

February 23, 1983

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

'83 FEB 28 AIO:27

Before the Atomic Safety and Licensing Board

In the Matter of

CLEVELAND ELECTRIC, ILLUMINATING
COMPANY, Et Al.(Perry Nuclear Power Plant,
Units 1 and 2)Docket Nos. 50-440
50-441
(Operating License)OCRE REPLY TO APPLICANTS' ANSWER IN SUPPORT OF NRC STAFF
MOTION FOR SUMMARY DISPOSITION OF ISSUE #9

On January 14, 1983 the NRC Staff filed a motion for summary disposition of Issue #9 in this proceeding, which concerns radiation-induced polymer degradation. On February 8, 1983 Applicants filed a voluminous response to the Staff's motion which contained a number of assertions and references not previously identified in filings of either Staff or Applicants. 10 CFR 2.749 permits a party opposing a summary disposition motion to respond in writing within 10 days to new facts and arguments presented in any supporting statements which were not present in the papers of the moving party. It is pursuant to this provision that Ohio Citizens for Responsible Energy ("OCRE") files this reply, which is limited to only the new facts and arguments presented by Applicants, as specified below.

1. Applicants claim that a limitation of the Candia tests (see NUREG/CR-2156 and NUREG/CR-2157) is that, since electrical cable insulation samples were stripped from the conductor for the tests, thus exposing at least twice the insulation surface area to the oxygen-containing atmosphere, the tests may not be applicable to plant conditions (Srinivasan Kasturi Affidavit at 9, ¶ 18).

First, this argument ignores the fact that severe degradation

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of plant-installed cable actually occurred at the Savannah River Plant.

Secondly, stripping the insulation from the copper conductor may have eliminated another factor influencing polymer degradation: the strong effect of copper in promoting the thermo-oxidative degradation of at least one polymer, polyethylene. (NUREG/CR-2877 at 14)

2. Applicants claim that another limitation of the Sandia tests is that only mechanical properties were measured to detect degradation, whereas electrical properties would be of most importance for electrical insulation. Applicants also claim that later Sandia tests (Minor and Furgal, "Equipment Qualification Research Test of Electrical Cable with Factory Splices and Rework" NUREG/CR-2932, September 1982) indicate that cable insulation can still perform its electrical functions even with degradation of mechanical properties. (Kasturi Affidavit at 10, ¶¶ 19, 20)

This argument ignores the fact that degraded mechanical properties can, when combined with mechanical loads and stress, degrade electrical properties. E.g., embrittled insulation, when exposed to a seismic event, may crack, thereby degrading insulation integrity leading to electrical short circuits. The NUREG/CR-2932 studies (Vol. 2 at 18) revealed short circuits under high potential testing at points of mechanical loading of cables subjected to degradation experiments. [It should also be noted that Minor and Furgal observed strong dose rate effects influencing polymer degradation.]

3. Applicants claim that yet another limitation of the Sandia tests is that the dose rates used are far too high to be representative of normal dose rates in commercial power plants (Kasturi Affidavit at 11, ¶ 21).

This argument is illogical; if the dose rates used in the Sandia studies are too high to be applicable to actual plant operating conditions, then the typical qualification test dose rates are certainly too high to be applicable. Also, these dose rates used in the Sandia tests were chosen for the experimental purposes of determining the mechanism of dose-rate effects on polymer degradation, not to find a threshold dose rate at which degradation will occur. It should be noted that Gillen et al. emphasize in NUREG/CR-2763, "Loss of Coolant Accident (LOCA) Simulation Tests on Polymers: the Importance of Oxygen," July 1982, at 1 the significance of dose-rate effects: "the often used assumption of equal dose, equal damage [independent of dose rate] is wrong." The Sandia researchers conclude that more studies are needed with further lowering of the dose rates used (NUREG/CR-2763 at 29). [NUREG/CR-2763 at 16 also identified Tefzel, a polymer used in electrical coils at PNPP, as having large dose rate effects as well.]

4. Applicants claim that the degraded cable at the Savannah River Plant exhibited little degradation at exposure to dose rates of approximately 13 rad/hour (Kasturi Affidavit at 11, ¶ 22).

This is not true; see NUREG/CR-2877 at 10-12 and OCRE's Supplemental Response to Applicants' Second Set of Interrogatories, Interrogatory #19, dated February 7, 1983.

5. Applicants claim (Kasturi Affidavit at 12, 13, and 14, ¶¶ 23, 24, 25, and 26) polymer degradation does not significantly occur until the material has received an integrated dose of 10^6 - 10^7 rads, and that most equipment at PNPP will not receive such doses in the 40 year life of the plant.

FSAR Section 3.11 indicates that the following zones have normal integrated gamma doses exceeding 10^6 rads:

DW-1	2.8×10^7 rads	CT-6	3.0×10^6 rads
DW-2	4.5×10^7 rads	AB-5	1.1×10^7 rads
DW-3	2.0×10^6 rads	AB-7	1.7×10^7 rads
DW-4	2.8×10^7 rads	AB-8	7.75×10^6 rads
DW-5	2.8×10^7 rads	FB-6	9.4×10^6 rads
CT-5	1.8×10^8 rads	TB-1	3.0×10^6 rads

6. Applicants claim that design basis accident doses can be considered insignificant (Kasturi Affidavit at 18-19, ¶ 39). This is not corroborated by FSAR values. According to FSAR Section 3.11, the following zones have accident gamma doses (integrated over 180 days) exceeding the 10^6 rad threshold value for polymer degradation:

CT-0	1.6×10^7 rads	AB-3	1.9×10^7 rads
CT-1	4.2×10^7 rads	AB-4	4.1×10^7 rads
CT-2/ CT-3/ CT-4/CT-5/CT-6/CT-7/CT-8	1.8×10^7 rads	AB-5	1.1×10^7 rads
		AB-7	1.72×10^7 rads
DW-1/DW-2/ DW-3/DW-4/DW-5	2.7×10^8 rads	AB-8	9.5×10^6 rads
		FB-6	5.2×10^6 rads
AB-2	3.0×10^7 rads	FB-8	1.52×10^6 rads

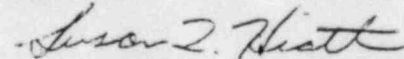
7. The operating plant survey (Kasturi Affidavit at 15-17, ¶¶ 31-36) is devoid of details which would allow independent scrutiny or analysis. Therefore the arguments based upon the survey should not be deemed uncontroverted, since Applicants have provided no real basis to controvert.

8. The surveillance/maintenance program described in the affidavit of David R. Green is so devoid of specifics and details that it

cannot be accepted as proof of anything. All that is described are general provisions of a yet-to-be-developed program. No indication is given of how degradation of specific equipment or components would be detected; e.g., how would embrittlement of electrical cables in conduit be detected? Is insulation resistance of such cables periodically measured? The information in the Green affidavit is too vague to have any bearing on Issue #9.

OCRE must conclude that Applicants' answer has not demonstrated the absence of a genuine issue of fact with respect to Issue #9. The Staff's motion for summary disposition must be denied.

Respectfully submitted,



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CERTIFICATE OF SERVICE

DOCKETER
NRC

This is to certify that copies of the foregoing OCRE REPLY TO APPLICANTS' ANSWER IN SUPPORT OF NRC STAFF MOTION FOR SUMMARY DISPOSITION OF ISSUE #9 were served by deposit in the U.S. Mail, first class, postage prepaid, this 23rd day of February 1983 to those on the service list below.

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