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Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381

CNL-16-034

February 19, 2016

10 CFR 50.4(b)(6)
10 CFR 50.34(b)
10 CFR 2.390

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Watts Bar Nuclear Plant Unit 2
Facility Operating License No. NPF-96
NRC Docket No. 50-391

Subject: **TMI Task Action I.D.1 Commitment Closure Regarding Control Room Design Review Special Program**

- References:
1. TVA Letter to NRC, dated July 27, 1983 (ML073530375)
 2. NUREG-0847 Supplement 15 "Safety Evaluation Report - Related to the Operation of Watts Bar Nuclear Plant, Units 1 and 2," dated June 1995

In Reference 1, the Tennessee Valley Authority (TVA) committed to provide the Nuclear Regulatory Commission (NRC) with the following information for the Watts Bar Nuclear Plants (WBN) related to the closure of the Action I.D.1 in NUREG-0660, "NRC Action Plan Developed as a Result of the TMI-2 Accident," regarding the control room design review (CRDR) program:

- TVA will submit the results of the additional noise measurements 120 days after fuel loading. As noted in Table 18.1 of Reference 2, "The NRC will review the results of the sound/noise survey, discussed below, which will be completed by TVA 120 days after fuel load, in relation to NUREG-0700 Guideline 6.1.5.5, 'Auditory Environment'."
- TVA will take a complete set of color photographs of all panels located in the main control rooms and auxiliary control rooms after the respective units are operational for submittal to NRC 120 days after fuel loading.

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ADD
NRR

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Enclosure 1 provides the results of the WBN Unit 2 main control room noise survey that was performed in accordance with NUREG-0700 Guideline 6.1.5.5, "Auditory Environment," requirements. Enclosure 1, Table 3, "Hazard Assessment Results/Summaries," lists the five WBN Unit 2 main control room locations and the corresponding noise measurement at each location. Page E1-6 depicts the five main control room locations where the noise measurements were taken. Main control room positions 1 and 2 are located behind the horseshoe where normal communications are not performed. Normal control room communications are performed in positions 3, 4, and 5 and are no more than 7 feet apart. Per NUREG-0700, these background noise levels are within the range where verbal communication should be intelligible using normal to raised voice levels.

Enclosure 2 provides a compact disk (CD) containing the color photographs of the main control room and auxiliary control room panels. The information provided in Enclosure 2 contains security sensitive information in accordance with 10 CFR 73.21(a)(1)(i). Because of the sensitive nature of this submittal, TVA request that this information be withheld from public disclosure in accordance with 10 CFR 2.390.

There are no new regulatory commitments in this letter. If you have any questions, please contact Gordon Arent, Director of Watts Bar Site Licensing, at (423) 365-2004.

Respectfully,



J. W. Shea
Vice President, Nuclear Licensing

Enclosures:

1. Watts Bar Nuclear Plant, Unit 2 Main Control Room Noise Survey
2. Watts Bar Nuclear Plant, Unit 2 Main Control Room and Auxiliary Control Room Panel Photographs

cc (w/o Enclosures):

NRC Regional Administrator - Region II
NRC Senior Resident Inspector, Unit 1
NRC Senior Resident Inspector, Unit 2

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ENCLOSURE 1
Tennessee Valley Authority

Watts Bar Nuclear Plant, Unit 2 Main Control Room Noise Survey

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Date of Report: (MM/DD/YY)	Date(s) of Assessment:	Report No.:	Customer:	Customer Location:	Customer Point of Contact:	Customer Work Authorization:
02/19/16	1/14/16	WBN0-175	TVA	Spring City, TN	Chad Isaacs	1411167

A. Scope of Assessment:

Alliant Corporation (Alliant) was tasked with conducting an area noise survey of the Unit 2 side of the Main Control Room at Watts Bar Nuclear Plant located in Spring City, TN. The survey was performed to assess where background noise levels met to the requirements of NUREG-0700 paragraph 12.1.2.5-3, which state "Background noise levels should not exceed 65 dB(A). Additional Information: Operators eight feet apart will have to speak loudly to be heard in the presence of a 65 dB(A) background noise. Therefore, if workstations, display panels, or control interfaces are widely separated in the control room, the background noise limit should be reduced." Alliant placed noise dosimeters in the five locations on the Unit 2 side that are described in Table 3 of this report.

Hazard	CAS No., if applicable	Assessment Method	OEL (Include U/M)	Shift-Length Adjusted OEL (Include U/M)	Source of OEL
Noise	NA	NA	NA	NA	NA

Table 2. Hazard Controls (Check all that apply.)

Engineering

- None
- General ventilation
- Enclosure of hazards; Type: _____
- Barriers to exposure; Type: _____
- Local exhaust ventilation; Type: _____
- Other; Type: _____

Administrative

- None
- Lengthened rest breaks
- Additional relief workers
- Exercise breaks to vary body motions
- Rotating workers
- Hazard-specific training; Type: _____
- Other; Type: _____

Personal Protective Equipment

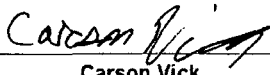
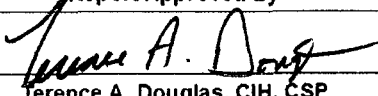
- None
- Eye protection; Type: _____
- Face protection; Type: _____
- Respiratory Protection; Type: _____
- Head protection; Type: _____
- Foot protection; Type: _____
- Electrical protective devices; Type: _____
- Hand Protection; Type: _____
- Hearing protection; Type: _____
- Other; Type: _____

Hazard Control Comments:

B. Findings and Observations

- During this survey, the A-weighted equivalent noise level (LAeq) was measured at the five locations depicted on the attached layout. LAeq is the noise level that would represent the same amount of noise energy as in the actual noise, effectively giving an average level over the measurement period.
- The A-weighting filter covers the full audio range - 20 Hz to 20 kHz, and it is used because it most closely represents the response of the human ear at the lower frequency levels.
- Since area monitoring was performed, not personal monitoring, time-weighted averages are not applicable. The noise levels reported in Table 3 do not represent personal exposures and should not be interpreted as such.
- Sample positions 3, 4 and 5 are located within the main operating area of the Unit 2 control room, and are no further than seven (7) feet apart from one another. Based upon Figure 12.3, *Voice level as a function of distance and ambient noise level* in NUREG-0700, these background noise levels are well within the range where verbal communication should be intelligible using normal or raised voice levels.

E. Report Preparation

	Report Prepared By	Report Approved By
Signature		
Name	Carson Vick	Terence A. Douglas, CIH, CSP
Date	2/19/16	2/19/16

F. Disclaimer

This report is for the sole use of Customer and Alliant Corporation. Use of this report by any other parties will be at such party's sole risk, and Alliant Corporation disclaims liability for any such use or reliance by third parties. The results presented in this report are indicative of conditions at the time of the survey. This study does not purport to include every health hazard at this location, and only those areas and exposures specifically mentioned were evaluated.

Table 3. Hazard Assessment Results / Summaries

AREA Assessment Summary for Noise

(All noise measurements are in dBA)

Sample No.	Date	Area	Sample Length (Minutes)	Measured LAeq
1	1/14/16	Corner of Control Counter of Unit 2	246	66.6
2	1/14/16	Corner of Control Counter of Unit 2	245	66.2
3	1/14/16	North Center of Unit 2 Section of Control Room	244	63.6
4	1/14/16	Center of Unit 2 Section of Control Room	244	64.3
5	1/14/16	Shift Managers Desk – West Side of Unit 2 Section of Control Room	243	63.2

This information contained in this report is subject to protection under the Privacy Act of 1974.

ND -Not Detected

NA -Not Applicable

< -Less Than

TWA -Time Weighted Average

PEL -Permissible Exposure Limit

AL -Action Limit

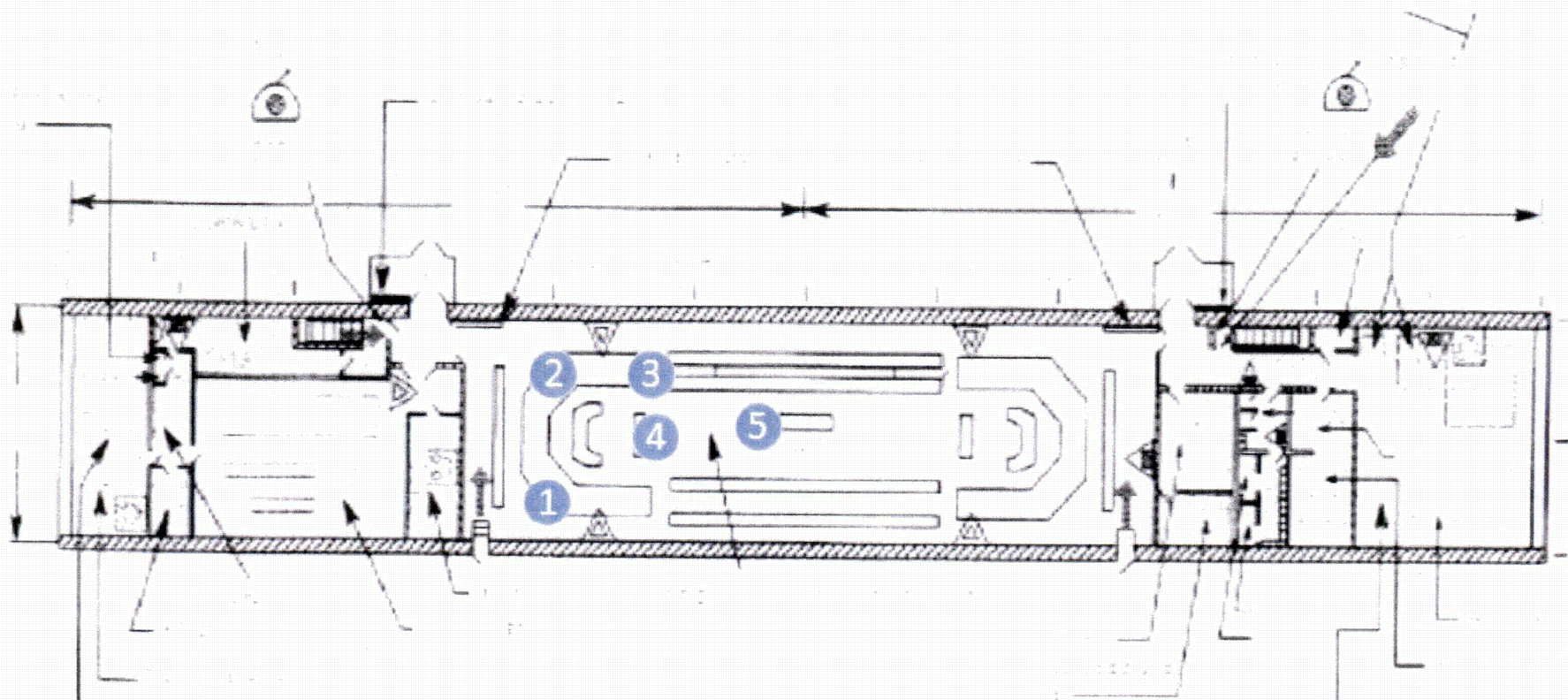
P -Personal Sample

dBA – decibel A-weighted filter

LAeq - A-weighted equivalent noise level

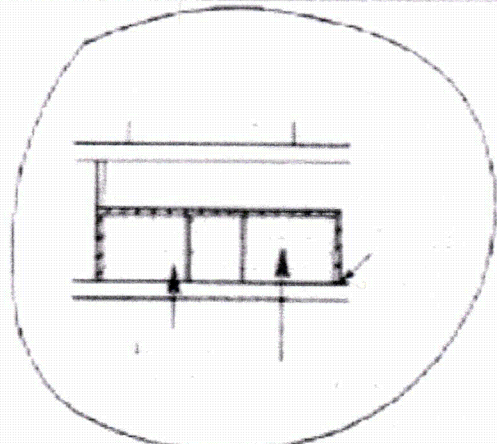
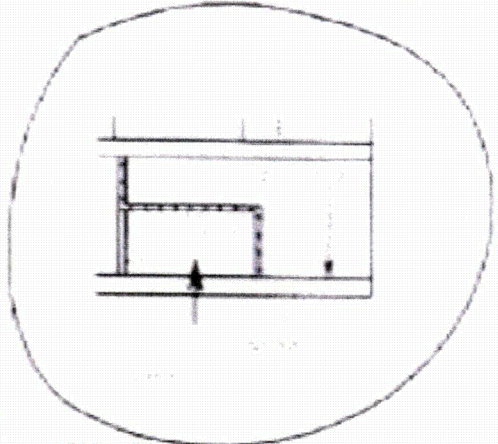
NRR – Noise Reduction Rating

HCP – Hearing Conservation Program



AUTO OPER/ISO 0-FCV-26-203
SYS LOCATED 692 C10-N

AUTO OPER/SO 0-FCV-26-211
SYS LOCATED 729 C3-0



Noise Monitoring
Sample Location

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12 WORKPLACE DESIGN

12.1 Control Room

12.1.2 Control Room Environment

12.1.2.5 Auditory Environment

12.1.2.5-1 General

The acoustic design of the control room should ensure that verbal communications among personnel are not impaired; auditory signals are readily detected; and auditory distraction, irritation, and fatigue are minimized.⁰⁷⁰⁰

12.1.2.5-2 Background Noise

Background noise should not impair verbal communication between any two points in the main operating area.

Additional Information: Verbal communications should be intelligible using normal or slightly raised voice levels. Figure 12.3 shows the voice levels needed for spoken communication over specified distances in the presence of different levels of background noise. Intelligibility of speech in noise is affected by the frequency spectra of the noise and of the speakers' voices and by the speakers' hearing sensitivity.^{0700, 5680}

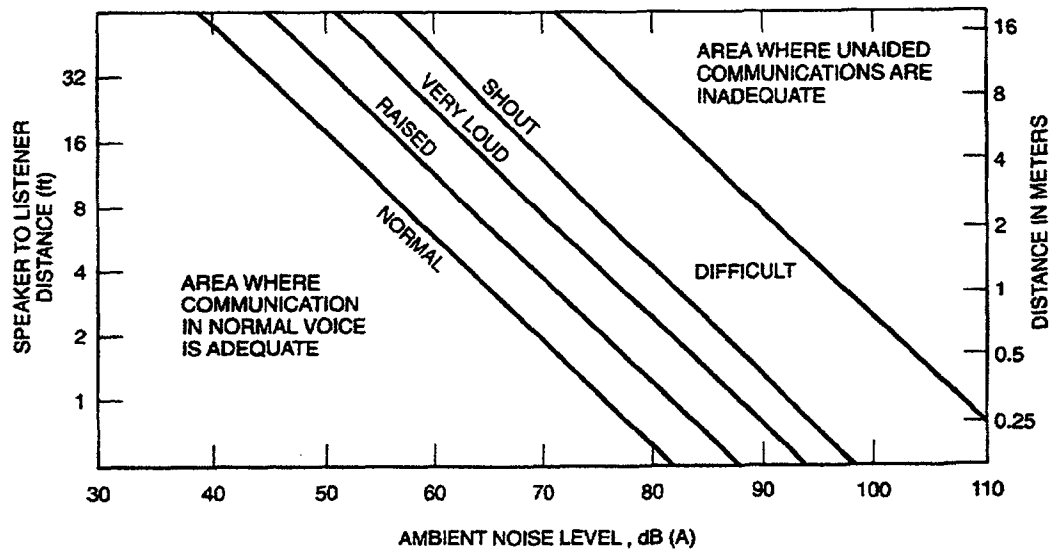


Figure 12.3 Voice level as a function of distance and ambient noise level

12.1.2.5-3 Background Noise Level

Background noise levels should not exceed 65 dB(A).

Additional Information: Operators eight feet apart will have to speak loudly to be heard in the presence of a 65 dB(A) background noise. Therefore, if workstations, display panels, or control interfaces are widely separated in the control room, the background noise limit should be reduced.⁰⁷⁰⁰

12 WORKPLACE DESIGN

12.1 Control Room

12.1.2 Control Room Environment

12.1.2.5 Auditory Environment

12.1.2.5-4 Further Reductions

Where communications between the main operating area and other control room locations are necessary, and voice transmission systems are not provided, further reductions in background noise should be implemented.⁰⁷⁰⁰

12.1.2.5-5 Noise Distractions

Noise distractions generated either inside or outside the control room should be minimized.⁰⁷⁰⁰

12.1.2.5-6 Reverberation Time and Sound Absorption

The acoustical treatment of the control room should limit reverberation time to 1 second or less.^{0700, 5908}

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ENCLOSURE 2
Tennessee Valley Authority

**Watts Bar Nuclear Plant, Unit 2 Main Control Room and
Auxiliary Control Room Panel Photographs
(see attached CD)**

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