

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION

In the Matter of)
METROPOLITAN EDISON COMPANY, ET AL.)
(Three Mile Island Nuclear Station,)
Unit No. 1))

Docket No. 50-289
(Restart)

NPC STAFF ANSWER OPPOSING COMMONWEALTH OF PENNSYLVANIA'S
PETITION FOR COMMISSION REVIEW OF APPEAL BOARD
DECISION (ALAB-698) ON DOSIMETRY FOR EMERGENCY WORKERS

Joseph R. Gray
Counsel for NRC Staff

December 8, 1982

DESIGNATED ORIGINAL

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In a petition filed on November 12, 1982,^{1/} the Commonwealth of Pennsylvania requests that the Commission review, pursuant to 10 CFR § 2.786, the decision of the Atomic Safety and Licensing Appeal Board on dosimetry to be provided to emergency workers responding to a radiological emergency at TMI-1.^{2/} In that decision, the Appeal Board affirmed the result of the Licensing Board's decision below, ruling that the regulations do not require, and State and county planning make unnecessary, the predistribution of permanent-record dosimetry for emergency workers, and rejecting the Commonwealth's appeal in this regard.^{3/} The Commonwealth now asserts that emergency workers have a right to the accurate and reliable measure of radiation exposure that permanent-record dosimeters would provide, that the Appeal Board's decision constitutes a callous disregard of the interests of emergency workers, and that the question of the type of dosimetry that should

1/ Commonwealth of Pennsylvania's Petition for Partial Review of ALAB-698, November 12, 1982 (Petition). Because the NRC Staff was not made aware of, and did not receive, the Commonwealth's Petition until December 1, 1982 (see NRC Staff's Motion for Extension of Time to File Answer Opposing Commonwealth of Pennsylvania's Petition for Review of ALAB-698, December 1, 1982), the Staff requested an extension of time to respond to the Petition. An extension of time until December 8, 1982 was granted by the Commission's Order of December 3, 1982.

2/ Metropolitan Edison Co., et al. (Three Mile Island Nuclear Station, Unit 1), ALAB-698, _____ NRC _____ (October 22, 1982).

3/ Id., Slip Op. at 8-9, 57.

be provided to emergency workers involves a matter of policy that ought to be addressed by the Commission.^{4/} The NRC Staff herewith opposes the Commonwealth's petition for Commission review of the Appeal Board's decision.

I. SUMMARY OF DECISION BELOW

On October 22, 1982, the Appeal Board issued two decisions (ALAB-697 and ALAB-698) examining various aspects of emergency planning for the Three Mile Island Nuclear Station. One issue resolved in the latter decision involved the adequacy of dosimetry to be provided to emergency workers for purposes of controlling the radiation exposure of such workers. On appeal, the Commonwealth of Pennsylvania contended that the Commission's regulations and emergency planning guidance require the provision of permanent-record dosimetry for emergency workers, that permanent-record dosimeters are necessary to adequately protect emergency workers, and that the Licensing Board erred in its decision on emergency planning in refusing to require, as a condition for restart of TMI-1, that permanent-record dosimeters in the form of thermoluminescent dosimeters (TLDs) be provided. In ALAB-698, the Appeal Board addressed in detail each of these assertions of the Commonwealth^{5/} and determined that, while permanent-record dosimeters represent a useful added measure of protection for emergency workers,^{6/} they are neither required by Commission regulations^{7/} nor necessary to adequately protect emergency workers in view of the specific State and county planning for TMI and the use of self-reading dosimeters which are

^{4/} Petition at 1, 3. The Staff has been informed by counsel for the Licensee that Licensee now intends to provide permanent-record dosimeters to the Commonwealth for use by offsite emergency workers responding to a radiological emergency at TMI. In the event that the Commonwealth and Licensee reach agreement on the Licensee's provision of such dosimetry, the Commonwealth's petition for review would be moot.

^{5/} See generally, ALAB-698, Slip Op. at 3-19.

^{6/} Id., Slip Op. at 19.

^{7/} Id., Slip Op. at 5, 9-15.

in ample supply.^{8/} Accordingly, the Appeal Board affirmed the Licensing Board's determination not to require the predistribution of permanent-record dosimeters as a condition of restart.

II. WHERE THE MATTER WAS RAISED BELOW

The matter of the need for permanent-record dosimetry for emergency workers was first raised explicitly in the Commonwealth's proposed findings submitted to the Licensing Board.^{9/} The issue was raised before the Appeal Board by the Commonwealth's exceptions 1 and 2^{10/} to the Licensing Board's Partial Initial Decision of December 14, 1981. The Commonwealth argued in its brief^{11/} in support of exceptions that the Licensing Board erred both legally and factually in failing to require permanent-record dosimetry for emergency workers as a condition for restart. The Staff argued in its responsive brief^{12/} that the regulations do not require permanent-record dosimeters for emergency workers if there are suitable alternatives that provide protection for workers and that the currently available dosimetry in conjunction with the State and county procedures for measuring and recording worker exposure provide such a suitable alternative. The Licensee presented arguments similar to those of the Staff in opposing the Commonwealth's appeal.^{13/}

^{8/} Id., Slip Op. at 16-19.

^{9/} Commonwealth of Pennsylvania's Proposed Findings of Fact and Conclusions of Law on Emergency Planning Issues, August 13, 1981, at 49-51.

^{10/} Commonwealth of Pennsylvania's Exceptions to the ASLB Partial Initial Decision on Plant Design and Emergency Planning, February 2, 1982.

^{11/} Brief of the Commonwealth of Pennsylvania on Exceptions to the ASLB Partial Initial Decision on Plant Design and Emergency Planning, March 10, 1982.

^{12/} NRC Staff's Brief in Response to the Exceptions of Others to the Atomic Safety and Licensing Board's Partial Initial Decision on Plant Design and Procedures, Separation, and Emergency Planning Issues, May 20, 1981, at 66-81.

^{13/} Licensee's Brief in Opposition to the Exceptions of Other Parties to the Atomic Safety and Licensing Board's Partial Initial Decision on Plant Design and Procedures, Separation, and Emergency Planning Issues, May 10, 1981, at 124-133.

III. WHY THE DECISION BELOW WAS CORRECT

The Commission's emergency planning regulations require, among other things, that "a range of protective actions [be] developed for the plume exposure pathway EPZ for emergency workers. . ." (10 CFR § 50.47(b)(10)) and that "means for controlling radiological exposures, in an emergency, [be] established for emergency workers." 10 CFR § 50.47(b)(11). These regulations do not, by their terms, establish that dosimetry of any kind must be provided for emergency workers and the Appeal Board so found.^{14/} From the plain language of the regulations it is clear that the Appeal Board was manifestly correct in this determination.^{15/}

What the regulations do require is the establishment of measures for controlling radiological exposures of emergency workers. The question facing the Appeal Board on the Commonwealth's appeal, then, is whether the planning and procedures in place for TMI provide the means for controlling the exposures of emergency workers. That question is basically a factual one which must be determined from the evidence of planning developed in the TMI-1 restart hearing.

The uncontroverted evidence shows that there are ample supplies of self-reading dosimeters to provide two such dosimeters, with effective ranges of 0.4R to 20R and 4R to 200R, to each offsite emergency worker for TMI and that supplies of both types of self-reading dosimeters have been predistributed to the level of local emergency response organizations in the TMI area.^{16/} The

^{14/} ALAB-698, Slip Op. at 5, 9.

^{15/} While regulatory guidance in NUREG-0654/FEMA-REP-1, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," recommends that emergency organizations provide their own emergency workers with both self-reading and permanent-record dosimeters, the Appeal Board properly found that such guidance does not rise to the level of a regulatory requirement and that compliance with such guidance is not required. ALAB-698, Slip Op. at 11-15. See Vermont Yankee Nuclear Power Corp. (Vermont Yankee Nuclear Power Station), CLI-74-40, 8 AEC 809, 811 (1974).

^{16/} See Staff Ex. 20 at p. 15; Tr. 22387 (Bath); Tr. 22427-28, 22769-71 (Adler). See also ALAB-698, Slip Op. at 6 and n. 9.

evidence also shows that it is these self-reading dosimeters, rather than permanent-record dosimeters, that are relied upon to provide worker protection during an emergency. Through the use of these self-reading dosimeters in accordance with instructions provided in the Commonwealth's Emergency Plan, each emergency worker in the field can determine at any time the total exposure received on that mission and when that exposure is approaching a level at which protective actions should be taken. When that occurs, the worker can take measures to protect himself or herself by leaving the area. Obviously, permanent-record dosimeters, which cannot be read by emergency workers in the field, do not provide the sort of instantaneous measure of total exposure which emergency workers in the field need in order to take actions to protect themselves.^{17/}

One shortcoming of self-reading dosimeters, relative to permanent-record dosimeters, is that self-reading dosimeters, standing alone, do not provide a long-term record of radiation exposure. However, that shortcoming is remedied by planning and procedures in the current Commonwealth and county emergency plans. The plans for each county stipulate that each emergency worker will be provided with a "Dosimetry Report Form" which each worker will complete during the course of his or her duties. Each worker enters

^{17/} In recognition of the fact that only self-reading dosimeters allow an emergency worker in the field to determine for himself/herself the dose he/she has received so that the worker may take necessary actions to avoid further exposure, the Commonwealth's Emergency Plan states: "Each emergency worker is to be provided two self-reading dosimeters which will enable the worker to 'read' at any time during the incident how much, if any, radiation he/she has received. Each emergency worker should read the dosimeters at least once each thirty minutes. The emergency worker protective action guide for whole body exposure used by BRP is 25 Rems; therefore an emergency worker should seek to be replaced or complete the assigned task and evacuate to a mass care center for personnel monitoring when either of the self-reading dosimeters indicates a total dose in the 15-20 R range." Commonwealth Ex. 2a, Appendix 16, pp. 16-6 to 16-7.

Permanent-record dosimeters which the Commonwealth wishes to provide to workers are characterized in the Commonwealth's plan simply as allowing "precise (emphasis in original) measurement of radiation exposure at some time after the exposure has been incurred (emphasis added)." Commonwealth Ex. 2a, Appendix 16, at 16-7.

the reading from the self-reading dosimeters before and after the mission to obtain the total exposure for the mission. By adding the mission exposures, the worker, using only the self-reading dosimeters, can determine the overall dose accumulated in the radiological emergency.^{18/} Through use of only the self-reading dosimeters and the reading and recording procedures in the emergency plans, a record of exposures received by each emergency worker over the course of his or her response in the radiological emergency is generated.

Thus, the evidence in this proceeding shows that the self-reading dosimeters, which are in ample supply, and the procedures for their use, provide not only the means for protecting emergency workers in the field but also the means for generating a long-term record of total dose received by each emergency worker. The Appeal Board, based on this evidence, found that the use of the two self-reading dosimeters under the specific instructions given to emergency workers in the emergency plans assures reasonable protection for the emergency workers and that permanent-record dosimeters are not needed.^{19/} That finding is correct.

The Commonwealth, in its Petition, attacks the Appeal Board's finding that the use of self-reading dosimeters is sufficient on several grounds. For one, the Commonwealth asserts that the range of exposures covered by the two self-reading dosimeters to be used (0.4R to 200R) is limited relative to the exposure range of permanent-record dosimeters such as TLDs.^{20/} However, there is no evidence that emergency worker exposures outside the range of the self-reading dosimeters will be incurred and, in fact, Federal Emergency Management Agency guidance on which the Commonwealth relies in arguing that TLDs

^{18/} See the emergency plans of York (Board Ex. 5, Annex R, Appendices 3, 4, pp. N-10 to N-12), Dauphin (Board Ex. 6, Annex N, Appendices 3, 4, pp. N-10 to N-12), Cumberland (Board Ex. 7, Annex N, Appendices 3, 4, pp. N-10 to N-12), Lancaster (Board Ex. 8, Annex R, Appendices 3, 4, pp. R-10 to R-12), and Lebanon (Board Ex. 9, Annex O, Appendices 3, 4, pp. Q-10 to Q-12) Counties.

^{19/} ALAB-698, Slip Op. at 16-18.

^{20/} Petition at 4.

should be provided indicates that exposures in excess of the 200R range of the self-reading dosimeter are unlikely and well beyond any exposure anticipated for emergency workers.^{21/} In any event, under the Commonwealth's planning, emergency workers whose dosimeters indicate exposures of 25R or more will be instructed to report to a medical facility for assessment and treatment. Any worker whose exposure might exceed 200R would likely be hospitalized and provided with all the available diagnostic tests, regardless of whether there is a TLD record of actual dose.^{22/}

The Commonwealth also asserts that self-reading dosimeters are less accurate than TLDs and are subject to discharge from impacts that can result in inaccurate readings.^{23/} As indicated by the Appeal Board, a self-reading dosimeter contains an encapsulated air chamber and a moveable exposure indicator which is initially zeroed (exposure indicator set to zero) by electrically charging the dosimeter. As the dosimeter is subjected to ionizing radiation, electrical charge is removed and the exposure indicator moves up the scale of exposure in proportion to the radiation dose.^{24/} Inaccuracies in the exposures measured by self-reading dosimeters arise from leakage of the electric charge or from discharge caused by shock to the dosimeter. Obviously such discharges will result in dosimeter-indicated exposures higher than exposures actually received. Thus, any inaccuracies in readings will be conservative since they will indicate a higher dose than the emergency worker actually received and could result in the worker's being removed from duty at actual exposure levels that are likely lower than those for which removal from the field would be called for under the Commonwealth's emergency

^{21/} FEMA-REP-2, "Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 - Airborne Release," September 1980, at 5-8 to 5-9.

^{22/} ALAB-698, Slip Op. at 18-19.

^{23/} Petition at 4.

^{24/} ALAB-698, Slip Op. at 6, n. 8.

plan.^{25/} The emergency worker is, therefore, fully protected through the use of the self-reading dosimeters and the record-keeping procedures in the emergency plans.

Finally, the Commonwealth argues that TLDs should be provided in order to effectuate offsite emergency planning. Specifically, the Commonwealth asserts that, since State and county emergency plans advise emergency workers that they will be provided with TLDs, emergency workers expect to receive such devices and may be unwilling to perform their duties in an emergency without them.^{26/} However, the emergency plans of the Commonwealth itself and of the counties downplay the value of TLDs and place primary reliance on self-reading dosimeters for the protection of emergency workers.^{27/} The plain language of the emergency plans makes it clear to emergency workers that the self-reading dosimeters are what are important for worker protection and that TLDs simply "allow precise (emphasis in original) measurement of radiation exposure at some time after the exposure has been incurred."^{28/} It is clear from the emergency plans that "TLDs are intended essentially as record-keeping devices for use after an emergency is over and as a more precise but redundant measure of radiation exposure."^{29/} There is simply no basis, and no evidence, on which to speculate, as the Commonwealth does,

^{25/} The Commonwealth also asserts (Petition at 4-5) that emergency workers are not highly trained in reading and recording exposures from self-reading dosimeters and implies that emergency workers cannot be relied upon to properly use such instruments (Petition at 4-5). The Commonwealth's argument in this regard is belied by the State's own heavy reliance in its planning on the emergency workers to properly read the dosimeters and record exposures. In any event, the Commonwealth's argument is specious in view of the simplicity of the self-reading dosimeters and of the exposure recording procedures in the emergency plans.

^{26/} Petition at 5-6.

^{27/} ALAB-698, Slip Op. at 17.

^{28/} See n. 17 supra.

^{29/} ALAB-698, Slip Op. at 17.

that the response of emergency workers will be adversely affected if TLDs are not provided.

In summary, none of the Commonwealth's objections to reliance on self-reading dosimeters and procedures, without TLDs, has merit. The Appeal Board's legal and factual determinations in ALAB-698 on the adequacy of emergency worker dosimetry are correct.

IV. WHY COMMISSION REVIEW SHOULD NOT BE UNDERTAKEN

The Appeal Board's decision on emergency worker dosimetry in ALAB-698 involves a correct and straightforward interpretation of the Commission's regulations and a thorough but uncomplicated evaluation of the uncontroverted evidence in view of the regulations. The Appeal Board's decision is mandated by the regulations and the emergency planning evidence in this case. The decision does not involve a new or novel interpretation of the regulations, does not establish new policy^{30/} and does not have substantial ramifications for future licensing.^{31/} In these circumstances, Commission review of the

^{30/} At the oral argument before the Commission in Harrisburg, Pa. on November 9, 1982, Mr. Adolph Belser of the Pennsylvania Emergency Management Agency referred to the proceeding for the Susquehanna Steam Electric Station wherein the applicant, Pennsylvania Power and Light Company, negotiated with the Commonwealth and voluntarily agreed to provide dosimetry, including TLDs, for offsite emergency workers. Mr. Belser indicated his view that the action by the applicant in Susquehanna sets a precedent which contributes in part to the Commonwealth's position on emergency worker dosimetry for TMI-1. (Oral Presentations on TMI-1 Restart, November 9, 1982, Tr. 140). It should be noted that there was no finding by the Licensing Board or the Appeal Board in the Susquehanna proceeding that TLDs are necessary to adequately protect emergency workers (see Pennsylvania Power & Light Company, et al. (Susquehanna Steam Electric Station, Units 1 & 2), Appeal Board Order, September 16, 1982), and Susquehanna sets no legal precedent in this regard. The Appeal Board's decision on emergency worker dosimetry for TMI-1 in ALAB-698 is not a departure from any legal precedent on emergency worker dosimetry established in the Susquehanna proceeding.

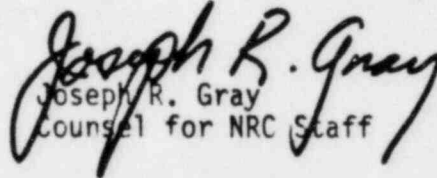
^{31/} The Appeal Board's decision on emergency worker dosimetry in ALAB-698 is based on site specific planning for TMI-1 and on specific facts (predistribution of two types of self-reading dosimeters and the use of explicit record keeping procedures for the self-reading dosimeters) which might not obtain for other facilities.

Appeal Board's decision on dosimetry for emergency workers is neither justified nor warranted.

V. CONCLUSION

Through the use of self-reading dosimeters and existing record-keeping procedures, adequate protection is provided for emergency workers and permanent-record dosimetry is not needed. The Appeal Board was entirely correct in so finding and Commission review of the Appeal Board's decision on emergency worker dosimetry is not warranted. The Commonwealth's petition for Commission review should be denied and the Appeal Board's decision should stand.

Respectfully submitted,


Joseph R. Gray
Counsel for NRC Staff

Dated at Bethesda, Maryland
this 8th day of December, 1982

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CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF ANSWER OPPOSING COMMONWEALTH OF PENNSYLVANIA'S PETITION FOR COMMISSION REVIEW OF APPEAL BOARD DECISION (ALAB-698) ON DOSIMETRY FOR EMERGENCY WORKERS" in the above-captioned proceeding have been served on the following by deposit in the United States mail, first class, or, as indicated by an asterisk, by deposit in the Nuclear Regulatory Commission's internal mail system, this 8th day of December, 1982:

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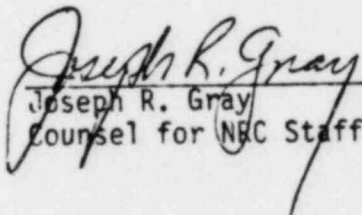
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