

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

DOCKETED
USNRC

August 31, 1983
'83 SEP -6 AM 1:07

OFFICE OF SECRETARY
DOCKETING & SERVICE
ANCH
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

JOINT INTERVENORS' RESPONSE TO STAFF INTERROGATORIES

Under our reading of the Board's 8-²⁴~~24~~-83 Order and pursuant to an oral request from counsel for the Staff, Joint Intervenor Conservation Council of NC, CHANGE/ELP, Rural Alliance and Wells Eddleman provide the following responses to NRC Staff Interrogatories to Joint Intervenor.

GENERAL INTERROGATORIES

Preliminary: Discovery is not open on Joint Contentions I and VII (see Board Order of 3-10-83) so no answers on these are provided. We understand (C. Barth to W. Eddleman, 5-83) that the Staff has dropped its requests for identity of non-witness experts.

1. Joint II: See responses of 5-16-83 and 8-31-83 to Applicants. The inadequacies are explained in considerable detail there and it is burdensome to repeat it here.

Joint IV, V, VI do not assert inadequacy of "analysis" by Applicants or Staff.

2. We don't have resumes of most of them. Gofman's background is in Radiation and Human Health, 1981. Not Applicable to IV, V & VI.

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3. Joint II: See referenced works and answers to Applicants' Interrogatories on Joint II. It is burdensome for us to write out a summary of views of individuals or groups expressed in their books or scientific papers. Staff can summarize as well as we can (though we do not guarantee Staff will). Not Applicable to IV,V,VI

4. See references in papers cited in responses to Applicants' Interrogatories on Joint II, and citations in ^{those} responses. We will make these available to Staff where they are in our possession.

Not Applicable to IV, VI, V.

5. See 4. Yes.

6. None identified so far.

7, 8: See 6.

9. Any calculations made responsive to specific interrogatories will be identified under them. To our knowledge, we have not calculated to substantiate our contentions at this point. Analysis is generally set forth in the basis for the contentions and those they supersede. We do not possess the information in the form you request it in.

Joint II: Analysis (see responses to Applicants, 5-16 and 8-31-83) shows that there are many factors leading to underestimation of health effects. These have not been precisely quantified by us yet.

Joint IV: Error of TLD's plus or minus 30% was established as basis of a contention in Catawba. Lack of real-time monitoring ability of TLDs is admitted. Ability of pressurized ionization monitors to detect specific nuclides in real time is known from manufacturers' specifications; Applicants say (resp to our int. 15(a)) that recording equipment is available for it. We believe that it is not ALARA unless doses are measured accurately, and the best

Applicants can come up with is about plus or minus 20%. That isn't accurate enough to determine exposure levels safely. At minimum,

the error should be assumed to be at maximum (including expected drift after calibration) in setting exposure limits, e.g. if calibration is within 20% and expected drift is 5% at the time of use, real dose should be assumed as 125% of indicated, and the limit used should be 0.8 (1/1.25) of that allowed were the instrument accurate. Joint Intervenor's still believe pressurized ionization measurement is the most appropriate and accurate way to assess actual radionuclides workers are exposed to.

V. Our analysis is based on known higher drift in longer intervals between calibrations. Look at the setpoint drift problems CP&L's Brunswick plant has had, and how much more frequent calibrations were needed to keep them more often within limits as required by technical specs. Air monitors and samplers are also subject to variations in volume. Applicants say their ^{emergency} air samplers will be within plus or minus 15% when calibrated, on volume intaken versus ~~xxxxx~~ reading of intake. In - plant monitors accuracy is not now known to Applicants (response to interrogatory 16(II) (a) 8-1-83) This can't be considered accurate enough when it's not even known. Joint Intervenor's believe 5% error is generous on air sampling volumes and could incorporate substantial error over time, especially since variation of air volume depends on the intake suction and thus may stayx off or move further off from the calibration standard over time.

JOINT VI: Lack of specific radionuclide detection on a prompt basis is shown in Applicants' response to our interrogatory 16 (III) pp 15-17 8-1-83. They need pressurized ^{rix} ionization monitors to do it as those are the only monitors we know that can rapidly detect specific radionuclides. They also (see resp to 16(II)) have to take time to analyze samples from air samplers. This shows that

the data from these samplers isn't prompt either. Knowing what nuclides are being released is necessary to protect public health and safety and to protect the public and emergency response personnel in and out of the nuclear plant. ALARA is not satisfied if only some nuclides are detected, after some time, when equipment is available to promptly detect them all, both at release and in the environment and where emergency personnel and the public are at risk of being exposed.

10. Analysis was made by the representatives of the Joint Intervenors, and by those (names not known to responder) who helped formulate their contentions; Analysis also includes ideas from nonwitness experts, as to whom the Staff has dropped its inquiry pursuant to the Board's 5-27-83 Order. You know the addresses and telephone numbers of all representatives of the Joint Intervenors. We object to providing the other information as to nonwitness experts. If we find other responsive information we will supplement this answer.

11. Please see response to Interrogatory 9; its answer is yes, and summaries are given for Joint IV, V and VI: objection to summarizing for Joint II because the info is so extensive and it's been given in response to Applicants' interrogatories.

12. You have a copy on pages 2-4 above; - Yes, other analysis will be made available; identification of nonwitness experts will be deleted from it if any were involved in it.

13. Wells Eddleman, 718-A Iredell, Durham NC 27705, 919-286-3076. Information on who else contributed to each answer is not available in the form requested; nonwitness experts are not identified.

SPECIFIC INTERROGATORIES

(Joint IV): 14. We do not have this info yet by sampling distribution. Our analysis is not complete of the info received

from Applicants 8-1. E.g. the Health Physics article they refer to re TLD's, April (1983, though they don't say that) (8-1-83 response^s at 11) was not available at the UNC-CH Health Sciences Library when Wells Eddleman was there last week.

The unreliability of TLDs to plus or minus 30% is established as the basis for an admitted contention in the Catawba proceeding. Inaccuracies in the plus or minus 50% and more range have been reported, but the cite on that is not readily available. We understand it was a study done for the NRC and that when accuracy of plus or minus 30% could not be achieved for dosimetry^{by most laboratories}, the NRC relaxed its standards. Joint intervenors do not believe such relaxation of standards is consistent with ALARA or the protection of the public health and safety. We believe the info may be in NUREG CR 2891 and 2892 which we haven't yet reviewed. 15. See response to 14. Will supplement when analysis done.

16. We don't know yet. We object to "which may be used" since we should only have to answer for what CP&L says it will use. CP&L plans to use TLDs made in Japan, not the USA, see response to our interrogatory 16(I)(a) 8-1-83 at 9, top.

17. See response to 14. We will supplement when more info is available. We don't know what "generation" of TLDs you mean, as the Harris TLD's identified by Applicants appear to be a new type on which data is just being published this year, ref. their 8-1-83 response at 11, article by Takenaga, Yamamoto and Yamashita, April (1983) "A New Phosphor LiBO:Cu for TLD", Health Physics 44(4) no page cite given. As noted above, we looked for this document (WE did) and it was not available last week.

18. Joint Intervenorors have not determined all this data. We believe portable pressurized ionization monitors with real-time recording equipment attached are available in packages small enough

and light enough in weight to be moved near work stations and used in radiation hazard areas are available. Our analysis is not yet complete.

19. Yes, if equipped with recording equipment which Applicants agree is available. Computation may be required. The dose found in this way, however, will be much more accurately determined than by a TLD with an accuracy of plus or minus 30%. Compare EPA document RD 71-1, p.33, end of section 3.3.8, desirability of knowing nuclides.

20. See Applicants' response to 15(a) 8-1-83; we also rely on opinions of nonwitness experts Wells Eddleman has spoken with in the past. We object to identifying them here; we understand Staff is not requesting identification of such nonwitness experts anyway.

21. Analysis is incomplete. Additional data was supplied by Applicants 8-1-83. We will supplement but do not have time now to undertake this review just to answer your question. The contention does not deal directly with the accuracy of self-reading dosimeters, but we have not established their accuracy either.

22, 23: Please see 21. Addendum to 23: If the TLD readings are inaccurate, the other dosimeter cannot verify them and should not. The only useful information would be when either the range of error (plus and minus) of both the TLD and the self-reading dosimeter used at the SAME POINT and SAME TIMES either (1) completely overlap, thus confirming each other within their margins of error, or (2) completely fail to overlap, indicating that one or the other, or perhaps both, are wrong.

JOINT CONTENTION V

24. Wells Eddleman doesn't possess PG 8.25. Travis Payne has looked for it and cannot locate it. We will supplement when we get a copy. Wells Eddleman has ordered one.

25. See 24.

26. The only ones known to us to be for use at Harris are those identified by Applicants 8-1-83 to us. If we learn more we will supplement. The identification of monitors is given by them and we don't have time to retype it for you.

27. We relied on opinions of those who formulated or helped to formulate contentions for the individual intervenors -- not list is available -- this includes nonwitness experts. Further analysis is incomplete and we will supplement when we have more. Applicants concede that NRC recommends every 6 months, not every year. See their questions to us, and our responses, on that. We believe this is in their first set, January 1983 date (31st), but can't readily locate it when these responses are being prepared.

Joint VI

Second 27. We believe that except for some radioiodines (e.g. I-131) and some noble gases (e.g. some Kr and Xe isotopes), all radionuclides escaping the Harris plant will not be detected as those specific radionuclides in the amounts released. Applicants are not installing equipment to detect specific radionuclides.

28. From the main vent stack, all HVAC exhaust points, all release points identified by Applicants so far in the FSAP and in response to interrogatories by any parties, and from other points, and as liquids both through the radwaste processing system and by bypassing it.

29. None of the detectors identified by Applicants has the ability to detect specific radionuclides other than I-131 and some Kr and Xe isotopes, so far as we are aware. The contention is that the specific radionuclides and amounts released will not be detected (in part: this is the last part of it).

Environmental monitoring cannot cure this deficiency because

environmental monitors are not sensitive enough nor numerous enough to detect what the plant is actually releasing. A study by D. Pisello et al (copy not yet in hands of any of JI to best of WE's current knowledge) points out that the minimum release detectable even by a ring of monitors such as in Applicants' environmental monitoring program is still on the order of a billion times the minimum detection limit of the detector (or analysis method for the monitor, assuming no decay in getting to the ~~detector~~ ^{monitor} or in getting analyzed). Thus, releases of many times (up to nearly 1 billion times) the minimum detection limit of any detector or analysis method may go undetected as far as the specific nuclides and amounts in the environment. Indeed, the entire release would go undetected in the environment.

Applicants state that their stack monitoring equipment etc can be out of service without having the plant shut down. Thus, unmonitored releases (even as to counts per minute, which is not identifying specific nuclides and amounts) can occur. There are also release points CP&L does not monitor. (see responses to interrogatories on Eddleman 29: as easy for you to look up as for us to).

There is also the opinion of nonwitness expert "Xerxes Xoe" who says "you need to know what is coming out of the plant at all times" to assure radiological safety for the public.

30. We don't have a catalog of pressurized ionization monitors accessible, and may not have one at all. We will supplement as necessary as we continue our analysis. We cannot guarantee that any given monitor will detect and measure all radionuclides released from Harris if CP&L operates it. We believe doubly or triply redundant detectors would be preferable and allow for outages. Triply redundant or more would be best as it gives more reliability of function and more ability to crosscheck readings.

31. See 30 as to incompleteness of present analysis. Pressurized ionization detectors can detect specific radionuclides being passed through them. The ability to make such detection, assess the amounts, and record the results (see App's response to our interrogatory 15(a), 8-1-83) is required.

32. (1) ALARA (2) Atomic Energy Act requirement that safety of public be primary responsibility of AEC (and successor NRC) (3) opinion of "Xerxes Xoe", nonwitness expert informally consulted. (4) 10 CFR part 20 which sets limits for every nuclide released, among fission products, activation products, transuranics and other radioisotopes found or produced in nuclear power plants (e.g. Harris). (5) RD-71-1, CP&L Document 000008, end of section 3.3.8 at page 33
Further analysis on this question is incomplete and we may supplement this response when we have more information.

33. There is no interrogatory 33.

34. Analysis is not complete. We do not think the analysis required for the contention can be done until the emergency plan is set forth and made available to us for review. Detection time is only part of the problem, and while we would not argue it is irrelevant, it is incomplete and needs to be analyzed in the context of the emergency plan.

35. Analysis incomplete. Joint Intervenors have not yet quantified this detection time in any detail. However, since even the fastest methods proposed by Applicants involve taking samples and analyzing them, direct-readout pressurized ionization monitors will give faster readings. As to nuclides Applicants do not have equipment to directly detect, any method that detects them is faster (since not-detected is the same as never detected). Pressurized ionization equipment with direct readout is much faster.

Of course, this equipment should also record its readings for integrated dose calculations and future reference as well as direct use during emergencies.

36. See above responses for some descriptions of deficiencies. Our analysis is not complete. It is not available in the form requested and it would be burdensome to work it up in that form. As we develop our analysis further, we will supplement this response at an appropriate time. We will attempt to locate the sections as best we can, down to the lines as we review them, if that is practical.

37. See 36 above and above responses. As noted above, analysis is presently incomplete. See also questions and responses on Eddleman 80 (release points) and 29 (release points and methods of leakage/escape of radionuclides. Where radioiodines can escape, in general other nuclides can too as gases, liquids or particles, particularly those in elemental or chemically-bonded forms as or more (1) volatile or (2) soluble than radioiodines, but not limited to x these).

NOTE: THERE WERE NO SPECIFIC INTERROGATORIES FROM STAFF ON JOINT II.

Production of documents: Those we possess, we will produce; please contact Wells Eddleman by 9-30-83 to arrange mutually convenient place and time and conditions.

I hereby affirm the above responses are true to the best of my present knowledge and belief.

8-31-83


Wells Eddleman