

VERMONT YANKEE NUCLEAR POWER CORPORATION

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January 6, 2000
BVY 00-01

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

- References:
- (a) Letter, VYNPC to USNRC, "Proposed Changes to Emergency Action Levels," BVY 99-94, dated July 27, 1999
 - (b) Letter, VYNPC to USNRC, "Technical Specification Proposed Change No. 229 Radiological Environmental Technical Specifications," BVY 99-159, dated December 14, 1999

**Subject: Vermont Yankee Nuclear Power Station
License No. DPR-28 (Docket No. 50-271)
Additional Information Related to Vermont Yankee's
Proposed Changes to Emergency Action Levels**

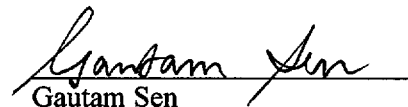
Reference (a) provided proposed changes to Vermont Yankee's (VY's) Emergency Action Levels (EALs). This letter provides additional information requested by USNRC staff during a telecon held on December 6, 1999.

Attachment 1 provides responses to the questions that were raised. Attachment 2 provides the applicable sections from VY's EAL Technical Basis Document. Attachment 3 provides a copy of our EAL classification matrix.

We trust that this information will allow you to complete your review of our submittal, however; if you need any additional information please contact Mr. Jim DeVincentis at (802) 258-4236.

Sincerely,

VERMONT YANKEE NUCLEAR POWER CORPORATION


Gautam Sen
Licensing Manager

Attachments

cc: USNRC Region 1 Administrator
USNRC Resident Inspector - VYNPS
USNRC Project Manager - VYNPS
Richard J. Conte, Chief, Emergency Preparedness and Safeguards Branch, Division of Reactor Safety, USNRC Region I
Vermont Department of Public Service

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SUMMARY OF VERMONT YANKEE COMMITMENTS

BVY NO.: 00-01

The following table identifies commitments made in this document by Vermont Yankee. Any other actions discussed in the submittal represent intended or planned actions by Vermont Yankee. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Licensing Manager of any questions regarding this document or any associated commitments.

COMMITMENT	COMMITTED DATE OR "OUTAGE"
None	N/A

Docket No. 50-271
BVY 00-01

Attachment 1

Vermont Yankee Nuclear Power Station

Response to Specific Questions on Proposed Changes to EALs

Question 1:

Provide additional basis for deletion of EAL S-2-d (BVY 99-94 Attachment 1, Page 8)

Response:

S-2-d, Reactor building ventilation radiation monitor reading > 140 mR/hr, was proposed to be deleted from Revision 17. BVY 99-94, Attachment 1 states that the event was removed due to being sufficiently addressed by the following EALs;

S-2-a, Containment radiation monitors reading > 1000 R/hr,

S-2-c, Refuel floor radiation monitors reading > 1000 mR/hr,

S-3-a, Any 2 of the following 4 conditions:

High area temperature and the appropriate PCIS valves fail to isolate the leak,

High area radiation levels and the appropriate PCIS valves fail to isolate the leak,

High flow indications and the appropriate PCIS valves fail to isolate the leak,

Visual confirmation of a line break.

This EAL referenced NUREG-0654 Site Area Emergency (SAE) #10, page 1-13, Major Damage to Spent Fuel in Containment or Fuel Handling Building (e.g., large object damages fuel or water loss below fuel level). Reactor building ventilation radiation monitors were not referenced in the SAE. Water level is addressed in Revision 17 by EAL S-2-d, Spent fuel pool water level below the top of the spent fuel bundles.

The reactor building ventilation radiation monitors are referenced in proposed Revision 17 by EAL A-2-c, Refuel floor or reactor building ventilation monitor high radiation trip as a result of damage to irradiated fuel. The monitors initiate a trip/isolation at approximately 14 mR/hr which isolates the ventilation system thus removing the transfer mechanism of any radiation release from a fuel handling accident via the reactor building ventilation system. Flow is directed to the Standby Gas Treatment System (filtered release) at a point prior to the radiation monitors. After the initial increase, which isolated the ventilation system, there is no representative sampling by the reactor building ventilation radiation monitors. Representative monitoring is accomplished by the refuel floor radiation monitors that tripped at 100 mR/hr in the vicinity of the ruptured bundle and isolated the reactor building ventilation system.

Use of the Reactor Building Ventilation System in an emergency venting scenario was not considered due to the nature of the initiating event which involves major fuel damage to spent fuel in containment (e.g., large object damages fuel or water loss below the fuel level). Emergency venting would only become necessary due to a fuel barrier (containment) threatening event, which this is not.

There is no analysis correlating upscale radiation readings on the reactor building ventilation radiation monitors to a distant source or fuel handling accident. Major fuel damage to spent fuel in containment (e.g., large object damages fuel or water loss below the fuel level) will continue to be sufficiently addressed by EALs S-2-a, S-2-c, S-2-d, and S-3-a. The reactor building ventilation radiation monitors address the initial trip of the ventilation system and would initiate an Alert in accordance with EAL A-2-c.

Question 2:

Provide additional basis for deletion of EAL U-2-c (BVY 99-94 Attachment 1, Page 8)

Response:

U-2-c, Main steam line high radiation isolation, was deleted from Revision 17. These monitors were provided to detect gross fuel failure resulting from a control rod drop accident. The setting of 3 times normal background for a reactor scram and main steam line isolation valve closure was established to limit fission product release so that 10CFR100 limits were not exceeded for the control rod drop accident. An alarm setting of 1.5 times background was also provided to alert the operator to possible gross fuel failure or abnormal fission product release from failed fuel due to transient reactor operation. There is no corresponding example initiating condition in NUREG-0654 and no technical basis for the inclusion of this condition as an unusual event. This EAL was a continuation of an EAL developed for early revisions of Reg. Guide 1.101.

The original basis for the EAL is not known, but is suspected to be based on the FSAR wording "to detect gross fuel failure." Gross fuel failure in the case of the control rod drop accident consists of noble and halogen gases released from the fuel pins as a result of over pressurizing the fuel pins. This was not of the same degree or consequences as fuel damage assumed in NUREG-0654. Increases in the gases released due to a control rod drop accident are treated in the same manner as other fission or radiolytic gases which migrate to the reactor coolant, carried with the steam for eventual treatment by the Advanced Off-Gas System and release via the stack.

The control rod drop accident is analyzed in the FSAR section 14. A control rod drop accident would initiate an Unusual Event under U-2-b, Valid AEOG RAD Hi-Hi alarm (3-G-1) which does not clear within 30 minutes prior to any appreciable release to the environment. Other effluent EALs at the Unusual Event threshold would be entered depending on the severity. Based on this the main steam line radiation isolation EAL was considered redundant and unnecessary. This is consistent with the conclusions drawn in NEDO-31400A "Safety Evaluation for Eliminating the Boiling Water Reactor Main Steam Isolation Valve Closure Function and Scram Function of the Main Steam Line Radiation Monitor," dated October 1992.

Question 3:

Provide additional information on the basis for "Note #4" that supports the change to EAL S-5-b (BVY 99-94 Attachment 1, Page 14)

Response:

S-5-b, Sustained wind velocity > 80 mph which renders safe shutdown equipment inoperable refers to "Note 4" that provides a short list of safe shutdown systems which are part of the safe shutdown capability analysis.

The technical basis for this EAL is included in Attachment 2 and a copy of the proposed Revision 17 of the EALs is provided in Attachment 3.

Question 4:

Provide additional information on the basis for the last paragraph on the basis for the proposed change to EAL U-8-g/U-7-b (BVY 99-94 Attachment 1, Page 20)

Response:

EAL U-8-g/U-7-b recognizes the difficulty associated with monitoring changing plant conditions without the availability of a major portion of safety system annunciation or indication equipment. "Unplanned" loss of annunciators or indicators excludes scheduled maintenance and testing activities. Safety system annunciation considered in this EAL is located on Control Room Panel (CRP) 9-3, CRP 9-4 and CRP 9-5.

While failure of a large portion of annunciators is more likely than a failure of a large portion of indications, the loss of indication is included in this EAL due to the difficulty associated with assessment of plant conditions when indication is not available. The loss of a specific safety system indicator should remain a function of the specific system or component operability status.

This would be addressed by Technical Specifications (TS). The initiation of a TS imposed operating mode change or plant shutdown related to an instrument loss must be reported according to 10CFR50.72. If the mode change or shutdown is not in compliance with the TS LCO action time statement, an Unusual Event would be declared according to EAL U-7-a. Fifteen minutes was selected as a threshold to exclude transient or momentary losses.

Due to the limited number of safety systems in operation during cold shutdown, refueling, and de-fueled modes, this EAL is not applicable during these modes of operation.

This Unusual Event will be escalated to an Alert if a transient is in progress or compensatory indications (i.e. Safety Parameter Display System) are also unavailable during the loss of annunciation or indication.

“Loss of ability to sample gaseous discharge from the stack locally or loss of all stack gas radiation monitors” was removed based on EPPOS#1, as an action less than TS which is analyzed under Technical Specifications and reportable under 10CFR50.72. Loss of ability to sample or loss of stack radiation monitors is not a precursor to an Unusual Event or a precursor to fuel or barrier damage. It merely compounds offsite recommendations should a more severe event occur. There is no reference to loss of stack gas sampling or stack radiation monitors in NUREG-0654 or equivalent EAL initiating condition contained in NUMARC/NESP-007. Inability to monitor effluents is contained within S-7-a when it affects EOP parameters. EALs that relate to the actual gas sampling are U-2-a and U-2-b, which require confirmatory sampling of reactor water and the plant discharge.

Technical Specifications currently exist for Stack Off-Gas valve isolation (Off-Gas System Isolation Instrumentation, TS 3.2.D in accordance with Table 3.2.4), Stack Noble Gas Effluent monitors (Post-Accident Instrumentation, TS 3.2.G in accordance with Table 3.2.6), Radioactive Gaseous Waste Sampling and Analysis Program (TS Table 4.8.2 associated with several TS 3.8 sections), and Gaseous Effluent Monitoring Instrumentation (TS 3.8.E.1a, 3.8.J.1, 3.8.K.1 and 3.9.B & C associated with Table 3.9.2). In accordance with these TS sections, if either the instrument or the capability to sample is lost, generally 7 days or longer is allowed prior to a report or required shutdown. If both (instrument and capability) are lost, shutdown can be accomplished in as short as 6 hours. Failure to shutdown would be addressed in the Revision 17 EAL U.7.a. Other EALs in Revision 17 continue to require the confirmation of the sample such as U-2-a and U-2-b, which are the NUMARC-0654 Unusual Event item #3a and 3b for the actual stack release. In the revised EAL, the indications located on the CRPs 9-3, 9-4, and 9-5 are addressed which include the stack monitors. It should be noted that reference (b) proposes relocation of some of the above TS requirements to the Off-Site Dose Calculation Manual.

Due the degree of redundancy in the TS and other EALs, which address the general loss of instrumentation, the revised EAL did not require specific reference to the stack instrumentation and sampling capability.

Docket No. 50-271
BVY 00-01

Attachment 2

Vermont Yankee Nuclear Power Station

Supporting Technical Bases Information for Changes to EALs S-5-b and U-7-b

CATEGORY: 5 Natural Phenomenon

SUBCATEGORY: Wind Velocity

EAL#: S-5-b

CLASSIFICATION: Site Area Emergency

EAL:

Sustained wind velocity > 80 mph which renders safe shutdown equipment inoperable

NOTE: Per VYNPS Safe Shutdown Capability Analysis Figure 2-3, Principal Safe Shutdown Systems are:

- RPS (CRD SCRAM)
- SRVs
- Core Spray
- RHR
- HPCI
- RCIC
- RHR Service Water
- Service Water

MODE APPLICABILITY:

All

BASIS:

The FSAR states that the station structures were designed to withstand wind loadings of 80 mph (sustained) with gusts to 100 mph as measured at a height above grade of 30 feet. VY's design levels for tornado wind velocities of 300 mph applies only to the Control Building. Therefore, the more conservative design criterion (80 mph) is used.

Sustained winds in excess of design (80 mph) pose a substantial threat to plant systems necessary to establish and maintain functions necessary for the protection of the public.

To aid in determining the "safe shutdown equipment" referred to, a reference is included to the "Vermont Yankee Nuclear Power Station Safe Shutdown Capability Analysis", Revision 5, Figure 2-3, "Principal Safe Shutdown Systems"

NUREG IC: SAE 15c

BASIS REFERENCE(S):

1. FSAR Section 12.2.1
2. Vermont Yankee Nuclear Power Station Safe Shutdown Capability Analysis, Revision 5, Figure 2-3, "Principal Safe Shutdown Systems

CATEGORY: 7 Loss of Systems or Equipment

SUBCATEGORY: Loss of CR Alarms or Indicators

EAL#: U-7-b

CLASSIFICATION: Unusual Event

EAL:

Unplanned loss of most or all safety system annunciation or indication (CRP 9-3, 9-4 and 9-5) in the control room for greater than 15 min.

MODE APPLICABILITY:

Power Operations, Startup/Hot Standby, Hot Shutdown

BASIS:

This EAL recognizes the difficulty associated with monitoring changing plant conditions without the use of a major portion of safety system annunciation or indication equipment. "Unplanned" loss of annunciators or indicators excludes scheduled maintenance and testing activities. Safety system annunciation considered in this EAL is found on CRP 9-3, CRP 9-4, and CRP 9-5. The other annunciators are important to plant operation, but are not important to safety.

It is not intended that plant personnel perform a detailed count of inoperable instrumentation before declaration of an Unusual Event is made. Rather, a judgment by the Shift Supervisor is used as the threshold for determining the severity of plant conditions and the need for emergency declaration. This judgment is supported by the specific opinion of the Shift Supervisor that additional operating personnel will be required to provide increased monitoring of systems needed to safely operate the plant.

It is recognized that plant design provides redundant safety system indication powered from separate uninterruptable power supplies. While failure of a large portion of annunciators is more likely than a failure of a large portion of indications, the loss of indication is included in this EAL due to the difficulty associated with assessment of plant conditions when indication is not available. The loss of a specific safety system indicator should remain a function of the specific system or component operability status. This would be addressed by Technical Specifications. The initiation of a Technical Specification imposed operating mode change or plant shutdown related to an instrument loss must be reported according to 10CFR50.72. If the mode change or shutdown is not in compliance with the Technical Specification LCO action time statement, the Unusual Event would be declared according to EAL U-7-a.

Fifteen minutes was selected as a threshold to exclude transient or momentary losses.

Due to the limited number of safety systems in operation during cold shutdown, refueling, and defueled modes, this EAL is not applicable during these modes of operation.

This Unusual Event will be escalated to an Alert if a transient is in progress or compensatory indications (SPDS) are also unavailable during the loss of annunciation or indication.

NUREG IC: NUE 11

BASIS REFERENCE(S):

1. NUMARC/NESP-007, Rev. 2, "Category S," pages 5-56, 5-67, and 5-76
2. NUMARC, "Questions and Answers - Methodology for Development of Emergency Action Levels", NUMARC/NESP-007, Rev. 2, dated 6/93

Docket No. 50-271
BVY 00-01

Attachment 3

Vermont Yankee Nuclear Power Station

Proposed Revision 17 of Vermont Yankees Emergency Action Levels

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