.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

________ 4.10.31 IF desired by Shift Manager,
THEN close DH 7A*, BWST ISOLATION VLV LINE 1.

________ 4.10.32 Notify the Shift Manager DH Loop 2 is in Standby DH Mode
AND to perform an operability evaluation. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

________ 4.10.33 *Direct Chemistry to sample the RCS and check for proper Boron concentration.*

Subsection 4.10 completed by ______________________________________ Date __________

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.11 Add Water to the RCS from the BWST using the BWST Recirc Pump

INITIALS

Prerequisites

_______ 4.11.1 Verify DH System is NOT on SFP Purification. Refer to Subsection 4.15, Restoration of Purification of the RCS using the SFP Purification System.

_______ 4.11.2 Verify BWST Recirc Pump is in service. Refer to DB-OP-06015, Borated Water Storage Tank Operating Procedure.

NOTE 4.11.3

Surveillance Requirement 4.1.1.2 requires verification (Unit Log entry) of Reactor Coolant System flow greater than or equal to 2800 gpm *within one hour prior to the start of and at least once per hour during a* reduction in RCS boron concentration by either:

- Verifying at least one RCP in operation,

OR

- Verifying at least one Decay Heat pump is in operation supplying greater than or equal to 2800 gpm.
- For exceptions to this surveillance refer to T.S. 3.1.1.2, Boron Dilution.

CAUTION 4.11.3

If the minimum RCS flow rate is NOT met, the deboration operation shall be suspended immediately.

4.11.3 IF a reduction in RCS boron Concentration is to be made, THEN verify the following:

_______ a. RCS flow is greater than or equal to 2800 gpm,

OR

b. The plant is in MODE 5 or 6 AND either one of the following conditions are met.

_______ 1. The water to be added to the RCS has a boron concentration greater than the refueling concentration determined by TS 3.9.1 for Mode 6.

OR

_______ 2. The water to be added to the RCS has a boron concentration equal to or greater than the SDM requirement of T.S. 3.1.1.1, Shutdown Margin, for Mode 5.

_______ 4.11.4 IF the SFP Boron concentration is equal to or greater than the SDM requirement of T.S. 3.1.1.1, Shutdown Margin for Mode 5, THEN N/A step 4.11.8.

Prerequisites completed by ______________________________ Date __________

Procedure

> NOTE 4.11.5
>
> Due to seismic concerns it is acceptable to leave BW 7, BWST TO SPF PUMPS OR BW RECIRC PUMP, open with the BWST Recirc Pump shutdown for up to eight hours.

_______ 4.11.5 Stop the BWST Recirc Pump using HIS 1613.

> NOTE 4.11.6
>
> Attachment 12 will verify the SFP Purification System is isolated, and bypasses the SFP Demin Filter and the SFP Demineralizer.

_______ 4.11.6 Perform Attachment 12, Add Water to the RCS from the BWST using the BWST Recirc Pump.

_______ 4.11.7 Open SF 2656, SFP PURIF TO DH SYSTEM OR BWST VALVE.

4.11.8 IF it is required to recirc the BWST through the SFP Purification System to ensure proper boron concentration in the lines prior to adding to the RCS, THEN perform the following:

_______ a. Open SF 98, SFP CLEANUP SYSTEM TO BWST.

> NOTE 4.11.8.b
>
> An operator is required to be stationed at BW 16 to control flow and monitor pressure.

_______ b. Throttle BW 16, BWST RECIRC PUMP TO SFP PURIFICATION, one turn open.

_______ c. Start the BWST Recirc Pump using HIS 1613.

_______ d. Throttle BW 16 open to obtain maximum flow while maintaining BWST Recirc Pump discharge pressure greater than 65 psig, as indicated on PI 1614, BWST RECIRC PUMP DISCHG PRESS.

_______ e. After a minimum of 30 minutes has elapsed, stop the BWST Recirc Pump using HIS 1613.

________ f. Close BW 16, BWST RECIRC PUMP TO SFP PURIFICATION.

________ g. Close 98, SFP CLEANUP SYSTEM TO BWST.

4.11.9 Perform the following to align DH Pump Suction to SFP:

________ a. IF DH Pump 1 is running,
THEN open DH 29, DH PUMP 1 SUCTION FROM SFP DEMIN.

________ b. IF DH Pump 2 is running,
THEN open DH 28, DH PUMP 2 SUCTION FROM SFP DEMIN.

________ 4.11.10 Check the suction pressure of the running DH Pump is less than 60 psig.

NOTE 4.11.11

- The following steps require 2 operators: (1) at BW 16 to control flow, and (1) at FIS 1616 to monitor SFP Purification flow.
- RCS level should be monitored from the CTRM to ensure proper water addition to the RCS.
- Gravity flow may occur when BW 16 is opened. Starting the BWST Recirc Pump may not be required.
- Monitor count rate and Boronometer (if in service) when potentially changing RCS Boron concentration.

________ 4.11.11 Throttle BW 16, BWST RECIRC PUMP TO SFP PURIFICATION, one turn open.

________ 4.11.12 IF desired,
THEN start the BWST Recirc Pump using HIS 1613.

________ 4.11.13 Throttle BW 16, BWST RECIRC PUMP TO SFP PURIFICATION, to maintain less than 100 gpm on FIS 1616, SFP FLT OUT.

4.11.14 WHEN the desired RCS level is reached,
THEN perform the following:

________ a. Verify the BWST Recirc Pump is stopped using HIS 1613, BORATED WATER RECIRC PUMP.

________ b. Close BW 16, BWST RECIRC PUMP TO SFP PURIFICATION.

________ 4.11.15 IF it is desired to add additional water to the RCS,
THEN repeat Steps 4.11.11 thru 4.11.14 until the desired level is reached.

________ 4.11.16 IF DH Pump 1 was used to add water,
THEN close DH 29, DH PUMP 1 SUCTION FROM SFP DEMIN.

________ 4.11.17 IF DH Pump 2 was used to add water,
THEN close DH 28, DH PUMP 2 SUCTION FROM SFP DEMIN.

_______ 4.11.18 Close SF 2656, SFP PURIF TO DH SYSTEM OR BWST VALVE.

NOTE 4.11.19

Manager – Operations and Manager – Radiation Protection approval is required prior to placing the SFP Demineralizer in service without the SFP Filter in service.

_______ 4.11.19 IF placing the SFP Demineralizer in service without the SFP Filter, THEN obtain Manager – Operations and Manager – Radiation Protection approval.

4.11.20 IF desired to return the SFP Filter to service, THEN perform the following:

_______ a. Open SF 92, SFP FILTER INLET.

_______ b. Open SF 93, SFP FILTER OUTLET.

_______ c. Close SF 94, SFP FILTER BYPASS.

4.11.21 IF desired to return the SFP Demineralizer to service, THEN perform the following:

_______ a. Open SF 80, SFP DEMIN INLET VALVE.

_______ b. Open SF 88, SFP DEMIN OUTLET VALVE.

_______ c. Close SF 79, SFP DEMIN BYPASS VALVE.

_______ 4.11.22 Restore the BWST Recirc System as directed by the Shift Manager, REFER TO DB-OP-06015, Borated Water Storage Tank Operating Procedure.

_______ 4.11.23 Restore the SFP Purification System as directed by the Shift Manager, REFER TO DB-OP-06021, Spent Fuel Pool Operating Procedure .

_______ 4.11.24 Direct Chemistry to sample the RCS and check for proper Boron concentration.

Subsection 4.11 completed by ______________________________ Date __________

4.12 Purification of the RCS using the MU and Purification System

INITIALS — Prerequisites

_______ 4.12.1 Verify MU and Purification System is shutdown. Refer to DB-OP-06006, Makeup and Purification System.

_______ 4.12.2 Verify DH Cooler Outlet Temperature of the in-service DH Cooler is less than 120°F.

_______ 4.12.3 Verify RCS Pressure less than 100 psig.

_______ 4.12.4 Notify Radiation Protection the operating DH Loop will be placed on MU and Purification.

_______ 4.12.5 Notify Chemistry the operating DH Loop will be placed on MU and Purification.

Prerequisites completed by ______________________________ Date ____________

Procedure

_______ 4.12.6 Verify the CLOSE power fuses for AC 105, MU PMP 1-1 MP-371 are removed.

_______ 4.12.7 Verify the CLOSE power fuses for AD 105, MU PMP 1-2 MP-372 are removed.

_______ 4.12.8 Close MU 206*, MU PUMP 1 RECIRC STOP TO SEAL RETURN.

_______ 4.12.9 Close MU 203*, MU PUMP 2 RECIRC STOP TO SEAL RETURN.

4.12.10 Place a CAUTION tag stating "This valve is closed to prevent inadvertent transfer of water to the RCS while DH is on purification." on the following valves: (Refer to DB-OP-00016, Removal and Restoration of Plant Equipment)

_______ • MU 206*, MU PUMP 1 RECIRC STOP TO SEAL RETURN

_______ • MU 203*, MU PUMP 2 RECIRC STOP TO SEAL RETURN.

_______ 4.12.11 IF DH Loop 1 is in service,
THEN perform Attachment 13, Place DH Loop 1 on MU and Purification.

_______ 4.12.12 IF DH Loop 2 is in service,
THEN perform Attachment 14, Place DH Loop 2 on MU and Purification.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 4.12.13 and 4.12.14

DB-PF-06703, Miscellaneous Operations Curves, Curve CC 6.2 provides additional guidance for DH Pump Operation.

CAUTION 4.12.13 and 4.12.14

When placing a Purification Demin in service be aware that RCS boron concentration could change, depending on RCS boron concentration at the time the Purification Demin was last placed in service.

_______ 4.12.13 IF DH Loop 1 is in service,
THEN throttle DH 61, DH PUMP 1 DISCHARGE TO MU & PURIF AND SFP DEMIN ISO, to maintain 25-140 gpm on FI MU7, LETDOWN FLOW, or F717, RC LETDOWN FLOW,
AND less than 100 psig on P719, RC LETDOWN PRESSURE.

_______ 4.12.14 IF DH Loop 2 is in service,
THEN throttle DH 62, DH PUMP 2 DISCHARGE TO MU & PURIF & SFP DEMIN ISO, to maintain 25-140 gpm on FI MU7, LETDOWN FLOW, or F717, RC LETDOWN FLOW,
AND less than 100 psig on P719, RC LETDOWN PRESSURE.

_______ 4.12.15 IF a DH Loop was made inoperable as a Boric Acid Flowpath in Subsection 4.13, Restoration from Purification of the RCS using the MU and Purification System,
THEN Notify the Shift Manager the DH Loop as a Boric Acid Flowpath has been restored AND to perform an operability evaluation. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

Subsection 4.12 completed by ______________________________ Date _________

4.13 Restoration from Purification of the RCS using the MU and Purification System

INITIALS Prerequisites

_______ 4.13.1 A pre-evolution briefing has been conducted covering the performance of this Subsection, which makes the affected DH Loop incapable of performing its intended function. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 4.13.2 Notify Radiation Protection the operating DH Loop will be removed from MU and Purification.

_______ 4.13.3 Notify Chemistry the operating DH Loop will be removed from MU and Purification.

Prerequisites completed by ______________________________ Date ___________

Procedure

_______ 4.13.4 The following step(s) makes the affected DH Loop inoperable as a Boric Acid Flowpath. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

CAUTION 4.13.5 and 4.13.6

A Boric Acid Flowpath from the Boric Acid Addition System to the RCS is isolated when performing these steps. Refer to TS 3.1.2.1, 3.1.2.2, 3.1.2.5, and TRM Specs 3.1.2.8 and 3.1.2.9.

4.13.5 IF DH Loop 1 is in service,
THEN perform the following:

_______ a. Verify DH 61, DH PUMP 1 DISCHARGE TO MU & PURIF AND SFP DEMIN ISO, is closed.

_______ b. Perform Attachment 15, Restore from DH Loop 1 on MU and Purification.

4.13.6 IF DH Loop 2 is in service,
THEN perform the following:

_______ a. Verify DH 62, DH PUMP 2 DISCHARGE TO MU & PURIF & SFP DEMIN ISO, is closed.

_______ b. Perform Attachment 16, Restore from DH Loop 2 on MU and Purification.

NOTE 4.13.7

RCS pressure and temperature may not support performing this step at this time. DB-OP-06900, Plant Heatup, and DB-OP-06006, Makeup and Purification System Operating Procedure, are normally used to restore the Makeup System.

4.13.7 IF DH Loop 1 AND DH Loop 2 are to remain off MU and Purification, THEN perform the following if desired by the Shift Manager:

_______ a. Open MU 206*, MU PUMP 1 RECIRC STOP TO SEAL RETURN.

_______ b. Open MU 203*, MU PUMP 2 RECIRC STOP TO SEAL RETURN.

_______ c. Install CLOSE power fuses for AC 105, MU PMP 1-1 MP-371.

_______ d. Install CLOSE power fuses for AD 105, MU PMP 1-2 MP-372.

e. Remove the CAUTION tags stating "This valve is closed to prevent inadvertent transfer of water to the RCS while DH is on purification." from the following valves: (Refer to DB-OP-00016, Removal and Restoration of Plant Equipment)

_______ • MU 206*, MU PUMP 1 RECIRC STOP TO SEAL RETURN

_______ • MU 203*, MU PUMP 2 RECIRC STOP TO SEAL RETURN.

Subsection 4.13 completed by________________________ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.14 Purification of the RCS using the SFP Purification System

INITIALS — Prerequisites

______ 4.14.1 Verify the SFP is NOT on SFP Purification. Refer to DB-OP-06021, Spent Fuel Pool Operating Procedure.

______ 4.14.2 Verify the BWST is NOT on SFP Purification. Refer to DB-OP-06015, Borated Water Storage Tank Operating Procedure.

______ 4.14.3 Verify the outlet temperature of the in-service DH Cooler is less than 120°F.

______ 4.14.4 Verify RCS pressure is less than 100 psig.

______ 4.14.5 Notify Radiation Protection the operating DH Loop will be placed on SFP Purification.

______ 4.14.6 Notify Chemistry the operating DH Loop will be placed on SFP Purification.

Prerequisites completed by ______________________ Date __________

Procedure

______ 4.14.7 Verify BW 16, BWST RECIRC PUMP TO SFP PURIFICATION, is closed.

______ 4.14.8 Verify SF 98, SFP CLEANUP SYSTEM TO BWST, is closed.

> NOTE 4.14.9
>
> Manager – Operations and Manager – Radiation Protection approval is required prior to placing the SFP Demineralizer in service without the SFP Filter in service.

______ 4.14.9 IF placing the SFP Demineralizer in service without the SFP Filter, THEN obtain Manager – Operations and Manager – Radiation Protection approval.

4.14.10 Line up the SFP Purification System:

a. IF SFP Filter is to be placed in service, THEN perform the following:

_______ 1. Open SF 92, SFP FILTER INLET VALVE.

_______ 2. Open SF 93, SFP FILTER OUTLET VALVE.

_______ 3. Close SF 94, SFP FILTER BYPASS VALVE.

b. IF SFP Filter is to be bypassed, THEN perform the following:

_______ 1. Open SF 94, SFP DEMIN BYPASS VALVE.

_______ 2. Close SF 92, SFP FILTER INLET VALVE.

_______ 3. Close SF 93, SFP FILTER OUTLET VALVE.

c. IF SFP Demineralizer is to be placed in service, THEN perform the following:

_______ 1. Open SF 80, SFP DEMIN INLET VALVE.

_______ 2. Open SF 88, SFP DEMIN OUTLET VALVE.

_______ 3. Close SF 79, SFP DEMIN BYPASS VALVE.

d. IF SFP Demineralizer is to be bypassed, THEN perform the following:

_______ 1. Open SF 79, SFP DEMIN BYPASS VALVE.

_______ 2. Close SF 80, SFP DEMIN INLET VALVE.

_______ 3. Close SF 88, SFP DEMIN OUTLET VALVE.

_______ 4.14.11 Open DH 70, DH TO SFP PURIFICATION.

_______ 4.14.12 IF DH Loop 1 is being placed on SFP Purification, THEN open DH 29, DH Pump 1 SUCTION FROM SFP DEMIN.

_______ 4.14.13 IF DH Loop 2 is being placed on SFP Purification, THEN open DH 28, DH PUMP 2 SUCTION FROM SFP DEMIN.

_______ 4.14.14 Open SF 2656, SFP PURIF TO DH SYSTEM OR BWST VALVE.

NOTE 4.14.15 and 4.14.16

This step requires 3 operators; one at DH 61 or DH 62, another at FIS 1616 to monitor SFP Purification flow, and a third at PI 1634 to monitor SFP Purification pressure.

CAUTION 4.14.15 and 4.14.16

When placing the SFP Demin in service be aware that RCS boron concentration could change, depending on RCS boron concentration at the time the SFP Demin was last placed in service.

_______ 4.14.15 IF DH Loop 1 is being placed on SFP Purification, THEN throttle DH 61, DH PUMP 1 DISCHARGE TO MU & PURIF AND SFP DEMIN ISO, to maintain 80-100 gpm on FIS 1616, SFP FLT OUT, AND less than 100 psig on PI 1634, SPENT FUEL POOL DEMINERALIZER INLET.

_______ 4.14.16 IF DH Loop 2 is being placed on SFP Purification, THEN throttle DH 62, DH PUMP 2 DISCHARGE TO MU & PURIF & SFP DEMIN ISO, to maintain 80-100 gpm on FIS 1616, SFP FLT OUT, AND less than 100 psig on PI 1634, SPENT FUEL POOL DEMINERALIZER INLET.

Subsection 4.14 completed by ________________________________ Date _________

4.15 Restoration from Purification of the RCS using the SFP Purification System

INITIALS Prerequisites

_______ 4.15.1 Notify Radiation Protection the operating DH Loop will be removed from SFP Purification.

_______ 4.15.2 Notify Chemistry the operating DH Loop will be removed from SFP Purification.

Prerequisites completed by ______________________________ Date __________

Procedure

4.15.3 IF DH Loop 1 is on SFP Purification,
AND it is desired to stop purification flow,
THEN perform the following:

_______ a. Verify DH 61, DH PUMP 1 DISCHARGE TO MU & PURIF AND SFP DEMIN ISO, is closed.

_______ b. Close DH 70, DH PUMP 1/2 DISCHARGE TO SFP DEMIN.

_______ c. Verify DH 29, DH PUMP 1 SUCTION FROM SFP PURIF. SYSTEM, is closed.

_______ d. Close SF 2656, SFP PURIF TO DH SYSTEM OR BWST VALVE.

4.15.4 IF DH Loop 2 is on SFP Purification,
AND it is desired to stop purification flow,
THEN perform the following:

_______ a. Verify DH 62, DH PUMP 2 DISCHARGE TO MU & PURIF & SFP DEMIN ISO, is closed.

_______ b. Close DH 70, DH PUMP 1/2 DISCHARGE TO SFP DEMIN.

_______ c. Verify DH 28, DH PUMP 2 SUCTION FROM SFP PURIF. SYSTEM, is closed.

_______ d. Close SF 2656, SFP PURIF TO DH SYSTEM OR BWST VALVE.

_______ 4.15.5 Restore the SFP Purification system as directed by the Shift Manager. REFER TO DB-OP-06021, Spent Fuel Pool Operating Procedure .

Subsection 4.15 completed by ______________________________ Date __________

4.16 Purification of the RCS using both the MU and Purification System and the SFP Purification System

INITIALS

Prerequisites

_______ 4.16.1 Verify SFP System is NOT on SFP Purification. Refer to DB-OP-06021, Spent Fuel Pool Operating Procedure.

_______ 4.16.2 Verify the BWST is NOT on SFP Purification. Refer to DB-OP-06015, Borated Water Storage Tank Operating Procedure.

_______ 4.16.3 Notify Radiation Protection the operating DH Loop will be placed on MU and Purification and SFP Purification.

_______ 4.16.4 Notify Chemistry the operating DH Loop will be placed on MU and Purification and SFP Purification.

_______ 4.16.5 Verify RCS draining is NOT scheduled to occur while in this lineup. Refer to Limits and Precautions 2.2.8.

Prerequisites completed by ______________________________ Date __________

Procedure

_______ 4.16.6 Verify the operating DH Loop has been placed on MU and Purification. REFER TO Subsection 4.12, Purification of the RCS using the MU and Purification System.

NOTE 4.16.7

Manager – Operations and Manager – Radiation Protection approval is required prior to placing the SFP Demineralizer in service without the SFP Filter in service.

_______ 4.16.7 IF placing the SFP Demineralizer in service without the SFP Filter, THEN obtain Manager – Operations and Manager – Radiation Protection approval.

4.16.8 Lineup the SFP Purification System:

a. IF the SFP Filter is to be placed in service, THEN perform the following:

_______ 1. Open SF 92, SFP FILTER INLET VALVE.

_______ 2. Open SF 93, SFP FILTER OUTLET VALVE.

_______ 3. Close SF 94, SFP FILTER BYPASS VALVE.

b. IF the SFP Filter is to be bypassed,
THEN perform the following:

_______ 1. Open SF 94, SFP FILTER BYPASS VALVE.

_______ 2. Close SF 92, SFP FILTER INLET VALVE.

_______ 3. Close SF 93, SFP FILTER OUTLET VALVE.

c. IF the SFP Demin is to be placed in service,
THEN perform the following:

_______ 1. Open SF 80, SFP DEMIN INLET VALVE.

_______ 2. Open SF 88, SFP DEMIN OUTLET VALVE.

_______ 3. Close SF 79, SFP DEMIN BYPASS VALVE.

d. IF the SFP Demin is to be bypassed,
THEN perform the following:

_______ 1. Open SF 79, SFP DEMIN BYPASS VALVE.

_______ 2. Close SF 80, SFP DEMIN INLET VALVE.

_______ 3. Close SF 88, SFP DEMIN OUTLET VALVE.

_______ 4.16.9 IF DH Loop 1 is being placed on SFP Purification,
THEN open DH 29, DH PUMP 1 SUCTION FROM SFP DEMIN.

_______ 4.16.10 IF DH Loop 2 is being placed on SFP Purification,
THEN open DH 28, DH PUMP 2 SUCTION FROM SFP DEMIN.

_______ 4.16.11 Open SF 2656, SFP PURIF TO DH SYSTEM OR BWST VALVE.

NOTE 4.16.12

- Care should be taken to prevent pressure surges on the system which could approach 125 psig, which is the lift setpoint of DH 2797.
- This step requires 3 operators; one at DH 70, another at FIS 1616 to monitor SFP Purification flow, and a third at PI 1634 to monitor SFP Purification pressure. If pressure is maintained less than 100 psig on P719 (Letdown System Pressure), then you should not exceed 100 psig on PI 1634.
- Step 4.16.12 may need to be performed concurrently with either Step 4.16.13 or 4.16.14.

_______ 4.16.12 Slowly open DH 70 to establish 80-100 gpm flow on FIS 1616, SFP FLT OUT, AND less than 100 psig on PI 1634, SFP DEMINERALIZER INLET, AND P719, RC LETDOWN PRESSURE.

_______ 4.16.13 IF DH Loop 1 is in service,
THEN throttle DH 61, DH PUMP 1 DISCHARGE TO MU & PURIF AND SFP DEMIN ISO, as necessary to maintain 25-140 gpm on FI MU7 or F717, RC LETDOWN FLOW
AND less than 100 psig on P719, RC LETDOWN PRESSURE.

_______ 4.16.14 IF DH Loop 2 is in service,
THEN throttle DH 62, DH PUMP 2 DISCHARGE TO MU & PURIF & SFP DEMIN ISO, as necessary to maintain 25-140 gpm on FI MU7 or F717, RC LETDOWN FLOW
AND less than 100 psig on P719, RC LETDOWN PRESSURE.

_______ 4.16.15 WHEN both SFP Purification and the Makeup Purification system have been placed in sercice,
THEN place a magnetic placard near HISMU11, DIVERT VALVE, which states "Do NOT shift MU11 to the CWRT position unless the SFP Pufication System has been removed from service".

Subsection 4.16 completed by ______________________________ Date _________

4.17 Restoration from SFP Purification of the RCS with MU and Purification Left in Service

INITIALS

Prerequisites

_______ 4.17.1 Notify Radiation Protection the operating DH Loop will be removed from SFP Purification with MU and Purification left in service.

_______ 4.17.2 Notify Chemistry the operating DH Loop will be removed from SFP Purification with MU and Purification left in service.

Prerequisites completed by ______________________________ Date ____________

Procedure

4.17.3 IF DH Loop 1 is in service,
THEN perform the following:

NOTE 4.17.3.a

Both SFP Purification and MU and Purification flows are initially stopped to prevent a pressure surge on the system which could approach the lift setpoint of DH2797, which lifts at 125 psig.

_______ a. Close DH 61, DH PUMP 1 DISCHARGE TO MU & P AND SFP DEMIN ISOL VALVE.

_______ b. Close DH 70, DH PUMP 1/2 DISCHARGE TO SFP DEMIN VALVE.

_______ c. Close DH 29, DH PUMP 1 SUCTION FROM SFP PURIF SYSTEM VALVE.

_______ d. Close SF 2656, SFP PURIF TO DH SYSTEM OR BWST VALVE.

_______ e. Throttle DH 61, DH PUMP 1 DISCHARGE TO MU & PURIF AND SFP DEMIN ISO, as necessary to maintain 25-140 gpm on FI MU7 or F717, RC LETDOWN FLOW,
AND less than 100 psig on P719, RC LETDOWN PRESSURE.

_______ f. Restore SFP Purification as directed by the Shift Manager. REFER TO DB-OP-06021, Spent Fuel Pool Operating Procedure.

4.17.4 IF DH Loop 2 is in service,
THEN perform the following:

NOTE 4.17.4.a

Both SFP Purification and MU and Purification flows are initially stopped to prevent a pressure surge on the system which could approach the lift setpoint of DH2797, which lifts at 125 psig.

_______ a. Close DH 62, DH PUMP 2 DISCHARGE TO MU & PURIF & SFP DEMIN ISO.

_______ b. Close DH 70, DH PUMP 1/2 DISCHARGE TO SFP DEMIN VALVE.

_______ c. Close DH 28, DH PUMP 2 SUCTION FROM SFP PURIF SYSTEM VALVE.

_______ d. Close SF 2656, SFP PURIF TO DH SYSTEM OR BWST VALVE.

_______ e. Throttle DH 62, DH PUMP 2 DISCHARGE TO MU & PURIF & SFP DEMIN ISO, as necessary to maintain 25-140 gpm on FI MU7 or F717, RC LETDOWN FLOW,
AND less than 100 psig on P719, RC LETDOWN PRESSURE.

_______ f. Restore SFP Purification as directed by the Shift Manager. REFER TO DB-OP-06021, Spent Fuel Pool Operating Procedure.

_______ 4.17.5 Remove magnetic placard near HISMU11, DIVERT VALVE, which states "Do NOT shift MU11 to the CWRT position unless the SFP Pufication System has been removed from service".

Subsection 4.17 completed by ______________________________ Date __________

4.18 Restoration from SFP Purification and MU and Purification of the RCS

INITIALS — Prerequisites

_______ 4.18.1 Notify Radiation Protection the operating DH Loop will be removed from SFP Purification and MU and Purification.

_______ 4.18.2 Notify Chemistry the operating DH Loop will be removed from SFP Purification and MU and Purification.

Prerequisites completed by ______________________________ Date __________

Procedure

_______ 4.18.3 Verify the operating DH Loop has been removed from MU and Purification. REFER TO Subsection 4.13, Restoration from Purification of the RCS using the MU and Purification System.

_______ 4.18.4 Close DH 70, DH PUMP 1/2 DISCHARGE TO SFP DEMIN VALVE.

_______ 4.18.5 Close SF 2656, SFP PURIF TO DH SYSTEM OR BWST VALVE.

_______ 4.18.6 IF DH Loop 1 is in service,
THEN close DH 29, DH PUMP 1 SUCTION FROM THE SFP PURIF SYSTEM VALVE.

_______ 4.18.7 IF DH Loop 2 is in service,
THEN close DH 28, DH PUMP 2 SUCTION FROM THE SFP PURIF SYSTEM VALVE.

_______ 4.18.8 Restore the SFP Purification System as directed by the Shift Manager. REFER TO DB-OP-06021, Spent Fuel Pool Operating Procedure.

_______ 4.18.9 Remove the magnetic placard near HISMU11, DIVERT VALVE, which states "Do NOT shift MU11 to the CWRT position unless the SFP Pufication System has been removed from service".

Subsection 4.18 completed by ______________________________ Date __________

4.19 Prepare for DH System Cooling of the SFP using DH Pump 1

INITIALS

Prerequisites

_______ 4.19.1 A pre-evolution briefing has been conducted covering the performance of this Subsection which makes DH Loop 1 incapable of performing its intended function. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 4.19.2 Verify CCW System is in service to supply Essential Header 1. REFER TO DB-OP-06262, Component Cooling Water System Procedure.

_______ 4.19.3 Verify SFP Cooling System is in the normal lineup. Refer to DB-OP-06021, Spent Fuel Pool Operating Procedure.

Prerequisites completed by ______________________________ Date ____________

Procedure

_______ 4.19.4 Verify DH Pump 1 stopped using HIS DH6B.

_______ 4.19.5 The following step makes DH Loop 1 inoperable. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 4.19.6 Verify the CLOSE power fuses for AC 112, DECAY HT PUMP 1-1 MP-421, are removed.

4.19.7 IF DH 1517, DH PUMP 1 SUCTION FROM RCS, is open, THEN perform the following,

_______ a. Verify BE 1126 (E11D), MV 1517 DH NORM SUCT LINE 1 ISO VLV, is closed.

_______ b. Close DH 1517, DH PUMP 1 SUCTION FROM RCS, using HIS 1517.

_______ c. Open BE 1126 (E11D), MV 1517 DH NORM SUCT LINE 1 ISO VLV.

4.19.8 IF DH 2733*, DH PUMP 1 SUCTION FROM BWST OR EMERG SUMP, is open, THEN perform the following,

_______ a. Verify BE 1121 (E11A), MV 2733 DH PMP 1 SUCT VLV FRM BWST, is closed.

_______ b. Close DH 2733*, DH PUMP 1 SUCTION FROM BWST OR EMERG SUMP, using HIS 2733.

_______ c. Open BE 1121 (E11A), MV 2733 DH PMP 1 SUCT VLV FRM BWST.

* Controlled per DB-OP-00008, Operation and Control of Locked Valves.

4.19.9 IF DH 1B*, DH PUMP 1 DISCHARGE TO RCS, is open,
THEN perform the following,

_______ a. Verify control power is on DH 1B* using HIS DH1B-2.

_______ b. Verify DH 1B*, DH PUMP 1 DISCHARGE TO RCS, is closed using HIS DH1B.

_______ c. Remove control power from DH 1B* using HIS DH1B-2.

_______ 4.19.10 Perform Attachment 17, DH System Cooling of SFP using DH Pump 1.

_______ 4.19.11 Open DH 66*, DH PUMP 1 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

_______ 4.19.12 Open DH 31*, DH PUMP 1 SUCTION FROM SFP COOLING SYSTEM.

_______ 4.19.13 Place an Operations Information Placard near HIS DH6B stating:

"DH Loop 1 has been prepared to cool the SFP per DB-OP-06012."

Subsection 4.19 completed by ______________________________ Date ____________

* Controlled per DB-OP-00008, Operation and Control of Locked Valves.

4.20 DH System Cooling of the SFP using DH Pump 1

INITIALS

Prerequisites

_______ 4.20.1 Verify Subsection 4.19, Prepare for DH System Cooling of the SFP using DH Pump 1, is complete.

Prerequisites completed by ______________________________ Date __________

Procedure

> CAUTION 4.20.2
>
> Do not operate SFP pump(s) while cooling SFP using a DH pump. Required NPSH for SFP pumps is not available, and SFP pumps would cavitate.

4.20.2 Stop AND Lockout both SFP pumps by performing the following:

_______ • Place HIS 1602, PUMP 1, in LOCKED OUT.

_______ • Place HIS 1604, PUMP 2, in LOCKED OUT.

_______ 4.20.3 Close SF 47, SFP INLET FROM SFP HXs.

_______ 4.20.4 Open DH 69, DH PUMPS DISCHARGE TO SFP COOLING.

_______ 4.20.5 Slowly open SF 115, SFP OUTLET TO DH SYSTEM.

> NOTE 4.20.6
>
> If CCW Non-essential Header is being supplied from CCW Loop 1, high flow conditions may exist when CC 1467 is opened.

_______ 4.20.6 Open CC 1467, CC OUTLET FROM DH COOLER 1, using HIS 1467.

4.20.7 IF CCW non-essential header is being supplied from CCW Loop 1, THEN perform the following:

_______ a. Check running CCW loop 1 pump flow.

_______ b. IF CCW loop 1 flow is greater than 7800 gpm, THEN REFER TO DB-OP-06262, Component Cooling Water System Procedure, to reduce CCW flow during Decay Heat Removal Operations.

_______ 4.20.8 Verify Attachment 8, DH Pump 1 Prestart Checklist is current.

_______ 4.20.9 Verify the CLOSE power fuses for AC 112, DECAY HT PUMP 1-1 MP-421, are installed.

________ 4.20.10 Press AUTO for DH14B*, using HIS DH14B.

________ 4.20.11 Press AUTO for DH13B, using HIS DH13B.

________ 4.20.12 Verify DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, is closed using HIC DH14B.

________ 4.20.13 Verify DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, is closed , using HIC DH13B.

NOTE 4.20.14

Maintain greater than 4 psig suction pressure for DH Pump 1.

________ 4.20.14 Station an operator at DH Pump 1.

________ 4.20.15 Start DH Pump 1 using HIS DH6B.

________ 4.20.16 Position the following valves as necessary to obtain the desired flowrate:

- DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIC DH 14B.
- DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

Subsection 4.20 completed by ______________________________ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.21 Restoration from DH System Cooling of the SFP using DH Pump 1

INITIALS

Prerequisites

None

Procedure

_______ 4.21.1 Verify DH Pump 1, stopped using HIS DH6B.

_______ 4.21.2 Verify the CLOSE power fuses for AC 112, DECAY HT PUMP 1-1 MP-421, are removed.

_______ 4.21.3 Verify SF 115, SFP OUTLET TO DH REMOVAL SYSTEM, is closed.

_______ 4.21.4 Close DH 66*, DH PUMP 1 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

_______ 4.21.5 Verify DH 69, DH SYSTEM DISCHG TO SFP COOLING SYSTEM, is closed.

_______ 4.21.6 Close DH 31*, DH PUMP 1 SUCTION FROM SFP COOLING SYSTEM.

_______ 4.21.7 Verify DH 1517A*, DH PUMP 1 SUCTION EQUALIZING VALVE, is open.

NOTE 4.21.8

Computer point Z560 will indicate TRBL until DH 1B is fully open and the control power is removed.

4.21.8 IF desired,
THEN perform the following:

_______ a. Place control power on DH 1B* using HIS DH1B-2.

_______ b. Open DH 1B*, DH PUMP 1 DISCHARGE TO RCS, using HIS DH1B.

_______ c. Remove control power from DH 1B* using HIS DH1B-2.

_______ 4.21.9 Verify SF 47, SFP INLET FROM SFP HX'S, is open.

_______ 4.21.10 Close CC 1467, CC OUTLET FROM DH COOLER 1, using HIS 1467.

_______ 4.21.11 IF CCW Essential Header 1 cooling is no longer required,
THEN shutdown the CCW Pump supplying Essential Header 1.
REFER TO DB-OP-06262, Component Cooling Water System Procedure.

_______ 4.21.12 IF DH Pump 1 will be placed in Standby DH Mode
THEN perform Subsection 3.5, Place DH Loop 1 in Standby DH Mode.

_______ 4.21.13 IF DH Pump 1 will be placed in Standby LPI Mode
THEN perform Subsection 3.3, Place DH Loop 1 in Standby LPI Mode.

* Controlled per DB-OP-00008, Operation and Control of Locked Valves.

_______ 4.21.14 Verify SFP Cooling System is in service. Refer to DB-OP-06021, Spent Fuel Pool Operating Procedure.

_______ 4.21.15 Remove Operations Information Placard near HIS DH6B.

Subsection 4.21 completed by ______________________________ Date __________

4.22 Prepare for DH System Cooling of the SFP using DH Pump 2

INITIALS Prerequisites

_______ 4.22.1 A pre-evolution briefing has been conducted covering the performance of this Subsection which makes DH Loop 2 incapable of performing its intended function. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 4.22.2 Verify CCW System is in service to supply Essential Header 2. REFER TO DB-OP-06262, Component Cooling Water System Procedure.

_______ 4.22.3 Verify SFP Cooling System is in the normal lineup. Refer to DB-OP-06021, Spent Fuel Pool Operating Procedure.

Prerequisites completed by ______________________ Date __________

Procedure

_______ 4.22.4 Verify DH Pump 2 stopped using HIS DH6A.

_______ 4.22.5 The following step makes DH Loop 2 inoperable. Refer to Limit and Precaution 2.1.24 for Technical Specifications that may apply.

_______ 4.22.6 Verify the CLOSE power fuses for AD 112, DECAY HT PUMP 1-2 MP-422, are removed.

4.22.7 IF DH 1518, DH PUMP 2 SUCTION FROM RCS, is open, THEN perform the following,

_______ a. Verify BF 1129 (F11C), MV 1518 DH NORM SUCT LINE 2 ISO VLV, is closed.

_______ b. Close DH 1518, DH PUMP 2 SUCTION FROM RCS, using HIS 1518.

_______ c. Open BF 1129 (F11C), MV 1518 DH NORM SUCT LINE 2 ISO VLV.

4.22.8 IF DH 2734*, DH PUMP 2 SUCTION FROM BWST OR EMERG SUMP, is open, THEN perform the following,

_______ a. Verify BF 1134 (F11C), MV 2734 DH PUMP 2 SUCTION FROM BWST OR EMERGENCY SUMP, is closed.

_______ b. Close DH 2734*, DH PUMP 2 SUCTION FROM BWST OR EMERG SUMP, using HIS 2734.

_______ c. Open BF 1134 (F11C) MV 2734 DH PUMP 2 SUCTION FROM BWST OR EMERGENCY SUMP.

4.22.9 IF DH 1A*, DH PUMP 2 DISCHARGE TO RCS, is open, THEN perform the following,

______ a. Verify control power is on DH 1A* using HIS DH1A-2.

______ b. Verify DH 1A*, DH PUMP 2 DISCHARGE TO RCS, is closed using HIS DH1A.

______ c. Remove control power from DH 1A* using HIS DH1A-2.

______ 4.22.10 Perform Attachment 18, DH System Cooling of SFP using DH Pump 2.

______ 4.22.11 Open DH 65*, DH PUMP 2 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

______ 4.22.12 Open DH 30*, DH PUMP 2 SUCTION FROM SFP.

______ 4.22.13 Place an Operations Information Placard near HIS DH6A stating:

"DH Loop 2 has been prepared to cool the SFP per DB-OP-06012."

Subsection 4.22 completed by ______________________________ Date ____________

* Controlled per DB-OP-00008, Operation and Control of Locked Valves.

4.23 DH System Cooling of the SFP using DH Pump 2

INITIALS

Prerequisites

________ 4.23.1 Verify Subsection 4.22, Prepare for DH System Cooling of the SFP using DH Pump 2, is complete.

Prerequisites completed by __________________________________ Date __________

Procedure

CAUTION 4.23.2

Do not operate SFP pump(s) while cooling SFP using a DH pump. Required NPSH for SFP pumps is not available, and SFP pumps would cavitate.

4.23.2 Stop AND Lockout both SFP pumps by performing the following:

________ • Place HIS 1602, PUMP 1, in LOCKED OUT.

________ • Place HIS 1604, PUMP 2, in LOCKED OUT.

________ 4.23.3 Close SF 47, SFP INLET FROM SFP HXs.

________ 4.23.4 Open DH 69, DH PUMPS DISCHARGE TO SFP COOLING.

________ 4.23.5 Slowly open SF 115, SFP OUTLET TO DH SYSTEM.

NOTE 4.23.6

If CCW Non-essential Header is being supplied from CCW Loop 2, high flow conditions may exist when CC 1469 is opened.

________ 4.23.6 Open CC 1469, CC OUTLET FROM DH COOLER 2, using HIS 1469.

4.23.7 IF CCW non-essential header is being supplied from CCW Loop 2, THEN perform the following:

________ a. Check running CCW loop 2 pump flow.

________ b. IF CCW loop 2 flow is greater than 7800 gpm, THEN REFER TO DB-OP-06262, Component Cooling Water System Procedure, to reduce CCW flow during Decay heat Removal Operations.

________ 4.23.8 Verify Attachment 9, DH Pump 2 Prestart Checklist is current.

________ 4.23.9 Verify the CLOSE power fuses for AD 112, DECAY HT PUMP 1-2 MP-422, are installed.

_______ 4.23.10 Press AUTO for DH14A*, using HIS DH14A.

_______ 4.23.11 Press AUTO for DH13A, using HIS DH13A.

_______ 4.23.12 Verify DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, is closed using HIC DH14A.

_______ 4.23.13 Verify DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, is closed , using *HIC DH13A.*

NOTE 4.23.14

Maintain greater than 4 psig suction pressure for DH Pump 2.

_______ 4.23.14 Station an operator at DH Pump 2.

_______ 4.23.15 Start DH Pump 2 using HIS DH6A.

_______ 4.23.16 Position the following valves as necessary to obtain the desired flowrate:

- DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH 14A.
- DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

Subsection 4.23 completed by ______________________________ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.24 Restoration from DH System Cooling of the SFP using DH Pump 2

INITIALS

Prerequisites

None

Procedure

_______ 4.24.1 Verify DH Pump 2, stopped using HIS DH6A.

_______ 4.24.2 Verify the CLOSE power fuses for AD 112, DECAY HT PUMP 1-2 MP-422, are removed.

_______ 4.24.3 Verify SF 115, SFP OUTLET TO DH REMOVAL SYSTEM, is closed.

_______ 4.24.4 Close DH 65*, DH PUMP 2 DISCH TO BWST/RF CANAL/SFP COOLING SYS.

_______ 4.24.5 Verify DH 69, DH SYSTEM DISCHG TO SFP COOLING SYSTEM, is closed.

_______ 4.24.6 Close DH 30*, DH PUMP 2 SUCTION FROM SFP COOLING SYSTEM.

_______ 4.24.7 Verify DH 1518A*, DH PUMP 2 SUCTION EQUALIZING VALVE, is open.

NOTE 4.24.8

Computer point Z564 will indicate TRBL until DH 1A is fully open and the control power is removed.

4.24.8 IF desired,
THEN perform the following:

_______ a. Place control power on DH 1A* using HIS DH1A-2.

_______ b. Open DH 1A*, DH PUMP 2 DISCHARGE TO RCS, using HIS DH1A.

_______ c. Remove control power from DH 1A* using HIS DH1A-2.

_______ 4.24.9 Verify SF 47, SFP INLET FROM SFP HX'S, is open.

_______ 4.24.10 Close CC 1469, CC OUTLET FROM DH COOLER 2, using HIS 1469.

_______ 4.24.11 IF CCW Essential Header 2 cooling is no longer required,
THEN shutdown the CCW Pump supplying Essential Header 2.
REFER TO DB-OP-06262, Component Cooling Water System Procedure.

_______ 4.24.12 IF DH Pump 2 will be placed in Standby DH Mode
THEN perform Subsection 3.6, Place DH Loop 2 in Standby DH Mode.

* Controlled per DB-OP-00008, Operation and Control of Locked Valves.

________ 4.24.13 IF DH Pump 2 will be placed in Standby LPI Mode
THEN perform Subsection 3.4, Place DH Loop 2 in Standby LPI Mode.

________ 4.24.14 Verify SFP Cooling System is in service. Refer to DB-OP-06021, Spent Fuel Pool Operating Procedure.

________ 4.24.15 Remove Operations Information Placard near HIS DH6A.

Subsection 4.24 completed by ______________________________ Date ____________

4.25 Preparation for DH Loop 1 Operation at Reduced RCS Inventory

INITIALS Prerequisites

________ 4.25.1 Verify DB-OP-06904, Shutdown Operations, has directed performance of this Subsection.

Prerequisites completed by ______________________________ Date __________

Procedure

NOTE 4.25.2

DH 1A* is closed to protect DH Loop 2 in the event of an inadvertent SFAS trip causing DH Pump 2 to start and DH 14A* to fail open.

________ 4.25.2 Verify DH 1A*, DH PUMP 2 DISCHARGE TO RCS, is closed.

________ 4.25.3 Position the following valves as necessary to reduce DH Loop 1 flow to the desired flowrate, not to exceed the maximum allowed for the final RCS level as indicated on FYI DH2B, DH 1 FLOW. REFER TO DB-PF-06703, Miscellaneous Operation Curves, CC 6.2 AND 6.4.

- DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIC DH 14B.
- DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

________ 4.25.4 Place control power on DH 1B* using HIS DH1B-2.

NOTE 4.25.5

- DH 1B is throttled to limit DH Loop 1 flow to less than the maximum limits of curves CC 6.2 and CC 6.4 of DB-PF-06703, Miscellaneous Operation Curves, if DH 14B were to fail open. Additional DH flow reduction to achieve proper flow at reduced RCS level is maintained by throttling DH 14B and/or DH 13B.
- RCS temperature should be monitored continuously to ensure that reduced DH flow is still adequate to maintain desired RCS temperature.

________ 4.25.5 Throttle closed on DH 1B*, DH PUMP 1 DISCHARGE TO RCS, using HIS DH1B to reduce DH Loop 1 flow slightly (approximately 50 gpm) as indicated on FYI DH2B, DH 1 FLOW.

________ 4.25.6 Remove control power from DH 1B* using HIS DH1B-2.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

_______ 4.25.7 Position the following valves as necessary to reduce DH Loop 1 flow approximately 75 gpm less than the value set in Step 4.25.3.

- DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, using HIC DH 14B.
- DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, using HIC DH 13B.

> NOTE 4.25.8
>
> To comply with TS 3.4.1.2 while making repairs to CF 30, CF 31, DH 76*, DH 77*, DH 1A* or DH 1B*, it is necessary to provide two redundant, single failure-proof decay heat removal loops. This step provides guidance for compliance in this condition.

4.25.8 IF repairs will be made to DH 1A*, DH 76*, or CF 30, THEN perform the following:

_______ a. Verify DH Loop 1 is in operation.

> NOTE 4.25.8.b and c
>
> These steps enable the idle DH Pump to supply water to the operating DH Loop if the running DH Pump should fail using DH 830*.

_______ b. Open DH 830*, DH COOLER 2/1 DISCHARGE X-CONN.

_______ c. Place an Operational Information Tag on CTRM panel C5704 near HIS DH830 stating the following:

"If DH Pump 1 should fail, perform the actions of DB-OP-02527, Loss of Decay Heat Removal"

Subsection 4.25 completed by ______________________________ Date __________

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.26 Restoration from DH Loop 1 Operation at Reduced Inventory

INITIALS

Prerequisites

_______ 4.26.1 Verify DB-OP-06904, Shutdown Operations, has directed performance of this Subsection.

Prerequisites completed by ______________________________ Date ____________

Procedure

> NOTE 4.26.2
>
> Computer point Z560 will indicate TRBL until DH 1B is fully open and the control power is removed.

4.26.2 IF RCS water level is being increased
THEN perform the following:

_______ a. Place control power on DH 1B* using HIS DH1B-2.

_______ b. Open DH 1B*, DH PUMP 1 DISCHARGE TO RCS, using HIS DH1B.

_______ c. Remove control power from DH 1B* using HIS DH1B-2.

> NOTE 4.26.2.d
>
> Purification flow may need to be readjusted as DH System flow is increased.

_______ d. IF RCS level is less than 30 inches,
THEN slowly increase DH Loop 1 flow to approximately 3000 gpm as RCS level rises as indicated on FYI DH2B, DH 1 FLOW, REFER TO curve CC 6.2 AND CC 6.4 of DB-PF-06703, Miscellaneous Operation Curves.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 4.26.3
Computer point Z564 will indicate TRBL until DH 1A is fully open and the control power is removed.

4.26.3 WHEN RCS level is at RV Flange level (78-82 inches), THEN perform the following:

_______ a. Place control power on DH 1A* using HIS DH1A-2.

_______ b. Open DH 1A*, DH PUMP 2 DISCHARGE TO RCS, using HIS DH1A.

_______ c. Remove control power from DH 1A* using HIS DH1A-2.

4.26.4 IF Step 4.25.8 was performed AND all repairs to DH 1A*, DH 76*, or CF 30 are complete, THEN perform the following:

_______ a. Close DH 830*, DH COOLER 1/2 DISCHARGE X-CONN.

_______ b. Remove the Operational Information Tag placed on CTRM panel C5704.

Subsection 4.26 completed by ______________________________ Date __________

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.27 Preparation for DH Loop 2 Operation at Reduced RCS Inventory

INITIALS

Prerequisites

_______ 4.27.1 Verify DB-OP-06904, Shutdown Operations has directed performance of this Subsection.

Prerequisites completed by ______________________________ Date __________

Procedure

NOTE 4.27.2

DH 1B* is closed to protect DH Loop 1 in the event of an inadvertent SFAS trip causing DH Pump 1 to start and DH 14B* to fail open.

_______ 4.27.2 Verify DH 1B*, DH PUMP 1 DISCHARGE TO RCS, is closed.

_______ 4.27.3 Position the following valves as necessary to reduce DH Loop 2 flow to the desired flowrate, not to exceed the maximum allowed for the final RCS level as indicated on FYI DH2A, DH 2 FLOW. REFER TO DB-PF-06703, Miscellaneous Operation Curves, CC 6.2 and 6.4.

- DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH 14A.
- DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

_______ 4.27.4 Place control power on DH 1A* using HIS DH1A-2.

NOTE 4.27.5

- *DH 1A is throttled to limit DH Loop 2 flow to less than the maximum limits of curves CC 6.2 and CC 6.4 of DB-PF-06703, Miscellaneous Operation Curves, if DH 14A were to fail open.* Additional DH flow reduction to achieve proper flow at reduced RCS level is maintained by throttling DH 14A and/or DH 13A.
- RCS temperature should be monitored continuously to ensure that reduced DH flow is still adequate to maintain desired RCS temperature.

_______ 4.27.5 Throttle closed on DH 1A*, DH PUMP 2 DISCHARGE TO RCS, using HIS DH1A to reduce DH Loop 2 flow slightly (approximately 50 gpm) as indicated on FYI DH2A, DH 2 FLOW.

_______ 4.27.6 Remove control power from DH 1A* using HIS DH1A-2.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

______ 4.27.7 Position the following valves as necessary to reduce DH Loop 2 flow approximately 75 gpm less than the value set in Step 4.27.3.

- DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, using HIC DH 14A.
- DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, using HIC DH 13A.

NOTE 4.27.8
To comply with TS 3.4.1.2 while making repairs to CF 30, CF 31, DH 76*, DH 77*, DH 1A* or DH 1B*, it is necessary to provide two redundant, single failure-proof decay heat removal loops. This step provides guidance for compliance in this condition.

4.27.8 IF repairs are being made for DH 1B*, DH 77*, or CF 31, THEN perform the following:

______ a. Verify DH Loop 2 is in operation.

NOTE 4.27.8.b and c
These steps enable the idle DH Pump to supply water to the operating DH Loop if the running DH Pump should fail using DH 831*.

______ b. Open DH 831*, DH COOLER 1/2 DISCHARGE X-CON.

______ c. Place an Operational Information Tag on CTRM panel C5704 near HIS DH831 stating the following:

"If DH Pump 2 should fail, perform the actions of DB-OP-02527, Loss of Decay Heat Removal"

Subsection 4.27 completed by ______________________ Date __________

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.28 Restoration from DH Loop 2 Operation at Reduced RCS Inventory

INITIALS

Prerequisites

________ 4.28.1 Verify DB-OP-06904, Shutdown Operations, has directed performance of this Subsection.

Prerequisites completed by ______________________________ Date ____________

Procedure

> NOTE 4.28.2
>
> Computer point Z564 will indicate TRBL until DH 1A is fully open and the control power is removed.

4.28.2 IF RCS Water level is being increased THEN perform the following:

________ a. Place control power on DH 1A* using HIS DH1A-2.

________ b. Open DH 1A*, DH PUMP 2 DISCHARGE TO RCS, using HIS DH1A.

________ c. Remove control power from DH 1A* using HIS DH1A-2.

> NOTE 4.28.2.d
>
> Purification flow may need to be readjusted as DH System flow is increased.

________ d. IF RCS level is less than 30 inches, THEN slowly increase DH Loop 2 flow to approximately 3000 gpm as RCS level rises, REFER TO curve CC 6.2 AND CC 6.4 of DB-PF-06703, Miscellaneous Operation Curves.

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 4.28.3

Computer point Z560 will indicate TRBL until DH 1B is fully open and the control power is removed.

4.28.3 WHEN RCS water level is at RV Flange level (78-82 inches), THEN perform the following:

_______ a. Place control power on DH 1B* using HIS DH1B-2.

_______ b. Open DH 1B*, DH PUMP 1 DISCHARGE TO RCS, using HIS DH1B.

_______ c. Remove control power from DH 1B* using HIS DH1B-2.

4.28.4 IF Step 4.27.8 was performed,
AND all repairs to DH 1B*, DH 77*, or CF 31 are complete,
THEN perform the following:

_______ a. Close DH 831*, DH COOLER 1/2 DISCHARGE X-CONN.

_______ b. Remove the Operational Information Tag placed on CTRM Panel C5704.

Subsection 4.28 completed by_______________________________ Date _________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.29 Creating a Void Between DH 2735 and DH 2736

INITIALS Prerequisites

> NOTE 4.29.1
>
> PCAQR 96-1199 identified the potential for thermally induced over pressurization of isolated sections of piping originally identified in Generic Letter 96-06. This procedure subsection establishes a method to drain this line creating a void and preventing over-pressurization.

________ 4.29.1 Obtain Shift Manager's permission to drain the line between DH 2735* and DH 2736*.

________ 4.29.2 Notify Radiation Protection of the impending drain.

> NOTE 4.29.3
>
> - An electric drill-powered (peristaltic) pump greatly enhances performance of this subsection. Peristaltic pumps may be obtained from the lube oil issue room.
> - Clean tubing is used to prevent oil contamination of the RCS. See Chemistry for new/clean tubing.
> - The intent of this section is to depressurize the line between DH2735 and DH2736 then drain an additional amount of water (desired ~ ½ gallon) to create a void in the piping.

________ 4.29.3 Obtain a poly bottle and a suitable drain rig which includes a peristaltic pump with clean tubing (if available), that is capable of receiving approximately five gallons of fluid.

________ 4.29.4 Obtain permission to operate the Capped Valves:

- DH 99[1], DH COOLER 2 OUTLET TO PZR AUX SPRAY LINE LEAK TEST.
- DH 99A[1], DH COOLER 2 OUTLET TO PZR AUX SPRAY LINE LEAK TEST.

Prerequisites completed by ______________________________ Date __________

Procedure

________ 4.29.5 Verify DH 2735*, DH AUX SPRAY STOP VALVE, is closed.

[1] Controlled per DB-OP-00009, Operation and Control of Capped Valves

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

________ 4.29.6 Verify DH 2736*, DH AUX SPRAY THROTTLE VALVE, is closed.

________ 4.29.7 Install the drain rig at DH 99A[1], DH COOLER 2 OUTLET TO PZR AUX SPRAY LINE LEAK TEST.

________ 4.29.8 Open DH 99A[1], DH COOLER 2 OUTLET TO PZR AUX SPRAY LINE LEAK TEST.

________ 4.29.9 Slowly open DH 99[1], DH COOLER 2 OUTLET TO PZR AUX SPRAY LINE LEAK TEST, to drain fluid until the section of piping between DH2735 and DH2736 is depressurized.

________ 4.29.10 Start the peristaltic pump to drain an additional approximately one half gallon of fluid.

NOTE 4.29.11
No vent path is available so drain progress may be slow.

4.29.11 IF one half gallon of fluid can NOT be obtained, THEN perform the following:

________ a. Stop the peristaltic pump.

________ b. Close DH 99[1], DH COOLER 2 OUTLET TO PZR AUX SPRAY LINE LEAK TEST.

________ c. Measure the amount of the fluid actually obtained.

________ d. Contact the Shift Manager to provide resolution.

________ e. N/A Step 4.29.12.

4.29.12 WHEN approximately one half gallon of fluid has been drained, THEN perform the following:

________ a. Stop the peristaltic pump.

________ b. Close DH 99[1], DH COOLER 2 OUTLET TO PZR AUX SPRAY LINE LEAK TEST.

________ 4.29.13 Close DH 99A[1], DH COOLER 2 OUTLET TO PZR AUX SPRAY LINE LEAK TEST.

________ 4.29.14 Remove the drain rig from DH 99A[1], DH COOLER 2 OUTLET TO PZR AUX SPRAY LINE LEAK TEST.

[1] Controlled per DB-OP-00009, Operation and Control of Capped Valves
* Controlled per DB-OP-00008, Operation and Control of Locked Valves

_______ 4.29.15 Place an Operations Information Placard on CTRM Panel C5705 near HIS DH2735 and HIS DH2736 stating:

"The piping between DH 2735 and DH 2736 is drained to introduce a void to satisfy Generic Letter 96-06."

Subsection 4.29 completed by_______________________________ Date ___________

4.30 Operating the Decay Heat Valve Pit Inspection Cover

INITIALS Prerequisites

NOTE 4.30.1

As allowed by Technical Specification 3.5.2, the inspection port on the watertight enclosure may be opened without requiring performance of the vacuum leakage rate test in order to perform inspections. After use, the inspection port cover must be verified closed in its correct position.

_______ 4.30.1 Verify that a replacement inspection port O-ring is available.

4.30.2 Verify one OR both of the following to provide enclosure lighting:

_______ • L39D1, BKR 13, BREAKER FOR LTG: C.V. EL.565 is closed (panel located on CTMT elev. 585, near Containment Air Coolers), AND the enclosure lights are lit.

_______ • A camera with high intensity light is available.

_______ 4.30.3 Obtain Shift Manager's permission to open the DHR Valve Pit Inspection Cover.

Prerequisites completed by ______________________ Date ________

Procedure

_______ 4.30.2 Unlock the Kamlock cover on the inspection port by positioning the locking arms to the full down position.

_______ 4.30.3 Remove the Kamlock cover from the inspection port.

_______ 4.30.4 Complete desired inspection of the DHR Valve Pit.

_______ 4.30.5 IF the inspection cover O-ring shows indications of nicks, cuts, cracks or any other signs of wear,
THEN replace the O-ring. Refer to Technical Specification 3.5.2

_______ 4.30.6 Verify the inspection cover O-ring is properly seated in the inspection cover.

_______ 4.30.7 Install the Kamlock cover on the inspection port.

_______ 4.30.8 Lock the inspection cover into place by positioning the locking arms in the full up position.

_______ 4.30.9 Verify inspection cover installed with locking arms in the full up position.

____
IV

Independent Verification ______________________ Date ________

_______ 4.30.10 IF replacement of the inspection cover O-ring was required,
THEN verify DB-SP-03135, Decay Heat Valve Pit Leak Test, is performed prior to declaring the enclosure operable.

Subsection 4.30 completed by ______________________ Date ________

4.31 Establish Manual Control of DH 14A

INITIALS Prerequisites

None

Procedure

4.31.1 Take manual control of DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, by performing the following:

________ a. Verify the air solenoid valve is de-energized by depressing OPEN on HIS DH 14A.

________ b. Position IA 445, THREE WAY MANUAL INSTRUMENT AIR VALVE FOR DH 14A, to vent ZC DH 14A and isolate the air supply.

________ c. Rotate the clutch handle 90 degrees to allow it to be fully seated in the clutch indicator's DEEP SLOT.

________ d. Rotate the handwheel until the spring loaded clutch key engages the handwheel gear.

________ e. DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, may now be positioned using the handwheel.

________ f. Place Operational Information Tags on DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, AND HIC DH 14A stating the following:

"Manual control has been established for DH 14A per DB-OP-06012."

Subsection 4.31 completed by________________________________ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.32 Restore from Manual Control of DH 14A

INITIALS

Prerequisites

None

Procedure

4.32.1 Restore from manual control of DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, by performing the following:

________ a. Rotate the handwheel until there is little or no load on it.

________ b. *Pull the clutch handle out AND index it 90 degrees until it fully seats in* the clutch indicator's SHALLOW SLOT.

________ c. Position IA 445, THREE WAY MANUAL INSTRUMENT AIR VALVE FOR DH 14A, to supply air to ZC DH 14A and isolate vent.

________ d. Set HIC DH 14A to match the actual position of DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE.

________ e. Depress AUTO on HIS DH 14A.

________ f. DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, may now be controlled with HIC DH 14A.

________ g. Remove the Operational Information Tags on DH 14A*, DH COOLER 2 OUTLET FLOW CONTROL VALVE, AND HIC DH 14A.

Subsection 4.32 completed by__________________________________ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.33 Establish Manual Control of DH 13A

INITIALS

Prerequisites

None

Procedure

NOTE 4.33.1

The DH 13A valve is closed by spring tension and upon loss of air will fail to the closed position.

4.33.1 Take manual control of DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, by performing the following:

________ a. Verify the air solenoid valve is de-energized by depressing CLOSE on HIS DH 13A.

________ b. Position IA 454, THREE WAY MANUAL INSTRUMENT AIR VALVE FOR DH 13A, to vent ZC DH 13A and isolate the air supply.

________ c. DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, may now be positioned using the handwheel.

________ d. Place Operational Information Tags on DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, AND HIC DH 13A stating the following:

"Manual control has been established for DH 13A per DB-OP-06012."

Subsection 4.33 completed by________________________________ Date ________

4.34 Restore from Manual Control of DH 13A

INITIALS

Prerequisites

None

Procedure

4.34.1 Restore from manual control of DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, by performing the following:

________ a. Rotate the valve actuator handwheel until valve indicates closed.

________ b. Position IA 454, THREE WAY MANUAL INSTRUMENT AIR VALVE FOR DH 13A, to supply air to ZC DH 13A and isolate vent.

________ c. Set HIC DH 13A to match the actual position of DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE.

________ d. Depress AUTO on HIS DH 13A.

________ e. DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE, may now be controlled with HIC DH 13A.

________ f. Remove the Operational Information Tags on DH 13A, DH COOLER 2 BYPASS FLOW CONTROL VALVE AND HIC DH 13A.

Subsection 4.34 completed by____ Date __________

4.35 Establish Manual Control of DH 14B

INITIALS

Prerequisites

None

Procedure

4.35.1 Take manual control of DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, by performing the following:

_______ a. Verify the air solenoid valve is de-energized by depressing OPEN on HIS DH 14B.

_______ b. Position IA 444, THREE WAY MANUAL INSTRUMENT AIR VALVE FOR DH 14B, to vent ZC DH 14B and isolate the air supply.

_______ c. Rotate the clutch handle 90 degrees to allow it to be fully seated in the clutch indicator's DEEP SLOT.

_______ d. Rotate the handwheel until the spring loaded clutch key engages the handwheel gear.

_______ e. DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, may now be positioned using the handwheel.

_______ f. Place Operational Information Tags on DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, AND HIC DH 14B stating the following:

"Manual control has been established for DH 14B per DB-OP-06012."

Subsection 4.35 completed by______________________________ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.36 Restore from Manual Control of DH 14B

INITIALS

Prerequisites

None

Procedure

4.36.1 Restore from manual control of DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, by performing the following:

_______ a. Rotate the handwheel until there is little or no load on it.

_______ b. Pull the clutch handle out AND index it 90 degrees until it fully seats in the clutch indicator's SHALLOW SLOT.

_______ c. Position IA 444, THREE WAY MANUAL INSTRUMENT AIR VALVE FOR DH 14B, to supply air to ZC DH 14B and isolate vent.

_______ d. Set HIC DH 14B to match the actual position of DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE.

_______ e. Depress AUTO on HIS DH 14B.

_______ f. DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, may now be controlled with HIC DH 14B.

_______ g. Remove the Operational Information Tags on DH 14B*, DH COOLER 1 OUTLET FLOW CONTROL VALVE, AND HIC DH 14B.

Subsection 4.36 completed by ______________________________ Date __________

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

4.37 Establish Manual Control of DH 13B

INITIALS

Prerequisites

None

Procedure

4.37.1 Take manual control of DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, by performing the following:

________ a. Verify the air solenoid valve is de-energized by depressing CLOSE on HIS DH 13B.

________ b. Position IA 455, THREE WAY MANUAL INSTRUMENT AIR VALVE FOR DH 13B, to vent ZC DH 13B and isolate the air supply.

________ c. Rotate the clutch handle 90 degrees to allow it to be fully seated in the clutch indicator's DEEP SLOT.

________ d. Rotate the handwheel until the spring loaded clutch key engages the handwheel gear.

________ e. DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, may now be positioned using the handwheel.

________ f. Place Operational Information Tags on DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, AND HIC DH 13B stating the following:

"Manual control has been established for DH 13B per DB-OP-06012."

Subsection 4.37 completed by ________________________________ Date ____________

4.38 Restore from Manual Control of DH 13B

INITIALS

Prerequisites

None

Procedure

4.38.1 Restore from manual control of DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, by performing the following:

________ a. Rotate the handwheel until there is little or no load on it.

________ b. Pull the clutch handle out AND index it 90 degrees until it fully seats in the clutch indicator's SHALLOW SLOT.

________ c. Position IA 455, THREE WAY MANUAL INSTRUMENT AIR VALVE FOR DH 13B, to supply air to ZC DH 13B and isolate vent.

________ d. Set HIC DH 13B to match the actual position of DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE.

________ e. Depress AUTO on HIS DH 13B.

________ f. DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, may now be controlled with HIC DH 13B.

________ g. Remove the Operational Information Tags on DH 13B, DH COOLER 1 BYPASS FLOW CONTROL VALVE, AND HIC DH 13B.

Subsection 4.38 completed by ______________________________ Date ______________

4.39 Filling and Venting DH Train 1 Post Maintenance MODEs 1 to 3

INITIALS

Prerequisites

_______ 4.39.1 Verify the Shift Manager has approved filling and venting DH Train 1.

Shift Manager ______________________ Date ________

_______ 4.39.2 Verify DH10*, DH PUMP 1 MINIMUM COOLDOWN ISOLATION is entered in the Locked Valve Log.

_______ 4.39.3 Conduct a pre-job brief, refer to NOBP-LP-2604, Effective Job Briefs.

Prerequisites completed by ______________________________ Date ____________

_______ 4.39.4 Open DH57, DH PUMP 1 CASING VENT.

_______ 4.39.5 Crack open DH2733*, DH PUMP 1 SUCTION (BWST OR EMER SUMP), to fill the system.

_______ 4.39.6 WHEN a steady stream of water issues from DH57, DH PUMP 1 CASING VENT,
THEN close DH57, DH PUMP 1 CASING VENT.

_______ 4.39.7 Open DH2733*, DH PUMP 1 SUCTION (BWST OR EMER SUMP), using HIS 2733, DH PUMP 1 LPI SUCT DH 2733.

_______ 4.39.8 Lock open DH45*, DH PUMP 1 DISCHARGE ISOLATION.

_______ 4.39.9 Open DH165, DH PUMP 1 DISCHARGE LINE VENT.

_______ 4.39.10 WHEN a steady stream of water issues from DH165, DH PUMP 1 DISCHARGE LINE VENT,
THEN close DH165, DH PUMP 1 DISCHARGE LINE VENT.

_______ 4.39.11 Lock open DH41*, DH PUMP 1 DISCHARGE FLUSH CONNECTION/SAMPLE LINE ISOLATION.

_______ 4.39.12 Open HP115, HIGH PRESSURE INJECTION PUMP 1 ALTERNATE MINIMUM FLOW LINE VENT.

_______ 4.39.13 Open HP115A, HIGH PRESSURE INJECTION PUMP 1 ALTERNATE MINIMUM FLOW LINE VENT.

_______ 4.39.14 WHEN a steady stream of water issues from HP115A, HIGH PRESSURE INJECTION PUMP 1 ALTERNATE MINIMUM FLOW LINE VENT
THEN close HP115A, HIGH PRESSURE INJECTION PUMP 1 ALTERNATE MINIMUM FLOW LINE VENT.

_______ 4.39.15 Close HP115, HIGH PRESSURE INJECTION PUMP 1 ALTERNATE MINIMUM FLOW LINE VENT

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

______ 4.39.16 Open DH164B, DECAY HEAT PUMP 1 SUCTION LINE FROM EMERGENCY SUMP VENT.

______ 4.39.17 WHEN a steady stream of water issues from DH164B, DECAY HEAT PUMP 1 SUCTION LINE FROM EMERGENCY SUMP VENT.
THEN close DH164B, DECAY HEAT PUMP 1 SUCTION LINE FROM EMERGENCY SUMP VENT.

4.39.18 Verify the following valves are closed:

- ______ DH1518, DH PUMP 2 SUCTION FROM RCS.
- ______ DH21*, REACTOR COOLANT SYSTEM TO DH SYSTEM ISOLATION BYPASS.
- ______ DH23*, REACTOR COOLANT SYSTEM TO DH SYSTEM ISOLATION BYPASS.
- ______ DH10*, DH PUMP 1 MINIMUM COOLDOWN ISOLATION.
- ______ DH11, REACTOR COOLANT SYSTEM TO DECAY HEAT SYSTEM.
- ______ DH12, REACTOR COOLANT SYSTEM TO DECAY HEAT SYSTEM.

NOTE 4.39.19
DH1517 will automatically close if manually opened to 20% open.

______ 4.39.19 Manually crack open DH1517, DH PUMP 1 SUCTION FROM RCS.

______ 4.39.20 Open DH173, DH PUMP 1 SUCTION FROM REACTOR COOLANT SYSTEM VENT.

______ 4.39.21 WHEN a steady stream of water issues from DH173, DH PUMP 1 SUCTION FROM REACTOR COOLANT SYSTEM VENT,
THEN close DH173, DH PUMP 1 SUCTION FROM REACTOR COOLANT SYSTEM VENT.

______ 4.39.22 Close DH1517, DH PUMP 1 SUCTION FROM RCS using HIS 1517, DH 1517.

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 4.39.23 and 4.39.24

The Shift Manager may mark components outside the clearance boundary N/A in the Valve and Instrument Checklists.

_______ 4.39.23 Perform Attachment 6, DH Loop 1 Instrument Checklist.

_______ 4.39.24 Perform Attachment 1, DH Loop 1 Normal Lineup Valve Checklist.

Subsection 4.39 completed by ______________________________ Date __________

4.40 Filling and Venting DH Train 2 Post Maintenance MODEs 1 to 3

INITIALS

Prerequisites

_______ 4.40.1 Verify the Shift Manager has approved filling and venting DH Train 2.

Shift Manager ____________________ Date ________

4.40.2 Verify the following valves are entered in the Locked Valve Log:

_______ • DH10*, DH PUMP 1 MINIMUM COOLDOWN ISOLATION

_______ • DH30*, DH PUMP 2 SUCTION FROM SFP COOLING SYS.

_______ 4.40.3 Contact Radiation Protection for assistance in accessing DH51, DH SUCTION FROM SFP VENT. The valve is near the ceiling of #4 MPR.

_______ 4.40.4 Conduct a pre-job brief, refer to NOBP-LP-2604, Effective Job Briefs.

Prerequisites completed by ______________________________ Date __________

_______ 4.40.5 Open DH56, DH PUMP 2 CASING VENT.

_______ 4.40.6 Crack open DH2734*, DH PUMP 2 SUCTION (BWST OR EMER SUMP), to fill the system.

_______ 4.40.7 WHEN a steady stream of water issues from DH56, DH PUMP 2 CASING VENT,
THEN close DH56, DH PUMP 2 CASING VENT.

_______ 4.40.8 Open DH2734*, DH PUMP 2 SUCTION (BWST OR EMER SUMP), HIS 2734, DH PUMP 2 LPI SUCT DH 2734.

_______ 4.40.9 Lock open DH44*, DH PUMP 2 DISCHARGE ISOLATION.

_______ 4.40.10 Open DH161, DH PUMP 2 DISCHARGE LINE VENT.

_______ 4.40.11 WHEN a steady stream of water issues from DH161, DH PUMP 2 DISCHARGE LINE VENT,
THEN close DH161, DH PUMP 2 DISCHARGE LINE VENT.

_______ 4.40.12 Open DH164, DH PUMP 2 SUCTION FROM CONTAINMENT EMERGENCY SUMP VENT.

_______ 4.40.13 WHEN a steady stream of water issues from DH164, DH PUMP 2 SUCTION FROM CONTAINMENT EMERGENCY SUMP VENT
THEN close DH164, DH PUMP 2 SUCTION FROM CONTAINMENT EMERGENCY SUMP VENT.

_______ 4.40.14 Verify DH31*, DH PUMP 1 SUCTION FROM SFP COOLING SYS, is closed.

_______ 4.40.15 Open DH30*, DH PUMP 2 SUCTION FROM SFP COOLING SYS.

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

_______ 4.40.16 Open DH51, DH SUCTION FROM SFP VENT.

_______ 4.40.17 WHEN a steady stream of water issues from DH51, DH SUCTION FROM SFP VENT,
THEN close DH51, DH SUCTION FROM SFP VENT.

_______ 4.40.18 Close AND lock DH30*, DH PUMP 2 SUCTION FROM SFP COOLING SYS.

4.40.19 Verify the following valves are closed:

_______ • DH1517, DH PUMP 1 SUCTION FROM RCS.

_______ • DH21*, REACTOR COOLANT SYSTEM TO DH SYSTEM ISOLATION BYPASS.

_______ • DH23*, REACTOR COOLANT SYSTEM TO DH SYSTEM ISOLATION BYPASS.

_______ • DH10*, DH PUMP 1 MINIMUM COOLDOWN ISOLATION.

_______ • DH11, REACTOR COOLANT SYSTEM TO DECAY HEAT SYSTEM.

_______ • DH12, REACTOR COOLANT SYSTEM TO DECAY HEAT SYSTEM.

_______ 4.40.20 Open DH176, DH PUMP 2 SUCTION FROM RCS VENT.

_______ 4.40.21 WHEN a steady stream of water issues from DH176, DH PUMP 2 SUCTION FROM RCS VENT,
THEN close DH176, DH PUMP 2 SUCTION FROM RCS VENT.

NOTE 4.40.22
DH1518 will automatically close if manually opened to 20% open.

_______ 4.40.22 Manually crack open DH1518, DH PUMP 2 SUCTION FROM RCS.

_______ 4.40.23 Open DH173, DH PUMP 1 SUCTION FROM REACTOR COOLANT SYSTEM VENT.

_______ 4.40.24 WHEN a steady stream of water issues from DH173, DH PUMP 1 SUCTION FROM REACTOR COOLANT SYSTEM VENT,
THEN close DH173, DH PUMP 1 SUCTION FROM REACTOR COOLANT SYSTEM VENT.

_______ 4.40.25 Close DH1518, DH PUMP 2 SUCTION FROM RCS, using HIS 1518, DH 1518.

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

NOTE 4.40.26 and 4.40.27

The Shift Manager may mark components outside the clearance boundary N/A in the Valve and Instrument Checklists.

________ 4.40.26 Perform Attachment 7, DH Loop 2 Instrument Checklist.

________ 4.40.27 Perform Attachment 2, DH Loop 2 Normal Lineup Valve Checklist.

Subsection 4.40 completed by ______________________________ Date _____________

5.0 EMERGENCY OPERATIONS

None

6.0 REFERENCES

6.1 Developmental

6.1.1 NRC Generic Letter 88-17

6.1.2 USAR Sections 6.3.2.11 and 9.1.3.1

6.1.3 Technical Specifications: 3.1.1.2, 3.1.2.1, 3.1.2.2, 3.1.2.5, 3.4.1.2, 3.4.2, 3.5.2, 3.5.3, 3.9.8.1, 3.9.8.2, and 3.9.1

6.1.4 SER 29-89, Loss of Residual Heat Removal Capability Due to Common Mode Failure of Flow Control Valves

6.1.5 Operational Schematic OS-002, Makeup and Purification System

6.1.6 Operational Schematic OS-004, Decay Heat Removal/Low Pressure Injection

6.1.7 Operational Schematic OS-006, Core Flooding System

6.1.8 P&ID M-031, Makeup and Purification System

6.1.9 P&ID M-033B, C, Decay Heat Train 1 and 2

6.1.10 P&ID M-035, Spent Fuel Pool Cooling System

6.1.11 Seventh Refueling Outage Safety Review

6.1.12 NOP-OP-1005, Shutdown Safety

6.1.13 NEN-87-10167, Compliance with T.S. 3.4.1.2

6.1.14 Calculation 034.009 R03

6.2 Implementation

6.2.1 NOP-OP-1001, Clearance/Tagging Program

6.2.2 NOBP-LP-2604, Effective Job Briefs

6.2.3 DB-CH-01662, Plant Systems Cleanliness Inspection

6.2.4 DB-OP-00008, Operation and Control of Locked Valves

6.2.5 DB-OP-00009, Operation and Control of Capped Valves

6.2.6 DB-OP-00016, Temporary Configuration Control

6.2.7 DB-OP-02527, Loss of Decay Heat Removal

6.2.8 DB-OP-03004, Locked Valve Verification

6.2.9 DB-OP-06001, Boron Concentration Control

6.2.10 DB-OP-06006, Makeup and Purification System

6.2.11 DB-OP-06015, Borated Water Storage Tank Operating Procedure

6.2.12 DB-OP-06021, Spent Fuel Pool Operating Procedure

6.2.13 DB-OP-06023, Fill, Drain and Purification of the Refueling Canal

6.2.14 DB-OP-06031, Boric Acid Addition Tank Operating Procedure

6.2.15 DB-OP-06101, Clean Liquid Radwaste System

6.2.16 DB-OP-06262, Component Cooling Water System Procedure

6.2.17 DB-OP-06900, Plant Heatup

6.2.18 DB-OP-06903, Plant Shutdown and Cooldown

6.2.19 DB-OP-06904, Shutdown Operations

6.2.20 DB-PF-06703, Miscellaneous Operations Curves

6.2.21 DB-SP-03135, Decay Heat Valve Pit Leak Test

6.2.22 DB-SP-03212, Venting of ECCS Piping

ATTACHMENT 1: DH LOOP 1 NORMAL LINEUP VALVE CHECKLIST
Page 1 of 4

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND VERIFY
CTRM				
DH COOLER 1/2 CROSS-CONNECT	DH 831*	LOCKED CLOSED		
BWST ISOLATION VALVE (LINE 1)	DH 7B*	LOCKED[1] OPEN		
DH PUMP 1 SUCTION FROM EMERGENCY SUMP	DH 9B*	LOCKED CLOSED		
DH PUMP 1 OUTLET TO HPI PUMP 1 SUCTION	DH 64	CLOSED		
DH COOLER 1 OUTLET FLOW CONTROL	DH 14B*	LOCKED[1] OPEN		
DH COOLER 1 BYPASS FLOW CONTROL	DH 13B	CLOSED[1]		
CTMT 565 NEAR CFT 1-1* **				
DH PUMP 1 DISCH TO RCS LEAK TEST CONN.	DH 75**	CLOSED		N/A
DH PUMP 1 DISCH TO RCS LEAK TEST CONN.	DH 75A**	CLOSED & CAPPED		N/A
DH PUMP 1 DISCH TO RCS STOP CHECK	DH 77*	LOCKED OPEN		
DH PUMP 1 DISCH TO RCS VENT	DH 177**	CLOSED		N/A
DH PUMP 1 DISCH TO RCS VENT	DH 177A**	CLOSED & CAPPED		N/A
ROOM 236 #2 MPR				
DH PUMP 1 MIN. COOLDOWN F.E. SOURCE	DH 4909A	OPEN		N/A
DH PUMP 1 MIN. COOLDOWN F.E. SOURCE	DH 4909B	OPEN		N/A
DH PUMP 1 SUCTION FROM SFP COOLING SYSTEM	DH 31*	LOCKED CLOSED		
DH PUMP 1 SUCTION FROM SFP PURIF SYSTEM	DH 29	CLOSED		
DH PUMP 1 SUCTION FROM RCS LEAK TEST	DH 27	CLOSED		N/A

* Controlled per DB-OP-00008, Operation and Control of Locked Valves
** Controlled per DB-OP-00009, Operation and Control of Capped Valves
*** N/A these valves if Containment is inaccessible
[1] These valves may be out of position due to plant conditions in Modes 5 or 6.

ATTACHMENT 1: DH LOOP 1 NORMAL LINEUP VALVE CHECKLIST (Continued)
Page 2 of 4

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND VERIFY
DECAY HEAT PUMP 1 SUCTION TO BORON PRECIPATATION CONTROL LINE ISOLATION	DH 203*	LOCKED CLOSED		
BORON PRECIPATATION CONTROL LINE DRAIN	DH 204**	CLOSED & CAPPED		
BORON PRECIPATATION CONTROL LINE VENT	DH 205**	CLOSED & CAPPED		
DH PUMP 1 MINIMUM COOLDOWN ISOLATION	DH 10*	LOCKED[2] OPEN		
DH PUMP 1 SUCTION EQUALIZING VALVE	DH 1517A*	LOCKED OPEN		
ROOM 208 #1 MPR				
DH PUMP 1 DISCH PS-2882B SOURCE	DH 2882B	OPEN		N/A
DH PUMP 1 DISCH LINE LEAK TEST CONN.	DH 73	CLOSED		N/A
ROOM 105 #1 ECCS ROOM				
DH PUMP 1 RECIRC LINE SHUT OFF	DH 55*	LOCKED[1] OPEN		
DH PUMP 1 DISCH TO BWST/RF CANAL/ SFP COOLING SYS	DH 66*	LOCKED CLOSED		
DH PUMP 1 FLOW TRANSMITTER SOURCE K1	DH 2BA	OPEN		N/A
DH PUMP 1 FLOW TRANSMITTER SOURCE K2	DH 2BB	OPEN		N/A
PP 9824 SOURCE VALVE	DH 9824	CLOSED		N/A
DH PUMP 1 SUCTION FLUSH CONN	DH 37	CLOSED		N/A
DH PUMP 1 SUCTION PRESSURE SOURCE	DH 1507	OPEN		N/A
DH PUMP 1 VENT	DH 57	CLOSED		N/A
DH PUMP 1 DISCH PRESSURE SOURCE	DH 5B	OPEN		N/A
DH PUMP 1 DISCH FLUSH CONN SAMPLE LINE ISOL	DH 41*	LOCKED OPEN		N/A

*Controlled per DB-OP-00008, Operation and Control of Locked Valves
**Controlled per DB-OP-00009, Operation and Control of Capped Valves
1 Reach Rod
2 Locked Open when both trains are in the LPI Mode.

ATTACHMENT 1: DH LOOP 1 NORMAL LINEUP VALVE CHECKLIST (Continued)
Page 3 of 4

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND VERIFY
DH PUMP 1 DISCH FLUSH CONN ISOL VALVE	DH 172	CLOSED		N/A
DH PUMP 1 DISCH ISOLATION	DH 45*	LOCKED OPEN		
DH PUMP 1 DRAIN	DH 15	CLOSED		N/A
DH PUMP 1 DRAIN	DH 16	CLOSED		N/A
DH PUMP 1 DRAIN	DH 39	CLOSED		N/A
DH PUMP 1 DISCHARGE SAMPLE ISOL	DH 59	OPEN[3]		N/A
EMERG SUMP LINE JACKET DRAIN & TEST	DH 152**	CLOSED & CAPPED		N/A
DH PUMP 1 OUTLET TO HPI PMP VENT	DH 166	CLOSED		N/A
DH PUMP 1 DISCH LINE VENT	DH 165	CLOSED		N/A
DECAY HEAT PUMP 1 SUCTION LINE FROM EMERGENCY SUMP VENT	DH 164B	CLOSED		N/A
DH PUMP 1 SUCTION FROM EMERG CTMT LEAK TEST	DH 163	CLOSED		N/A
DH PUMP 1 SUCTION FROM NAOH MIX TANK	DH 35	CLOSED[2]		
BWST SUPPLY TO MU PMP SUCTION VENT	DH 136	CLOSED		N/A
ROOM 113A DH EXCHANGER HATCH AREA				
DH PUMP 1 SUCTION FROM MU & PURIF DEMIN	DH 33	CLOSED[1]		
DH PUMP 1 DISCHARGE TO MU & PURIF AND SFP DEMIN ISO	DH 61	CLOSED[1]		

* Controlled per DB-OP-00008, Operation and Control of Locked Valves
** Controlled per DB-OP-00009, Operation and Control of Capped Valves
[1] Reach Rod
[2] Operated with chainfall from floor next to DH Pump 1
[3] Valve may be out of position depending upon which DH train is in service.

ATTACHMENT 1: DH LOOP 1 NORMAL LINEUP VALVE CHECKLIST (Continued)
Page 4 of 4

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND. VERIFY
ROOM 113 DH COOLER ROOM				
DH PUMP 1 RECIRC LINE PRESS TEST TAP	DH 1504	CLOSED		N/A
DH COOLER 1 INLET FLUSH CONN	DH 47	CLOSED		N/A
DH COOLER 1 INLET PRESS TEST TAP	DH 1317	CLOSED		N/A
DH COOLER 1 OUTLET PRESS SOURCE	DH 1553	OPEN		N/A
DH COOLER 1 OUTLET LINE FLUSH CONN	DH 53	CLOSED		N/A
DH PUMP 1 RECIRC LINE PRESS TEST TAP	DH 1506	CLOSED		N/A
DH COOLER 1 OUTLET LINE DRAIN	DH 80	CLOSED		N/A
DH COOLER CROSS-CONNECT BYPASS STOP CHECK	DH 127*	LOCKED OPEN		
BWST LINE 1 TO MU PUMP SUCTION ISOL	DH 129	CLOSED		N/A
BWST SUPPLY TO MU PUMP SUCTION DRAIN	DH 135	CLOSED		N/A
BWST LINE 1 TO MU PUMP SUCTION ISOL	DH 130	CLOSED & CAPPED		N/A
BORON PRECIPATATION CONTROL LINE DH COOLER 1-1 ISOLATION	DH 206*	LOCKED OPEN		
BORON PRECIPATATION CONTROL LINE DRAIN	DH 208**	CLOSED & CAPPED		N/A
BORON PRECIPATATION CONTROL LINE, TEST CONNECTION	DH 209	CLOSED		N/A

* Controlled per DB-OP-00008, Operation and Control of Locked Valves
** Controlled per DB-OP-00009, Operation and Control of Capped Valves

ATTACHMENT 2: DH LOOP 2 NORMAL LINEUP VALVE CHECKLIST
Page 1 of 5

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND. VERIFY
CTRM				
DH AUX SPRAY STOP VALVE	DH 2735*	CLOSED		
DH AUX SPRAY THROTTLE VALVE	DH 2736*	CLOSED		
DH COOLER 1/2 CROSS CONNECT	DH 830*	CLOSED		
BWST LINE 2 ISO VALVE	DH 7A*	OPEN [2]		
DH PUMP 2 DISCH TO HPI PUMP 2 SUCTION	DH 63	CLOSED		
DH PUMP 2 SUCTION FROM EMERG SUMP	DH 9A*	CLOSED		
DH CLR 2 OUTLET FLOW CONTROL	DH 14A*	OPEN [2]		
DH CLR 2 BYPASS FLOW CONTROL	DH 13A	CLOSED [2]		
ROOM 314 #4 MPR				
DH PUMP 2 AUX SPRAY FI SOURCE	DH 4999A	OPEN		N/A
DH PUMP 2 AUX SPRAY FI SOURCE	DH 4999B	OPEN		N/A
DH PUMP 2 AUXILIARY SPRAY FLOW INDICATOR SOURCE	DH 4999E	OPEN		
DH PUMP 2 AUXILIARY SPRAY FLOW INDICATOR SOURCE	DH 4999F	OPEN		
DH COOLER 2 OUTLET TO PRZ AUX SPRAY LINE LEAK TEST	DH 100	CLOSED		N/A
DH COOLER 2 OUTLET TO PZR AUX SPRAY LINE LEAK TEST	DH 100A	CLOSED		N/A
DH COOLER 2 OUTLET TO PZR AUX SPRAY LINE LEAK TEST	DH 99**	CLOSED		N/A
DH COOLER 2 OUTLET TO PZR AUX SPRAY LINE LEAK TEST	DH 99A**	CLOSED & CAPPED		N/A
DH PUMP 2 AUXILIARY SPRAY LINE ISOLATION	DH 200*	LOCKED CLOSED[3]		

* Controlled per DB-OP-00008, Operation and Control of Locked Valves
** Controlled per DB-OP-00009, Operation and Control of Capped Valves
[2] These valves may be out of position due to plant conditions in Modes 5 or 6.
[3] These valves may be out of position if DHR is supplying PZR Aux Spray in Modes 5 or 6.

ATTACHMENT 2: DH LOOP 2 NORMAL LINEUP VALVE CHECKLIST (Continued)
Page 2 of 5

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND. VERIFY
DH PUMP 2 AUXILIARY SPRAY LINE ISOLATION	DH 201*	LOCKED CLOSED[3]		
DH COOLER 2 OUTLET TO PRESSURIZER AUXILIARY SPRAY LINE VENT	DH 202	CLOSED		N/A
DH COOLER 2 OUTLET TO PRESSURIZER AUXILIARY SPRAY LINE VENT	DH 202A	CLOSED		N/A
ROOM 236 #2 MPR				
DH PUMP 2 SUCTION FROM MU&P SYS DEMIN	DH 32	CLOSED[1]		
DH PUMP 2 SUCTION FROM NAOH MIX TANK	DH 34	CLOSED[1]		
DH PUMP 2 SUCTION EQUALIZING VALVE	DH 1518A*	LOCKED OPEN		
DH 176, DH PUMP 2 SUCTION FROM RCS VENT	DH 176	CLOSED		
DH PUMP 2 MINIMUM COOLDOWN ISOLATION	DH 26*	LOCKED CLOSED		
DH PUMP 2 MIN COOLDOWN F.E. SOURCE	DH 4908A	CLOSED[2]		N/A
DH PUMP 2 MIN COOLDOWN F.E. SOURCE	DH 4908B	CLOSED[2]		N/A
DH PUMP 2 SUCTION FROM SFP COOLING SYS	DH 30*	LOCKED CLOSED		
DH PUMP 2 SUCTION FROM RCS LEAK TEST	DH 174	CLOSED		N/A
DH PUMP 2 SUCTION FROM SFP PURIF	DH 28	CLOSED		
DH PUMP 2 DISCH TO BWST/RF CANAL/SFP COOLING SYS	DH 65*	LOCKED CLOSED		
DH PUMP 2 DISCH TO RCS DRAIN	DH 156**	CLOSED		N/A
DH PUMP 2 DISCH TO RCS DRAIN	DH 156A**	CLOSED & CAPPED		N/A
DH PUMP 2 DISCH LINE LEAK TEST CONN	DH 72	CLOSED		N/A
DH PUMP 2 DISCH PRESS SWITCH SOURCE	DH 2882A	OPEN		N/A
DH PUMP 2 FLOW TRANSMITTER K1 SOURCE	DH 2AB	OPEN		N/A

[1]Reach Rod
* Controlled per DB-OP-00008, Operation and Control of Locked Valves
** Controlled per DB-OP-00009, Operation and Control of Capped Valves
[2]Abandoned in place
[3]These valves may be out of position if DHR is supplying PZR Aux Spray in Modes 5 or 6

ATTACHMENT 2: DH LOOP 2 NORMAL LINEUP VALVE CHECKLIST (Continued)
Page 3 of 5

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND. VERIFY
DH PUMP 2 FLOW TRANSMITTER K1 SOURCE	DH 2AA	OPEN		N/A
DH PUMP 2 DISCH LINE VENT	DH 158	CLOSED		N/A
ROOM 110A ECCS PUMP ROOMS ACCESS CORRIDOR				
DH PUMP 2 DISCHARGE TO MU & PURIF & SFP DEMIN ISO	DH 62	CLOSED[1]		
ROOM 113 DH EXCHANGER PIT				
DH PUMP 2 DISCH LINE FLUSH CONN	DH 46	CLOSED		N/A
DH COOLER 2 INLET PRESS TEST TAP	DH 1555	CLOSED		N/A
DH COOLER 2 OUTLET PRESS SOURCE	DH 1551	OPEN		N/A
DH COOLER 2 OUTLET LINE DRAIN	DH 160	CLOSED		N/A
DH PUMP 2 AUX SPRAY ISO	DH 178	OPEN		
DH CLR 2 OUTLET FLUSH CONN	DH 52	CLOSED		N/A
DH PUMP 2 RECIRC LINE PRESS TEST TAP	DH 1514	CLOSED		N/A
BWST LINE 2 TO MU PUMP SUCTION ISO	DH 132	CLOSED		N/A
BWST SUPPLY TO MU PUMP SUCTION DRAIN	DH 134	CLOSED		N/A
BWST LINE 2 TO MU PUMP SUCTION ISO	DH 131	CLOSED & CAPPED		N/A
DH COOLER X CONN BYPASS STOP CHECK	DH 125*	LOCKED OPEN		
DH PUMP 2 RECIRC LINE PRESS TEST TAP	DH 1516	CLOSED		N/A
EMERG SUMP LINE JACKET DRAIN & TEST	DH 153**	CLOSED & CAPPED		N/A
ECCS TRAIN 2 COMMON SUCTION LINE VENT	DH154	CLOSED		
DH PUMP 2 SUCTION FROM CTMT EMERG SUMP VENT	DH 164	CLOSED		N/A

* Controlled per DB-OP-00008, Operation and Control of Locked Valves
** Controlled per DB-OP-00009, Operation and Control of Capped Valves
[1] Reach Rod

ATTACHMENT 2: DH LOOP 2 NORMAL LINEUP VALVE CHECKLIST (Continued)
Page 4 of 5

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND. VERIFY
DH PUMP 2 SUCT FROM CTMT EMERG SUMP LEAK TEST	DH 162	CLOSED		N/A
DH PUMP 2 SUCT FROM MU&P SYS DEMIN VENT	DH 175	CLOSED		N/A
RM 105 #1 ECCS ROOM				
DH PUMP 2 DISCHARGE SAMPLE ISO	DH 60	OPEN [2]		N/A
RM 115 #2 ECCS ROOM				
DH PUMP 2 RECIRC LINE STOP VALVE	DH 54*	LOCKED[1] OPEN		
DH PUMP 2 SUCTION PRESS SOURCE	DH 1538	OPEN		N/A
DH PUMP 2 DISCH PRESS SOURCE	DH 5A	OPEN		N/A
DH PUMP 2 DISCH LINE FLUSH CONN SAMPLE LINE ISO	DH 40	OPEN		N/A
DH PUMP 2 DISCH FLUSH CONN ISO VALVE	DH 171	CLOSED		N/A
DH PUMP 2 SUCTION LINE FLUSH CONN	DH 36	CLOSED		N/A
DH PUMP 2 DISCH ISO	DH 44*	LOCKED OPEN		
DH PUMP 2 DRAIN	DH 18	CLOSED		N/A
DH PUMP 2 DRAIN	DH 17	CLOSED		N/A
DH PUMP 2 CASING DRAIN	DH 38	CLOSED		N/A
PP 9825 SOURCE VALVE	DH 9825	CLOSED		N/A
DH PUMP 2 CASING VENT	DH 56	CLOSED		N/A
DH PUMP 2 DISCH LINE VENT	DH 161	CLOSED		N/A

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

1 Reach Rod

2 Valve may be out of position depending upon which DH train is in service.

ATTACHMENT 2: DH LOOP 2 NORMAL LINEUP VALVE CHECKLIST (Continued)
Page 5 of 5

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND. VERIFY
CTMT 565 NEAR CFT 1-2* **				
DH PUMP 2 DISCH TO RCS STOP CHECK	DH 76*	LOCKED[3] OPEN		
DH PUMP 2 DISCH TO RCS VENT	DH 74**	CLOSED		N/A
DH PUMP 2 DISCH TO RCS VENT	DH 74A**	CLOSED & CAPPED		N/A
DH PUMP 2 DISCH TO RCS LEAK TEST CONN	DH 155**	CLOSED[1]		N/A
DH PUMP 2 DISCH TO RCS LEAK TEST CONN	DH 155A**	CLOSED[1]& CAPPED		N/A
CTMT 603 NEAR PERSONNEL HATCH* **				
PZR AUX SPRAY ISO VALVE	DH 159	OPEN		
DH CLR 2 OUTLET TO PZR AUX SPRAY IN LEAKAGE TEST	DH 98	CLOSED		N/A
DH CLR 2 OUTLET TO PZR AUX SPRAY IN LEAKAGE TEST	DH 98A	CLOSED		N/A

* Controlled per DB-OP-00008, Operation and Control of Locked Valves
** Controlled per DB-OP-00009, Operation and Control of Capped Valves
*** N/A if CTMT inaccessible
[1] These valves are to be verified closed immediately prior to installation of insulation on DH 76 only

ATTACHMENT 3: CHECKLIST FOR VALVES COMMON TO BOTH DH LOOPS
Page 1 of 2

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND. VERIFY
CTRM				
RCS TO DH SYSTEM	DH 11	OPEN[1/2] CLOSED		
RCS TO DH SYSTEM	DH 12	OPEN[1/2] CLOSED		
ROOM 314 #4 MPR				
DH SUCTION FROM SFP VENT	DH 51	CLOSED		
DH DISCHARGE TO SFP VENT	DH 101	CLOSED		
RM 301 DRUMMING AREA (SE CORNER)				
DH SYSTEM TO MU&P SYSTEM VENT	DH 121	CLOSED		
RM 312 SFP PUMP ROOM (NORTH)				
DH DISCHARGE TO SFP VENT	DH 102	CLOSED		
RM 236 #2 MPR				
RCS TO DH SYSTEM LEAK TEST	DH 25*	CLOSED & CAPPED		
DH PUMPS SUCTION FROM RCS VENT	DH 173*	CLOSED & CAPPED		
ROOM 110A ECCS PUMP ROOMS ACCESS CORRIDOR				
DH PUMPS DISCHARGE TO MU&P DEMIN	DH 71	CLOSED[3]		
DH PUMPS DISCHARGE TO SFP DEMIN	DH 70	CLOSED		

* Controlled per DB-OP-00009, Operation and Control of Capped Valves
[1] Open if RCS temp is less than 280°F, Shift Manager to annotate desired valve position.
[2] Closed (by procedure) above 280°F, Shift Manager to annotate desired valve position.
[3] This valve is OPEN if either DH Loop is aligned for MU & Purification

ATTACHMENT 3: VALVE CHECKLIST FOR VALVES COMMON TO BOTH DH LOOPS (Continued)
Page 2 of 2

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND. VERIFY
ROOM 105 #1 ECCS ROOM				
DH PUMPS DISCHARGE TO BWST LEAK TEST	DH 124	CLOSED		
DH PUMPS DISCHARGE TO BWST	DH 68	CLOSED		
DH PUMPS DISCHARGE TO BWST (THROTTLE)	DH 67	CLOSED		
DH SYSTEM DISCHARGE/RETURN FOR RF CANAL	DH 83	CLOSED		
DH SYSTEM CROSS-CONNECT LINE DRAIN	DH 169	CLOSED		
ROOM 113 DH COOLER ROOM				
DH PUMPS DISCHARGE TO SFP COOLING	DH 69	CLOSED		
DH PUMPS TO PURIF DEMIN DRAIN	DH 96	CLOSED		
ROOM 208 #1 MPR (NORTH OF SEAL RETURN COOLERS)				
DH SYSTEM TO MU & PURIFCATION SYSTEM	DH 123	CLOSED[1]		
BWST PIT				
BWST OUTLET ISOLATION	DH 79*	LOCKED OPEN		
BWST OUTLET SAMPLE	SS 13	OPEN		
CTMT 565 NEAR N2 STATION**				
RCS TO DH SYSTEM ISOLATION BYPASS	DH 21*	LOCKED[2] CLOSED		
RCS TO DH SYSTEM ISO BYPASS LEAK TEST	DH 22	CLOSED		
RCS TO DH SYSTEM ISO BYPASS LEAK TEST	DH 22A	CLOSED		
RCS TO DH SYSTEM ISOLATION BYPASS	DH 23*	LOCKED[2] CLOSED		

* Controlled per DB-OP-00008, Operation and Control of Locked Valves
** N/A these valves if CTMT is inaccessible
[1] This valve is OPEN if either DH Loop is aligned for MU & Purification
[2] These valves have separate locks/keys and are unique from other locked valves

ATTACHMENT 4: DH LOOP 1 SWITCH AND BREAKER CHECKLIST
Page 1 of 1

Checklist Only - Consult Shift Manager prior to repositioning breaker.

BREAKER DESCRIPTION	DEVICE LOCATION	DEVICE NUMBER	DEVICE POSITION	VERIFY BY	IND VERIFY
ROOM 105 #1 ECCS ROOM					
DH64 CLOSE PERMISSIVE	N/A	HSDH64	ENABLE		
ROOM 209 CORRIDOR TO #1 MPR					
MV DH07B BWST OUT VLV B	E11A	BE 1157	OPEN		
MV DH09B CTMT EMER SUMP OUT VLV	E11A	BE 1112	OPEN		
MV 2733 DH PUMP 1 SUCT VLV FROM BWST	E11A	BE 1121	CLOSED[1]		
MV DH01B LP INJ 1 VLV	E11A	BE 1106	CLOSED		
ROOM 227 AUX BLDG 565' CENTRAL PASSAGE					
MV 1517 DH NORM SUCTION LINE 1 ISO VLV	E11D	BE 1126	CLOSED[1]		
MV 831 DH REMOVAL CLR 1 OUT XOVER	E11D	BE 1195	CLOSED		
ROOM 304 CORRIDOR TO #3 AND #4 MPR					
MV DH12 DH REMOVAL SUCT LINE VLV	E11B	BE 1183	CLOSED[2]		
MV 2735 PRZR SPRAY LINE ISO VLV	E11B	BE 1155	CLOSED		
ROOM 427 #2 EPR					
MV DH11 DH REMOVAL SUCT LINE VLV	F11A	BF 1130	CLOSED[2]		
MV 2736 PRZR SPRAY LINE ISO VLV	F11A	BF1125	CLOSED		
ROOM 402 #1 EPR					
MV DH64 LPI-HPI CROSS CONN ISO VLV 1	E11E	BE1187	CLOSED[3]		

[1]May be OPEN per DB-OP-06904, Shutdown Operations.
[2]May be OPEN per DB-OP-06900, Plant Heatup.
[3]May be OPEN if in DH mode.

ATTACHMENT 5: DH LOOP 2 SWITCH AND BREAKER CHECKLIST
Page 1 of 1

Checklist Only - Consult Shift Manager prior to repositioning breaker.

DEVICE DESCRIPTION	DEVICE LOCATION	DEVICE NUMBER	DEVICE POSITION	VERIFY BY	IND VERIFY
ROOM 101 BWST PIPE TUNNEL					
MV DH63 LPI-HPI CROSS CONN ISO VLV 2	F11E	BF 1195	CLOSED[3]		
RM 115 #2 ECCS ROOM					
DH 63 CLOSE PERMISSIVE	N/A	HSDH63	ENABLE		
ROOM 227 AUX BLDG 565' CENTRAL PASSAGE					
MV DH09A CTMT EMER SUMP OUT VLV	F11D	BF 1142	OPEN		
MV 830 DH REMOVAL CLR 2 OUT XOVER	F11D	BF1185	CLOSED		
ROOM 236 #2 MPR					
MV 2734 DH PUMP 2 SUCT VLV FROM BWST	F11C	BF1134	CLOSED[1]		
MV DH01A LP INJ 2 VLV	F11C	BF 1136	CLOSED		
MV 1518 DH NORM SUCT LINE 2 ISO VLV	F11C	BF 1129	CLOSED[1]		
ROOM 304 CORRIDOR TO #3 AND #4 MPR					
MV DH12 DH REMOVAL SUCT LINE VLV	E11B	BE 1183	CLOSED[2]		
MV 2735 PRZR SPRAY LINE ISO VLV	E11B	BE 1155	CLOSED		
ROOM 427 #2 EPR					
MV DH11 DH REMOVAL SUCT LINE VLV	F11A	BF 1130	CLOSED[2]		
MV 2736 PRZR SPRAY LINE ISO VLV	F11A	BF 1125	CLOSED		
ROOM 405 FUEL HANDLING STORAGE ROOM					
MV DH07A BWST OUT VLV A	F11B	BF 1148	OPEN		

[1]May be OPEN per DB--OP-06904, Shutdown Operations
[2]May be OPEN per DB-OP-06900, Plant Heatup
[3]May be OPEN if in DH Mode.

ATTACHMENT 6: DH LOOP 1 INSTRUMENT CHECKLIST

Check List Only

Contact the Shift Manager prior to repositioning valves

"IN SERVICE" means all the valves, including the manifold valves are in the proper position to place an instrument in service. It also means all air isolation and equalization valves for actuators or other positioners are in their proper position.

DEVICE NUMBER	DEVICE DESCRIPTION	REQUIRED POSITION	VERIFIED BY	IND VERIFY
ROOM 208 #1 MPR				
PSH 2882B	LP INJ LINE 1 BEFORE ISO VALVE PRESS SWITCH	IN SERVICE		
PI 2882B	LP INJ LINE 1 BEFORE ISO VALVE PRESS INDICATOR	IN SERVICE		
DH 2882G	PI 2882B SECONDARY ISOLATION VALVE	OPEN		
ROOM 208 #1 MPR				
DH 2882H	PI 2882B BLOWDOWN VALVE	CLOSED		
ROOM 236 #2 MPR				
FT 4909	DH BYPASS AROUND HV1517 FLOW TRANSMITTER	IN SERVICE		
DH 4909C	FT 4909 BLOWDOWN VALVE	CLOSED		
DH 4909D	FT 4909 BLOWDOWN VALVE	CLOSED		
DH 4909E	FT 4909 VENT VALVE	CLOSED		
DH 4909F	FT 4909 VENT VALVE	CLOSED		
ROOM 105 #1 ECCS ROOM				
FT DH2B	LOW PRESS INJ LINE 1 FLOW TRANSMITTER	IN SERVICE		
DH 2BC	FT DH2B BLOWDOWN VALVE	CLOSED		
DH 2BD	FT DH2B BLOWDOWN VALVE	CLOSED		
PI 1507	DH & LP INJ PUMP 1-1 SUCTION PRESS INDICATOR	IN SERVICE		

ATTACHMENT 6: DH LOOP 1 INSTRUMENT CHECKLIST (Continued)
Page 2 of 2

DEVICE NUMBER	DEVICE DESCRIPTION	REQUIRED POSITION	VERIFIED BY	IND VERIFY
PI 1507A	DH & LP INJ PUMP 1-1 SUCTION PRESS INDICATOR	IN SERVICE[1]		
DH 1507A	DH PUMP 1 SUCTION PRESS SOURCE	OPEN		
DH 1507B	PI 1507 BLOWDOWN VALVE	CLOSED		
DH 1507C	PI 1507A SECONDARY ISOLATION VALVE	CLOSED[1]		
PI DH5B	DECAY HEAT PUMP 1-1 DISCHARGE PRESS INDICATOR	IN SERVICE		
DH 5BA	PI DH5B SECONDARY ISOLATION VALVE	OPEN		
DH 5BB	PI DH 5B BLOWDOWN VALVE	CLOSED		
ROOM 113 DH COOLER ROOM				
PI 1553	DH COOLER 1-1 OUT PRESS INDICATOR	IN SERVICE		
DH 1553A	PI 1553 SECONDARY ISOLATION VALVE	OPEN		
DH 1553B	PI 1553 BLOWDOWN VALVE	CLOSED		
DH 14B	DECAY HEAT COOLER 1-1 OUT FLOW CNTRL VALVE	IN SERVICE		
DH 13B	DH COOLER 1-1 BYPASS FLOW CONTROL VALVE	IN SERVICE		

Reviewed by ______________________________ Date ______________
Shift Manager

[1] The low range suction pressure gage PI 1507A is normally isolated. This is verified by checking DH 1507C closed. It is acceptable to be left in service during DH Loop operation at Reduced RCS Inventory.

ATTACHMENT 7: DH LOOP 2 INSTRUMENT CHECKLIST

Check List Only

Contact the Shift Manager prior to repositioning valves

"IN SERVICE I&C" means all the valves, including the manifold valves are in the proper position to place an instrument in service. It also means all air isolation and equalization valves for actuators or other positioners are in their proper position.

DEVICE NUMBER	DEVICE DESCRIPTION	REQUIRED POSITION	VERIFIED BY	IND VERIFY
ROOM 314 AUX BLDG 585' #4 MPR				
FT 4999	PZR AUX SPRAY LINE FLOW INDICATOR	IN SERVICE		
DH 4999AA	FI 4999 MAINT ISOLATION VALVE	OPEN		
DH 4999BA	FI 4999 MAINT ISOLATION VALVE	OPEN		
DH 4999C	FI 4999 BLOWDOWN VALVE	CLOSED		
DH 4999D	FI 4999 BLOWDOWN VALVE	CLOSED		
ROOM 236 #2 MPR				
PSH 2882A	LP INJ LINE 2 BEFORE ISO VALVE PRESS SWITCH HIGH	IN SERVICE		
PI 2882A	LP INJ LINE 2 BEFORE ISO VALVE PRESS INDICATOR	IN SERVICE		
DH 2882C	PI 2882A SECONDARY ISOLATION VALVE	OPEN		
DH 2882D	PI 2882A BLOWDOWN VALVE	CLOSED		
FT 4908	DH BYPASS AROUND HV1518 FLOW TRANSMITTER	OUT OF SERVICE[1]		
DH 4908C	FT 4908 BLOWDOWN VALVE	CLOSED		
DH 4908D	FT 4908 BLOWDOWN VALVE	CLOSED		
DH 4908E	FT 4908 VENT VALVE	CLOSED		
DH 4908F	FT 4908 VENT VALVE	CLOSED		
FT DH2A	LOW PRESS INJ LINE 2 FLOW TRANSMITTER	IN SERVICE		
DH 2AC	FT DH2A BLOWDOWN VALVE	CLOSED		

[1]Instrument abandoned in place

ATTACHMENT 7: DH LOOP 2 INSTRUMENT CHECKLIST (Continued)
Page 2 of 2

DEVICE NUMBER	DEVICE DESCRIPTION	REQUIRED POSITION	VERIFIED BY	IND VERIFY
DH 2AD	FT DH2A BLOWDOWN VALVE	CLOSED		
ROOM 115 #2 ECCS ROOM				
PI 1538	DH INJ PUMP 1-2 SUCTION PRESS INDICATOR	IN SERVICE		
PI 1538A	DH INJ PUMP 1-2 SUCTION PRESS INDICATOR	IN SERVICE[1]		
DH 1538A	PI 1538 SECONDARY ISOLATION VALVE	OPEN		
DH 1538B	PI 1538 BLOWDOWN VALVE	CLOSED		
DH 1538C	PI 1538A SECONDARY ISOLATION VALVE	CLOSED[1]		
PI DH5A	DECAY HEAT PUMP 1-2 DISCHARGE PRESS INDICATOR	IN SERVICE		
DH 5AA	PI DH5A SECONDARY ISOLATION VALVE	OPEN		
DH 5AB	PI DH 5A BLOWDOWN VALVE	CLOSED		
ROOM 113 DH COOLER ROOM				
PI 1551	DH COOLER 1-2 OUT PRESS INDICATOR	IN SERVICE		
DH 1551A	PI 1551 SECONDARY ISOLATION VALVE	OPEN		
DH 1551B	PI 1551 BLOWDOWN VALVE	CLOSED		
DH 14A	DECAY HEAT COOLER 1-2 OUT FLOW CNTRL VALVE	IN SERVICE		
DH 13A	DH COOLER 1-2 BYPASS FLOW CONTROL VALVE	IN SERVICE		

Reviewed by ______________________________ Date ______________
Shift Manager

[1] The low range suction pressure gage PI 1538A is normally isolated. This is verified by checking DH 1538C closed. It is acceptable to be left in service during DH Loop operation at Reduced RCS Inventory.

ATTACHMENT 8: DH PUMP 1 PRESTART CHECKLIST
Page 1 of 2

INITIALS

______ 1. Verify DH 45*, DH PUMP 1 DISCHARGE ISOLATION, is open.

______ 2. Verify DH 55*, DH PUMP 1 RECIRC LINE STOP VALVE, is open.

NOTE 3.0

DB-SP-03212, Venting of ECCS Piping, satisfies Surveillance Requirement 4.5.2.b.

CAUTION 3.0

Larger than expected quantities of gas escaping when the pump is vented is an indication of voiding in the suction piping. The Shift Manager and System Engineer should be notified if this occurs.

______ 3. IF DB-SP-03212, Venting of ECCS Piping, is required,
THEN GO TO DB-SP-03212, Venting of ECCS Piping, and perform applicable steps.

______ 4. Verify CC 653*, CC TO HPI AND DH PUMP 1 NORMAL SOURCE VALVE, is open.

______ 5. Verify CC 148*, CC TO DH PUMP 1 NORMAL SOURCE VALVE, is open.

______ 6. Verify CC 151*, CC FROM DH PUMP 1 NORMAL SOURCE OUTLET VALVE, is open.

______ 7. Verify CC 661*, CC FROM HPI AND DH PUMP 1 NORMAL SOURCE VALVE, is open.

______ 8. Verify CC 147, CC TO DH PUMP 1 ALTERNATE SOURCE VALVE, is closed.

______ 9. Verify CC 152, CC FROM DH PUMP 1 ALTERNATE SOURCE OUTLET VALVE, is closed.

10. Verify DH Pump 1 oil levels are normal:

______ • Pump outboard bearing.

______ • Pump inboard bearing.

______ • Motor outboard bearing.

______ • Motor inboard bearing.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

INITIALS

11. Verify DH Pump 1 suction pressure is greater than 3.7 psig by performing one of the following: (N/A methods not used)

_______ a. Read PI1507, DH & LP INJ PUMP 1-1 SUCTION PRESS INDICATOR.

_______ b. Read installed M&TE.

c. IF PI1507A is isolated,
THEN perform the following:

_______ 1. Open DH1507C, PI1507A SECONDARY ISOLATION VALVE.

_______ 2. Read PI1507A, DH & LP INJ PUMP 1-1 SUCTION PRESS INDICATOR.

_______ 3. IF the RCS is NOT at a reduced inventory,
THEN close DH1507C, PI1507A SECONDARY ISOLATION VALVE.

12. Verify seal water is valved in to DH Pump 1 by checking the following cyclone separator valves:

_______ • DH 110A, DH PUMP 1 DISCHARGE TO CYCLONE SEPARATOR A, is open.

_______ • DH 112A, CYCLONE SEPARATOR A OUTLET TO DH PUMP 1 OUTBOARD SEAL, is open.

_______ • DH 110B, DH PUMP 1 DISCHARGE TO CYCLONE SEPARATOR B, is open.

_______ • DH 112B, CYCLONE SEPARATOR OUTLET TO DH PUMP 1 INBOARD SEAL, is open.

_______ • DH 114A, CYCLONE SEPARATOR A OUTLET TO DH PUMP 1 SUCTION, is throttled 2 turns from full open.

_______ • DH 114B, CYCLONE SEPARATOR B OUTLET TO DH PUMP 1 SUCTION, is throttled 2 turns from full open.

13. Perform the following at AC 112, DECAY HT PUMP 1-1 MP-421:

_______ a. Verify Iso SW DSA Appendix R AB1203.26 switch is in NORMAL.

_______ b. Verify Iso SW DSB Appendix R AB1203.26 switch is in NORMAL.

_______ c. Verify AC 112, DECAY HT PUMP 1-1 MP-421, is racked in.

_______ d. Verify the CLOSE power fuses for AC 112, DECAY HT PUMP 1-1 MP-421, are installed.

Attachment 8 completed by ______________________________ Date ____________________

Reviewed by ______________________________ Date ____________________
Shift Manager

ATTACHMENT 9: DH PUMP 2 PRESTART CHECKLIST
Page 1 of 2

INITIALS

_______ 1. Verify DH 44*, DH PUMP 2 DISCHARGE ISOLATION, is open.

_______ 2. Verify DH 54*, DH PUMP 2 RECIRC LINE STOP VALVE, is open.

NOTE 3.0

DB-SP-03212, Venting of ECCS Piping, satisfies Surveillance Requirement 4.5.2.b.

CAUTION 3.0

Larger than expected quantities of gas escaping when the pump is vented is an indication of voiding in the suction piping. The Shift Manager and System Engineer should be notified if this occurs.

_______ 3. IF DB-SP-03212, Venting of ECCS Piping, is required,
THEN GO TO DB-SP-03212, Venting of ECCS Piping, and perform applicable steps.

_______ 4. Verify CC 654*, CC TO HPI AND DH PUMP 2 NORMAL SOURCE VALVE, is open.

_______ 5. Verify CC 149*, CC TO DH PUMP 2 NORMAL SOURCE VALVE, is open.

_______ 6. Verify CC 153*, CC FROM DH PUMP 2 NORMAL SOURCE OUTLET VALVE, is open.

_______ 7. Verify CC 660*, CC FROM HPI AND DH PUMP 2 NORMAL SOURCE VALVE, is open.

_______ 8. Verify CC 150, CC TO DH PUMP 2 ALTERNATE SOURCE VALVE, is closed.

_______ 9. Verify CC 154, CC FROM DH PUMP 2 ALTERNATE SOURCE OUTLET VALVE, is closed.

10. Verify DH Pump 2 oil levels are normal:

_______ • Pump outboard bearing.

_______ • Pump inboard bearing.

_______ • Motor outboard bearing.

_______ • Motor inboard bearing.

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

ATTACHMENT 9: DH PUMP 2 PRESTART CHECKLIST (Continued)
Page 2 of 2

INITIALS

11. Verify DH Pump 2 suction pressure is greater than 3.7 psig by performing one of the following: (N/A methods not used)

_______ a. Read PI1538, DH & LP INJ PUMP 1-2 SUCTION PRESS INDICATOR.

_______ b. Read installed M&TE.

c. IF PI1538A is isolated,
THEN perform the following:

_______ 1. Open DH1538C, PI1538A SECONDARY ISOLATION VALVE.

_______ 2. Read PI1538A, DH & LP INJ PUMP 1-2 SUCTION PRESS INDICATOR.

_______ 3. IF the RCS is NOT at a reduced inventory,
THEN close DH1538C, PI1538A SECONDARY ISOLATION VALVE.

12. Verify seal water is valved in to DH Pump 2 by checking the following cyclone separator valves:

_______ • DH 111A, DH PUMP 2 DISCHARGE TO CYCLONE SEPARATOR A, is open.

_______ • DH 113A, CYCLONE SEPARATOR A OUTLET TO DH PUMP 2 OUTBOARD SEAL, is open.

_______ • DH 111B, DH PUMP 2 DISCHARGE TO CYCLONE SEPARATOR B, is open.

_______ • DH 113B, CYCLONE SEPARATOR OUTLET TO DH PUMP 2 INBOARD SEAL, is open.

_______ • DH 115A, CYCLONE SEPARATOR A OUTLET TO DH PUMP 2 SUCTION, is throttled 2 turns from full open.

_______ • DH 115B, CYCLONE SEPARATOR B OUTLET TO DH PUMP 2 SUCTION, is throttled 2 turns from full open.

13. Perform the following at AD 112, DECAY HT PUMP 1-2 MP-422:

_______ a. Verify EMER CTRL XFER switch is in NORMAL.

_______ b. Verify AD 112, DECAY HT PUMP 1-2 MP-422, is racked in.

_______ c. Verify the CLOSE power fuses for AD 112, DECAY HT PUMP 1-2 MP-422, are installed.

Attachment 9 completed by ______________________ Date ______________

Reviewed by ______________________ Date ______________
Shift Manager

ATTACHMENT 10: RECIRCULATE THE BWST USING DH PUMP 1

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND VERIFY
CTRM				
DH PUMP 1 DISCH TO HPI PUMP 1 SUCTION	DH 64	CLOSED		
ROOM 236 #2 MPR				
DH PUMP 1 MINIMUM COOLDOWN ISOLATION	DH 10*	CLOSED		
DH PUMP 1 SUCTION FROM SFP PURIF SYSTEM	DH 29	CLOSED		
DH PUMP 1 SUCTION FROM SFP COOLING SYS	DH 31*	CLOSED		
ROOM 113 DH COOLER ROOM				
DH SYSTEM DISCHARGE TO SFP COOLING SYSTEM	DH 69	CLOSED		
DH PUMP 1 DISCHARGE TO MU & PURIF AND SFP DEMIN ISO	DH 61	CLOSED[1]		
ROOM 110A ECCS PUMP ROOMS ACCESS CORRIDOR				
DH PUMP 1 SUCTION FROM MU & PURIF DEMIN	DH 33	CLOSED[1]		
ROOM 105 #1 ECCS ROOM				
DH PUMP 1 SUCTION FROM NAOH MIX TANK	DH 35	CLOSED[2]		
DH SYSTEM DISCHARGE/RETURN FOR RF CANAL	DH 83	CLOSED		
DH PUMP 1 DISCH TO BWST/RF CANAL/SFP COOLING SYS	DH 66*	OPEN		
DH PUMPS DISCHARGE TO BWST	DH 68	OPEN		

* Controlled per DB-OP-00008, Operation and Control of Locked Valves

[1] Reach Rod

[2] Operated with chainfall from floor next to DH Pump 1.

ATTACHMENT 11: RECIRCULATE THE BWST USING DH PUMP 2
Page 1 of 1

Checklist Only - Consult Shift Manager prior to repositioning valve

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND VERIFY
CTRM				
DH AUX SPRAY THROTTLE ISO VALVE	DH 2736*	LOCKED CLOSED		
DH PUMP 2 DISCH TO HPI PUMP 2 SUCTION	DH 63	CLOSED		
ROOM 105 #1 ECCS ROOM				
DH SYSTEM DISCHARGE/RETURN FOR RF CANAL	DH 83	CLOSED		
ROOM 236 #2 MPR				
DH PUMP 2 MINIMUM COOLDOWN ISOLATION	DH 26*	LOCKED CLOSED		
DH PUMP 2 DISCH TO BWST/RF CANAL/SFP COOLING SYS	DH 65*	OPEN		
DH PUMP 2 SUCTION FROM SFP PURIF SYSTEM	DH 28	CLOSED		
DH PUMP 2 SUCTION FROM SFP COOLING SYS	DH 30*	LOCKED CLOSED		
DH PUMP 2 SUCTION FROM PURIF DEMIN	DH 32	CLOSED[1]		
DH PUMP 2 SUCTION FROM NAOH MIX TANK	DH 34	CLOSED[1]		
ROOM 113 DH COOLER ROOM				
DH SYSTEM DISCHARGE TO SFP COOLING SYSTEM	DH 69	CLOSED		
DH PUMP 2 DISCHARGE TO MU & PURIF & SFP DEMIN ISO	DH 62	CLOSED		
ROOM 105 #1 ECCS ROOM				
DH PUMPS DISCHARGE TO BWST	DH 68	OPEN		

*Controlled per DB-OP-00008, Operation and Control of Locked Valves
[1] Reach Rod

ATTACHMENT 12: ADD WATER TO THE RCS FROM THE BWST USING THE BWST RECIRC PUMP
Page 1 of 2

Checklist Only - Consult Shift Manager prior to repositioning valve

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND VERIFY
RM 312 SFP PUMP ROOM				
SFP CLEANUP SYSTEM TO SFP	SF 2653	CLOSED		
SFP PUMPS DISCHARGE TO SFP CLEANUP	SF 78	CLOSED		
RM 304 CORRIDOR TO #3 AND #4 MPR				
BWST TO SFP SUCTION	BW 21	CLOSED		
BWST HEATER TO SFP PUMPS	BW 29	CLOSED		
RM 209 CORRIDOR TO #1 MPR				
PW ISOLATION TO BWST RECIRC PUMP	PW 35	CLOSED		
DW ISOLATION TO BWST RECIRC PUMP	DW 70	CLOSED		
BWST RECIRC PUMP TO SFP PURIFICATION	BW 16	CLOSED		
BWST HEATER OUTLET ISOLATION	BW 19	CLOSED		
RM 236 #2 MPR				
DH PUMP 1 SUCTION FROM SFP PURIFICATION	DH 29	CLOSED		
DH PUMP 2 SUCTION FROM SFP PURIFICATION	DH 28	CLOSED		
RM 240 BAAT ROOM				
BAATS TO BWST RECIRC LINE	MU 360	CLOSED		
RM 227 AUX BLDG 565' CENTRAL PASSAGE				
SFP DEMIN INLET	SF 80	CLOSED[1]		
SFP DEMIN OUTLET	SF 88	CLOSED[1]		
SFP DEMIN BYPASS	SF 79	OPEN[1]		

[1]Reach Rod

ATTACHMENT 12: ADD WATER TO THE RCS FROM THE BWST USING THE BWST RECIRC PUMP (Continued)
Page 2 of 2

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND VERIFY
RM 230 DEMINERALIZER FILTER ROOM				
SFP FILTER INLET	SF 92	CLOSED[1]		
SFP FILTER OUTLET	SF 93	CLOSED[1]		
SFP FILTER BYPASS	SF 94	OPEN[1]		
SFP PURIF TO DH SYSTEM OR BWST	SF 2656	CLOSED[1]		
RM 119 DEGASIFER ROOM				
SFP FILTER IN-LINE VENT	SF 91	CLOSED[2]		
RM 122 WASTE GAS VALVE ACCESS ROOM				
SFP PURIF FLOW XMTR SOURCE (K1)	SF 1616A	OPEN		
SFP PURIF FLOW XMTR SOURCE (K2)	SF 1616B	OPEN		
RM 209 CORRIDOR TO #1 MPR				
BWST TO BWST RECIRC PUMP SUCTION VALVE (MTR-OP)	BW 2688	OPEN		

[1] Reach Rod
[2] Inaccessible, only needs to be checked after maintenance

ATTACHMENT 13: PLACE DH LOOP 1 ON MU AND PURIFICATION
Page 1 of 1

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND VERIFY
ROOM 208 #1 MPR (NORTH OF SEAL RETURN COOLERS)				
DH SYSTEM TO MU & PURIFICATION SYSTEM	DH 123	OPEN		
ROOM 212 VALVE ROOM UPPER LEVEL				
MU TANK INLET ISOLATION	MU 182	CLOSED[1]		
MU FLOW TO DH PUMPS SUCTION	MU 274	OPEN[1]		
ROOM 212 VALVE ROOM LOWER LEVEL				
MU FILTER OUTLET RETURN TO DEMINERALIZERS	MU 97	CLOSED[1]		
ROOM 225 MAKEUP PUMP ROOM				
MAKEUP TANK AND PUMPS BYPASS	MU 178	CLOSED		
ROOM 110A ECCS PUMP ROOMS ACCESS CORRIDOR				
DH PUMP 1 SUCTION FROM MU & PURIF DEMIN	DH 33	OPEN[1]		
DH PUMPS DISCHARGE TO MU & P DEMIN	DH 71	OPEN[1]		

[1]Reach Rod

ATTACHMENT 14: PLACE DH LOOP 2 ON MU AND PURIFICATION

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND VERIFY
ROOM 208 #1 MPR (NORTH OF SEAL RETURN COOLERS)				
DH SYSTEM TO MU & PURIFICATION SYSTEM	DH 123	OPEN		
ROOM 212 VALVE ROOM LOWER LEVEL				
MU FILTER OUTLET RETURN TO DEMINERALIZERS	MU 97	CLOSED[1]		
ROOM 212 VALVE ROOM UPPER LEVEL				
MU TANK INLET ISOLATION	MU 182	CLOSED[1]		
MU FLOW TO DH PUMPS SUCTION	MU 274	OPEN[1]		
ROOM 225 MAKEUP PUMP ROOM				
MAKEUP TANK AND PUMPS BYPASS	MU 178	CLOSED		
ROOM 236 #2 MPR				
DH PUMP 2 SUCTION FROM MU & P DEMIN	DH 32	OPEN[1]		
ROOM 110A ECCS PUMP ROOMS ACCESS CORRIDOR				
DH PUMPS DISCHARGE TO MU & DEMIN	DH 71	OPEN[1]		

[1]Reach Rod

ATTACHMENT 15: RESTORE FROM DH LOOP 1 ON MU AND PURIFICATION

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND VERIFY
ROOM 208 #1 MPR (NORTH OF SEAL RETURN COOLERS)				
DH SYSTEM TO MU & PURIFICATION SYSTEM	DH 123	CLOSED		
ROOM 212 VALVE ROOM UPPER LEVEL				
MU TANK INLET ISOLATION	MU 182	OPEN[1]		
MU FLOW TO DH PUMPS SUCTION	MU 274	CLOSED[1]		
ROOM 110A ECCS PUMP ROOMS ACCESS CORRIDOR				
DH PUMP 1 SUCTION FROM MU & PURIF DEMIN	DH 33	CLOSED[1]		
DH PUMPS DISCHARGE TO MU & P DEMIN	DH 71	CLOSED[1]		

[1]Reach Rod

ATTACHMENT 16: RESTORE FROM DH LOOP 2 ON MU AND PURIFICATION

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND VERIFY
ROOM 208 #1 MPR (NORTH OF SEAL RETURN COOLERS)				
DH SYSTEM TO MU & PURIFICATION SYSTEM	DH 123	CLOSED		
ROOM 212 VALVE ROOM UPPER LEVEL				
MU TANK INLET ISOLATION	MU 182	OPEN[1]		
MU FLOW TO DH PUMPS SUCTION	MU 274	CLOSED[1]		
ROOM 236 #2 MPR				
DH PUMP 2 SUCTION FROM MU & P DEMIN	DH 32	CLOSED[1]		
ROOM 110A ECCS PUMP ROOMS ACCESS CORRIDOR				
DH PUMPS DISCHARGE TO MU & P DEMIN	DH 71	CLOSED[1]		

[1]Reach Rod

ATTACHMENT 17: DH SYSTEM COOLING OF SFP USING DH PUMP 1
Page 1 of 1

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND VERIFY
ROOM 304 CORRIDOR TO #3 AND #4 MPR				
BWST SUPPLY LINE TO SFP PUMPS	SF 11	CLOSED		
SFP OUTLET ISOLATION	SF 3	OPEN		
SFP DRAIN	SF 4*	CLOSED		N/A
ROOM 236 #2 MPR				
DH PUMP 2 DISCH BWST/RF CANAL/SFP COOLING SYS	DH 65*	CLOSED		
DH PUMP 2 SUCTION FROM SFP COOLING SYS	DH 30*	CLOSED		
DH PUMP 1 SUCTION FROM SFP PURIF SYS	DH 29	CLOSED		
DH PUMP 1 SUCTION EQUALIZING VALVE	DH 1517A*	OPEN		
ROOM 113 DH COOLER ROOM				
DH COOLER 1/2 CROSS CONNECT	DH 831*	CLOSED		
DH COOLER 1 BYPASS FLOW CONTROL	DH 13B	CLOSED		
ROOM 110A ECCS PUMP ROOMS ACCESS CORRIDOR				
DH PUMP 1 DISCHARGE TO MU & PURIF AND SFP DEMIN ISO	DH 61	CLOSED[1]		
DH PUMP 1 SUCTION FROM MU & PURIF DEMIN	DH 33	CLOSED[1]		
ROOM 105 #1 ECCS ROOM				
DH PUMP 1/2 DISCHARGE TO BWST	DH 67	CLOSED		
DH PUMP 1/2 DISCHARGE TO BWST	DH 68	CLOSED		
DH SYSTEM DISCHARGE/RETURN FOR RF CANAL	DH 83	CLOSED		
DH PUMP 1 SUCTION FROM NOAH MIX TANK	DH 35	CLOSED		N/A
DH PUMP 1 DISCH TO HPI PUMP 1 SUCTION	DH 64	CLOSED		

*Controlled per DB-OP-00008, Operation and Control of Locked Valves
[1]Reach Rod

ATTACHMENT 18: DH SYSTEM COOLING OF SFP USING DH PUMP 2

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND. VERIFY
ROOM 304 CORRIDOR TO #3 AND #4 MPR				
BWST SUPPLY LINE TO SFP PUMPS	SF 11	CLOSED		
SFP OUTLET ISOLATION	SF 3	OPEN		
SFP DRAIN	SF 4*	CLOSED		N/A
ROOM 236 #2 MPR				
DH PUMP 1 SUCTION FROM SFP COOLING SYS	DH 31*	CLOSED		
DH PUMP 2 SUCTION FROM SFP PURIF SYS	DH 28	CLOSED		
DH PUMP 2 SUCTION FROM MU&P DEMIN	DH 32	CLOSED[1]		
DH PUMP 2 SUCTION FROM NOAH MIX TANK	DH 34	CLOSED[1]		N/A
DH PUMP 2 SUCTION EQUALIZING VALVE	DH 1518A*	OPEN		
ROOM 113 DH COOLER ROOM				
DH COOLER 2/1 CROSS CONNECT	DH 830*	CLOSED		
DH COOLER 2 BYPASS FLOW CONTROL	DH 13A	CLOSED		
ROOM 110A ECCS PUMP ROOMS ACCESS CORRIDOR				
DH PUMP 2 DISCHARGE TO MU & PURIF & SFP DEMIN ISO	DH 62	CLOSED[1]		
ROOM 105 #1 ECCS ROOM				
DH PUMP 1 DISCH TO BWST/RF CANAL/SFP COOLING SYS	DH 66*	CLOSED		
DH PUMP 1/2 DISCHARGE TO BWST	DH 67	CLOSED		
DH PUMP 1/2 DISCHARGE TO BWST	DH 68	CLOSED		
DH SYSTEM DISCHARGE/RETURN FOR RF CANAL	DH 83	CLOSED		
ROOM 115 #2 ECCS ROOM				
DH PUMP 2 DISCH TO HPI PUMP 2 SUCTION	DH 63	CLOSED		

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

[1]Reach Rod

ATTACHMENT 19: DECAY HEAT VALVE PIT VALVE CHECKLIST

Checklist Only - Consult Shift Manager prior to repositioning valve.

VALVE DESCRIPTION	VALVE NUMBER	VALVE POSITION	VERIFY BY	IND. VERIFY
RCS TO DH SYSTEM THERMAL EXPANSION ISOLATION	DH 20*	LOCKED OPEN		
RCS TO DH SYSTEM THERMAL EXPANSION ISOLATION	DH 24*	LOCKED OPEN		
RCS TO DH SYSTEM LEAK TEST CONNECTION	DH 48	CLOSED		
RCS TO DH SYSTEM LEAK TEST CONNECTION	DH 48A	CLOSED		
RCS TO DH SYSTEM LEAK TEST CONNECTION	DH 50	CLOSED		
RCS TO DH SYSTEM LEAK TEST CONNECTION	DH 50A	CLOSED		
RCS TO DH SYSTEM DRAIN	DH 170	CLOSED		
RCS TO DH SYSTEM DRAIN	DH 170A	CLOSED		

*Controlled per DB-OP-00008, Operation and Control of Locked Valves

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RAI Screening Required: Yes

Status: Closed

This Document will be approved by: **Carl Schulten; Gerald Waig**

Regulatory Basis must be included in Comments section of this Form

This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted)

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200803111017** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.4 Tim Kolb**; TB POC: ; JFD Number: **2**; Page Number(s): **118**; ITS Number: **3.4.6**; OSI: **None**; DOC Number: **None**; Bases JFD Number: **None**
Comment	**Revise ISTS Section 3.4.6 and 3.4.7 LCO requirements to allow 1 hour for pumps to not be in operation (as allowed by CTS and STS Note 1). This time is needed to establish natural circulation without entering the Condition and Required Actions for no loop in service. This change was requested by the Licensee.** **Per 10 CFR 50.36(d)(2) the LCO's are the lowest functional capability or performance level of equipment required for safe operation of the facility.**
Issue Date	**03/11/2008**
Close Date	**04/04/2008**

Responses

Licensee Response by Bryan Kays on 03/14/2008	Davis-Besse has reviewed the requirements of ITS 3.4.6 and ITS 3.4.7 and determined that the CTS 3.4.1.2 Note ** (Volume 9, Page 134) 1 hour allowance is only needed for ITS 3.4.7, "RCS Loops – MODE 5, Loops Filled." A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 03/17/2008	Change is consistent with current tech spec allowance to have DHR pumps off for 1 hour. No further questions on this item.
NRC Response by Timothy Kolb on 03/17/2008	Evaluate the need for an M-DOC for ITS section 3.4.5 and 3.4.6 due to allowance for 1 hr with DHR pumps off is not being carried forward to ITS. 3.4.6 references 3.4.7 and 3.4.8 M01 but the 3.4.7 M01 was deleted with this change. The 3.4.8 M01 only talks about mode 5 with loops not filled.
Licensee Response by Bryan Kays on 04/01/2008	This response supersedes the response on 3/14/2008. Davis-Besse has reviewed the requirements of ITS 3.4.6 and ITS 3.4.7 and determined that the CTS 3.4.1.2 Note ** (Volume 9, Page 134) 1 hour allowance is applicable to ITS 3.4.6, " RCS Loops

	– MODE 4" and ITS 3.4.7, "RCS Loops – MODE 5, Loops Filled." A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment. However, the CTS Note is not applicable to LCO 3.4.5, since the DHR pumps are not used in MODE 3. Therefore, an M DOC is not needed for not including the CTS Note in LCO 3.4.5.
NRC Response by Timothy Kolb on 04/02/2008	Revised data and markups are consistent with current licensing basis. No further questions on this item, however, additional changes are needed to completely characterize the changes being made, as follows: ITS section 3.4.5, page 89 of 415, needs a reference to ITS 3.4.6 added to the change for CTS LCO 3.4.1.2 c. It should reference "See ITS 3.4.6, 3.4.7 and 3.4.8." ITS section 3.4.5, page 89 of 415, needs a reference to ITS 3.4.6 added to the change for CTS **Note that says "See ITS 3.4.6, 3.4.7 and 3.4.8."
Licensee Response by Bryan Kays on 04/04/2008	The NRC reviewer is correct. The first requested change is actually unrelated to the changes to ITS 3.4.6 (i.e., it would need to be corrected regardless of the proposed change to ITS 3.4.6). The second requested change needs to be made due to the proposed change to ITS 3.4.6. A draft markup regarding these two requested changes is attached. This draft markup is in addition to that previously provided in the 4/1/08 Davis-Besse response. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 04/04/2008	Update provided as requested. No further questions at this time. This item is closed.

Date Created: 03/11/2008 10:17 AM by Timothy Kolb
Last Modified: 04/04/2008 08:34 AM

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NRC Reviewer

ID	**200711021322** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.4 Tim Kolb** ITS Number: **3.4.7** TB POC: OSI: **None** JFD Number: **None** DOC Number: **M.2** Page Number(s): **144** Bases JFD Number: **None**
Comment	**Revise SR 3.4.7.3 to remove "DHR" from the sentence such that it reads "... indicated power available to each required pump." The LCO has been revised to allow any combination of RCS or DHR loops operable such that two loops are required to be operable and one in operation. This can be met by two RCS loops with both DHR loops inoperable. In this case SR 3.4.7.3 would not be met but the requirements of the LCO would be met. Doc M02 (page 138) and the Bases (page 154) would also need to be revised.** **10CFR50.36 (Surveillance Requirements) ensure that limiting conditions for operation will be met.**
Issue Date	**11/02/2007**
Close Date	**02/08/2008**

Responses

Licensee Response by Jerry Jones on 11/30/2007	LCO 3.4.7 (Volume 9, Page 144) does allow any combination of Reactor Coolant System (RCS) loops and decay heat removal (DHR) loops such that two loops are OPERABLE and one loop is in operation. However, as stated in the LCO Section of the Bases, Insert 3 (Page 152), a reactor coolant pump is not required to be OPERABLE for the RCS loop to be OPERABLE. The RCS loop only requires an OPERABLE steam generator; i.e., this LCO allows natural circulation through an RCS loop to meet the requirements. As stated in Justification for Deviation (JFD) 1 (Page 145), this allowance was approved by the NRC as documented in the Safety Evaluation for Amendment 38. Thus, the only pumps required to be checked by SR 3.4.7.3 (Page 144) are the DHR pumps - but only when they are being used to meet the LCO requirements. The use of the word "required" in the SR ensures that the SR only has to be performed on the required DHR pumps. When the LCO is being met by the RCS loops, then there are no "required" DHR pumps. Therefore, no change

	to the SR is required.
NRC Response by Timothy Kolb on 12/04/2007	After further review there are discrepancies between the Bases and the TS LCO. The STS LCO is written for DHR loops only to meet the LCO, therefore SR 3.4.7.3 is written for DHR pumps. The licensee is modifying the LCO to allow any combination of RCS or DHR loops to be operable with one in operation. The Bases for SR 3.4.7.3 needs to address the allowance for the RCS loops to meet this. Since one loop has to be in operation then this implies that the breaker for the RCS pump that is off needs to be checked if that is the loop meeting the requirement. The whole basis for checking the breaker is that if you lose your forced flow then you need to have a backup for placing a pump in operation. This spec should be almost identical to 3.4.6.
Licensee Response by Jerry Jones on 02/07/2008	LCO 3.4.7 (Volume 9, Page 144) does allow any combination of Reactor Coolant System (RCS) loops and decay heat removal (DHR) loops such that two loops are OPERABLE and one loop is in operation. However, if the LCO is being met using the RCS loop allowance, then, as stated in the LCO Section of the Bases, Insert 3 (Page 152), a reactor coolant pump is not required to be OPERABLE for the RCS loop to be OPERABLE. The RCS loop only requires an OPERABLE steam generator in the natural circulation mode; i.e., the SG level must be greater than or equal to 35 inches of secondary side water level above the lower tube sheet. Thus, while the Background Section of the Bases, third paragraph (Page 147) does state that if the reactor coolant pumps are available, the SG water level need not be adjusted, this does not mean that the LCO can be met using a reactor coolant pump in operation with SG level less than 35 inches of secondary side water level above the lower tube sheet. This statement in the Background Section is describing various modes of providing decay heat removal – it is not describing methods to meet the LCO. To meet the LCO, SG level greater than or equal to 35 inches is required. Therefore, ITS SR 3.4.7.3 (Page 144) is correct in that the DHR pump is the only required pump that could be used to meet the LCO requirements.
NRC Response by Timothy Kolb on 02/08/2008	The licensee has provided an acceptable response to address all issues of this question. No further questions on this item. This item is closed.

Date Created: 11/02/2007 01:22 PM by Timothy Kolb
Last Modified: 02/08/2008 10:35 AM

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NRC Reviewer

ID	**200710011531**		Conference Call Requested? **No**	
Category	**In Scope**			
ITS Information	ITS Section: **3.4 Tim Kolb** ITS Number: **3.4.9**	TB POC: **None** OSI: **None**	JFD Number: **None** DOC Number: **None**	Page Number(s): **185** Bases JFD Number: **None**
Comment	**Doc M01 pertaining to the proposed addition of LCO 3.4.9.b says the minimum pzr heater capacity of 112kw is needed for pzr heaters. I believe this is a typo and should be changed to 150kw as shown in the markups on page 188 of 415.**			
Issue Date	**10/01/2007**			
Close Date	**10/04/2007**			

Responses

Licensee Response by Bill Bentley on 10/03/2007	The comment is correct. DOC M01 heater capacity of 112kw should be changed to 150kw. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 10/05/2007	Response acceptable. Consider item closed.

Date Created: 10/01/2007 03:31 PM by Timothy Kolb
Last Modified: 10/05/2007 05:20 PM

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NRC ITS TRACKING

NRC Reviewer

ID	**200710231000** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.4 Tim Kolb**; TB POC: ; JFD Number: **None**; Page Number(s): **183**; ITS Number: **3.4.9**; OSI: **None**; DOC Number: **L.1**; Bases JFD Number: **None**
Comment	**Revise DOC L01 to also discuss the change associated with changing the CTS Pressurizer level limit of <228 inches to ITS level limit of < or equal to 228 inches OR retain CTS limit and revise ITS LCO limit to be <228 inches.** **The CTS Pressirizer level LCO limit is between 45 and 228 inches which means that level must be <228 inches. ITS is allowing < or equal to 228 inches which is less restrictive.** **10CFR50.36 requires LCO limits to ensure equipment is operable.** **Also see pages 185,188,189 and 194.**
Issue Date	**10/23/2007**
Close Date	**11/02/2007**

Responses

Licensee Response by Bill Bentley on 10/25/2007	The Davis-Besse License Amendment No. 255 changed the high Pressurizer level limit from 305 inches to 228 inches. In the NRC Safety Evaluation for License Amendment No. 255, dated August 12, 2003, it is clear that the value of 228 inches is the upper limit. In other words, it is acceptable for the Pressurizer level to be less than or "equal to" 228 inches. Specifically, there is a passage in the NRC Safety Evaluation Section 3.0, Technical Evaluation, that states "The pressurizer inoperability can be due to complete loss of steam bubble in the pressurizer, or due to the water level higher than 228 inches or lower than 45 inches." From this wording, it is clear that the pressurizer is not to be considered inoperable unless the stipulated limits are exceeded. Therefore, the inclusion of the "equal to" allowance for the upper limit is not a less restrictive change and no change to Discussion of Change L01 is necessary. A copy of the NRC Safety Evaluation for Amendment No. 255, with highlighted areas, is attached for information.
NRC Response by Timothy Kolb	Follow-up question: Per CTS wording "The pressurizer shall be OPERABLE with a

on 10/30/2007	water level between 45 and 228 inches", if pressurizer level was exactly 228", would you call the pressurizer INOPERABLE and take actions to reduce level within 1 hr?
Licensee Response by Bill Bentley on 11/02/2007	A file has been attached to this response with selected portions from the shifty surveillance check procedure, the Pressurizer system operating procedure, and the current tech spec bases for CTS 3.4.4. The highlighted portions show that 228 inches is considered the maximum allowed value (limit) for pressurizer level. Therefore, the pressurizer would not be declared inoperable if level was exactly equal to 228 inches.
NRC Response by Timothy Kolb on 11/02/2007	I am satisfied with the supporting data attached. No further questions at this time. This item is closed.

Date Created: 10/23/2007 10:00 AM by Timothy Kolb
Last Modified: 11/02/2007 12:40 PM

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO.255 TO FACILITY OPERATING LICENSE NO. NPF-3

FIRSTENERGY NUCLEAR OPERATING COMPANY

DAVIS-BESSE NUCLEAR POWER STATION

DOCKET NO. 50-346

1.0 INTRODUCTION

By letter dated November 30, 2001 (Ref. 1) pursuant to Title 10 of the Code of Federal Regulations (CFR) Section 50.90, FirstEnergy Nuclear Operating Company (FENOC), requested an amendment to Operating License NPF-3 for the Davis Besse Nuclear Power Station (DBNPS), Unit 1. The license amendment request (LAR) revises the current DBNPS Technical Specification (TS) 3/4.4.4, "Reactor Coolant System - Pressurizer." Specifically, the proposed TS changes would (1) reduce the pressurizer high level limit specified in limiting condition for operation (LCO) 3.4.4 from 305 inches to 228 inches, and (2) modify the action requirement, when the pressurizer is inoperable, by adding a statement, which allows for up to 1 hour to restore the pressurizer to OPERABLE status before taking action to place the plant in HOT STANDBY.

2.0 REGULATORY EVALUATION

Section 182a of the Atomic Energy Act (Act) requires applicants for nuclear power plant operating licenses to include TSs as part of the license. These TS are derived from the plant safety analyses.

The staff has reviewed the proposed changes for compliance with 10 CFR 50.36 and agreement with the precedent as established in NUREG-1430. In general, licensees cannot justify TS changes solely on the basis of adopting the model standard technical specifications (STS). To ensure this, the staff makes a determination that proposed changes maintain adequate safety. There are two classes of changes to the TS: (1) changes needed to reflect contents of the design basis, and (2) voluntary changes to take advantage of the evolution in policy and guidance as to the required content and preferred format of TS over time. This LAR deals with both classes of changes: (1) revising the pressurizer high water limit reflects the contents of the design basis, and (2) providing a time limit for restoring pressurizer operability is a voluntary change that takes advantage of the content and preferred format of TS. In determining the acceptability of the revised pressurizer high water limit, the staff evaluated the licensee's loss of feedwater transient analysis. In determining the acceptability of adding a time limit for restoring pressurizer operability, the staff used the accumulation of generically approved guidance in NUREG-1430, Revision 2, "Standard Technical Specifications, Babcock and Wilcox Plants," dated October 10, 2001.

Licensees may revise the TS to adopt current improved STS format and content provided that plant-specific review supports a finding of continued adequate safety because: (1) the change is editorial, administrative, or provides clarification (i.e., no requirements are materially altered), (2) the change is more restrictive than the licensee's current requirement, or (3) the change is less restrictive than the licensee's current requirement, but nonetheless still affords adequate assurance of safety when judged against current regulatory standards. The detailed application of this general framework, and additional specialized guidance, are discussed in Section 3.0 in the context of specific proposed changes.

3.0 TECHNICAL EVALUATION

DBNPS TS LCO 3.4.4 specifies that, during Modes 1 and 2 operation, the pressurizer shall be operable with (a) a steam bubble, and (b) a water level between 45 and 305 inches. This LCO is intended to ensure that a steam bubble exists in the pressurizer prior to power operation to minimize the consequences of potential overpressure transients. The pressurizer high level limit permits pressure control equipment such as sprays and heaters to function as designed. The high level limit also prevents filling the pressurizer, i.e., water solid, during anticipated transients, thus ensuring that the pressurizer code safety valves and pilot-operated relief valves can provide overpressure protection by steam relief rather than water relief. Although the prevention of water relief through code safety valves is not a requirement for compliance with a safety limit, it is a design basis because water relief could potentially challenge valve reliability.

The proposed change to LCO 3.4.4 to reduce the existing high pressurizer water level limit of 305 inches to 228 inches is more restrictive than the existing LCO. The need for the proposed reduction in the high pressurizer water level limit was identified by the licensee during a review of the design basis. The licensee determined that the high level limit of 305 inches did not provide enough steam volume to prevent the pressurizer from going water solid during a loss of feedwater (LOFW) event, which is the most severe anticipatory transient with respect to pressurizer insurge. The licensee desires to prevent the pressurizer from going water solid in order to avoid code safety valves and power operated relief valves (PORV) from controlling reactor coolant system (RCS) pressure by relieving water, rather than steam, since water relief could potentially damage the valves. The proposed high level limit of 228 inches will reduce the likelihood of pressurizer going water solid during the most anticipated transient; thereby reducing the potential damage to the code safety relief valves and the PORV. The proposed change to TS 3/4.4.4 involving decreasing the pressurizer high level limit is more restrictive than the current limit.

The licensee performed an LOFW transient analysis with an initial pressurizer water level at a 220 inches, which is the nominal controller setpoint for power operation. The analysis result showed that when the pressurizer reached its peak level during the transient, 26 cubic feet of steam volume existed in the pressurizer. This 26 cubic feet of available steam space corresponds to 8 inches of initial pressurizer level. Hence the new high level limit of 228 inches is established to ensure that the pressurizer will not go water solid during a LOFW event initiated when operating with pressurizer level below this limit. Since the LOFW event is the most severe anticipated transient in terms of insurge into the pressurizer, the staff concludes that the high water level limit of 228 inches will provide assurance of no water release through the code safety valves during anticipatory transients, and is acceptable.

The licensee also proposed to revise the ACTION requirement, in the event that the pressurizer is inoperable, by adding a statement allowing for up to one hour to restore the pressurizer to OPERABLE status before taking action to place the plant in HOT STANDBY within the next

6 hours. The pressurizer inoperability can be due to complete loss of steam bubble in the pressurizer, or due to the water level higher than 228 inches or lower than 45 inches. In the event pressurizer water level exceeds 228 inches, the STS for Babcock & Wilcox designed plants (NUREG-1430) allows for one hour to restore the pressurizer to OPERABLE status. The staff also considers that the high water level is established to prevent water release through the safety valve to ensure valve reliability, rather than for compliance of safety limit. Therefore, allowing one hour to restore pressurizer operability would have an insignificant effect on public safety, and is acceptable. Since the complete loss of steam bubble in the pressurizer will be preceded by a condition of the pressurizer water level exceeding the high water level limit of 228 inches, this inoperability condition is covered by the high level limit.

The pressurizer low water level limit is based on providing enough water volume to prevent a reactor coolant system low pressure condition that would actuate the reactor protection system (RPS) or the engineered safety feature actuation system (ESFAS). Should an RCS depressurization event occur while the pressurizer water level is below the 45-inch low level limit, the plant will still be protected by the RPS and ESFAS. Therefore allowing up to one hour to restore to the OPERABLE status for the low level limit noncompliance will have no safety significance, and is acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Ohio State official was notified of the proposed issuance of the amendment. The State official has no comments.

5.0 ENVIRONMENTAL CONSIDERATIONS

This amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluent that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (68 FR 37578). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The staff has reviewed the proposed changes to DBNPS TS 3.4.4 to (1) reduce the pressurizer high level limit from 305 inches to 228 inches, and (2) revise the Action requirement for inoperable pressurizer by allowing one hour to restore the pressurizer to OPERABLE status before taking action to place the plant in HOT STANDBY. Based on the evaluation described in Section 2.0, the staff concludes these changes acceptable.

The staff has concluded, based on the considerations above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation into proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

7.0 REFERENCE

1. Letter from Guy G. Campbell, FirstEnergy, to US Nuclear Regulatory Commission, "Davis-Besse Nuclear Power Station, License Amendment Application to Revise Technical Specification 3/4.4.4, 'Reactor Coolant System - Pressurizer,' to Adopt New Pressurizer Level Requirements (License Amendment Request No. 01-0012)," November 30, 2001.

Principal Contributors: P. Hearn
Y. Hsii

Date: August 12, 2003

NOTE 4.12

This requirement is applicable when the Control Room Emergency Ventilation System is operating. However, the Control Room air temperature should never reach this temperature during normal operation.

4.12 Control Room Air Temperature Verification (TS 4.7.6.1.a)

4.12.1 WHEN the control room emergency ventilation system is operating, THEN perform the following:

a. Record Control Room air temperature using the Hygrothermograph in the back of the Control Room or other instrumentation as directed by the Control Room SRO. Record the M&TE Number and Cal Due Date in the COMMENTS section or NOTE field.

b. IF the reading is greater than the LIMIT,
THEN notify the Shift Manager
AND REFER TO Technical Specification 3.7.6.1, Control Room Emergency Ventilation System.

4.13 Pressurizer Level Verification and Channel Check Comparison (TS 4.4.4)

NOTE 4.13.1

The currently selected points are normally preferred in order to minimize the transfer of control signals.

4.13.1 Record Pressurizer level from LRS RC 14, COMPENSATED PRESSURIZER LEVEL, using the presently selected level and temperature transmitters.

4.13.2 IF LRS RC 14, COMPENSATED PRESSURIZER LEVEL is not available, THEN record Computer Point (L768) RC PRZR COMP LVL, using the SPDS Computer.

4.13.3 Compare the data with the MAXIMUM and MINIMUM LIMITS.

a. IF the data recorded is NOT within the LIMITS,
THEN notify the Shift Manager
AND REFER TO Technical Specification 3.4.4, Pressurizer.

ATTACHMENT 1: SHIFT READINGS - MODE 1 & 2
Page 2 of 8

Shift Readings, Mode 1 & 2

CONTROL ROOM (ATCA)											
Tech Spec Section	Mode	Parameters	Instrument	Data	Instrument	Data	Calculate Maximum Difference	Difference Tolerance OR Limit	Met	Step	Comments
TRM 4.4.9.2	PZR TEMP ≥440 °F	PZR Spray Water Diff Calc: PZR Temp minus Spray Line Temp	TI RC15	°F			_____ °F (ΔT)	MAX ΔT 410 °F	YES	4.10	
			TI RC4A4 (c)	°F							
4.4.4	1 , 2	PZR Level	LRS RC14 (f)	IN				MAX 228 IN MIN 45 IN	YES	4.13	
~~4.2.5.1~~	~~1~~	RC NR Pressure Loop 1 and 2	PRS RC2B	PSIG	PRS RC2A2	PSIG	PSID	~~TOL 30 PSID~~	~~YES~~	4.14	
4.3.1.1.1	1 , 2							MIN: 4 RCPs - 2062.7 3 RCPs – 2058.7(g)	YES		
4.2.5.1	1	RC Outlet Temperature (Th)	TI RC3B4	°F	TI RC3A2	°F		MAX 610 °F	YES	4.15	
4.3.1.1.1 4.2.1	2	Source Range Count Rate (h)	NI 2	CPS	NI 1	CPS	DECADES	TOL 0.5 Decades	YES	4.16	
		Source Range Start Up Rate (h)	NI 2	DPM	NI 1	DPM	DPM	TOL 0.25 DPM	YES	4.17	
	1 , 2	Intermediate Range Amps	NI 4	AMPS	NI 3	AMPS	DECADES	TOL 0.5 Decades	YES	4.18	
		Intermediate Range Start Up Rate	NI 4	DPM	NI 3	DPM	DPM	TOL 0.25 DPM	YES	4.19	
		Power Range Flux	NI 6	%	NI 5	%	_______ %	TOL 4.0 %	YES	4.20	
			NI 8	%	NI 7	%		MAX: 4 RCPs - 105.1% 3 RCPs - 80.6%	YES		
	1 >40%	Power Range Δ Flux	NI 6	%	NI 5	%	_____%	TOL 4.0% MAX + _____%(i)	YES	4.21	
			NI 8	%	NI 7	%		MAX - _____%(i)			

2.2 Equipment Limits

2.2.1 Nitrogen injected into the Pressurizer shall not lower the injection nozzle temperature more than 100°F.

2.2.2 Nitrogen injected into the pressurizer shall not lower the injection nozzle temperature below 100°F (NDTT + 60°F) if the RC pressure is above 550 psig.

2.2.3 The pressurizer spray shall not be used if the temperature difference between the pressurizer and the spray fluid is greater than 410°F. (Difference between CPTs T774, and T776 or T777 or control room panel indications.)

2.2.4 Except during emergencies, the maximum number of starts on the RC2 PRZR SPRAY VALVE, Motor is 20 per hour. If any abnormal indications of valve operation are noted, such as cycling in opposition to indicated switch position, the Supply Breaker (BF 1260 on MCC F12B) should be opened to stop valve cycling and Electrical Maintenance notified.

2.2.5 The PZR heatup and cooldown rates shall not exceed 100°F/hr as measured by Temperature Indicator TI RC 15 located in the Control Room or by Computer Points T776 or T777.

2.2.6 Maximum PZR operating temperature is 670°F.

2.2.7 When the Reactor Coolant temperature is greater than 200°F, a minimum bypass spray flow of 0.75 GPM shall be maintained.

2.2.8 In all modes, pressurizer temperature shall be limited to: (Applicability - At all times) (TRM 3.4.9.2)

a. A maximum heatup and cooldown rate of 100°F in any one hour period

b. A maximum spray water temperature differential of 410°F

c. Initiate a condition report for engineering evaluation. REFER TO EN-DP-00355 (Determination of Allowable Operating Transient Cycles) if temperature differential between the pressurizer spray line and pressurizer spray nozzle exceeds 300°F.

d. A minimum temperature of 120°F when pressure is 625 psig or greater.

2.2.9 Pressurizer level indication is dependent on Containment temperature. Elevated reference leg temperature causes the indicated level to be higher than the actual level.

2.2.10 Whenever the Reactor is critical, maximum pressurizer level is 228 inches. (Modes 1 & 2) (TS 3.4.4)

2.2.11 Minimum water level is 160 inches whenever Reactor power is greater than 28%.

3/4.4.4 PRESSURIZER

A steam bubble in the pressurizer ensures that the RCS is not a hydraulically solid system and is capable of accommodating pressure surges during operation. The steam bubble also protects the pressurizer code safety valves and pilot operated relief valve against water relief.

The low level limit is based on providing enough water volume to prevent the low level interlock from de-energizing the pressurizer heaters during steady state operations. The high level limit is based on providing enough steam volume to prevent water relief through the pressurizer relief valves during the most challenging anticipated pressurizer insurge transient, which is a loss of feedwater. Since prevention of water relief is a goal for abnormal transient operation, rather than a Safety Limit, the value for high pressurizer level is nominal and is not adjusted for instrument error.

The ACTION statement provides 1 hour to restore pressurizer level prior to requiring shutdown. The 1-hour completion time is considered to be a reasonable time for restoring pressurizer level to within limits.

The pilot operated relief valve and steam bubble function to relieve RCS pressure during all design transients. Operation of the pilot operated relief valve minimizes the undesirable opening of the spring-loaded pressurizer code safety valves.

3/4.4.5 STEAM GENERATOR TUBE INTEGRITY

Steam generator (SG) tubes are small diameter, thin walled tubes that carry primary coolant through the primary to secondary heat exchangers. The SG tubes have a number of important safety functions. Steam generator tubes are an integral part of the reactor coolant pressure boundary (RCPB) and, as such, are relied on to maintain the primary system's pressure and inventory. The SG tubes isolate the radioactive fission products in the primary coolant from the secondary system. In addition, as part of the RCPB, the SG tubes are unique in that they act as the heat transfer surface between the primary and secondary systems to remove heat from the primary system. This Specification addresses only the RCPB integrity function of the SG. The SG heat removal function is addressed by LCO 3.4.4.1, "Coolant Loops and Coolant Circulation – Startup and Power Operation," and LCO 3.4.1.2, "Coolant Loops and Coolant Circulation – Shutdown and Hot Standby."

SG tube integrity means that the tubes are capable of performing their intended RCPB safety function consistent with the licensing basis, including applicable regulatory requirements.

Steam generator tubing is subject to a variety of degradation mechanisms. Steam generator tubes may experience tube degradation related to corrosion phenomena, such as wastage, pitting, intergranular attack, and stress corrosion cracking, along with other mechanically induced phenomena such as denting and wear. These degradation mechanisms can impair tube integrity if they are not managed effectively. The SG performance criteria are used to manage SG tube degradation.

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ID	**200710231009** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.4 Tim Kolb**; TB POC: ; JFD Number: **1**; Page Number(s): **188**; ITS Number: **3.4.9**; OSI: **None**; DOC Number: **None**; Bases JFD Number: **None**
Comment	**The completion time for Action B is inserting plant specific information in the bracket for 12 hours vice 24 hours. Please reference JFD 1 for this change. All that is indicated at this time is JFD 3 which does not talk about this change.**
Issue Date	**10/23/2007**
Close Date	**10/30/2007**

Responses

Licensee Response by Jerry Jones on 10/25/2007	As stated in the NRC reviewer's comment, the change to ISTS 3.4.9, Required Action B.2 (deleting the words "with RCS temperature less than or equal to [275] degrees F" and changing the Completion Time from 24 hours to 12 hours) is justified by Justification for Deviation (JFD) 3. The last sentence of JFD 3 (Volume 9, Page 190) states "Due to this change, the NOTE to the LCO has been deleted and the associated Required Action (Required Action B.2) and Completion Time has been modified to be consistent with the normal time provided in the ISTS to be in MODE 4." Thus, JFD 3 does discuss and justify the change and the addition of JFD 1 is not needed.
NRC Response by Timothy Kolb on 10/30/2007	Agree with licensee that JFD 3 does adequately support the change. No further action required.

Date Created: 10/23/2007 10:09 AM by Timothy Kolb
Last Modified: 10/30/2007 09:13 AM

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RAI Screening Required: No

Status: Approval Not Required

This is a Non RAI Dialogue

This document will not be relied upon by staff for disposition of the LAR

This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted)

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200710231028** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.4 Tim Kolb**; TB POC: ; JFD Number: **3**; Page Number(s): **189**; ITS Number: **3.4.9**; OSI: **None**; DOC Number: **None**; Bases JFD Number: **None**
Comment	**Deletion of SR 3.4.9.3 indicates that this is justified with JFD 3. This should be changed to indicate JFD 2. Also, JFD 2 should clearly state that SR 3.4.9.3 is being deleted because you get the impression that the only part that the JFD applies to is the bracketed information in SR 3.4.9.2.**
Issue Date	**10/23/2007**
Close Date	**10/30/2007**

Responses

Licensee Response by Jerry Jones on 10/25/2007	The comment is correct. Justification for Deviations (JFD) 3 is not the correct JFD and the ISTS Markup for ISTS SR 3.4.9.3 (Volume 9, Page 189) will be changed to annotate JFD 2. In addition, JFD 2 (Page 190) will be modified to clearly identify both the changes to ISTS LCO 3.4.9.b and ISTS SR 3.4.9.2, and the deletion of ISTS SR 3.4.9.3. A draft markup regarding these changes is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 10/30/2007	Changes proposed by licensee are adequate to address the question. No further action required.

Date Created: 10/23/2007 10:28 AM by Timothy Kolb
Last Modified: 10/30/2007 09:19 AM

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RAI Screening Required: Yes

This Document will be approved by: **Tim Kobetz**

This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted)

Status: Closed

Regulatory Basis must be included in Comments section of this Form

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200710231054** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.4 Tim Kolb**; TB POC: ; JFD Number: **1**; Page Number(s): **184**; ITS Number: **3.4.9**; OSI: **None**; DOC Number: **M.1**; Bases JFD Number: **3**
Comment	**Provide justification that the proposed surveillance frequency of 24 months is adequate to detect pressurizer heater degradation.** **This frequency is beyond the recommendation frequency specified in STS. JFD 1 only specifies that plant specific information has been added. How do you ensure heaters are OPERABLE prior to entering the Mode of Applicability following an outage? 10CFR50.36 requires surveillances to ensure the LCO can be met.** **Also see pages 189 and 190**
Issue Date	**10/23/2007**
Close Date	**11/28/2007**

Responses

Licensee Response by Bill Bentley on 11/14/2007	The essential pressurizer heaters are divided into two banks. Each bank is designed at 126KW each. One 126KW bank is powered from essential power train 1 and the other 126KW bank is powered from essential power train 2. The Davis Besse operating experience from essential pressurizer heater testing (procedure DB-SP-04368) and essential pressurizer heaters maintenance history (procedure DB-ME-09602) over the period of eight (8) fuel cycles (in years 1991 through 2006) was reviewed by Plant Engineering. The operation experience information shows that well over 150KW of essential pressurizer heaters has remained operable between refueling outages over the last 15 years. Over the span of eight (8) fuel cycles (or 15 years) the essential heaters had only one heater element failure (14KW loss) at any one given time (based on DB-ME-09602 data). The essential heaters never dropped less than 238KW (designed capacity) or less than an actual measured 247.13KW (calculated on actual voltage and current measurements per DB-SP-04368) at any one given time.

NRC Response by Timothy Kolb on 11/28/2007	Question has been adequately answered. No further questions at this time.

Date Created: 10/23/2007 10:54 AM by Timothy Kolb
Last Modified: 11/28/2007 07:03 AM

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RAI Screening Required: No

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Status: Approval Not Required

This document will not be relied upon by staff for disposition of the LAR

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200801140737**		Conference Call Requested? **No**	
Category	**In Scope**			
ITS Information	ITS Section: **3.4 Tim Kolb**	TB POC:	JFD Number: **None**	Page Number(s):
	ITS Number: **3.4.9**	OSI: **None**	DOC Number: **None**	Bases JFD Number: **None**
Comment	**This item is created to allow licensee to provide additional/updated information on the minimum capacity of essential pressurizer heaters. This information will be reviewed as an update to the ITS submittal.**			
Issue Date	**01/14/2008**			
Close Date	**02/19/2008**			

Responses

Licensee Response by Jerry Jones on 02/13/2008	Davis-Besse has re-evaluated the required essential pressurizer heater capacity to maintain RCS pressure following a loss of offsite power so that reactor coolant subcooling can be maintained. Davis-Besse has determined that only 85kW of essential pressurizer heaters are required, not the 150kW previously submitted. As shown in the ITS submittal, this value is not in the Davis-Besse current Technical Specifications. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment. Furthermore, this change supersedes the draft markup provided in the response to 200710011531, which was correcting a typographical error in Discussion of Change (DOC) M01 (the DOC that justifies the addition of the essential pressurizer heater value).
NRC Response by Timothy Kolb on 02/15/2008	Provide the analysis used to calculate the required essential pressurizer heater value.
Licensee Response by Bill Bentley on 02/18/2008	The requested calculation is attached, with names redacted. Some portions of the calculation package were not included, as noted on the second page.
NRC Response by Timothy Kolb on 02/19/2008	The attached PZR heater calculation has been reviewed and provides the requested information. The information supports the change to requiring 85kW of PZR heaters

	available since the conditions only need to be maintained for 15 hours instead of 100 hours as previously calculated. This is supported by the necessary changes to the FSAR in accordance with the 50.59 process. No further questions at this time. This item is closed.

Date Created: 01/14/2008 07:37 AM by Timothy Kolb
Last Modified: 02/19/2008 10:23 AM

FirstEnergy	**CALCULATION** NOP-CC-3002-01 Rev. 03	Page i

CALCULATION NO. C-NSA-064.02-016 Rev. 1	**INITIATING DOCUMENT** CR 07-16199	**[ ] VENDOR CALC SUMMARY** **VENDOR CALCULATION NO.**

☐ BV1	☐ BV2	☒ DB	☐ PY

Title/Subject: Minimum Essential Pressurizer Heater Capacity

Category	☒ Active	☐ Historical	☐ Study
Classification	☐ Tier 1 Calculation	☒ Safety-Related/Augmented Quality	☐ Nonsafety-Related
Open Assumptions?	☐ Yes ☒ No	If Yes, Enter Tracking Number	
System Number	Various		
Functional Location	Various		
Commitments:	N/A		
(Perry & Davis-Besse Only)	Calculation Type: ~~Safety Related~~ NA MZV 12/12/07	Referenced In Atlas?	☐ Yes ☒ No
(Perry Only)	Referenced In USAR Validation Database	☐ Yes ☐ No	

Computer Program(s)

Program Name	Version / Revision	Category	Status	Description
Fortran	N/A	C	Active	Software development tool

Rev.	Affected Pages	Originator (Print, Sign & Date)	Reviewer/Design Verifier (Print, Sign & Date)	Approver (Print, Sign & Date)
0	Original	Dennis Blakely, 10/13/89	William DeJong, 11/10/89	Frank Swanger, 12/18/89
	Description of Change: N/A			Initiating Document:
	Describe where the calculation will be evaluated for 10CFR50.59 applicability.			
Rev.	Affected Pages	Originator (Print, Sign & Date)	Reviewer/Design Verifier (Print, Sign & Date)	Approver (Print, Sign & Date)
1	All	[redacted] 12-11-07	[redacted] 12/12/07	[redacted] 12/12/07
	Description of Change: Calculation is revised to include new ambient heat loss value of 210.0 KW			Initiating Document: CR 07-16199
	Describe where the calculation will be evaluated for 10CFR50.59 applicability. RAD and Screen 07-05280-00			
Rev.	Affected Pages	Originator (Print, Sign & Date)	Reviewer/Design Verifier (Print, Sign & Date)	Approver (Print, Sign & Date)
	Description of Change:			Initiating Document:
	Describe where the calculation will be evaluated for 10CFR50.59 applicability.			

FirstEnergy	CALCULATION NOP-CC-3002-01 Rev. 03
CALCULATION NO. C-NSA-064.02-016 Rev. 1	**[ ] VENDOR CALC SUMMARY** **VENDOR CALCULATION NO.**

These Records are not included since they add nothing with respect to the calculation
WJBentley 2-18-08

CALCULATION NO. C-NSA-064.02-016 Rev. 1	[ ] VENDOR CALC SUMMARY
	VENDOR CALCULATION NO.

OBJECTIVE OR PURPOSE:

This calculation is being performed in response to a request from Operations to determine the necessary minimum essential Pressurizer heaters which must be available to continue plant operation without taking action to restore lost capacity. This calculation will determine the heaters needed to meet the acceptance criteria (see below) for leaks from 0 gpm to 2 gpm out the Pressurizer Safety Valves/Pilot Operated relief Valve (PSV's/PORV).

SCOPE OF CALCULATION/REVISION:

Revision 1 updates the minimum essential Pressurizer heater capacity based on the new 198.4KW ambient heat loss value measured during 14 RFO in 2006 per DB-OP-06003(DIN 2) Section 4.5. This calculation conservatively uses an ambient heat loss value of 210.0 KW to bound possible future increases in ambient heat losses.

SUMMARY OF RESULTS/CONCLUSIONS:

The required heater capacity is 85 KW when ambient heat loss is 210.0 KW or less with no leakage through the PSV's/PORV. If PSV's/PORV leakage is occurring, see Attachments 6 and 7.

LIMITATIONS OR RESTRICTIONS ON CALCULATION APPLICABILITY:

This calculation is only valid for a Pressurizer ambient heat loss of 210.0 KW and leakage through the PSV's/PORV over a range of 0 to 2 gpm.

IMPACT ON OUTPUT DOCUMENTS:

The results of this calculation will support the implementation of the new Improved Technical Specifications (Limiting condition for operation 3.4.9.b).

DB-OP-06003 Pressurizer Operating Procedure: Notification 600429120

SD-039A Reactor Coolant System Description: Notification 600430402

FirstEnergy

NOP-CC-3002-01 Rev. 03

CALCULATION

CALCULATION NO. C-NSA-064.02-016 Rev. 1	**[ ] VENDOR CALC SUMMARY** **VENDOR CALCULATION NO.**

DOCUMENT INDEX

DIN No.	Document Number/Title	Revision, Edition, Date	Reference	Input	Output
1	C-NSA-064.02-010 Pressurizer Pressure Decay Due To Ambient Losses & Steam Leakage	Rev.0 6/23/1987	☒	☒	☐
2	DB-OP-06003 Pressurizer Operating Procedure System STATUS FILE COVER SHEET: Section 4.5 page 25	Rev. 18 DB-OP-06003 Rev.18 4/24/06 (Attachment 11)	☒	☒	☐
3	DB-OP-06003 Pressurizer Operating Procedure		☐	☐	☒
4	USAR Section Table 5.1-4 Pressurizer Design Data	Rev. 25 6/06	☐	☒	☐
5	Engineer In-Training Reference Manual	8th Edition	☐	☒	☐
6	Reactor Coolant System Description SD-039A TABLE 2.4-4	Rev.5	☐	☒	☐
7	Technical Specification 3/4.7.1.4 Condensate Storage Tanks	309	☒	☐	☐
8	Not used		☐	☐	☐
9	Reactor Coolant System Description SD-039A TABLE 2.4-4	Rev.0	☒	☐	☐
10	DB-SP-03357 RCS Water Inventory Balance	Rev.11	☒	☐	☐
11	Improved Technical Specifications Limiting Condition for Operation 3.4.9.b	Rev.0	☐	☐	☒
12	Not used		☐	☐	☒
13	DB-PF-06705 Tank Level Calibration Curves	Rev.7	☐	☒	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
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			☐	☐	☐

FirstEnergy

CALCULATION COMPUTATION

NOP-CC-3002-01 Rev. 03

CALCULATION NO. C-NSA-064.02-016

Revision R 01

ANALYSIS METHODOLOGY

This calculation uses the primary Fortran computer code named PZR used in Calc C-NSA-64.02.016, Rev.0 The program has been modified to allow it to be compiled using a VAX/VMS operating system. See Attachment 1 for program listing.

The remainder of the program is the same as the previous program (except for minor read, write, and format changes to accommodate different user needs and compiler differences). The program calculates the Pressurizer pressure and temperature at each time step by summing all the energy gains and losses and mass gains and losses, and assuming the Pressurizer stays at a quasi steady state condition.

The modeling utilized by the PZR program is based on the following:

- The PZR program uses an iterative method to find a heater capacity which will keep the Pressurizer above a user specified temperature for a user specified period of time. When the calculated time to reach the selected temperature is 2 hours off from the selected time, heater capacity is added or removed in 10 KW increments. When calculated time to reach the desired temperature is within 2 hours of the desired time, heater capacity is changed in 0.5 KW increments. The program will adjust heater capacity until the calculated time is within one time step of the desired time.
- The program allows the user to select an automatic process which inputs all normally manual input data and calculates the desired time for a user specified series of leak sizes. The program creates the normal output of each iteration for each leak size in PZR.OUT and writes a summary of the final iteration for each leak size in SUM.OUT.
- The program is set up to utilize the Davis-Besse Pressurizer mass 275000 lbm and heat capacity 0.1 BTU/^{0}F-lbm (DIN 5 P.21-7).
- The program calculates the steam space size based on a Pressurizer size of 1500 ft^3 (DIN 6) and the user specified liquid volume.
- Pressurizer shell metal heat capacitance is modeled.
- The ambient heat losses are proportional to the difference between the containment atmosphere temperature and the Pressurizer temperature.
- See Section 3.0 of C-NSA-064.02-010 (DIN 1) for an explanation of the theoretical basis of the PZR program and derivation of the principle equations.

ASSUMPTIONS

- The Pressurizer metal and Pressurizer steam/water are at thermal equilibrium. This is a conservative assumption because the transient is slow (15 hours to go from 650^{o}F to 580^{o}F)
- Steam leakage is proportional to the Pressurizer pressure due to choking.
- The Pressurizer is modeled as a single volume made up of saturated steam and liquid.
- Make up enters the Pressurizer via the surge line and mixes perfectly. This is conservative assumption because the heaters and inlet nozzle distribute flow in the Pressurizer.

- No thermal stratification occurs in the water region due to in surges from the RCS. RCS in surges maintain the Pressurizer water level at 220". This flow along with the operation of the Pressurizer heaters maintain a homogenous temperature in the water region.
- The thermal diffusivity of the insulation is negligible compared to the rate of temperature change (the exterior of the insulation stays in equilibrium with the containment).
- Heat capacitance of the Pressurizer insulation is ignored.
- A 1gpm leak is conservatively estimated to equal 500 lbm/hr:

  70°F water $1\frac{gal}{min} * \frac{1}{7.48}\frac{ft^3}{gal} * 62.3\frac{lbm}{ft^3} * \frac{60\ min}{1\ hr} = 499.7\frac{lbm}{hr}$

  500 lbm/hr is therefore conservative and envelopes any leak measurement methods or temperatures. Note: The density of water is inversely proportional to its temperature. Therefore it is conservative to use the density of water at 70°F (initial Pressurizer water temperature DIN 6) when calculating mass flowrate of the 1 gpm leak above.

ACCEPTANCE CRITERIA

The Technical Specifications (DIN 7) require an adequate steam plant water supply to allow the plant to maintain a post trip hot standby condition for 13 hours prior to starting a natural circulation cooldown. In order to ensure the NSS (RCS) is less restrictive, a standby time of 15 hours was used. It is necessary to have a 20^0F subcooled margin to allow restart of the RCP's. If decay heat is being removed through the Main Steam Safety Valves (MSSV's), which are set at 1050 psig to 1100 psig, the RCS will be at a nominal 555^0 F. Allowing for a 5^0 F ΔT in the RCS, would require a Pressurizer temperature of 580^0 F (T_{Hot}=560^0 F) after 15 hours. The 15 hours provides a margin, as do other conservatisms in the calculation. Therefore, this calculation determines the amount of heaters necessary to keep the Pressurizer above 580°F for 15 hours.

DESIGN INPUTS

For the analyses performed in this calculation, a number of input parameters are constants. These constants are described below.

- Pressurizer Vessel Mass: From DIN 4 (p.5.1-12) the vessel dry mass is 304,000 lb. To be conservative this analyses assumed a Pressurizer vessel mass of 275,000 lb.
- Pressurizer Specific Heat : Cp $\cong$ 0.1 BTU/ lb °F (DIN 5 P.21-7)
- Pressurizer Pressure: Nominal Pressurizer pressure $\cong$ 2155 psig (DIN 6)
  This calculation uses an initial Pressurizer pressure of 2170 psig.
- Pressurizer Volume: The total volume is 1500 ft^3 (DIN 6). Note: The normal water volume is calculated to be 950 ft^3 (DIN 13), this value corresponds to the current operating Pressurizer water level of 220"(DIN 6). This calculation conservatively uses the following

  V_{LIQ} = 850 ft^3 (DIN 13)

  V_{STM} = 1500 – 850 = 650 ft

- Ambient Heat Loss Value Program Verification Section: 136 KW (DIN 1)
- Ambient Heat Loss Value Computation Section: 198.4 KW (DIN 2).
  Note: this ambient heat loss value was measured with 0.138 gpm leakage through the PSV's/PORV (DIN 10). This calculation conservatively uses an ambient heat loss value of 210.0 KW with 0 gpm leakage through the PSV's/PORV to bound future increases in ambient heat losses.
- RCS Enthalpy: 525 BTU/lb (DIN 1)
- Containment temperature: 120 °F (DIN 1)

Note: The minimum essential Pressurizer heaters required to maintain the Pressurizer fluid above 580 °F for 15 hours is mostly influenced by the amount of leakage through the PSV's/PORV and is not very sensitive to the containment temperature. With low leakage rates the minimum essential Pressurizer heater capacity with a Containment temperature of 90 °F is slightly greater than what is required with a Containment temperature of 120 °F. However as the leakage rate increases the results for both cases are virtually identical (less than 1% difference). In light of this and the fact that area around the Pressurizer is hotter than the average containment temperature, a Containment temperature 120 °F is a conservative value for this calculation. See Attachment 9 for a comparison of the amount of heaters necessary to maintain the Pressurizer fluid above 580 °F for 15 hours with a Containment temperature of 90 °F and 120 °F. Both cases use an ambient loss value of 210.0 KW and leakage through the PSV's/PORV ranging from 0.0 gpm to 2.0 gpm.

PROGRAM VERIFICATION

The verification of the revised program will be done in steps. First, the ability of the new program is compared to the output of DIN 1 for Case No.1 of Section 7.0. A copy of the DIN 1 followed by the output of the revised code is given in Attachment 2. Note that this case was run with a Pressurizer heating capacity of 0 KW, 0 gpm leakage and 136 KW ambient losses. The two cases give excellent agreement throughout the period covered with both predicting a temperature of 580°F at 13 hours.

Next, the program was run in manual search mode to demonstrate the program's capability to find a specific heater/leak/time combination. This run determined that 0 KW of heaters are required to maintain the Pressurizer temperature above 580 °F for 13 hours with 0 gpm leakage through the PSV's/PORV and an ambient loss value of 136 KW. The results of this run included in Attachment 3 contain the first two heater combinations used by the program and the last two heater combinations used. This was done due to the volume of intermediate steps. In all, twenty three heater combinations were used to find the proper solution. This slow convergence is attributed to the fact that the heaters are only changed in 0.5 KW increments when calculated time to reach the desired temperature is within 2 hours of the desired time. This increases the accuracy of the results.

Next, a manual search for the number of heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 136 KW ambient losses for leakage rates of 0 gpm and 1 gpm will be made. These two final answers will then be used to show the automatic mode's capability. Then an automatic search will be performed to find the number of heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 136 KW ambient losses with leakage through the PSV's/PORV ranging from 0.0 gpm to 2.0 gpm. The results of the automatic case will then be compared to the results of the manual cases. The information from the summary file from the automatic mode indicate heaters of 16.5 KW are needed for the 0 gpm case and 88.0 KW are needed for the 1 gpm case. The manual mode shows 16.5 KW heaters are needed for 0 gpm and 88.0 KW are needed for the 1 gpm case. The results of both modes agree. The validity of the automated program has therefore been established. The results of manual and automatic searches for the 0 gpm and 1 gpm cases are provided in Attachments 4 and 5 respectively.

COMPUTATION

An automatic run of the program will be made for leak rates ranging from 0.0 gpm (0.0 lbm/hr) to 2.0 gpm (1000 lbm/hr) in 50 lbm/hr steps. This is being done in response to CR 07-16199 which identified a new value of 198.4 KW for ambient losses to the containment atmosphere. This calculation conservatively uses an ambient heat loss value of 210.0 KW to bound possible future increases in ambient heat losses. The output to the summary file is included in Attachment 8. Note that above each summary is the leak rate in gpm and the heater solution for that leak. This data has been used to prepare a plot of the output in terms that operations personnel can use (Attachment 5).

RESULTS/CONCLUSIONS

The graph provided in Attachment 6 shows the amount of essential heaters required to stay above 580°F in the Pressurizer for 15 hours with the specified total leak rate through PSV's/PORV and an ambient heat loss of 210.0 KW. The table following the graph lists the data points (Attachment 7).

```
      Program PZR
C    ******************************************************
C       Program for calculating transient Pressure Decay  *
C       In the Pressurizer due to Ambient Heat Losses and  *
C      a Steam Leak out the primary safety valves.        *
C    ******************************************************
C    ****** Initialize problem *******
C
C    ******************************************************
C      a Steam Leak out the primary safety valves.        *
C       In the Pressurizer due to Ambient Heat Losses and  *
C       Program for calculating transient Pressure Decay  *
C    ******************************************************
      Program PZR
C    ******************************************************
C       Program for calculating transient Pressure Decay  *
C       In the Pressurizer due to Ambient Heat Losses and  *
C      a Steam Leak out the primary safety valves.        *
C    ******************************************************
C
C     ****** Initialize problem *******
      character*60 titl
      character*1 ives,imuk,iamb,istart
      xmves=275000.0
      vescp=0.100
      jmuk=1
C
C     ******* Open Output File Sum.out must already exist ***
       open(6,file='sum.out',status='old')
C     **** Allow automatic data generation for increasing leak sizes
      write(*,700)
700   format( ' Do you want auto leak increments? (type 1 for yes) ')
      read(*,701)kflag
701   format(I1)
      if(kflag.ne.1) go to 702
      titl='autocalc'
      ives='Y'
      iamb='Y'
      jmuk=1
      irun=1
      open(4,file='pzr.in',status='old')
      read(4,705)p0,vliq,qamb0,qhtr,hrcs,tamb,temfin,tend,dt,iprnt
705   format(9E9.4,I3)
      vstm=1500.0-vliq
      write(*,704)
704   format(' Enter Smallest Leak Size (lbm/hour)(form x.y)')
      read(*,703)wlek0
703   format(E9.3)
      write(*,706)
706   format(' Enter Largest Leak Size (lbm/hr)(form x.y)')
      read(*,703)flek
      write(*,707)
707   format(' Enter Leak Step Size (form x.y)')
      read(*,703)slek
      xcase=1.0
```

```
      go to 909
C
C     ****Title Entry****
C
702   write(*,3)
3     format(' Enter Case Number ')
      read(*,500)xcase
      write(*,4)
4     format(' Enter Case Description (60 characters max) ')
      read(*,'(a60)')titl
C
C     **** Select Pressurizer Model ****
C
      write(*,5)
5     format(' Is pressurizer metal to be modeled?(Cap Y for yes)')
      read(*,'(a1)')ives
      if(ives.eq.'Y') go to 100
      xmves=0.0
      vescp=0.0
100   continue
C
C     **** Initialize Problem ****
C
      write(*,7)
7     format(' Perform automatic restarts at the initial
     / conditions to search',/,' for a specific combination
     / of heaters, leaks, and time? (Cap Y for yes)')
      read(*,'(a1)')istart
      if(istart.eq.'Y')irun=1
      write(*,8)
8     format(' Enter: Starting Pressure (psia)(f.f)')
      read(*,500)p0
500   format(e9.3)
      write(*,9)
9     format(' Enter: Liquid Volume (cu. ft.)(f.f)')
      read(*,500)vliq
      vstm=1500.0-vliq
      write(*,10)
10    format(' Enter Ambient Heat Loss (KW) (f.f)')
      read(*,500)qamb0
      write(*,11)
11    format(' Enter leakrate (lbm/hr)(f.f) ')
      read(*,500)wlek0
      write(*,12)
12    format(' Enter Essential Heater Capacity (KW)(f.f) ')
      read(*,500)qhtr
      write(*, 13)
13    format(' Enter Average RCS enthalpy for period (BTU/lbm)(f.f) ')
      read(*,500)hrcs
C
C     **** Check for variable ambient losses and makeup ****
C
      write(*,14)
14    format(' Vary PZR ambient losses w/ pressure?',
     /' (Cap Y for yes) ')
```

```
      read(*,'(a1)')iamb
      if(iamb.ne.'Y')go to 107
      write(*,15)
15    format(' Enter ambient containment temperature (deg. F)')
      read(*,500)tamb
107   continue
C
      write(*,16)
16    format(' Do you want to maintain a constant PZR Level?
     / (Cap Y for yes) ')
      read(*,'(a1)')imuk
C     ****Select Iteration Mode ****
C
C     ****Select Iteration Mode ****
C
      write(*,17)
17    format(' Specify lowest temperature to solve for ')
      read(*,500)temfin
      write(*,18)
18    format(' Specify time to reach the above temp in hours ')
      read(*,500)tend
300   continue
C
C     **** Specify time step and output frequency ****
C
      write(*,20)
20    format(' Enter time step interval (hours) and number of',
     / 'time steps per printout interval: .FFF,ii ')
      read(*,*)dt,iprnt
C
C     **** Reproduce Input Conditions ****
C
909   continue
      open(5,file='pzr.out',status='old')
910   continue
      write(5,411)titl,xcase
      write(5,320)xmves,vescp,vliq,vstm,qhtr,qamb0,wlek0,
     / tamb,hrcs
320   format (/,15x,' Initial Conditions ',/
     / /,2x,'PZR Mass  = ',f7.0,' LBM',8x,'PZR Cp   = ',f6.3,' BTU/#-F',
     / /,2x,'Liq Vol   = ',f6.2,'  ft3',8x,'Stm Vol  = ',f6.2,' ft3',
     / /,2x,'Htr Cap   = ',f6.2,'  kW ',8x,'Amb Loss = ',f6.2,' kW',
     / /,2x,'Leak Rate = ',f6.2,'  #/hr',7x,'CTM Temp = ',f6.2,' Deg F',
     / /,2x,'RCS Ave h = ',f6.2,'  BTU/lbm',/)
C
C     **** Initialize Transient ****
C
      call steam(2,p0,hi,ti1,vi,1.0,d1,hg,d2,vg,d3,ug)
      call steam(2,p0,hi,ti2,vi,0.0,hf,d1,vf,d2,uf,d3)
      t0=(ti1+ti2)/2
      time=0.0
      pold=p0
      icount=iprnt
c
      xmliq=vliq/vf
```

```
    xmstm=vstm/vg
    xmass=xmstm+xmliq
c
    epres=(xmliq*uf)+(xmstm*ug)
    w0=wlek0
    wleak=w0
    q0=qamb0
    qamb=q0
    psat=p0
    tsat=t0
    dm=0.0
    ipag=50
C
C   **** begin transient ****
C
400  continue
    if(icount.lt.iprnt) go to 405
    ipag=ipag+1
    if(ipag.lt.50)go to 410
    write(5,411)titl,xcase
411  format(//,' Davis-Besse Nuclear Power Station ',/,
   / 2x,' Title: ',a60,/,2x,' Case: ',F4.1)
    write(5,412)
412  format(//,' Time   Pressure   Temp    Mass',
   /'  Energy  Ambient Loss  Stm Leak',/,
   /'  (hr)   (PSIA)    (F)    (LB)',
   /'  (MBTU)      (kW)     (#/hr)',/)
    ipag=1
410  continue
    epresm=epres/1.0e06
    write(5,414)time,psat,tsat,xmass,epresm,qamb,wleak
414  format(2x,f6.2,2x,f8.1,4x,f8.2,2x,f8.0,2x,f6.2,4x,f8.2,
   / 5x,f8.2)
    icount=0
C
405  icount=icount+1
    time=time+dt
C
    if(tsat.lt.temfin) go to 911
C
C   *** Estimate Pressurizer Mass ****
C
317  if(jmuk.ne.-1.and.dm.eq.0.0) dm=(wleak*dt)
    xm=xmass+dm-(wleak*dt)
C
C   **** Establish Properties at Psat ****
C
    call steam(2,psat,hi,tgat,vi,1.0,d1,hg,d2,vg,d3,ug)
    call steam(2,psat,hi,tfat,vi,0.0,hf,d1,vf,d2,uf,d3)
    tsat=(tgat+tfat)/2
C
C   **** Calculate new energy balance and VA ****
C
    ein=(dm*hrcs)+ (qhtr*3413.0*dt)
    eout=((wleak*hg)+(qamb*3413.0))*dt
```

```
      de=(ein-eout)
      va=(vliq+vstm)/xm
C
C     **** Calculate new Pressure ****
C
      dp=pold-psat
      if(dp.eq.0) dp=10
      iter=0
C
416   continue
      p=psat-dp
      iter=iter+1
C
      call steam(2,p,hi,tgg,vi,1.0,d1,hg,d2,vg,d3,ug)
      call steam(2,p,hi,tfg,vi,0.0,hf,d1,vf,d2,uf,d3)
      tg=(tgg+tfg)/2
C
C     **** Calculate Energy Losses from PZR Metal ****
C
      deves=0.0
      if(ives.eq.'Y') deves=(tsat-tg)*xmves*vescp
      ea=epres+deves+de
      ua=ea/xm
      x=(va-vf)/(vg-vf)
      uc=uf+(x*(ug-uf))
      x=(va-vf)/(vg-vf)
      ua=ea/xm
      ea=epres+deves+de
      if(ives.eq.'Y') deves=(tsat-tg)*xmves*vescp
      deves=0.0
C
C     **** Calculate Energy Losses from PZR Metal ****
C
      tg=(tgg+tfg)/2
      call steam(2,p,hi,tfg,vi,0.0,hf,d1,vf,d2,uf,d3)
      call steam(2,p,hi,tgg,vi,1.0,d1,hg,d2,vg,d3,ug)
C
      iter=iter+1
      p=psat-dp
416   continue
      p=psat-dpp=psat-dp
      iter=iter+1
C
      call steam(2,p,hi,tgg,vi,1.0,d1,hg,d2,vg,d3,ug)
      call steam(2,p,hi,tfg,vi,0.0,hf,d1,vf,d2,uf,d3)
      tg=(tgg+tfg)/2
C
C     **** Calculate Energy Losses from PZR Metal ****
C
      deves=0.0
      if(ives.eq.'Y') deves=(tsat-tg)*xmves*vescp
      ea=epres+deves+de
      ua=ea/xm
      x=(va-vf)/(vg-vf)
      uc=uf+(x*(ug-uf))
```

```
      du=uc-ua
      if(abs(du).lt.0.01) go to 415
C
      dp=dp+(du/0.12)
C
      if(iter.gt.25) stop
      go to 416
415   continue
C
C     **** check DM assumption ****
C
      if(jmuk.eq.-1) go to 800
C
      vliqc=vf*xm*(1.0-x)
      dvl=vliq-vliqc
      if(abs(dvl).lt.0.5) go to 800
C
      dm=dm+1.0*((dvl/vf)-(dvl/vg))
      go to 317
800   continue
C
C     **** Update paramaters ****
C
      pold=psat
      psat=p
      xmass=xm
      epres=ea
      tsat=tg
C
C     **** Calculate Leak Flow and Ambient Heat Loss
C
      wleak=w0*psat/p0
      if(tamb.ne.0.0) qamb=q0*(tsat-tamb)/(t0-tamb)
      go to 400
C
900   continue
C
C     **** Restarts problem with new heater value if selected ****
C
911   write(5,414)time,psat,tsat,xmass,epresm,qamb,wleak
      if(irun.ne.1) go to 999
      if(abs(time-tend).lt.dt) go to 998
      bank=0.5
      mx=1
      if(abs(time-tend).gt.2.0) bank=10.0
      if(time.gt.tend) mx=-1
      qhtr=qhtr+(mx*bank)
      go to 910
998   continue
      vleak=wlek0/500
      write(6,411)titl,xcase
      write(6,320)xmves,vescp,vliq,vstm,qhtr,qamb0,wlek0,tamb,hrcs
      write (6,801) vleak,qhtr,dt
801   format(/,' Leak Size = ',f7.4,' gpm ',3x,'Heaters Required = ',
     / f7.1,' kW',/,'Time Step = ',f4.3,' hours',/)
```

```
      write(6,412)
      write(6,414)time,psat,tsat,xmass,epresm,qamb,wleak
      if(kflag.ne.1) go to 999
      wlek0=wlek0+slek
      if(slek.lt.0.0) go to 851
      if(wlek0.gt.flek) go to 999
      go to 852
851   if(wlek0.lt.flek) go to 999
852   xcase=xcase+1.0
      go to 909
999   stop
      end
C
C     ***********************************************************
C
      subroutine steam(n,p,h,t,v,x,hf,hg,vf,vg,uf,ug)
      data a,b,c /6.8948e-3,2.326e-3,0.06242/
      ps=p*a
      hs=h*b
      if(t.gt.-460.0) ts=(t-32.0)/1.8
      call phtv(n,ps,hs,ts,vs,x,hfs,hgs,vfs,vgs)
      h=hs/b
      t=ts*1.8+32.0
      v=vs/c
      hf=hfs/b
      hg=hgs/b
      vf=vfs/c
      vg=vgs/c
      uf=hf-(p*vf*144/778)
      ug=hg-(p*vg*144/778)
      return
      end
C*****************************************************************
C*                                                          *
C*  For SI Unit                                             *
C*  Steam Table FIt Range: (2.6psi=)0.018MPA<P<20MPA(=2900psi)  *
C*                        0<T(C)<500                        *
C*  N   Input   Output        Two-phase Region Only         *
C*                                                          *
C*  1   P,h     T,v,X,hf,hg    vf,vg,tf,tg                  *
C*  2   P,X     h,T,v, ,hf,hg  vf,vg,tf,tg                  *
C*  3   P,T     h, ,v,X,hf,hg  vf,vg,tf,tg                  *
C*  4   P,h,X   T,v, ,hl,hg    vl,vg,tl,tg                  *
C*  5   P,h, hl T,v,X, ,hg     vl,vg,tl,tg                  *
C*                                                          *
C*             Deviation            Deviation               *
C* T(c)           0.6        V(m3/kg)     0.75%             *
C* Tsf(C)         0.34       Hsf(MJ/KG)   0.42%             *
C* Tsg(C)         0.33       Hsg (MJ/KG)  0.02%             *
C* Tfg(C)         0.41       Vsf (MJ/KG)  0.35%             *
C*                           Vsg (MJ/KG)  0.68%             *
C*                                                          *
C*  ***Note: Input data start in second column              *
C*****************************************************************
C
```

```
      subroutine phtv(n,p,h,t,v,x,hf,hg,vf,vg)
      i=1
      if(p.lt.2.54) i=2
      if(p.lt.0.254) i=3
      if(n.eq.5) dy=hf
C     ***************************************************sat. enthalpy
      call hs(i,p,hf,hg)
C     ************************************************function select
      go to (60,20,40,50,80),n
60    x=(h-hf)/(hg-hf)
      ix=x*2.0-1.0
      if(ix) 10,20,30
50    if((x.le.(h-hf)/(hg-dy)).or.(x.gt.0.99)) go to 20
      hf=(h-x*hg)/(1-x)
      go to 20
80    if(dy.lt.hf) hf=dy
      go to 60
C     ********************************************** subcooled region
10    call tvf(i,p,h,t,v,x)
      return
C     ********************************************** two phase region
20    call tvf(i,p,hf,tf,vf,dy)
      call tvg(i,p,hg,tg,vg,dy)
      t=tf+(tg-tf)*x
90    v=vf+(vg-vf)*x
      h=hf+(hg-hf)*x
      return
C     **************************************** superheated region
30    call tvg (i,p,h,t,v,x)
      return
C     **************************************** Root finding for n=3
40    call tvf(i,p,hf,tf,vf,dy)
      call tvg(i,p,hg,tg,vg,dy)
      x=(t-tf)/(tg-tf)
      ix=x*2-1.0
      if(ix.ge.0)h=hg+(t-tg)*0.0035
      if(ix.le.0)h=hf+(t-tf)*0.0045
      if(ix.ge.0)h=hg+(t-tg)*0.0035
      h2=h+0.01
      if(ix.le.0)call tvf(i,p,h2,t2,v,x)
      if(ix.ge.0)call tvg(i,p,h2,t2,v,x)
      do 52 j=1,20
      if(ix.le.0)call tvf(i,p,h,t1,v,x)
      if(ix.ge.0)call tvg(i,p,h,t1,v,x)
      if(abs(t1-t2).le.0.01) return
      dy=(h-h2)*(t-t1)/(t2-t1)
      h2=h
      t2=t1
52    h=h-dy
      return
      end
c     *****************************************************************
      subroutine tvf(i,p,h,t,v,x)
      dimension c(8,3),d(8,3)
      data c,d /
```

```
     c   .999188e-03,  .365564e-03,  -.453015e-03,  .535586e-03,
     c  -.313119e-03,  .840313e-04,  -.471833e-06, -.112135e-05,
     c   .100003e-02,  .289623e-03,  -.107606e-04, -.391337e-03,
     c   .527342e-03, -.197494e-03,  -.535778e-06, -.130627e-05,
     c   .100017e-02,  .143832e-03,   .159702e-02, -.680383e-02,
     c   .115173e-01, -.705069e-02,  -.494504e-06, -.603751e-05,
     c  -.210988e+00, -.236060e+00,   .258339e+03,  .114507e+00,
     c  -.183594e+05, -.191390e+01,  -.169846e+01,  .442107e-01,
     c  -.211215e+00, -.239750e+00,   .223402e+03,  .149138e+00,
     c   .154974e+05, -.142742e+02,   .451826e+01, -.413036e-01,
     c  -.993287e-01, -.186423e+00,   .120130e+03, -.376364e+00,
     c   .118161e+06, -.118172e+03,   .130407e+03, -.190300e+02/
      h2=h*h
      h3=h2*h
      x=0.0
      v=c(1,i)+h2*(c(2,i)+h*((c(3,i)+c(8,i)*p)+h*(c(4,i)
     1 +h*(c(5,i)+h*c(6,i)))))+c(7,i)*p
      t=d(1,i)+h*(d(3,i)+d(4,i)*p+d(5,i)*v+h3*(d(6,i)+
     1  h*(d(7,i)+d(8,i)*p)))+d(2,i)*p
      return
      end
c     ***************************************************************
      subroutine tvg(i,p,h,t,v,x)
      dimension a(24), b(48)
      common /ptv/ p2,p3,h2,h3
      data a,b /
     c -.677906e-03, -.203433e+00, .101584e+00, .424347e-02,
     c -.817181e-03,  .491944e-04, -.845092e-06, .232192e-06,
     c  .451866e+00, -.384700e+00, .874351e-01, -.176215e-03,
     c  .656127e-05, -.258968e+00, .905559e-01, -.114619e-01,
     c  .142021e+01, -.133357e+01, .415940e+00, -.431492e-01,
     c -.353044e+00,  .148183e+00, -.359236e-01, .291338e-02,
     c  .148871e+04, -.255685e+05, .124939e+05, -.168816e+01,
     c  .930071e+04, -.463394e+05, -.174152e+03, -.333183e+05,
     c  .394599e+00, -.232106e-02, -.454377e+03, .149634e+03,
     c -.139017e+02,  .313127e+02, -.293547e+01, .283482e-01,
     c  .512073e+04, -.576867e+04, .167389e+04, -.132115e+02,
     c  .439440e+01, -.395979e+00, .575157e+04, -.517963e+04,
     c  .156062e+04, -.157129e+03, -.123211e+04, .113388e+04,
     c -.348469e+03,  .357562e+02, .236432e+01, -.718216e+00,
     c -.136998e+04,  .538993e+03, .438502e+01, -.217310e+01,
     c  .256647e+00,  .574552e+05, -.740565e+05, .367921e+05,
     c -.861864e+04,  .909206e+03, -.302121e+02, -.518790e+05,
     c  .657443e+05, -.311965e+05, .656905e+04, -.517906e+03/
      h2=h*h
      h3=h2*h
      x=1.0
      go to (10,20,30),i
10    v=a(1)+(a(2)+h*(a(3)+h3*(a(4)+h*a(5))))/p
     1 +p*(a(6)+h3*h2*(a(7)+a(8)*h))
      t=b(1)+p*(b(14)+p*(b(15)+b(16)*p))+h2*(b(9)*p2+
     1 b(10)*p3+h*(b(11)+h*(b(12)+b(13)*h)))+v*(b(2)+
     2 h*(b(3)+b(4)*p3)+p*(b(5)+v*(b(6)+p2*(b(7)+v*v*
     3 b(8)))))
      return
```

```
20    v=a(9)+h*(a(10)+h*(a(11)+h2*h2*(a(12)+h2*a(13))))
    1  +(a(14)+h2*(a(15)+h*a(16)))/p
      t=b(17)+p*(b(23)+p*(b(27)+b(31)*p)) + h*(b(18)+p*(b(24)+
    1  p*(b(28)+b(32)*p))+h*(b(19)+p*(b(25)+b(29)*p)+
    2  h*(p*(b(26)+b(30)*p)+h3*(b(20)+h*(b(21)+h*b(22))))))
      return
30    v=a(17)+h*(a(18)+h*(a(19)+a(20)*h))+
    1  (a(21)+h2*(a(22)+h*(a(23)+a(24)*h)))/p
      t=b(33)+h*(b(34)+h3*(b(35)+h*(b(36)+b(37)*h))) +
    1  p*(b(38)+h*(b(39)+h*(b(40)+h*(b(41)+h*(b(42)+b(43)*h)))))
    2  +p*(b(44)+h*(b(45)+h*(b(46)+h*(b(47)+b(48)*h)))))
      return
      end
c     ************************************************************
      subroutine hs(i,p,hf,hg)
      dimension e(7,3),f(7,3)
      common /ptv/ p2,p3,h2,h3
      data e,f /
     c  .636204e+00,  .174102e+00,  -.220086e-01,  .205320e-02,
     c -.104990e-03,  .230396e-05,  -.191656e-10,  .362749e+00,
     c  .898611e+00, -.985891e+00,   .731280e+00, -.294829e+00,
     c  .503356e-01, -.203285e-03,   .142732e+00,  .692175e+01,
     c -.873682e+02,  .700744e+03,  -.297843e+04,  .527922e+04,
     c -.227851e+05,  .276148e+01,   .307687e-01, -.752462e-02,
     c  .700822e-03, -.369365e-04,   .806215e-06, -.876932e-11,
     c  .265852e+01,  .314542e+00,  -.392826e+00,  .294625e+00,
     c -.119177e+00,  .203607e-01,  -.821436e-04,  .256443e+01,
     c  .291939e+01, -.379813e+02,   .305620e+03, -.130014e+04,
     c  .230517e+04, -.996097e+04/
      p2=p*p
      p3=p2*p
C     ******************************************** Saturated H
      hf=e(1,i)+p*(e(2,i)+p*(e(3,i)+p*(e(4,i)+p*(e(5,i)+
     1  p*(e(6,i)+p3*e(7,i))))))
      hg=f(1,i)+p*(f(2,i)+p*(f(3,i)+p*(f(4,i)+p*(f(5,i)+
     1  p*(f(6,i)+p3*f(7,i))))))
      return
      end
```

C-NSA-064.02.016 Rev. 1
Minimum Essential Pressurizer Heater capacity
Attachment 2
Page 1 of 2

TOLEDO EDISON
CALCULATION SHEET
ED 7191A

STATION/UNIT	CALCULATION NO.	REVISION NO.
D-B 1	C-NSA-64.02-010	0

SUBJECT: Pressurizer Pressure Decay Due to Ambient Losses & Steam Leakage — SHEET NO. 27 OF 31

ORIGINATOR	DATE	CHECKED	DATE
J.F. Dunne	5-4-87	C.Berger	5/8/87

CASE 1 RESULTS

DAVIS-BESSE NUCLEAR POWER PLANT
TITLE: NO HEATERS & NO RCS LEAKAGE
CASE: NUMBER 1

PRESSURIZER VESSEL MASS = 275000. LBM
PRESSURIZER VESSEL SPECIFIC HEAT = .100 BTU/#-F
INITIAL PRESSURIZER PRESSURE = 2170.0 PSIA
PRESSURIZER LIQUID VOLUME = 850.0 CU FT
PRESSURIZER STEAM VOLUME = 650.0 CU FT
PRESSURIZER STEAM LEAK RATE = .0 #/HR
AMBIENT HEAT LOSS AT POWER = 136.0 KW
PRESSURIZER HEATER CAPACITY = .0 KW
RCS HOT LEG ENTHALPY = 525.00 BTU/#
CONTAINMENT TEMPERATURE = 120.0 F

DAVIS-BESSE NUCLEAR POWER PLANT
TITLE: NO HEATERS & NO RCS LEAKAGE
CASE: NUMBER 1

TIME HR	PRESSURE PSIA	TEMP F	MASS LB	ENERGY MBTU	AMB HT LOSS KW	STM LEAK #/HR
.00	2170.0	647.46	35953.	25.968	136.00	.00
1.00	2088.3	641.95	36256.	25.816	134.58	.00
2.00	2009.7	636.48	36560.	25.669	133.17	.00
3.00	1933.9	631.04	36863.	25.525	131.76	.00
4.00	1861.4	625.68	37129.	25.364	130.38	.00
5.00	1791.5	620.37	37392.	25.206	129.01	.00
6.00	1724.3	615.09	37662.	25.054	127.65	.00
7.00	1659.6	609.84	37915.	24.898	126.30	.00
8.00	1597.9	604.69	38164.	24.741	124.97	.00
9.00	1538.3	599.55	38430.	24.598	123.65	.00
10.00	1480.8	594.48	38650.	24.433	122.34	.00
11.00	1426.0	589.47	38881.	24.276	121.05	.00
12.00	1372.7	584.48	39111.	24.122	119.76	.00
13.00	1321.9	579.56	39312.	23.957	118.49	.00
14.00	1272.9	574.69	39537.	23.806	117.24	.00
15.00	1225.8	569.87	39747.	23.651	115.99	.00
16.00	1180.5	565.10	39946.	23.492	114.76	.00
17.00	1137.3	560.41	40147.	23.337	113.55	.00
18.00	1095.4	555.75	40355.	23.189	112.35	.00

Davis-Besse Nuclear Power Station
Title: REVISED PROGRAM NO HEATERS NO LEAKAGE
Case: 2.0

Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 0.00 kW   Amb Loss = 136.00 kW
Leak Rate = 0.00 #/hr   CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
0.00	2170.0	647.71	36008.	26.00	136.00	0.00
1.00	2088.1	642.17	36308.	25.85	134.57	0.00
2.00	2009.2	636.67	36608.	25.70	133.16	0.00
3.00	1933.2	631.21	36908.	25.56	131.75	0.00
4.00	1860.1	625.78	37208.	25.41	130.35	0.00
5.00	1790.4	620.44	37471.	25.26	128.97	0.00
6.00	1723.4	615.15	37723.	25.10	127.61	0.00
7.00	1659.2	609.91	37961.	24.93	126.26	0.00
8.00	1597.5	604.72	38215.	24.78	124.92	0.00
9.00	1538.2	599.57	38468.	24.63	123.60	0.00
10.00	1481.3	594.49	38703.	24.47	122.29	0.00
11.00	1426.6	589.46	38950.	24.32	120.99	0.00
12.00	1374.1	584.49	39167.	24.16	119.71	0.00
13.00	1323.6	579.57	39381.	24.01	118.44	0.00
13.13	1323.6	579.57	39381.	24.01	118.44	0.00

Davis-Besse Nuclear Power Station
Title: REVISED PROGRAM 0 GPM LEAK FIND HTRS for 580 F AT 13 HOURS
Case: 2.0

Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 30.00 kW   Amb Loss = 136.00 kW
Leak Rate = 0.00 #/hr   CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
0.00	2170.0	647.71	36008.	26.00	136.00	0.00
1.00	2106.1	643.40	36245.	25.88	134.89	0.00
2.00	2043.9	639.11	36481.	25.77	133.78	0.00
3.00	1983.6	634.85	36718.	25.66	132.69	0.00
4.00	1925.3	630.63	36955.	25.55	131.60	0.00
5.00	1869.3	626.48	37154.	25.42	130.53	0.00
6.00	1815.1	622.36	37354.	25.30	129.47	0.00
7.00	1762.6	618.27	37571.	25.19	128.41	0.00
8.00	1711.9	614.22	37770.	25.07	127.37	0.00
9.00	1662.8	610.21	37974.	24.96	126.34	0.00
10.00	1615.6	606.26	38152.	24.83	125.32	0.00
11.00	1569.9	602.34	38338.	24.71	124.31	0.00
12.00	1525.7	598.47	38504.	24.59	123.31	0.00
13.00	1482.9	594.63	38685.	24.47	122.32	0.00
14.00	1441.3	590.82	38869.	24.36	121.34	0.00
15.00	1401.3	587.08	39038.	24.24	120.37	0.00
16.00	1362.4	583.36	39203.	24.12	119.42	0.00
17.00	1324.7	579.68	39383.	24.01	118.47	0.00
17.13	1324.7	579.68	39383.	24.01	118.47	0.00

Manual search for Heaters to be at 580 F at 13 hours with a 0 GPM leak
first step

Davis-Besse Nuclear Power Station
Title: REVISED PROGRAM 0 GPM LEAK FIND HTRS for 580 F AT 13 HOURS
Case: 1.0

Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 20.00 kW   Amb Loss = 136.00 kW
Leak Rate = 0.00 #/hr   CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
0.00	2170.0	647.71	36008.	26.00	136.00	0.00
1.00	2100.0	642.98	36266.	25.87	134.78	0.00
2.00	2032.2	638.29	36525.	25.75	133.57	0.00
3.00	1966.7	633.63	36783.	25.62	132.37	0.00
4.00	1903.4	629.01	37041.	25.51	131.18	0.00
5.00	1842.7	624.46	37268.	25.37	130.01	0.00
6.00	1784.1	619.95	37485.	25.24	128.85	0.00
7.00	1727.7	615.49	37693.	25.10	127.70	0.00
8.00	1673.0	611.05	37914.	24.97	126.55	0.00
9.00	1620.5	606.67	38134.	24.84	125.43	0.00
10.00	1569.8	602.33	38357.	24.72	124.31	0.00
11.00	1520.9	598.04	38551.	24.59	123.20	0.00
12.00	1473.7	593.80	38743.	24.46	122.11	0.00
13.00	1428.2	589.60	38924.	24.32	121.03	0.00
14.00	1384.1	585.45	39109.	24.19	119.96	0.00
15.00	1341.6	581.34	39290.	24.06	118.90	0.00
15.50	1326.1	579.82	39347.	24.06	118.50	0.00

Manual search for Heaters to be at 580 F at 13 hours with a 0 GPM leak
second step

Davis-Besse Nuclear Power Station
Title: REVISED PROGRAM 0 GPM LEAK FIND HTRS for 580 F AT 13 HOURS
Case: 1.0

Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 0.50 kW   Amb Loss = 136.00 kW
Leak Rate = 0.00 #/hr   CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Time	Pressure	Temp	Mass	Energy	Ambient Loss	Stm Leak
(hr)	(PSIA)	(F)	(LB)	(MBTU)	(kW)	(#/hr)
0.00	2170.0	647.71	36008.	26.00	136.00	0.00
1.00	2088.4	642.19	36309.	25.85	134.58	0.00
2.00	2009.7	636.71	36611.	25.70	133.17	0.00
3.00	1934.0	631.26	36912.	25.56	131.76	0.00
4.00	1861.4	625.88	37185.	25.41	130.37	0.00
5.00	1791.8	620.56	37438.	25.24	129.00	0.00
6.00	1724.9	615.27	37708.	25.09	127.64	0.00
7.00	1660.8	610.04	37973.	24.95	126.29	0.00
8.00	1599.3	604.87	38220.	24.79	124.96	0.00
9.00	1540.2	599.75	38474.	24.64	123.64	0.00
10.00	1483.5	594.69	38704.	24.48	122.34	0.00
11.00	1428.9	589.68	38920.	24.32	121.04	0.00
12.00	1376.6	584.73	39141.	24.16	119.77	0.00
13.00	1326.2	579.82	39357.	24.01	118.51	0.00
13.13	1326.2	579.82	39357.	24.01	118.51	0.00

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Manual search for Heaters to be at 580 F at 13 hours with a 0 GPM leak
second to last step
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Davis-Besse Nuclear Power Station
Title: revised program 0 gpm leak find htrs for 580 F at 13 hours
Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 0.00 kW   Amb Loss = 136.00 kW
Leak Rate = 0.00 #/hr   CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
0.00	2170.0	647.71	36008.	26.00	136.00	0.00
1.00	2088.1	642.17	36308.	25.85	134.57	0.00
2.00	2009.2	636.67	36608.	25.70	133.16	0.00
3.00	1933.2	631.21	36908.	25.56	131.75	0.00
4.00	1860.1	625.78	37208.	25.41	130.35	0.00
5.00	1790.4	620.44	37471.	25.26	128.97	0.00
6.00	1723.4	615.15	37723.	25.10	127.61	0.00
7.00	1659.2	609.91	37961.	24.93	126.26	0.00
8.00	1597.5	604.72	38215.	24.78	124.92	0.00
9.00	1538.2	599.57	38468.	24.63	123.60	0.00
10.00	1481.3	594.49	38703.	24.47	122.29	0.00
11.00	1426.6	589.46	38950.	24.32	120.99	0.00
12.00	1374.1	584.49	39167.	24.16	119.71	0.00
13.00	1323.6	579.57	39381.	24.01	118.44	0.00
13.13	1323.6	579.57	39381.	24.01	118.44	0.00

Manual search for Heaters to be at 580 F at 13 hours with a 0 GPM leak
last step

Case: 2.0
Title: REVISED PROGRAM 0 GPM LEAK FIND HTRS FOR 580 F AT 15 HOURS
Davis-Besse Nuclear Power Station

Initial Conditions
PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 16.50 kW   Amb Loss = 136.00 kW
Leak Rate = 0.00 #/hr   CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
0.00	2170.0	647.71	36008.	26.00	136.00	0.00
1.00	2097.9	642.84	36274.	25.87	134.75	0.00
2.00	2028.2	638.01	36540.	25.74	133.50	0.00
3.00	1960.8	633.21	36806.	25.61	132.26	0.00
4.00	1895.9	628.46	37053.	25.48	131.04	0.00
5.00	1833.5	623.77	37294.	25.35	129.83	0.00
6.00	1773.3	619.10	37538.	25.22	128.63	0.00
7.00	1715.4	614.51	37754.	25.08	127.44	0.00
8.00	1659.7	609.95	37959.	24.93	126.27	0.00
9.00	1605.9	605.43	38182.	24.80	125.10	0.00
10.00	1554.0	600.96	38404.	24.67	123.95	0.00
11.00	1504.1	596.55	38608.	24.54	122.82	0.00
12.00	1455.9	592.17	38827.	24.41	121.69	0.00
13.00	1409.4	587.84	39018.	24.27	120.57	0.00
14.00	1364.6	583.57	39205.	24.13	119.47	0.00
15.00	1326.6	579.87	39355.	24.13	118.52	0.00

Manual search for heaters to maintain Pressurizer fluid temperature above 580 °F for 15 hours with 136 ambient losses and 0.0 GPM leak

Davis-Besse Nuclear Power Station
Title: REVISED PROGRAM 1.0 GPM LEAK FIND HTRS FOR 580 F AT 15 HOURS
Case: 2.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 88.00 kW Amb Loss = 136.00 kW
Leak Rate = 500.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
0.00	2170.0	647.71	36008.	26.00	136.00	500.00
1.00	2088.7	642.21	36316.	25.86	134.58	481.26
2.00	2011.8	636.86	36610.	25.71	133.20	463.55
3.00	1939.2	631.64	36877.	25.56	131.86	446.82
4.00	1870.4	626.56	37152.	25.43	130.55	430.98
5.00	1805.5	621.61	37417.	25.29	129.28	416.01
6.00	1744.3	616.82	37650.	25.15	128.04	401.92
7.00	1686.6	612.17	37869.	25.01	126.84	388.63
8.00	1632.0	607.64	38070.	24.86	125.67	376.04
9.00	1580.3	603.24	38285.	24.73	124.54	364.12
10.00	1531.1	598.95	38497.	24.61	123.43	352.79
11.00	1484.6	594.79	38689.	24.48	122.36	342.08
12.00	1440.4	590.74	38891.	24.36	121.32	331.89
13.00	1398.5	586.81	39063.	24.24	120.31	322.23
14.00	1358.5	582.98	39229.	24.11	119.32	313.02
15.00	1325.3	579.74	39343.	24.11	118.48	305.37

Manual search for heaters to maintain Pressurizer fluid temperature above 580 °F for 15 hours with 136 ambient losses and 1.0 GPM leak

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 1.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 16.50 kW Amb Loss = 136.00 kW
Leak Rate = 0.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.0000 gpm Heaters Required = 16.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1326.6	579.87	39355.	24.13	118.52	0.00

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 2.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 23.50 kW Amb Loss = 136.00 kW
Leak Rate = 50.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.1000 gpm Heaters Required = 23.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.2	579.73	39377.	24.12	118.48	30.54

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 136 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 3.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 30.50 kW Amb Loss = 136.00 kW
Leak Rate = 100.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.2000 gpm Heaters Required = 30.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.0	579.61	39379.	24.12	118.45	61.01

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 4.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 37.50 kW Amb Loss = 136.00 kW
Leak Rate = 150.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.3000 gpm Heaters Required = 37.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1322.8	579.49	39371.	24.12	118.42	91.44

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 136 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 5.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 45.00 kW Amb Loss = 136.00 kW
Leak Rate = 200.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.4000 gpm Heaters Required = 45.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.6	579.67	39364.	24.11	118.47	122.08

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 6.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 52.00 kW Amb Loss = 136.00 kW
Leak Rate = 250.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.5000 gpm Heaters Required = 52.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1323.7	579.58	39353.	24.11	118.44	152.50

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 136 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 7.0

Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 59.50 kW   Amb Loss = 136.00 kW
Leak Rate = 300.00 #/hr   CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.6000 gpm   Heaters Required = 59.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.4	579.75	39360.	24.13	118.49	183.23

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 8.0

Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 66.50 kW   Amb Loss = 136.00 kW
Leak Rate = 350.00 #/hr   CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.7000 gpm   Heaters Required = 66.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.5	579.66	39384.	24.10	118.46	213.63

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 136 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 9.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 73.50 kW Amb Loss = 136.00 kW
Leak Rate = 400.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.8000 gpm Heaters Required = 73.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1323.9	579.60	39348.	24.11	118.45	244.03

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 10.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 80.50 kW Amb Loss = 136.00 kW
Leak Rate = 450.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.9000 gpm Heaters Required = 80.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1323.3	579.54	39370.	24.11	118.43	274.41

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 136 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 11.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 88.00 kW Amb Loss = 136.00 kW
Leak Rate = 500.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.0000 gpm Heaters Required = 88.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.3	579.74	39343.	24.11	118.48	305.37

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 12.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 95.00 kW Amb Loss = 136.00 kW
Leak Rate = 550.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.1000 gpm Heaters Required = 95.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.7	579.68	39376.	24.11	118.47	335.76

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 136 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 13.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 102.00 kW Amb Loss = 136.00 kW
Leak Rate = 600.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.2000 gpm Heaters Required = 102.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.2	579.63	39383.	24.10	118.45	366.13

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 14.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 109.00 kW Amb Loss = 136.00 kW
Leak Rate = 650.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.3000 gpm Heaters Required = 109.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1323.8	579.59	39380.	24.10	118.45	396.54

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 136 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 15.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 116.00 kW Amb Loss = 136.00 kW
Leak Rate = 700.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.4000 gpm Heaters Required = 116.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1323.5	579.56	39384.	24.10	118.44	426.94

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 16.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 123.50 kW Amb Loss = 136.00 kW
Leak Rate = 750.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.5000 gpm Heaters Required = 123.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.7	579.78	39363.	24.10	118.49	458.20

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 136 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 17.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 130.50 kW Amb Loss = 136.00 kW
Leak Rate = 800.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.6000 gpm Heaters Required = 130.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.6	579.77	39360.	24.09	118.49	488.71

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 18.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 137.50 kW Amb Loss = 136.00 kW
Leak Rate = 850.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.7000 gpm Heaters Required = 137.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.5	579.76	39344.	24.10	118.49	519.19

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 136 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 19.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 144.50 kW Amb Loss = 136.00 kW
Leak Rate = 900.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.8000 gpm Heaters Required = 144.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.4	579.75	39343.	24.10	118.49	549.71

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 20.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 151.50 kW Amb Loss = 136.00 kW
Leak Rate = 950.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.9000 gpm Heaters Required = 151.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.5	579.76	39342.	24.10	118.49	580.28

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 136 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 21.0

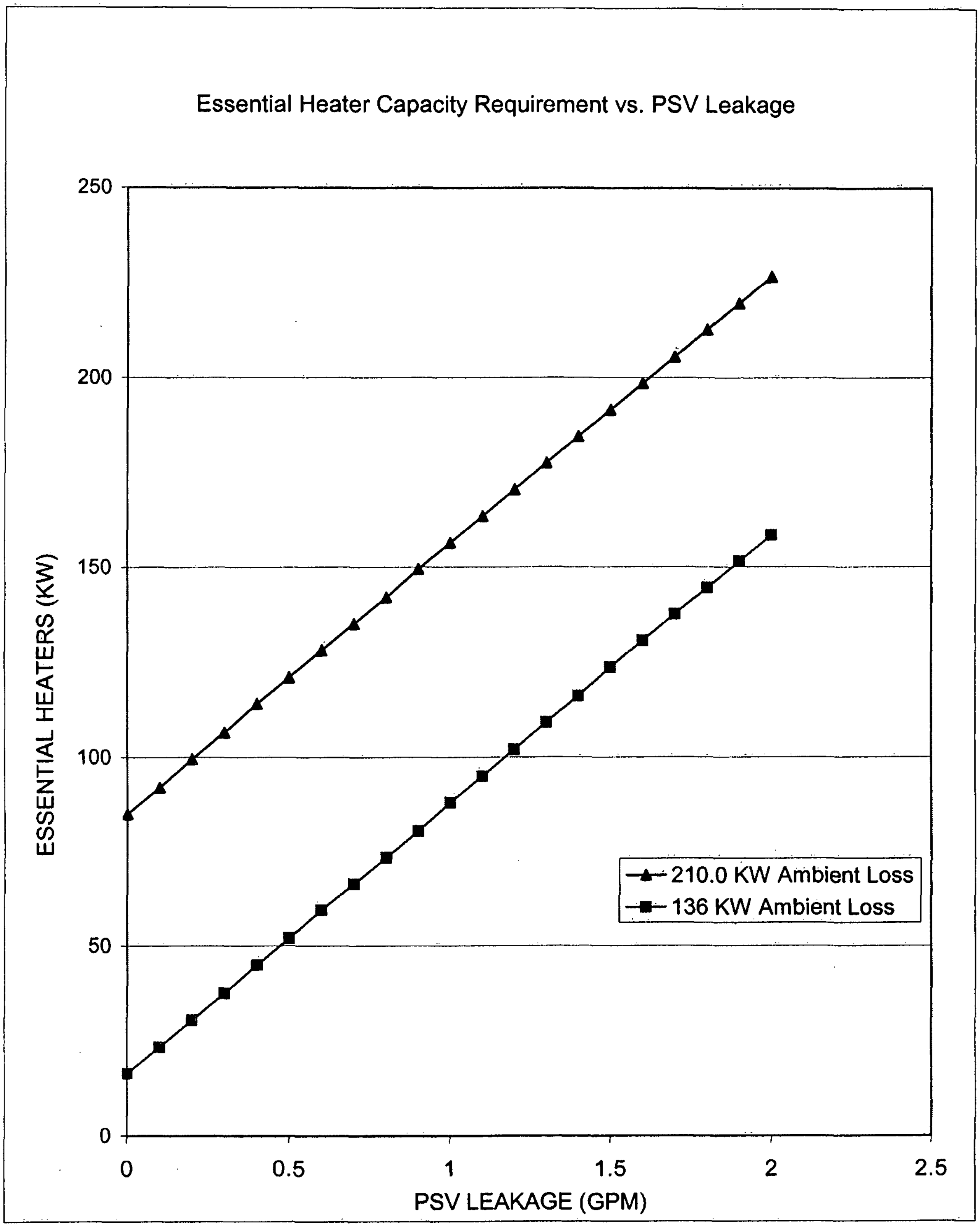
Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 158.50 kW Amb Loss = 136.00 kW
Leak Rate = 1000.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 2.0000 gpm Heaters Required = 158.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.5	579.76	39342.	24.10	118.49	610.85

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 136 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm


Essential Heater Capacity Requirement vs. PSV Leakage
250
200
150
100
50
0
ESSENTIAL HEATERS (KW)
0
0.5
1
1.5
2
2.5
PSV LEAKAGE (GPM)
210.0 KW Ambient Loss
136 KW Ambient Loss

PSV LEAKAGE AND HEATER CAPACITY DATA POINTS
Ambient Heat Loss Value 210.0 KW
Data from Attachment 8

Leak Rate lmb/hr	Leak Rate GPM	Essential Heaters KW
0	0	85
50	0.1	92
100	0.2	99.5
150	0.3	106.5
200	0.4	114
250	0.5	121
300	0.6	128
350	0.7	135
400	0.8	142
450	0.9	149.5
500	1	156.5
550	1.1	163.5
600	1.2	170.5
650	1.3	177.5
700	1.4	184.5
750	1.5	191.5
800	1.6	198.5
850	1.7	205.5
900	1.8	212.5
950	1.9	219.5
1000	2	226.5

PSV LEAKAGE AND HEATER CAPACITY DATA POINTS
Ambient Heat Loss Value 136 KW
Data from Attachment 5

Leak Rate lmb/hr	Leak Rate GPM	Essential Heaters KW
0	0	16.5
50	0.1	23.5
100	0.2	30.5
150	0.3	37.5
200	0.4	45
250	0.5	52
300	0.6	59.5
350	0.7	66.5
400	0.8	73.5
450	0.9	80.5
500	1	88
550	1.1	95
600	1.2	102
650	1.3	109
700	1.4	116
750	1.5	123.5
800	1.6	130.5
850	1.7	137.5
900	1.8	144.5
950	1.9	151.5
1000	2	158.5

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 1.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 85.00 kW Amb Loss = 210.00 kW
Leak Rate = 0.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.0000 gpm Heaters Required = 85.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.0	579.61	39367.	24.11	182.90	0.00

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 2.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 92.00 kW Amb Loss = 210.00 kW
Leak Rate = 50.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.1000 gpm Heaters Required = 92.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1322.9	579.50	39386.	24.11	182.86	30.48

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 120 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 3.0

Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 99.50 kW   Amb Loss = 210.00 kW
Leak Rate = 100.00 #/hr   CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.2000 gpm   Heaters Required = 99.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.7	579.68	39363.	24.12	182.93	61.05

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 4.0

Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 106.50 kW   Amb Loss = 210.00 kW
Leak Rate = 150.00 #/hr   CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.3000 gpm   Heaters Required = 106.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1323.8	579.59	39387.	24.10	182.89	91.51

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 120 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 5.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 114.00 kW Amb Loss = 210.00 kW
Leak Rate = 200.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.4000 gpm Heaters Required = 114.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.8	579.78	39342.	24.11	182.97	122.19

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 6.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 121.00 kW Amb Loss = 210.00 kW
Leak Rate = 250.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.5000 gpm Heaters Required = 121.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.0	579.71	39362.	24.10	182.94	152.65

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 120 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 7.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 128.00 kW Amb Loss = 210.00 kW
Leak Rate = 300.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.6000 gpm Heaters Required = 128.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.4	579.65	39365.	24.10	182.92	183.09

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 8.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 135.00 kW Amb Loss = 210.00 kW
Leak Rate = 350.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.7000 gpm Heaters Required = 135.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1323.8	579.59	39354.	24.10	182.89	213.51

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 120 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 9.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 142.00 kW Amb Loss = 210.00 kW
Leak Rate = 400.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.8000 gpm Heaters Required = 142.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1323.3	579.54	39350.	24.11	182.87	243.93

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 10.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 149.50 kW Amb Loss = 210.00 kW
Leak Rate = 450.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.9000 gpm Heaters Required = 149.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.4	579.75	39360.	24.11	182.96	274.85

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 120 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 11.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 156.50 kW Amb Loss = 210.00 kW
Leak Rate = 500.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.0000 gpm Heaters Required = 156.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.0	579.70	39372.	24.10	182.94	305.29

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 12.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 163.50 kW Amb Loss = 210.00 kW
Leak Rate = 550.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.1000 gpm Heaters Required = 163.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.7	579.68	39375.	24.10	182.93	335.75

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 120 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 13.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 170.50 kW Amb Loss = 210.00 kW
Leak Rate = 600.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.2000 gpm Heaters Required = 170.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.5	579.66	39365.	24.09	182.92	366.21

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 14.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 177.50 kW Amb Loss = 210.00 kW
Leak Rate = 650.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.3000 gpm Heaters Required = 177.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.3	579.64	39365.	24.09	182.91	396.68

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 120 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 15.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 184.50 kW Amb Loss = 210.00 kW
Leak Rate = 700.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.4000 gpm Heaters Required = 184.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.2	579.63	39355.	24.10	182.91	427.17

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 16.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 191.50 kW Amb Loss = 210.00 kW
Leak Rate = 750.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.5000 gpm Heaters Required = 191.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.2	579.63	39352.	24.09	182.91	457.68

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 120 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 17.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 198.50 kW Amb Loss = 210.00 kW
Leak Rate = 800.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.6000 gpm Heaters Required = 198.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.2	579.63	39350.	24.09	182.91	488.20

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 18.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 205.50 kW Amb Loss = 210.00 kW
Leak Rate = 850.00 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.7000 gpm Heaters Required = 205.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.4	579.65	39351.	24.09	182.92	518.77

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 120 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 19.0

Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 212.50 kW   Amb Loss = 210.00 kW
Leak Rate = 900.00 #/hr   CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.8000 gpm   Heaters Required = 212.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.4	579.65	39350.	24.09	182.92	549.31

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 20.0

Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 219.50 kW   Amb Loss = 210.00 kW
Leak Rate = 950.00 #/hr   CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.9000 gpm   Heaters Required = 219.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.7	579.68	39350.	24.09	182.93	579.94

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 120 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 21.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 226.50 kW Amb Loss = 210.00 kW
Leak Rate = 1000 #/hr CTM Temp = 120.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 2.0000 gpm Heaters Required = 226.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.8	579.69	39362.	24.10	182.93	610.52

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 120 °F

PSV LEAKAGE AND HEATER CAPACITY DATA POINTS
Ambient Heat Loss Value 210.0 KW
Containment Temperature 120 F
Data from Attachment 8

Leak Rate lmb/hr	Leak Rate GPM	Essential Heaters KW
0	0	85
50	0.1	92
100	0.2	99.5
150	0.3	106.5
200	0.4	114
250	0.5	121
300	0.6	128
350	0.7	135
400	0.8	142
450	0.9	149.5
500	1	156.5
550	1.1	163.5
600	1.2	170.5
650	1.3	177.5
700	1.4	184.5
750	1.5	191.5
800	1.6	198.5
850	1.7	205.5
900	1.8	212.5
950	1.9	219.5
1000	2	226.5

PSV LEAKAGE AND HEATER CAPACITY DATA POINTS
Ambient Heat Loss Value 210.0 KW
Containmet Temperature 90 F
Data from Attachment 10

Leak Rate lmb/hr	Leak Rate GPM	Essential Heaters KW
0	0	86
50	0.1	93
100	0.2	100
150	0.3	107.5
200	0.4	114.5
250	0.5	121.5
300	0.6	129
350	0.7	136
400	0.8	143
450	0.9	150
500	1	157.5
550	1.1	164.5
600	1.2	171.5
650	1.3	178.5
700	1.4	185.5
750	1.5	192.5
800	1.6	199.5
850	1.7	206.5
900	1.8	213.5
950	1.9	220.5
1000	2	227.5

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 1.0

Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 86.00 kW   Amb Loss = 210.00 kW
Leak Rate = 0.00 #/hr   CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.0000 gpm   Heaters Required = 86.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.2	579.73	39361.	24.13	184.40	0.00

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 2.0

Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 93.00 kW   Amb Loss = 210.00 kW
Leak Rate = 50.00 #/hr   CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.1000 gpm   Heaters Required = 93.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.1	579.62	39365.	24.12	184.36	30.5

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 90 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 3.0

Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 100.00 kW   Amb Loss = 210.00 kW
Leak Rate = 100.00 #/hr   CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.2000 gpm   Heaters Required = 100.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1323.1	579.53	39352.	24.12	184.33	60.97

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 4.0

Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 107.50 kW   Amb Loss = 210.00 kW
Leak Rate = 150.00 #/hr   CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.3000 gpm   Heaters Required = 107.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.9	579.70	39363.	24.11	184.39	91.59

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 90 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 5.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 114.50 kW Amb Loss = 210.00 kW
Leak Rate = 200.00 #/hr CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.4000 gpm Heaters Required = 114.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.1	579.62	39354.	24.11	184.36	122.03

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 6.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 121.50 kW Amb Loss = 210.00 kW
Leak Rate = 250.00 #/hr CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.5000 gpm Heaters Required = 121.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1323.3	579.54	39369.	24.10	184.33	152.45

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 90 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 7.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 129.00 kW Amb Loss = 210.00 kW
Leak Rate = 300.00 #/hr CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.6000 gpm Heaters Required = 129.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.2	579.73	39361.	24.11	184.41	183.21

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 8.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 136.00 kW Amb Loss = 210.00 kW
Leak Rate = 350.00 #/hr CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.7000 gpm Heaters Required = 136.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.7	579.68	39349.	24.11	184.38	213.66

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 90 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 9.0

Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 143.00 kW   Amb Loss = 210.00 kW
Leak Rate = 400.00 #/hr   CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.8000 gpm   Heaters Required = 143.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.2	579.63	39366.	24.11	184.37	244.09

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 10.0

Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 150.00 kW   Amb Loss = 210.00 kW
Leak Rate = 450.00 #/hr   CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 0.9000 gpm   Heaters Required = 150.0 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1323.7	579.58	39367.	24.11	184.35	274.50

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 90 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 11.0

Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 157.50 kW   Amb Loss = 210.00 kW
Leak Rate = 500.00 #/hr   CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.0000 gpm   Heaters Required = 157.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.8	579.79	39372.	24.11	184.43	305.48

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 12.0

Initial Conditions

PZR Mass = 275000. LBM   PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3   Stm Vol = 650.00 ft3
Htr Cap = 164.50 kW   Amb Loss = 210.00 kW
Leak Rate = 550.00 #/hr   CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.1000 gpm   Heaters Required = 164.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.4	579.75	39360.	24.10	184.41	335.94

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 90 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 13.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 171.50 kW Amb Loss = 210.00 kW
Leak Rate = 600.00 #/hr CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.2000 gpm Heaters Required = 171.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.2	579.73	39380.	24.10	184.40	366.41

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 14.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 178.50 kW Amb Loss = 210.00 kW
Leak Rate = 650.00 #/hr CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.3000 gpm Heaters Required = 178.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.0	579.71	39363.	24.09	184.40	396.90

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 90 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 15.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 185.50 kW Amb Loss = 210.00 kW
Leak Rate = 700.00 #/hr CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.4000 gpm Heaters Required = 185.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.8	579.69	39363.	24.09	184.39	427.36

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 16.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 192.50 kW Amb Loss = 210.00 kW
Leak Rate = 750.00 #/hr CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.5000 gpm Heaters Required = 192.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.8	579.68	39363.	24.09	184.39	457.87

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 90 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 17.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 199.50 kW Amb Loss = 210.00 kW
Leak Rate = 800.00 #/hr CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.6000 gpm Heaters Required = 199.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.9	579.69	39348.	24.10	184.39	488.43

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 18.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 206.50 kW Amb Loss = 210.00 kW
Leak Rate = 850.00 #/hr CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.7000 gpm Heaters Required = 206.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.8	579.69	39349.	24.09	184.39	518.95

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 90 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 19.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 213.50 kW Amb Loss = 210.00 kW
Leak Rate = 900.00 #/hr CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.8000 gpm Heaters Required = 213.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1324.9	579.70	39345.	24.09	184.39	549.51

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 20.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 220.50 kW Amb Loss = 210.00 kW
Leak Rate = 950.00 #/hr CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 1.9000 gpm Heaters Required = 220.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.1	579.72	39345.	24.09	184.40	580.10

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 90 °F

Davis-Besse Nuclear Power Station
Title: autocalc
Case: 21.0

Initial Conditions

PZR Mass = 275000. LBM PZR Cp = 0.100 BTU/#-F
Liq Vol = 850.00 ft3 Stm Vol = 650.00 ft3
Htr Cap = 227.50 kW Amb Loss = 210.00 kW
Leak Rate = 1000.0 #/hr CTM Temp = 90.00 Deg F
RCS Ave h = 525.00 BTU/lbm

Leak Size = 2.0000 gpm Heaters Required = 227.5 kW
Time Step = .125 hours

Time (hr)	Pressure (PSIA)	Temp (F)	Mass (LB)	Energy (MBTU)	Ambient Loss (kW)	Stm Leak (#/hr)
15.00	1325.3	579.74	39347.	24.09	184.41	610.73

sum.out: automatic search to for heaters to maintain the Pressurizer fluid above 580°F for 15 hours with 210.0 KW ambient losses with leakage rates ranging from 0.0 gpm to 2.0 gpm
Containment Temperature: 90 °F

SYSTEM STATUS FILE COVER SHEET

DB-0065-3

WORKING COPY	
VERIFIED CURRENT	
Initial/Date	Initial/Date
DE 4/24/6	

DATE: 4/24/6

PROCEDURE NUMBER: DB-OP-06003

SUBSECTION / ATTACHMENT: 4.5

REASON FOR PERFORMING:

Setting RC 49

- *Has this evolution been logged in the Unit Log?*
- *Are all N/A's used in this procedure acceptable as delineated in admin procedures for using N/A?*
- *Are applicable Subsections signed and dated?*
- *Are all valve and breaker lineup spaces filled in or otherwise documented?*

Review Completed By: [signature] Date: 4/24/6

C-NSA-064.02-016 Rev. 1
Minimum Essential Pressurizer Heater Capacity
ATTACHMENT 11
Page 2 of 2

DE 4.5.12 Close RC49, PRESSURIZER MINIMUM FLOW SPRAY VALVE.

DE 4.5.13 Open RC10, PRESSURIZER SPRAY MOTOR ISOLATION.

DE 4.5.14 Place the PZR HTR BANK 1 in HAND, AND stabilize RCS pressure. Record RCS Pressure.

2162 RCS Pressure

DE 4.5.15 Record the initial conditions of the RCS parameters on Attachment 5, RCS Conditions for setting RC49.

DE 4.5.16 Direct Engineering to perform Attachment 6, Step 2, Initial PZR HTR Input.

DE 4.5.17 Direct Engineering to perform Attachment 6, Step 3, KW Input to PZR HTR calculation and record below.

Heat loss with no spray flow 198.4 KW

DE 4.5.18 Calculate the heater input required to compensate for 1.5 gpm spray flow, using Attachment 5, RCS Conditions for Setting RC49.

KW input for 1.5 gpm 85.5 KW

DE 4.5.19 Calculate the total KW input needed from the heaters by summing the heat loss with no spray flow, and the KW needed for 1.5 gpm spray flow. (Steps 4.5.17 and 4.5.18).

Total heater input required 283.9 KW

4.5.20 Adjust PZR HTR BANK 1 output as follows:

DE a. Establish communications with the electricians at (C4607) SCR Linear Power Controller.

DE b. Adjust the PZR HTR BANK 1 output to match the necessary rise in heater output as determined in Step 4.5.19.

DE c. Monitor the output of PZR HTR BANK 1 with the voltmeter and ammeter so it can be determined when the heater output is correct.

DE d. Direct Engineering to record the new voltage and current readings of the SCR output on Attachment 6, PZR Heater Inputs.

FirstEnergy

DESIGN VERIFICATION RECORD

NOP-CC-2001-01 Rev. 00

SECTION I: TO BE COMPLETED BY DESIGN ORIGINATOR

DOCUMENT(S)/ACTIVITY TO BE VERIFIED:

C-NSA-064.02.016 Rev.01 Minimum Essential Pressurizer Heater Capacity

☒ SAFETY RELATED ☐ AUGMENTED QUALITY ☐ NONSAFETY RELATED

SUPPORTING/REFERENCE DOCUMENTS

See DIN Listing	

DESIGN ORIGINATOR: *(Print and Sign Name)*	DATE
Patrick Bozym Patrick Bozym	11/21/07

SECTION II: TO BE COMPLETED BY VERIFIER

VERIFICATION METHOD *(Check one)*

☒ DESIGN REVIEW *(Complete Design Review Checklist or Calculation Review Checklist)* ☐ ALTERNATE CALCULATION ☐ QUALIFICATION TESTING

JUSTIFICATION FOR SUPERVISOR PERFORMING VERIFICATION:

APPROVAL: *(Print and Sign Name)*	DATE

EXTENT OF VERIFICATION:

See attached Calculation Review Checklist.

COMMENTS, ERRORS OR DEFICIENCIES IDENTIFIED? ☐ YES ☒ NO

RESOLUTION: *(For Alternate Calculation or Qualification Testing only)*

	DATE
RESOLVED BY: *(Print and Sign Name)* ~~M. Nelson M Nelson~~ MN 12/12/07	~~12/12/07~~
VERIFIER: *(Print and Sign Name)* M. Nelson M Nelson	12/12/07
APPROVED BY: *(Print and Sign Name)* Kevin Zellers K Zellers	12/12/07

FirstEnergy	CALCULATION REVIEW CHECKLIST NOP-CC-2001-04 Rev. 05	 CALCULATION NO. CNSA-064.02-016 REV. R01 ADDENDUM NO. N/A UNIT Davis-Besse

QUESTION	NA	Yes	No	COMMENTS	RESOLUTION
GENERAL 1 Does the stated objective/purpose clearly describe why the calculation is being performed?		X			
2. Are design input / output documents and references listed and clearly identified in the document index, including edition and addenda, where applicable?		X			
3. Were verbal inputs from third parties properly documented?	X				
4. Are design input parameters, such as physical and geometric characteristic and regulatory or code and standard requirements, accurately taken from the design input documents and correctly incorporated, including tolerances and units?		X			
5. Are the design inputs relevant, current, consistent with design/licensing bases and directly applicable to the purpose of the calculation, including appropriate tolerances and ranges/modes of operation?		X		Sensitivity study performed for containment temperature to ensure input value is reasonable.	
6. Are all design inputs retrievable? If not, have they been added as attachments?		X			
7. Are preliminary or conceptual inputs clearly identified for later confirmation as open assumptions?	X				
8. Where applicable, were construction and operating considerations included as input information?	X				
9. Were design input / output documents properly updated to reference this calculation?		X			
ASSUMPTIONS 10. Have the assumptions necessary to perform the analysis been clearly identified and adequately described?	X			No asumptions are listed in the Assumption section.	
11. Are all assumptions for the calculation reasonable and consistent with design/licensing bases?	X				
12. Have all open assumptions needing later confirmation been clearly identified on the Calculation cover sheet, including when the open assumption needs to be closed?	X				
13. Has an SAP Activity Initiation Form been created for open assumptions?	X				
14. Have engineering judgments been clearly identified?	X				
15. Are engineering judgments reasonable and adequately documented?	X				
16. Is suitable justification provided for all assumptions/engineering judgements (except those based upon recognized engineering practice, physical constants or elementary scientific principles)?	X				
METHOD OF ANALYSIS 17. Is the method used appropriate considering the purpose and type of calculation?		X			
18. Is the method in accordance with applicable codes, standards, and design/licensing bases?	X				
IDENTIFICATION OF COMPUTER CODES (Ref: NOP-SS-1001) 19. Have the versions of the computer codes employed in the design analysis been certified for this application?	X			Computer program verified by the calc. No specific version number is associated with the computer program.	
20. Are codes properly identified along with source (vendor, organization, etc.)?		X		Code listing provided.	
21. Is the code applicable for the analysis being performed?		X			

FirstEnergy	CALCULATION REVIEW CHECKLIST NOP-CC-2001-04 Rev. 05	 CALCULATION NO. CNSA-064.02-016 REV. R01 ADDENDUM NO. N/A UNIT Davis-Besse

QUESTION	NA	Yes	No	COMMENTS	RESOLUTION
22. Is the computer program(s) being used listed on the FENOC Usable Software List for the site?			X	PZR code is category "C," therefore, it is not required to be listed.	
23. Does the computer model, that has been created, adequately reflect actual (or to be modified) plant conditions (e.g., dimensional accuracy, type of model/code options used, time steps, etc.)?		X			
24. Did the computer output generate any ERROR or WARNING Messages that could invalidate the results?			X		
25. Is the computer output reasonable when compared to inputs and what was expected?		X			
COMPUTATIONS 26. Are the equations used consistent with recognized engineering practice and design/licensing bases?		X			
27. Is there a reasonable justification provided for the uses of any equations not in common use?	X				
28. Were the mathematical operations performed properly and the results accurate?		X			
29. Have adjustment factors, uncertainties, empirical correlations, etc., used in the analysis been correctly applied?	X			Conservative methodology utilized, therefore, inputs are best-estimate values.	
30. Is the result presented with proper units and tolerance?		X			
31. Has proper consideration been given to results that may be overly sensitive to very small changes in input?	X				
CONCLUSIONS 32. Is the magnitude of the result reasonable and expected when compared to inputs?		X			
33. Is there a reasonable justification provided for deviations from the acceptance criteria?	X				
34. Are stated conclusions justifiable based on the calculation results?		X			
35. Are all pages sequentially numbered and marked with a valid calculation and revision number?		X			
36. Is all information legible and reproducible?		X			
37. Is the calculation presentation complete and understandable without any need to refer back to the Originator for clarification or explanations?		X			
38. Is calculation format presented in a logical and orderly manner, in conformance with the standard calculation content of NOP-CC-3002 (Attachment 1)?		X			
39. Have all changes in the documentation been initialed (or signed) and dated by the author of the change and all required reviewers?	X				
DESIGN/LICENSING 40. Have all calculation results stayed within existing design/licensing basis parameters?	X				
41. If the response to Question 40 is NO, has Licensing been notified as appropriate? (i.e. UFSAR or Tech Spec Change Request has been initiated).	X				
42. Is the direction of trends reasonable?		X			
43. Has the calculation Preparer used all applicable design information/requirements provided?		X			
44. Did the calculation Preparer determine if the calculation was referenced in design basis documents and/or databases?		X		System Descriptions checked for potential changes.	

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CALCULATION REVIEW CHECKLIST

NOP-CC-2001-04 Rev. 05

CALCULATION NO. CNSA-064.02-016

REV. R01
ADDENDUM NO. N/A
UNIT Davis-Besse

QUESTION	NA	Yes	No	COMMENTS	RESOLUTION
45. Did the Preparer determine if the calculation was used as a reference in the UFSAR?		X			
46. If the calculation is used as a reference in the UFSAR, is a change to the UFSAR required or an update to the UFSAR Validation Database, if applicable, required?	X				
47. If the answer to Question 46 is YES, have the appropriate documents been initiated?	X				
48. Has the applicability of 10CFR50.59 to this calculation been considered and documented?		X			
ACCEPTABLE 49. Does the calculation meet its purpose/objective?					
50. Is the calculation acceptable for use?		X			
51. What checking method was used to review the calculation? Check all that apply.	---	---	---		
• spot check for math	X				
• complete check for math	X				
• comparison with tests	X				
• check by alternate method	X				
• comparison with previous calculation		X			
52. If the calculation was prepared by a vendor, does it comply with the technical and quality requirements described in the Procurement Documents? Reference the Purchase Order number or other procurement document number in the Comments Section of this question.	X				
53. Have Professional Engineer (PE) certification requirements been addressed and documented where required by ASME Code (if applicable).	X				

Review Summary:

All inputs and results are reasonable. The calculation is acceptable for use.

Technical Review *(Print and Sign Name)*	Date	**Owner's Acceptance Review** *(Required for calculations prepared by a vendor)*	
		Reviewer *(Print and Sign Name)*	Date
Design Verification *(Print and Sign Name)* M. Nelson M. Nelson	Date 12/5/07	Approver *(Print and Sign Name)*	Date

FirstEnergy	REGULATORY APPLICABILITY DETERMINATION NOP-LP-4003-01 Rev. 03 Page 1 of 2	No. 07-05280 Rev. 00
Initiating Activity No. Calculation C-NSA-064.02-016		Rev. 1

☐ BVPS 1 ☐ BVPS 2 ☑ DBNPS ☐ PNPP

Title:

Minimum Essential Heater Capacity

Brief description of activity (what is being changed and why):

The required number of essentially powered Pressurizer (PZR) heaters is being altered. This is being done to account for increased ambient heat losses from the Pressurizer, as measured during 14RFO using procedure DB-OP-06003, Section 4.5. That test determined that current PZR heat loss is 198.4 kW, whereas Calculation C-NSA-064.02-016, Revision 0 assumes that ambient losses are 136 kW. The proposed Revision 1 uses the most recently measured ambient loss plus a margin term to ensure the value to the plant meets the design requirement.

The basis of the value for essentially powered heaters specified in Updated Final Safety Analysis Report (UFSAR) Table 5.1-4 (112 kW with ambient losses of 136 kW) is compliance with Section 2.1.1 of NUREG-0578, as delineated in UFSAR Section 5.5.10.2. The NUREG Section states:

Provide redundant emergency power for the minimum number of Pressurizer heaters required to maintain natural circulation conditions in the event of loss of offsite power (LOOP).

The duration to maintain natural circulation is not specified. The 112 kW value presently provided in the UFSAR is based on maintaining natural circulation in excess of 100 hours, as documented in Calculation C-NSA-064.02-010, R. 0. However, other limitations on the capability to maintain natural circulation exist, particularly the amount of water in the Condensate Storage Tanks. The Davis-Besse Technical Specification 3.7.1.3 requires enough water in those tanks to maintain hot standby for 13 hours and then to cool down to less than 280 degrees Fahrenheit. Therefore, the proposed revision to C-NSA-064.02-016 aligns the duration for maintaining natural circulation to 15 hours, to match the 13 hour CST volume requirement with 2 hours of added margin.

1. **EXEMPTIONS**

Is the scope of the entire activity exempt from the 10CFR50.59 process because it is limited to:

1.1 Managerial or administrative changes........ ☐ YES ☑ NO

1.2 UFSAR changes (or equivalent information) excluded from the requirement to perform a 10CFR50.59 Screen and Evaluation by NEI 96-07 or NEI 98-03?........ ☐ YES ☑ NO

1.3 Maintenance activities and temporary alterations in support of maintenance planned for 90 days or less while at power........ ☐ YES ☑ NO

1.4 Changes evaluated under another program that included a 10CFR50.59 Screen........ ☐ YES ☑ NO

☐ BVPS 1 ☐ BVPS 2 ☑ DBNPS ☐ PNPP

2. **OTHER REGULATIONS**

2.1 Does the activity require a license amendment?

2.1.1 Operating License ☐ YES ☑ NO

2.1.2 Technical Specifications ☐ YES ☑ NO

2.1.3 Environmental Protection Plan (BVPS and PNPP only) ☐ YES ☑ NO

2.2 Is the activity or any portion of the activity governed by one or more of the following regulations:

2.2.1 Quality Assurance Program (10CFR50.54(a)) ☐ YES ☑ NO

2.2.2 Security Plans (10CFR50.54(p)) ☐ YES ☑ NO

2.2.3 Emergency Plan (10CFR50.54(q)) ☐ YES ☑ NO

2.2.4 IST Program Plan (10CFR50.55(a)(f)) ☐ YES ☑ NO

2.2.5 ISI Program Plan (10CFR50.55(a)(g)) ☐ YES ☑ NO

2.2.6 Fire Protection Program (10CFR50.48) ☐ YES ☑ NO

2.2.7 Independent Spent Fuel Storage Facility (10CFR72.48) ☐ YES ☑ NO

2.2.8 Another regulation:

Standards For Protection Against Radiation (10 CFR 20 including ODCM) ☐ YES ☑ NO

Specific Exemptions (10 CFR 50.12) ☐ YES ☑ NO

ECCS Acceptance Criteria (10 CFR 50.46) ☐ YES ☑ NO

Environmental Protection (DBNPS only) ☐ YES ☑ NO

Other - list the regulation(s): **None** ☐ YES ☑ NO

3. **CONCLUSION**

3.1 Does 10CFR50.59 apply? ☑ YES ☐ NO

3.2 Does this activity require a change to the UFSAR? Change Request No: **07-184** ☑ YES ☐ NO

3.3 Summarize the bases for responses: Include Keywords used to search documents.

Keywords: Pressurizer, heaters

Altering the required heater capacity and its basis is a technical change and therefore does not qualify for any administrative exemptions from 10CFR50.59. Altering the required number of heaters and its basis does not affect any of the programs listed in Section 2.2. Therefore, the changes are to be evaluated under 10CFR50.59 since no other change regulations apply.

A UFSAR Change is required because the plant ambient losses and the required number of heaters is explicitly described in Table 5.1-4. The design basis, compliance with Section 2.1.1 of NUREG-0578 is not being altered so UFSAR Section 5.5.10.2 does not require alteration.

Preparer (Print name) **Blakely, Dennis R**	Signature Dennis R Blakely	Date **11/26/2007**
Reviewer (Print name) **Nelson, Michael L**	Signature M L Nelson	Date 11/28/07

Database Updated ☒	Signature M. Nelson M L Nelson	Date 11/28/07

FirstEnergy	10 CFR 50.59 SCREEN NOP-LP-4003-02 Rev. 01 Page 1 of 2	No. 07-05280 Rev. 00
Initiating Activity No. Calculation C-NSA-064.02-016		Rev. 1

☐ BVPS 1 ☐ BVPS 2 ☑ DBNPS ☐ PNPP

Title

Minimum Essential Heater Capacity

Scope of activity being screened.

The required number of essentially powered Pressurizer (PZR) heaters is being altered. This is being done to account for increased ambient heat losses from the Pressurizer, as measured during 14RFO using procedure DB-OP-06003, Section 4.5. That test determined that current PZR heat loss is 198.4 kW, whereas Calculation C-NSA-064.02-016, Revision 0 assumes that ambient losses are 136 kW. The proposed Revision 1 uses the most recently measured ambient loss plus a margin term to ensure the value to the plant meets the design requirement.

The basis of the value for essentially powered heaters specified in Updated Final Safety Analysis Report (UFSAR) Table 5.1-4 (112 kW with ambient losses of 136 kW) is compliance with Section 2.1.1 of NUREG-0578, as delineated in UFSAR Section 5.5.10.2. The NUREG Section states:

Provide redundant emergency power for the minimum number of Pressurizer heaters required to maintain natural circulation conditions in the event of loss of offsite power (LOOP).

The duration to maintain natural circulation is not specified. The 112 kW value presently provided in the UFSAR is based on maintaining natural circulation in excess of 100 hours, as documented in Calculation C-NSA-064.02-010, R. 0. However, other limitations on the capability to maintain natural circulation exist, particularly the amount of water in the Condensate Storage Tanks. The Davis-Besse Technical Specification 3.7.1.3 requires enough water in those tanks to maintain hot standby for 13 hours and then to cool down to less than 280 degrees Fahrenheit. Therefore, the proposed revision to C-NSA-064.02-016 aligns the duration for maintaining natural circulation to 15 hours, to match the 13 hour CST volume requirement with 2 hours of added margin.

List the UFSAR-described design functions potentially affected by the activity.

The design function potentially affected by this change is the ability to maintain the Reactor Coolant System in a subcooled condition to support single phase natural circulation following a loss of offsite power (LOOP) event. This event is considered significant because it limits the equipment available to remove core decay heat to that powered by the Emergency Diesel Generators or steam. That includes the Auxiliary Feedwater Pumps. To ensure that the RCS stays subcooled and the steam bubble remains in the PZR, it is necessary to keep the PZR temperature sufficiently high compared to the RCS temperature. The RCS could be maintained at the post-trip value for up to 13 hours, based on Technical Specification 3.7.1.3. Therefore, a calculation has been performed to determine the amount of PZR Heaters required to ensure the bubble remains in the PZR for slightly longer than that time period.

10CFR 50.59 screening questions. Check the correct response.

1.	Does the proposed activity involve a change to an SSC that adversely affects an UFSAR-described design function?	☐ YES	☑ NO
2.	Does the proposed activity involve a change to a procedure that adversely affects how UFSAR-described SSC design functions are performed or controlled?	☐ YES	☑ NO
3.	Does the proposed activity involve revising or replacing an UFSAR-described evaluation methodology used in establishing the design bases or in the safety analyses?	☐ YES	☑ NO
4.	Does the proposed activity involve a test or experiment not described in the UFSAR, where an SSC is utilized or controlled in a manner that is outside the reference bounds of the design for that SSC or is inconsistent with analyses or descriptions in the UFSAR?	☐ YES	☑ NO

List the documents reviewed where relevant information was found, including section numbers and key words searched:

UFSAR Sections: 5.1.8, 5.1.9, 5.2.2.3, 5.5.10.2, 5.6, Table 5.1-4 Change Request No: 07-184

Technical Specifications: 3/4.7.1.3 and Bases, 3/4.4.4 and Bases

Other regulatory documents: NUREG-0578, NUREG-0737

FirstEnergy	10 CFR 50.59 SCREEN NOP-LP-4003-02 Rev. 01 Page 2 of 2	No. 07-05280 Rev. 00
Initiating Activity No. Calculation C-NSA-064.02-016		Rev. 1

☐ BVPS 1 ☐ BVPS 2 ☑ DBNPS ☐ PNPP

Keywords: Pressurizer, Heaters

☐ At least one question is answered YES. Perform a 10CFR50.59 Evaluation.

☑ All questions are answered NO. A 10CFR50.59 Evaluation is not required. Justify the determination:

Revising the number of essentially power PZR heaters to compensate for increased ambient losses does not adversely affect any UFSAR described design function because it ensures that the amount of heaters needed to meet the design requirement are powered from each of the Emergency Diesel Generators. As the ambient loss term changes, it is necessary to revise the required heat capacity. Revision of the calculation has determined the number of heaters needed so that the design function is maintained. Margin has been included in the calculation to allow for variations in actual ambient losses as well as in the duration of how long natural circulation might be maintained. Therefore, revising the calculation to ensure the design requirement is met is not an adverse change to SSCs. Changing the design basis of the required number of heaters is not adverse because the requirement, as stated in the UFSAR, is still being met. The stated design requirement is to meet Section 2.1.1. of NUREG-0578. That requirement does not include a specified time. Appendix A of that NUREG acknowledges that natural circulation will not continue indefinitely due to other limitations on plant systems. It is concluded that there was no intent to require heaters to maintain full temperature and pressure conditions indefinitely. Aligning the design requirement for the heaters to maintain subcooling for a duration slightly longer than the secondary side can support natural circulation without cool down is still conservatively implementing the NUREG-0578 requirement and is therefore considered to not be an adverse change UFSAR described design functions.

Changing the required number of essentially powered PZR heaters and the basis for the requirement does not adversely affect how any UFSAR described SSC design functions are performed or controlled because the same capability to keep the RCS subcooled for as long as the secondary side systems can support natural circulation is not changing. Hence all design functions will be accomplished in the same manner as before the change. While the RCS will more closely approach the saturated condition, it will remain subcooled for the required duration, based on the calculation results.

The same methodology is being used to determine the required number of heaters as was used to establish the 112 kW of heaters with 136 kW of losses requirement. Therefore, no change is occurring in the evaluation methodology used to establish the design basis of the plant or used in the plant's safety analyses.

The change in required number of essentially powered PZR heaters is not a test or experiment not described in the UFSAR. All SSC are operated within their design bounds and limitations and consistent with the analyses and descriptions in the UFSAR. Therefore, the activity does not constitute a test or experiment.

Preparer (Print name) Blakely, Dennis R	Signature Dennis R Blakely	Date 11/26/2007
Reviewer (Print name) Nelson, Michael L	Signature M Nelson	Date 11/28/07

Database updated ☒	Signature M. Nelson M Nelson	Date 11/28/07

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DESIGN INTERFACE SUMMARY – DB

DIS Rev. R00

NOP-CC-2004-05 Rev. 08

Document/Activity Evaluated: C-NSA-064.02-016 Minimum Essential Pressurizer Heater Capacity **Rev.**01

Req'd	Sect.	Topic	Prepare DIE and forward to:	DIE No.
PROGRAMS and PROCEDURES INTERFACES				
☒	N/A	Maintenance Programs & Procedures	Maintenance	Note 1
☒	N/A	Ops Programs & Procedures	Operations	01
☒	N/A	System Programs & Procedures	Responsible Plant Engineer	02,03
☒	N/A	Engineering Assessment Board	EAB Chairman	04
☒	N/A	Training	Training (Information Only Copy)	N/A
DESIGN INTERFACES				
Potential Interface Evaluated using DIRC (NOP-CC-2004-02) Rev 3				
☐	1.0	ALARA	Radiation Protection	
☐	2.0	Fire Protection/Safe Shutdown	Electrical/I&C Engineering Unit, DES	
☐	3.0	Environmental Qualification	Engineering Programs Unit, TSES	
☐	4.0	Human Factors	Electrical/I&C Engineering Unit, DES	
☐	5.0	Plant Security System Interface	Electrical/I&C Engineering Unit, DES / Security Operations	
☐	6.0	Seismic Interaction/Seismic Qualification	Mechanical/Structural Engineering Unit, DES	
☐	7.0	Pipe Rupture Interaction	Engineering Analysis Unit, DES	
☐	8.0	Internal Missile Hazards	Engineering Analysis Unit, DES	
☐	9.0	NSSS Design Basis	Engineering Analysis Unit, DES	
☐	10.0	Containment Isolation	Mechanical/Structural Engineering Unit, DES	
☐	11.0	Materials Compatibility/Chemical Control	Mechanical/Structural Engineering Unit, DES	
☐	12.0	Control Room Habitability	Mechanical/Structural Engineering Unit, DES	
☐	13.0	Mechanical Systems (13.1 – 13.20)	Mechanical/Structural Engineering Unit, DES	
☐	13.0	Mechanical Systems (13.21 – 13.27)	Engineering Analysis Unit, DES	
☐	14.0	Penetrations	Mechanical/Structural Engineering Unit, DES	
☐	15.0	Miscellaneous Structural Considerations	Mechanical/Structural Engineering Unit, DES	
☐	16.0	Heavy Loads	Mechanical/Structural Engineering Unit, DES	
☒	17.0	Electrical Systems Analysis	Electrical/I&C Engineering Unit, DES	
☐	18.0	Instrumentation and Controls	Electrical/I&C Engineering Unit, DES	
☐	19.0	Simulator (Hardware & Software)	Training	
☐	20.0	In-Service Testing (20.1 - 20.10)	Engineering Programs Unit, TSES	
☐	20.0	Repair/Replacement Program & ISI (20.11-20.19)	Engineering Programs Unit/Rapid Response Engineering Unit, TSES	
☐	20.0	Snubber Program (20.20)	Engineering Programs Unit, TSES Mechanical/Structural Engineering Unit, DES	
☐	21.0	Piping and Pipe Supports	Mechanical/Structural Engineering Unit, DES	
☐	22.0	Reactor Core	Operations - RE/Engineering Analysis Unit, DES	
☐	23.0	Licensing Review	Regulatory Compliance	
☐	24.0	Lubrication/Vibration Monitoring	Maintenance- PS	
☐	25.0	Probabilistic Safety Assessment	Engineering Analysis Unit, DES	
☐	26.0	Piping & Equipment	Mechanical/Structural Engineering Unit, DES	
☐	27.0	Valve Programs	Engineering Programs Unit, TSES	
☐	28.0	Plant Computers/Software	Electrical/I&C Systems Engineering Unit, PEERS	
☐	29.0	Maintenance Rule, 10CFR 50.65	Engineering Programs Unit, TSES	
☐	30.0	Operations Impact	Operations Services	
☐	31.0	Maintenance	Maintenance- ME,EL,IC,PS	
☐	32.0	Chemistry	Chemistry	
☐	33.0	Training	Training	
☐	34.0	Corrosion-Erosion Monitoring and Analysis	Engineering Programs Unit, TSES	
☐	35.0	RCS Integrated Leakage Reduction Program	Engineering Programs Unit, TSES	
☐	36.0	Boric Acid Corrosion Control Program	Engineering Programs Unit, TSES	
☐	37.0	Locked and Capped Valve Review	Operations Services	
☐	38.0	Dry Fuel Storage Review	Operations- RE / Mechanical/Structural Engineering Unit, DES	
☐	39.0	Protective Coatings/Painting	Mechanical/Structural Engineering Unit, DES	
☐	40.0	Personal Safety Considerations	Industrial Safety, OPS	
☐	41.0	Emergency Response	Emergency Response Section	

Comments: Note 1. This calculation will not impact any site programs or procedures. Therefore the mandatory reviews as identified above, have been waived with concurrence of the Engineering Supervisor.

[signature] Kevin Zeller Date: 12-5-07

Prepared by: *(Print Name and Sign)*	**Date**	**Reviewed by:** *(Print Name and Sign)*	**Date**
Patrick Bozym [signature]	11/28/07	M Nelson [signature]	12/5/07

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DESIGN INTERFACE EVALUATION

NOP-CC-2004-07 Rev. 03

Document/Activity	Rev.	DIE No./Rev.
C-NSA-064.02-016 Minimum Essential/Pressurizer Heater Capacity	1	01

To: Interfacing Organization *(As identified on DIS)*	Contact		
Operations	R. Patrick		
From: *(Design Engineer)*	**Mail Zone**	**Phone**	**DIE Response Date**
Patrick Bozym	DB 3105	x8283	11/22/07
Description of Change/Areas of Concern	**List DIRC Questions**		
Minimum essential Pressurizer heaters requirment updated to reflect new ambient heat loss value of 198.4 KW	30.2		

To be completed by the Interface Evaluator. Refer to NOP-CC-2004, Section 4.2.1 and Attachment 2 for guidance.

IMPACT ON DESIGN AND LICENSING BASIS
- Describe affect on current licensing basis for the system/structure/component (SSC) involved.
- Describe affect of proposed change on existing design basis.
- Identify relevant design criteria and standards (including applicable revision/addenda).
- Identify potential failure mechanisms and failure consequences.
- Describe impact on operational configuration, system interactions, and any other pertinent considerations. Identify required actions.

INSTALLATION AND TESTING
- Identify appropriate installation requirements and acceptance criteria for testing.
- Identify any limitations such as open assumptions or engineering holds. Identify what is restrained and what is required to release the hold.

IMPACT ON TRAINING
- Does the change add, modify, or delete equipment, components, systems, or processes that result in the need for personnel to acquire additional skills and knowledge? ☒ No ☐ Yes
  - If Yes, complete the Affected Documents section below. Identify Training as the Document Type, assign an Action Code, Responsible Organization and Tracking Number. NA all other fields.

COMMENTS/ADDITIONAL INPUT/ INFORMATION

AFFECTED DOCUMENTS

List new and/or existing documents requiring issue/update as a result of this activity (e.g., drawings, procedures, databases, lesson plans, and vendor manuals). List current revision/version of the document.

Document Type	Document	Unit	Rev.	Version	Action Code*	Responsible Organization	Tracking No.**
	NONE FOR OPERATIONS						

*Action Completion Code:
1 Document must be issued/effective at implementation of the activity prior to returning the SSC to service (Operational Acceptance).
2 Document must be issued/effective following issuance of the package, but prior to implementation.
3 Document must be issued/effective upon issuance of the package for implementation.
4 Document must be issued/effective following return of the SSC to service (Operational Acceptance) and prior to closeout of the activity.
5 Document needs to be changed as a result of the activity, but the change can be done when the responsible organization deems appropriate. ** A tracking number is required for these actions.

CONCLUSION

☒ **Interface Not Required** (Provide Justification)
THERE IS NO IMPACT TO OPERATIONS PROGRAMS, PROCESSES OR PROCEDURES - SEE ATTACHED

☐ **Interface Provided** (Indicate if Final Review required)	☐ Final Review required	
Interface Evaluator *(Print Name and Sign)* Date	Approval *(Print Name and Sign)*	Date
Bob Lakis Per telecon [signature] 12-11-07		

FINAL REVIEW

	Interface Evaluator	Date
☐ Comments need to be resolved		
☐ My comments/input have been properly incorporated and/or addressed.		

IMPACT ON DESIGN AND LICENSING BASIS

- Describe affect on current licensing basis for the system/structure/component (SSC) involved.

  This Design Interface Evaluation (DIE) has been reviewed for its impact on Operations, Operations Programs and Operations Procedures. Any identified areas affected by this DIE have been documented under "AFFECTED DOCUMENTS".

- Describe affect of proposed change on existing design basis.

  This Design Interface Evaluation (DIE) has been reviewed for its impact on Operations, Operations Programs and Operations Procedures. Any identified areas affected by this DIE have been documented under "AFFECTED DOCUMENTS".

- Identify relevant design criteria and standards (including applicable revision/addenda).

  This Design Interface Evaluation (DIE) has been reviewed for its impact on Operations, Operations Programs and Operations Procedures. Any identified areas affected by this DIE have been documented under "AFFECTED DOCUMENTS".

- Identify potential failure mechanisms and failure consequences.

  This Design Interface Evaluation (DIE) has been reviewed for its impact on Operations, Operations Programs and Operations Procedures. Any identified areas affected by this DIE have been documented under "AFFECTED DOCUMENTS".

- Describe impact on operational configuration, system interactions, and any other considerations. Identify required actions.

  This Design Interface Evaluation (DIE) has been reviewed for its impact on Operations, Operations Programs and Operations Procedures. Any identified areas affected by this DIE have been documented under "AFFECTED DOCUMENTS".

INSTALLATION AND TESTING

- Identify appropriate installation requirements and acceptance criteria for testing.

  This Design Interface Evaluation (DIE) has been reviewed for its impact on Operations, Operations Programs and Operations Procedures. Any identified areas affected by this DIE have been documented under "AFFECTED DOCUMENTS".

- Identify any limitations such as open assumptions or engineering holds. Identify what is restrained and what is required to release the hold.

  This Design Interface Evaluation (DIE) has been reviewed for its impact on Operations, Operations Programs and Operations Procedures. Any identified areas affected by this DIE have been documented under "AFFECTED DOCUMENTS".

IMPACT ON TRAINING

- Does the change add, modify, or delete equipment, components, systems, or processes that result in the need for personnel to acquire additional skills and knowledge? ☒ No ☐ Yes

This Design Interface Evaluation (DIE) has been reviewed for its impact on Operations, Operations Programs and Operations Procedures. It has been determined there is no impact to Operations Programs, Processes or Procedures for this DIE therefore **"Interface Not Required"** has been marked.

FirstEnergy

DESIGN INTERFACE EVALUATION

NOP-CC-2004-07 Rev. 03

kz 12-5-07

Document/Activity C-NSA-064.02-16 Minimum Essential Pressurizer Heater Capacity	**Rev.01**	**DIE No./Rev.** 02

To: Interfacing Organization *(As Identified on DIS)* Mechanical Systems	**Contact** Michael Parker		
From: *(Design Engineer)* Patrick Bozym	**Mail Zone** 3105	**Phone** 8283	**DIE Response Date** 12/03/07
Description of Change/Areas of Concern Minimum Essential Pressurizer heater requirement updated to reflect new ambient heat loss value of 198.4 KW.	**List DIRC Questions**		

To be completed by the Interface Evaluator. Refer to NOP-CC-2004, Section 4.2.1 and Attachment 2 for guidance.

IMPACT ON DESIGN AND LICENSING BASIS

- Describe affect on current licensing basis for the system/structure/component (SSC) involved.
- Describe affect of proposed change on existing design basis.
- Identify relevant design criteria and standards (including applicable revision/addenda)
- Identify potential failure mechanisms and failure consequences.
- Describe impact on operational configuration, system interactions, and any other pertinent considerations. Identify required actions

See Attached MMB 11/27/07

INSTALLATION AND TESTING

- Identify appropriate installation requirements and acceptance criteria for testing
- Identify any limitations such as open assumptions or engineering holds. Identify what is restrained and what is required to release the hold.

IMPACT ON TRAINING

- Does the change add, modify, or delete equipment, components systems, or processes that result in the need for personnel to acquire additional skills and knowledge? ☒ No ☐ Yes
    - If Yes, complete the Affected Documents section below. Identify Training as the Document Type assign an Action Code Responsible Organization and Tracking Number NA all other fields.

COMMENTS/ADDITIONAL INPUT/ INFORMATION

AFFECTED DOCUMENTS

List new and/or existing documents requiring issue/update as a result of this activity (e.g. drawings procedures databases, lesson plans and vendor manuals). List current revision/version of the document.

Document Type	Document	Unit	Rev.	Version	Action Code*	Responsible Organization	Tracking No **
	NONE						

*Action Completion Code:

1 Document must be issued/effective at implementation of the activity prior to returning the SSC to service (Operational Acceptance).
2 Document must be issued/effective following issuance of the package, but prior to implementation.
3 Document must be issued/effective upon issuance of the package for implementation.
4 Document must be issued/effective following return of the SSC to service (Operational Acceptance) and prior to closeout of the activity.
5 Document needs to be changed as a result of the activity, but the change can be done when the responsible organization deems appropriate. ** A tracking number is required for these actions.

CONCLUSION

☐ **Interface Not Required** (Provide Justification)

☒ **Interface Provided** (Indicate if Final Review required)		☒ Final Review required	
Interface Evaluator *(Print Name and Sign)* Mike Beier [signature]	Date 11/27/07	Approval *(Print Name and Sign)* M. G. Parker [signature]	Date 11/28/07

FINAL REVIEW

☐ Comments need to be resolved	Interface Evaluator	Date
☒ My comments/input have been properly incorporated and/or addressed.	Interface Evaluator Patrick Bozym for M. Beier [signature]	Date 11/29/07

See E-Mail p. 3 of 4

Calc C-NSA-064.02-016 Rev 1 PZR HTRS- DIE Review

Per NOP-CC-2004 4.2.1 the Interface Evaluator is responsible for describing the following on the DIE as applicable to his area of responsibility If the items are not within the scope of the review, then N/A is to be stated on the DIE and a justification provided for the answer (per NOP-CC-2004 4 2 1):

- Effect on current licensing basis for the system/structure/component (SSC) involved

Response- Effect on current licensing basis is to be evaluated by Design Engineering and thus is not evaluated by the System Engineer DIE.

- Effect of proposed change on existing design basis

Response- Effect on existing design basis is to be evaluated by Design Engineering and thus is not evaluated by the System Engineer DIE

- Relevant design criteria and standards (including applicable revision/addenda)

Response- Relevant design criteria and standards are the responsibility of Design Engineering and thus are not evaluated by the Sys Eng DIE.

- Potential failure mechanisms and failure consequences

Response- Potential failure mechanisms and failure consequences are the responsibility of Design Eng & thus not evaluated by the Sys Eng DIE

- Operational configuration, system interactions, and any other pertinent considerations that are associated with proposed activity Identify required actions

Response- Calculation does not affect existing system operation or maintenance activities The calc updates the minimum essential pressurizer capacity based on a new ambient heat loss value

Also, per NOP-CC-2004 4.2.1:

- Ensure appropriate installation requirements and acceptance criteria for SSC testing are included, if applicable:

Response- There is no revised system testing requirements as the result of the changes to the calculation.

- Identify any limitations applicable to the evaluation response

Response- No limitations noted.

- Identify any training requirements.

Response- *No additional training would be required to support the changes made to this calculation*

Per NOP-CC-2004 Attachment 2- System Engineer Review
In accordance with NOP-CC-2004, the System Engineer is responsible for ensuring the following items are addressed on DIE:

1 **Impact of change on system.**
Discussion- This Calculation does not change the function or operation of the RCS System Calculation C-NSA-064.02-016 rev 01 provides the basis for determining the req'd heater capacity needed to meet the criteria based on specific leakage out of the pressurizer via PSV's and PORV.
2. **Change in system operation maintenance. Include all repetitive task additions/deletions.**
Discussion- This Calculation does not affect existing system operation or maintenance activities The calc updates the minimum essential pressurizer capacity based on a new ambient heat loss value.
Impact on procedures/instructions under the responsibility of Plant Engineering resulting from change.
Discussion- System operating procedures are not affected, nor the System Description (below the level of detail) by this calculation change. This calculation is also being reviewed by Electrical System Engineer responsible for the pressurizer heaters and is familiar with any electrical (Maintenance) procedures that may be affected
3. **Test requirements and plant and/or system configuration required for testing.**
Discussion- There are no test requirements that have to be revised as a result of this Calculation
5. **Identify need for increased vendor oversight or enhanced procurement.**
Discussion- This Calculation will not require increased vendor oversight or enhanced procurement

Additional comments:

1) Calc should recognize that the assumed leakage is through the PSV's (Code Safety valves) and also the PORV Where ever PSV's is mentioned, include PORV also Or could state that the leakage is "in-leakage to the Quench Tank from the pressurizer
2) Attach 6 legend is reversed. The upper line is indicating the 136KW ambient loss when in fact this is for the 210KW ambient loss
3) The assumed 210 KW ambient heat loss appears to be too conservative of a value. This was based on an actual 198.4 KW measured during 14RFO; however, when this was performed a Quench Tank in-leakage (PSV & PORV) of 0.138 gpm was present It is felt that an equivalent KW rating for the 0 138gpm be calculated and then subtracted from the 198 4 KW (or the 210 KW) so as to normalize this value to be able to arrive at an ambient heat loss at 0 gpm pressurizer out-leakage An alternative could be to use the values in the calc assuming that at 0.138 gpm heater capacity is 85 KW and since the graph is linear, extrapolation back to o gpm would be the equivalent of ~ 78 KW. By performing this, the Ambient Heat Loss line in Att 6 is less (lower on the graph)

[signature] Mike Beier System Engineer

Michael P. Beier/FirstEnergy
11/29/2007 01:24 PM

To Patrick J Bozym/FirstEnergy@FirstEnergy
cc
bcc
Subject Re: DIE review for calc (Pres Htrs)

Patrick,
I have reviewed the most recent copy of calc for pres. htrs that you sent today. My previous DIE comments have been adequately incorporated.
Thanks,
Mike
Patrick J Bozym/FirstEnergy

Patrick J Bozym /FirstEnergy
11/29/2007 01:12 PM

To Michael P. Beier/FirstEnergy@FirstEnergy
cc
Subject Re: DIE review for calc (Pres Htrs)

Mike
Sorry about that.
This should be the right file this time.
Patrick

C-NSA-064.02-016_Rev.1.pdf

Michael P. Beier/FirstEnergy

Michael P. Beier/FirstEnergy
11/29/2007 01:05 PM

To Patrick J Bozym/FirstEnergy@FirstEnergy
cc
Subject Re: DIE review for calc (Pres Htrs)

Patrick,
You sent me a copy my DIE response? Please send the calc.
Thanks,
Mike

Patrick J Bozym/FirstEnergy

Patrick J Bozym /FirstEnergy
11/29/2007 11:10 AM

To Michael P. Beier/FirstEnergy@FirstEnergy p 4 of 4

cc

Subject Re: DIE review for calc (Pres Htrs)

Mike

Attached is the calculation with a updated design input section, which points out 0.138 gpm leakage throuhg the PSV's/PORV was present when the 198.4 KW ambient loss value was measured. I also replased PSV's with PSV's/PORV in the calc, and made the legand in attachment 6 easier to read.

Patrick Bozym
x8283

FirstEnergy

DESIGN INTERFACE EVALUATION

NOP-CC-2004-07 Rev. 03

Document/Activity	C-NSA-064.02-16 Minimum Essential Pressurizer Heater Capacity	Rev 01	DIE No./Rev. 03

To: Interfacing Organization (As Identified on DIS) EAB Nuclear Electrical & Controls Systems	Contact Brian Young		
From: (Design Engineer) Patrick Bozym	Mail Zone 3105	Phone 8283	DIE Response Date 12/03/07
Description of Change/Areas of Concern Minimum Essential Pressurizer heater requirement updated to reflect new ambient heat loss value of 198.4 KW	List DIRC Questions		

To be completed by the Interface Evaluator. Refer to NOP-CC-2004, Section 4.2.1 and Attachment 2 for guidance.

IMPACT ON DESIGN AND LICENSING BASIS —— NONE — (THIS SECTION NOT EVALUATED BY DBPE.)

- Describe affect on current licensing basis for the system/structure/component (SSC) involved
- Describe affect of proposed change on existing design basis.
- Identify relevant design criteria and standards (including applicable revision/addenda)
- Identify potential failure mechanisms and failure consequences
- Describe impact on operational configuration, system interactions, and any other pertinent considerations. Identify required actions

INSTALLATION AND TESTING

- Identify appropriate installation requirements and acceptance criteria for testing → N/A
- Identify any limitations such as open assumptions or engineering holds Identify what is restrained and what is required to release the hold.

IMPACT ON TRAINING —— NONE

- Does the change add, modify, or delete equipment, components systems or processes that result in the need for personnel to acquire additional skills and knowledge? ☒ No ☐ Yes
  - If Yes, complete the Affected Documents section below. Identify Training as the Document Type, assign an Action Code Responsible Organization and Tracking Number NA all other fields

COMMENTS/ADDITIONAL INPUT/ INFORMATION (SEE ATTACHED SHEET)

AFFECTED DOCUMENTS

List new and/or existing documents requiring issue/update as a result of this activity (e g , drawings, procedures databases, lesson plans, and vendor manuals). List current revision/version of the document.

Document Type	Document	Unit	Rev	Version	Action Code*	Responsible Organization	Tracking No **
	NONE UNDER DBPE						

*Action Completion Code:

1 Document must be issued/effective at implementation of the activity prior to returning the SSC to service (Operational Acceptance)
2 Document must be issued/effective following issuance of the package, but prior to implementation
3 Document must be issued/effective upon issuance of the package for implementation
4 Document must be issued/effective following return of the SSC to service (Operational Acceptance) and prior to closeout of the activity
5 Document needs to be changed as a result of the activity, but the change can be done when the responsible organization deems appropriate. ** A tracking number is required for these actions.

CONCLUSION

☐ Interface Not Required (Provide Justification)

JAF 12/4/07

☒ Interface Provided (Indicate if Final Review required) 12/4/07 ☒ Final Review required

Interface Evaluator (Print Name and Sign)	Date	Approval (Print Name and Sign)	Date
JOHN A. FEHL [signature]	11/29/07	Brian Young [signature]	12/4/07

FINAL REVIEW

	Interface Evaluator	Date
☐ Comments need to be resolved		
☒ My comments/input have been properly incorporated and/or addressed.	[signature]	12/11/07

This calculation C-NSA-064.02-016 Rev 01 takes into account latest pressurizer ambient heat losses identified during 14RFO in April 2006. This calculation provides the new minimum essential pressurizer heater capacity needed based on the latest identified pressurizer ambient heat losses

SPECIFIC COMMENTS on this calculation:

1.) This calculation needs to say that the assumed leakage is based on PSVs and the PORV. Not just the PSVs. Or total leakage based on Quench Tank leakage accumulations *(Per telecon, this comment has been resolved 12/4/07).*

2.) The legend on Attachment 6 is incorrect. The legend is reversed. (Per telecom, this comment has been resolved 12/4/07).

3.) Provide changes needed in Operations procedure DB-OP-06003 via notification to Operations per telecon discussion with Dennis Blakely on 12/4/07.

4) Per telecon with Dennis Blakely 12/4/07, it is understood that 85KW essential heater capability is needed per bank (based on no RCS leakage.) Therefore, the 126KW capacity of each essential heater bank is acceptable. Also it is understood that the essential heaters capacity is NOT required to have to compensate for minimum bypass spray flow since this flow is considered neglible in natural recirculation during a transient. Therefore, it is correct to use the 198.4KW value for ambient heat loss in this calculation.

DIE STANDARD Input:

1) Impact of change on system -- This calculation provides a new plot for minimum required essential heaters capacity needed based on the new identified increased pressurizer ambient heat losses in April 2006 (conservatively considered here to be 210 KW) No system change is warranted or required (See comment #4 discussion above)

2) Change in system operation maintenance Include all repetitive task additions/deletions. – The resolution from this calculation will not impact repetitive maintenance activities There is a recommended change to Operations procedure DB-OP-06003 (See comment #3 above)

3) Impact on procedures/instructions under the responsibility of Plant Engineering resulting from this change - There is no impact on any procedures/instructions under the responsibility of Plant Engineering because of this calculation. There are changes needed to the Pressurizer System Description (See comment #3 discussion above)

4) Test requirements and plant and/or system configuration required for testing. -- No special testing is required for this calculation other than what is already stipulated in DB-OP-06003 Section 4 5

5) Identify need for increased vendor oversight or enhanced procurement – This calculation does not require any mandated vendor oversight or procurement

John A Fehl 12/4/07

John Fehl – System Engineer Date

FirstEnergy

DESIGN INTERFACE EVALUATION

NOP-CC-2004-07 Rev. 03

Document/Activity C-NSA-064.02-16 Minimum Essential Pressurizer Heater Capacity		**Rev.01**	**DIE No./Rev.** 04

To: Interfacing Organization *(As identified on DIS)* EAB	**Contact** Andy Migas		
From: *(Design Engineer)* Patrick Bozym	**Mail Zone** 3105	**Phone** 7392	**DIE Response Date**
Description of Change/Areas of Concern Minimum Essential Pressurizer heater requirement updated to reflect new ambient heat loss value of 198.4 KW	**List DIRC Questions**		

To be completed by the Interface Evaluator. Refer to NOP-CC-2004, Section 4.2.1 and Attachment 2 for guidance.

IMPACT ON DESIGN AND LICENSING BASIS

- Describe affect on current licensing basis for the system/structure/component (SSC) involved. N/A *
- Describe affect of proposed change on existing design basis.
- Identify relevant design criteria and standards (including applicable revision/addenda).
- Identify potential failure mechanisms and failure consequences.
- Describe impact on operational configuration, system interactions, and any other pertinent considerations. Identify required actions.

INSTALLATION AND TESTING

- Identify appropriate installation requirements and acceptance criteria for testing.
- Identify any limitations such as open assumptions or engineering holds. Identify what is restrained and what is required to release the hold.

IMPACT ON TRAINING

- Does the change add, modify, or delete equipment, components, systems, or processes that result in the need for personnel to acquire additional skills and knowledge? ☐ No ☐ Yes
  - If Yes, complete the Affected Documents section below. Identify Training as the Document Type, assign an Action Code, Responsible Organization and Tracking Number. NA all other fields.

COMMENTS/ADDITIONAL INPUT/ INFORMATION

AFFECTED DOCUMENTS

List new and/or existing documents requiring issue/update as a result of this activity (e.g., drawings, procedures, databases, lesson plans, and vendor manuals). List current revision/version of the document.

Document Type	Document	Unit	Rev.	Version	Action Code*	Responsible Organization	Tracking No.**

*Action Completion Code:

1 Document must be issued/effective at implementation of the activity prior to returning the SSC to service (Operational Acceptance).
2 Document must be issued/effective following issuance of the package, but prior to implementation.
3 Document must be issued/effective upon issuance of the package for implementation.
4 Document must be issued/effective following return of the SSC to service (Operational Acceptance) and prior to closeout of the activity.
5 Document needs to be changed as a result of the activity, but the change can be done when the responsible organization deems appropriate. ** A tracking number is required for these actions.

CONCLUSION

☐ **Interface Not Required** (Provide Justification)

☒ **Interface Provided** (Indicate if Final Review required)		☒ Final Review required	
Interface Evaluator *(Print Name and Sign)* A.G. MIGAS [signature]	Date 12/10/07	Approval *(Print Name and Sign)* A.G. MIGAS [signature]	Date 12/10/07

FINAL REVIEW

☒ Comments need to be resolved	Interface Evaluator [signature]	Date 12/10/07
☒ My comments/input have been properly incorporated and/or addressed.	Interface Evaluator [signature]	Date 12/12/07

* EAB PROVIDES REVIEW PER NOBP-CC-2005.

DOCUMENT REVIEW
ED 6864-2

FILE
DIE 04/0

REVIEW CONDUCTED BY		
ORGANIZATION EAB	INDIVIDUAL (PRINT NAME) A. Migas	SHEET 2 OF 2

☐ NO COMMENTS ☐ NO RESPONSE REQUESTED ☒ A RESPONSE TO EACH COMMENT IS REQUESTED, PLEASE RETURN THIS FORM WITH YOUR RESPONSE IN THE SPACE PROVIDED

DOCUMENT TITLE OR NUMBER
C-NSA-064.02-016 Rev. 1 Minimum Essential Pressurizer Heater Capacity

COMMENTS	RESPONSE
1. Description of Change – The revised heat loss value used in the revision is 210 kW.	Changed 198.4 kW to 210 kW
2. Impact on Output Documents – If this revision supports the Improved Tech Specs (ITS), then identify the number. If this revision does not support the ITS, then revise this section.	Limiting condition for operation 3.4.9.b
3. DIN – Has a PIN been written to DIN 1 to identify this calculation as an output document?	Yes
4. Analysis Methodology – Some of the modeling items identified appear to be assumptions per the definition in NOP-CC-2002. Identify these items in the assumption section and provide the justification/basis.	Incorporated Assumptions section
5. Design Inputs – Provide the source of normal water volume as 889 ft^3. DIN 4 and DIN 9 identify this as 800 ft^3.	950 ft^3 volume corresponds to pressurizer water level of 220". This calc. conservatively uses a value of 850 ft^3
6. Attachment 11 – This page from the system description has been superseded. Suggest it not be attached to the calculation.	Deleted this Attachment
7. DIE 01 is missing a signature.	signed per telecon
8. DIE 03 – This DIE identifies that DB-OP-06003 and System Description SD-039A require revision. These should be identified in a DIE sheet or an Affected Documents List.	Incorporated Affected Documents into Impact on output documents section DB-OP-06003: Notification 600429120 SD-039A: Notification 600429120 LB 12-11-07

REVIEWER SIGNATURE	DATE	RESOLUTION CONCURRENCE SIGNATURE	DATE
A. Migas	12/10/07	A. Migas	12/12/07

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RAI Screening Required: No

Status: Approval Not Required

This is a Non RAI Dialogue

This document will not be relied upon by staff for disposition of the LAR

This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted) **Yes**

NRC ITS TRACKING

NRC Reviewer

ID	**200712271212** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **3.4 Tim Kolb** TB POC: JFD Number: **None** Page Number(s): **8** ITS Number: **None** OSI: **None** DOC Number: **None** Bases JFD Number: **None**
Comment	**Volume 2 of the submittal, No Significant Hazards for Generic Changes states on page 8 for question 1 that no significant increase in the probablility or consequence of an accident previously evaluated will be allowed. Consider adding the words "without prior NRC approval" to the end of the sentence to make it completely correct.**
Issue Date	**12/27/2007**
Close Date	**02/15/2008**

Responses

Licensee Response by Jerry Jones on 02/13/2008	Davis-Besse will add the words “without prior NRC approval” to the end of the next to last sentence in the first question of No Significant Hazards Consideration For Generic Changes, Removed Detail Changes (Volume 2, Page 8). A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.
NRC Response by Timothy Kolb on 02/15/2008	No further questions on this item. This item is closed.

Date Created: 12/27/2007 12:12 PM by Timothy Kolb
Last Modified: 02/15/2008 08:11 AM

Chapter 4.0 RAIs

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RAI Screening Required: Yes

This Document will be approved by: **Tim Kobetz**

This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted)

Status: Closed

Regulatory Basis must be included in Comments section of this Form

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200710090851** Conference Call Requested? **No**
Category	**In Scope**
ITS Information	ITS Section: **4.0 Gerald Weig**; TB POC: ; JFD Number: **5**; Page Number(s): **15**; ITS Number: **4.3**; OSI: **21**; DOC Number: **None**; Bases JFD Number: **None**
Comment	**Please provide additional clarification for this deviation from ISTS pertaining to ITS 4.3.1, Criticality.** **JFD 5 – The justification provided for the removal of the maximum weight percent (wt %) fuel enrichment does not support the removal of this value. The reference to 4.2.1 does not include any enrichment information. Additionally, the reference to ITS 3.7.16 indicates that a maximum fuel enrichment of 5.05 wt % is allowed in the spent fuel pool, which is contrary to ITS 4.3.1.2a.** **Refer to 10 CFR 50.68(b)(7).**
Issue Date	**10/09/2007**
Close Date	**01/28/2008**

Responses

Licensee Response by Jerry Jones on 11/02/2007	ISTS 4.3.1.1.a (Volume 15, Page 12) includes a requirement on the maximum U-235 enrichment for the spent fuel storage poolracks. This requirement was not added to the Davis-Besse ITS, and was justified by Justification for Deviations (JFD) 5 (Page 15). As stated in JFD 5, ITS 3.7.16 places a limitation on the maximum enrichment of the fuel that can be stored in the spent fuel storage pool. ITS Figure 3.7.16-1 (Volume 12, Page 372) provides a maximum limitation of 5.05 wt%, which is consistent with the current Figure in the CTS (CTS Figure 3.9-1) (Volume 12, Page 365). The CTS and ITS Figure limit provides the spent fuel pool design limit on the maximum enrichment of fuel that can be stored in the spent fuel storage pool. 10 CFR 50.36 (d)(4) states, in part, that Design Features (i.e., Chapter 4.0 of the ISTS) to be included in the Technical Specifications are those features of the facility that are not covered in categories described in Safety Limits, Limiting Conditions for Operation (LCO), and Surveillance Requirements. Since the

	maximum fuel enrichment for storage in the spent fuel storage pool is covered by an LCO, then it is not necessary to include this specific requirement in the Davis-Besse ITS. This is the intent of the statement in JFD 5 that ITS LCO 3.7.16 places limitation on storage of spent fuel in the spent fuel storage pool racks. Furthermore, CTS 5.6.1.2.c (Volume 15, Page 6) references the Technical Specification that Figure 3.9-1 is a part of, and this reference is maintained in ITS 4.3.1.1.c (Page 14). Therefore, Davis-Besse believes that JFD 5 contains adequate information to justify not including a specific enrichment value in ITS 4.3.1.1, consistent with the current licensing basis. Part of the NRC question states "The reference to 4.2.1 does not include any enrichment information." The sentence in JFD #5 that states "The limitations and requirements of the fuel is already provided in Specification 4.2.1", will be removed to avoid confusion, since this statement is not needed as part of the justification. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment. The last part of the NRC question states "Additionally, the reference to ITS 3.7.16 indicates that a maximum fuel enrichment of 5.05% is allowed in the spent fuel pool, which is contrary to ITS 4.3.1.2.a." The new fuel storage racks are addressed by ITS 4.3.1.2.a, and the new fuel storage racks are not part of the spent fuel pool. Therefore, nothing is contrary about the reference to ITS 3.7.16. During a phone call with the NRC on 10/17/07, Tthe NRC also questioned the allowance in CTS Figure 3.9-1 that the maximum enrichment of spent fuel that could be stored in the spent fuel storage pool racks could be 5.05 wt%, and referred to the requirements of 10 CFR 50.68(b)(7). 10 CFR 50.68(b)(7) states "The maximum nominal U-235 enrichment of fresh fuel assemblies is limited to five (5.0) percent by weight." This specific CFR requirement is limiting the enrichment of new fuel. However, CTS 4.3.1.1 and 4.3.1.2 are describing the design of the spent and new fuel storage designs. The Davis-Besse new fuel storage pool racks are designed to hold new fuel at a maximum enrichment of 5.0 wt%, as shown in CTS 5.6.1.1.d (Page 6) and ITS 4.3.1.2.a (Page 14). The spent fuel pool racks, however, are designed to hold fuel with a maximum enrichment of 5.05 wt%, as described above. Davis-Besse must still comply with the 10 CFR 50.68(b)(7) requirement on maximum enrichment of new fuel, thus cannot currently use any fuel with a nominal enrichment greater than 5.0 wt%. This is specifically delineated in the Davis-Besse UFSAR. UFSAR Section 9.1.2.1 states that fuel stored in the spent fuel pool is administratively limited to a maximum nominal enrichment of 5.0 wt% U-235 to comply with subsection b of 10 CFR 50.68. If the CFR is changed in the future to allow a higher enrichment of fuel, Davis-Besse would not necessarily require a change to Technical Specifications for storing of the higher enriched fuel in the spent fuel pool (since the current analysis supports enrichments up to 5.05 wt%).the Davis-Besse Technical Specifications would allow the greater than 5.0 wt% enriched new fuel to be loaded into the spent fuel pool racks without requiring any further Technical Specification changes.

Date Created: 10/09/2007 08:51 AM by Gerald Waig
Last Modified: 01/28/2008 09:32 AM

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RAI Screening Required: Yes

This Document will be approved by: **Tim Kobetz**

This document has been reviewed and information in this question contains NO SUNSI sensitive material (the checkbox to the right must be selected before this question can be submitted)

Status: Closed

Regulatory Basis must be included in Comments section of this Form

Yes

NRC ITS TRACKING

NRC Reviewer

ID	**200710090904** Conference Call Requested? **No**
Category	**ESI - Emergent Staff Issue**
ITS Information	ITS Section: **4.0 Gerald Weig** TB POC: JFD Number: **6** Page Number(s): **15** ITS Number: **4.3** OSI: **21** DOC Number: **None** Bases JFD Number: **None**
Comment	**Please provide additional clarification for this deviation from ISTS.** **ITS 4.3.1.1c states "Fuel assemblies stored in the spent fuel storage racks in accordance with LCO 3.7.16."** **JFD 6 states that fuel is loaded in accordance with LCO 3.7.16 – with no exceptions allowed. However, LCO 3.7.16 does not specify identify fuel loading only categorization of the fuel. A note on Figure 3.9-1 refers to "Loading pattern considerations....described in the Bases".** **Refer to 10 CFR 50.36(c)(4), Design Features**
Issue Date	**10/09/2007**
Close Date	**01/11/2008**

Responses

Licensee Response by Jerry Jones on 10/18/2007	ITS LCO 3.7.16 (Volume 12, Page 370) states that fuel assemblies stored in the spent fuel pool shall be placed in the spent fuel pool storage racks in accordance with the criteria shown in Figure 3.7.16-1. While the Note to Figure 3.7.16-1 (Page 372) uses the words "loading pattern considerations," it is not the intent of these words to imply that the loading patterns in the ITS Bases (Page 376) are only "considerations." The loading patterns described in the ITS Bases must be complied with to meet the ITS LCO requirement. The proposed words in the ITS were used since these are the current words in the Davis Besse CTS LCO 3.9.13 and Figure 3.9-1 (Pages 364 and 365). However, based on the NRC reviewer's comment that the word "considerations" could imply something less than a specific requirement, the second sentence of the Note to ITS Figure 3.7.16-1 will be modified to state "The approved loading patterns applicable to Category "A," "B," and "C" assemblies are specified in the Bases." These words provide a more positive requirement related to the loading patterns. The ITS 3.7.16 Bases, LCO section

	(Page 376) describes the three types of loading patterns applicable to Category A, B, and C assemblies. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS Conversion Amendment.

Date Created: 10/09/2007 09:04 AM by Gerald Waig
Last Modified: 01/11/2008 04:01 PM