EG&G Idaho, Inc.

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Responsible NRC Individual and NRC Office or Division: Paul Shemanski, Division of Operating Reactors

This document was prepared primarily for preliminary or internal use. It has not received full review and approval. Since there may be substantive changes, this document should not be considered final.

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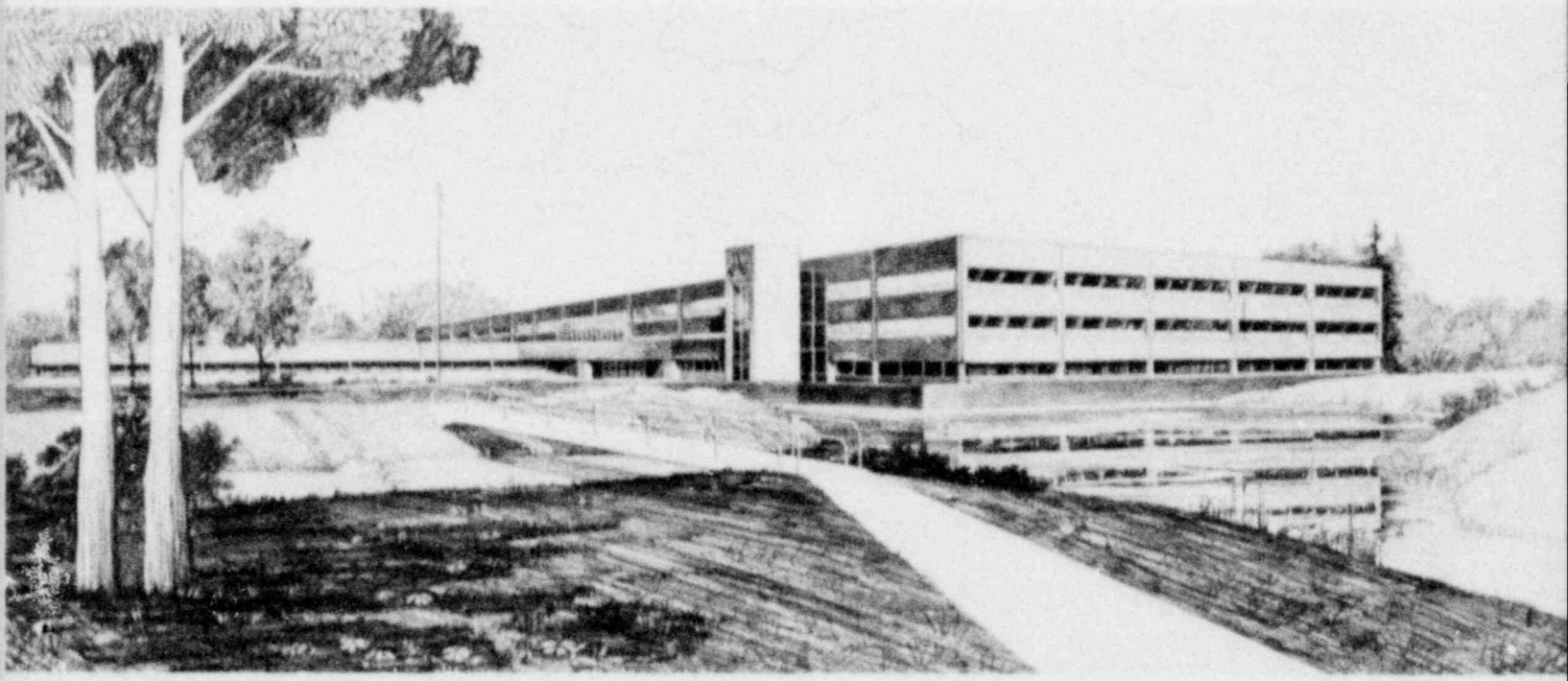
ELECTRICAL, INSTRUMENTATION AND CONTROL ASPECTS OF PROPOSED TECHNICAL SPECIFICATIONS CHANGE REGARDING BLOCKING OF SAFETY INJECTION SIGNALS WHEN PRESSURE IS BELOW 2000 PSIG, H. B. ROBINSON, UNIT 2

S. E. Mays

U.S. Department of Energy
Idaho Operations Office • Idaho National Engineering Laboratory



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TECHNICAL EVALUATION REPORT

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H. B. ROBINSON, UNIT 2

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H. B. ROBINSON, UNIT 2

1.0 INTRODUCTION

The objective of this review is to evaluate if plant safety is degraded by allowing the proposed changes to the H. B. Robinson, Unit 2 Technical Specifications to allow blocking the "High Differential Pressure Between any Steam Line and the Steam Header" Safety Injection System (SIS) initiation when primary plant pressure is less than 2000 psig (as in cooldown operations). This change was proposed by Carolina Power and Light Company in their letter Utley to Schwencer dated March 6, 1979.

2.0 DISCUSSION

The present H. B. Robinson, Unit 2 Technical Specifications allow blocking the "Pressurizer Low Pressure and Low Level" SIS initiation when primary pressure is less than 2000 psig (as in cooldown operations). However, the same switch which blocks this signal also blocks the "High Differential Pressure Between any Steam Line and the Steam Header" SIS initiation. Table 3.5.3 of the Technical Specifications presently does not allow this signal to be blocked under any conditions. Therefore, Carolina Power and Light Company has requested that Table 3.5.3 of the Technical Specifications be changed to allow blocking the "High Differential Pressure Between any Steam Line and the Steam Header" when primary plant pressure is less than 2000 psig.

Section 14.2.5 of the H. B. Robinson, Unit 2 Final Facility Description and Safety Analysis Report (FSAR) discusses the factors protecting the core in the event of a steam line rupture. The SIS initiation and rapid closure of the main steam isolation valves is required to ensure that the possible return to criticality will not

result in sufficient heat flux to cause core damage and to ensure that adequate shutdown margin is maintained.

SIS initiation and rapid closure of the main steam isolation valves during a steam line rupture can be initiated by any of the following signals.

(1) Pressurizer Low Level and Low Pressure

(2) High Differential Pressure Between any Steam Line and the Steam Header

(3) High Containment Pressure

(4) High Steam Flow in 2/3 Steam Lines Coincident with Low T_{avg} or Low Steam Pressure.

Technical Specifications, Table 3.5.3 allows blocking signal (1) above when primary pressure is less than 2000 psig. The proposed change would also allow signal (2) above to be blocked when pressure is less than 2000 psig. This would leave only signals (3) and (4) above available for SIS initiation and rapid closure of the main steam isolation valves in the event of a steam line rupture. Table 3.5.3 of the Technical Specifications requires a minimum of two containment pressure channels to be operable with one degree of redundancy. It also requires operability of at least one steam line flow channel per loop, two T_{avg} channels with one degree of redundancy, and two steam pressure channels with one degree of redundancy. Therefore, SIS initiation and core protection is provided by two separate redundant systems if both signals (1) and (2) above are blocked when the primary pressure is below 2000 psig.

Furthermore, as noted in NRC Memo from J. H. Sniezek to D. Eisenhut, dated April 5, 1978, the steam header pressure transmitter range is so narrow that safety injection will occur during normal cooldown operations unless the "High Differential Pressure Between any Steam Line and

the Steam Header" signal is blocked. Such a safety injection could result in an uncontrolled cooldown and possible plant overpressurization which is undesirable.

3.0 EVALUATION

The NRC staff position stated in generic letter of November 28, 1978 required that all licensees "review the design of all safety actuation signal circuits which incorporate a manual override feature to ensure that overriding of one safety actuation signal does not also cause the bypass (block) of any other safety actuation signal, that sufficient physical features are provided to facilitate adequate administrative controls, and that the use of each such manual override is annunciated at the system level for every system impacted." It is recommended that the switch which blocks both the "Pressurizer Low Level and Low Pressure" signal and the "High Differential Pressure Between any Steam Line and the Steam Header" signal be modified to comply with this staff position.

It is recommended that the proposed change to Table 3.5.3 of the H. B. Robinson, Unit 2 Technical Specifications to allow blocking the "High Differential Pressure Between any Steam Line and the Steam Header" signal when primary pressure is less than 2000 psig be allowed. Adequate protection from a steam line rupture is provided without this signal by independent and redundant systems. Additionally, this will prevent inadvertent SIS initiation during cooldown due to the limited range of the Steam Header Pressure transmitter.

4.0 REFERENCES

1. CPLC letter (Utley) to NRC (Schwencer) dated March 6, 1979.

2. H. B. Robinson, Unit 2 Technical Specifications, Table 3.5.3.

3. H. B. Robinson, Unit 2 Final Facility Description and Safety Analysis Report.

4. NRC Memo J. H. Sniezek to D. Eisenhut, dated April 5, 1978.

5. NRC generic letter dated November 28, 1978, Containment Purging During Normal Plant Operation.