



LONG ISLAND LIGHTING COMPANY

SHOREHAM NUCLEAR POWER STATION

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MAY 26 1987

SNRC-1338

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Compliance With 10 CFR 50.62(c)(3)
Alternate Rod Insertion System
Shoreham Nuclear Power Station - Unit 1
Docket No. 50-322

- References:
- (1) NRC (G. Lainas) to BWR Owner's Group (T. A. Pickens) Safety Evaluation Report of Topical Report NEDE-31096-P, ATWS, dated October 21, 1986
 - (2) LILCO letter (J. D. Leonard) to NRC (H. R. Denton) dated October 10, 1985, "Submittal of the Proposed Implementation Schedule for 10 CFR 50.62 (ATWS) Modifications" (SNRC-1205)

Gentlemen:

To document Shoreham's compliance with 10 CFR 50.62(c)(3), we are attaching a copy of a completed "Checklist for Plant Specific Review of Alternate Rod Injection System (ARI)". This checklist was included as Appendix A to the Safety Evaluation Report which accompanied reference 1. LILCO is a participating member of the BWR Owner's Group ATWS Compliance Alternatives Committee. The Shoreham Alternate Rod Insertion System conforms to all aspects of NEDE-31096P except as noted below and in the attachment.

We have answered all the questions and added appropriate comments. With respect to checklist item 9(b), a portion of the ARI trip logic is presently powered from a 120Vac source which would be supplied from the emergency diesel generators during a loss of offsite power. In accordance with the "guidance regarding system and equipment specifications", which accompanied the Federal Register notice of the final rule (June 26, 1984), this is

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acceptable. However, to eliminate any potential delay in ARI operation, the power for the trip logic will be changed to an uninterruptible source. In accordance with Reference 2, this work will be completed on a timely basis in coordination with other station modifications, but in no case later than the first refueling outage.

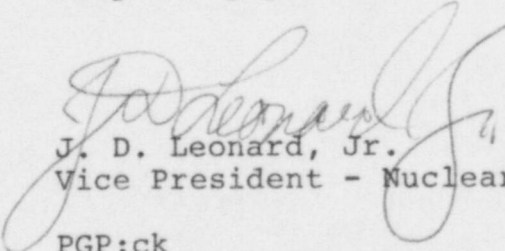
The Shoreham Alternate Rod Insertion (ARI) system consists of two independent trains, each powered by a combination of a safety related 125VDC and 120VAC power. The system pressure and level sensors, selected relays and the solenoid operated vent valves are energized by Class 1E DC power. The ATWS-ARI Trip Contact Interface, primarily consisting of the timer and seal-in circuitry, is presently powered by safety-related divisional AC power with diesel generator backup. A loss of offsite power would delay ARI actuation by the amount of time (approximately ten (10) seconds) required to reenergize the safety related buses from the diesel generators. The system would remain functional even with an unavailability of the Division I or II diesel generator although longer control rod insertion times (of less than one (1) minute) could be expected due to the actuation of one of the two ARI valves. To put this in perspective for an ATWS at 100% power, the Shoreham PRA has stated that the Standby Liquid Control System (SLCS) must inject sufficient sodium pentaborate to achieve hot shutdown by approximately thirty (30) minutes to avoid core damage. Thus, even with a ten second delay, the ARI will achieve hot shutdown much quicker than the SLCS.

The proposed ARI modification work described on page 2 of reference 2, is complete.

Please note, the term Alternate Rod Insertion as used at Shoreham is synonymous with Alternate Rod Injection as used by the NRC. Also, we refer to the RTS as the Reactor Protection System (RPS).

If there are any questions, please contact this office.

Very truly yours,



J. D. Leonard, Jr.
Vice President - Nuclear Operations

PGP:ck

Attachment

cc: R. Lo
Region I Administrator
C. Warren

APPENDIX A

CHECKLIST FOR PLANT SPECIFIC REVIEW OF
ALTERNATE ROD INJECTION SYSTEM (ARI)
SHOREHAM NUCLEAR POWER STATION

Conformance
with ARI SER

1. ARI system function time

Rod insertion motion will begin within
15 seconds and be completed within 25
seconds from ARI initiation

Yes

2. Safety-related requirements

(a) Class 1E isolators are used to
interface with safety-related
systems

Design exceeds
SER requirements

(b) Class 1E isolators are powered
from a Class 1E source

Design exceeds
SER requirements

(c) Isolator qualification documents
are available for staff audit

Yes

Alternate Rod Insertion System is safety-related.

3. Redundancy

The ARI system performs a function
redundant to the backup scram system

Yes

Ref: USAR Section 7.7.1.15

The ARI valves are redundant to the
backup scram valves, as both function
to vent the scram air header to cause
a scram.

4. Diversity from existing RTS

(a) ARI system is energize-to-function

Yes

(b) ARI system uses DC powered valves

Yes

(c) Instrument channel components
(excluding sensors but including
all signal conditioning and
isolation devices) are diverse
from the existing RTS components.

Yes

Ref.: USAR Section 7.7.1.15

ARI system is diverse from the Reactor Protection System (RPS) and provides a diverse backup to the RPS. It is an energize-to-operate function. This provides added diversity from the RPS. The ARI system solenoid valves are powered from the 125V DC batteries. Instrumentation components and analog trip unit sensors are also diverse from RPS.

5. Electrical independence from the existing RTS

- | | | |
|-----|--|----------------|
| (a) | ARI actuation logic separate from RTS logic | <u>Yes</u> |
| (b) | ARI circuits are isolated from safety related circuits | Not Applicable |

Ref.: USAR Section 7.7.1.15

ARI system utilizes the sensor output from 1B21*LT157A-D (Level less than or equal to -38") and 1B21*PT158 A-D (pressure greater than or equal to 1120 psig) whereas the RPS signals are from B21*LT154 A-D (Level less than or equal to 12.5") and B21*PT7156A-D (pressure greater than or equal to 1043 psig).

ARI actuation circuit provides a two-out-of-two logic for both level and pressure instrumentation for automatic initiation whereas the RPS actuation circuit provides a one-out-of-two-taken-twice logic.

6. Physical separation from the existing RTS

- | | | |
|-----|---|------------|
| (a) | ARI system is physically separated from RTS | <u>Yes</u> |
|-----|---|------------|

ARI system is safety-related with adequate separation between the redundant Division I and Division II equipment. RPS system is physically separated from ARI and its cables run in RPS conduits for each channel. This provides the required separation from the RPS system.

7. Environmental Qualification

ARI equipment is qualified to conditions during an ATWS event up to the time the ARI function is completed	<u>Yes</u>
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Shoreham Equipment Qualification Status Report shows the ARI valves 1C11*SOV048 A,B, level transmitters 1B21*LT157 A-D and pressure transmitters 1B21*PT158 A-D are qualified for loss of coolant and pipe break outside containment conditions. Analog Master trip units and relays are located in mild environment. The SNPS design exceeds the BWR Owners Group requirements for the environmental qualification of ARI equipment.

8. Quality Assurance

- (a) Comply with Generic Letter 85-06 Yes

ARI system is safety related. Application of the SNPS Quality Assurance program to ARI exceeds the requirements of the Generic Letter 85-06.

9. Safety-related power supply

- (a) Air system power independent from RTS Yes

- (b) ARI system can perform its function during any loss-of-offsite-power event Noted below

ARI trip logic at present is powered from a 120V ac source which is dependent on the emergency diesel generator during loss of offsite power. This will be changed to a 120V ac uninterruptible power source.

10. Testability at Power

- (a) ARI is testable at power Yes

- (b) Bypass features conform to bypass criteria used in RTS Noted below

Implementation of SP 47.106.03 (draft), SP 44.611.12, SP 44.621.02 and SP 44.622.06 will provide a program for testing of the ARI system logic and instrumentation up to but not including the final trip devices by using a redundant two-out-of-two logic arrangement. Each individual level and pressure instrument can be tested during plant operation without actuating the ARI system since two level or two pressure signals must be present in one channel to complete the signal.

Bypass feature is not needed to test one level or pressure instrument as described above.

11. Inadvertent Actuation

- (a) ARI Actuation setpoints will not challenge scram Yes

- (b) Coincident logic is utilized in ARI design Yes

Ref.: Technical Specification Table 3.3.4.1-2 and Table 2.2.1-1

	<u>RPV Pressure</u>	<u>RPV Level</u>
Scram setpoints	1043 psig	Level 3 (12.5")
ARI setpoints	*1120 psig	Level 2 (-38")

ARI Actuation setpoints will not challenge scram.

ARI design utilizes coincident logic as described in (10) above.

12. Manual Initiation

(a) Manual initiation capability is Yes
provided

Ref.: DOP 85-140

13. Information Readout

(a) Information readout is provided Yes
in main control room

14. Completion of protective action once Yes
it is initiated

*ATWS-ARI setpoint is being changed from 1120 psig to 1077 psig per DOP 86-080.