REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8311280472 DOC.DATE: 83/11/18 NOTARIZED: NO DOCKET #
FACIL:50-400 Shearon Harris Nuclear Power Plant, Unit 1, Carolina 05000400
50-401 Shearon Harris Nuclear Power Plant, Unit 2, Carolina 05000401
AUTH.NAME AUTHOR AFFILIATION
MCDUFFIE,M.A. Carolina Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
DENTON,H.R. Office of Nuclear Reactor Regulation, Director

SUBJECT: Forwards Auxiliary Sys & Instrumentation & Control Sys Branch responses to draft SER open items.Responses to other draft SER open items will be provided shortly.

DISTRIBUTION CODE: B001S COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 8
TITLE: Licensing Submittal: PSAR/FSAR Amdts & Related Correspondence

NOTES:

	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL
	NRR/DL/ADL		1	0	NRR LB3 BC		1	0
	NRR LB3 LA		1	0	BUCKLEY,B	01	1	1
INTERNAL:	ELD/HDS1		1	0	IE FILE		1	1
	IE/DEPER/EPB	36	3	3	IE/DEPER/IRB	35	1	1
	IE/DEQA/QAB	21	1	1	NRR/DE/AEAB		1	0
	NRR/DE/CEB	11	1	1	NRR/DE/EHEB		1	1
	NRR/DE/EQB	13	2	2	NRR/DE/GB	28	2	2
	NRR/DE/MEB	18	1	1	NRR/DE/MTEB	17	1	1
	NRR/DE/SAB	24	1	1	NRR/DE/SGEB	25	1	1
	NRR/DHFS/HFEB	40	1	1	NRR/DHFS/LQB	32	1	1
	NRR/DHFS/PSRB		1	1	NRR/DL/SSPB		1	0
	NRR/DSI/AEB	26	1	1	NRR/DSI/ASB		1	1
	NRR/DSI/CPB	10	1	1	NRR/DSI/CSB	09	1	1
	NRR/DSI/ICSB	16	1	1	NRR/DSI/METB	12	1	1
	NRR/DSI/PSB	19	1	1	NRR/DSI/RAB	22	1	1
	NRR/DSI/RSB	23	1	1	REG FILE	04	1	1
	RGN2		3	3	RM/DDAMI/MIB		1	0
EXTERNAL:	ACRS	41	6	6	BNL(AMDTS ONLY)		1	1
	DMB/DSS (AMDTS)		1	1	FEMA-REP DIV	39	1	1
	LPDR	03	1	1	NRC PDR	02	1	1
	NSIC	05	1	1	NTIS		1	1

TOTAL NUMBER OF COPIES REQUIRED: LTTR 53 ENCL 46

[illegible]

ffice of [illegible]uclear Reactor [illegible] irector

[illegible] ower [illegible] uxiliary Sys[illegible] Instrumentation [illegible] ontrol Sy[illegible]

[illegible] to draft [illegible] items [illegible]

[illegible] elated Correspon[illegible]

[illegible]

CP&L

Carolina Power & Light Company

NOV 18 1983

SERIAL: LAP-83-541

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT
UNIT NOS. 1 AND 2
DOCKET NOS. 50-400 AND 50-401
DRAFT SAFETY EVALUATION REPORT RESPONSES

Dear Mr. Denton:

Carolina Power & Light Company (CP&L) hereby transmits one original and forty copies of responses to Shearon Harris Nuclear Power Plant Draft Safety Evaluation Report Open Items. The response numbers are listed on the cover page of the attachment along with the corresponding review branch and reviewer for each response.

We will be providing responses to other Open Items in the Draft Safety Evaluation Report shortly.

Yours very truly,

M. A. McDuffie
Senior Vice President
Nuclear Generation

FXT/lcv (8541FXT)
Attachment

cc: Mr. B. C. Buckley (NRC)
Mr. N. Wagner (NRC)
Mr. G. F. Maxwell (NRC-SHNPP)
Mr. J. P. O'Reilly (NRC-RII)
Mr. Travis Payne (KUDZU)
Mr. Daniel F. Read (CHANGE/ELP)
Mr. R. P. Gruber (NCUC)
Chapel Hill Public Library
Wake County Public Library
Mr. Wells Eddleman
Dr. Phyllis Lotchin
Mr. John D. Runkle
Dr. Richard D. Wilson
Mr. G. O. Bright (ASLB)
Dr. J. H. Carpenter (ASLB)
Mr. J. L. Kelley (ASLB)

yetteville Street • P. O. Box 1551 • Raleigh, N. C. 27602

LIST OF OPEN ITEMS, REVIEW BRANCH, AND REVIEWER

AUXILIARY SYSTEMS BRANCH/N. WAGNER
OPEN ITEM

INSTRUMENTATION & CONTROL SYSTEM BRANCH/H. LI
OPEN ITEM 77

Shearon Harris Nuclear Power Plant
Draft SER Open Item
Auxiliary Systems Branch

Are missiles considered credible from NSSS safety-related pumps (outside of containment) due to locked rotor?

Response

Missiles from pumps located in safety-related areas outside of containment are not considered credible. The components of these pumps which fall under the scope of the ASME code are designed, analyzed, and enveloped by pertinent ASME code allowable stress limits. The ASME code, which is conservative in nature, precludes the possibility of missiles being generated when code allowable stress limits are met. Non-code components of these pumps are designed, analyzed, and enveloped by various industry standard allowable limits.

Therefore, missiles from pumps located in safety-related areas outside of containment due to locked rotor will not occur.

(8537NLU pgp)

Shearon Harris Nuclear Power Plant
DSER Open Item 77
Supplemental Information

The applicant has been requested to respond to the plant-specific design information requested in the NRC SER of August 10, 1983 (Eisenhut to Sheppard) for Westinghouse plants incorporating the automatic shunt trip modification as follows:

1. Provide the electrical schematic/elementary diagrams for the reactor trip and bypass breakers showing the undervoltage and shunt coil actuation circuits, as well as the breaker control (e.g., closing) circuits, and circuits providing breaker status information/alarms to the control room.

2. Identify the power sources for the shunt trip coils. Verify that they are Class 1E and that all components providing power to the shunt trip circuitry are Class 1E and that any faults within non-Class 1E circuitry will not degrade the shunt trip function. Describe the annunciation/indication provided in the control room upon loss of power to the shunt trip circuits. Also describe the overvoltage protection and/or alarms provided to prevent or alert the operator(s) to an overvoltage condition that could affect both the UV coil and the parallel shunt trip actuation relay.

3. Verify that the relays added for the automatic shunt trip function are within the capacity of their associated power supplies and that the relay contacts are adequately sized to accomplish the shunt trip function. If the added relays are other than the Potter & Brumfield MDR series relays (P/N 2383A38 or P/N 955655) recommended by Westinghouse, provide a description of the relays and their design specifications.

4. State whether the test procedure/sequence used to independently verify operability of the undervoltage and shunt trip devices in response to an automatic reactor trip signal is identical to the test procedure proposed by the Westinghouse Owners' Group (WOG). Identify any differences between the WOG test procedure the the test procedure to be used and provide a rationale/justification for these differences.

5. Verify that the circuitry used to implement the automatic shunt trip function is Class 1E (safety related) and that the procurement, installation, operation, testing, and maintenance of this circuitry will be in accordance with the quality assurance criteria set forth in Appendix B to 10CFR Part 50.

6. Verify that the shunt trip attachments and associated circuitry are/will be seismically qualified (i.e., be demonstrated to be operable during and after a seismic event) in accordance with the provisions of Regulatory Guide 1.100, Revision 1, which endorses IEEE Standard 344, and that all non-safety-related circuitry/components in physical proximity to or associated with the automatic shunt trip function will not degrade this function during or after a seismic event.

7. Verify that the components used to accomplish the automatic shunt trip function are designed for the environment where they are located.

8. Describe the physical separation provided between the circuits used to manually initate the shunt trip attachments of the redundant reactor trip breakers. If physical separation is not maintained between these circuits, demonstrate that faults within these circuits cannot degrade both redundant trains.

9. Verify that the operability of the control room manual reactor trip switch contacts and wiring will be adequately tested prior to startup after each refueling outage. Verify that the test procedure used will not involve installing jumpers, lifting leads, or pulling fuses and identify any deviations from the WOG procedure. Permanently installed test connnections (i.e., to allow connection of a voltmeter) are acceptable.

10. Verify that each bypass breaker will be tested to demonstrate its operability prior to placing it into service for reactor trip breaker testing.

11. Verify that the test procedure used to determine reactor trip breaker operability will also demonstrate proper operation of the associated control room indication/annunciation.

12. Verify that the response time of the automatic shunt trip feature will be tested periodically and shown to be less than or equal to that assumed in the FSAR analyses or that specified in the technical specifications.

13. Propose technical specification changes to require periodic testing of the undervoltage and shunt trip functions and the manual reactor trip switch contacts and wiring.

Response:

The information submitted herein provides an initial response to the plant-specific design information requested. Consistent with the Carolina Power & Light Company's response to NRC Generic Letter 83-28, Item 4.3, "Reactor Trip System Reliability (Automatic Actuation of Shunt-Trip Attachment for Westinghouse and B&W Plants)," a full response to the plant-specific design information requested will be provided by December 1984.

Plant-Specific Design Information

1. Request for Drawings

   Electrical schematic/elementary wiring diagrams as requested will be provided by December 1984.

2. Request for Class 1E Power with Indication and Overvoltage Capability

   A. Power Supply

      The power supplies that feed the shunt trip coils are Class 1E. They are 125 V DC, DP-1A-SA, CKT 18 for train A and 125V DC, DP-1B-SB, CKT 18 for train B. Since the Class IE circuitry provided to the shunt

trip is separated from non-Class 1E circuitry per criteria addressed in the FSAR, credible faults within non-Class 1E circuitry will not degrade the shunt trip function.

B. Indication

Existing indications on the main control board for breaker operation are the red and green position lights. These lights are powered from the same fused 125 VDC supply used for closing and shunt tripping the circuit breakers. The green light being on indicates that the breaker is open and power is available for closing and tripping the breaker. The red light indicates that the breaker is closed. Since the red light is connected in series with the shunt trip coil and an "a" auxiliary contact, the red light also indicates that power is available to the shunt trip device and that there is circuit continuity in the shunt trip coil. This provides an indication that the shunt trip coil is ready to perform its function when required.

C. Overvoltage Conditions

The added shunt trip circuitry is powered from the reactor protection logic voltage supply. Components in the added shunt trip circuitry have been selected based on their ability to perform their intended function up to a voltage as high as approximately 115% of nominal voltage. Plants with the Solid State Protection System can take credit for its overvoltage protection set at 115% of nominal voltage (48 VDC) since circuit malfunctions resulting in an overvoltage condition will result in a fail-safe consequence of load removal, including the UV coil and the parallel shunt trip actuation relay, which will trip the breaker.

The shunt trip coils in the reactor trip breakers are powered from 125 VDC via the station batteries. Normally the shunt trip coils are in a deenergized condition. When the trip breakers are closed, the red lamp current (aproximately 50 m.a.) flows through the trip coil to monitor the circuit continuity. This current is not large enough to actuate the trip coil armature. The reactor trip signal applies a nominal voltage of 125 VDC to each shunt trip coil in the redundant trains. As the breaker trips, its auxiliary switch opens to deenergize the shunt trip coil. Since the 125 VDC voltage is supplied from the battery system, it may temporarily rise to the battery equalizing voltage (not exceeding 115% of nominal voltage). The shunt trip coil will cause the breaker to open, despite an overvoltage condition, since it is energized to operate.

3. Request for Information on Added Relays

The added relays for the automatic trip function will be the Potter and Brumfield MDR series relays (P/N 2383A38 or P/N 955655) that were recommended by Westinghouse. These relays have been verified by Westinghouse to be within the capacity of their associated power supplies and that the relay contacts are adequately sized to accomplish the shunt trip function.

4. Request for Test Procedure Proposed by Westinghouse Owners' Group

Shearon Harris will commit to implement the test procedures proposed by the Westinghouse Owners' Group, which were submitted to the NRC in letter OG-101, dated June 14, 1983. The test procedures provide for the independent confirmation of the operability of the undervoltage trip and shunt trip devices.

5. Request for Class 1E Shunt Trip Function

The added circuitry used to implement the automatic trip function will be Class 1E. Additionally, the procurement, installation, operation, testing, and maintenance of this circuitry will be in accordance with the Shearon Harris quality assurance procedures which satisfy the quality assurance requirements of Appendix B to 10CFR Part 50.

6. Request for Seismic Qualification

The shunt trip attachment and associated circuitry will be seismically qualified in accordance with Regulatory Guide 1.100, Revision 1, as noted in FSAR Section 1.8. Non-safety-related components will not degrade the function of the shunt trip attachment during or after a seismic event.

7. Request for Environmental Qualification

The components that will be used to accomplish the automatic shunt trip function are designed for the environment where they are located.

8. Request for Separation

Physical separation between circuits used to manually initate the shunt trip attachments of the redundant reactor trip breakers will be maintained. Methods of separation include:

A. Dual section manual reactor trip switches with metal barriers between redundant train switch decks.

B. Train A and train B wiring within the MCB are enclosed in metal conduits.

C. Field cabling from the MCB and reactor protection logic to redundant train A and train B reactor trip switchgear are routed as train A and train B circuits and, as such, are physically separated.

D. Shunt trip attachment interposing relays and their associated terminal blocks, reactor protection logic outputs for energizing the shunt trip interposing relays, will be housed in separate metal enclosures.

9. Request for Test Procedure of Control Board Manual Switch

The operability of the control room manual reactor trip switch contacts and wiring will be adequately tested prior to startup after each refueling outage. The test procedure will not involve installing jumpers, lifting leads, or pulling fuses.

10. Request for Bypass Breaker Testing

The purpose of the bypass breaker is to allow online testing of the main reactor trip breaker. This short period is the only time a bypass breaker may be called upon to provide a protective function. Additionally, protection is still considered to be provided by the opposite train main reactor trip breaker.

Considering the relatively low occurence of a combined event (one main reactor trip breaker in test, opposite main reactor trip breaker failure, and the requirement for a reactor trip), frequent testing of each bypass breaker is not warranted. Therefore, Shearon Harris does not propose to verify the operability of each bypass breaker prior to placing it in service each time the main reactor trip breakers are to be tested.

However, Shearon Harris will commit to operability testing of the bypass breakers on a schedule consistent with Item 9. That is, they will be tested prior to startup after each refueling outage.

11. Request for Reactor Trip Breaker Operability Indication Test Procedures

The test procedures used at Shearon Harris to determine reactor trip breaker operability will include verification of the proper operation of the associated control room indication.

12. Request for Response Time Testing

Currently, the Westinghouse Owners' Group has a life-cycle testing program for the DS-416 UVTA and STA's. Should the testing program indicate that breaker response time degrades with operation, then periodic online testing will be considered. Shearon Harris will address this item at a later date, when the life-cycle testing program results are known.

13. Request for Technical Specification Changes

Technical Specifications currently under preparation will include a requirement for periodic testing of the undervoltage and shunt trip functions and manual reactor trip switch contacts and wiring. Shearon Harris Technical Specifications are expected to be submitted by June 1984.