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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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BEFORE THE ATOMIC SAFETY AND LICENSING APPEAL BOARDS

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In the Matters of)

PHILADELPHIA ELECTRIC COMPANY ET AL.)
(Peach Bottom Atomic Power Station,)
Units 2 and 3))

Docket Nos. 50-277
50-278

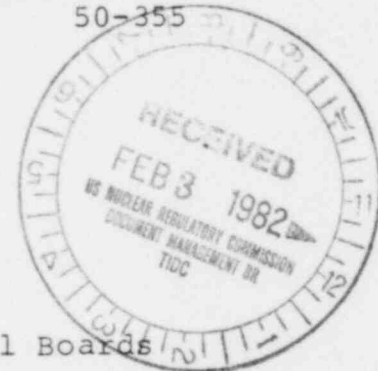
METROPOLITAN EDISON COMPANY ET AL.)
(Three Mile Island Nuclear Station,)
Unit 2))

Docket No. 50-320

PUBLIC SERVICE ELECTRIC AND GAS CO.)
(Hope Creek Generating Station,)
Units 1 and 2))

Docket Nos. 50-354
50-355

THREE MILE ISLAND UNIT 2
LICENSEES' REPLY TO INTERVENORS'
RESPONSE TO ALAB-654



In ALAB-640, 13 NRC 487 (1981), the Appeal Boards determined the amounts of radon-222 released to the atmosphere as a result of the mining and milling of uranium needed to fuel a model 1000 MWe reactor, as well as each of the facilities involved in this consolidated proceeding. In ALAB-654, 14 NRC _____ (September 11, 1981), the Appeal Boards gave the intervenors the opportunity to demonstrate that radon emissions in the amounts determined in ALAB-640 "will produce a substantial enough incremental environmental effect both (1) to require consideration in the NEPA cost/benefit balance for each facility; and (2) to tip that balance against plant operation." ALAB-654, slip op. at 4.

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The Appeal Boards noted that the subject of health effects from fuel cycle releases was thoroughly explored in evidentiary hearings in the Perkins proceeding (Duke Power Company (Perkins Nuclear Station, Unit 1, 2, 3), Docket Nos. STN 50-488, 50-489, and 50-490, hearing held on May 16 and 17, 1978) ("Perkins Hearing"), in the context of calculated releases not dissimilar to those determined in ALAB-640. Based on the calculated releases offered at the hearing, and on the testimony of highly qualified expert witnesses, the Perkins Licensing Board concluded that the incremental radon contribution of the uranium fuel cycle attributable to the Perkins facilities would not have significant health effects. Duke Power Company (Perkins Nuclear Station, Units 1, 2, and 3), LBP-78-25, 8 NRC 87, 95-100 (1978).

The Appeal Boards ruled that as a condition precedent to the holding of a further evidentiary hearing on the environmental effects of the radon releases associated with the uranium fuel cycle, the intervenors had to make "a concrete threshold showing that there is a difference in competent expert opinion on the health effects issue." ALAB-654, slip op. 6. To make such a showing, intervenors had to provide "the documented opinion of one or more qualified authorities to the effect that the incremental fuel cycle-related radon emissions will have a significant environmental effect in terms of human health." ALAB-654, slip op. at 6, emphasis in original. Such an opinion would have to take into account explicitly "(1) the comparative relationship between the amount of those emissions (as found in ALAB-640) and of natural radon emissions; and (2) the fluctuations in natural emissions (indoor

vis a vis outdoor as well as from one geographic area to another)" and would have to explain how "a very small increment to natural background radon, falling well within the fluctuations in natural radon levels, might have significant health effects on its own." ALAB-654, slip op. at 7.

The intervenors were given sixty days to respond to the very explicit directives of ALAB-654. After two extensions of time, the intervenors in the Peach Bottom and Three Mile Island Unit 2 proceedings filed on December 18, 1981 a document entitled "Intervenors' Response to ALAB-654" ("Intervenors' Response").
^{1/}
No other responses were filed.

The Intervenors' Response consists of a three-page memorandum to which is attached a "Supplemental Affidavit of Dr. Chauncey Kepford Setting Forth the Intervenors' Statement of the Facts as to Which There is a Material Dispute" ("Kepford Supplemental Affidavit") [which, among other things, refers to a

^{1/} The Intervenors' Response states that Ecology Action of Oswego, intervenor in the now-terminated Sterling proceeding, Rochester Gas and Electric Co. ((Sterling Power Project, Nuclear Unit 1), Docket No. STN 50-485) joins in it. Mr. David Caccia, intervenor in the Hope Creek proceeding, did not attend the evidentiary hearing in the consolidated radon proceeding and did not file a response to ALAB-654.

June 26, 1979 "Affidavit of Dr. Chauncey Kepford Setting Forth the Intervenor's Statement of the Facts as to Which There Is a Material Dispute" ("Kepford Affidavit")]. The Response and the two affidavits fail to meet the requirements of ALAB-654, for they do not make a showing that there is a difference in competent expert opinion on the health effect issue that would require another hearing in this protracted proceeding. Consequently, the Appeal Boards should now determine that the de minimis approach adopted by the Licensing Board in Perkins was correct, and that the health effects of radon releases attributable to the fuel cycle for the facilities involved in this proceeding are negligible and need not be further considered in the NEPA cost/benefit analysis for those facilities.

The first way in which the Intervenor's Response falls short of the ALAB-654 requirements is that it does not proffer "competent expert opinion" by "one or more qualified authorities." Whatever his qualifications may be in other fields, Dr. Kepford has received no academic training, nor possesses any work experience, in health physics, radiation biology, anatomy, physiology, medicine, epidemiology, or any other discipline relevant to an assessment of the health effects of radon-222 emissions on humans; nor has he authored any papers, technical reports or other publications that would evidence his expertise in those disciplines.^{2/} See Deposition of Chauncey Kepford in the Perkins proceeding, taken on June 8, 1978,

^{2/} No statement of Dr. Kepford's qualifications is attached to either of his two affidavits. A statement of Dr. Kepford's qualifications is included in the record of the Perkins proceeding, foll. Tr. 2820. Neither that statement nor the voir dire examination in his deposition give any indication that he qualifies as an expert on the matters of interest here.

Tr. 2677-2710. In view of his obvious lack of qualifications, Dr. Kepford's opinions do not rise to the level of expert testimony and can not create a factual issue against the opinions of well qualified expert witnesses such as Dr. Leonard D. Hamilton. See ALAB-654, slip op. at 5-6.

The second way in which the Intervenor's Response fails to comply with ALAB-654 is by not being responsive to the Appeal Boards' call for a showing that the incremental fuel-cycle related radon emissions will have a significant effect on human health taking into account "(1) the comparative relationship between the amount of those emissions (as found in ALAB-640) and of natural radon emissions; and (2) the fluctuations in natural emissions (indoor vis a vis outdoor as well as from one geographic area to another)." ALAB-654, slip op. at 7. Instead of addressing these clearly identified questions, the Intervenor's Response and Kepford Supplemental Affidavit merely take exception to the Appeal Boards' premise and repeat their time-worn argument that background radiation is irrelevant to a determination of the health impact of the fuel cycle radon releases. Intervenor's Response, passim; Kepford Supplemental Affidavit, paras. 9-10. In fact, it is well established, both in the courts and in Commission proceedings, that insignificant or de minimis risks need not receive detailed consideration by an agency in fulfilling its regulatory function over an industrial activity. Industrial Department, AFL-CIO v. American Petroleum Institute, ___ U.S. ___, 100 S. Ct. 2844, 2875 (1980) (C.J. Burger, concurring); Carolina Environmental Study Group v. United States, 510 F.2d 796 (D.C. Cir. 1975); Citizens for Safe Power v. Nuclear Regulatory Commission, 524 F.2d 1291, 1300-1301 (D.C. Cir. 1975); Ethyl Corporation

v. EPA, 541 F.2d 1, 18 (D.C. Cir.), cert. denied, 426 U.S. 941 (1976). And the courts have also sanctioned a comparison of the radioactive emissions attributable to an industrial activity with natural background radiation as a way to determine whether the industrial activity has a significant environmental impact. Citizens For Safe Power, supra, 524 F.2d at 1296-1301; Peshlakai v. Duncan, 476 F. Supp. 1247, 1253 (D.D.C. 1979) (radon emissions from uranium milling and mining de minimis when compared to natural background radiation).

Given the intervenors' failure to make the showing required in ALAB-654 as a condition precedent to the holding of a further evidentiary hearing, the Appeal Boards should proceed now to make the final determination on the radon issue. The record in Perkins and the previous filings by the parties suffice for the Appeal Boards to find that the environmental impact of the radon-222 releases associated with the uranium fuel cycle is negligible. In addition, the attached "Affidavit of Leonard D. Hamilton, M.D., concerning the Health Effects of Radon Releases from Uranium Mining and Milling" ("Hamilton Affidavit"), demonstrates that the arguments made in the Intervenor's Response and the Kepford Supplemental Affidavit lack scientific basis and raise no material issues of fact which would require a further evidentiary hearing on this matter.

The Hamilton Affidavit computes the health effects on individuals and populations of the fuel cycle radon emissions for the reactors involved in this proceeding based on the ALAB-640 release data. It demonstrates that the probability of an individual contracting a fatal cancer during his lifetime as a result of the radon-222 releases attributable to a large power reactor is negligible,

even for a hypothetical maximally exposed individual.^{3/} See Hamilton Affidavit, paras. 9-10, 12-14. Moreover, the incremental risk to human health posed by fuel cycle radon-222 releases is also insignificant in comparison to the small risk resulting from natural sources of radiation. Hamilton Affidavit, para. 11. Thus, both in absolute terms^{4/} and in comparison to the unavoidable exposure

3/ Intervenors' principal argument for holding a hearing on the health effects issue is that there is some risk that adverse health effects will result from exposure to even very low levels of radiation. See Kepford Supplemental Affidavit, paras. 1, 9. Dr. Hamilton points out in his affidavit that in all likelihood a threshold dose exists below which the repair mechanisms in the human body will nullify the effects of exposure to radiation. Hamilton Affidavit, paras. 3-7. Nevertheless, Dr. Hamilton's calculations were made using intervenors' theory, i.e., the conservative no-threshold linear hypothesis. Even using this hypothesis, the calculated individual and population risks due to uranium fuel cycle radon releases are negligible.

4/ Intervenors have repeatedly argued that proper analysis of the radon health effects requires that population health risks due to radon releases be integrated over the entire period of activity of the radon predecessors. They add fractional yearly deaths over 4.5 billion years (the period of activity of uranium-238) and come up with one hundred million premature deaths from cancer per annual fuel requirement per reactor. Kepford Supplemental Affidavit, paras. 3-5.

Dr. Hamilton demonstrates that such claims make neither analytical nor practical sense. For instance, the worst-case radon emissions from unsealed mines and uncovered tailings per year of operation of the Three Mile Island Unit 2 reactor would have an upper bound impact of 0.0016 deaths per year in the entire population of the United States. Hamilton Affidavit, Exhibit "F". These probabilistically computed fractional deaths do not accumulate over generations, just as radiation doses do not transfer from one individual to the next. Hamilton Affidavit, para. 15. Even if they did, it is totally unrealistic to assume continued availability of radon sources, continued presence of a population to receive radiation doses, and continued fatality of radiation induced cancer over a period of 4.5 billion years. Hamilton Affidavit, para. 16. For these reasons, the "uncertainty inherent in the computational procedure proposed by the intervenors ... renders it an exercise in mathematical futility." Id.

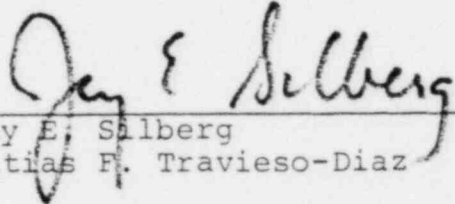
to natural background radiation, the health impact of radon-222 releases resulting from the fuel cycle for a reactor such as those involved in this proceeding is truly de minimis and need not be considered when making the NEPA cost-benefit analysis for the facility.

For the foregoing reasons, the Appeal Boards should rule that no further evidence needsto be taken in this proceeding and bring it to a close by finding that the radon-222 emissions resulting from the fuel cycle for each facility have an insignificant environmental impact and do not affectthe cost/benefit balance for the facility.

Respectfully submitted,

SHAW, PITTMAN, POTTS & TROWBRIDGE

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