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August 27, 1984

W3P84-2366  
3-A1.01.06

Director of Nuclear Reactor Regulation  
Attention: Mr. G.W. Knighton, Chief  
Licensing Branch No. 3  
Division of Licensing  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

SUBJECT: Waterford SES Unit 3  
Docket No. 50-382  
Safety Parameter Display System (SPDS)  
Isolation Devices

REFERENCE: Letter dated August 6, 1984  
from Knighton (NRC) to Leddick (LP&L)

Dear Sir:

In your referenced letter you requested additional information resulting from the Staff review of the Waterford 3 SPDS. Specifically, you requested in Question 420.01 from ICSB, verification of adequate SPDS isolation from safety-related systems.

The Waterford 3 SPDS is a non-safety related software implementation of the Plant Monitoring Computer (PMC). SPDS safety-related data inputs are received solely through the QSPDS, a system implemented primarily to handle the inadequate core cooling requirements of NUREG 0737. The QSPDS directs output to its own display and to the PMC via a fiber-optic data link, providing adequate isolation of safety-related systems. Enclosed please find a detailed response to Question 420.01.

Of the questions transmitted by your referenced letter, 420.01 alone deals with safety-related concerns over the implementation of SPDS at Waterford 3. As no Technical Specification changes are necessary for SPDS and no unreviewed safety question exists as demonstrated by this submittal the criteria of NUREG 0737 Supplement 1 for SPDS implementation without prior NRC approval have been met. We request that your review of this matter be included in the next Supplement to the Waterford SER.

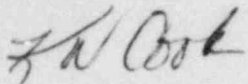
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Should you have any further questions or comments on this subject, please contact Mike Meisner at (504) 363-8938.

Yours very truly,



K. W. Cook  
Nuclear Support & Licensing Manager

KWC/MJM/ch  
Enclosure

cc: E.L. Blake, W.M. Stevenson, J.T. Collins, D.M. Crutchfield, J. Wilson,  
R. Stevens, J. Joyce, G.L. Constable

bcc: R.S. Leddick, F.J. Drummond, R.P. Barkhurst, R.M. Nelson, T.F. Gerrets,  
G.G. Hofer, W.A. Cross, K.R. Iyengar, R.F. Burski, R.V. Seidl,  
R.W. Naylor, Project Files, Nuclear Records (2), Licensing Library

Response to

NRC Question 420.01 Isolation Devices

- Q1a. For each type of device used to accomplish electrical isolation, describe the specific testing performed to demonstrate that the device is acceptable for its application(s). This description should include elementary diagrams when necessary to indicate the test configuration and how the maximum credible faults were applied to the devices.
- A1a. The QSPDS is tied to the PMC via a fiber-optic data link. The modem on both ends was qualified by CE via test 00000-ICE-3306 (proprietary). By the very nature of the optic link electrical isolation is obtained. The glass fibre has one of the highest insulation resistances of any material. The link is approximately 400 feet. The fiber-optic modems were manufactured by "Manage, Inc.", part number FOM-232A.
- Q1b. Data to verify that the maximum credible faults applied during the test were the maximum voltage/current to which the device could be exposed, and define how the maximum voltage/current was determined.
- A1b. The fiber-optic cable was tested to IEEE-383-74 and due to its inherent physical properties is excluded from fault testing per IEEE Standard 279-1971.
- Q1c. Data to verify that the maximum credible fault was applied to the output of the device in the transverse mode (between signal and return) and other faults were considered (i.e., open and short circuits).
- A1c. The output of the fiber-optic modem is non-electrical and, therefore, this is not applicable. However, the cable has been tested to 250KV which is several orders of magnitude higher than the maximum credible fault of 500VAC for the Plant Monitoring Computer System. Since the optic cable is non-conducting any fault will take the path of least resistance (air) first.
- Q1d. Define the pass/fail acceptance criteria for each type of device.
- A1d. Line to line and line to ground transient voltage faults do not apply to a non-conducting optical cable medium.
- Q1e. A commitment that the isolation devices comply with the environmental qualifications (10 CFR 50.49) and with the seismic qualifications which were the basis for plant licensing.
- A1e. As previously stated, the isolation devices were qualified for Waterford 3 by CE per the referenced qualification report in accordance with 10 CFR 50.49. CE used the IEEE Standard 323-1974 and IEEE Standard 344-1975 as a basis for this qualification test.

- Q1f. A description of the measures taken to protect the safety systems from electrical interference (i.e., Electrostatic Coupling, EMT, Common Mode and Crosstalk) that may be generated by the SPDS.
- A1f. The fiber-optic cable was tested by Beldon Cable Corporation (the supplier). The cable meets the applicable criteria of IEEE 383-74. The cable is Beldon type 226141. As the cable is non-conducting it is also immune to electrical interference.