

November 19, 1982

SBN-378
T.F. B7.1.2

United States Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. George W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing

References: (a) Construction Permits CPPR-135 and CPPR-136, Docket
Nos. 50-443 and 50-444
(b) USNRC Letter, dated February 12, 1982, "Request for
Additional Information," F. J. Miraglia to W. C. Tallman
(c) PSNH Letter, dated March 12, 1982, "Response to 430 Series
RAIs; (Power Systems Branch)," J. DeVincentis to
F. J. Miraglia

Subject: Revised Response to RAI 430.67 and 430.68; (Power Systems
Branch)

Dear Sir:

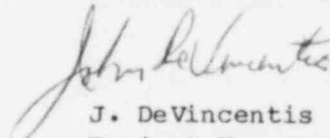
We have enclosed revised responses and an annotated version of FSAR
Section 9.5.2.2.a.4.b in response to the subject Requests for Additional
Information (RAIs) which were forwarded in Reference (b).

The original response to RAI 430.67 and 430.68 was submitted in
Reference (c).

The enclosed information will be included in OL Application Amendment 48.

Very truly yours,

YANKEE ATOMIC ELECTRIC COMPANY


J. DeVincentis
Project Manager

ALL/fsf

cc: Atomic Safety and Licensing Board Service List

BOO!

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430.67
(9.5.2)

The information regarding the On-Site Communication System (Section 9.5.2) does not adequately cover the system capabilities during transients and accidents. Provide the following information:

- (a) Identify all working stations on the plant site where it may be necessary for plant personnel to communicate with the Control Room or the emergency shutdown panel during and/or following transients and/or accidents (including fires) in order to mitigate the consequences of the event and to attain a safe cold plant shutdown.
- (b) Indicate the maximum sound levels that could exist at each of the above identified working stations for all transients and accident conditions.
- (c) Indicate the types of Communication Systems available at each of the above identified working stations.
- (d) Indicate the maximum background noise level that could exist at each working station and yet reliably expect effective communications with the Control Room using:
 1. the page party Communication System, and
 2. any other additional Communication System provided that working station.
- (e) Describe the performance requirements and tests that the above on-site working stations Communication Systems will be required to pass in order to be assured that effective communication with the Control Room or emergency shutdown panel is possible under all conditions.
- (f) Identify and describe the power source(s) provided for each of the Communication Systems.
- (g) Discuss the protective measures taken to assure a functionally operable On-Site Communication System. The discussion should include the considerations given to component failures, loss of power, and the severing of a communication line or trunk as a result of an accident or fire.

RESPONSE: (a-d) The station design provides for bringing the plant to cold shutdown from the Control Room. Therefore, if the Control Room is available, there is no need to man remote locations to mitigate the consequences of an event or to attain a safe cold plant shutdown.

For those events which require Control Room evacuation, the following table lists the areas required to be manned to achieve and maintain cold shutdown including maximum sound level and communications available.

	Maximum Sound Level	Communication Systems			
		Sound Powered	Paging	Telephone	Radio
Switchgear Room A (Control Building El. 21'-6")	77 dba	Yes	Yes	Yes	Yes
Switchgear Room B (Control Building El. 21'-6")	77 dba	Yes	Yes	Yes	Yes
RHR Vault A (El. 0'-1-1/2")	63 dba	Yes	Yes	Yes	Yes
RHR Vault B (El. 0'-1-1/2")	63 dba	Yes	No (Note 1)	No	Yes
Diesel Generator Control Panel A (Diesel Generator Building El. 21'-6")	120 dba	Yes	Yes	Yes	Yes
Diesel Generator Control Panel B (Diesel Generator Building El. 21'-6")	120 dba	Yes	Yes	Yes	Yes

NOTE:

- 1) Paging station shared with RHR Vault A because of close proximity to RHR Vault B.

Attachment 1, Tabulation of Communication Equipment, identifies by building elevation the communications available throughout the nuclear island buildings. This extensive communication network assures that communications are in close proximity to other areas where it may be desirable to monitor, operate or maintain equipment. Additionally, the radio system with the repeater and radiax (Note 1) is designed to provide communication between all areas of the station (except the Containment Building) via hand-held portable radios. Even without the radiax the hand-held portable radios will assure that communications are available at the locations that are required to be manned to bring the station to hot and cold shutdown for all design basis events.

- (e) The telephone is designed to provide satisfactory performance under the following conditions:

Up to 60 dba - Standard Handset
Up to 70 dba - Volume Control Handset
Over 70 dba - Sound Absorbent Booths

The paging stations are designed to provide satisfactory performance under the following conditions:

Up to 100 dba - Standard Handset
Over 100 dba - Sound Absorbent Booths

Headphones will be provided as necessary to assure effective communication via the sound powered system.

Mobility and individual volume control on hand-held portable radios assure that this system will provide effective communications under the maximum expected noise levels.

Functional tests will be conducted under conditions that simulate the maximum plant noise levels being generated during the various operating conditions and accident conditions to demonstrate system capabilities.

- (f) The telephone system PABX is located in the construction office building and is powered by an off-site construction power source. Following completion of Unit 2, power will be supplied from a Unit 2 non-safety power system. Back-up power to the telephone system PABX is provided by a dedicated engine generator unit that supplies power to the telephone system and its HVAC System only.

The Public Address (PA) System for Unit 1 is powered from a Unit 1, Train "A" UPS bus. The PA System for Unit 2 is powered from a Unit 2, Train "A" UPS bus.

The hand-held portable radios are powered by rechargeable batteries. The repeaters for the station radio system are powered from a non-safety power system. Back-up power is provided by dedicated batteries rated for 8-hour use.

The sound-powered telephone system requires no external power supply to maintain its function.

(g) The following protective measures have been taken to assure a functionally operable on-site Communication System:

- The power supplies for the various communication systems are diverse (see Response (f)).
- The Communication Systems are physically separated. The telephone PABX is located in the construction office building. The paging control cabinet for Unit 1 is located in the Unit 1 Turbine Building Relay Room. The paging control cabinet for Unit 2 is located in the Unit 2 Turbine Building Relay Room. The radio system repeater stations are located on Elevation 50'-0" of Unit 1 and Unit 2 Turbine Buildings.
- Cables for the PA System are run in Train A raceways that are different from those used for the telephone system.
- The jacks for the dedicated sound-powered loop which provide communications between the remote shutdown locations are mounted in seismically qualified equipment or are mounted in individual junction boxes which are seismically supported. Many of the jacks on the other sound-powered loops are also mounted in equipment which is seismically qualified. The switching panel for the sound-powered Communication System is located in the Control Room and is seismically supported.

Note 1: Radiax is a slotted coax cable designed to function as a continuous antenna both for receiving and transmitting.

TABULATION OF COMMUNICATION EQUIPMENT

	<u>LOCATION</u>	<u>NO. OF NET CO. TELEPHONES</u>	<u>NO. OF PA SYSTEM HANDSET STATIONS</u>	<u>NO. OF PA SYSTEM SPEAKERS</u>	<u>SOUND-POWERED SYSTEM</u>		<u>RADIO SYSTEM EQUIPMENT</u>
					<u>NO. OF TELEPHONE JACKS</u>	<u>NO. OF CHANNELS</u>	
1.	CONTROL BUILDING, EL. 21'-6"	10	2	16	32	3	YES
2.	CONTROL BUILDING, EL. 50'-0"	2	--	4	--	--	YES
3.	CONTROL BUILDING, EL. 75'-0"	19	4	19	43	3	YES
4.	EMERGENCY FEEDWATER PUMP ROOM, EL. 27'-0"	3	1	3	2	3	YES
5.	D.C. BUILDING, EL. (-) 16'-0"	2	--	2	--	--	YES
6.	D.G. BUILDING, EL. 21'-6"	4	2	4	6	3	YES
7.	D.G. BUILDING, EL. 51'-6"	2	--	8	--	--	YES
8.	CABLE TRAY TUNNEL, EL. 0'-0"	--	--	1	--	--	YES
9.	ELEC. PENET. AREA, EL. 0'-0"	1	--	1	1	1	YES
10.	CABLE TRAY TUNNEL, EL. (-) 20'-0"	--	--	1	--	--	YES
11.	ELEC. PENET. AREA, EL. (-) 26'-0"	1	--	2	1	1	YES
12.	CONTAINMENT BUILDING, EL. (-) 26'-0"	3	1	12	8	3	---
13.	CONTAINMENT BUILDING, EL. 0'-0"	2	1	9	14	3	---
14.	CONTAINMENT BUILDING, EL. 25'-0"	8	3	7	5	3	---
15.	MAIN STEAM TUNNEL, EAST	2	--	6	5	6	YES
16.	MAIN STEAM TUNNEL, WEST	4	--	6	2	3	YES
17.	MECH. PENET. AREA, EL. (-) 11'-2-1/2"	1	--	--	--	--	YES

TABULATION OF COMMUNICATION EQUIPMENT
(Continued)

	<u>LOCATION</u>	<u>NO. OF NET CO. TELEPHONES</u>	<u>NO. OF PA SYSTEM HANDSET STATIONS</u>	<u>NO. OF PA SYSTEM SPEAKERS</u>	<u>SOUND-POWERED SYSTEM</u>		<u>RADIO SYSTEM EQUIPMENT</u>
					<u>NO. OF TELEPHONE JACKS</u>	<u>NO. OF CHANNELS</u>	
18.	MECH. PENET. AREA, EL. (-) 20'-0"	1	--	3	--	--	YES
19.	MECH. PENET. AREA, EL. (-) 34'-6"	--	--	--	2	3	YES
20.	RCA & CLEAN TUNNELS	3	--	8	--	--	YES
21.	FUEL STORAGE BUILDING, EL. 7'-0"	1	--	4	2	3	YES
22.	FUEL STORAGE BUILDING, EL. 25'-0"	4	1	6	1	3	YES
23.	FUEL STORAGE BUILDING, EL. 64'-0"	1	--	2	2	3	YES
24.	PAB BLDG., EL. 7'-0"	8	2	10	7	3	YES
25.	PAB BLDG., EL. 25'-0"	8	1	14	13	3	YES
26.	PAB BLDG., EL. 53'-0"	6	1	12	11	3	YES
27.	PAB BLDG., EL. 81'-0"	2	--	2	4	3	YES
28.	PAB BLDG., EL. (-) 6'-0"	2	--	7	1	3	YES
29.	PAB BLDG., EL. (-) 26'-0"	1	--	1	1	3	YES
30.	PAB RHR VAULTS, EL. (-) 61'-0"	2	--	4	2	3	YES
31.	PAB RHR VAULTS, EL. (-) 50'-0"	2	--	2	2	3	YES
32.	PAB RHR VAULTS, EL. (-) 31'-10"	2	--	2	--	--	YES
33.	PAB RHR VAULTS, EL. (-) 9'-0"	2	--	--	--	--	YES

TABULATION OF COMMUNICATION EQUIPMENT
(Continued)

<u>LOCATION</u>	<u>NO. OF NET CO. TELEPHONES</u>	<u>NO. OF PA SYSTEM HANDSET STATIONS</u>	<u>NO. OF PA SYSTEM SPEAKERS</u>	<u>SOUND-POWERED SYSTEM</u>		<u>RADIO SYSTEM EQUIPMENT</u>
				<u>NO. OF TELEPHONE JACKS</u>	<u>NO. OF CHANNELS</u>	
34. RHR SHUTDOWN LOC., EL. 0'-1-1/2"	1	1	2	3	3	YES
35. WALKWAY CB TO PAB, EL. 20'-8"	1	1	2	--	--	YES
36. ELEC. TUNNEL CB TO PAB, EL. 30'-8"	--	--	1	--	--	YES
37. SERVICE WATER PUMP ROOM, EL. 21'-0"	2	1	5	2	3	YES
38. SERVICE WATER ELEC. ROOM, EL. 22'-0"	2	--	2	2	3	YES
39. COOLING TOWER ELEC. ROOM, EAST, EL. 22'-0"	1	2	2	3	3	YES
40. COOLING TOWER PUMP ROOM, EAST, EL. 46'-0"	1	--	2	1	3	YES
41. COOLING TOWER ELEC. ROOM, WEST, EL. 22'-0"	1	2	2	3	3	YES
42. COOLING TOWER PUMP ROOM, WEST, EL. 46'-0"	1	--	2	1	3	YES

430.68
(9.5.2)

The description provided in Sections 8.3 and 9.5.2 of the FSAR is not sufficient to determine the functional capability of the Communication Systems during certain accident conditions. You state that power for the telephone and PA systems is supplied from Train A. The sound-powered telephone system is routed in the Train A raceways. The power source for the radio system and the repeater stations in the plant is not described. Assuming an accident condition such as a high energy line pipe break which damages the sound-powered telephone systems, and the failure of the Train A power source, show that effective communication can be maintained in all the areas listed in Request 430.67 above and that the plant can be brought to a safe (cold) shutdown, using the remaining operable portions of the Communication System. Also provide the power source to the radio system and operating stations in the plant.

RESPONSE:

We have reviewed the cable routes for the Communication Systems and have determined that the only area where the telephone and PA trunk lines and radio system radiax (Note 1) come in close proximity to one another is where they enter the Control Building. The minimum separation is 7'-4" at this location and both the telephone cable and radio antenna are in conduit. There are no high energy lines in this area of the Turbine Building or in Switchgear Room A. Although they all enter Switchgear Room A, they are immediately routed in opposite directions, thus providing even further separation.

The sound-powered systems enter the Control Building from the opposite direction from the telephone system, PA system and radio system radiax.

Despite the multiplicity of equipment and diversity of power supplies identified in our response to RAI 430.67, we have been informed by the PSB reviewer that in order to approve our communication system we must demonstrate that with the radio system repeater/radiax not functioning, the operators can effectively communicate between all safety-related areas of the plant. He further stated that if message relaying is required to communicate between all safety-related areas, adequate personnel will be available on-site to perform this function.

The SRP states that the communication system is acceptable if it provides effective communication between plant personnel in all vital areas. Our position is that Seabrook Station is designed to achieve hot and cold shutdown from either the Control Room or the remote shutdown stations depending on the design basis event, including fire. (See Fire Report of Safe Shutdown Capability and response to RAI 440.133.) This design precludes the necessity to perform operator actions at other than the locations identified in the table included in response to RAI 430.67. To insist that we must be able to communicate to all safety-related areas immediately following all design basis events is unwarranted in light of our design.

Communication systems are not safety-related and cannot be qualified to function under all design basis events. The diversity of equipment and power supplies provides a high degree of assurance that at least a portion of our system will be available to communicate throughout the station. Ultimately, the hand-held portable radios, which are unaffected by the design base events assures that we can communicate between the stations required to be manned (vital areas as used in 9.5.2 of SRP) to safely shutdown the station.

Later into events, it will certainly be necessary to send personnel to other areas of the station, both safety-related and non-safety-related. The on-site staff will be augmented to handle the multiplicity of functions required to ultimately bring the station to a normal condition. This augmented staff will also be available to relay communications as necessary around the site via the hand-held portable radios.

For the above reasons, we feel our design complies with the acceptance criteria of the SRP and additional changes to our communication system is unwarranted nor should it be necessary to provide additional on-site personnel to relay communications.

Note 1: Radiax is a slotted coax cable designed to function as a continuous antenna both for receiving and transmitting.

Handsets and headsets are stored and issued as required. Each remote safe shutdown station has a headset stored in a convenient location.

4. Station Radio System

(a) VHF System

This system is utilized as a primary means for offsite paging of personnel for manning of the station and emergency facilities and for two-way communications with mobile and portable vehicles assigned to radiological survey teams.

Remote control consoles will exist at the Station Control Rooms, the Technical Support Centers and the Emergency Operations Facility. These locations will control onsite and offsite VHF radio base stations in a single frequency simplex transmission mode of operation.

(b) UHF Operating and Maintenance System

This system is utilized for two-way communications by station Operating and Maintenance personnel.

The system is a two frequency operation which operates through a common onsite repeater base station for improved transmission capability or directly from the control stations to remote portables should there be a repeater base station failure.

Remote control consoles located at the Station Control Rooms, the Technical Support Centers and the Operational Support Center operate through common control station.

A second control station exists at the Emergency Operations Facility.

(c) Security System

For description of the radio system provided for security, refer to the Security Plan.

b. Plant to Offsite Communications

1. Telephone System

The plant PABX system is connected to the telephone utility company system by leased trunk lines. These lines are brought to the plant telephone equipment room through a separate conduit and duct system.

The repeater for the UHF Operating and Maintenance System are powered from the non safety power system. Backup power is provided by dedicated batteries rated for 8 hours use