

August 3, 1981

Docket No. 50-155  
LS05-81-08-001



Mr. David P. Hoffman  
Nuclear Licensing Administrator  
Consumers Power Company  
1945 W Parnall Road  
Jackson, Michigan 49201

Dear Mr. Hoffman:

SUBJECT: SEP TOPIC III-10.A, THERMAL-OVERLOAD PROTECTION FOR MOTORS  
OF MOTOR-OPERATED VALVES, SAFETY EVALUATION REPORT FOR BIG  
ROCK POINT

The enclosed revised staff safety evaluation is based on a contractor document that has been made available to you previously. This evaluation supports the findings of the staff safety evaluation of Topic III-10.A and proposes modifications to the control circuits for motor-operated valves in systems required for safety.

The need to actually implement these changes will be determined during the integrated safety assessment. This topic assessment may be revised in the future if your facility design is changed or if NRC criteria relating to this topic are modified before the integrated assessment is completed.

Sincerely,

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

Enclosure:  
As stated

cc w/enclosure:  
See next page

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SAFETY EVALUATION REPORT  
FOR BIG ROCK POINT PLANT

TOPIC: III-10.A THERMAL-OVERLOAD PROTECTION FOR MOTORS OF MOTOR-OPERATED VALVES

I. INTRODUCTION

The primary objective of thermal overload relays is to protect motor windings of motor-operated valves (MOV) against excessive heating. This feature of thermal overload relays could, however, interfere with the successful functioning of a safety related system. In nuclear plant safety system application, the ultimate criterion should be to drive the valve to its proper position to mitigate the consequences of an accident, rather than to be concerned with degradation or failure of the motor due to excessive heating.

II. REVIEW CRITERIA

The primary review criteria are:

1. IEEE Std. 279-1971, and
2. Regulatory Guide 1.106.

As a result of numerous operating plant events resulting from torque switch problems the following supplemental criterion was used:

- (a) In MOV designs that use a torque switch to limit the opening or closing of the valve, the automatic opening or closing signal should be used in conjunction with a corresponding limit switch.

III. RELATED SAFETY TOPICS AND INTERFACES

There are no safety areas related to the scope of this review that are addressed by other SEP Topics nor are any other topics dependant on the results of this review.

IV. REVIEW GUIDELINES

The review should assure that: (1) thermal overload protection, if provided, for MOV's should have the trip setpoint at a value high enough to prevent spurious trips due to design inaccuracies, trip setpoint drift, or variation in the ambient temperature at the installed location; (2) the circuits that bypass the thermal overload protection under accident conditions are designed to IEEE Std. 279-1971 criteria, as appropriate for the rest of the safety related system; and (3) in MOV designs that use a torque switch instead of a limit switch to limit the opening or closing of the valve, the automatic opening or closing signal should be used in conjunction with a corresponding limit switch and thermal overload should remain as backup protection over the first 10% of valve travel.

V. EVALUATION

The design provisions for motor-operated valve protection are described in EG&G Report 1661F, "Thermal-Overload Protection for Motors of Motor-Operated Valves." In summary, Big Rock Point does not meet current licensing criteria.

VI. CONCLUSIONS

The Big Rock Point designs do not satisfy the current licensing criteria for safety related valve functions. Because of the failure of valves due to inadequate protection could lead to the failure of redundant systems, the staff proposes that the control systems for safety related valves be modified to satisfy our criteria.