RAS 8939

November 29, 2004

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

DOCKETED
USNRC

November 29, 2004 (3:38pm)

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

| | | |
|---|---|---|
| In the Matter of | ) | |
| | ) | Docket No. 50-271 |
| ENTERGY NUCLEAR VERMONT YANKEE, LLC and ENTERGY NUCLEAR OPERATIONS, INC. (Vermont Yankee Nuclear Power Station) | ) | ASLBP No. 04-832-02-OLA (Operating License Amendment) |

# ENTERGY'S RESPONSE TO NEW ARGUMENTS RAISED IN VERMONT DEPARTMENT OF PUBLIC SERVICE'S REPLY TO ENTERGY'S ANSWER TO THE DEPARTMENT'S REQUEST FOR LEAVE TO FILE A NEW CONTENTION

Applicants Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc. (collectively "Entergy") hereby respond to new arguments raised in the Vermont Department of Public Service's ("DPS") Reply[1] to Entergy's answer in opposition[2] to DPS's request for admission of a new contention.[3] Although 10 C.F.R. §2.309(h)(3) does not contemplate a response to a reply to an answer to a request to file a new contention, Commission case law permits such a response when the reply introduces new arguments that were not raised in the petitioner's initial filing. *Cleveland Electric Illuminating Co.* (Perry Nuclear Power Plant, Units 1 &2), LBP-82-89, 16 NRC 1355, 1356-57 (1982). That is precisely the situation here.

Notwithstanding the DPS Reply's attempt to buttress its arguments by the use of unsupported and inappropriate accusations of "distortions," "misrepresentations," "stretch[ing of] facts," "mischaracteriz[ing of] arguments," and "mislead[ing] this Board", DPS Reply at 1, 2,

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1 "Vermont Department of Public Service Reply to Answer of Applicant to the Department's Request for Leave to File a New Contention" (November 17, 2004) ("DPS Reply").

2 "Entergy's Answer to Vermont Department Of Public Service Request For Leave To File A New Contention" (November 10, 2004) ("Entergy's November 10 Answer").

3 "Vermont Department of Public Service Request for Leave to File a New Contention" (October 18, 2004) ("DPS Request").

Template=SECY-041

SECY-02

4, 5, etc., the fact is that the DPS Reply sets forth bases and arguments that cannot be found in the proposed contention itself or elsewhere in DPS's initial Request. The new arguments should be rejected since they are raised, without justification, for the first time in DPS' Reply and also because they fail to otherwise present an admissible issue.

## I. BACKGROUND

Proposed DPS Contention 6 states:

> The Application for Amendment, Including All Supplements Thereto, Fails to Comply With 10 CFR 50 Appendix R, Specific Requirements, Paragraph L(2)(b) Because It Does Not Verify The Assumption, Used For Purposes of the Safe Shutdown Capability Analysis (SSCA), that the Reactor Core Isolation Cooling (RCIC) System Can Be Made Operable In Sufficient Time To Permit The Operator To Perform the Required Actions Before Core Uncovery.

DPS Request at 1. As the text of proposed Contention 6 and the supporting arguments originally offered make clear, the exclusive focus of the proposed contention is that Entergy's application does *verify* that there is sufficient time for operator actions to prevent core uncovery. The text of the proposed contention itself states that the application fails to comply with Commission regulations "Because It Does Not *Verify* The Assumption" of sufficient time for operator action. *Id.* (emphasis added). DPS supports the proposed contention by correctly quoting Entergy's response to the NRC's request for additional information (DPS Ex. 38) for the proposition that Entergy "is in the process of *verifying* this assumption of" adequate time for operator action and that "[t]his *verification*" will be completed by December 1, 2004. *Id.* at 2 (emphasis added). The "supporting evidence" for the proposed contention further states that Entergy "has yet to *verify* how much time it will take to implement those procedures". *Id.* (emphasis added). There is not a suggestion in the DPS Request that DPS seeks to challenge the *results* of the verification rather than the fact that verification has not taken place. In its November 10 Answer, Entergy opposed admission of proposed Contention 6 by addressing DPS's claim that verification had not yet taken place.

## II. NEW ARGUMENTS MADE IN THE DPS REPLY, AND RESPONSES THERETO

In contrast with the proposed contention's exclusive focus on the fact that verification had not yet taken place, the DPS Reply attempts to morph the proposed contention into an attack on the *results* of the verification. DPS's shift is made clear throughout its Reply:

> "Applicant equates a commitment to perform verification with actually fulfilling the regulatory requirement." DPS Reply at 3.
>
> "Performing a verification is not the end in itself." *Id.*
>
> "It is the results of a verification that are controlling . . ." *Id.*
>
> [I]t is necessary to see if the verification process was properly conducted and to see if it demonstrates compliance with the regulatory standard." *Id.* at 4.

These are new arguments and newly asserted claims. DPS provides neither justification why these new arguments could not have been set forth in its original Request nor seeks, as required, leave from the Board to advance them. *Houston Lighting & Power Co.* (Allens Creek Nuclear Generating Station, Unit 1), ALAB-565, 10 NRC 521, 523 n. 11 (1979) (substantive alterations of proposed contentions can only be done with leave of the Board.) The new arguments in DPS's Reply, therefore, should be rejected by the Board as improperly raised.

Furthermore, these new arguments do not give rise to an admissible contention, since they are speculative concerns for which DPS has cited no support. *See Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2), CLI-02-14, 55 NRC 278, 293 (2002).

In its Reply, DPS challenges Entergy's objection that the original contention is based on information not materially different than information previously available. DPS Reply at 6. This challenge, too, takes the form of a new argument:

> Furthermore, at hearing DPS will contest the method Entergy uses to make it's [sic] determination. For example, Entergy does not use the 2-sigma value for decay heat uncertainty which it has stated it uses in other analyses. Nor does

> Entergy use the design basis value of 85 degrees F for initial service water temperature, but rather a less conservative value of 80 degrees F. At hearing DPS will show Entergy has even less time to perform the required actions than claimed.

DPS Reply at 7. None of these assertions can be found in DPS' original filing. That is reason enough to disregard them. But the allegations are also without citation or support[4], further reason to disregard them.

The final reason to disregard these late, unsupported allegations is that they are simply wrong. The current calculation of record for Extended Power Uprate ("EPU") conditions uses both values that DPS says are not used, *i.e.*, the design basis value of 85° F for initial service water temperature and the 2 sigma value for decay heat uncertainty[5]. While an earlier non-EPU calculation used the 80° F initial RHR service water temperature and did not include the 2 sigma uncertainty[6], that calculation was superceded in 2000 for current licensing basis conditions[7] and in 2003 for EPU application by the calculation cited in footnote 5.

Finally, DPS argues that "[a]n analysis that is found to be out of date and non-conservative, that reduces the time margins available for event mitigation by 50%, is definitely something that must either be remedied or the license amendment application must be denied." DPS Reply at 8. Here too DPS is incorrect. For this statement, DPS relies on DPS Exhibit 40 (NRC's November 5, 2004 Engineering Inspection Preliminary Results at A-7). DPS Reply at 6. However, DPS' selective quotation of the Preliminary Results omits several key passages which neutralize whatever support DPS seeks to draw from the document. First, DPS omits the NRC's

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[4] Neither the Reply nor its accompanying Affidavit of William K. Sherman provide even a single reference to support these statements.

[5] *See* Attachment 1 hereto, Vermont Yankee Calculation VYC-2306 (approved August 29, 2003), "Torus Temperature for Appendix R Events at EPU Conditions", pages 15,17.

[6] *See* Attachment 2 hereto, Vermont Yankee Calculation VYC-1628D (approved November 5, 1998), "Torus Temperature Response to Appendix R and Station Blackout Scenarios". pages 43-44.

[7] *See* Attachment 3 hereto, Vermont Yankee Calculation VYC-2120 (approved June 20, 2000), "Torus Temperature for Appendix R Events with a RHR Service Water Temperature of 85°F", pages 13, 16.

conclusion that "[t]his finding is of very low safety significance because at current licensed operating conditions, sufficient margin would remain to ensure that the core would not be uncovered during the analyzed event." DPS Exhibit at A-7. The Preliminary Results go on to observe that "the loss of margin may have prevented the operators from initiating the RCIC system in sufficient time to prevent core uncovery under EPU conditions" but significantly qualifies this observation with the introductory phrase, "*Had this finding not been identified*". Since the finding *has been identified* (by the Preliminary Results), the sole predicate for DPS' conclusion disappears. Again, rank speculation that provides no support for the proposed contention. Here to the issue has as a factual matter been resolved.[8]

## III. CONCLUSION

For the reasons stated above and in Entergy's November 10 Answer, DPS's request for the admission of proposed Contention 6 should be denied.

Respectfully submitted,

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Counsel for Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc.

Dated: November 29, 2004

[8] *See* Attachment 4 hereto, "Apparent Cause Evaluation Report, CR Number CR-VTY-2004-2552" (noting questioning of margin for RCIC initiation during 2004 NRC Engineering Assessment, page 1, and completion of steps "to regain lost margin in the current timeline," page 3).

November 29, 2004

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Before the Atomic Safety and Licensing Board

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| | ) | Docket No. 50-271 |
| ENTERGY NUCLEAR VERMONT YANKEE, LLC and ENTERGY NUCLEAR OPERATIONS, INC. (Vermont Yankee Nuclear Power Station) | ) | ASLBP No. 04-832-02-OLA (Operating License Amendment) |

## CERTIFICATE OF SERVICE

I hereby certify that copies of "Entergy's Response to New Arguments Raised in Vermont Department of Public Service's Reply to Entergy's Answer to Vermont Department of Public Service Request for Leave to File a New Contention" were served on the persons listed below by deposit in the U.S. Mail, first class, postage prepaid, and where indicated by an asterisk by electronic mail, this 29th day of November, 2004.

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Document #: 1445547 v.2

# Attachment 1

This document contains Vermont Yankee proprietary information. This information may not be transmitted in whole or in part, to any other organization without permission of Vermont Yankee.

# VY CALCULATION TITLE PAGE

| VYC-2306 | 0 | N/A | N/A |
|---|---|---|---|
| VY Calculation Number | Revision Number | Vendor Calculation Number | Revision Number |

Title: Torus Temperature for Appendix R Events, at EPU Conditions

QA Status: ☒ SC ☐ NNS ☐ OQA Operating Cycle Number* N/A

* The Operating Cycle Number should only be entered here if the results of the calculation only apply during a specific operating cycle otherwise enter "N/A".

Calculation Supports A Design Change/Specification? ☐ Yes ☒ No N/A (VYDC/MM/TM/Spec No.)

Implementation Required? ☒ Yes ☒ No a2h Calculation Done as a Study Only? ☐ Yes ☒ No

Safety Evaluation Number: N/A

Superseded Calculation Number, Title and Revision: N/A

For Revisions: List CCNs, IIJs, or SAs incorporated/superseded by this revision: N/A

Computer Code(s): GOTHIC 7.0p2

Are there open items in this calculation/revision? ☒ Yes ☐ No

Review and Approval: (Print and Sign Name)

Preparer: Liliane Schor Date: 8/29/2003

Preparer: Alan Robertshaw (Sections 2.2, 3.2, 4.2 & 5.2) Date: 29 August 2003

Interdiscipline Reviewer(s): Date:

Independent Reviewers(s): Alan Robertshaw Date: 29 August 2003

Independent Reviewers(s): Liliane Schor (Sections 2.2, 3.2, 4.2 & 5.2) Date: 8/29/2003

Approved: James G Rogers Date: 8/29/03

Accepted (only for AP 0017 calculations performed by vendors) ☒ N/A

Date:

Final Turnover to DCC (Section 2):

1) All open items, if any, have been closed.

2) Implementation Confirmation (Section 2.3.4)

Total No. Pages in Package (including all attachments) 121

☐ Calculation accurately reflects existing plant configuration, (confirmation method indicated below)

☐ Walkdown ☐ As-Built input review ☐ Discussion with (Print Name)

OR

☐ N/A, calculation does not reflect existing plant configuration

3) Resolution of documents identified in the Design Output Documents Section of VYAPF 0017.07 has been initiated as required (Section 2.3.6, 2.3.7)

Printed Name / Signature / Date

Page 1 of 58 Pages*

* For calculations performed using AP0017 this is the number of pages in the body of the calculation. For vendor calculations, this is the number of pages of AP 0017 forms added. (Title page, review forms, data sheets, 50.59, etc.)

## Table 1 :Vessel and Core Initial Conditions

| Parameter | Nominal Value | Analysis Value | Basis | Comments |
|---|---|---|---|---|
| Power | 1912 MWth | 1950 MWth | 120% power + 2% calorimetric uncertainty | |
| Decay Heat | ANS 5.1 | ANS 5.1+2sigma | Reference 3 indicated that the 2 sigma uncertainty is needed to compensate for neglecting other actinide than the ones in the ANS 5.1 standard. appropriate to be used | (Decay Heat from Reference 5) |
| Vessel Pressure | 1020 psia | 1045 psia | Reference 19 | Appendix R analysis for EPU which determines the time to vessel uncovery uses a vessel pressure of 1035.5 psia (see References 18) as an upper bound of the nominal pressure. The use of 1045 psia for the vessel pressure for the torus temperature Appendix R analysis is judged to be conservative. |
| Vessel Level | 162 inches | 172 inches | Reference 19 | Analysis value conservatively accounts for 3 inches increase above normal (uncertainty and operational fluctuations) and 7 inches for dimensional uncertainties. The reviewer comments (Reference 19, page65) identified that the normal level could be as high as 165 inches. Hence the analysis could be performed at a vessel level of 175 inches. An additional 3 inches in level lead to an increase in the suppression pool temperature of 0.2 °F which was judged to be insignificant. |
| MSIV closure time | 3-5 seconds | 3 seconds | The Tech Spec minimum value closure retains more energy in the vessel | |
| Core Flow Rate | 48.0E6 lb/hr | 51.36e6 lb/hr | Includes ICF of 7%. | VY operates with only 5% ICF, however the analysis would allow a 7% increase in core flow. ICF conditions lead to higher stored energy. |
| Initial Feedwater Flowrate | 7.8786e6 lb/hr | 8.076e6 lb/hr | Feedwater flow consistent with power level, matches Steady State steam flow rate. | Reference 20 (TE 2003-020) |
| Initial feedwater temperature | 393.5-393.6 °F | 393.9 °F | Consistent with 20% power uprate +2% calorimetric uncertainty | See discussion in TE 2003-020. (Reference 20) |

## Table 2 - ECCS Initial Conditions and Parameters

| Parameter | Nominal | Analysis Value | Basis | Comments |
|---|---|---|---|---|
| Core Spray Flow | Curve of flow vs. vessel-torus ΔP. | Same as nominal. | The core spray flow rate used in the Appendix R analysis will be used. The flow rate is determined function of the vessel-torus ΔP. (consistent with the LOCA analysis) (OPL4 –Reference 21) | The Core Spray System will be used for level control only after the feedwater is depleted.<br><br>During the alternate shutdown cooling a flow of 3500 gpm at 100 psid will be used, provided that adequate NPSH is available to support this flow (open item). |
| RHR Flow (t>600 seconds) | 7000 gpm | 7000 gpm | Nominal RHR flow used for the Appendix R application.<br><br>Assumption unchanged for EPU | The Appendix R analysis is performed assuming nominal conditions.<br><br>Based on the results of the analysis, the available RHR pump can be split between vessel and torus cooling. |
| RHR Hx Tube Plugging | N/A | 5% | Allowable plugging margin | |
| RHRSW Flow | 2950-3140 gpm (per OP-2124 - Rev 49 Reference 10 | 2950 gpm | Assumption unchanged for EPU | The Appendix R analysis is performed assuming nominal conditions. |
| RHRSW Inlet Temperature | 32-85 °F | 85.1 °F | Reference 13 | Maximum allowable Service Water Temperature |

# Attachment 2

~~PROPRIETARY~~

ORIGINAL: PAGE 1 of 132 PAGES
Rev. 1: PAGE 1 of ____ PAGES
Rev. 2: PAGE 1 of ____ PAGES
Rev. 3: PAGE 1 of ____ PAGES

QA RECORD?
X YES
____ NO

NO. 13.C16.036; 13.C09.001

Safety Class/P.O. NO. (if applicable) SC 1; 00241.00.0090.00.00000

YANKEE ATOMIC ELECTRIC COMPANY
CALCULATION/ANALYSIS FOR

TITLE Torus Temperature Response to Appendix R and Station Blackout Scenarios

PLANT Vermont Yankee CYCLE N/A

CALCULATION NUMBER VYC-1628D
Supplement to VYC-1628 Rev. 0

| | PREPARED BY /DATE | REVIEWED BY* /DATE | APPROVED BY /DATE | SUPERSEDES CALC./REV. NO. |
|---|---|---|---|---|
| ORIGINAL | 11/5/98 Carl D. Fago, DCS | 11/5/98 R. K. Sundaram, DCS; 11/5/98 W. S. Leung, DCS | 11/5/98 Paul A. Bergeron, DCS | N/A |
| REVISION 2 | | | | |

KEYWORDS: GOTHIC60a, Wetwell, Torus, SBO (Station Blackout), LPCI (Low Pressure Coolant Injection), CS (Core Spray), CSCS (Core Standby Cooling System), ECCS (Emergency Core Cooling System) NPSH (Net Positive Suction Head)

COMPUTER CODES: GOTHIC60a, EXCEL 97

EQUIP/TAG NOs.: P-10-1A, B, C, D; P-46-1A, B

SYSTEMS: RHR, CS, Primary Containment

REFERENCES: See page 45

FORM WE-103-1
Revision 5

* For individual reviewer scope, see pgs. 51 & 55.



~~PROPRIETARY~~

## 4.0 Conclusions

The two most limiting, previously analyzed App. R scenarios were examined. For the most limiting App. R scenario, a variety of input sensitivities were performed. The most limiting, previously analyzed SBO scenario was examined. Peak torus temperatures for these cases were determined. A summary of the results is provided in Table 6. Run 01 through Run 04 analyze the same scenario but with modified input assumptions. Run 05 and Run 06 present additional scenarios, an App. R scenario and a station blackout scenario, respectively.

Table 6 App. R and SBO Torus Temperature Case Results Summary

| ID | Title | Peak Torus Temperature |
|---|---|---|
| Run01 | App. R Case 3a, Fully Conservative | 187.5°F @ 20,140 sec |
| Run02 | App. R Case 3a, Run 01 + Reduced Decay Heat Uncertainty | 186.2°F @ 20,080 sec |
| Run03 | App. R Case 3a, Run 02 + Reduced RHR and RHRSW Flow Uncertainty | 184.0°F @ 19,840 sec |
| Run04 | App. R Case 3a, Run 03 + Reduced SW Temperature Uncertainty | 181.9°F @ 19,680 sec |
| Run05 | App. R Case 4, Fully Conservative | 178.5°F @ 6,574 sec |
| Run06 | SBO Scenario 3, Fully Conservative | 176.8°F @ 24,000 sec |

For Appendix R scenario Case 4 (Run 05) and the station blackout scenario (Run 06), the results show peak torus temperatures under 182.1°F using the same input parameters as the LBLOCA and SBLOCA torus temperature analyses. For Appendix R scenario Case 3a, the peak torus temperature results are shown to be under 182.1°F using a revised set of input parameters (Run 04). As these input parameters are appropriate for use in Appendix R safe shutdown analyses, Run 04 is proposed as the revised basis for this Appendix R scenario. Therefore, it is concluded that the App. R and SBO events are bounded by the large break LOCA peak torus temperature results.

The limiting Appendix R scenario uses several input assumptions different than used in Ref. 5:

- the decay heat values used in this analysis are cycle independent as opposed to those used in Ref. 5 that were cycle dependent; this is a more conservative assumption than was used Ref. 5;
- the decay heat input for Run 04 does not include the 2σ decay heat uncertainty. The use of this decay heat assumption is justified in Section 3.1.2 and is a less conservative assumption than was used in Ref. 5;

- the assumed river water temperature in this calculation is 80°F that represents a > 99th percentile value for this environmental condition. The use of this value is justified in Section 3.1.4 and is a less conservative assumption than was used in Ref. 5. Note that plant design and operating limit for river water temperature remains 85°F. The input assumption used here does not change this limit.

For the last two items, the basis for the acceptability of using inputs that deviate from design basis accident input parameters is the statement in 10 CFR 50 Appendix R para. III.L.6 that states:

> "Shutdown systems installed to ensure postfire shutdown capability need not be designed to meet ... other design basis accident criteria..."

The values used for these two input parameters are specifically justified in Sections 3.1.2 and 3.1.4. The resulting analysis is still conservative even while it minimizes the conservatism on these specific input parameters.

# Attachment 3

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# VY CALCULATION TITLE PAGE

| 2120 | 0 | N/A | N/A |
|---|---|---|---|
| VY Calculation Number | Revision Number | Vendor Calculation Number | Revision Number |

Title: Torus Temperature for Appendix R Events with a RHR Service Water Temperature of 85 °F

QA Status: [X] SC [ ] NNS [ ] OQA  Operating Cycle Number Cycle Independent

Calculation Supports A Design Change/Specification? [ ] Yes [X] No _____ VYDC/MM/TM/Spec No.

Calculation Supports An Independent Analysis? [x] Yes [ ] No VYC-1628D Rev. 0, WRF00-0058/Task 12 Reference

Calculation Done as a Study Only? Yes [ ] No [x]

Safety Evaluation Number: N/A

Superseded Calculation Number, Title and Revision: N/A

Review and Approval: (Print and Sign Name)

* Liliane Schon

Preparer: Philip J Guimond  Date: 6-16-00 6-16-00

Interdiscipline Reviewer(s): Dan Yasi  Carl Fage  Date: 6/16/00 / 6/16/00

Independent Reviewers(s): Farrokh Seifaee  Date: 6/19/00

Approved: M. W. Gmyrek  Date: 6/20/2000

Open Items Associated with Calculation? [ ] Yes [X] No [ ] Closed

Total No. Pages in Package (including attachments) 207

Installation Verification

[X] Calculation accurately reflects plant as-built configuration, OR
[ ] N/A, calculation does not affect plant configuration

| Printed Name | / Signature | / Date |
|---|---|---|

Page 1 of 207 Pages (body of calculation)

* Prepared pages 166-167
All Other Pages P.J. Guimond

Table 1 :Vessel and Core Initial Conditions

| Parameter | Nominal Value | Analysis Value | Basis | Comments |
|---|---|---|---|---|
| Power | 1593 MWth | 1625 MWth | 100% power + 2% calorimetric uncertainty | |
| Decay Heat | ANS 5.1 | ANS 5.1<br><br>ANS 5.1 + 2σ was also used | Based on benchmarking with Appendix R assumptions used by other utilities (Pilgrim and Cooper Nuclear Power Station) | ANS 5.1 + 2σ was also used to demonstrate that the uncertainty would not result in temperature exceeding the acceptable value |
| Vessel Pressure | 1020 psia | 1045 psia | Reference 14 | Appendix R analysis which determines the time to vessel uncovery uses a vessel pressure of 1035.5 psia (see References 4 and 13) as an upper bound of the nominal pressure. The use of 1045 psia for the vessel pressure for the torus temperature Appendix R analysis is judged to be conservative. Analysis value represents a 25 psi increase above nominal to account for operational fluctuations and uncertaintiy. |
| Vessel Level | 162 inches | 172 inches | Reference 14 | Analysis value conservatively accounts for 3 inches increase above nominal (uncertainty and operational fluctuations) and 7 inches for dimensional uncertainties and thermal expansion. More details can be found in Reference 14, Page 65.The reviewer comments (Reference 14) identified that the normal level could be as high as 165 inches. Hence the |

Table 2 - ECCS Initial Conditions and Parameters

| Parameter | Nominal | Analysis Value | Basis | Comments |
|---|---|---|---|---|
| Core Spray Flow | Curve of flow vs. vessel-torus ΔP. | Same as nominal. | The core spray flow rate used in the Appendix R torus temperature (Reference 2)analysis was used. The flow rate is determined as a function of the vessel-torus ΔP. (consistent with the LOCA analysis) (References 5 and 13). | The Core Spray System was used for level control only after the feedwater is depleted.<br><br>During the alternate shutdown cooling a flow of 3500 gpm at 100 psid was used. Adequate NPSH is available to support this flow. |
| RHR Flow (t>600 seconds) | 7000 gpm | 7000 gpm | Nominal RHR flow used for the Appendix R application. | The Appendix R analysis is performed assuming nominal conditions. |
| RHR Hx Tube Plugging | N/A | 5% | Allowable plugging margin | |
| RHRHX Flow | 2950-3140 gpm (per OP-2124 - Rev 49 Reference 10 | 2950 gpm | | The Appendix R analysis is performed assuming nominal conditions. |
| RHRSW Inlet Temperature | 32-85 °F | 85.1 °F | Reference 17 | Maximum allowable Service Water Temperature + 0.1°F.<br><br>The additional 0.1°F provides a conservative margin for RHRSW pump heat addition and has negligible impact on peak torus temperature results. |

# Attachment 4

# APPARENT CAUSE EVALUATION REPORT

**CR Number:** CR-VTY-2004-2552
**Assigned Department:** Operations
**Investigator:** John Twarog **Ext:** (802) 258-5467
**Date Report Completed:**

☐ The CR was caused by or identified an equipment/component failure.

☒ The CR involved one or more HU inappropriate acts.

## Problem Statement:

Existing Appendix R alternate shutdown timelines may be too long to support EPU conditions.

## Report Narrative:

As a result of the 2004 NRC Engineering Assessment, an inspector questioned how ENVY controls, reviews and documents operator actions and timeline credited in the licensee design basis. The question arose during the discussion of the Appendix "R" safe shutdown timelines.

Background

An Appendix "R" fire, that requires a plant shutdown from outside the Control Room, requires certain actions to be performed within a certain time. One of these actions is to initiate injection with RCIC prior to uncovering the core.

At current license power limit (CLPL) of 1593 Mth, the calculated time for uncovering the core is 25.34 minutes and injection with the RCIC system must commence within this time (Ref. VYC -1917). The current revision of the Safe Shutdown Capability Analysis (SSCA) references a time to initiate RCIC injection of ~15 minutes. This is based on a series of walk-downs performed in 1996 which document a time of 13.33 minutes (Ref. Memo, W. M. Pittman to L. E. Doane, Timelines – Operator Actions in OP 3126 Rev. 14.). An informational walkdown performed in 2001 resulted in a RCIC initiation time of 18.82 minutes. In 2003, new electrical safety requirements were added (coveralls and face shield) that added an additional 2 minutes to the timeline. This resulted in a total RCIC initiation time of 20.82 minutes which is still less than 25.34 minutes required in VYC-1917. At our present power level and using the present electrical safety standard, there is approximately ~4.5 minutes of margin in the RCIC initiation timeline.

The company is currently evaluating additional safety requirements, i.e. flash suits, and if the use of the flash suits becomes a requirement, then an additional 2 to 4 minutes of time will be required to compensate for dress out and the increased difficulty of working in a flash suit. This would have the potential to invalidate the current timeline.

A walkdown, utilizing OP-3126 "Shutdown Using Alternate Methods", was performed with an NRC Inspector, the Assistant Operator Manager and a Control Room Supervisor to confirm compliance at the CLPL. Although the walkdown wasn't a complete walkdown of the OP3126 procedure, the NRC Inspector concurred with Operations the required action can be was completed within the required time of 25.34 minutes.

It was noted that at EPU conditions there may not be enough margin in the timeline to complete the required actions. The vessel boil off time under 20% EPU conditions is analyzed to be 21.33 minutes. (Ref. VYC-2270) This is ~4 minutes shorter than the timeline for the CLPL and results in a margin of 0.51 minutes using the 2001 timeline with the current safety requirements. This may not be enough margin to support an alternate shutdown scenario at 20% EPU conditions and if the flash suits are required, the margin would be negative.

## Extent of Condition

An Extent of Condition Evaluation was performed to identify other areas where timeliness of Operator's Action is required. This evaluation is attached as Appendix A to this Condition Report.

## Common Cause Analysis:

Not required to be performed since Condition Report is not an Adverse Trend.

## RELATED OPERATING EXPERIENCE:

### Previous Related Conditions (ENVY):

A search of the PCRS database was performed and the following ENVY Condition Reports were identified:

- CR-VTY-1996-0192 "Communications Systems not adequate to ensure timely OP3126 completion"
- CR-VTY-1995-0533 "Insufficient time to initiate Alternate Shutdown System prior to core being uncovered"

Both of these Condition Report identified problems with the timeline associated with an Appendix "R" fire where shutdown is required to be performed outside of the Control Room. CR-VTY-1995-0533 identified the current 25 minute time requirement.

### Related Industry (OE):

A fleet wide conference call was held on August 26, 2004 to discuss the issue of processes other sites utilize to validate timelines associated with required Operator Actions. Additional benchmarking was performed with utilities outside of the Entergy fleet. None of the other sites contacted had a formal program to ensure changes in licensing basis operators actions are identified and evaluated.

## Corrective Actions:

| Immediate/Interim Actions Completed | |
|---|---|
| Item # | Action taken |
| AC-1 | Safety Standard Variances (SSV) No. 2004-42 and 2004-43 (attached) have been completed to regain lost margin in the current timeline due to donning PPE. |