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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
VERMONT YANKEE NUCLEAR POWER CORPORATION	)	Docket No. 50-271-OLA-2 (Testing Requirements for ECCS and SLC Systems)
	)	
(Vermont Yankee Nuclear Power Station)	)	(ASLBP No. 87-567-04-OLA)
	)	

STATE OF VERMONT'S SECOND SET OF
INTERROGATORIES AND REQUESTS
FOR THE PRODUCTION OF DOCUMENTS TO VERMONT
YANKEE NUCLEAR POWER CORPORATION

INSTRUCTIONS FOR USE

The following interrogatories are to be answered in writing and under oath by an employee, representative or agent of the Applicant with personal knowledge of the facts or information requested in each interrogatory. Please note the obligation to supplement answers to interrogatories, pursuant to 10 C.F.R. { 2.740 (e).

1. Please identify all persons who participated in the preparation of answers to these interrogatories and production requests, and identify the portions of your response to which each person contributed.

2. Do any of the American Society of Mechanical Engineers (ASME) inservice testing provisions from which the Applicant was

granted relief, pursuant to 10 CFR 50.55a(g), in 1980 (as being "impractical") relate to testing of Emergency Core Cooling System (ECCS) or Standby Liquid Cooling (SLC) System components?

3. For each component for which tests are proposed to be eliminated, what are the testing intervals under the ASME inservice testing program?

4. Are there any differences in the types of tests carried out under the ASME inservice testing program and the tests which are proposed to be eliminated? Describe any differences.

5. What is the historic out-of-service frequency for each valve or component for which testing is proposed to be eliminated?

6. What is the projected service life, in both time and number of occasions used, for each valve or component for which testing is proposed to be eliminated?

7. Are any of the valves for which testing is proposed to be eliminated "check valves", within the meaning of I&E Bulletin 83-03 (March 10,1983)?

8. On the list of active components and devices necessary to perform the safety function of the systems (Attachment A of "Applicant's Answers to State of Vermont's First Set of

Interrogatories and Requests for the Production of Documents to Vermont Yankee Nuclear Power Corporation," - hereinafter, "Applicant's Answers"), identify which items are instrumentation and control items.

9. Are there any instrumentation and control items (sensors, actuation devices, relays, logic devices, etc.) not listed on Attachment A of "Applicant's Answers" which are part of the systems for which testing is proposed to be eliminated, and which:

   a. Are required to perform the safety function of the system? Identify these instrumentation and control items in the same format provided in Attachment A of "Applicant's Answers."

   b. Could fail and cause inoperability of the system? Identify these instrumentation and control items in the same format provided in Attachment A of "Applicant's Answers."

   c. Are all of the instrumentation and control items identified in paragraphs a. and b. above tested under the testing of alternate systems requirements which are proposed to be deleted? If there are instrumentation and control items which are not tested under current

requirements, identify each item and describe why it is not presently tested.

d. Since Applicant's proposal is to amend the design bases of the systems to rely on the ASME XI testing program in lieu of testing the alternate system in the event that one redundant train is out-of-service, are any of the instrumentation and control items from paragraphs a. and b. above not included in the Applicant's Inservice Testing Program? If so, identify which items are not included. For these items, explain why Applicant considers it acceptable to eliminate their testing from the design bases.

10. Are there any items listed in Attachment A to "Applicant's Answers," which are tested at frequencies greater than once every three months? If so, identify each item.

11. Section 5.3.1.1.2 ("Use of Time-Related Models") of NUREG/CR-2300, "PRA Procedures Guide," January 1983, contains the following statements:

> "Standby components are usually subjected to periodic testing, which occurs, for example, once a month or perhaps once a year. The time between tests is the length of time the component is exposed to failure without detection, and hence the term "fault-exposure time." ... The fault-exposure time is usually determined from plant procedures, but some caution should be used when examining a system for test intervals. As an example, consider [a system that] is tested in various pieces; that is, the logic is tested once a month, as are the spray pumps. The sensors are calibrated once a year and tested once a year through the logic. However,

the entire system is never tested end to end. This results in a specific contact never being tested during the life of the plant."

a. Are there any portions of the systems for which testing of the alternate system is proposed to be eliminated which contain a combination (sensor -> logic -> Device), as indicated in Section 5.3.1.1.2 of NUREG/CR-2300, which is not tested during the life of the plant? Identify each case.

b. If there is a portion of a system which is not tested (either never, or over a long period) is it not possible that the time-related unavailability, Q_t, could be large enough to obscure the effects identified in Figure 5-1 of "The Report?" If this were the case, what would be the value of eliminating testing of the alternate system when the overall effect on system (un)availability would be negligible?

c. For each portion of the Core Spray System identified in paragraph a. above, identify how the fault exposure time was determined for the analysis in "The Report."

d. Describe how Applicant would perform a Probabilistic Risk Assessment (PRA) on the portions of systems in paragraph a. which are not tested. If there are any differences between your method and that described in

Section 5.3.1.1.2 of NUREG/CR-2300, please explain the differences.

e. In Section 9.5 of "The Report," it is stated, "Because of the similarity in types and numbers of components that must actively function during a true demand, conclusions based on quantitative results for the Core Spray System are used in the evaluation of testing requirements ... for other pumping systems." This appears to be inconsistent with your response to Interrogatory No. 28, "First Set," where it is stated that a portion of the SLC system is not tested. How would the system unavailability curve for the SLC system differ from that of the Core Spray System, considering the high time-related failure unavailability, Q_t, of the "squib" valves? Provide qualitative and quantitative responses.

f. In response to Interrogatory No. 28, "First Set," it is stated that "the squib valves...could not be, and should not have been 'taken into account' by the Report." But does not Section 5.3.1.1.2 of NUREG/CR-2300 identify how the squib valves 'could' and 'should' have been taken into account in the Report?

12. The Applicant's analysis described in the report entitled "Impact of Alternate Testing on Component and System

Availability (hereinafter, "The Report")," does not explain how the "Time-Related Fractions," in Tables 5.7 and 5.8, are used in the time-related failure rate equations on pages 6, 7 and 27.

a. Provide an explanation.

b. Industry time-related failure rates are provided for pumps and valves, respectively, in NUREG/CR-1205, Revision 1, Data Summaries of Licensee Event Reports of Pumps at U.S. Commercial Nuclear Power Plants, January 1982, and NUREG/CR-1363, Revision 1, Data Summaries of Licensee Event Reports of Valves at U.S. Commercial Nuclear Power Plants, October 1982. Why were these values not used instead of time-related fractions?

c. Does the use of time-related fractions result in the expected increase over time in Q_t, unavailability due to potential time-related failure. Explain specifically how this is so.

13. For the outage events described in Attachment B to "Applicant's Answers:"

a. Which items are on the list because they were out of service for planned preventative maintenance?

b. Which items are on the list because they were out of service due to non-operability/non-functioning in a test?

c. Which items are on the list because they were out of service due to failure while running (a running pump or fan fails, a modulating valve fails)?

d. On Attachment B of "Applicant's Answers," which are the six (6) items identified in response to Interrogatory No. 14c, , "First Set," as occurrences in which testing of the alternate system resulted in failure which caused power reduction? Please identify the causes for each failure.

14. Of the 175 times in 5 years that testing of alternate systems has been required (Attachment B of "Applicant's Answers):

a. How many times did the alternate system fail?

b. How many times did the alternate system fail and repair of the alternate system was accomplished before power was reduced?

c. How many times did the alternate system fail and repair of the alternate system was not accomplished before power had to be reduced?

d. How many times did the alternate system fail and repair of the original system was accomplished before power was reduced?

15. Table 5.6 and Appendix B of "the Report" contains a description of Observed Failures for Vermont Yankee Core Spray System. The data used for the analysis are based on these failures. Yet Attachment B to "Applicant's Answers" lists Core Spray failures which are not identified in Table 5.6 or Appendix B.

a. Provide a description in the Appendix B format for each of the following:

1) Core Spray 7B out-of-service, 8-26-83

2) 'B' Core Spray out-of-service, 10-12-83

3) 'A' Core Spray out-of-service, 2-9-84

4) 'A' C/S, 'B' C/P out-of-service, 2-20-85

5) 'B' C/S Pump out-of-service, 12-8-86

6) 'B' C/S Pump out-of-service, 12-19-86

7) 'B' C/S Pump out-of-service, 1-20-87

8) 'B' C/S Pump out-of-service, 4-2-87

9) C/S 5A out-of-service, 12-11-87

10) 'A' C/S out-of-service, 2-12-88

b. Why were the above out-of-service events omitted from "the Report?"

c. Does consideration of the events listed in paragraph a. above alter the data used in Tables 5.7 and 5.8 of "the Report?" If yes, please explain how the data is altered.

d. Does consideration of the events listed in paragraph a. above alter the results of Figure 5-1 of "the Report?" If yes, please explain how the results are altered.

e. How many other failures and out-of-service events have occurred in the Core Spray System over the life of the plant which should be included in "the Report?"

f. Why are the following failures listed in Table 5.6 and Appendix B of "the Report" not identified in Attachment B of "Applicant's Answers?" For each failure listed, indicate why it did not result in testing of the

alternate system in accordance with the Technical Specification?

1) C/S V-11A failure, 9-5-87

2) C/S V-5A failure, 12-8-87

3) C/S V-26A failure, 2-3-88

g. Are there instances of Diesel Generator failure identified on Attachment B of "Applicant's Answers" which should have been included in Report, Appendix C, Vermont Yankee Diesel Generator Failures? If so, do these omissions affect your data, results and/or conclusions?

16. Concerning maintenance of the Core Spray system:

a. Describe the maintenance required for Valves V-11, V-12, V-5 and V-26. What is the maintenance frequency of these valves for the past 5 years? How often, or in what percentage of maintenance activities, does maintenance result in declaring the system inoperable and thus requiring testing of the alternate system? How often, or in what percentage of maintenance activities, is maintenance able to be scheduled during plant

b. Describe the maintenance required for a Core Spray Pump. What is the maintenance frequency of this pump for the past 5 years? How often, or in what percentage of maintenance activities, does maintenance result in declaring the system inoperable and thus requiring testing of the alternate system? How often, or in what percentage of maintenance activities, is the maintenance able to be scheduled during plant outage.

c. For an overall system unavailability analysis, what is the value which should be used for number of outages due to maintenance (per time period)?

17. Were "the Report" and "Applicant's Answers" prepared under an applicable Quality Assurance program or under applicable procedures? Provide the procedures. If Applicant believes this request to be burdensome, then summarize the requirements of the program or procedures. Were these procedures followed in the preparation, review and approval of these documents?

18. In order to meet a Technical Specification Limiting Condition for Operation (LCO) to be in COLD SHUTDOWN in 24 hours, when must the decision be made to begin reducing power. When must actual power reduction begin?

19. In response to Interrogatory No. 27b, "First Set," Applicant declined to provide an graphical representation showing the sensitivity of results to the assumption of trying to repair a failed component while both trains were out-of-service, rather than proceeding immediately to safe shutdown. This evaluation has been performed, with results shown in Attachment A. This evaluation was performed using data and equations from "the Report" except that time-related failure rates were used from the NUREG's identified in Interrogatory No. 12b above. Results are plotted as in Table 5.1 of "the Report," and are shown for two cases:

1- Remaining at power when the second train fails, and attempting repair (the case evaluated by the Applicant), and

2- Proceeding immediately to safe shutdown upon failure of the second train (in this case the repair unavailability is inactive because the unit is shutdown).

a. Since Applicant's response the Interrogatory No. 26b, "First Set," states it is not the practice to attempt repair when both redundant trains are inoperable, why is the immediate shutdown plot (Item 2 above) not the proper result of the evaluation instead of Figure 5.1 of "the Report?"

b. The results in Attachment A correctly show the benefit from daily testing of the alternate system. When the repair portion is removed, it is seen that elimination of daily testing and resorting to 30-day ASME XI tests roughly doubles the unavailability of the second train, assuming the first is already out of service. Considering this change, why is the correct risk avoidance decision for public health and safety not rather to retain the presently required daily testing of alternate systems and instead proceed directly to safe shutdown without repair, as stated in Applicant response to Interrogatory No. 27b, "First Set?"

20. In the application for elimination of testing of alternate systems from the Vermont Yankee Technical Specifications (VY-TS), dated December 7, 1987, Applicant states, the elimination of testing of alternate systems "is consistent with the testing requirements contained in BWR Standard Technical Specifications (BWR-STS)." However, the testing requirements in the BWR-STS, or lack of them, are predicated on meeting other requirements of the BWR-STS, as well as system and component design to the state-of-the-art at the time of issue of the BWR-STS (Revision 3, December 1980).

a. In BWR-STS Section 3/4.7.1.1, daily testing of the alternate system is not required for the residual heat removal service water system. However, in 3.7.1.1.c the system is only allowed to remain inoperable without this

testing for 72 hours before shutdown is required. Vermont Yankee-TS Section 3.5.C.3 allows the system to be inoperable for a full 7 days before shutdown is required. If testing is proposed to be eliminated in accordance with the BWR-STS, why should not Vermont Yankee adopt the more stringent LCO of the BWR-STS?

b. In BWR-STS Section 3/4.7.1.2, daily testing of the alternate system is not required for the plant service water system. However, in 3.7.1.2.a.3 the system is only allowed to remain inoperable without this testing for 72 hours before shutdown is required. Vermont Yankee-TS Section 3.5.D.2 allows the system to be inoperable for a full 15 days before shutdown is required. If testing is proposed to be eliminated in accordance with the BWR-STS, why should not Vermont Yankee adopt the more stringent LCO of the BWR-STS?

c. In BWR-STS Section 3/4.8.2, daily testing of the alternate system is not required for the 480 V Uninterruptible Power Systems. However, in 3.8.2.1.a the system is only allowed to remain inoperable without this testing for 8 hours before shutdown is required. Vermont Yankee-TS Section 3.10.B.4, which refers to Section 3.5.A.4, allows the system to be inoperable for a full 7 days before shutdown is required. If testing is proposed to be eliminated in accordance with the

BWR-STS, why should not Vermont Yankee adopt the more stringent LCO of the BWR-STS?

d. In BWR-STS Section 3/4.8.1, for the emergency diesel generators, one diesel generator is only allowed to remain inoperable for 72 hours before shutdown is required. Vermont Yankee-TS Section 3.10.B.1, which refers to Section 3.5.H.1, allows the system to be inoperable for a full 7 days before shutdown is required.

Further, the BWR-STS requires testing of the alternate diesel generator in Section 4.8.1.1.2.a.4 within one hour and at least once per 8 hours thereafter. In the BWR-STS both the LCO and the testing requirements are more stringent than Vermont Yankee-TS. Why should not Vermont Yankee adopt these BWR-STS requirements? Vermont Yankee-TS Section 3.5.C.3 allows the system to be inoperable for a full 7 days before shutdown is required. If testing is proposed to be eliminated in accordance with the BWR-STS, why should not Vermont Yankee adopt the more stringent LCO of the BWR-STS?

Submitted by,

STATE OF VERMONT

9/30/88

Samuel H. Press
Special Assistant Attorney General
Director for Public Advocacy
Vermont Department of Public Service
120 State Street
State Office Building
Montpelier, Vermont 05602
(802) 828-2811

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges

Charles Bechhoefer, Chairman
Glenn O. Bright
Dr. James H. Carpenter

In the Matter of	)	
	)	
VERMONT YANKEE NUCLEAR POWER POWER CORPORATION	)	Docket No. 50-271-OLA-2 (Testing Requirements for ECCS and SLC Systems)
	)	
(Vermont Yankee Nuclear Power Station)	)	
	)	

CERTIFICATE OF SERVICE

The undersigned certifies that on September 30, 1988, copies of State of Vermont's Second Set of Interrogatories and Requests for the Production of Documents to Vermont Yankee Nuclear Power Corporation were served on the following parties to this case by first class mail or as otherwise indicated:

Charles Bechhoefer, Chairman
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Glenn O. Bright
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dr. James H. Carpenter
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Secretary of the Commission
Attn: Docketing and Service Section
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555 (2 Copies)

Christine N. Kohl, Chairman
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

George Dean, Esq.
Assistant Attorney General
Commonwealth of Massachusetts
Department of the Attorney General
One Ashburnton Place
Boston, MA 02108

Ellyn R. Weiss, Esq.
Harmon & Weiss
Suite 430
2001 S. Street, NW
Washington, D. C. 20009

Ann Hodgdon, Esq.
Office of the General Counsel Bethesda
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

R. K. Gad III
Ropes & Gray
225 Franklin Street
Boston, MA 02110

Gary J. Edles
Atomic Safety and Licensing Appeal Board
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Howard A. Wilber
Atomic Safety and Licensing Appeal Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Geoffrey M. Huntington, Esq.
Office of the Attorney General
Environmental Protection Agency
State House Annex
25 Capitol Street
Concord, NH 03301-6397

Atomic Safety and Licensing Appeal Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

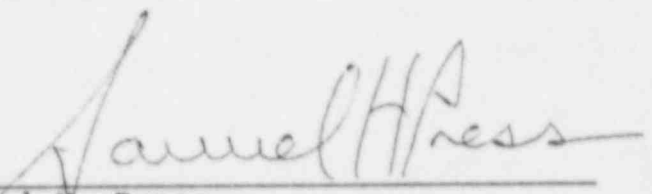
Lando W. Zech, Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Thomas M. Roberts, Commissioner
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Frederick M. Bernthal
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Kenneth M. Carr
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Kenneth Rogers
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555



Samuel H. Press
Special Assistant Attorney General
Director for Public Advocacy
Vermont Department of Public Service
120 State Street
Montpelier, VT 05602
(802) 828-2811

Counsel for State of Vermont