UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

SAFETY EVALUATION BY THE
DIRECTORATE OF LICENSING
SUPPORTING AMENDMENT NO. 4
TO LICENSE NO. DPR-50
(Change No. 3 to Appendix A
of Technical Specifications)

METROPOLITAN EDISON COMPANY
JERSEY CENTRAL POWER AND LIGHT COMPANY
PENNSYLVANIA ELECTRIC COMPANY

THREE MILE ISLAND NUCLEAR STATION - UNIT 1
DOCKET NO. 50-289

Introduction

On July 12, 1974, the Station Superintendent (J. Herbein) notified the Licensing Project Manager (R. Bernero) that the Three Mile Island Nuclear Station - Unit 1 (TMI-1) was operating at power with one steam generator safety valve weeping. The valve vendor advised gagging the valve to prevent damage to it and possibly stop the leak. Since Section 3.4.1 of the Technical Specifications requires all 18 steam generator safety valves to be operable while the system is hot, the Superintendent requested an urgent change to the Technical Specifications. The urgency is based on the current high power demands in the PMJ grid due to continuing hot weather.

Discussion

Technical Specifications have been set in the past just as they are now for TMI-1, to require the full complement of steam generator safety valves to be operable with no qualification for operation with one or more inoperable. The full complement is needed to provide relief capacity with suitable design margin of rated full power steam flow. The plant overpower trip set point is, of course, normally set to a point commensurate with operation at rated full power. Recent experience has led the Regulatory staff to consider Technical Specifications which could allow plant operation with one or more steam generator safety valves inoperable provided that there is a commensurate reduction in the overpower trip set point. Such specifications are now being prepared and issued in current cases.

The basis of calculation to determine the appropriate overpower trip reduction is to assume that the maximum number of disabled safety valves on any steam generator is the number of disabled valves on each steam generator. It is further assumed that the capacity of any disabled valve is equal to the relief capacity of the highest capacity valve in the system. Thus, there is no reduction of design margin when operating in the degraded mode and no need to analyze operation with asymmetric relief capacity.

TMI-1 is a two steam generator plant with the following set of safety valves on each steam generator:

Valve Setting (psig)	No. of Valves	Relief Capacity (lbs/hr)
1040	1	194,000
1050	2	792,000
1060	2	799,000
1080	2	814,000
1092.5	2	824,000
Total per steam generator	9	6,650,000
Total plant	18	13,300,000

The normal overpower trip set point is 105.5% of rated power (2535 MWth). A revised set point may then be calculated by the formula:

$$\text{Set Point}_n = \frac{13{,}300{,}000 - 2n(824{,}000)}{13{,}300{,}000} \times 105.5$$

where n = the maximum number of safety valves disabled on any one steam generator.

This leads to the table of set points:

Maximum Number of Safety Valves Disabled On Any Steam Generator	Maximum Overpower Trip Set Point (% of Rated Power)
0	105.5
1	92.4
2	79.4
3	66.3

As a matter of judgment, the allowable number of disabled valves should be limited to no more than three of the nine valves on a steam generator.

Conclusion

The staff, therefore, concludes that it is acceptable to amend Section 3.4.1 of the Technical Specifications to permit operation at temperature with safety valves disabled provided that the overpower trip setting is reduced in accordance with the preceding table. The staff further concludes that this amendment does not:

(1) involve a significant hazards consideration or a safety consideration of a type or magnitude not considered by any previous staff safety review of this facility,

(2) potentially involve a substantial increase in the probability or consequences of an accident considered in any previous staff safety review, or

(3) potentially decrease the margin of safety during normal plant operation, anticipated operational occurrences or postulated accidents considered in any previous staff safety review.

Based on the foregoing analysis, the staff finds that there is reasonable assurance that the health and safety of the public will not be endangered by approval of this amendment to License No. DPR-50.

Robert M. Bernero

Robert M. Bernero, Project Manager
Light Water Reactors Branch 2-3
Directorate of Licensing

for. D. A. Patterson

A. Schwencer, Chief
Light Water Reactors Branch 2-3
Directorate of Licensing

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