

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

August 31, 1983

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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

Glenn O. Bright
Dr. James H. Carpenter
James L. Kelley, Chairman

In the Matter of

CAROLINA POWER AND LIGHT CO. et al.
(Shearon Harris Nuclear Power Plant,
Units 1 and 2)

Dockets 50-400 OL
50-401 OL

ASLBP No. 82-468-01
OL

MOTION FOR PARTIAL SUMMARY DISPOSITION
ON EDDLEMAN CONTENTION 80

I. BACKGROUND

On May 14, 1982, Wells Eddleman, pro se, submitted Eddleman contention 80 on mixing and dispersion models for radionuclides. In its Memorandum and Order (Reflecting Decisions Made Following Prehearing Conference), dated September 22, 1982, the Board admitted Eddleman contention 80¹ (see at 62) saying it "alleges that the mixing and dispersion models for radionuclide emissions from Harris are deficient because they ... do not adequately account for rainout." Wells Eddleman now seeks partial summary disposition on the rainout issue. There is no genuine issue to be heard as to the facts that

¹Eddleman 80 reads in full: "The mixing and dispersion models for radioactive gas, liquid and other radiological releases from SHNPP under 10 CFR part 20 are deficient in that they assume more complete mixing and dispersion of such radionuclides released than will actually take place, take insufficient account of rainout of such a release plume in a small area (rain precipitating the radionuclides in the plume) and thus do not assure that releases comply with 10 CFR 20.106 and the protection of the public health and safety, including holding individual doses below 25 rem whole body & thyroid doses below 300 rem in an accident, and below 10⁻³ of those values in normal operation.

Applicants' mixing and dispersion models (which are NRC models) cannot model rainout.² Likewise, there is no dispute that rainout can increase nuclide deposition several orders of magnitude (i.e. 100 to 1000 times).³ There is no dispute that such an increase in the deposition of nuclides would bring Applicants' and Staff's estimates of population dose (calculated per Appendix I) into violation of the limit of 25 mrem/year whole body and 300 mrem/year thyroid to at least one individual in violation of 10 CFR 20.106 and Appendix I.

Taking ER Table 5.2.5-2 values for these doses (the NRC computes a higher release of radioiodines, see answer to my interrogatory 27, page 60,6/24/83), if we multiply the liquid dose by 100 (a value of 2 orders of magnitude, which is small in the range of "several orders of magnitude") it becomes 158 mrem/year whole body. Likewise, the gaseous whole body dose becomes 104 mrem/year (100 x 1.04) and the maximum dose to any organ becomes 5.2 x 100 or 520 mrem/year.

II. ACTION REQUESTED

Protection of the public health and safety from radioactive material released by operating nuclear power plants is among the highest of the Nuclear Regulatory Commission's responsibilities. Since the above-cited uncontested facts show that rainout can lead to exposures to radioactive material, and doses to the public, unacceptable under NRC regulations as cited in Eddleman contention 80, I respectfully request relief as follows:

² Applicants' response to Eddleman interrogatory 80-2(a), 4-28-83 at pp 31-32

³ BNL-3391, Diffusion and Deposition in Relation to Reactor Safety Problems, Summary and Conclusions at p.16, "The typical rainfall which is relatively light, greatly increases the deposition close to the source and usually extends the isolines of contamination to much greater distances than would be the case in dry weather ..."

Footnote continues on p 3

Under authority given the Board by 10 CFR 2.749, the Board should decline to grant an operating license to the Applicants until they have accurately modeled the effects of plume rainout on radionuclide doses to the public and concentrations allowed under 10 CFR part 20, and shown the doses to the public from radioactive emissions from the Harris plant do not exceed applicable NRC limits (e.g. 10 CFR 20.106, 10 CFR 50 Appendix I) when the effect of rainout is accurately included in modeling of such concentrations, exposures and doses to the public.

Respectfully submitted,

31 August 1983

Wells Eddleman

Wells Eddleman

ANNEX of material facts as to which there is no genuine issue to be heard, is attached hereto.

footnote 3 continued:

"...In dry weather, an initial rise of only a few hundred meters may reduce contamination downwind by several orders of magnitude. This rule cannot be applied during precipitation, and may in fact be reversed because of the more rapid movement of the debris." BNL 3391 at 16, Conclusions

Figures 10, 11, 12 and 13 (labeled 6, 10, 11 and 12 in the copy of BNL 3391 I have) dramatically show the very high deposition of radionuclides within 10 km (6 mi) of a nuclear site due to rainout. These should be contrasted with the figures showing deposition without rainout, see figs 2 and 3, +8
The rainout depositions give depositions at 10 km uniformly about 1000 times as high, as can be seen from the figures.

ANNEX to Wells Eddleman's 8-31-83 Motion
for partial summary disposition of Eddleman 80 re rainout.

Material facts as to which there is no genuine issue to be heard:

1. Applicants' (NRC) models of radionuclide mixing and dispersion (XOQDOQ and RG 1.145) cannot account for rainout.
2. Rainout significantly increases deposition of radionuclides, up to several orders of magnitude.
3. "several orders of magnitude" means at least 100 times.
4. Applicants dose estimates, corrected for rainout per the summary of BNL 3391 (p.16)(see fig. 12 thereof, and figs 10, 11, & 13) exceed applicable NRC limits, including Appendix I and the limits cited for normal operation in Eddleman 80.
5. Applicants' models for radionuclide airborne dispersion are NRC's XOQDOQ and RG 1.145 radiation
6. Population doses in excess of NRC rules should certainly not be allowed.
7. Figures 10,11,12 and 13 of BNL 3391 showing deposition of nuclides with rainout, are generally 1000 times higher in deposition shown, than the deposition without rainout shown in Figs 2,3,7 and 8 thereof.
8. 1000 is more than 100.