

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

Yankee Atomic Electric Company

(Yankee Rowe Nuclear Power Station)

)
)
) Docket No. 50-029

) ASLBP No. 96-718-01-R

) September 13, 1996

CITIZENS AWARENESS NETWORK'S
AND NEW ENGLAND COALITION ON NUCLEAR POLLUTION'S
REPLY STATEMENT OF MATERIAL FACTS IN DISPUTE

Introduction

Intervenors Citizens Awareness Network and the New England Coalition on Nuclear Pollution submit the following statement of disputed material facts in reply to the NRC Staff's Response in Support of Yankee Atomic Electric Company's Motion for Summary Disposition (September 9, 1996) (hereinafter "Staff Response"). This reply statement is supported by the attached Reply Affidavit of Marvin Resnikoff, Ph.D (September 12, 1996) (hereinafter "Resnikoff Reply").

Disputed Material Facts

1) Intervenors dispute the staff's claim that the occupational DECON doses already incurred are 440 person-rem "as a matter of record." Staff Response at 6. See also supporting Affidavit of Morton B. Fairtile, par. 5.d (September 9, 1996) (hereinafter "Fairtile Affidavit"), which asserts that YAEC's stated value of 440 person-rem is a "reasonable representation." As detailed in the Affidavit of Marvin Resnikoff, Ph.D (September 6, 1996) (hereinafter "Resnikoff"), YAEC has underreported incurred doses in numerous respects. The categories in which

YAEC has incorrectly underestimated or failed to include decommissioning doses in its calculation of incurred doses include the following: reporting of gamma doses to workers characterized as receiving "no measurable exposure" (Id., pars. 15-21); dose measurements for decommissioning activities in 1992 (Id., pars. 22-25); doses attributed to operating and maintenance (Id., par. 28); inhalation exposures (Id., pars. 34-39); off-site waste processing (Id., pars. 40-42); transportation exposures (Id., pars. 43-46); and public exposures due to effluent releases (Id., par. 47). See also Resnikoff, Tables 1, 2, and 3.

2) NRC staff affiants Charles A. Willis and Morton B. Fairtile both assert that YAEC's methodology for projecting radiation doses comports with industry practice. Affidavit of Charles A. Willis In Support of the NRC Staff's Response in Support of Yankee Atomic Electric Company's Motion for Summary Disposition, par. 6 (September 9, 1996) (hereinafter "Willis Affidavit"); Fairtile Affidavit, par. 5. As Dr. Resnikoff discussed in his Reply Affidavit, however, the fact that YAEC's methods generally comport with industry practice does not guarantee that they will be reliable. Resnikoff Reply, par. 4. The results of dose projections depend on the quality of the individual model and data inputs to the model. Here, YAEC has not provided enough information regarding the data inputs for the TLG model in order to evaluate their reliability. Moreover, YAEC has used neither the NRC-preferred practices for bioassays for parti-

cle inhalation, nor the current method for predicting transportation doses. Resnikoff, pars. 36-38, 43-46. Finally, the Yankee Rowe design is one-of-a-kind, and therefore models and data that are used for other plants may not necessarily be valid in comparison. Resnikoff Reply, par. 4.

3) Mr. Willis and Mr. Fairtile also state that their confidence in YAEC's methodology is reinforced by the accuracy of YAEC's previous dose projections. Willis Affidavit, par. 5; Fairtile Affidavit, par. 6. This assertion is not supported by the factual record. It appears that most of YAEC's previous dose projections for now-completed projections were based on actual dose measurements for the activities and/or ALARA reviews. See CAN's and NECNP's Statement of Material Facts in Dispute, par. 3.f. To the extent that the 1993 projections were based on actual dose measurements for the activities, they do not constitute projections at all. In addition, dose projections from ALARA reviews for near-term projects will be close to actual exposures. One cannot expect the same degree of accuracy with respect to dose projections for long-term activities, for which there are no actual measurements or ALARA reviews. Id. and Resnikoff Reply, par. 5.

4) Intervenors also dispute statements by Mr. Willis and Mr. Fairtile regarding the similarity of future work with past work, and the "routine" nature of future work. Willis Affidavit, par. 6; Fairtile Affidavit, pars. 5 and 5.c. A significant por-

tion of the remaining work consists of demolition of buildings and foundations, involving spalling of contaminated concrete, use of jackhammers and rock splitters, and/or explosive techniques. Resnikoff Reply, par. 6. This type of activity has not been undertaken to any significant extent so far. In addition, YAEK must clean up contamination in the soil and groundwater, which has not been started yet. In fact, YAEK has not even submitted a Site Characterization Report for this work yet, so it is impossible for anyone to evaluate likely doses due to such work. Id.

5) Both the demolition work and the soil clean-up are likely to be dusty and dirty work that may cause significant radiation doses. Resnikoff Reply, par. 6. YAEK has virtually no relevant experience with this work on which it could base future dose estimates. Thus, neither of these activities is "routine" or "familiar." In addition, YAEK refers to categories of decommissioning activities such as "Etc." or "Miscellaneous," without defining them. Therefore, there is no basis for evaluating the nature of these activities, the doses they are likely to cause, or whether they are familiar or routine. Id.

6) Mr. Fairtile states that the reactor vessel removal will be very much like the steam generator removal project. Fairtile Affidavit, par. 5.c. He also asserts that the future dismantlement of the lower neutron shield tank is "expected to be like the successfully completed Upper Neutron Shield Tank project." He

concludes, therefore, that "all the remaining work defined as 'major' would likely be performed below the YAEK estimates." Id. Intervenor's dispute these conclusion as ill-founded. Both the pressure vessel and the lower neutron shield tank are significantly more radioactive than the steam generators and the upper neutron shield tank, thus affecting the doses that their removal will cause. Resnikoff Reply, par. 7. As YAEK has previously stated, the reactor vessel, plus the lower shield tank, contain 99% of the remaining radioactivity in the plant. Letter from Andrew C. Kadak to John C. Hoyle at 4 (October 24, 1995). In contrast, the steam generators and the upper neutron shield had comparatively moderate levels of radioactivity. For instance, YAEK described the inner wall of the shield as only "mildly activated." Letter from YAEK to NRC (October 19, 1995). In addition, the upper and lower neutron shield tanks are positioned differently in relation to the reactor vessel, which is extremely radioactive. Resnikoff Reply, par. 7. YAEK has stated that the upper neutron shield tank is located above the reactor vessel support lugs, which hold up the reactor vessel. Letter from YAEK to NRC (October 19, 1995). If, as it appears, the lower neutron shield tank is below or at the same level as the lugs, it may be more complicated to remove. As discussed below, residual lead contamination may also complicate removal of the lower neutron shield tank. Resnikoff Reply, par. 7.


7) Intervenor's also dispute Mr. Fairtile's conclusion that the upper neutron shield tank removal project was "successful."

Compare Fairtile Affidavit, par. 5.c, with Resnikoff Reply, par. 8. According to the NRC staff, removal of the upper neutron shield tank would not have been allowed prior to approval of YAEC's decommissioning plan but for the fact that the tank had become contaminated with lead dust when the lead shielding was cut during the Component Removal Program. Yankee Atomic Electric Co. (Yankee Nuclear Power Station), DD-96-1, 43 NRC 29, 38-39 (1996). The NRC found that removal of the upper neutron shield tank necessary to protect plant workers against a lead dust hazard if the plant were placed in SAFSTOR. Id. Had YAEC left the upper neutron shield intact in the first place, it could have avoided the lead contamination and thereby appropriately delayed removing the upper neutron shield tank until after approval of the Decommissioning Plan. Therefore, the upper neutron shield tank removal represents a real failure of the decommissioning process, not a success. It also shows that in the process of decommissioning, a licensee may create new exposure risks that were not previously considered in dose estimates. Resnikoff Reply, par. 8.

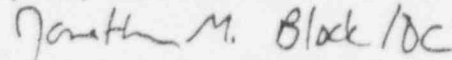
8) Mr. Fairtile asserts that YAEC's projections were "slightly on the high or conservative side." Fairtile Affidavit, par. 5. Intervenors dispute this assertion on several grounds. First, as discussed in the Resnikoff Affidavit, pars. 29-31, YAEC has not provided enough information on which to evaluate YAEC's dose projections, let alone support a finding that these projec-

tions are conservative. Second, YAEC's projection of 91 person-rem for its remaining dismantling activities over the next two and a half years is inconsistent with its previous performance, and, is thus nonconservative. As discussed in the Resnikoff Affidavit, par. 32, decommissioning doses have remained at roughly the same level of 160 person-rem/year since 1992. This includes TLD readings of 72 person-rem for the first half of 1996, a period when YAEC was engaged in ostensibly "minor" decommissioning activities. Resnikoff Reply, par. 9. There is no reason to believe this trend will decline, and in fact it may well increase due to the very dirty demolition work ahead. Resnikoff Affidavit, par. 32. Third, the non-conservatism of YAEC's dose estimates is further demonstrated by the fact that YAEC's 1993 dose projections for removal of reactor vessel internals, which apparently were not based on actual dose measurements or ALARA reviews but solely on estimated input to the TLG data base, were off by a factor of 3.5. This shows a very high margin of error, not a slight conservatism. Resnikoff Affidavit, par. 32. Finally, as discussed in paragraph 1 above, YAEC has omitted or underreported doses for numerous aspects of its decommissioning operation, thus adding to the non-conservatism of YAEC's projected radiation exposures to workers and the public.

Respectfully submitted,



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September 13, 1996

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REPLY AFFIDAVIT OF MARVIN RESNIKOFF, Ph.D

I, Marvin Resnikoff, being duly sworn, state as follows:

1) On September 6, 1996, I filed an affidavit in support of CAN's and NECNP's opposition to YAEC's motion for summary disposition, Affidavit of Marvin Resnikoff, Ph.D (hereinafter "Resnikoff Affidavit").

2) This Reply Affidavit is submitted in support of CAN's and NECNP's Reply to the NRC Staff's Response in Support of YAEC's Motion for Summary Disposition (September 13, 1996). In particular, this affidavit addresses certain statements made in the affidavits submitted in support of the NRC staff's response: Affidavit of Charles A. Willis In Support of the NRC Staff's Response in Support of Yankee Atomic Electric Company's Motion for Summary Disposition (September 9, 1996) and Affidavit of Morton B. Fairtile In Support of the NRC Staff's Response in Support of Yankee Atomic Electric Company's Motion for Summary Disposition (September 9, 1996).

3) I continue to abide by the opinions expressed in my previous affidavit. In addition, I would like to respond to several assertions made by Mr. Willis and Mr. Fairtile regarding the reliability or acceptability of YAEC's "to go" dose estimates.

4) Mr. Willis and Mr. Fairtile assert that YAEC's methodology for projecting radiation doses comports with industry practice. Willis Affidavit, par. 6, Fairtile Affidavit, par. 5. The fact that YAEC's methods generally comport with industry practice, however, does not guarantee that they will be reliable. The results of dose projections depend on the quality of the individual model and data inputs to the model. In this case, as I have previously stated, YAEC has not provided enough information regarding the data inputs for the TLG model in order to evaluate their reliability. Resnikoff Affidavit, par. 31. Additionally, YAEC has used neither the NRC-preferred practices for bioassays for particle inhalation, nor the current method for predicting transportation doses. See Resnikoff Affidavit, pars. 34-36, 43-46. Finally, the Yankee Rowe design is one-of-a-kind, and therefore models and data that are used for other plants may not necessarily be valid in comparison.

5) Mr. Willis and Mr. Fairtile also state that their confidence in YAEC's methodology is reinforced by the accuracy of YAEC's previous dose projections. It appears, however, that most of YAEC's previous dose projections for now-completed projections were based on actual dose measurements for the activities and/or ALARA reviews. See CAN's and NECNP's Statement of Material Facts in Dispute, par. 3.f. To the extent that the 1993 projections were based on actual dose measurements for the activities, they do not constitute projections at all. Moreover, as I have previously stated, dose projections from ALARA

reviews for near-term projects will be close to actual exposures. Resnikoff Affidavit, par. 31. One cannot expect the same degree of accuracy with respect to dose projections for long-term activities, for which there are no actual measurements or ALARA reviews. See Resnikoff Affidavit, par. 30.

6) I also disagree with the statements by Mr. Willis and Mr. Fairtile regarding the similarity of future work with past work, and the "routine" nature of future work. Willis Affidavit, par. 6; Fairtile Affidavit, pars. 5 and 5.c. It appears that a significant portion of the remaining work consists of demolition of buildings and foundations, involving spalling of contaminated concrete, use of jackhammers and rock splitters, and/or explosive techniques. To my knowledge, this type of activity has not been undertaken to any significant extent so far. In addition, YAEC must clean up contamination in the soil and groundwater. To my knowledge, none of this work has been started yet. In fact, YAEC has not even submitted a Site Characterization Report for this work yet, so it is impossible for anyone to evaluate likely doses due to such work. Both the demolition work and the soil clean-up are likely to be dusty and dirty work that may cause significant radiation doses. YAEC has virtually no relevant experience with this work on which it could base future dose estimates. Thus, neither of these activities is "routine" or "familiar." In addition, as I have previously noted, YAEC refers to categories of decommissioning activities such as "Etc." or "Miscellaneous," without defining them. Resnikoff Affidavit, par. 29. Therefore, there is no basis for evaluating the nature of these activities, the doses they are likely to cause, or whether they are familiar or routine.

7) Mr. Fairtile states that the reactor vessel removal will be very much like the steam generator removal project. Fairtile Affidavit, par. 5.c. He also asserts that the future dismantlement of the lower neutron shield tank is "expected to be like the successfully completed Upper Neutron Shield Tank project." He concludes, therefore, that "all the remaining work defined as 'major' would likely be performed below the YAEC estimates." Id. I do not believe these conclusion are well-founded. Both the pressure vessel and the lower neutron shield tank are significantly more radioactive than the steam generators and the upper neutron shield tank, thus affecting the doses that their removal will cause. As YAEC has previously stated, the reactor vessel, plus the lower shield tank, contain 99% of the remaining radioactivity in the plant. In contrast, the steam generators and the upper neutron shield had comparatively moderate levels of radioactivity. For instance, YAEC described the inner wall of the shield as only "mildly activated." Letter from YAEC to NRC (October 19, 1995). In addition, the upper and lower neutron shield tanks are positioned differently in relation to the reactor vessel, which is extremely radioactive. YAEC has stated that the upper neutron shield tank is located above the reactor vessel support lugs, which hold up the reactor vessel. Letter from YAEC to NRC (October 19, 1995). If, as it appears, the lower neutron shield tank is below or at the same level as the lugs, it may be more complicated to remove. As discussed in paragraph 8 below, residual lead contamination may also complicate removal of the lower neutron shield tank.

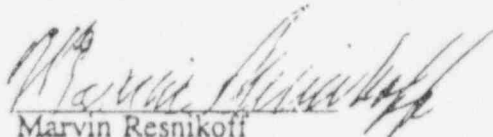
8) I also disagree with Mr. Fairtile's conclusion that the upper neutron shield tank removal project was "successful." According to the NRC staff, removal of the upper neutron shield tank would not have been allowed prior to approval of YAEC's decommissioning plan but for the fact that the tank had become contaminated with lead dust when the lead shielding was cut during the Component Removal Program. Yankee Atomic Electric Co. (Yankee Nuclear Power Station), DD-96-1, 43 NRC 29, 78-39 (1996). The NRC found that removal of the upper neutron shield tank was necessary to protect plant workers against a lead dust hazard, even if the plant were placed in SAFSTOR. Id. Had YAEC left the upper neutron shield intact in the first place, it could have avoided the lead contamination and thereby appropriately delayed removing the upper neutron shield tank until after approval of the

Decommissioning Plan. In my professional judgment, therefore, the upper neutron shield tank removal represents a real failure of the decommissioning process, not a success. It also shows that in the process of decommissioning, a licensee may create new exposure risks that were not previously considered in dose estimates.

9) Mr Fairtile also states that YAEC's projections were "slightly on the high or conservative side." I do not agree with this conclusion. As I have previously stated, YAEC has not provided enough information on which to base a finding of conservatism. I also believe that a lack of conservatism is demonstrated by the fact that decommissioning doses have remained at roughly the same level of 160 person-rem/year since 1992. This includes TLD readings of 72 person-rem for the first half of 1996, a period when YAEC was engaged in ostensibly "minor" decommissioning activities. See Resnikoff Affidavit, par. 32 and Table 2. My opinion is further reinforced by the fact that YAEC's 1993 dose projections for removal of reactor vessel internals, which apparently were not based on actual dose measurements or ALARA reviews but solely on estimated input to the TLG data base, were off by a factor of 3.5. This shows a very high margin of error, not a slight conservatism.

10) In conclusion, I disagree with the statements of Messrs. Willis and Fairtile regarding the reliability of YAEC's "to go" dose estimates. Moreover, I dispute the facts on which they rely.

This concludes my affidavit.


Marvin Resnikoff

State of New York
County of New York

Subscribed and sworn to this 12th day of September, 1996.


Notary public

JENELLE H. SCARBROUGH
NOTARY PUBLIC, STATE OF N.Y.
NO. 41-4379472
QUALIFIED IN QUEENS COUNTY
COMMISSION EXPIRES MARCH 25, 1997

CERTIFICATE OF SERVICE

I, Diane Curran, certify that on September 13, 1996, copies of the foregoing CITIZENS AWARENESS NETWORK'S AND NEW ENGLAND COALITION ON NUCLEAR POLLUTION'S REPLY TO NRC STAFF'S RESPONSE IN SUPPORT OF YAEC'S MOTION FOR SUMMARY DISPOSITION and CITIZENS AWARENESS NETWORK'S AND NEW ENGLAND COALITION ON NUCLEAR POLLUTION'S CONDITIONAL AGREEMENT TO UNAUTHORIZED FILING OF NRC STAFF'S RESPONSE IN SUPPORT OF YAEC'S MOTION FOR SUMMARY DISPOSITION, AND MOTION FOR LEAVE TO REPLY were served by first class mail and/or by FAX on the following, as indicated below:

*Docketing and Service
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

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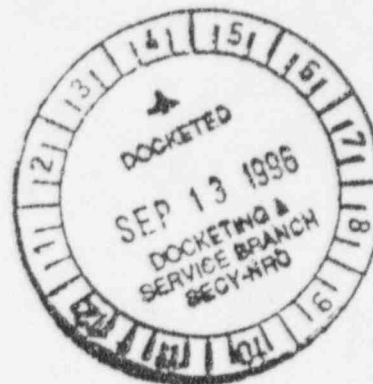
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