Central files

July 2, 1981

Docket No. 50-409
LS05-81-07-003

Mr. Frank Linder
General Manager
Dairyland Power Cooperative
2615 East Avenue South
LaCrosse, Wisconsin 54601

Dear Mr. Linder:

SUBJECT: SEP TOPIC VI-4, OVERRIDE OF CONTAINMENT PURGE ISOLATION AND OTHER ESF ACTUATION SIGNALS (LACROSSE)

The staff has determined that the scope of review and evaluation performed for multi-plant generic activity B-24 includes the electrical aspects of SEP Topic VI-4. Additional review and evaluation is, therefore, not required.

Enclosed is a copy of our current evaluation of the electrical portion of generic activity B-24 for LaCrosse. This assessment compares your facility, as described in Docket No. 50-409, 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 30 days upon receipt of this letter.

This safety evaluation is the staff's position regarding design of your facility in the subject area. With regard to the referenced topic, the staff has concluded your facility meets current licensing criteria.

Sincerely,

Dennis M. Crutchfield, Chief
Operating Reactors Branch No. 5
Division of Licensing

Enclosure:
As stated

cc w/enclosure:
See next page

SE01

DSU USE EX (38) 5/1

OFFICE	SEPB:PM	SEPB:DL	SEPB:DL	ORB#5:DL:PM	ORB#5:DL:C	AD:SA:DL	
SURNAME	RScholl:dk	RHermann	WRussell	RCaruso	DCrutchfield	GLainas	
DATE	6/30/81	6/30/81	6/30/81	7/1/81	7/1/81	7/1/81	

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ENCLOSURE

SAFETY EVALUATION REPORT

LACROSSE

OVERRIDE OF CONTAINMENT PURGE ISOLATION AND OTHER-ENGINEERED SAFETY FEATURE ACTUATION SIGNALS

Introduction

Instances have been reported at nuclear power plants where the intended automatic closure of the containment purge/ventilation valves during a postulated accident would not have occurred because the safety actuation signals were inadvertently overriden and/or blocked, due to design deficiencies. These instances were determined to constitute an Abnormal Occurrence (#78-5). As a follow-up action, NRR issued a generic letter requesting each licensee to take certain actions.

Evaluation

The enclosed report "Electrical, Instrumentation, and Control Aspects of the Overriden of Containment Purge Valve Isolation" (0386J) was prepared for us by EG&G, Idaho, as part of our technical assistance contract program. The report provides their technical evaluation of the design compliance with NRC-provided criteria. It identifies one area where the ventilation valves do not satisfy our criteria.

The area of concern is that the containment is not isolated automatically when the core spray system is initiated manually. However, the plant does not have a system level manual initiation of core spray, therefore the present design is acceptable.

The question raised by the contractor regarding GDC-56 will be covered by the mechanical system review being performed under SEP Topic VI-4.

Conclusion

The staff finds the present design for the electrical overrides and bypasses to be acceptable.

SEP TECHNICAL EVALUATION

TOPIC VI-4
ELECTRICAL, INSTRUMENTATION, AND CONTROL ASPECTS OF
THE OVERRIDE OF CONTAINMENT PURGE VALVE ISOLATION

LA CROSSE BOILING WATER REACTOR

Docket No. 50-409

May 1981

Reliability and Statistics Branch
Engineering Analysis Division
EG&G Idaho, Inc.

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SEP TECHNICAL EVALUATION

TOPIC VI-4
ELECTRICAL, INSTRUMENTATION, AND CONTROL ASPECTS OF
THE OVERRRIDE OF CONTAINMENT PURGE VALVE ISOLATION

LA CROSSE BOILING WATER REACTOR

1.0 INTRODUCTION

Based on the information supplied by the Dairyland Power Cooperative (DPC), this report addresses the electrical, instrumentation, and control systems design aspects of the Containment Ventilation Isolation (CVI) system and other related Engineered Safety Feature (ESF) functions for Millstone Unit 1.

Several instances have been reported where the automatic closure of the containment ventilation or purge isolation valves would not have occurred because the safety actuation signals were manually overridden or bl. ed during normal plant operations. 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 themselves. These events were determined by the Nuclear Regulatory Commission (NRC) to be an Abnormal Occurrence (#78-05) and accordingly, were reported to Congress.

The NRC is now reviewing the electrical override aspects of containment purging and venting 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. This required a review of these systems by the licensee. DPC responded on February 1, 1979[2]. On February 20. 1981[3], DPC provided additional information requested by the NRC. The Final Safety Analysis Report (FSAR) and a letter of January 14, 1980,[4] also contain design information reviewed for this report.

2.0 EVALUATION OF THE LA CROSSE BOILING WATER REACTOR

2.1 Review Guidelines. The intent of this evaluation is to determine if the actuating signals for the ESF equipment meet the following NRC requirements:

1. Guideline No. 1--In keeping with the requirements of General Design Criteria 55 and 56, the override[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.

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 ESF should be designed and qualified as safety grade equipment.

3. Guideline No. 6--the overriding or resetting[b] of the ESF actuation signal should not cause any valve or damper to change position.

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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.

Guideline 6 in this review applies primarily to other related ESF systems because implementation of this guideline for containment isolation will be reviewed by the Lessons Learned Task Force, based on the recommendations in NUREG-0578, Section 2.1.4. When containment isolation is not involved, consideration on a case-by-case basis of automatic valve repositioning upon reset may be considered acceptable. Acceptability would be dependent upon system function, design intent, and suitable operating procedures.

2.2 Containment Ventilation Isolation Circuits Design Description. The containment purge and vent isolation valves use solenoid-operated air pilot valves. Loss of power or air will cause the isolation valves to close. Automatic closure of the containment purge inlet and outlet isolation valves will occur on any of the following conditions[3]:

1. High reactor containment building pressure (5 psig).
2. High primary system pressure (1325 psig).
3. Low reactor water level.
4. High Radiation.

The four inch vent header valves will close on the above signals, except for high radiation. During operation, these valves are closed. DPC has indicated[3], that these signals are derived from safety grade equipment. SEP Topic III-12, "Environmental Qualification," will verify that they are.

The high primary system pressure signal can be bypassed, one channel at a time, for calibration, by a key operated switch.[2] Both channels cannot be bypassed at the same time, and this bypass does not affect any other signals. The use of the key-operated bypass switch is annunciated.

2.3 Containment Ventilation Isolation System Design Evaluation. Guideline 1 requires that no signal override can prevent another safety actuation signal from functioning. The La Crosse Station complies with this guideline.

Guideline 2 requires that reset and override switches have physical provisions to aid in the administrative control of these switches. The key-locked bypass switch, previously mentioned, complies with this guideline. DPC will install locked covers over the radiation reset switches.

Guideline 3 requires system level annunciation whenever an override affects the performance of a safety system. The use of the override is annunciated in conformance with this guideline.

Guideline 4 requires that isolation of the CVI valves be actuated by several diverse signals. This requirement is met. However, the normally closed four inch vent header isolation valves do not close on a high radiation signal. Since they are closed during operation (when an accident would occur) this is not viewed as a deficiency. Manual actuation of either the high pressure core spray or the alternate core spray systems will not actuate closure of the CVI valves.

Guideline 5 requires that isolation actuation signals be derived from safety grade equipment. DPC indicates that the isolation actuation signals are qualified to operate in their normal environment. Should isolation be necessary, it would be accomplished prior to any significant exposure to radiation, temperature or pressure. SEP Topic III-12 will further examine the enviornmental qualifications of this equipment.

Guideline 6 requires that no reset of isolation logic will automatically open the isolation valves. DPC indicates that no valve or damper will change position when a containment isolation signal is overridden or reset.[3]

2.4 Other Related Engineered Safety Feature System Circuits. A review of other related ESF circuits was also made. No other manual overrides have been identified in the review of the material submitted for this audit.

3.0 SUMMARY

The NRC issued a letter, "Containment Purging During Normal Plant Operation," which requested DPC to review purging requirements, controls, and procedures for purging at the La Crosse station.

The electrical, instrumentation, and control design aspects of the containment ventilation isolation valves for La Crosse Unit 1 were evaluated using the design gudelines stated in Section 2.1 of this report. These guidelines are satisfied. However, automatic isolation will not occur for manual operation of the high pressure core spray or the alternate core spray systems. The NRC should determine if this is acceptable.

Both redundant CVI 20-inch valves are located inside containment. This is not presently acceptable per General Design Criteria 56 which requires one valve to be inside containment and the other valve outside containment. The NRC should determine the continued acceptability of this exemption to this General Design Criteria.

4.0 REFERENCES

1. NRC/DOR letter (A. Schwencer) to DPC and all BWR and PWR licensees, "Containment Purging During Normal Plant Operation," dated November 28, 1978.

2. DPC letter, F. Linder to the Director of Nuclear Reactor Regulation, NRC, "Containment Purging During Normal Plant Operation," February 1, 1979, LAC-6104.

3. DPC letter, F. Linder to the Director of Nuclear Reactor Regulation, NRC, "Bypass and Reset of Engineered Safety Features," February 20, 1981, LAC-7379.

4. DPC letter, F. Linder to the Director of Nuclear Reactor Regulation, NRC, "IE Bulletin No. 79-08. Additional Information-Events Relevant to BWR's Identified During Three Mile Island Incident," January 14, 1980, LAC-6732.