Department of Energy
Washington, D.C. 20545
Docket No. 50-537
HQ:S:82:151

DEC 20 1982

Mr. Paul S. Check, Director
CRBR Program Office
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Check:

INSTRUMENTATION (CHAPTER 7) WORKING MEETINGS - ADDITIONAL INFORMATION

References: 1) J. R. Longenecker to P. S. Check, Subject: Meeting Summary for Instrumentation (Chapter 7) Working Meeting, September 21 and 22, 1982, dated September 24, 1982

2) J. R. Longenecker to P. S. Check, Subject: Meeting Summary for Instrumentation (Chapter 7) Working Meeting, November 18 and 19, 1982, dated November 29, 1982

Enclosure 1 contains the additional information requested during the subject meetings for which response dates of December 17, 1982, were projected. The amended Preliminary Safety Analysis Report (PSAR) pages will be incorporated into a future PSAR revision.

Item 54 from the September 21 and 22, 1982, Chapter 7 meeting (November Item 4) is the last Chapter 7 item requiring a response. It will be provided by December 22, 1982.

Enclosure 2 provides two pages that were inadvertently left out of the December 6, 1982, submittal of Chapter 7 information. These pages belong to the item 32 response.

Any questions regarding the information provided or further activities can be addressed to Mr. R. Rosecky (FTS 626-6149) or Mr. A. Meller (FTS 626-6355) of the Project Office Oak Ridge staff.

Sincerely,

John R. Longenecker

John R. Longenecker
Acting Director, Office of
Breeder Demonstration Projects
Office of Nuclear Energy

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2 Enclosures

cc: Service List
Standard Distribution
Licensing Distribution

Enclosure 1

Instrumentation and Control (Chapter 7) September 21 and 22, and November 18 and 19 Working Meetings Action Items due to NRC December 10, 1982

September Item (November Item)

6
42 (10)
54 (4)*

*Item not complete at this time; expected submittal date is December 22.

SEPTEMBER ITEM 6

NRC CONCERN:

Provide a discussion of Regulatory Guides in Section 7.1

RESOLUTION:

Section 7.1 has been revised to indicate those Regulatory Guides which are applicable to safety related I&C systems described in Chapter 7. Those sections which discuss the application of specific regulatory guides are identified in Section 7.1.

protection system instrument channels are functionally tested by varying the magnitude of the test signal through the trip point to verify that the comparator trips, then readjusting its magnitude to reset the comparator. After this functional test is completed, the test signal is removed from the instrument channel, and the instrument channel operation is restored. Calibration checks to assure that the protection system channel meets its performance requirements will be accomplished at periodic intervals during regularly scheduled shutdowns. Actuated equipment will, in general, be testable on line. In cases where this is not practical (for example, a control rod cannot be dropped during operation without scramming the reactor), the recommendations of EICSB 22 will be met. 57 16

~~7.1.2.9~~ Conformance to Regulatory Guide 1.47 "Bypassed and Inoperable Status Indication for Nuclear Power Plant Safety Systems"

~~Administrative procedures for indicating the bypass or inoperable status of portions of the protection system or supporting systems will be supplemented by a system that automatically indicates at a system level the bypass or deliberately induced inoperability of the Protection System, systems actuated or controlled by the Protection System, or supporting systems that must be operable for the Protection and related systems to perform their safety related functions. An indication of each bypass or deliberately induced inoperability will be displayed in the control room in accordance with Regulatory Guide 1.47.~~

7.1.2.~~10~~ 9 Conformance to Regulatory Guide 1.53 "Application of the Single Failure Criterion to Nuclear Power Plant Protection Systems"

Any single failure within the protection system will not prevent proper protection action at the system level when required. The Plant Protection System is periodically tested so that failures are detected. Test schemes will be designed to duplicate as closely as possible the operation being tested. Design precautions include two independent, redundant diverse shutdown systems, each capable of shutting down the reactor; physical independence between redundant channels; and physical barriers utilized for separation between redundant channels. The use of fire retardant materials in construction, fire retardant cable and wire insulation jackets, and physical separation between redundant circuits is relied upon to prevent or mitigate the consequences of a fire.

7.1.2.~~11~~ 10 Conformance to Regulatory Guide 1.62 "Manual Initiation of Protective Functions"

The Plant Protection System will provide for manual actuation of each protective action at the system level. The manual initiation of a protective action will result in a Protection System response identical to automatic actuation of the same protective action. For example, manual trip buttons permit operator initiation of reactor scram and containment isolation. The amount of equipment common to both manual and automatic initiation is minimized. Manual initiation of protection actions is designed to go to completion once initiated. No single failure within automatic, manual, or common portions of protective subsystems will prevent initiation of a protective system action by manual or automatic means. 57

7.1.2.12 Regulatory Guide 1.89 "Qualification of Class 1E Equipment for Nuclear Power Plants"

IEEE Standard 323-1974 will be applied to the safety related instrumentation and control equipment as indicated in Section 7.1.2.5.

This guide further recommends the use of a source term that is equivalent to one based on the failure of all safety related equipment designed to prevent or mitigate the condition from which the source term is derived. The purpose of qualification is to assure that the safety related equipment will perform under the environmental conditions to which it will be subjected. It is highly inconsistent to require the qualification of equipment to radiation levels which could not be reached even as a result of complete failure of the very equipment being qualified. As such, Regulatory Guide 1.89 source term requirement will not be imposed on the safety-related instrumentation and control systems and components.

Radiation environments to be considered in qualifying safety-related instrumentation and control systems and components will be determined considering the source term during and/or after the applicable design basis events, the spatial location, shielding and equipment.

7.1.2.~~13~~ 11 I & E Information Notice 79-22 "Qualification of Control Systems"

Safety system design features will be included to mitigate any malfunctions of non-safety grade control equipment which occur as a result of high energy line breaks, such that the effects of such malfunctions will not cause control system failures to complicate any event beyond the PSAR analysis.

TABLE 7.1-2

LIST OF REGULATORY GUIDES APPLICABLE TO SAFETY RELATED INSTRUMENTATION AND CONTROL SYSTEMS

1.6	Independence Between Redundant Power Sources and their Distribution Systems (as discussed in Sections 8.3.1.2 and 8.3.2.2)
1.11	~~Instrument~~ Lines Penetrating Primary Reactor Containment
1.12	Instrumentation for Earthquakes
~~1.17~~	~~Protection of Nuclear Power Plants Against Industrial Sabotage~~
1.22	Periodic Testing of Protection System Actuation Functions
1.28	Quality Assurance Program Requirements (Design and Construction)
1.29	Seismic Design Classification
1.30	Quality Assurance Program Requirements for the Installation, Inspection, and Testing of Instrumentation and Electric Equipment
1.32	~~Use of IEEE Std 308-1971~~ Criteria for ~~Class 1E~~ Safety Related Electric Power Systems for Nuclear Power ~~Generating Stations~~ Plants
1.40	Qualification Tests of Continuous Duty Motors Installed Inside the Containment of Water Cooled Nuclear Power Plants
1.47	Bypassed and Inoperable Status Indication for Nuclear Power Plant Safety Systems (as discussed in Section 7.5.12)
1.53	Application of the Single Failure Criterion to Nuclear Power Plant Protection Systems
1.62	Manual Initiation of Protective Actions
1.63	Electric Penetration Assemblies in Containment Structures for Water-Cooled Nuclear Power Plants
1.64	Quality Assurance Program Requirements for the Design of Nuclear Power Plants
1.73	Qualification Tests of Electric Valve Operators Installed Inside the Containment of Nuclear Power Plants
1.75	Physical Independence of Electric System
1.78	Control Room Habitability During Chemical Release (as discussed in Section 6.3).
1.89	Qualification of Class IE Equipment for Nuclear Power Plants (as discussed in Section ~~7.1.2.5~~ 3.11).

~~Attachment to LEM-82-108~~

(Insert to Table 7.1-2)

1.97	Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions during and Following an Accident (as discussed in Section 7.5.11)
1.100	Seismic Qualification of Electric Equipment for Nuclear Power Plants
1.105	Instrument Setpoints
1.118	Periodic Testing of Electric Power and Protection Systems
1.133	Loose-Part Detection Program for the Primary System of Light-Water-Cooled Reactors (as discussed in Section 7.5.13)

NOVEMBER ITEM 10, SODIUM FREEZE PROTECTION

NRC CONCERN:

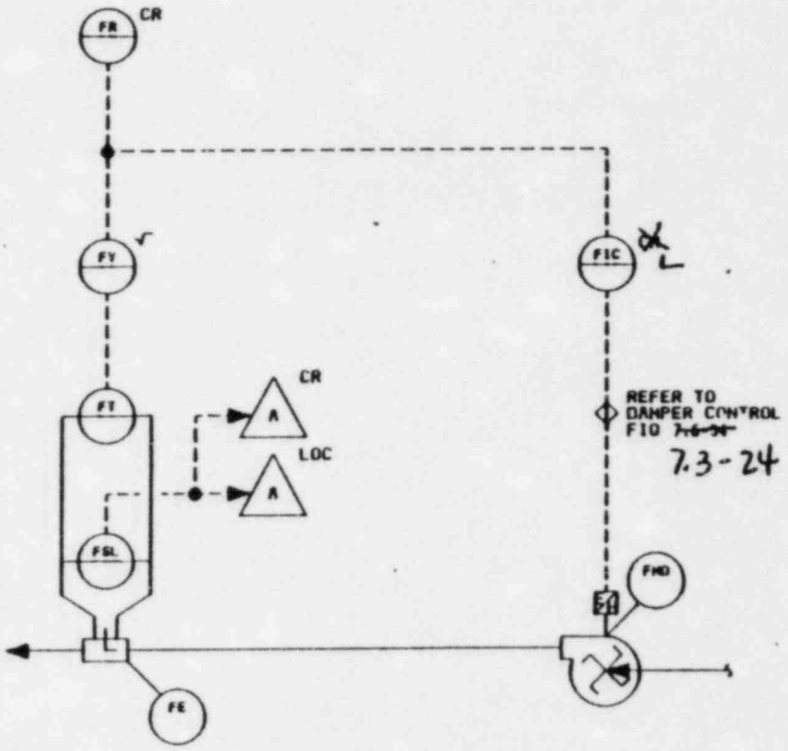
Describe design criteria for the Trace Heating System. Describe the electrical separation between the control and monitoring for the Trace Heating Systems. Describe seismic criteria also. Describe alarms. (Include Cover Gas Equalization Lines, EVST, Control Rod Drive Lines, Overflow Heat Exchangers, Impurity Monitoring Systems and Vessel Support Area).

RESOLUTION:

Section 9.4 has been revised in J. R. Longenecker to P. S. Check letter (number HQ:S:82:148) dated December 20, 1982, to provide more detail about the Trace Heating System, electrical separation requirements, seismic criteria (Seismic II) and alarms and controls.

Enclosure 2

Additional information for Item 32 of the December 6 submittal.



7.6-55

Amend. 71
Sept. 1982

7.3-23

FIGURE ~~7.6-37~~ CONTROL ROOM FILTER UNIT FAN
FUNCTIONAL CONTROL DIAGRAM ~~TYPICAL FLOW MODULATED VORTEX DAMPER~~
INLET VANE MODULATION

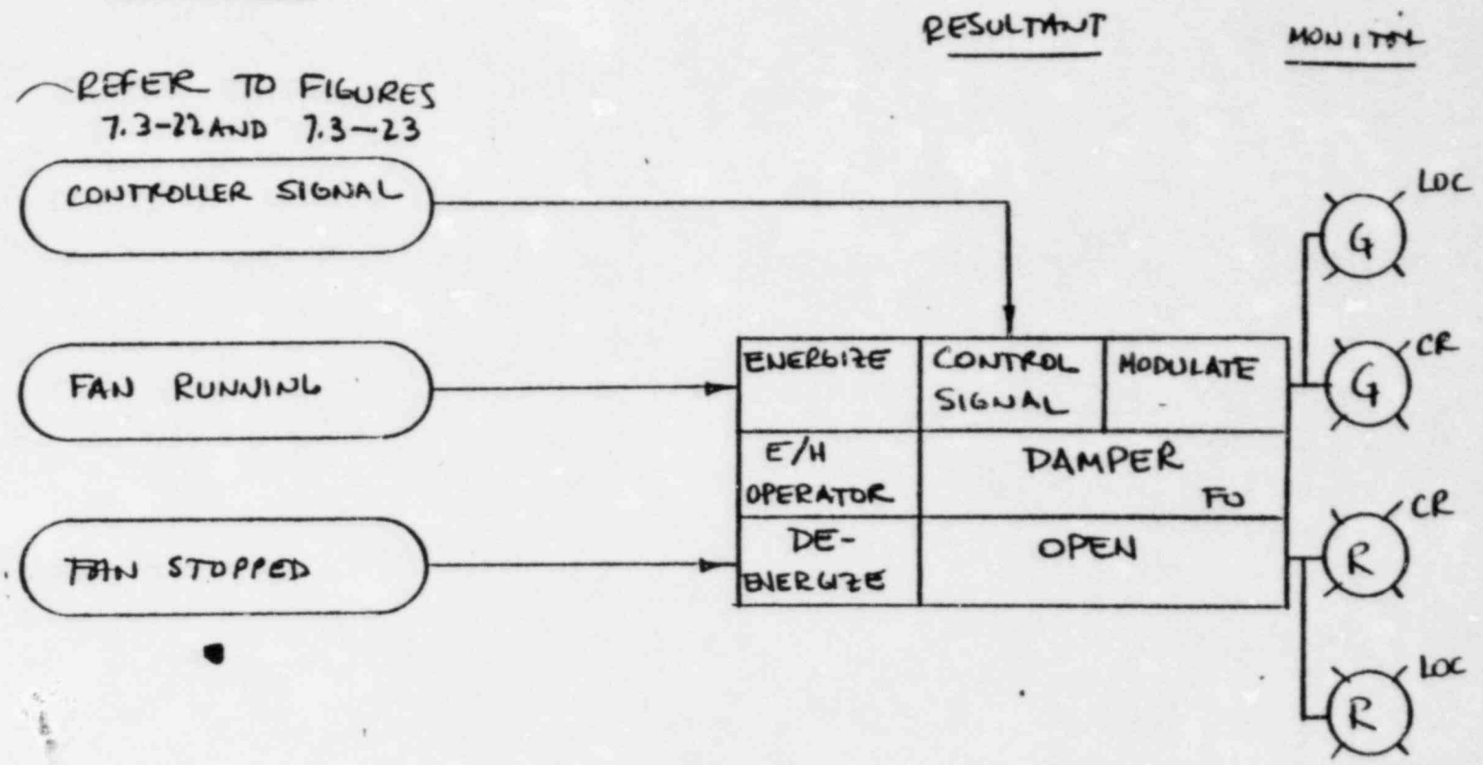


FIGURE 7.3-24 FUNCTIONAL CONTROL DIAGRAM
CONTROL ROOM HVAC UNIT AND FILTER FAN
INLET VANE MODULATION