

August 23, 2001

Mr. John Faranetta
Vice President Research
The Okonite Company
Hilltop Road
Ramsey New Jersey 07446

Re: Okonite Bonded Jacket Cable Loss-of-Coolant Accident Test Failures

Dear Mr. Faranetta:

In your letter dated July 26, 2001, to Samuel Collins, you provided the NRC staff with a description of a standard environmental qualification test of Okonite Okolon cables to be conducted at the Wyle Laboratories and you also requested any comments the staff may have on the test protocol. The following staff comments were discussed with you during a telecon on August 16, 2001:

- Since the activation energy of the ethylene propylene rubber (EPR) cable insulation was not provided in the test protocol, the NRC staff could not correlate what "aging conditions" the 150°C thermal exposures to the 19 cable specimens are intended to represent in terms of a qualified life at a given temperature e.g., 40 years @ 90°C, 60 years @ 90°C, 40 years @ 50°C, 60 years @ 50°C, etc. In addition, sample aging times of less than 100 hours are not permitted by the IEEE Std 323-1974 (three specimens in the test protocol would be thermally aged for 50, 70, and 90 hours).

During the telecon, you stated that the Okonite Company is currently in the process of determining whether the Arrhenius Methodology (based on the activation energy of EPR) or the aging methodology from the original Okonite Test Report (NQRN-1A) will be used to correlate what "aging conditions" the 150°C thermal exposures are intended to represent.

- Although the previous qualification tests of Okonite Okolon cables were based on a 150°C aging temperature, the NRC staff believes that a lower aging temperature might be more realistic and would eliminate the concern due to diffusion-limited oxidation (DLO) effects since the lower aging temperature would not have a profound effect on either the EPR insulation or the hypalon jacket. Since hypalon is known to age approximately ten times faster than EPR, the mechanical stress due to the degraded hypalon on the EPR due to bonding may result in cable failure at 150°C exposures up to 350 hours due to severe overtesting (adding the radiation aging would increase the degradation still further).

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During the telecon, you stated that Okonite is aware of the DLO effects on EPR and Hypalon at elevated aging temperatures however, the 150°C thermal exposures on the 19 cable specimens from 50 hours to 350 hours are intended to determine the break point (failure) of the Okonite Okolon cables. Thermal aging on two Okonite supplied runs of 1/C # 12 7X Okonite 015 Okolon insulated wire is scheduled to begin approximately August 22, 2001.

The staff would be interested in witnessing the cable test at Wyle Laboratories. We appreciate your continued efforts on this subject. Please contact Paul Shemanski at 301-415-1377, pcs@nrc.gov or Cornelius Holden at 301-415-1288, cfh@nrc.gov if you have any questions on this issue.

Sincerely,

Jack R. Strosnider, Director
Division of Engineering
Office of Nuclear Reactor Regulation

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Jack R. Strosnider, Director
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Office of Nuclear Reactor Regulation

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