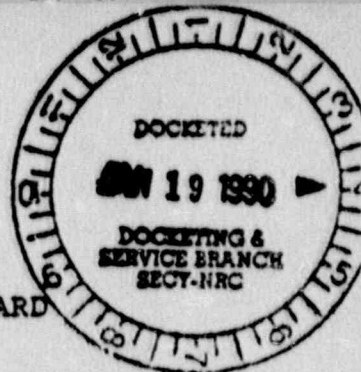


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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Thomas S. Moore, Chairman  
Christine N. Kohl  
Howard A. Wilber

January 19, 1990  
(ALAB-926)

In the Matter of )  
 )  
GENERAL PUBLIC UTILITIES )  
NUCLEAR CORPORATION )  
(Three Mile Island Nuclear )  
Station, Unit 2) )

SERVED JAN 19 1990  
RE-SERVED JAN 22 1990

Docket No. 50-320-OLA  
(Disposal of Accident-  
Generated Water)

Frances Skolnick, Lancaster, Pennsylvania, for the  
joint intervenors, Three Mile Island Alert, Inc., and  
Susquehanna Valley Alliance.

Thomas A. Baxter, Washington, D.C. (with whom Ernest L.  
Blake, Jr., David R. Lewis, and Maurice A. Ross,  
Washington, D.C., were on the brief), for the  
applicant, General Public Utilities Nuclear  
Corporation.

Stephen H. Lewis (Colleen P. Woodhead was on the brief)  
for the Nuclear Regulatory Commission staff.

DECISION

The joint intervenors, Susquehanna Valley Alliance and  
Three Mile Island Alert, Inc., have appealed the Licensing  
Board's decision authorizing a license amendment for the  
accident-damaged Unit 2 reactor at Three Mile Island (TMI)  
belonging to the applicant, General Public Utilities Nuclear

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Corporation (GPUN).<sup>1</sup> The amendment at issue has the effect of permitting the applicant to evaporate, by forced heating over a one to two-year period, the large volume of water that has accumulated onsite from the accident and ensuing decontamination activities. For the reasons that follow, we affirm the Licensing Board's authorization of the license amendment.

I.

The 1979 accident at TMI Unit 2 and subsequent cleanup resulted in the accumulation at the plant of some 2.3 million gallons of radioactively contaminated water, tagged accident-generated water or AGW. By a series of actions after the accident, the Commission prohibited the disposal of the AGW and, since the accident, it has been stored in numerous locations at the plant. The Commission also authorized the processing of the AGW through specially designed demineralizer systems (called SDS and Epicor II) to reduce its radioactive content. With one exception, these systems leave only trace amounts of the radionuclides in the AGW. The demineralizer systems cannot remove tritium, which, as an isotope of hydrogen, replaces one of the hydrogen atoms in the water molecule to form tritiated

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<sup>1</sup> See LBP-89-7, 29 NRC 138 (1989).



water; thus, 1,020 curies of tritium is the predominant radionuclide in the AGW.<sup>2</sup>

The agency's environmental review of the disposal of the AGW dates back to 1981 when the NRC staff, based upon then available information, addressed the impacts of the disposition of the AGW as part of the Final Programmatic Environmental Impact Statement (PEIS) on the decontamination and disposal of all radioactive wastes resulting from the accident.<sup>3</sup> In a policy statement issued by the Commission

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<sup>2</sup> Staff Exh. 1, NUREG-0683 Supplement No. 2, "Programmatic Environmental Impact Statement Related to Decontamination and Disposal of Radioactive Wastes Resulting from March 28, 1979 Accident at Three Mile Island Nuclear Station, Unit 2" (June 1987), at 2.3; 2.6. See LBP-89-7, 29 NRC at 141 n.5.

Tritium is a naturally occurring gas with a 12.3 year half-life that is produced by cosmic ray interactions with atmospheric hydrogen. The world inventory of naturally occurring tritium is about 70 megacuries (70 MCi or 70,000,000 curies) and it is produced naturally at a rate of about 4 megacuries (4 MCi or 4,000,000 curies) per year. Tritium is also produced by fission and fusion reactions, so it is created by nuclear reactors and weapons tests. The world inventory of tritium from weapons testing reached a high of about 3.1 gigacuries (3.1 GCi or 3,100,000,000 curies) in 1963 and has been declining since that time. In the case of TMI Unit 2, the Final Environmental Impact Statement for the facility estimated that normal plant operation would release to the environment 1,110 curies of tritium a year in gaseous and liquid effluents. Tritium is used commercially in a number of consumer products such as luminous watch dials, instruments, and exit signs. Staff Exh. 1 at 2.6 - 2.8. See also LBP-89-7, 29 NRC at 160-61.

<sup>3</sup> See NUREG-0683, "Final Programmatic Environmental Impact Statement Related to Decontamination and Disposal of  
(Footnote Continued)

shortly after the promulgation of the PEIS, the Commission reserved for itself the final approval of any future proposal for the disposition of the AGW.<sup>4</sup> Thereafter, in 1986, the applicant proposed to the agency a plan to dispose of the AGW by forced evaporation to the atmosphere followed by solidification of the remaining evaporator bottoms for disposal at a commercial low-level waste burial facility.<sup>5</sup>

The staff then prepared a draft supplement to the PEIS dedicated to AGW disposal. After considering public comments on the draft, the staff issued a final supplement concluding that the applicant's proposal, along with eight other alternatives, could be implemented without significant environmental impacts.<sup>6</sup> More specifically, the staff found in the final supplement that the potential health effects both to workers and the offsite public from any of the alternatives were exceedingly small.<sup>7</sup> The staff also surveyed fifteen additional alternatives in the final supplement but eliminated them from detailed evaluation

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(Footnote Continued)

Radioactive Wastes Resulting from March 28, 1979, Accident [at] Three Mile Island Nuclear Station, Unit 2" (March 1981) [hereinafter 1981 PEIS], at 7-1 to 7-84.

<sup>4</sup> 46 Fed. Reg. 24,764 (1981).

<sup>5</sup> Staff Exh. 1 at 1.1 n.(a), 3.3.

<sup>6</sup> Id. at 6.1.

<sup>7</sup> Id. at 5.5 - 5.6.



after finding that they were less desirable from a technical standpoint or clearly inferior to the other studied alternatives.<sup>8</sup> Because the staff found that none of the appraised alternatives was clearly preferable to the applicant's proposal, it recommended approval of that proposal.<sup>9</sup>

In response to GPUN's application for an operating license amendment to delete certain agency-imposed technical specifications prohibiting the disposal of AGW, the Commission issued a notice of opportunity for a hearing on the requested license amendment and the instant proceeding commenced.<sup>10</sup> The Licensing Board admitted the joint intervenors as a party and the Commonwealth of Pennsylvania as an interested state.<sup>11</sup> Additionally, the Board admitted

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<sup>8</sup> Id. at 3.34 - 3.39.

<sup>9</sup> Id. at viii.

<sup>10</sup> 52 Fed. Reg. 28,626 (1987).

After the joint intervenors filed their intervention petitions, the Commission issued an order stating that it would conduct an immediate effectiveness review in the event the Licensing Board authorized the license amendment so that it could determine whether the amendment should be effective during the pendency of any administrative appellate review. According to the Commission, such review would implement its earlier directive reserving to itself the final approval of any AGW disposal proposal. See Commission Order (December 3, 1987) (unpublished) at 2.

<sup>11</sup> Memorandum and Order (Memorializing Special  
(Footnote Continued)

all or part of seven of the joint intervenors' proffered contentions.<sup>12</sup> After the completion of discovery, the applicant filed summary disposition motions, supported by the staff, addressing each of the admitted contentions. The Licensing Board granted the applicant's motions for all but portions of four issues. In a protracted opinion that parsed all of the summary disposition filings, the Licensing Board found that parts of contention 2 (evaluation of the no-action alternative), contention 3 (analysis of the AGW), contention 4b (concentration of tritium in AGW), and contention 5d (health effects of tritium in the AGW) presented disputed factual issues that must be tried.<sup>13</sup> It then held six days of evidentiary hearings at which nine expert witnesses testified for the applicant, five for the staff, and two for the intervenors.

From this evidentiary record, the Licensing Board found that the applicant had demonstrated, by a preponderance of the evidence, that the forced evaporation proposal was environmentally acceptable. It found that the applicant's plan will have extremely low levels of atmospheric release

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(Footnote Continued)  
Prehearing Conference; Ruling on Contentions; Scheduling)  
(January 5, 1988) (unpublished) at 20.

<sup>12</sup> Id. at 5-20.

<sup>13</sup> LBP-88-23, 28 NRC 178 (1988).



that, in turn, "will have extremely small radiation exposure consequences, both to workers and the general public."<sup>14</sup>

The Board also concluded that the applicant's evaporation proposal was obviously superior to the intervenors' so-called no-action alternative.<sup>15</sup> Accordingly, the Board authorized the grant of the license amendment.<sup>16</sup>

In an extended opinion, the Licensing Board examined each of the components of the expected radiation releases from the applicant's evaporation proposal. Its findings covered the risks and exposures from an accidental tank rupture release of the AGW during the evaporation process, the risks and exposures to workers in shipping and burying the evaporator bottoms, the risks and exposures from accidents in transporting the evaporator bottoms, the risks

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<sup>14</sup> LBP-89-7, 29 NRC at 143.

<sup>15</sup> Id. at 180.

<sup>16</sup> Id. at 191.

After the Licensing Board authorized the license amendment, the intervenors filed a stay application with us, which we denied in ALAB-914, 29 NRC 357 (1989). The Commission then conducted its immediate effectiveness review and found no reason to stay the effectiveness of the license amendment authorization pending completion of the administrative appellate process. CLI-89-5, 29 NRC 345, 347 (1989). The intervenors also have filed a petition for review of the Licensing Board's amendment authorization and the Commission's effectiveness decision. See Susquehanna Valley Alliance. v. NRC, No. 89-3393 (3d Cir. June 12, 1989).

and exposures to onsite workers from the evaporation process, and the risks and exposures to the offsite population from the evaporation process. In each instance, the Board found the risks and exposures to be insignificant. In particular, the Board found that the offsite doses from the atmospheric release of the evaporated AGW "are insignificant when compared to radiation doses that people receive every day as the result of natural phenomena."<sup>17</sup> It concluded that

the worst-case dose to the maximally exposed individual is on the order of a single day of natural background radiation and is received over a 1- to 2-year period. The additional dose to the maximally exposed individual from evaporation is far below the normal environmental dose variability, and the additional dose to the average offsite individual is thousands of times smaller.

Another way of considering these same data is that the dose to the hypothetical [maximally exposed] individual from evaporation of the AGW would be less than 10% of an additional dose a person would receive from living in a brick building each year, and is comparable to the whole-body dose an average individual in the general population receives from watching color television each year. The dose to the average individual is many hundreds of times less and thus de minimis.

The National Council on Radiation Protection and Measurements (NCRP) does not even calculate population doses when individual doses are this

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<sup>17</sup> LBP-89-7, 29 NRC at 151.



low because the NCRP considers them insignificant.<sup>18</sup>

The Licensing Board also scrutinized the expected radiation consequences of the intervenors' so-called no-action alternative. Because it found, in effect, that the intervenors had repeatedly changed the features of the no-action alternative during the course of discovery and the hearing, the Board analyzed the intervenors' last version, which called for treating the AGW to reduce the radionuclides other than tritium to a specified level and then storing the AGW onsite for a minimum of thirty years before final disposition.<sup>19</sup> Under this scenario, the Licensing Board found that the purported benefits of an additional thirty years of radioactive decay of the AGW would be insignificant because the dose levels from the applicant's evaporation proposal were already so low that they fell within the range of uncertainty of dose assessment methodology and radiological monitoring.<sup>20</sup> Hence, it found that "the doses from evaporation now are already so small

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<sup>18</sup> Id. at 152 (record citations omitted).

<sup>19</sup> Id. at 154-55.

<sup>20</sup> Id. at 157-58.

that any savings achieved from the Intervenor's proposed storage period are unimportant."<sup>21</sup>

After determining the extremely small size of the radiation releases from the applicant's proposal and the no-action alternative, the Licensing Board turned to the projected health effects of such releases. In addressing these effects, the Board first examined how tritium acts in the environment, how it is taken up by plants, animals, and humans, and how the effects of tritium should be modeled and calculated.<sup>22</sup> It then observed that to date there is no empirical evidence linking exposure to extremely low levels of radiation to health effects and that "at very low doses, such as those calculated for evaporation, adverse health effects have not been observed and the probability of occurrence could be zero."<sup>23</sup> The Board noted, however, that for radiation protection purposes, the accepted practice nevertheless was to extrapolate from observed effects at high doses to arrive at risk estimates for exposures at low doses.<sup>24</sup> Relying on evidence employing risk estimates derived from this methodology, the Licensing Board found

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<sup>21</sup> Id. at 158.

<sup>22</sup> Id. at 158-66

<sup>23</sup> Id. at 167.

<sup>24</sup> Id.



that "the upper-limit probability of a fatal cancer for the [hypothetical] maximally exposed individual is less than 1 chance in 5 million using the NRC's calculated dose, and less than 1 chance in 2.5 million using GPUN's calculated dose."<sup>25</sup> With regard to the average offsite individual living within fifty miles of the plant, the Board's finding concerning the probability of a fatal cancer as a result of the evaporation translates into odds that are many, many hundreds of times less than the odds for the maximally exposed individual.<sup>26</sup> Even though it made findings bounding the cancer risk, the Board found that it did not expect any health effects from the applicant's proposal.<sup>27</sup> Similarly, the Licensing Board reviewed the uncontested record evidence on the likelihood of a genetic disorder in the same affected population and concluded that "the doses are simply too low to predict or expect any genetic detriment."<sup>28</sup>

Finally, the Licensing Board considered the economic costs of the applicant's proposal and the intervenors' no-action alternative. On balance, it found that the applicant's proposal was obviously superior to the no-action

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<sup>25</sup> Id.

<sup>26</sup> Id.

<sup>27</sup> Id. at 168.

<sup>28</sup> Id. at 176.

alternative.<sup>29</sup> It then addressed the intervenors' contentions about the tritium content of the AGW and the accuracy of applicant's analysis of the radioactive content of the AGW. In this regard, the Board concluded that the tritium content of the AGW had been conservatively determined and that the radionuclide content of the AGW had been characterized adequately to permit an appropriate comparison of the disposal options.<sup>30</sup> Accordingly, the Board authorized the license amendment and the intervenors now have appealed.

## II.

A. Initially, we are constrained to note that the intervenors' brief is far from a model of clarity. The Commission's Rules of Practice regarding appellate briefs are unequivocal and straightforward: "[a]n appellant's brief must clearly identify the errors of fact or law that are the subject of the appeal. For each issue appealed, the precise portion of the record relied upon in support of the assertion of error must also be provided."<sup>31</sup> In addition, "the brief must contain sufficient information and cogent argument to alert the other parties and the appellate

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<sup>29</sup> Id. at 180.

<sup>30</sup> Id. at 189.

<sup>31</sup> 10 C.F.R. § 2.762(d)(1).



tribunal of the precise nature of and support for the appellant's claims."<sup>32</sup> We generally do not consider matters that are not adequately briefed and any party who has insufficiently articulated its appellate claims must bear full responsibility for any possible misapprehension of those arguments caused by the inadequacies of its brief.<sup>33</sup>

Here, we agree with the complaints of both the applicant and the staff that it is very difficult to separate the wheat from the chaff in the intervenors' seventy-page appellate filing. The intervenors have not clearly identified their purported claims of error or always specified the exact portion of the record relied upon in support of their claims. Indeed, they appear often to rely upon material not in the adjudicatory record and their brief contains little meaningful analysis or explanation of why the intervenors believe the Licensing Board's decision is in error. The applicant legitimately complains that the inadequacies of the intervenors' brief deprives it of fair

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<sup>32</sup> Carolina Power & Light Co. (Shearon Harris Nuclear Power Plant), ALAB-843, 24 NRC 200, 204 (1986). Accord id., ALAB-856, 24 NRC 802, 805 (1986); id., ALAB-837, 23 NRC 525, 533-34 (1986); Pennsylvania Power and Light Co. (Susquehanna Steam Electric Station, Units 1 and 2), ALAB-693, 16 NRC 952, 955-57 (1982).

<sup>33</sup> See Georgia Power Co. (Vogtle Electric Generating Plant Units 1 and 2), ALAB-872, 26 NRC 127, 131-32 (1987); Wisconsin Electric Power Co. (Point Beach Nuclear Plant, Units 1 and 2), ALAB-739, 18 NRC 335, 338 n.4 (1983).

notice of the matters being appealed. To compensate, and, in an overabundance of caution, the applicant has even gone so far as to respond to possible arguments it has identified in the Statement of the Case portion of the intervenors' brief. The staff, to a lesser extent, has done much the same thing. Neither of the responding briefs, however, agrees upon all the issues the intervenors seek to raise.

We have tried to glean from the intervenors' appellate filing the essence of the major errors they allege, taking into account the fact that the intervenors' representative is not an attorney and that we do not hold such representatives to the same standard for appellate briefs as lawyers.<sup>34</sup> We will not address issues or arguments, however, that the intervenors' brief does not make readily apparent or comprehensible. Such issues will be deemed waived. Similarly, we will not create issues from the shadows of the intervenors' brief, for the intervenors bear the full responsibility for their failure to identify clearly and to brief adequately the issues they seek to raise.

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<sup>34</sup> See Public Service Electric & Gas Co. (Salem Nuclear Generating Station, Unit 1), ALAB-650, 14 NRC 43, 50 n.7 (1981), aff'd sub nom. Township of Lower Alloways Creek v. Public Service Electric & Gas Co., 687 F.2d 732 (3d Cir. 1982).



B. First, the intervenors claim that the record does not support the Licensing Board's finding that the applicant's evaporation proposal is environmentally acceptable. As best we can discern from their brief, they argue this is so because neither the staff in preparing the supplement to the PEIS, nor the Licensing Board in its deliberations, evaluated the use of the applicant's disposal system (rather than the demineralizer systems) to pretreat the AGW in order to reduce the concentration of radionuclides, other than tritium, before evaporating the AGW.<sup>35</sup> The intervenors' argument is without merit.

In its supplement to the PEIS on the applicant's evaporation proposal, the staff based its assessment of environmental impacts on certain "base case" concentrations of all the radionuclides contained in the AGW.<sup>36</sup> Similarly, the applicant in presenting its evidence below, and the Licensing Board in making its findings, employed the same figures. The base case numbers reflect the concentration of radionuclides in the AGW after it has been processed through the demineralizer systems that remove to trace levels, with

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<sup>35</sup> SVA/TMIA's Brief in Support of Notification to File an Appeal, and a Request for Oral Argument Concerning this Appeal (April 7, 1989) [hereinafter Intervenors' Brief] at 16-18.

<sup>36</sup> Staff Exh. 1 at 2.3, Table 2.2.

the exception of tritium, the radioactive material in the AGW.<sup>37</sup> As the Licensing Board found, prior to disposal, further processing of approximately thirty-one percent of the 2.3 million gallons of AGW stored in various locations in the plant will be necessary to achieve these base case levels.<sup>38</sup> The Board also found that the applicant's proposed AGW disposal system is designed to permit the evaporation section to be operated independently of the vaporizer in a closed-cycle batch method of operation to permit the further processing of the AGW inventory to achieve base case levels of radioactivity.<sup>39</sup> Further, the

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<sup>37</sup> Id. at 2.2.

<sup>38</sup> LBP-89-7, 29 NRC at 146.

The portion of the AGW inventory that must be treated further is primarily the AGW used for cleanup activities. See Staff Exh. 1 at 2.2.

<sup>39</sup> LBP-89-7, 29 NRC at 146.

As described by the Licensing Board,

[t]he processed water disposal program consists of: (a) a dual-evaporator system designed to evaporate the processed water at a rate of 5 gallons per minute (gpm); (b) an electric-powered vaporizer designed to release the resultant steam to the atmosphere via a flash tank and exhaust stack; (c) a waste concentrator designed to produce the final compact waste form; and (d) a packaging section designed to prepare the resultant waste for shipment consistent with commercial low-level waste disposal regulations.

(Footnote Continued)



Board found that the same system operating limits are applicable to the operation of the AGW disposal system regardless of the method used to process the AGW to base case levels before it is processed for atmospheric release. It correctly found, therefore, that the method of pretreating the AGW is irrelevant to ensuring conformance with the final criteria for atmospheric release and to the resulting dose calculations.<sup>40</sup> For this reason, the intervenors' argument must fail.

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(Footnote Continued)

All AGW will be processed through the evaporator prior to release to the environment via vaporization. The designed flexibility of the disposal system permits the evaporator assembly to be decoupled from the vaporizer assembly. In this configuration, the evaporator operates independently of the vaporizer and processes the water in a batch-cycle method of operation. The distillate from the evaporator is pumped to a separate staging tank, and the feed to the vaporizer is supplied from an independent staging tank. Conversely, if the vaporizer is coupled to the evaporator during operations, the water is processed in a continuous-flow operation. The distillate from the evaporator is fed directly to the vaporizer for atmospheric discharge.

Id. at 145-46 (record citations omitted).

<sup>40</sup> Id. at 146-47.

In this regard, the Licensing Board found that "[t]he activity releases occurring from evaporator discharges of Base Case water result in releases that are a small fraction of the releases permitted by existing regulatory requirements for the operation of a nuclear power plant." Id. at 146 (record citation omitted).

In an argument similar to their first one, the intervenors also assert that neither the staff nor the Licensing Board reevaluated what the intervenors claim is the increased exposure to workers using the evaporator to pretreat the AGW and the increased risk to workers transporting the waste from such activity. Rather than cite any evidence to support their charge of increased occupational exposure, the intervenors simply allege that "[o]bviously if the water is more radioactive the risk of exposure could be greater."<sup>41</sup> But the record clearly shows that the occupational exposure estimates are not affected by the use of the evaporator to pretreat the AGW.<sup>42</sup> Indeed, the dose rates used by the applicant in calculating the occupational exposures for evaporating the AGW, and those accepted by the Licensing Board in its findings, are so conservatively estimated that the influent AGW concentrations could be tripled and still produce dose rates less than those assumed by the applicant.<sup>43</sup> Further, the record shows that no additional waste is created by using the evaporator in a closed-cycle mode to pretreat the AGW.<sup>44</sup>

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<sup>41</sup> Intervenor's Brief at 18.

<sup>42</sup> Tarpinian, Tr. at 507, 513-14.

<sup>43</sup> Id. at 501; LBP-89-7, 29 NRC at 148.

<sup>44</sup> Buchanan, Tr. at 529-30.



Hence, the record evidence is contrary to the intervenors' unsupported assertion.

C. The intervenors also complain that the Licensing Board erred in granting the applicant's motions for summary disposition of their contentions 4 and 6.<sup>45</sup> The intervenors' disjointed argument on this point, however, is devoid of any useful analysis of the Licensing Board's summary disposition ruling. They also fail to assign any comprehensible reasons as to how the lower Board erred. For example, we are told that the Board granted summary disposition on their contentions "in spite of the fact that JI [joint intervenors] had presented material facts controverting Licensee's facts that there were no material issues of fact to be heard."<sup>46</sup> But nowhere in their brief do the intervenors explain precisely what material facts were in dispute, why those facts were material, and why the

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<sup>45</sup> As admitted by the Licensing Board, intervenors' contention 4 had three subparts. Although it is far from clear, our best guess is that the intervenors' claim is aimed at the Licensing Board's ruling with regard to contention 4(b). That contention states that "[s]ufficient evidence has not been provided to ensure that the evaporator can filter out transuranics, other radionuclides as well as chemicals to protect the public health and safety." LBP-88-23, 28 NRC at 202, 218. The Licensing Board did, however, deny summary disposition with respect to that portion of contention 4(b) dealing with the concentration of tritium in one of the processed water storage tanks. Id. at 204.

<sup>46</sup> Intervenors' Brief at 20.

Licensing Board's treatment of the issues was in error. Nor are such errors obvious from reading the Licensing Board's detailed treatment of the parties' summary disposition filings on these contentions.<sup>47</sup> Further, the intervenors assert that "[t]he Board's ruling contradicted the rules governing Summary Disposition as described by the Board themselves in their order."<sup>48</sup> Here again, the intervenors fail to identify the summary disposition principles the Board purportedly violated and to explain how each of the Board's determinations violated such principles. In the circumstances, we are constrained to find that the intervenors have inadequately briefed these issues. Hence, they are deemed waived.

D. The heading of the intervenors' next argument reads: "The Record Does Not Support the Finding that the Radionuclide Concentration in the Water had been Adequately Characterized."<sup>49</sup> In the argument that follows, the intervenors rely upon documents such as the draft PEIS and various applicant-NRC correspondence that is not in the record. Further, they largely ignore the evidence that is in the record except to make repeated out-of-context

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<sup>47</sup> See LBP-88-23, 28 NRC at 203-04, 218-25.

<sup>48</sup> Intervenors' Brief at 20-21.

<sup>49</sup> Id. at 27.



references to it as alleged support for a series of rambling, unconnected statements all apparently intended to show that the Licensing Board's entire findings on the tritium content of the AGW are wrong.<sup>50</sup> Even though the intervenors do not identify any specific Licensing Board finding or focus on any of the evidence relied upon by the Board in making its determinations, it is apparent that they are attempting to challenge the Board's factual findings.

In reviewing factual findings, it is well settled that "we are not free to disregard the fact that the Licensing Boards are the Commission's primary fact finding tribunals."<sup>51</sup> Thus, we will only "reject or modify findings of the Licensing Board if, after giving its decision the probative force it intrinsically commands, we are convinced that the record compels a different result."<sup>52</sup> Stated another way, "we must be persuaded that the record evidence as a whole compels a different conclusion and we will not overturn the hearing judge's findings simply because we

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<sup>50</sup> Id. at 27-37.

<sup>51</sup> Northern Indiana Public Service Co. (Bailly Generating Station, Nuclear 1), ALAB-303, 2 NRC 858, 867 (1975).

<sup>52</sup> Niagara Mohawk Power Corp. (Nine Mile Point Nuclear Station, Unit 2), ALAB-264, 1 NRC 347, 357 (1975).

might have reached a different result had we been the initial fact finder."<sup>53</sup>

Here, the Licensing Board's findings on the tritium content of the AGW (contention 4b) and the accuracy of the measurement of the radioactive content of the AGW (contention 3) are thoroughly detailed, fully explained, and amply supported by the record evidence.<sup>54</sup> Our reading of

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<sup>53</sup> General Public Utilities Nuclear Corp. (Three Mile Island Nuclear Station, Unit No. 1), ALAB-881, 26 NRC 465, 473 (1987).

<sup>54</sup> LBP-89-7, 29 NRC at 180-89.

Intermingled with their claims concerning the purported inadequate characterization of the radionuclides in the AGW is the intervenors' apparent complaint about the characterization of transuranics in the AGW. Intervenor's Brief at 28-30. Among other things, intervenors' contention 5d concerned the alleged inadequate characterization of transuranics in the AGW. The applicant, supported by the staff, moved for summary disposition of this portion of contention 5d. In doing so, they both demonstrated that the transuranics had been addressed in the staff's and the applicant's analyses and that the impacts of the transuranics were insignificant. The Licensing Board granted the applicant's summary disposition motion on this aspect of contention 5d. LBP-88-23, 28 NRC at 216-18. Interestingly, in opposing the applicant's motion, the intervenors did not address their own allegations concerning transuranics. Id. at 216.

On appeal, the intervenors again appear to raise this issue, although nowhere in their brief do they even mention the Licensing Board's resolution of contention 5d or describe how the Board's summary disposition ruling was in error. Nor is any error readily apparent from the Licensing Board's opinion. As should be evident, the intervenors' briefing of the characterization of transuranics in the AGW is woefully insufficient and this issue is deemed waived.



the record satisfies us that the evidence presented by the expert witnesses of the applicant and the staff was essentially undisputed.

In its findings, the Licensing Board thoroughly rehearsed how the applicant determined that the AGW contained 1020 curies of tritium. The Board found that

[t]he most recent [1986] sample data from 25 bodies of water were used and the concentration of each body of water were [sic] then multiplied by its corresponding tank volume to yield the amount of tritium present in each tank. The total inventories of tritium in each tank were then added to obtain the total curies of tritium in the AGW. The result was a total of 1180 curies of tritium in the AGW. Correcting the data from July 1986 to October 1988 for radioactive decay, a conservative total tritium curie content of 1020 was estimated. This estimate is conservative because reductions for normal evaporative losses of 12.5 curies per calendar quarter were not included.

In addition to this 1986 sampling effort, GPUN has since analyzed about 5000 routine samples of AGW, including measurements of tritium; these measurements confirm the 1986 data. In conjunction with the routine samples analyzed by the GPUN laboratory, periodic independent Quality Control analyses are also performed. The QC techniques include round-robin, blind, duplicate, replicate, spiked, and split samples. In this way, the accuracy and precision of the entire analytical process is verified frequently. In addition, a sample was analyzed independently by GPUN's chemistry department and by the U.S. Department of Energy's Radiological and Environmental Sciences Laboratory ("RESL"), Idaho Falls, Idaho, on behalf of the NRC. This

analysis, as discussed further<sup>55</sup> below, is consistent with the GPUN data.

The Board then set out the record evidence and explained its findings that empirical evidence from sampling data, rather than model predictions, was the most accurate method for determining the content of the AGW.<sup>56</sup> It explained why the determination of 1020 curies of tritium used by the applicant and the staff in their analyses was an upper-bound figure and it then reviewed the evidence underlying its finding that this number also was a conservative one that "more than compensates for the theoretical possibilities put forward by the Intervenor in their arguments that the AGW could contain more than 1020 curies of tritium."<sup>57</sup> Finally, the Board addressed the record evidence on the applicant's chemical analysis procedures, the reasons for, and insignificance of, the different tritium measurements to which the intervenors pointed, and the staff's checks on the applicant's measurements.<sup>58</sup> It found that the tritium content of the AGW had been accurately and conservatively determined by

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<sup>55</sup> LBP-89-7, 29 NRC at 181-82 (record citations omitted).

<sup>56</sup> Id. at 182-83.

<sup>57</sup> Id. at 184.

<sup>58</sup> Id. at 184-89.



actual measurements that had been independently verified. Thus, it concluded that the radionuclide content of the AGW properly supported the environmental comparison of the disposal options.<sup>59</sup>

We have reviewed, as best we can discern them, the intervenors' myriad complaints apparently aimed at the Board's final determination on the tritium content of the AGW. No useful purpose would be served by burdening this opinion with a recitation and evidentiary refutation of each of the intervenors' claims. The Licensing Board's findings already do that more than adequately. Suffice it to say that we have examined the record and found nothing to undermine the Board's findings. Applying the applicable standard of review for such factual findings, we are not convinced that the record compels a different conclusion. Indeed, we are persuaded that the Board's findings are correct and that the intervenors' complaints are baseless.

E. Additionally, the intervenors argue that the Licensing Board wrongly required them to develop a no-action alternative to the applicant's evaporation proposal and then erroneously saddled them with the burden of proving that their alternative was obviously superior to the applicant's

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<sup>59</sup> Id. at 189.

proposal.<sup>60</sup> The record, however, does not substantiate the intervenors' charges of error.

In its findings, the Licensing Board fully and correctly answered these often repeated charges by the intervenors, and there is little we need add to that discussion.<sup>61</sup> The intervenors' contention 2 alleged that the agency's consideration of the no-action alternative in the supplement to the PEIS was inadequate.<sup>62</sup> As the Licensing Board explained, it was the intervenors' own representations during prehearing proceedings that established the particulars of the no-action alternative considered by the applicant, the staff, and the Board. First, during the special prehearing conference on the admissibility of their proffered contentions, the intervenors represented that the no-action alternative referenced in contention 2 assumed that the AGW eventually would be disposed of, in contrast to being indefinitely stored.<sup>63</sup> During discovery when the applicant and the staff sought to identify the basis for the intervenors' claim that the agency's consideration of the no-action alternative was

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<sup>60</sup> Intervenors' Brief at 38-44.

<sup>61</sup> See LBP-89-7, 29 NRC at 141-42, 152-58.

<sup>62</sup> See LBP-88-23, 28 NRC at 185.

<sup>63</sup> Tr. 65.



inadequate, the intervenors' interrogatory responses indicated that the no-action alternative should have the equivalent of a thirty-year storage period for the AGW.<sup>64</sup> Thereafter, this same time period was endorsed by the intervenors' own witnesses in direct testimony.<sup>65</sup> Having made these representations, the intervenors cannot now be heard to complain that the Licensing Board erred in making its findings based on a no-action alternative containing those same representations.<sup>66</sup>

Nor did the Licensing Board place the burden of proof upon the intervenors as they charge. Rather, the Board placed the ultimate burden of proof, in contradistinction to the burden of going forward, upon the applicant, where it

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<sup>64</sup> LBP-89-7, 29 NRC at 154; LBP-88-23, 28 NRC at 186 n.3.

<sup>65</sup> LBP-89-7, 29 NRC at 155.

<sup>66</sup> See Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc., 435 U.S. 519, 553-54 (1978).

To the extent the intervenors are complaining that the agency failed to consider leaving the AGW onsite indefinitely (Intervenors' Brief at 40), the Licensing Board also addressed this claim. Part of the intervenors' contention 8 called for the indefinite storage of the AGW inside containment. The Licensing Board granted the applicant's motion for summary disposition of this contention (LBP-88-23, 28 NRC at 225-32) and, in their brief, the intervenors neither mention the Board's disposition of contention 8 nor explain how the Board's summary disposition ruling was in error.

properly belonged.<sup>67</sup> The Board then found that the applicant had demonstrated, by a preponderance of the evidence, that its evaporation proposal was environmentally acceptable<sup>68</sup> and that the applicant's proposal was obviously superior to the no-action alternative.<sup>69</sup>

F. Finally, the intervenors challenge the Licensing Board's factual findings on the costs associated with the no-action alternative, the risks related to storage tank rupture, and the health effects of the applicant's proposal.<sup>70</sup> Once again, the intervenors present no meaningful analyses of the Licensing Board's findings and ignore the substantial record evidence relied upon by the Board.<sup>71</sup> Nevertheless, we have examined the record

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<sup>67</sup> Tr. 103-04; 581-84; LBP-89-7, 29 NRC at 141 n.8. See 10 C.F.R. § 2.732. See, e.g., Consumers Power Co. (Midland Plant, Units 1 and 2), ALAB-123, 6 AEC 331, 345 (1973).

<sup>68</sup> LBP-89-7, 29 NRC at 142.

<sup>69</sup> Id. at 180.

<sup>70</sup> Intervenors' Brief at 46-66.

<sup>71</sup> The intervenors also appear to misapprehend the principles applicable to the consideration of radiation doses. For example, the intervenors claim that the ALARA principle requires the radiation doses from the applicant's proposal to be "as low as possible," and that the Commission made a commitment to minimize doses to the public and workers during the cleanup at TMI. Id. at 45, 59. ALARA, however, does not mean "as low as possible." Rather, this acronym stands for "as low as reasonably achievable taking

(Footnote Continued)



underlying the Board's detailed findings in light of intervenors' allegations. It is sufficient to note that the Board's findings on these issues are all well supported and adequately explained.<sup>72</sup> Under the applicable standard for reviewing such factual findings, we are not persuaded that the evidence compels a different result. As we read the evidence, the record demands the findings made by the Licensing Board.

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(Footnote Continued)

into account the state of technology, and the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to the utilization of atomic energy in the public interest." 10 C.F.R. § 20.1(c). Further, in its 1981 policy statement on the cleanup of TMI, the Commission specified the "limits on the doses which may result to offsite individuals from radioactive effluents resulting from cleanup and decontamination activities," setting them forth in Appendix R to the PEIS. 46 Fed. Reg. at 24,764-65. As the record and the Licensing Board's decision show, the applicant's proposal will result in doses many times lower than the limits specified by the Commission. Compare LBP-89-7, 29 NRC at 151 (total dose to bone is 0.8 millirem and total body dose is 1.3 millirems for maximally exposed hypothetical individual), with 1981 PEIS, Vol. 2, App. R (dose to public from radionuclides in gaseous effluents shall be limited to 15 millirems to any organ).

<sup>72</sup> See LBP-89-7, 29 NRC at 177-80, 147, 158-76.

The National Research Council's Committee on the Biological Effects of Ionizing Radiation (BEIR) recently released its latest report known as BIER V. Although the report is not part of the record of this proceeding, the Committee's latest conclusions on exposures to low levels of radiation were anticipated by the expert witnesses for the staff and the applicant and considered by the Licensing Board. Id. at 174-75.

One point, however, deserves separate comment. The intervenors suggest that the Licensing Board harassed one of their expert witnesses and was discourteous to him.<sup>73</sup> In its decision, the Licensing Board made extended credibility findings with regard to this witness.<sup>74</sup> It found that the witness lacked credibility primarily because he "showed no concern for the authenticity and accuracy of the documents he had provided with his testimony" and that the witness "was careless about the accuracy of his testimony."<sup>75</sup> Further, the Board concluded that the intervenors' witness "lack[ed] credibility because of his inability to produce documentation or supporting explanations for his statements on risk values."<sup>76</sup> We have examined carefully the pertinent transcript pages and conclude that the intervenors' charges are groundless.<sup>77</sup> We also are satisfied that there is ample basis for the Licensing Board's credibility findings regarding this witness.<sup>78</sup>

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<sup>73</sup> Intervenors' Brief at 59.

<sup>74</sup> LBP-89-7, 29 NRC at 168-74.

<sup>75</sup> Id. at 170.

<sup>76</sup> Id.

<sup>77</sup> See Tr. 1525-1648.

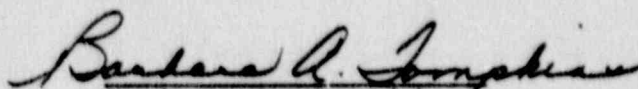
<sup>78</sup> While the intervenors' appeal was under consideration, the staff published in the Federal Register  
(Footnote Continued)

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For the foregoing reasons, the Licensing Board's decision in LBP-89-7, 29 NRC 138, authorizing the operating license amendment is affirmed.

It is so ORDERED.

FOR THE APPEAL BOARD

  
Barbara A. Tompkins  
Secretary to the  
Appeal Board

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(Footnote Continued)

an environmental assessment and finding of "no significant hazard" relating to GPUN's license amendment application. 54 Fed. Reg. 37,517 (1989). We found the published notice to be less than a model of clarity, so we requested the staff to respond to several questions concerning the scope and effect of the notice (see Appeal Board Order (September 13, 1989) (unpublished)), and then permitted the other parties to respond to the staff's filing. See Appeal Board Order (October 6, 1989) (unpublished). Because all of the matters contained in the staff notice already are reflected in the adjudicatory record and considered in the lower Board's decision, the staff's action has no effect on the Licensing Board's amendment authorization or the intervenors' appeal. Indeed, under the Commission's regulations, 10 C.F.R. § 51.102(c), the Licensing Board's decision and the supporting adjudicatory record, along with the supplement to the PEIS, form the complete environmental record of decision. See Philadelphia Electric Co. (Limerick Generating Station, Units 1 and 2), ALAB-819, 22 NRC 681, 705-06 (1985), aff'd in part and review otherwise declined, CLI-86-5, 23 NRC 125 (1986), remanded in part on other grounds sub nom. Limerick Ecology Action, Inc. v. NRC, 869 F.2d 719 (3d Cir. 1989). Accordingly, the staff's environmental assessment was merely a duplicative formality.



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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of

GPU NUCLEAR

(Three Mile Island, Unit 2)

Docket No.(s) 50-320-OLA

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing AB DECISION (ALAB-926) - 1/19 have been served upon the following persons by U.S. mail, first class, except as otherwise noted and in accordance with the requirements of 10 CFR Sec. 2.712.

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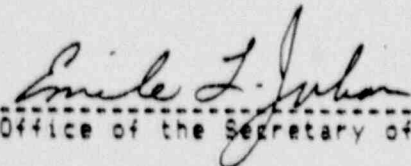
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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of

GPU NUCLEAR

(Three Mile Island, Unit 2)

Docket No. (s) 50-320-01A

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I hereby certify that copies of the foregoing AB DECISION (ALAB-926) 1/19/90 have been served upon the following persons by U.S. mail, first class, except as otherwise noted and in accordance with the requirements of 10 CFR Sec. 2.712.

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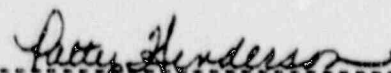
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