TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

February 26, 1982

Director of Nuclear Reactor Regulation
Attention: Ms. E. Adensam, Chief
Licensing Branch No. 4
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Ms. Adensam:

In the Matter of the Application of	)	Docket Nos. 50-390
Tennessee Valley Authority	)	50-391

Enclosed is a revised response to NRC question 40.77 in the Watts Bar Final Safety Analysis Report. This additional information should resolve open item 54 of the draft Safety Evaluation Report.

If you have any questions concerning this matter, please get in touch with D. P. Ormsby at FTS 858-2682.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

M. R. Wisenburg
Nuclear Engineer

Sworn to and subscribed before me
this 26th day of Feb. 1982
Paulette H. White
Notary Public
My Commission Expires 9-5-84

Enclosure
cc: U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

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40.77 Question
(9.5.2)

The information regarding the onsite communications 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 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 communication with the control room using:

1. the page party communications system, and

2. any other additional communication system provided that working station.

(e) Describe the performance requirements and tests that the above onsite 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 communications systems.

(g) Discuss the protective measures taken to assure a functionally operable onsite 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) During or following transients or accidents, communications with the control room or the Auxiliary Control Room from the following listed work stations may be necessary to mitigate the consequences of the event and attain a safe cold plant shutdown:

1. 6900-V Shutdown Board Rooms
2. 480-V Shutdown Board Rooms
3. Diesel Generator Building
4. Reactor MOV and Vent Board Rooms
5. Reactor Coolant Pump Boards
6. CVCS Boron Blender (Elevation 713)

(b & e) The communication systems listed in Question 40.77(C) are used during operation of the plant. This includes plant trips, cooldown, full power, refueling, startup, and testing. Telephone locations with high sound levels are equipped with sound dampening phone booths. We believe that using the communications systems during these modes of operation qualifies the communication system for all possible operation modes including accident and transient conditions. In addition, during hot functional and startup testing, cooldown and plant operation from the backup control room are required. This testing requires establishing and maintaining effective communications with plant employees throughout the plant.

The only test performed on communications equipment is done on the sound-powered phone system primarily because this system is seldom used. It is our position that the use of PAX and paging systems during normal and simulated emergency conditions verifies the suitability of these communications systems and no additional testing is required.

(c) The general descriptions of the communication systems are already described in FSAR Section 9.5.2.2. In addition, an inplant two-way radio system operating on frequencies in the 160-175 MHz range provides another means of communications. The types of systems available in the control room, Auxiliary Control Room, and at or nearby the working stations are as follows:

Main Control Room

1. Sound Power Systems SP-1, 2, 3, 4, 5, and 6
2. PAX
3. Paging

4. Radio
5. Direct Sound Power to the Diesel Generator Building

Auxiliary Control Room
1. Shutdown Control Center Communications Systems, both Primary and Alternate
2. Sound Power Systems SP-1, 2, 3, 4, 5, and 6
3. PAX
4. Paging
5. Radio

6900-V and 480-V Shutdown Boards
1. Shutdown Control Center Communications Systems, both Primary and Alternate
2. PAX
3. Paging
4. Radio

Diesel Generator Building
1. Shutdown Control Center Communications Systems, both Primary and Alternate
2. PAX
3. Paging
4. Direct Sound Power to the Main Control Rooms

Reactor MOV and Vent Board Rooms
1. PAX
2. Paging
3. Radio

Reactor Coolant Pump Boards and CVCS Boron Blender
1. PAX
2. Paging
3. Radio

(d) The ambient noise level at a working station will vary from station to station during normal plant operation and during an emergency situation. As Watts Bar Nuclear Plant is not an operating plant, the design of communications systems had to be based on estimated noise levels using information and noise levels obtained from operating plants. Estimated sound levels for identified working stations are as follows:

1. Main Control Room - The normal expected ambient noise level is 62 db, with the noise level reaching 66 db during an emergency situation. This rise could be caused by more personnel present in the room, louder voices, and more movement in and out of the room.

2. Auxiliary Control Room - The estimated sound level is 65 db -68 db. There will be no appreciable rise in this level during an emergency.

3. 6900-V Shutdown Board Rooms - The background noise in these areas is approximately 70 db. It is expected that this sound level would not change during an emergency because of elevation and location of these rooms.

4. 480-V Shutdown Board Rooms - The ambient noise level for similar areas in other plants has measured 68 db - 70 db. There is no reason to expect this level to rise during an emergency.

5. Diesel Generator Building - The noise level here during an emergency is 113-115 db (with units running). There is a shielded room in the Diesel Generator Building designated for the specific purpose of conversing with the control room during emergencies. The ambient noise level in this room is 70-75 db and is equipped with a PAX telephone, sound powered telephone (connected directly to the control room) and a CAP speaker. There are also CAP speakers and a PAX telephone in the corridor. Double receiver headsets can be used with sound powered jacks to receive instructions from the control room in high ambient noise areas in diesel generator rooms.

6. Reactor MOV and Vent Board Rooms - Estimated noise levels for these rooms are 72-75 db. Because of the location of these rooms, there will be no increase in sound levels during an emergency.

7. Reactor Coolant Pump Boards and CVCS Boron Blender - The sound level in this area is approximately 75-80 db. It is not expected to rise during an emergency and could go down slightly because of the shutdown of some motors.

The CAP System which is used throughout the plant for codes, alarms, and paging is capable of producing output signals of 110 db at 10 feet. This level of signal will give the CAP System sufficient range to be adjusted for proper voice and tone signaling in the working stations listed above.

The PAX telephone and the sound powered systems are being used effectively at operating plants in areas where sound levels are as high or even higher than those identified above.

(f) The paging (CAP) system is powered by a 24V DC power board which is backed by a 24V battery which has an 8 hr capacity of 1200 AH.

The sound-powered system requires no external power source.

The power source for the PAX telephone system is a 48V DC power board which is backed by a 48V battery with an 8 hr capacity of 900 AH.

(g) CAP SYSTEM

The paging system (CAP) speaker amplifiers are divided into two groups, designated as 'A' and 'B.' 'A' and 'B' speaker-amplifiers are located in all plant areas so as to assure audible paging from either the 'A' or 'B' speakers. Each group is fed from a different fuse panel with cable to the 'A' group being physically separated from cable feeding the 'B' group. If power is lost to either group of speaker-amplifiers, there is sufficient coverage from the remaining group to maintain the integrity of the system. In the event that a speaker-amplifier fails in such way that the signal input leads become shorted, a fuse blows immediately, isolating it from the rest of the system. The 'A' and 'B' groups form two completely redundant systems.

SOUND POWERED SYSTEM

The sound powered system designated for emergency communications with the control room consists of a primary system and an alternate system. These are wired independent of each other with a different cable routing for each system. If an individual telephone is lost because of fire or an accident, that station will be isolated from the system. However, the remaining sound powered telephones will perform in the normal way.

PAX TELEPHONE SYSTEM

The PAX telephone system is designed with a redundant power source. It is also designed so that failure of

a major component (excluding total power loss) will not affect greater than 50% of the system. The equipment is such that if a faulty path is encountered when making a call, the act of hanging up the receiver and again removing it will provide a different path.