Entergy

**Entergy Nuclear Operations, Inc.**
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October 17, 2008
BVY 08-070

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Reference:
(a) Letter, VYNPS to USNRC, "Technical Specification Proposed Change No. 273 Instrumentation Technical Specifications," BVY 08-001, dated February 12, 2008
(b) Letter, USNRC to VYNPS, "Vermont Yankee – Request for Additional Information Regarding Technical Specification Change Relating to Degraded Grid Protection System Instrumentation (TAC No. MD8011)," NVY 08-066, dated July 2, 2008
(c) Letter, VYNPS to USNRC, "Technical Specification Proposed Change No. 273, Supplement 1, Response to RAI Related to Degraded Grid Protection", BVY 08-050, dated August 28, 2008

**Subject:** **Vermont Yankee Nuclear Power Station**
**License No. DPR-28 (Docket No. 50-271)**
**Technical Specifications Proposed Change No. 273, Supplement 3,**
**Response to Additional RAI Related to Degraded Grid Protection**

Dear Sir or Madam,

In Reference (a), Entergy Nuclear Operations Inc. (ENO) submitted a proposed change to the instrumentation sections of the Vermont Yankee Operating License Technical Specifications. In Reference (b), the NRC staff provided a request for additional information (RAI) related to degraded grid protection system instrumentation. Reference (c) provided ENO's response.

Attachment 1 to this submittal provides ENO's response to additional requests for information relating to degraded grid protection discussed with the NRC staff on a telecom held on September 16, 2008.

This supplement to the original license amendment request does not change the scope or conclusions in the original application, nor does it change ENO's determination of no significant hazards consideration.

There are no new regulatory commitments being made in this letter.

Should you have any questions or require additional information concerning this submittal, please contact Mr. David J. Mannai at (802) 451- 3304.

A001
NRR

I declare under penalty of perjury, that the foregoing is true and accurate.
Executed on October 17, 2008

Sincerely,

Michael J Colomb
Site Vice President
Vermont Yankee Nuclear Power Station

Attachments (3)

cc: Mr. Samuel J. Collins
Regional Administrator, Region 1
U.S. Nuclear Regulatory Commission
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King of Prussia, PA 19406-1415

Mr. James S. Kim, Project Manager
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USNRC Resident Inspector
Entergy Nuclear Vermont Yankee, LLC
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Mr. David O'Brien, Commissioner
VT Department of Public Service
112 State Street – Drawer 20
Montpelier, Vermont 05620-2601

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Attachment 1

Technical Specification Proposed Change No. 273
Supplement 3

Vermont Yankee Nuclear Power Station

Response to Request for Information

# Technical Specification Proposed Change No. 273, Supplement 3
# Vermont Yankee Nuclear Power Station
# Response to Request For Additional Information

RAI No. 1

**In response to RAI No. 3, the licensee in its letter dated August 28, 2008, has stated: "The minimum (worst case) transient voltage at the starting motor (farthest load) adequate to start the load is 2538 V which is the terminal voltage of the RHR pump during the first step of the load profile. The RHR pump is analyzed to be able to accelerate its load at 70% of rated voltage or 3400 volts. The transient voltage dip to 2538 V lasts less than 0.1 seconds and voltage quickly recovers. The motor successfully accelerates the load as documented in the Integrated ECCS Test Results."**

**Provide a copy of the document which confirms that the transient voltage dip to 2538 V lasts less than 0.1 seconds and the voltage quickly recovers to the analyzed value of 70% of the motor rated voltage. Explain how the 70% of rated motor voltage is 3400 volts.**

Response to RAI No. 1

Each refueling outage, Vermont Yankee (VY) performs OP 4100, Integrated ECCS Test, which simulates a loss of offsite power and demonstrates that accident loads automatically start on the emergency diesel generators (EDG) in the required time. This test satisfies Technical Specification (TS) Surveillance 4.10.A.1.b.

This test was last performed during the spring 2007 refueling outage. Strip chart recordings of 4160 V bus voltage, and breaker operation for each automatically started ECCS motor are obtained as part of the test. These strip charts are used to document that the large motors start within the required time (see Attachment 2).

The EDG load sequence is described in the VY Updated Final Safety Analysis but is repeated here for convenience. Upon a loss of offsite power all breakers except for one service water pump motor and the feed to the 4160 V / 480 V transformers are tripped from each 4 kV safety bus. When the EDG reaches rated speed and voltage, its output breaker closes immediately restoring power to the 480 V buses and the service water pump motor. The first 1000 hp Residual Heat Removal (RHR) system pump breaker then receives a close signal (with no intentional time delay). The second 1000 hp RHR pump breaker receives a close signal 5 seconds after diesel breaker closure (TS acceptance criteria is a start within 3 to 5 seconds). The 700 hp Core Spray (CS) pump receives a close signal 10 seconds after diesel breaker closure. The CS pump start acceptance criterion is to start within 8 to 10 seconds after EDG breaker closure.

Examination of the strip chart recordings for EDG-B and 4160 V Bus 3 from the 2007 Integrated ECCS Test indicates that the worst case voltage dip during EDG voltage transient occurs when the second RHR pump motor starts. This larger voltage dip is created because, when the breaker for this load closes, the EDG voltage regulator is adjusting bus voltage toward nominal values after the voltage overshoot from the start of the previous large load and because the EDG is already carrying load from the 480 V system, the service water pump and the previously started RHR pump.

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Response to Request For Additional Information

Examination of the voltage for the start of the 2nd RHR pump indicates the following:

| Event | Strip Chart Reference | Strip Chart Units (Voltage) | Bus Voltage | Motor Voltage (%) |
|---|---|---|---|---|
| Initial Voltage | 0 | 19 | 4200 | 105 |
| Bus Voltage at Motor Start | 450 | 19 | 4200 | 105 |
| Minimum Voltage | 490 | 11.5 | 2542 | 64 |
| Min Voltage + 0.1 sec | 500 | 11.5 | 2542 | 64 |
| Min Voltage +0.2 sec | 510 | 12 | 2653 | 66 |
| Min Voltage + 0.3 sec | 520 | 12 | 2653 | 66 |
| Min Voltage + 0.4 sec | 530 | 12 | 2653 | 66 |
| Min Voltage + 0.5 sec | 540 | 12.5 | 2763 | 69 |
| Min Voltage + 0.6 sec | 550 | 13 | 2874 | 72 |
| Min Voltage + 0.7 sec | 560 | 13.5 | 2984 | 75 |
| Min Voltage + 0.8 sec | 570 | 14 | 3095 | 77 |
| Min Voltage + 0.9 sec | 580 | 14.5 | 3205 | 80 |
| Min Voltage + 1.0 sec | 590 | 15 | 3316 | 83 |

Each 10 units on the strip chart recording represent a time of 0.1 seconds. Minimum voltage shown occurs at strip chart reference 490 and lasts approximately 0.1 seconds.

EDG voltage continues to recover to nominal voltage within the next 0.7 seconds. The 700 hp CS pump motor starts successfully on the next load step with minimum voltage dip to 72% of rated motor voltage.

70% of rated motor voltage is 2800 volts not the 3400 volts previously stated.

RAI No. 2

**Provide the following clarifications on TS Table 3.2.8 (page 1 of 1):**

**(1) Items a and b are Trip Functions related to only LOCA condition.**
**(2) Items c and d are Alarm Functions related to only Non-LOCA condition.**
**(3) Items c and d do not have any trip function.**

**Provide a revised copy of TS Table 3.2.8 (page 1 of 1) with the necessary changes.**

# Technical Specification Proposed Change No. 273, Supplement 3
# Vermont Yankee Nuclear Power Station
# Response to Request For Additional Information

Response to RAI No. 2

Attachment 3 provides a revised TS Table 3.2.8 with the recommended enhancements. The revised Bases page is provided for information only.

RAI No. 3

**The current trip setting of the degraded voltage relay is 3,700 volts ± 40 volts. Provide the corresponding reset value of the relay.**

Response to RAI No. 3

The corresponding reset value of the relay is less than or equal to 1% above the trip value.

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Attachment 2

Technical Specification Proposed Change No. 273
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ECCS Test Results - Strip Chart Recorder

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Attachment 3

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Revised Technical Specification Pages

Table 3.2.8 (page 1 of 1)
Degraded Grid Protective System Instrumentation

| TRIP FUNCTION | APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS | REQUIRED CHANNELS PER BUS | ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE | TRIP SETTING |
|---|---|---|---|---|
| 1. Degraded Bus Voltage | | | | |
| a. Voltage Trip (b) | (a) | 2 | Note 1 | ≥ 3660 volts and ≤ 3740 volts |
| b. Trip Time Delay (b) | (a) | 1 | Note 2 | ≥ 9 seconds and ≤ 11 seconds |
| c. Voltage Alarm (c) | (a) | 2 | Note 3 | ≥ 3660 volts and ≤ 3740 volts |
| d. Alarm Time Delay (c) | (a) | 1 | Note 3 | ≥ 9 seconds and ≤ 11 seconds |

(a) When the associated diesel generator is required to be operable.
(b) LOCA condition.
(c) Non-LOCA condition.

Table 3.2.8 ACTION Notes

1. With one or more required Degraded Bus Voltage - Voltage Trip Function channels inoperable:

   a. Place any inoperable channel in trip within 1 hour.

   If the Action and associated completion time of Note 1.a are not met, immediately declare the associated diesel generator inoperable.

2. With one or more required Degraded Bus Voltage - Time Delay Trip Function channels inoperable:

   a. Restore any inoperable channel to operable status within 1 hour.

   If the Action and associated completion time of Note 2.a are not met, immediately declare the associated diesel generator inoperable.

3. With one or more required Degraded Bus Voltage - Voltage Alarm Function channels inoperable, take all of the applicable Actions in Notes 3.a and 3.b:

   a. With one or more buses with alarm capability not maintained, restore alarm capability within 1 hour; and

   b. Restore any inoperable channel to operable status within 24 hours.

   If the Action and associated completion time of Note 3.a or 3.b are not met, initiate increased voltage monitoring of the associated 4.16kV emergency bus(es).

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ION BUFFALO, NEW YORK PRINTED IN U.S.A. CHART NO. WAT 414-8 GRAPHIC CONTROLS

RECIRC LOOP B START

LHA-31B

RHR PUMP C

RHR PUMP D

CS PUMP B

BUS B

RHR P-B START

Test Initiation

RHR P-D START

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START

RHR P-C START

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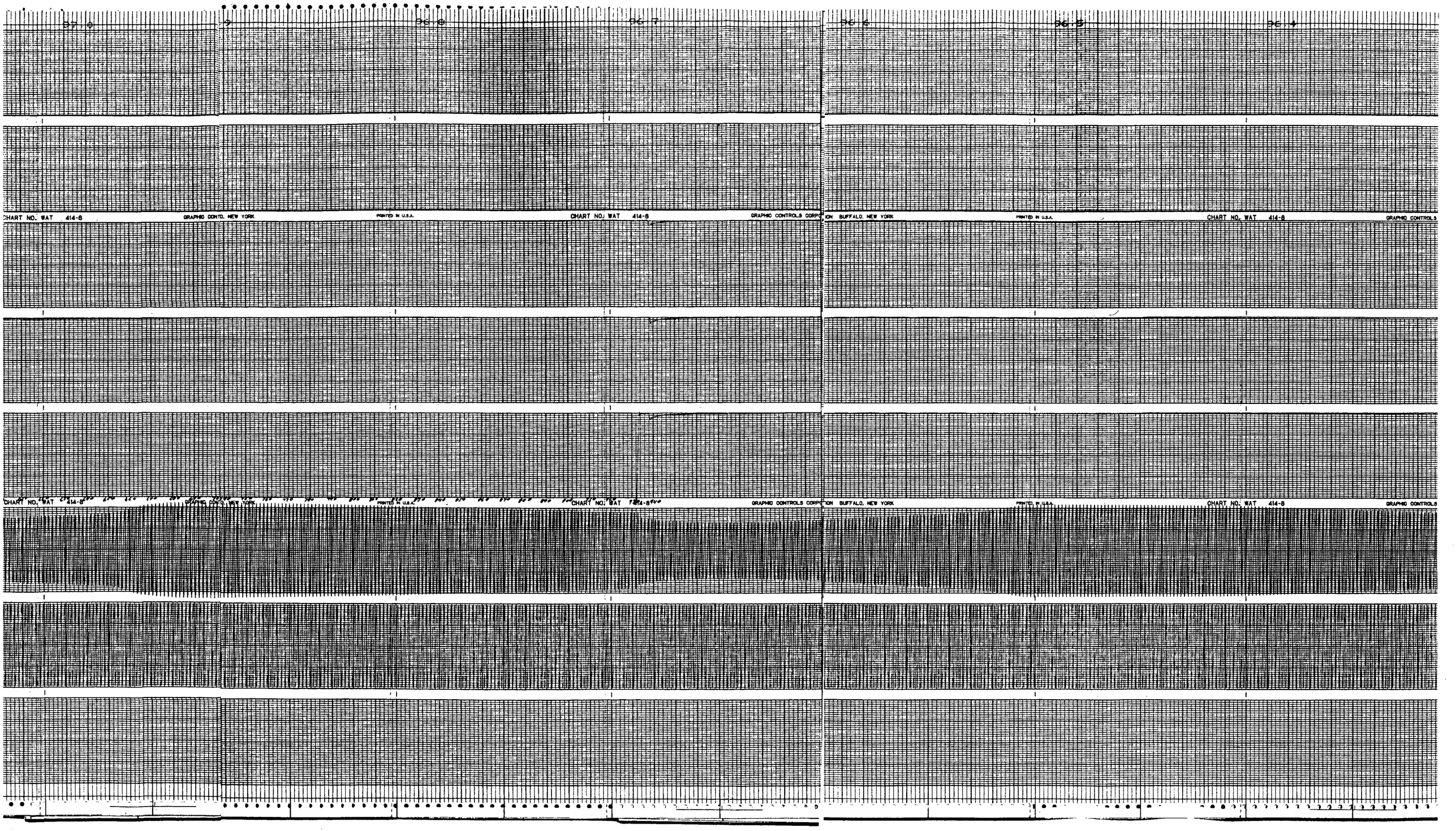


CS P-B START

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