



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

October 24, 1980

Docket No. 50-29

REGISTRATION SERVICES UNIT
DISTRICT BRANCH

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REGISTRATION SERVICES UNIT

Mr. James A. Kay
Senior Engineer-Licensing
Yankee Atomic Electric Company
25 Research Drive
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Dear Mr. Kay:

RE: SEP TOPIC VI-4 ELECTRICAL, INSTRUMENTATION AND CONTROL
ASPECTS OF THE OVERRIDE OF CONTAINMENT PURGE VALVE ISOLATION
(YANKEE-ROWE)

Enclosed is a copy of our evaluation of Systematic Evaluation Program Topic VI-4, Electrical, Instrumentation and Control Aspects of the Override of Containment Purge Valve Isolation. This assessment compares your facility, as described in Docket No. 50-29, with the criteria currently used by the regulatory staff for licensing new facilities. Please inform us if your as-built facility differs from the licensing basis assumed in our assessment within 60 days of receipt of this letter.

This evaluation will be a basic input to the integrated safety assessment for your facility unless you identify changes needed to reflect the as-built conditions at your facility. This topic assessment may be revised in the future if your facility design is changed or if NRC criteria relating to this topic is modified before the integrated assessment is completed.

Sincerely,

Dennis M. Crutchfield
Dennis M. Crutchfield, Chief
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Division of Licensing

Enclosure:
Completed SEP
Topic VI-4

cc w/enclosure:
See next page

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Mr. James A. Kay

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October 27, 1980

cc

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SEP TECHNICAL EVALUATION
TOPIC VI-4

ELECTRICAL, INSTRUMENTATION, AND CONTROL ASPECTS OF
THE OVERRIDE OF CONTAINMENT PURGE VALVE ISOLATION

YANKEE ROWE NUCLEAR STATION

Docket No. 50-29

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SEP TECHNICAL EVALUATION
TOPIC VI-4

ELECTRICAL, INSTRUMENTATION, AND CONTROL ASPECTS OF
THE OVERRIDE OF CONTAINMENT PURGE VALVE ISOLATION

YANKEE ROWE NUCLEAR STATION

1.0 INTRODUCTION

Based on the information supplied by Yankee Atomic Electric Company (YAEC), this report addresses the electrical, instrumentation, and control aspects of Containment Ventilation Isolation (CVI).

Instances have been reported where automatic closure of containment ventilation (purge isolation) valves would not occur, if needed, because the actuation signals were manually overridden (blocked) during normal plant operation. Lack of proper management controls, procedural inadequacies, and circuit design deficiencies contributed to these instances. These events also brought into question the mechanical operability of the valves. These events were determined by the Nuclear Regulatory Commission (NRC) to be an Abnormal Occurrence (#78-05) and were reported to Congress.

The NRC is now reviewing the electrical override aspects and the mechanical operability aspects of containment purging for all operating reactors. On November 28, 1978, the NRC issued a letter, "Containment Purging During Normal Plant Operation"¹ to all Boiling Water Reactor and Pressurized Water Reactor licensees to initiate a review of these systems. YAEC responded to this request for information in letters dated January 8, 1979² and November 1, 1979³.

2.0 EVALUATION OF YANKEE ROWE NUCLEAR STATION

2.1 Review Guidelines

The intent of this evaluation is to determine if the actuation signals for the CVI system meet the following NRC requirements:

1. Guideline No. 1--In keeping with the requirements of General Design Criteria 55 and 56, the overriding^a of one type of safety actuation signal (e.g., radiation) should not cause the blocking of any other type of safety actuation signal (e.g., pressure) for those valves that have no function besides containment isolation.
2. Guideline No. 2--Sufficient physical features (e.g., key lock switches) are to be provided to facilitate adequate administrative controls.
3. Guideline No. 3--A system level annunciation of the overridden status should be provided for every safety system impacted when any override is active. (See R.G. 1.47.)

Additionally, this review uses the following NRC design guidelines:

1. Guideline No. 4--Diverse signals should be provided to initiate isolation of the containment ventilation system. Specifically, containment high radiation, safety injection actuation, and containment high pressure (where containment high pressure is not a portion of safety injection actuation) should automatically initiate CVI.
2. Guideline No. 5--The instrumentation and control systems provided to initiate the CVI should be designed and qualified as safety grade equipment.
3. Guideline No. 6--the overriding or resetting^a of the CVI actuation signal should not cause any valve or damper to change position.

2.2 Containment Ventilation Isolation Circuits Design Description

The Yankee Rowe unit has manual containment purge valves. These valves are not a part of the automatic containment isolation system.²

a. The following definitions are given for clarity of use in this evaluation:

Override: the signal is still present, and it is blocked in order to perform a function contrary to the signal.

Reset: the signal has come and gone, and the circuit is being cleared in order to return it to the normal condition.

Section 3.6.1.1 of the Yankee Rowe Technical Specifications requires containment integrity whenever the plant is in an operating mode or the main coolant pressure is greater or equal to 300 psig.³ Since the containment purge valves are part of the containment boundary², these valves are locked closed when containment integrity is required by Technical Specifications.³

2.3 Containment Ventilation Isolation System Design Evaluation

Guideline 1 allows no signal override to prevent another safety actuation signal from functioning. Because there are no signals which initiate closure of the CVI valves, this guideline does not apply to Yankee Rowe.

Guideline 2 requires reset and override switches to have physical provisions to aid in administrative control of reset and override switches. This guideline does not apply to the Yankee Rowe CVI system.

Guideline 3 requires that system level annunciation for whenever an override affects the performance of a safety system. This guideline does not apply to the Yankee Rowe CVI system.

Guideline 4 requires that isolation of the CVI system be actuated by several diverse signals. The Yankee Rowe unit has only manual valves that are locked closed when the unit is in an operating mode. The NRC has no requirement that these valves be automatically operated; therefore, the Yankee Rowe unit need not conform to this guideline.

Guideline 5 requires isolation actuation signals to be derived from safety grade equipment. The Yankee Rowe unit has no present need to adhere to this guideline, as there are no isolation actuation signals.

Guideline 6 requires that resetting of isolation logic will not, of itself, automatically open the isolation valves. This guideline is not applicable as the Yankee Rowe CVI system uses manual valves that

are required by Technical Specification to be locked closed when the unit is in an operating condition.

3.0 SUMMARY

The electrical, instrumentation, and control design aspects of the containment ventilation isolation valves for the Yankee Rowe units were evaluated using the design guidelines stated in Section 2.1 of this report. Because the Yankee Rowe containment ventilation valves are locked shut as required by Technical Specifications, and have no automatic isolation signals or overrides, the NRC guidelines do not apply.

SEP Topic VII-2 will review related engineered safety feature systems to insure that control logic and design is in accordance with IEEE Standard 279. The mechanical operability of the containment purge valves is being analyzed separately from this report.

4.0 REFERENCES

1. NRC/DOR letter, A. Schwencer, to all BWR and PWR licensees, "Containment Purging During Normal Plant Operation," dated November 28, 1978.
2. YAEC letter, D. E. Moody, to United States Nuclear Regulatory Commission, "Containment Purging During Normal Plant Operation," WYR 79-2, January 8, 1979.
3. YAEC letter, W. P. Johnson, to United States Nuclear Regulatory Commission, "Containment Purging and Venting During Normal Operation," WYR 79-136, November 1, 1979.