

# WOLF CREEK

NUCLEAR OPERATING CORPORATION

Neil S. "Buzz" Carns  
Chairman, President and  
Chief Executive Officer

December 22, 1994

WM 94-0199

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Mail Station P1-137  
Washington, D.C. 20555

- Reference:
- 1) NRC Letter dated December 22, 1993, "Request For Additional Information Regarding Generic Letter 92-08 (TAC No. M85625)"
  - 2) Letter WO 94-0013 dated February 9, 1994, from O. L. Maynard, WCNOG, to the Nuclear Regulatory Commission
  - 3) Letter CO 94-0013 dated July 15, 1994, from R. N. Johannes, WCNOG, to the Nuclear Regulatory Commission

Subject: Docket No. 50-482: Response to Follow-Up to the Request for Additional Information Regarding Generic Letter 92-08

Gentlemen:

The NRC issued a letter dated September 23, 1994, "Follow-Up to the Request for Additional Information Regarding Generic Letter 92-08 Issued Pursuant to 10 CFR 50.54(f) on December 22, 1993," which required a response to be submitted to the NRC within 90 days of receipt of the letter. In that letter, you indicated that our response (References 2 and 3) to three sections of the RAI (Reference 1) had been deferred or was incomplete. Specifically, the sections requiring a revised response are: Section II, "Important Barrier Parameters," Section IV, "Ampacity Derating," and Section V, "Alternatives."

The attachment provides Wolf Creek Nuclear Operating Corporation's (WCNOG) response to the requested information. For completeness, we have duplicated our responses to Sections II, IV, and V from the original submittal, References 2 and 3, and revised them as necessary.

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P.O. Box 411 / Burlington, KS 66839 / Phone: (316) 364-8831

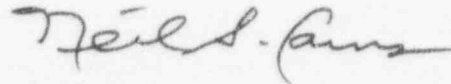
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If you have any questions concerning this matter, please contact me at (316) 364-8831, extension 4000, or Mr. Richard D. Flannigan at extension 4500.

Very truly yours,

A handwritten signature in dark ink, appearing to read "Neil S. Carns". The signature is fluid and cursive, with a long horizontal stroke at the end.

Neil S. Carns

NSC/jra

Attachment

cc: L. J. Callan (NRC), w/a  
D. D. Chamberlain (NRC), w/a  
J. F. Ringwald (NRC), w/a  
J. C. Stone (NRC), w/a

RESPONSE TO THERMO-LAG REQUEST FOR ADDITIONAL INFORMATION

RAI Section II. IMPORTANT BARRIER PARAMETERS

NRC Item II.B.1 State whether or not you have obtained and verified each of the aforementioned parameters for each Thermo-Lag barrier installed in the plant. If not, discuss the parameters you have not obtained or verified. Retain detailed information on site for NRC audit where the aforementioned parameters are known.

WCNOC RESPONSE

WCNOC has obtained and verified the 24 parameters listed in the RAI for WCGS BTP CMEB 9.5-1 applications. Total enclosed mass (raceway and cabling), panel rib location, protection of intervening and support steel, and wall interfaces have also been obtained as part of WCNOC's Application Guide evaluation.

Detailed information is available on-site for NRC audit of the known parameters.

Parameters of importance concerning cable items 1, 2, 3, 4 (cable fill), 5, 6, and 7 have also been obtained. Items 4 (distribution of cables) and 8 have not been obtained. WCNOC's NEI Application Guide evaluations do not warrant cable functionality evaluations. Therefore, WCNOC does not intend to obtain and verify the remaining cable parameters or to perform cable functionality evaluations.

NRC ITEM II.B.2 For any parameter that is not known or has not been verified, describe how you will evaluate the in-plant barrier for acceptability.

WCNOC RESPONSE

WCNOC has obtained and verified the parameters of importance at WCGS concerning cables protected by fire barriers used for safe shutdown in the event of a fire. If the NEI Thermo-Lag testing application to WCGS installations had demonstrated temperature criteria exceedance, one optional approach to resolution would have been to evaluate cable functionality at the elevated temperature using cable performance test data or information for specific installed cable types. However, the results of NEI testing and subsequent NEI Application Guide evaluations of WCGS Thermo-Lag installations indicate that cable functionality evaluations are not warranted. Therefore, WCNOC does not intend to obtain and verify cable parameters items 4 (cable distribution) and 8, or to perform cable functionality evaluations.

NRC ITEM II.B.3 To evaluate NUMARC's application guidance, an understanding of the types and extent of the unknown parameters is needed. Describe the type and extent of the unknown parameters at your plant in this context.

WCNOC RESPONSE

All 24 raceway parameters of importance were obtained by WCNOC to perform NEI Application Guide evaluations. NEI Guidelines do not include cable functionality. Therefore, no impact is caused by WCNOC plans to not obtain items 4 (cable distribution) or 8 information on parameters of importance concerning cables protected by fire barriers.

RAI Section IV. AMPACITY DERATING

Your response to Section IV.B may depend on unknown specifics of the NUMARC ampacity derating test program (e.g., the final barrier upgrades). However, your response should be as complete as possible. In addition, your response should be updated as additional information becomes available on the NUMARC program.

NRC ITEM IV.B.1. For the barriers described under Item I.B.1, describe those that you have determined will fall within the scope of the NUMARC program for ampacity derating, those that will not be bounded by the NUMARC program, and those for which ampacity derating does not apply.

WCNOC RESPONSE

NEI did not perform ampacity derating testing as part of their testing program. Thus, they did not provide bounding data for application to WCGS installations.

As discussed in the April 16, 1993 WCNOC response to NRC Generic Letter 92-08 (Letter ET 93-0047, F. T. Rhodes, WCNOC, to USNRC), WCGS ampacity derating factors for conduit and cable trays covered with Thermo-Lag 330-1 are based on vendor supplied heat transfer coefficient values for Thermo-Lag 330-1. During original design, WCNOC performed heat transfer calculations to address the specific applications and provide the basis for ampacity derating. The ampacity derating values are not based on ampacity derating tests. Conservatism was used in the assumptions made to bound operating parameters. The generic concern with the acceptability of ampacity derating factors is that long term life of the cable insulation may be degraded due to a potentially higher operating temperature for the cable.

WCNOC has evaluated WCGS Thermo-Lag 330-1 applications of conduits and cable trays for ampacity margin. Ampacity margin is the percentage difference between the actual current of the cable and the acceptable current of the cable not including the thermal insulating effects of Thermo-Lag. It was determined that WCGS has very conservative ampacity margins compared to results of tests performed by other organizations. The ampacity margins will be applied to future upgrades as appropriate. Furthermore, WCGS Class 1E

electrical cables are qualified for a 40 year life and have been in service less than one-quarter of the qualified life.

WCNOC currently has no plans to evaluate instrumentation and control cable as they do not carry a significant current compared to the ampacity of the conductors. Furthermore, the heat generated is not significant compared to that generated by power conductors.

WCNOC also does not intend to evaluate ampacity deratings on fire barrier configurations which enclose a raceway for six (6) inches or less in length. This is based on the fact that this small an area will not create a significant temperature rise.

NRC ITEM IV.B.2. For the barriers you have determined fall within the scope of the NUMARC program, describe what additional testing or evaluation you will need to perform to derive valid ampacity derating factors.

WCNOC RESPONSE

NEI did not perform ampacity derating testing as part of their testing program. Thus, they did not provide bounding data for application to WCGS installations. The NRC has questioned the generic use of the industry testing procedure for ampacity derating (IEEE P848). Therefore, WCNOC does not plan to perform any ampacity testing.

NRC ITEM IV.B.3. For the barrier configurations that you have determined will not be bounded by the NUMARC test program, describe your plan for evaluating whether or not the ampacity derating tests relied upon for the ampacity derating factors used for those electrical components protected by Thermo-Lag 330-1 (for protecting the safe-shutdown capability from fire or to achieve physical independence of electrical systems) are correct and applicable to the plant design. Describe all corrective actions needed and submit the schedule for completing such actions.

WCNOC RESPONSE

As stated in our response to NRC Item IV.B.1 WCNOC has evaluated WCGS Thermo-Lag 330-1 applications of conduits and cable trays for ampacity margin and determined that WCGS has a very conservative ampacity margin. Considering the margin of safety built into our circuits, WCGS does not intend to perform additional ampacity derating calculations at this time.

NRC ITEM IV.B.4. In the event that the NUMARC fire barrier tests indicate the need to upgrade existing in-plant barriers or to replace existing Thermo-Lag barriers with another fire barrier system, describe the alternative actions you will take (and

the schedule for performing those actions) to confirm that the ampacity derating factors were derived by valid tests and are applicable to the modified plant design.

#### WCNOC RESPONSE

Should WCNOC decide to perform upgrades to existing Thermo-Lag barriers, pertinent ampacity derating test results from other organizations, if applicable, will be considered. However, until the NRC concerns with ampacity derating issues (especially the use of IEEE P842) are resolved, insufficient basis exists for further action by WCNOC at this time.

This response is applicable for both Regulatory Guide 1.75 and BTP CMEB 9.5-1 applications.

#### RAI Section V. ALTERNATIVES

NRC ITEM V.B. Describe the specific alternatives available to you for achieving compliance with NRC fire protection requirements in plant areas that contain Thermo-Lag fire barriers. Examples of possible alternatives to Thermo-Lag based upgrades include the following:

1. Upgrade existing in-plant barriers using other materials.
2. Replace Thermo-Lag barriers with other fire barrier materials or systems.
3. Reroute cables or relocate other protected components.
4. Qualify 3-hour barriers as 1-hour barriers and install detection and suppression systems to satisfy NRC fire protection requirements.

#### WCNOC RESPONSE

If additional WCNOC evaluations using the NUMARC Application Guide indicate that some upgrades that rely on additional thickness of Thermo-Lag material (or other fire barrier materials) may not be practical due to the effects of ampacity derating or clearance problems, alternative methods exist to restore the fire barriers to operable status. The following is a discussion of some of the alternatives available. However, the following discussion is not meant to limit WCNOC to only those methods described.

1. The majority of WCGS applications involve 3-hour rated fire barriers. Evaluations, based upon calculations, testing, or analysis may be performed to justify the barrier as-installed.
2. Reroute of cable, or replacement of specific cables with fire rated cable (i.e., Rockbestos Firezone R)

3. If evaluation using the NUMARC Application Guide indicates that the specific WCGS applications are not bounded due to differences in baseline Thermo-Lag 330-1 installation details, WCNOG can rework the WCGS baseline installations to achieve compliance with the as-tested NUMARC configurations.
4. In many WCGS applications it would be possible to install fire suppression and fire detection to the area and then qualify the existing 3-hour barriers as 1-hour rated barriers.
5. Performing a re-evaluation of engineering analyses used for determination of safe shutdown pathways, equipment, and actions, could provide a basis for reduction in the scope of protected circuits and their associated fire barriers.
6. For certain applications, WCNOG could replace the Thermo-Lag fire barrier with rated fire barriers using other qualified materials or systems.
7. Upgrades using other fire barrier materials may be developed. However, the final approved test methods and acceptance criteria must be evaluated to determine net effect on the scope and complexity of upgrades to WCGS installed barriers before this option could be chosen.

The WCGS applications of Thermo-Lag 330-1 material installed to meet the requirements of Regulatory Guide 1.75 are not intended to meet 1-hour or 3-hour rated fire barrier configuration requirements. Future ampacity derating evaluations, or combustibility evaluations, for these applications may indicate Thermo-Lag 330-1 material is not suitable for use in specific applications. In this event, the Thermo-Lag 330-1 material will be replaced with an alternate material which is suitable as a radiant energy shield.