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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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Edwin I. Hatch Nuclear Plant
Response to Request for Additional Information
Relative to
Request to Revise Technical Specifications:
Quarterly Surveillance Extension

Ladies and Gentlemen:

By letter dated September 20, 2001, Southern Nuclear Operating Company (SNC) submitted to the NRC proposed Technical Specifications (TS) changes that extend quarterly surveillance frequencies to semi-annual; i.e., from 92 days to 184 days. During a teleconference on December 10, 2001, NRC staff and SNC discussed the NRC review questions. The Enclosure provides documentation of the NRC's questions followed by SNC's responses.

In addition, as agreed upon in the above teleconference, SNC will provide the NRC, in a separate submittal, revisions to the September 20, 2001, request to revise the quarterly surveillance extension. Specifically, the surveillance frequencies of 92 days will be changed to "92 days on a STAGGERED TEST BASIS." The submittal will contain the revised TS and Bases pages (Enclosures 7 and 9, respectively), as well as the associated marked-up TS and Bases pages (Enclosures 8 and 10, respectively). Enclosures 1 through 6 of the September 20, 2001, submittal will be unchanged.

If you have any questions, please contact this office.

Should you have any questions in this regard, please contact this office.

Respectfully submitted,

Lewis Sumner

H. L. Sumner, Jr.

TWL/sp

A001

Enclosure:

cc: Southern Nuclear Operating Company
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Enclosure

Edwin I. Hatch Nuclear Plant
Response to Request for Additional Information
Technical Specifications Quarterly Surveillance Extension Request

NRC Question No. 1

Will scram contactor testing (manual scram) and APRM adjustments remain weekly under the proposed channel function test surveillance frequency of 184 days?

SNC Response:

The Surveillance Requirements (SRs) that dictate weekly testing remain unchanged in the proposed Technical Specifications (TS) amendment as follows:

A. A CHANNEL FUNCTIONAL TEST (SR 3.3.1.1.5) is performed on the Reactor Protection System (RPS) instrumentation every 7 days as required by TS Table 3.3.1.1-1, Function 11, Manual Scram.

B. SR 3.3.1.1.2 specifies that a verification of the absolute difference between the average power range monitor (APRM) channels and the calculated power is within 2% of the rated thermal power (RTP) while operating ≥ 25% RTP. This verification, and adjustment if necessary, is specified for TS Table 3.3.1.1-1, Function 2.b, APRM Simulated Thermal Power – High, and Function 2.c, APRM Neutron Flux – High.

NRC Question/Request No. 2

Earlier evaluations (NEDC-30851) of channel functional test intervals indicated that a surveillance interval of up to 4 months would not significantly affect reactor protection system failure frequency. However, surveillance intervals beyond 4 months increased the RPS failure frequency at a noticeably higher rate and appears to be the limiting basis for the original quarterly surveillance interval. Discuss any changes in the analysis to support the proposed 6 month interval and the apparent discrepancy with earlier evaluations. The staff notes that instrument drift was not considered in the analysis with respect to these results. See figure 5-3, page 5-39 in NEDC-30851P-A.

SNC Response:

The justifications for the proposed 6-month Surveillance intervals were based upon deterministic evaluations, such as instrument drift analyses and CHANNEL FUNCTIONAL TEST performance history. Identified failures were not screened for probabilistic risk assessment (PRA) defined failures. The PRA sensitivity assessment was performed in support of the recommended changes. NEDC-30851P was not used as the justification basis for the Surveillance interval extensions. The PRA sensitivity study conservatively assumed a factor of 2 increase in failure rates for instrumentation presently included in the PRA to determine the impact on the existing core damage frequency (CDF). The results of the PRA sensitivity study conclude the impact on Plant Hatch's CDF due to the proposed increase in the Surveillance intervals is negligible.

NEDC-30851P, Figure 5-3, "Sensor Test Interval vs. RPS Failure Frequency," graphically depicts the failure frequency of RPS instrumentation while maintaining the scram contactor testing interval set equal to 7 days. NEDC-30851P does not explicitly state that the data cover all RPS channels considered in the evaluation; however, consideration of all RPS channels is implied. Paragraph 5.7.1 (page 5-16) of the report states that the major cause of RPS instrumentation failure is a common-cause failure of the scram contactors. For Plant Hatch, manual contactors are tested on a weekly basis as stated in SNC's response to NRC Question No. 1. Also, as indicated in the cover letter for this Enclosure, Plant Hatch will submit to the NRC a proposed revision to the TS surveillance interval extension request dated September 20, 2001. The revision changes the Frequency for selected CHANNEL FUNCTIONAL TESTS from "92 days" to "92 days on a STAGGERED TEST BASIS." The staggered testing scheme, as with the existing Frequency, will expose common-cause failures.

NRC Question/Request No. 3

Provide list of equipment and test boundaries included in a channel functional test.

SNC Response:

As discussed in the December 10, 2001, teleconference referenced in the cover letter for this Enclosure, the equipment and test boundaries for a CHANNEL FUNCTIONAL TEST are contained in various Plant Hatch Maintenance Department Instrument and Controls procedures. The Unit 1 and Unit 2 Technical Requirements Manuals (TRMs) contain equipment cross references sorted by TS and TRM references, and Master Parts List (MPL) numbers (Tables T10.1-1 and T10.1-2, respectively). The applicable Loss of Function Diagrams (LFDs) depicting the various instrumentation boundaries, such as trip systems, channels, and actuation logic, are also included in the instrumentation tables. This information, along with other design documentation, is used in establishing test boundaries for CHANNEL FUNCTIONAL TESTS.

Since the NRR reviewers are not on distribution for the TRMs, the following response is provided for information only in support of the NRR's request. A page from TRM Table T10.1-1, which lists instrumentation associated with various Specifications, and LFD-1-ECCS-23, which shows the defined boundaries for a specific instrumentation loop, are provided as Figures E-1 and E-2, respectively.

Technical Specification 1.1 provides the following definition of a CHANNEL FUNCTIONAL TEST:

> *A CHANNEL FUNCTIONAL TEST shall be the injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify OPERABILITY, including required alarm, interlock, display, and trip functions, and channel failure trips. The CHANNEL FUNCTIONAL TEST may be performed by means of any series of sequential, overlapping, or total channel steps so that the entire channel is tested.*

TRM Section T 1.2 defines a Channel and the Channel Functional Test Scope. SNC is currently revising these definitions to clarify the required scope of a CHANNEL FUNCTIONAL TEST. TRM Figure 1.2-1, Protective Action Logic System, which is provided as Figure E-3, shows the trip system and channels for a two-channel trip system with the channel boundaries ending at the respective channel relay contact. The current definitions and the revised definitions, with revisions shown in bold, double underline, are as follows:

CURRENT DEFINTIONS:

A. ***Channel*** – *An arrangement of components and modules that are required to generate a single protective action signal when the associated setpoint is reached. A channel ends where it combines with other single protective action signals. If there is only one input from a channel to an end device, the channel is usually considered to end at the terminals for the control logic of the end device.*

B. ***Channel Functional Test Scope*** – *The CHANNEL FUNCTIONAL TEST normally includes the components and modules of a channel, as defined above, except as follows. The test signal should be injected as close as possible to the sensor except when specifically stipulated in a licensing document. Each output (e.g., contact) of the channel should be tested with the following exception. If an alarm function is the sole function of the channel or is specifically addressed in the Technical Specifications, the alarm output of the channel must be tested up to the point where it loses its identity. If either of the above cases does not apply, the alarm function is not required to be tested. Figure 1.2-1 shows the typical configuration for a protective action logic system and the divisions between trip system, channels, trip logic, and actuation logic. This drawing shows two channels in a trip system; however a trip system may include more than two channels. As seen in the Figure 1.2-1, channel A1 and A2 end at the contacts for relays K1 and K2, respectively. Consequently, a CHANNEL FUNCTIONAL TEST for each of the channels normally includes these contacts.*

When a channel involves two functions, one supplied by the master trip unit and the other supplied by a slave trip unit, the 6 hour Allowed Outage Time (AOT) allowed by the Technical Specifications, for surveillance testing applies to the total time the channel is removed from service for testing both functions.

REVISED DEFINITIONS:

A. ***Channel*** – *An arrangement of components and modules that are required to generate a single protective action signal when the associated setpoint is reached. A channel ends where it combines with other single protective action signals* ***or enters a logic system composed of relays, via a bistable trip device****. If there is only one input from a channel to an end device, the channel is usually considered to end at the terminals for the control logic of the end device.*

B. ***Channel Functional Test Scope*** – *The CHANNEL FUNCTIONAL TEST normally includes the components and modules of a channel, as defined above, except as follows. The test signal should be injected as close as possible to the sensor except when specifically stipulated in a licensing document. Each output (e.g., contact) of the channel should be tested with the following exception. If an alarm function is the sole function of the channel or is specifically addressed in the Technical Specifications, the alarm output of the channel must be tested up to the point where it loses its identity. If either of the above cases does not apply, the alarm function is not required to be tested. Figure 1.2-1 shows the typical configuration for a protective action logic system and the divisions between trip system, channels, trip logic, and actuation logic. This drawing shows two channels in a trip system; however a trip system may include more than two channels. As seen in the Figure 1.2-1, channel A1 and A2 end at the contacts for relays K1 and K2, respectively. Consequently, a CHANNEL FUNCTIONAL TEST for each of the channels normally includes these*

> *contacts.* ***Where a positive indication of bistable trip status is provided, as in the Analog Transmitter Trip System, the trip status indication may be considered the channel end point for functional testing purposes, provided the bistable trip device is utilized as the initiating device for the actuation logic in the LOGIC SYSTEM FUNCTIONAL TEST. This will ensure appropriate overlap in testing.***
>
> *When a channel involves two functions, one supplied by the master trip unit and the other supplied by a slave trip unit, the 6 hour Allowed Outage Time (AOT) allowed by the Technical Specifications, for surveillance testing applies to the total time the channel is removed from service for testing both functions.*

NRC Question No. 4:

Data collection was limited to only 3 years - Did the data collection results support the failure rate assumptions in the plant PRA?

SNC Response:

Plant Hatch data collection was limited to 3 years, because the TS changes were evaluated using the guidance provided in Generic Letter 91-04. Instrumentation data collected for the Surveillance extension are raw data that show setpoint drift within a procedurally acceptable tolerance and, in many cases, do not constitute PRA failures. The actual number of true instrument failures examined is much smaller and would have little impact on a PRA data distribution. Generally, PRA instrumentation data consist of combined generic and plant data using a statistical process referred to as Bayesian updating. The mean values from the resulting distributions are typically used as the failure rate numbers.

The data collected were used to determine instrumentation drift characteristics. With the actual instrumentation drift defined, the instrumentation setpoints are updated to accommodate the extended Surveillance interval while maintaining acceptable procedural performance.

NRC Question No. 5

Page E-2[E1-2], Clarify what is meant by the failure data collected for the associated procedures shows that surveillance procedure failures for multiple groups of RPS and ECCS instrumentation are very small in number. Is this a reference to common cause failures experienced at the plant.? Does the PRA reflect plant component failure rates?

SNC Response:

Enclosure 1 of the quarterly surveillance extension revision request provides a summary of the methodology applied to the justifications. NRC Question No. 5 refers to the following statement on page E1-2.

> *Additionally, failure data collected for the associated procedures shows that surveillance procedure failures for multiple groups of RPS and emergency core cooling system (ECCS) instrumentation are very small in number.*

The above statement refers to the data collected from the performance history of CHANNEL FUNCTIONAL TEST procedures. The data represent various instrument types (e.g., pressure switches, level switches, differential transmitter) within a number of systems, including the RPS. The statement was not intended to imply the noted procedure failures were common-cause failures.

NRC Question No. 6

The PRA analysis did not address limit switches (valve), pressure switches, (control valves), vacuum switches, temperature switches, and radiation monitors that are included in channel functional tests. These devices appear not to be addressed in the analysis but constitute a significant portion of the instrumentation included in the surveillance interval request. Confirm that the assumed failure rates are consistent with the assumptions of the HNP sensitivity study and that for instrumentation not included in the study, but for which functional test interval extensions are requested, instrument failure rates will not change the conclusions of the analysis.

SNC Response:

The Plant Hatch PRA addresses limit switches for Main Steam Isolation Valves (MSIVs) and Turbine Stop Valves (TSVs). It also addresses the fast-closure pressure switches for the Turbine Control Valves (TCVs) as well as the first-stage pressure switches used to enable a reactor scram from TCV and TSV closure at a selected power. Temperature switches for items such as leak detection on the main steam lines in the turbine building, which can cause a Group I isolation, are not modeled. The MSIV closure signal provides a reactor scram and as such, is covered by the MSIV closure initiating event. The sensitivity study also includes doubling the failure rates for these components. The Plant Hatch main steam line radiation monitors no longer provide a Group I closure and are not considered in the Probabilistic Safety Assessment.

The BWR Owner's Group performed a peer review of the Plant Hatch PRA using the NEI draft "Probabilistic Risk Assessment (PRA) Peer Review Process Guidance," dated June 2, 2000, as the basis for review.

Both Plant Hatch PRA models were revised since the Individual Plant Examination submittals, and were converted from RISKMAN to CAFTA software. Due to unit similarities, the Unit 1 Revision 1a CAFTA model information was used for the Technical Specifications revision request.

TABLE T 10.1-1 (Sheet 11 of 19)
MASTER EQUIPMENT CROSS REFERENCE - SORTED BY MPL

MPL NUMBER(S)	SPECIFICATION	LOSS OF FUNCTION DIAGRAMS
1E11-K75A,B	TS 3.3.5.1-1 (2.f.)	LFD-1-ECCS-10
1E11-K81A,B	TRM T3.3.12-1 (1.)	N/A
1E11-N007A,B	TS 3.3.3.1-1 (12.)	N/A
1E11-N055A,B,C,D	TS 3.3.5.1-1 (4.f.)	LFD-1-ECCS-23
1E11-N055A,B,C,D	TS 3.3.5.1-1 (5.f.)	LFD-1-ECCS-23
1E11-N056A,B,C,D	TS 3.3.5.1-1 (4.f.)	LFD-1-ECCS-23
1E11-N056A,B,C,D	TS 3.3.5.1-1 (5.f.)	LFD-1-ECCS-23
1E11-N082A,B	TS 3.3.5.1-1 (2.g.)	LFD-1-ECCS-11
1E11-N094A,B	TS 3.3.6.1-1 (4.d.)	LFD-1-PCIS-24
1E11-N094A,B,C,D	TRM T3.3.7-1 (2.)	LFD-1-MCREC-03
1E11-N094A,B,C,D	TS 3.3.5.1-1 (1.b.)	LFD-1-ECCS-02
1E11-N094A,B,C,D	TS 3.3.5.1-1 (2.b.)	LFD-1-ECCS-06
1E11-N094A,B,C,D	TS 3.3.5.1-1 (3.b.)	LFD-1-ECCS-13
1E11-N094A,B,C,D	TS 3.3.5.1-1 (4.b.)	LFD-1-ECCS-19
1E11-N094A,B,C,D	TS 3.3.5.1-1 (5.b.)	LFD-1-ECCS-19
1E11-N094C,D	TS 3.3.6.1-1 (3.d.)	LFD-1-PCIS-15
1E11-N655A,B,C,D	TS 3.3.5.1-1 (4.f.)	LFD-1-ECCS-23
1E11-N655A,B,C,D	TS 3.3.5.1-1 (5.f.)	LFD-1-ECCS-23
1E11-N656A,B,C,D	TS 3.3.5.1-1 (4.f.)	LFD-1-ECCS-23
1E11-N656A,B,C,D	TS 3.3.5.1-1 (5.f.)	LFD-1-ECCS-23
1E11-N682A,B	TS 3.3.5.1-1 (2.g.)	LFD-1-ECCS-11
1E11-N694A,B	TS 3.3.6.1-1 (4.d.)	LFD-1-PCIS-24
1E11-N694A,B,C,D	TRM T3.3.7-1 (2.)	LFD-1-MCREC-03
1E11-N694A,B,C,D	TS 3.3.5.1-1 (1.b.)	LFD-1-ECCS-02
1E11-N694A,B,C,D	TS 3.3.5.1-1 (2.b.)	LFD-1-ECCS-06
1E11-N694A,B,C,D	TS 3.3.5.1-1 (3.b.)	LFD-1-ECCS-13
1E11-N694A,B,C,D	TS 3.3.5.1-1 (4.b.)	LFD-1-ECCS-19
1E11-N694A,B,C,D	TS 3.3.5.1-1 (5.b.)	LFD-1-ECCS-19
1E11-N694C,D	TS 3.3.6.1-1 (3.d.)	LFD-1-PCIS-15
1E11-R070	TS LCO 3.3.3.2 for RHR (SDC and SPC)	N/A
1E11-R071	TS LCO 3.3.3.2 for RHR (SDC and SPC)	N/A
1E11-R602A,B	TS 3.3.3.1-1 (12.)	N/A

HATCH UNIT 1 TRM **REVISION 12**

FIGURE E-1
TYPICAL TRM INSTRUMENTATION CROSS-REFERENCE TABLE

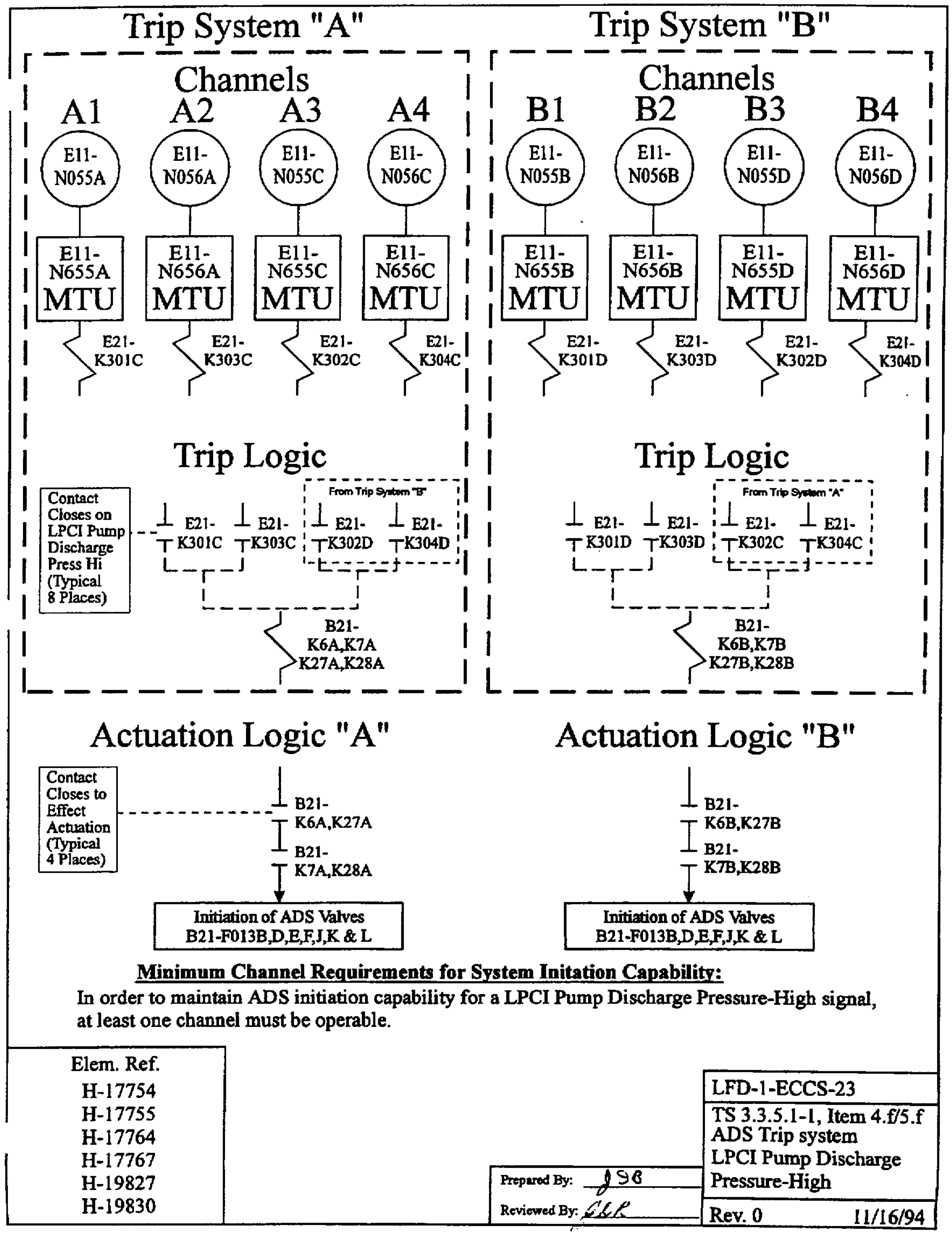

FIGURE E-2
TYPICAL TRM LOSS OF FUNCTION DIAGRAM SHOWING DEFINED BOUNDARIES

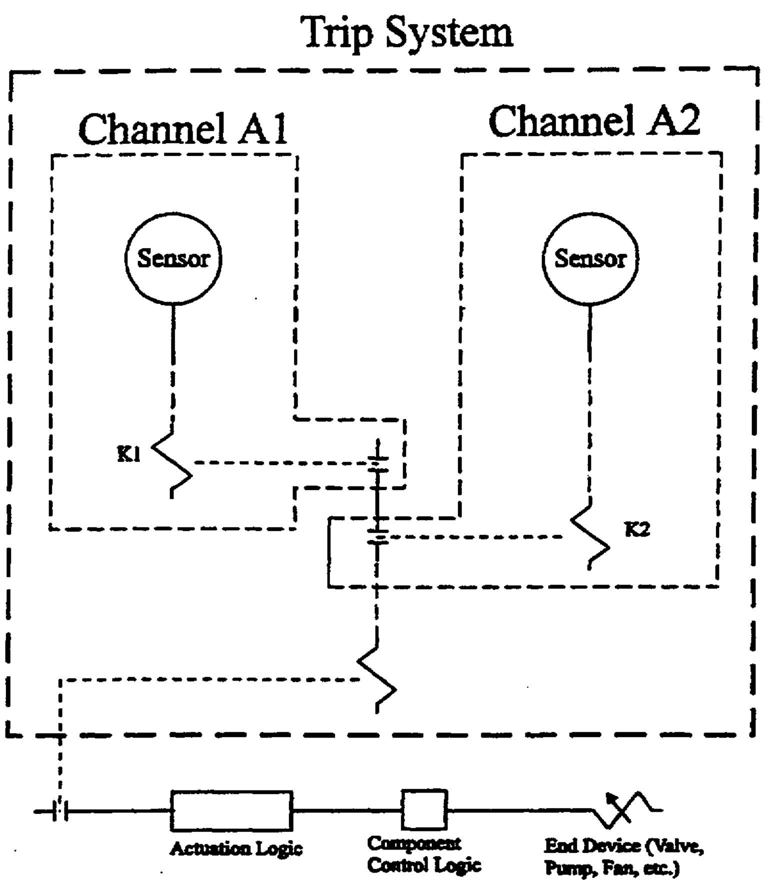

Figure 1.2-1

PROTECTIVE ACTION LOGIC SYSTEM

HATCH UNIT 1 TRM T 1.2-3

FIGURE E-3
TRM FIGURE SHOWING PROTECTIVE ACTION LOGIC SYSTEM