7/22/83

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

In the Matter of	)	
	)	
UNITED STATES DEPARTMENT OF ENERGY	)	
	)	
PROJECT MANAGEMENT CORPORATION	)	Docket No. 50-537CP
	)	
TENNESSEE VALLEY AUTHORITY	)	
	)	
(Clinch River Breeder Reactor Plant)	)	

APPLICANTS' RESPONSE TO INTERVENORS' EXCEPTIONS TO THE ATOMIC SAFETY AND LICENSING BOARD'S PARTIAL INITIAL DECISION (LIMITED WORK AUTHORIZATION) OF FEBRUARY 28, 1983

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The United States Department of Energy (DOE) and Project Management Corporation, for themselves and on behalf of the Tennessee Valley Authority (the Applicants), hereby file this Response to "Intervenors' Exceptions to the Atomic Safety and Licensing Board's Partial Initial Decision (Limited Work Authorization) of February 28, 1983," dated May 18, 1983.

SUMMARY OF ARGUMENT

This case comes before the Appeal Board on exception from the Licensing Board's February 28, 1983 Partial Initial Decision (PID) on a Limited Work Authorization (LWA) for the Clinch River Breeder Reactor Plant (CRBRP), which authorized the conduct of site preparation activities pursuant to 10 C.F.R. § 50.10(e).

Intervenors devote the bulk of their brief to site suitability issues.[1/] Within this block of issues there are two central themes which run throughout their arguments. First, Intervenors contend that the Board erred in establishing limitations on the scope and detail of the LWA stage inquiry into the particulars of the CRBRP design as it relates to site suitability. While Intervenors argued below that the LWA decision should await completion of a full safety review, which would have rendered the Board's limitations unnecessary and the LWA procedure a nullity, they have not taken exception to the Board's conclusion that the LWA procedure does apply to CRBRP. The scope limitations imposed by the Board were well founded in the Commission's statutory and regulatory framework governing LWA decisions. In addition, these limitations were explicitly conditioned upon affording Intervenors an opportunity to fully litigate the balance of these issues at the Construction Permit (CP) hearings.

The relief sought by Intervenors here -- an additional and unlimited opportunity to inquire into the CRBRP design as it relates to site suitability -- was explicitly granted by the Licensing Board's rulings and PID. On June 21, 1983, however,

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1/ Intervenors' exceptions are addressed herein in terms of ten blocks of issues: 1) site suitability; 2) the risk to DOE facilities in proximity to the Clinch River site; 3) safeguards risks; 4) the environmental effects of CRBRP fuel cycle activities; 5) alternative sites; 6) plant design alternatives; 7) DOE's methods for supplying CRBRP fuel; 8) application of the ALARA principle to accidents; 9) qualification of Intervenors' technical advisor as an interrogator; and 10) introduction of ACRS materials into the record.

Intervenors filed a Motion to Withdraw all of their contentions from the CP proceedings, and on June 29, 1983, the Board granted the Motion. They are now before this Appeal Board arguing that they were deprived of the opportunity to fully litigate CRBRP design issues relating to site suitability, having just come before the Licensing Board to request leave to forego that same opportunity. Intervenors' position is simply incongruous, and their site suitability arguments are fatally infected by this incongruity.

Intervenors' second major theme arises out of their view that for the Board to find that hypothetical core disruptive accidents (HCDA's) should not be design basis accidents (DBA's) for purposes of CRBRP site suitability analysis, it is necessary to show through quantitative reliability and probabilistic risk analyses that the numerical probability of an HCDA exceeding the 10 C.F.R. § 100.11(a) dose guideline values is 10^{-6} per reactor year or less. Simply stated, this argument is in direct conflict with existing Commission regulations, policy, and the analytical state-of-the-art as evidenced in the record.[2/]

2/ Not surprisingly, Intervenors' arguments about the CRBRP design as it relates to site suitability do not capture the state of the record regarding the CRBRP design approach to safety. The CRBRP has been designed with unprecedented emphasis on prevention of core damage events. To this end, CRBRP includes two fast-acting reactor shutdown systems, each capable of shutting the reactor down, and redundant and diverse shutdown heat removal systems capable of removing all decay heat through any one of four independent heat removal paths. Further, CRBRP includes measures in the design to preclude large leaks in primary system piping, and to prevent any local imbalances in core heat generation and removal from progressing to core-wide involvement. These design characteristics have been the primary bases for Applicants'
(Continued)

Intervenors' remaining arguments, including those relating to alleged errors in the NRC Staff's site suitability analyses, fuel cycle impacts, safeguards risks, etc., are matters of such fine detail that no meaningful summary can be given, and reference must be made to Applicants' specific responses below.

I. INTERVENORS' SITE SUITABILITY ARGUMENTS -- CONTENTIONS 1, 2, and 3

Intervenors' Brief,[3/] at 4-35,[4/] raises a series of

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and Staff's LWA conclusions, now confirmed upon completion of the full CP safety review, that HCDA's should not be design basis events for purposes of site suitability analysis. Notwithstanding these preventive characteristics, CRBRP has also been designed with features to accommodate and mitigate core damage events, including energetic HCDA's. In particular, for accommodation of whole core melt events, CRBRP has a containment vent/purge and clean-up system, a containment annulus cooling system, and instrumentation for detection and management of core melt events. In short, the CRBRP design incorporates not only the Commission's traditional three-level defense-in-depth concept, but has also placed unprecedented emphasis on design for core damage prevention, and incorporates an additional level of protection consisting of design features for mitigating the risk of beyond-design basis HCDA's. See A Exh 1, TR 1989-2071.

3/ Citations to the record herein are in the following form: a) Applicants' Exhibit - A Exh; Staff's Exhibit - S Exh; Intervenors' Exhibit - I Exh; b) Applicants' Witness - A W; Staff's Witness - S W; Intervenors' Witness - I W; c) Transcript - TR; d) Citations to prefiled written testimony include citations to exhibit number, page number, and transcript page; e) Applicants' Proposed Partial Initial Decision, January 24, 1983 - APID; f) NRC Staff's Proposed Opinion and Findings of Fact on LWA-1 Matters, January 24, 1983 - SPOF; (g) ASLB Partial Initial Decision (Limited Work Authorization), February 28, 1983 - PID; h) Intervenors' Brief in Support of Exceptions to the Atomic Safety and Licensing Board's Partial Initial Decision (Limited Work Authorization) of February 28, 1983, dated May 18, 1983 - Intervenors' Brief; i) Applicants' Deposition - A Dep; Staff's Deposition - S Dep.

4/ The arguments addressed herein encompass Intervenors' Exceptions 1, 3, 81, 83, 90, 7, 78, 99, 9, 10, 79, 90, 91, 92, 2,
(Continued)

procedural and substantive arguments relating to site suitability issues. For the most part, Intervenors' substantive arguments are answered by simply pointing to the evidence in the record in support of the Board's decision. On the other hand, similar consideration of Intervenors' procedural arguments carries a substantial risk of confusion since the Intervenors have made no attempt to define the fundamental differences in position between themselves, on the one hand, and Staff and Applicants, on the other. Accordingly, the following will address: a) the fundamental differences in position between the parties; b) the bases for the Board's rulings and decision; c) Intervenors' procedural arguments; and d) Intervenors' substantive arguments.

A. THE FUNDAMENTAL DIFFERENCES IN POSITION BETWEEN THE PARTIES

The present controversy revolves around the issue of whether HCDA's should be DBA's for purposes of CRBRP site suitability analysis. Intervenors argued that HCDA's must be DBA's, while Applicants and the NRC Staff arrived at a judgment that HCDA's should not be considered as DBA's for CRBRP site suitability analysis.

The Applicants and Staff based their position upon their analyses of the relevant initiators and sequences, the general design characteristics, the criteria, and the state of technology, all of which showed that CRBRP can be designed so that the likelihood of core conditions progressing to HCDA initiation is

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4, 5, 8, 12, 13, 14, 26, 82, 15 - 18, 27, 19 - 25, 28 - 32, 35 and 37, at pages 4 - 35 of Intervenors' Brief.

extremely low. APID at F-7 -- F-25. Applicants' and Staff's evaluations of these factors were grounded upon deterministic engineering analyses and judgments, and neither relied upon quantitative reliability or probabilistic analyses. PID at 73; APID at F-7 -- F-25, F-40 -- F-42.

In contrast, Intervenors maintained that, for purposes of CRBRP site suitability analysis, it is necessary to demonstrate through quantitative reliability and/or probabilistic analyses that the numerical probability of an HCDA resulting in consequences exceeding the 10 C.F.R. Part 100 dose guideline values is less than 10^{-6} per reactor year. PID at 72; APID at F-40 -- F-42; I Exh 3 at 30-59, TR 2839-68. As a corollary to this, Intervenors submitted that this demonstration must be made on the basis of a complete, detailed safety review of the CRBRP. Intervenors' Brief at 5.

The disjunction in the parties' respective positions, and their differing views as to the statutory, regulatory, and practical limits on the scope of review at the Limited Work Authorization (LWA) stage gave rise to the Board's scope rulings.

B. THE BASES FOR THE BOARD'S RULINGS AND DECISION

Contrary to Intervenors' position, the site suitability determination at the LWA stage need not be a definitive, plant-specific or design-specific finding which requires a complete safety review for support. That determination: 1) does not require a complete safety review, but can be "based on the

available information and review to date;"[5] 2) does not require definitive evidence, but rather a showing of "reasonable assurance that the proposed site is a suitable location;"[6] and 3) does not presuppose a completed, detailed design, but instead considers the general design characteristics of a "reactor of the general size and type proposed."[7]

The LWA decision is neither irrevocable nor with prejudice to the succeeding safety review at the Construction Permit (CP) stage. In this regard, the applicable NRC regulation states that "[a]ny activities undertaken pursuant to an authorization granted under this paragraph shall be entirely at the risk of the applicant and, except as to matters determined under paragraphs (e)(2) and (e)(3)(ii), the grant of the authorization shall have no bearing on the issuance of a construction permit...". 10 C.F.R. § 50.10(e)(4). Should the subsequent safety review reveal a need for modifications to the facility or previous findings, the Applicants would bear the risk. This reinforces the notions that information necessary for environmental and site suitability (LWA) findings can and should be substantially more limited than those for the CP, and that the LWA site suitability decisions can rest upon a more limited set of findings.

Not only is the LWA decision limited in scope, but even the subsequent CP review is subject to substantial

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5/ 10 C.F.R. § 50.10(e)(2)(iii).

6/ Id.

7/ Id.; compare 10 C.F.R. § 50.35(a).

limitations.[8/] The applicable NRC regulation, 10 C.F.R. § 50.35(a), defines the scope and structure of the CP review. Under 10 C.F.R. § 50.35(a) even the ultimate CP findings do not contemplate a final resolution of all safety issues. Rather, it is sufficient to find that certain issues can be left for later consideration, that research and development programs are reasonably designed to achieve timely resolution of those issues, and that, on this basis, there is reasonable assurance (taking into consideration the site criteria contained in 10 C.F.R. Part 100) that the proposed facility can be constructed and operated at the proposed location without undue risk to the health and safety of the public.[9/]

A fortiori, the Board's consideration of site suitability issues at the LWA stage should be governed by the following

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8/ The Supreme Court has directly addressed the scope of, and limitations upon, CP findings in Power Reactor Development Corp. v. International Union of Electrical, Radio and Machine Workers (PRDC), 367 U.S. 396 (1961). In PRDC the Court considered the question of "whether the Commission's safety finding at the CP stage, i.e., 'information sufficient to provide reasonable assurance that a facility of the general type proposed can be constructed and operated at the proposed location without undue risk to the health and safety of the public,' must be backed up with as much conviction as to the safety of the final design of the specific reactor in operation as the second, final finding [i.e., for issuance of an operating license] must be." PRDC, 367 U.S. at 407. The Court answered that question squarely in the negative. Id.

9/ 10 C.F.R. § 50.35(a). In contrast to the LWA site suitability finding under 10 C.F.R. § 50.10(e)(2), the CP site suitability finding under 10 C.F.R. § 50.35(a) contemplates a more specific analysis for the facility during the safety review, rather than a finding concerning a reactor of the general size and type proposed.

principles:[10/] 1) the analysis of site suitability should be based on (a) the available information and review to date, (b) a standard of reasonable assurance, and (c) a reactor of the general size and type proposed; 2) the applicant proceeds at his own risk upon grant of an LWA, or even a CP; 3) the detailed review of safety issues should be undertaken at the CP stage, and even then, unresolved issues can await timely resolution at the operating license (OL) stage; and 4) LWA findings should be predicated upon a limited review of general design characteristics, while detailed review of design measures is appropriate for the subsequent CP or OL stages.

With the differing views of the parties and the foregoing principles in view, the Board ruled that a full-scale inquiry into the specific design of the CRBRP would be inappropriate at the LWA stage, and that the LWA review should focus upon: a) the major classes of accident initiators potentially leading to HCDA's; b) the relevant criteria to be imposed for the CRBRP; c) the state of technology as it relates to the applicable design characteristics and criteria; and d) the general characteristics of the CRBRP design (e.g., redundant, diverse shutdown systems). The Board also deferred for consideration in subsequent proceedings: a) Intervenors' contention 1b), which contemplated a detailed challenge to the Applicants' reliability

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10/ Intervenors' position would hold that one cannot consider an LWA for CRBRP until the safety review is completed, thus rendering the LWA regulation a nullity for CRBRP. The Board specifically addressed that issue in the PID. PID at 198-200. Significantly, Intervenors have not taken exception to that portion of the PID.

assurance program, and b) Intervenors' contention 3a), which alleged that a detailed probabilistic risk assessment, comparable in scope to WASH-1400, was required. The Board explicitly preserved Intervenors' opportunity to fully litigate at the CP stage the balance of all issues which were subject to the LWA stage limitations. See Board Order, dated April 22, 1982.

Intervenors still maintain here that the decision concerning whether an HCDA should be a DBA must be based upon a complete, detailed safety review, and that Applicants must demonstrate that the numerical probability of an HCDA with consequences exceeding the 10 C.F.R. Part 100 site suitability does guidelines is 10^{-6} or less. With the parties' positions and the bases for the Board's rulings and decision in view, Intervenors' procedural arguments can now be examined.

C. INTERVENORS' PROCEDURAL SITE SUITABILITY ARGUMENTS

Intervenors argue that the Board erred in: 1) failing to resolve, to the degree necessary for an LWA determination, the issue of whether HCDA's should be DBA's;[11/] 2) limiting the scope and detail of the inquiry on the issue of whether HCDA's should be DBA's; [12/] 3) basing its LWA decision on the issue of whether HCDA's should be DBA's on the feasibility of designing CRBRP to meet that objective;[13/] 4) deferring Intervenors' contentions concerning quantitative reliability analyses and probabilistic

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11/ Intervenors' Brief at 4-8.

12/ Id. at 9-11.

13/ Id. at 11-14.

risk assessment to later stages of the proceedings;[14/] 5) denying Intervenors' Motions to Strike Portions of Applicants' Testimony and Exhibits;[15/] and 6) failing to confront Intervenors' arguments that HCDA's should in fact be considered credible DBA's.[16/]

1. The Board Resolved, to the Degree Necessary for an LWA Determination, the Issue of Whether HCDA's Should be DBA's -- Exceptions 1 and 3 at 4-8.

Intervenors argue that the Board has two ways of determining the site suitability source term[17/] for purposes of LWA site suitability analysis: 1) on the basis of a full safety review,[18/] or 2) on the basis of "the most conservative assumptions to ensure site suitability." Intervenors' Brief at 6. In advancing the second proposition Intervenors have ignored the regulatory framework within which the Board's decision was made, the uncontradicted evidence in the record, and the nature and effect of the Board's decision.

14/ Id. at 14-17.

15/ Id. at 17-19.

16/ Id. at 19-22.

17/ 10 C.F.R. § 100.11(a) provides that "[t]he fission product assumed for these calculations should be based upon a major accident, hypothesized for purposes of site analyses or postulated from considerations of possible accidental events, that would result in potential hazards not exceeded by those from any accident considered credible". 10 C.F.R. § 100.11(a), footnote 1.

18/ Section IB., supra, addresses this argument. See also note 10, supra.

Intervenors' "the most conservative" standard is not supported by sound authority, and conflicts with the Commission's statutory and regulatory framework governing an LWA decision. Intervenors' reliance upon Union of Concerned Scientists v. AEC, 499 F.2d 1069 (D.C. Cir. 1974), is misplaced. That case decided the issue of whether the Commission's treatment of an issue by generic rulemaking would foreclose consideration of the same issue in an individual licensing case. In dicta the court stated that "[t]he AEC has chosen to employ a most conservative (drastic) assumption in determining site suitability because site selection is the most crucial decision." 499 F.2d 1090 (Emphasis added). Even as to this dicta, Union of Concerned Scientists neither addressed nor decided the issue of whether site suitability findings must be based upon "the most conservative" assumption.19/

19/ Intervenors directly cite 10 C.F.R. § 100.2(b) for the proposition that even more conservatism is required for a "first-of-a-kind" reactor such as CRBRP. The language of 10 C.F.R. § 100.2(b) does provide "that these criteria [in Part 100] will be applied in a manner that takes into account the lack of experience." That has been the case here. See, e.g., S Exh 1; A Exh 1, TR 1989-2071; PID at 21. Moreover, 10 C.F.R. Part 100.2(b) must be read in concert with the Commission's two-step licensing process, and the applicable LWA regulation. As shown in Section IB., supra, site suitability findings under 10 C.F.R. § 50.10(e)(2) at the LWA stage should be based upon: a) the available information and review to date, b) a standard of reasonable assurance, and c) a reactor of the general size and type proposed. In contrast, the subsequent CP site suitability finding under 10 C.F.R. § 50.35 contemplates a more specific finding for the facility based upon a completed safety review. Compare 10 C.F.R. § 50.10(e)(2), with 10 C.F.R. § 50.35(a). Moreover, pending completion of the safety review and issuance of a CP, the Applicant proceeds at his own risk under an LWA. 10 C.F.R. § 50.10(e)(4).

When followed to its logical conclusion, Intervenors' "the most conservative" standard would render the LWA procedure unavailable to CRBRP. Unless the safety review is complete, one cannot preclude the possibility that an HCDA might be found to be an appropriate DBA for CRBRP. Given that proposition, then "the most conservative" assumption would be to require that the site suitability source term bound HCDA's, or even some more severe accident which might conceivably emerge in the safety review. In any event, one could not have absolute assurance of meeting "the most conservative" standard until completion of the safety review, and thus the LWA procedure would be a nullity -- a result the Board expressly rejected as in conflict with the Commission's regulations,[20/] and to which the Intervenors have not taken exception.

The Board found on the basis of the uncontradicted record evidence that the consequences associated with the site suitability source term release represent an upper or conservative bound to all DBA's in CRBRP. PID at 21, 81.[21/] The Board expressly rejected as unpersuasive Intervenors' only "substantive" evidence on the issue of whether an HCDA should be a DBA, that is, their arguments that prior experience at domestic and foreign sodium-cooled facilities showed that HCDA's should be

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20/ See PID at 198-200.

21/ Further, the Board found that the CRBRP containment/confinement has been shown capable of performing its intended function to accommodate all DBA's, and hold doses below the applicable 10 C.F.R. § 100.11(a) site suitability dose guideline values. PID at 22, 81-82.

DBA's for purposes of CRBRP site suitability analyses. PID at 20, 71; see APID at F-32 -- F-40.

The record contains extensive evidence concerning the four categories of major CRBRP design features and characteristics to prevent the progression of an accident beyond design basis conditions to initiation of an HCDA.[22/] The Board found that these features can inhibit the initiation of an HCDA, and thus these features lend credibility to the proposition that HCDA's need not be included within the envelope of DBA's for CRBRP. PID at 19, 66-71.

As to the nature and effect of the Board's decision, Intervenors would have the Appeal Board perceive the Board's decision as being preclusive and final. In accordance with its previous rulings, however, the Board exercised considerable caution to avoid attaching any preclusive or final effect to its findings on whether an HCDA should be a DBA, and most importantly, to avoid any prejudice to the rights of all parties to finally litigate that question at the CP proceedings upon

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22/ PID at 18-19, 66-71; see APID at F-5 -- F-25; S Exh 1 at II-6 -- II-13; S Exh 2 at 10-11, 13-19, TR 2455-56, 2458-64; A Exh 1 at 14-46, TR 2003-2035. These include two redundant, diverse, independent, fast-acting reactor shutdown systems; redundant and diverse shutdown heat removal systems which provide decay heat removal through four independent paths; means to prevent double-ended inlet pipe rupture; and means to maintain the balance between heat removal and heat generation in individual fuel subassemblies. Id. The record is uncontroverted that all major classes of initiators and sequences of importance to initiation of HCDA conditions were identified, and that these four categories of design features and characteristics are necessary and sufficient to maintain core conditions within design basis conditions and prevent progression to HCDA conditions. Id.

completion of the full safety review. PID at 22; see Board Order, dated April 22, 1982 at 4-7. While recognizing that there were no threshold matters which militate against exclusion of HCDA's from the design base, the Board foresaw a "heavy burden upon these parties at the construction permit evidentiary hearings to provide sufficient evidence to permit a resolution of this question". PID at 22.

Intervenors cannot complain of any preclusive or final effect.[23/] Two points warrant emphasis here. First, the Board's decision gave Intervenors the very relief sought here -- the opportunity for unlimited and final litigation on the question of whether HCDA's should be DBA's. The issue was scheduled to be heard during the week of July 18, 1983, and their need for relief, if any, would have been satisfied at that time. See Notice of Construction Permit Evidentiary Hearing, dated May 24, 1983.

Second, on June 21, 1983 the day before the last milestone in the Board's schedule for CP prehearing activities,[24/] the Intervenors filed a Motion to Withdraw all of their CP contentions, including the very contentions which encompass the issue of whether an HCDA should be a DBA. On July 29, 1983 the Board granted Intervenors' Motion and dismissed the contentions.

23/ The safety review for CRBRP has been completed. The Staff's Safety Evaluation Report (SER) was issued in March, 1983, the Advisory Committee on Reactor Safeguards letter was issued in April of 1983, and evidentiary hearings on all CP issues commenced on July 18, 1983. See Notice of Construction Permit Evidentiary Hearing, dated May 24, 1983.

24/ See Board Order, dated March 29, 1983.

TR 7329-33. Intervenors have decided to forego the opportunity to finally litigate the question of whether an HCDA should be a DBA. They are before this Appeal Board arguing that they were deprived of the opportunity to so litigate, while having just come before the Licensing Board to request leave to forego that same opportunity.

The Board's decision was based upon a sound construction of the applicable statutory and regulatory framework governing the LWA decision process, and the reliable, probative evidence in the record. In addition, the Board's decision assiduously protected Intervenors' opportunity to finally litigate the issue of whether an HCDA should be a DBA, and Intervenors have now eschewed that protection and that opportunity. The Appeal Board should affirm.

2. The Licensing Board Established Appropriate Limitations on the Scope and Detail of the Inquiry on the Issue of Whether HCDA's Should be DBA's -- Exceptions 81, 83 and 90 at 9 - 11.

Intervenors argue that the factors applied by the Board to limit the scope and detail of inquiry at the LWA stage are lacking in: a) basis[25/] and b) relevance to the necessary determinations for an LWA. Intervenors' Brief at 9-10.

The specific factors adopted by the Board reflect the exercise of sound discretion and are well supported by the weight of the evidence in the record. Clearly, the Board had discretion

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25/ The Board's basis for limiting the scope and detail of inquiry is fully explained in the Board Order, dated April 22, 1982, and elaborated in Section IB., supra.

to apply some limitations on the scope of inquiry.[26] The factors delineated by the Board involved consideration of the major classes of accident initiators potentially leading to HCDA's, the relevant criteria to be imposed for the CRBRP, the general design characteristics of the CRBRP design (e.g., redundant, diverse shutdown systems), and the state of technology as it relates to the applicable design characteristics and criteria. Board Order, dated April 22, 1982 at 2-3. With a broad sweep and without citation to the record, Intervenors' brief dismisses these factors as having "only superficial relevance", as not a "meaningful test", or not the "real issue".[27] The record shows, however, that Intervenors proposed no alternative factors.[28] Further, the record shows that the factors identified by the Board are the important considerations which affect a rational judgment as to whether HCDA's should be DBA's. See PID at 66-71; see APID at F-5 -- F-25; see, e.g., S Exh 1 at II-6 -- II-13; A Exh 1 at 14-46, TR 2003-2035. The record shows no substantial evidence to the contrary. PID at 22, 72.

26/ Otherwise, one must accept Intervenors' argument as to the necessity for a complete safety review, or its logical equivalent, the "the most conservative" standard. See Section IC1., supra.

27/ Intervenors' Brief at 10.

28/ See Intervenors' Statement of Position Regarding Contentions 1, 2, & 3, April 20, 1982, at 11-14.

Intervenors have maintained throughout the proceedings that the decision must rest either upon a complete safety review,[29/] or upon a demonstration (using quantitative reliability/probabilistic analysis) that the probability of an HCDA exceeding the 10 C.F.R. Part 100 dose guidelines is 10^{-6} per reactor year or less.[30/] Intervenors' point as to reliability/probability analysis conflicts with the Commission's existing regulatory policy and requirements relating to the role of probabilistic analysis in the licensing process.

Prior to January, 1982 there was no regulatory requirement for a probabilistic risk assessment (PRA) at any stage of the licensing process. See for example, Public Service Company of New Hampshire (Seabrook Station, Units 1 and 2), Nos. 50-443 OL, 50-444 OL, ASLB Slip Op. at 8, 15 NRC ___, (September 13, 1982). The regulations now require completion of a PRA for current generation power plants which had CP applications pending as of February 16, 1983 "no later than two years following issuance of the construction permit." 10 C.F.R. § 50.34(f)(1); 48 Fed. Reg. 2286 (January 15, 1982).

More recently, the Commission issued its Policy Statement on Safety Goals for the Operations of Nuclear Power Plants,

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29/ This argument has been answered in Section IB., supra.

30/ See PID at 72-73; APID at F-40 -- F-41; I Exh 1 at 30-59, TR 2839-68. Intervenors' most recent expression of this point occurred in Dr. Cochran's depositions during the CP phase. Dr. Cochran suggested that Applicants and Staff have two choices: either include HCDA's in the design basis or demonstrate, quantitatively, that an HCDA is incredible. S Dep of Dr. Cochran, May 12, 1983, S Dep TR 38; A Dep of Dr. Cochran, May 13, 1983, A Dep TR 14-15.

48 Fed. Reg. 10772 (March 24, 1983), which defined the role of a PRA in the licensing process for nuclear power plants. In that Statement the Commission established a two-year period for evaluating the safety goals and preliminary numerical design objectives contained in the Statement. The Commission noted that the qualitative goals and quantitative objectives "will not replace the NRC's reactor regulations. Rather, NRC will continue to use conformance to regulatory requirements as the exclusive licensing basis for plants." 48 Fed. Reg. 10772.

In its April 13, 1983, Proposed Policy Statement on Severe Accidents and Related Views on Nuclear Reactor Regulations, the Commission affirmed that a PRA need not be performed prior to issuance of a construction permit, and that existing deterministic regulatory requirements shall be the exclusive licensing basis for plants.[31/] Further, the real value and proper role of a PRA is in defining relative risks.[32/] 48 Fed.

31/ 48 Fed. Reg. 16014 (April 13, 1983). The Safety Goal Policy Statement provides, in pertinent part, that "[d]uring the evaluation period, the qualitative safety goals and quantitative design objectives will not be used in the licensing process or be interpreted as requiring the performance of probabilistic risk assessments by applicants or licensees [see Part III]. Rather, the NRC will continue to use conformance to regulatory requirements as the exclusive licensing basis for plants." 48 Fed. Reg. 16015 (Emphasis added).

32/ Consistent with this concept, the record shows that PRA will be used as a means for assuring that the reliability inherent in the CRBRP design concepts will be realized in practice. S W Morris, TR 5646-47; S Exh 2 at 25, TR 2470; A W Clare, TR 1689-90; see PID at 73; APID at F-42. It is not envisioned as the basis for a CP decision, much less an LWA decision on whether an HCDA should be a DBA. PID at 73; APID at F-40 -- F-42. The methods of analysis and techniques for PRA are not sufficiently well developed to serve as the basis for such a decision. S Exh 2 at 25, TR 2470; see PID at 73. The (Continued)

Reg. 16015. In contrast, Intervenors envision the PRA as a prerequisite to the absolute determination as to whether an HCDA should be a DBA. See PID at 72-73. The Commission has expressly cautioned against the use of PRA inferences "to reach bottom-line safety conclusions." 48 Fed. Reg. 10772. Consistent with the Commission's direction, both Applicants and Staff have based their positions as to whether an HCDA should be a DBA on deterministic analyses, and Intervenors had an ample opportunity to litigate those analyses. See PID at 66-73. Commission policy[33/] clearly directs that a PRA is not required at this stage of these proceedings, and that the existing body of deterministic regulatory requirements constitute "the exclusive basis for licensing plants."

There is one additional factor affecting Intervenors' argument concerning the need to base the LWA decision on probabilistic analysis.[34/] Despite their claims here of having had no

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NRC Staff ultimately views the CRBRP PRA as an additional tool or mechanism for integrating deterministic analyses into a complete plant model to obtain an understanding of the relative importance of individual systems and components. SER at D-1. This, in turn, will establish "the foundation and framework for a continuing risk management program as an aid to plant operation." SER at D-1.

33/ The Commission has the exclusive authority to make policy. Offshore Power Systems (Floating Nuclear Power Plants), CLI-79-9, 10 NRC 257, 261 (1979); South Carolina Electric and Gas Co. (Virgil C. Sumner Nuclear Station Unit 1), LBP-81-44 (Oct. 15, 1981).

34/ As noted in Sections IB., IC1. and IC2., supra, the Board's limitations were imposed without prejudice to a full scale inquiry at the CP stage, and in fact, the Board merely deferred Intervenors' PRA contention 3a) to that stage of the proceedings. See Board Order, dated April 22, 1982 at 6. When Intervenors were afforded the opportunity to litigate the issue without any limitation at the CP stage, they did not (Continued)

opportunity to litigate the PRA issue, when the CP stage was in fact reached, Intervenors had no quarrel with the substantive scope, content, and adequacy of Applicants' Reliability Assurance and PRA programs, but merely with their timing.[35/] Intervenors' sole point was that the PRA must be completed prior to issuance of a CP.[36/] During the depositions of Dr. Cochran by both Applicants and the NRC Staff, Dr. Cochran stated that Intervenors did not have "any basis for faulting" either the PRA Program or the Relability Assurance Program.[37/]

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take that opportunity and withdrew all of their contentions, including their PRA contention. See Section IC1., supra.

35/ Intervenors' Brief at 11 makes two additional points: a) that Applicants relied on "design detail," whereas Intervenors could not; and b) Intervenors had no opportunity for discovery on the Staff's Appendix J analysis in the FES Supplement. The former point is answered in Section IC5., infra. The latter point is simply not true. After an initial phase of hearings on site suitability issues, in August of 1982 the Board reopened discovery on all Intervenor contentions (even though it had been closed in June), and specifically allowed Intervenors to undertake discovery on Appendix J. Board Order, dated August 31, 1982; see PID at 10-11 and note 14. In fact, Intervenors conducted extensive discovery on Appendix J. See PID at 10-11 and note 14.

36/ In response to Admission 33 of Applicants' Eleventh Set of Interrogatories and Request for Admissions, dated April 25, 1983, Intervenors made the following statement:

> Intervenors claim that a comprehensive PRA should be completed prior to issuance of a CP for CRBR if the CP is to be based on placing CDAs outside the DBA envelope.

During the May 12, 1983 Staff deposition of Dr. Cochran, Dr. Cochran affirmed that position. S Dep of Dr. Cochran, May 12, 1983, S Dep TR 146.

37/ S Dep of Dr. Cochran, May 12, 1983, S Dep TR 164-65; A Dep of Dr. Cochran, May 13, 1983, A Dep TR 16.

Intervenors have pointed to no substantive basis in the record to show that the factors adopted by the Board were improper, but have merely reiterated their position that there are only two ways to decide whether an HCDA should be a DBA: 1) on the basis of a complete safety review, or 2) on the basis of a PRA. Neither argument has merit and both present irreconcilable conflicts with the Commission's statutes, regulations, and policy.

3. The Board Properly Based its LWA Decision on the Issue of Whether HCDA's Should be DBA's on the Feasibility of Designing CRBRP to Meet That Objective -- Exceptions 7, 9, 79 and 10 at 11-16

Intervenors argue that the Board's consideration of the feasibility of designing CRBRP to exclude HCDA's as DBA's has no place in the LWA decision since: 1) on a first-of-a-kind reactor there is a substantial possibility that the design intent will not be achieved; and 2) the possibility of change could affect the NEPA cost-benefit balance. Intervenors' Brief at 11-16.

The record shows no substantial likelihood that the design intent will not be achieved. On the contrary, no threshold matters have been identified that raise such a likelihood. PID at 22, 72. Moreover, in urging extreme conservatism to guard against that possibility, and in raising the spectre of extreme risk associated with the decision, Intervenors have ignored two simple counterpoints. First, the risk of change resulting from a complete safety review is explicitly placed upon the Applicant by the LWA regulation. 10 C.F.R. § 50.10(e)(4). Second, Intervenors' implied spectre of public risk is illusory.

The LWA decision does not authorize safety-related construction, and a final decision based upon a complete safety review will be made before any authorization for safety-related construction is issued.[38] See 10 C.F.R. § 50.10(e).

As to the possibility that change could affect the NEPA cost-benefit balance, Intervenors have again misconceived the Board's decision. The Board properly weighed all relevant costs and benefits of the proposed action, including accident risk considerations, and rendered the appropriate NEPA findings.[39]

38/ Indeed, Intervenors' argument has a hollow ring when one considers the facts that the now completed safety review has yielded no change, and that Intervenors have now abandoned the opportunity to show a need for change. See Section IC1., supra. As to Intervenors' argument concerning the exclusion of systems reliability and failure rates, we redirect the Appeal Board's attention to Section IC2., supra, and the realities of Intervenors' position. The issue of reliability analyses and PRA was properly deferred by the Board to subsequent stages of the proceedings. See Section IC2., supra. Moreover, Intervenors' admitted failure to subsequently raise any matters of substance regarding reliability analyses and PRA, and their decision to ultimately abandon pursuit of that issue underscore the frailty of this argument. Intervenors' Exceptions 79 and 90 at 16-17 argue that the Board should not have ruled out Intervenor contention 3a), which alleges the need for a PRA. The Board did not rule out the contention. The Board deferred the contention until the CP stage. Board Order, dated April 22, 1982 at 6. Intervenors suffered no prejudice since they were allowed full opportunity to discover and litigate as to the Staff's analyses in Appendix J of the FES Supplement, and in any event, in subsequent proceedings it was determined that Intervenors took no substantive issue with the adequacy of Applicants' PRA program. See Section IC2., supra.

39/ Intervenors' citation to Sierra Club v. Sigler, 695 F.2d 957, 968-975 (5th Cir. 1983) ("employ a worst case analysis") ignores the Board's Finding that the site suitability source term consequences represent an upper bound to all design bases accidents. PID at 21, 81. Further, the Board's recognition that the issue of whether an HCDA should be a DBA would be considered in further detail at the CP stage (PID at 21-22) is entirely consistent with a fair recognition of
(Continued)

PID at 23-24, 83, 194-197, 202. Moreover, the Board properly limited the review at the LWA stage, while preserving all parties' opportunity to finally litigate the question of whether an HCDA should be a DBA. PID at 22; see Board Order, dated April 22, 1982 at 3-7. Although Intervenors' withdrawal suggests that they have no real interest in pursuit of that issue, nevertheless, it is fair to assume that the Board itself will respond appropriately if change occurs, and that Applicants will absorb that risk.

4. The Board Properly Deferred Intervenors' Contentions Concerning Quantitative Reliability Analyses and Probabilistic Risk Assessment to Later Stages of the Proceedings -- Exceptions 78, 99 and 9 at 14-16

For the reasons stated in Section IC2., supra, Applicants submit that the Board properly deferred consideration of Intervenors' quantitative reliability and PRA contentions to the CP stage of the proceedings. Moreover, Intervenors' failure to raise any substantive matters concerning this issue when given the opportunity to fully litigate it at the CP stage, coupled with their ultimate decision to forego full litigation of the issue, demonstrate the lack of substance to this argument.[40/]

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uncertainty. See Natural Resources Defense Council v. Nuclear Regulatory Commission, 685 F.2d 459 (D.C. Cir. 1982); reversed sub nom., Baltimore Gas & Electric Co. v. Natural Resources Defense Council, 51 U.S.L.W. 4678 (1983).

40/ See Section IC2., supra. Two additional points in Intervenors' argument warrant a brief response. First, Intervenors mischaracterize the reliability program as "the basic analytical tool used by Applicants to select HCDA initiators for review, reveal common mode failures and systems interactions, and provide assurance that a CDA for CRBR is an exceedingly unlikely event." Intervenors' Brief at 15. On (Continued)

5. The Board Properly Denied Intervenors' Motions to Strike Portions of Applicants' Testimony and Exhibits -- Exceptions 91 and 92 at 17 - 19

In limiting the scope and detail of inquiry at the LWA stage, and deferring consideration of Intervenors' contentions concerning quantitative reliability analyses and PRA until the CP stage, the Board also made parallel rulings designed specifically to protect Intervenors against prejudice and to preserve their opportunity to finally litigate these issues at the CP stage. In one such instance, the Board insisted that certain statements in Applicants' testimony be qualified consistent with the Board's scope limitations "to protect Intervenors from being required to address the adequacy of proposed CRBR safety systems at this time". TR 1349; see Board Order, dated September 27, 1982 at 2. Applicants complied with the Board's directive. Id. at 2-3.

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the contrary, Applicants have not relied upon the reliability program to determine whether an HCDA should be a DBA. See PID at 73; APID at F-40 -- F-42. Rather, Applicants have based that decision upon deterministic engineering analyses and have only used reliability analyses as a design tool to enhance assurance that the reliability inherent in the CRBRP features will ultimately be realized. PID at 73; APID at 42. Second, Intervenors argue that the Board's recognition of this role of the reliability program was somehow improper because Intervenors were not given "a chance to contest the adequacy of the program." Intervenors' Brief at 16. The Board's recognition of the program was proper. Indeed, Intervenors' testimony included numerous references, however inaccurate, to that program. E.g., I Exh 1; I Exh 13 at 25, TR 2834. Compare A W Clare, TR 1483. More importantly, Intervenors' statement as to their desire to test the "adequacy" of the program is contradicted by their own actions. During CP discovery, Intervenors conceded that they had no quarrel with the adequacy of the program, but only with the timing of the program. See Section IC 2., supra. Subsequently, Intervenors decided to forego any chance to contest the adequacy of the program. See Section 1B, supra.

In spite of this, Intervenors now argue that denial of their Motions to Strike certain remaining portions of Applicants' testimony, as qualified pursuant to the Board's directive, is inconsistent with the Board's limitations on scope at the LWA stage. Intervenors' Motions to Strike, Applicants' Responses thereto, and the Board Order, dated September 27, 1982, are a matter of record which speak for themselves in detail, and need not be reiterated here. Indeed, the September 27 Order was entirely consistent with the scope limitations previously established in the April 22 Order, and more importantly, protected Intervenors against any prejudice.[41/]

41/ Intervenors emphasize on appeal that they "wanted to address the adequacy (or lack thereof) of CRBR safety systems", and sought protection from the "applicants' use of detailed information about the adequacy of CRBR safety systems". Intervenors' Brief at 18. Intervenors argue that Applicants were free to use detail, while Intervenors were not free to use reliability analyses to test the adequacy of those systems. Id. at 19. Intervenors can hardly complain of prejudice. The Board's insistence upon qualification of Applicants' testimony so that it would have no preclusive effect as to Intervenors, and the Board's cautious findings in its ultimate LWA decision provided complete protection to Intervenors. In addition, Intervenors' claims that they wanted to test system adequacy in detail and to pursue reliability analyses are inconsistent with their actions at the CP stage. See Sections IB., IC1. and IC2., supra. Simply stated, Intervenors have misconstrued the intention and effect of the Board's rulings on their Motions to Strike. Those rulings were explicitly designed to protect, and in fact did protect, Intervenors.

6. The Board gave Proper Consideration to Intervenors' Arguments that HCDA's Should be Considered Credible DBA's -- Exceptions 2, 4 and 5 at 19-22

Intervenors argue that there is affirmative evidence in the record that HCDA's should be DBA's.[42/] In particular, Intervenors argue: 1) the Staff has adopted a reliability objective of 10^{-6} per reactor year that HCDA's would not result in consequences exceeding 10 C.F.R. Part 100 guideline values, Intervenors' Brief at 20-21; 2) the Staff's analyses in Appendix J of the FES Supplement show that HCDA's have a probability of more than 10^{-4} per year, Id. at 20-21; 3) the consequences of HCDA's will exceed the Part 100 guideline values Id. at 21-22; and accordingly, 4) HCDA's must be DBA's, Id. at 22.

As an initial point of reference, it should be emphasized that the argument advanced by Intervenors was not the product of testimony sponsored by a well-qualified witness. Rather, as Intervenors tacitly concede,[43/] this so-called evidence surfaced for the first time after the evidentiary presentations, by way of closing argument by Intervenors' technical representative, Dr. Cochran. TR 6626-33, 6639-43, TR 6562-63; APID at F-43 -- F-44.

42/ Intervenors complain in passing that some of this evidence was not even mentioned in the decision. Intervenors' Brief at 19. While the Board's findings explicitly rejected all matters not otherwise mentioned (PID at 12), the record does show that that evidence is simply not reliable and probative. See Section ID., infra.

43/ See Intervenors' Brief, at 20, n.8.

In addition, each of the three factual premises for Intervenors' argument is without support in the record. First, neither Staff nor Applicants have adopted or relied upon a single-valued quantitative reliability objective, nor have they used quantitative reliability analyses as the basis for a decision on whether an HCDA should be a DBA. PID at 73; see APID at F-40 -- F-42.[44/] For the reasons stated in Section IC2., supra, the starting point for Intervenors' argument has been rejected by the Commission as the basis for licensing nuclear power plants.

Second, Intervenors have misapplied the Staff's analyses in Appendix J of the FES Supplement. The referenced 10^{-4} probability of HCDA initiation in Appendix J[45/] was not proferred as a

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44/ It should be noted that Intervenors' reference to the Standard Review Plan is incorrect. Intervenors' Brief at 19. The quoted portion of the Standard Review Plan does not establish a generally applicable numerical reliability goal, much less a goal for CRBRP. The Standard Review Plan addresses offsite hazards (e.g., nearby industrial facilities). See S Exh 6 at 1. There is no inconsistency here with the Appeal Board's decision in Florida Power and Light Company (St. Lucie Nuclear Power Plant, Unit No. 2), ALAB-603, 12 NRC 30 (1980). The record contains no evidence that there are important sequences which remain unidentified, and which would suggest a need for additional inquiry and scrutiny. Moreover, Intervenors have not suggested any important sequences of this nature, or any which might fall within the ambit of the Commission's TMI-1 decision. Metropolitan Edison Company (Three Mile Island Nuclear Station Unit No. 1), CLI-80-16, 11 NRC 674 (1980). Further, in regard to the specific sequence considered in St. Lucie, supra, it should be noted that the CRBRP has the capability in the design to remove decay heat under loss-of-power, or "station blackout" conditions. A Exh 46 at 19, TR 5395.

45/ The 10^{-4} value is the Staff's conservative estimate of the probability of HCDA initiation, and it does not include the conditional probability that, given an HCDA, it will result in doses exceeding the Part 100 dose guidelines. S Exh 8 at J-8 -- J-11.

reliability analysis for comparison against a single-value reliability objective, and thus, to demonstrate whether an HCDA should be a DBA. S Exh 17 at 8, 14, TR 5755, 5761; A Exh 46 at 12, 21, TR 5388, 5397; see APID at F-43. Rather, it was developed as a conservative estimate of accident initiation probability, for purposes of addressing the environmental risk of accidents under the Commission's applicable Policy Statement (45 Fed. Reg. 40101 (June 13, 1980)). S Exh 8 at J-1. In short, the probability values relied upon by Intervenors are simply not applicable.

Third, Intervenors' estimates of the consequences of HCDA's are without support in the record. Intervenors' "first order approximations" or "adjustments", with meteorological factors, to Applicants' and Staff's dose calculations, are simply incorrect.[46/] See SPOF, Findings 104 and 105, at 72-73. Intervenors' additional "adjustments" for such factors as plutonium isotopic composition, uncertainty in dose guideline values, etc. are similarly incorrect or insignificant in their effect. See APID at F-43 -- F-53; Section ID3., infra.

In short, Intervenors have advanced no reliable, probative evidence to support the proposition that HCDA's should be DBA's.[47/]

46/ Of course, they were not the product of testimony sponsored by a qualified witness, but instead emerged for the first time at closing argument. See text, supra.

47/ PID at 22; Louisiana Power & Light Co. (Waterford Steam Electric Station Units), ALAB-732, Slip Op., June 29, 1983 at 23-24. Intervenors' Brief, Exception 8 at 22-23 repeats the argument answered in Section IC2., supra. The Board's deferral of reliability issues to the CP phase was correct, and (Continued)

D. INTERVENORS' SUBSTANTIVE SITE SUITABILITY ARGUMENTS

Intervenors argue that the Board erred in: 1) failing to require that loss of coolant accidents (LOCA) from large primary coolant pipe breaks be DBA's;[48] 2) failing to determine that the design of the containment will limit calculated doses to values within the site suitability dose guideline values;[49] 3) rejecting Intervenors' evidence to show errors in the Staff's site suitability analyses,[50] including errors relating to: a) plutonium isotopic concentrations;[51] b) the "entire passage of the cloud;"[52] c) releases from the containment vent/purge system;[53] and 4) rejecting Intervenors' evidence that the site suitability dose guideline values were inadequate,[54] including evidence relating to: a) the Morgan hypothesis;[55] and b) the warm particle hypothesis.[56]

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the Board's recognition of the existence of programs to deal with common cause failure was appropriate.

48/ Intervenors' Brief at 23.

49/ Intervenors' Brief at 25-26. Applicants' Response to Exceptions 13, 14, 26 and 82 at 24 is set forth in Sections IC1., IC2., and IC3., supra, by way of response to Exceptions 1, 3, 7, 81, 83 and 90.

50/ Intervenors' Brief at 26-27.

51/ Id. at 27-28.

52/ Id. at 28-29.

53/ Id. at 29-30.

54/ Id. at 32-33.

55/ Id. at 33.

56/ Id. at 33-34. The ultimate conclusion urged by Intervenors -- that the ultimate NEPA cost-benefit analysis is inadequate (Continued)

1. The Board Gave Proper Consideration to Large Primary Coolant Pipe Breaks -- Exception 12 at 23

Intervenors argue that in light of the fact that a LOCA is considered a design basis accident for Light Water Reactors (LWR's), and because the conditions in CRBRP and LWR's are the same, therefore, large pipe ruptures should be DBA's in CRBRP. Intervenors' Brief at 23.

The conditions in CRBRP are markedly different than in LWR's. Based upon the uncontroverted record evidence, these major differences include: a) the primary coolant system operates at low pressure and subcooled conditions well below the boiling point of the coolant; b) guard vessels are installed around the major primary system components and elevated piping is used between those components to maintain coolant inventory in the event of a leak; c) sensitive leak detection systems will be installed in CRBRP to detect leaks which are substantially smaller than any leak approaching a design basis leak size; and d) fracture mechanics analyses support the conclusion that the CRBRP stainless steel primary piping materials will not develop sufficiently large flaws, cracks, or leaks to yield leaks approaching the design basis leak size. A Exh 1 at 40-43, TR 2029-32; A Exh 46 at 14-16, TR 5390-92; S Exh 2 at 16-17, TR 2461-62; see PID at 67-68; see APID at F-17 -- F-19.[57/]

-- has been previously addressed in Section IC 3., supra, and is further addressed by the specific responses to each of Intervenors' arguments presented herein.

57/ In contrast, Intervenors' "evidence" concerning the frequency of pipe rupture was properly disregarded. See Intervenors' Brief at 23. Intervenors' only sponsoring witness, Dr. Cochran, admitted that he was not an expert regarding pipe (Continued)

2. The Board Properly Determined That the Containment Will Limit Calculated Doses to Values Within The Site Suitability Dose Guideline Values -- Exceptions 15, 16, 17 at 25-26

Intervenors argue that the Board's conclusions as to the capability of the containment design to limit doses within the Part 100 dose guideline values were too "vague". Intervenors' Brief at 25. This argument finds its genesis in Intervenors' misconstruction of the Board's decision. The Board found that the design would limit doses to values within the Part 100 dose guideline values for all design basis events. PID at 21, 22, 80-81. Of course, the Board recognized that the safety review was ongoing, and to avoid any foreclosure of the issues which might arise from that review, noted that the "Staff's final position on the adequacy of the containment confinement design will be presented when the SER is published."[58/] PID at 22, 81-82. The

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breaks. I W Cochran, TR 6100. In addition, Intervenors' only "evidence" consisted of Dr. Cochran's references to two reports authored by others which show that the probability of pipe leaks of any size (including pin-hole leaks) in CRBRP is exceedingly small, and between 0.1 and 1 times that for PWR's. I Exh 22, Attachment 3 at 2, 10, TR 6263, 6271; I W Cochran, TR 6135-36; see PID at 86-87; APID at F-79 -- F-80.

58/ The CRBRP has a containment/confinement system similar to those on LWR's which will accommodate design basis events and, according to the Board's decision, limit offsite doses to values within the Part 100 guidelines. PID at 21, 22. In addition, however, and unlike LWR's, the CRBRP has features in the design to accommodate events beyond the design basis, including core melt events. APID at F-7 -- F-9. For core melt events, the CRBRP has a containment vent/purge and clean-up system a containment annulus cooling system, and related instrumentation for management of beyond design basis core melt events. A Exh 1 at 55; see APID at F-7 -- F-9. Although Intervenors have ignored these design characteristics, and the distinction between design basis and beyond design basis features, the Board did not. The Board properly found that the CRBRP containment would limit the consequences of all design basis events to values below the Part 100

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Board did not, as Intervenors allege, sidestep the issue. The Board merely preserved Intervenors' rights as to subsequent proceedings.

3. The Record Discredits Intervenors' Claims of Error in the Staff's Site Suitability Analyses -- Exceptions 18 and 27 at 26-27.

Intervenors have alleged three primary sources of error in the Staff's site suitability analysis. In what follows, each alleged source of error is addressed.[59/]

a. Plutonium Isotopics -- Exception 19 at 27-28

Intervenors argue that CRBRP could be fueled in the future with plutonium from high burnup LWR fuel having isotopic concentrations of Pu 238 and Pu 241 which exceed the isotopic values stated in the application. They then argue that, if fuel with higher concentrations of Pu 238 or Pu 241 were used, the

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guidelines, and also found that for certain more severe core melt events (when combined with containment system failures) that the Part 100 guidelines might be exceeded. Compare PID, Finding 27 at 81, with PID Finding 30 at 82. It was in this context that the Board indicated that further consideration of the containment capability would be undertaken in subsequent proceedings. PID at 22, 82.

59/ As to Intervenors' Exception 19 at 27 (dosimetric and metabolic models), Intervenors pointed out that the Construction Permit bone surface site suitability guideline value which would derive from the whole body and thyroid values in 10 C.F.R. § 100.11(a), footnote 2, would be 150 rem. Intervenors' Brief at 27. Intervenors argue that if the Staff had used dosimetric and metabolic models which are newer than those used in longstanding Staff practice, then the bone surface dose calculated by the Staff would be 27 rem. Id. Assuming that to be the case, it follows that, even if the models urged by Intervenors had been used, the containment/confinement would still limit doses to values within the Part 100 dose guidelines, and the Board's conclusions were correct.

dose consequences would exceed the results of the Staff's analyses.[60/]

The record shows three responses to Intervenors' argument. First, the values for Pu 238 and Pu 241 concentrations used by the Staff for site suitability analyses are substantially greater than the values stated in the Application. Intervenors' Brief at 28; A Exh 14 at 15A-3, 15A-11; see APID at F-48. Second, if the isotopic concentrations stated in the application should change so that the site suitability analysis is significantly affected, the matter would be reviewed by the Staff and the license would be amended as necessary. S W Hulman, TR 2347; A W Strawbridge, TR 1833; see APID at F-48 -- F-49. Third, virtually all fuel in LWR storage pools has isotopic concentrations of Pu 238 and Pu 241 below those used for the Staff's site suitability analysis. A W Sherwood, TR 4313; I W Cochran, TR 4553; see APID at F-132 -- F-133.

b. The Entire Passage of the Cloud -- Exception 21 at 28-29

10 C.F.R. § 100.11(a)(2) contemplates that the dose at the low population zone boundary will be calculated for "the entire passage of the radioactive cloud." 10 C.F.R.

60/ The factor of 2-4 increase in doses claimed by Intervenors is based upon incorrect technical premises. If plutonium fuel is repeatedly recycled in LWR's, then the Pu 238 and Pu 241 will build up in concentrations which might yield a factor of 2-4 increase in dose over the course of successive recycles. Even Intervenors concede that in CRBRP, repeated recycle will result in burn-up of Pu 238 and Pu 241, and a consequent reduction in the dose attributable to those isotopes with repeated recycle. A Exh 36, Vol. 3, 14.4A, Appendix to Chapter 5.7; I W Cochran, TR 4539.

§ 100.11(a)(2). Intervenors assert that an NRC Staff sensitivity calculation, which assumed an instantaneous release of the site suitability source term inventory remaining in the containment at the end of the 30-day period (a so-called "puff release"), showed doses significantly larger than those calculated for the first 30 days. Intervenors' Brief at 28-29; I Exh 9 at 9-10, TR 3127-28. This sensitivity calculation, however, was an attempt by the Staff to define the upper bound of effects attributable to releases beyond the first 30 days. S Exh 3 at 16, TR 2499; S W Bell, TR 2403-04; see APID at F-46 -- F-47.

The Applicants' analyses showed that ninety percent of the total 30-day dose would be incurred in the first day and ninety-eight percent would be incurred in the first week. A W Strawbridge, TR 1830-32. Moreover, the Staff's sensitivity calculation did not consider the effects of plateout and fallout within the containment after the first 24 hours. S W Bell, TR 2359. When the Staff recalculated the dose effects after 30 days, assuming a reasonable level of plateout and fallout and a design basis leak rate consistent with the Staff's normal site suitability source term analysis assumptions, the doses calculated were reduced to an insignificant fra..ion of the dose calculated for the 30-day period. S W Bell, TR 2400, 2403-04; see APID at F-46 -- F-47.

c. Releases from the Vent/Purge System -- Exception 29 at 29-30

Intervenors also argue that the Staff's SSST analyses underestimated the doses by failing to consider releases through

the vent/purge and clean-up system provided in the design for beyond-design basis events.[61] Intervenors argue that if one considers the system that pumps radioactivity back into the containment (the annulus exhaust/filtration system provided as an engineered safety feature for design basis events), one should also consider the system that pumps radioactivity out of the reactor containment building (the vent/purge system for beyond-design basis events). TR 6649.

The site suitability source term analysis was properly predicated on the assumption that an HCDA should not be a DBA. See PID 21, 22, 81; see APID at F-51. The site suitability

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61/ Intervenors' Brief at 30. Intervenors' argument at 30-31 concerning the dose commitment period of fifty years is neither significant nor supported by the record. Intervenors' closing argument urged that the doses were underestimated by a factor of 1.5 because the NRC Staff should have used a dose commitment period of eighty years for the maximally exposed individual, rather than fifty years, which is more appropriate for workers exposed at age twenty. TR 6650-51 (citing I W Morgan, TR 3170-74). Dr. Morgan presumed that the maximally exposed individual would live to be eighty (TR 3170), and by implication, a period of eighty years would be necessary to protect the maximally exposed infant (see TR 3174). Dr. Morgan, however, did not know the average age of individuals living in the vicinity of the site, and thus had no substantial basis for urging use of this worst case. I W Morgan, TR 3174. In addition, Intervenors' argument is of no moment since it mistakes the basic purpose of site suitability analysis. The methods of analysis used by both the NRC Staff and Applicants are based on NRC's standard guidance in NUREG-0172 and TID-14844. I Exh 9 at 16-17, TR 3134-35; A W Strawbridge, TR 5158; S W Branagan, TR 2344; see 10 C.F.R. § 100.11, n.1; S Exh 3, Attachment A. The analyses are conducted as an aid in evaluating reactor sites, and the site suitability dose guidelines are reference values against which the analyses can be judged for that purpose. 10 C.F.R. § 100.11(a) and n.2. The analyses are not conducted to assure radiation protection for the maximally exposed individual, nor are the dose guidelines to be considered radiation protection limits for individuals. Id.; S Exh 3, Attachment A at 6, TR 2551.

source term analysis assumed that the containment annulus exhaust/filtration system would be available as an engineered safety feature for mitigating design basis events. S Exh 1 at II-15 -- II-16, III-10; A Exh 1 at 50-51, TR 2039-40; see PID at 80-81; APID at F-52. After containment isolation, the annulus exhaust/filtration system would take leakage into the annulus from the reactor containment building, pass that leakage through a filtration system, and return a portion of the filtered leakage back into the annulus between the reactor containment building and the confinement building. It does not recirculate that leakage back into the reactor containment building as presumed by Intervenors. S Exh 1 at II-15; A Exh 5; see PID at 80; APID at F-52. On the other hand, if conditions should progress beyond the design basis, and containment integrity were threatened (not expected until about a day after initiation of the event), the operator could then manually open a normally closed containment vent (the vent/purge system to which Intervenors refer) which would discharge to the environment through a containment clean-up system. S Exh 1 at II-6; A Exh 1 at 55, 68-72, TR 2044, 2057-60; A Exh 17; see APID at F-52. Under design basis conditions, the containment vent/purge system is closed, and it is neither

meaningful nor necessary to consider the effects of the vent/purge system in the context of the CRBRP SSST analysis.[62] Id.

4. The Board Properly Rejected Intervenors' Evidence Concerning the Adequacy of the Site Suitability Dose Guideline Values -- Exceptions 28-29 at 32-33

Intervenors argue that the Board's conclusions as to the adequacy of the site suitability dose guideline values for CRBRP are in error because the Board did not accept Intervenors' arguments concerning: a) the Morgan hypothesis, and b) the warm particle hypothesis.[63]

62/ Because the Board properly made a threshold decision that, for purposes of site suitability evaluation at the LWA stage, HCDA's need not be DBA's, Intervenors' argument that the fuel release fraction must be increased to bound HCDA's is of no moment. See Intervenors' Brief, Exceptions 24 and 25 at 31-32; see Sections IB. and IC1., supra. The record is uncontroverted that the site suitability source term recommended by the NRC Staff includes a fuel release fraction which would have consequences exceeding many HCDA's, but most importantly, exceeds those for any credible DBA. PID at 21, 22, 74, 81; APID at F-27 -- F-28. Intervenors also argue that, even if HCDA's were not DBA's, a higher fraction (10% rather than 1%) should be used to "reach a sufficient level of conservatism" and to account for uncertainties and the possibility that the full safety review will result in HCDA's being included as DBA's. The record shows, without contradiction, that 1% is conservative. Id.; S Exh 3 at 13-15, TR 2496-98. Further, the full safety review has not yielded the conclusion that HCDA's should be DBA's.

63/ Intervenors' Brief, at 33, also complains of the Board's failure to credit the testimony of Drs. Cobb and Johnson. Neither Dr. Cobb nor Dr. Johnson's testimony was worthy of serious consideration by the Board. On cross-examination, it was established that Dr. Cobb did not know whether his testimony was relevant to the dose guideline values or not. I W Cobb, TR 2897-98. In fact, Dr. Cobb's testimony addressed the adequacy of the proposed EPA guidelines for contamination in soil. I W Cobb, TR 2884-85. These guidelines, which provide screening standards for clean-up of existing contaminated sites, are simply not applicable in any way to the issue of the validity of the dose guideline values. A Exh 25 at 8-9,
(Continued)

a. The Morgar Hypothesis -- Exception 30 at 33

The "Morgan bone" hypothesis holds that the value of the maximum permissible body burden for Pu 239 set forth in ICRP Publication Number 2 (ICRP-2) is non-conservative by a factor of 240. Intervenors' Brief at 33. The site suitability dose guideline values for organs of importance to plutonium exposure were not derived on the basis of ICRP-2, but only on the basis of the existing 10 C.F.R. Part 100 dose guideline values and the ICRP-26 mortality risk weighing factors. A Exh 25 at 10-12, TR 2084-86; see PID at 79. Although the record shows that the Morgan hypothesis should not have a substantial effect on the validity of the ICRP-2 maximum permissible body burden value (at most a factor of 2, rather than 240), this does not affect the validity of the site suitability dose guideline values since their derivation was independent of ICRP-2. Id.; S Exh 3 at 32-33, TR 2515-16; see PID at 79.

b. The Warm Particle Hypothesis -- Exception 31 at 33-34

Intervenors argue that the so-called "warm particle" hypothesis suggests that there is an additional source of uncertainty in the site suitability dose guideline values. I Exh 4 at 32-33, TR 3082-83. While the record is barren of any evidence to suggest that there is a logical nexus between the

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TR 2082-83. Dr. Johnson's testimony related not to the dose guidelines, but rather the fuel cycle. I W Johnson, TR 5962. Dr. Johnson argued that, based upon experience at the Rocky Flats facility, Applicants and Staff had underestimated the releases from the CRBRP fuel cycle facilities. The Board properly rejected this comparison as invalid. See PID at 131-32.

"warm particle" hypothesis and the validity of the site suitability dose guideline values, the record does show, without contradiction, that the "warm particle" hypothesis is speculative and not supported by the available scientific evidence. A W McClellan, TR 4043; see PID at 80.[64/]

II. INTERVENORS' ARGUMENTS CONCERNING THE EFFECTS OF CRBRP ACCIDENTS ON NEARBY FACILITIES -- CONTENTION 5(b) [65/]

Intervenors argue that analysis of the effect of accidents at CRBRP on nearby facilities is inadequate because: a) the Applicants and Staff failed to consider the effects of a

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64/ Intervenors argue that because the site suitability dose guidelines are inadequate to "prevent serious injury to individuals offsite if an unlikely, but still credible, accident should occur (26 Fed. Reg. 1224 (Feb. 11, 1961))," the Board's conclusion that the dose guidelines do not represent "design or accident mitigation objectives" is in error. Intervenors' Brief, Exceptions 32, 35, at 34-35. The Federal Register citation by Intervenors refers to the original notice of proposed rulemaking for the Part 100 site evaluation criteria as a whole, not simply the dose guidelines. The final rulemaking notice for 10 C.F.R. Part 100, 27 Fed. Reg. 3509 (April 12, 1962), described the objectives of the site evaluation criteria not in terms of protection to an individual, but rather "to assure that the cumulative exposure dose to large numbers of people as a consequence of any nuclear accident should be low in comparison with what might be considered reasonable for total population dose." The Board's characterization is indeed correct. 10 C.F.R. § 100.11(a), footnote 2, states that nothing in Part 100 is "intended to imply that these numbers constitute acceptable limits for emergency doses to the public under accident conditions. Rather, this 25 rem whole body value and the 300 rem thyroid value have been set forth in these guides as reference values, which can be used in the evaluation of reactor sites with respect to potential reactor accidents of exceedingly low probability of occurrence, and low risk of public exposure to radiation." (Emphasis added).

65/ The arguments addressed herein encompass Intervenors' Exceptions 38, 39, 40, 41, 43, 44 and 45, at pages 35-39 of Intervenors' Brief.

range of accidents at CRBRP on nearby facilities; and b) the implications of long term evacuation in the event of releases corresponding to the CRBRP site suitability source term were not properly considered.[66/] Intervenors' Brief at 35-39.

A. APPLICANTS AND STAFF CONSIDERED A FULL AND ADEQUATE RANGE OF ACCIDENTS -- EXCEPTION 43 AT 36-37

Intervenors argue that Staff and Applicants failed to consider a range of accidents in analyzing the effects of accidents at CRBRP on nearby facilities. Intervenors' Brief at 36. In considering the effects of a CRBRP accident on nearby facilities, both Applicants and Staff calculated doses at those facilities using site suitability source term (SSST) releases, the consequences of which are greater than the consequences of any design basis accident for CRBRP. A Exh 47 at 5, TR 5425; S Exh 18 at 6, TR 5688.

To extend the range to events beyond the design basis, both Applicants and Staff also considered the effects on nearby facilities of HCDA's at CRBRP. Applicants analyzed four HCDA cases and chose the case with the highest radiological releases (Case 2). A Exh 46 at 37, TR 5413; A Exh 47 at 5-6, TR 5425-26, A W Strawbridge, TR 5181. Applicants' HCDA Case 2 is similar to

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66/ Intervenors also argue that the impact of CRBRP accidents on nearby facilities improperly failed to take into account the use of higher burnup fuel. Intervenors' Brief, Exception 44 at 37. This argument is dealt with at Section ID., supra. In addition, Intervenors argue that doses calculated at nearby facilities from SSST releases at CRBRP were in error because they did not consider releases through the containment vent/purge system. Intervenors' Brief, Exceptions 40-41 at 37-38. This argument is dealt with at Section ID., supra.

HCDA Class 1 used by the Staff in considering effects on nearby facilities. See S Exh 8, Table J-2; S W Thadani, TR 5664; A Exh 46 at 39, TR 5415.

Applicants' HCDA Case 2 and the Staff's Class 1 are properly representative of the risks of beyond design basis accidents for the CRBRP. A Exh 46 at 39, TR 5415; A W Strawbridge, TR 5783. More severe accidents, such as Staff's HCDA Classes 2, 3, and 4, assume progressively lower probability multiple failures of design basis features designed to prevent HCDA's, combined with either loss of containment function or failure of features designed to mitigate HCDA's. S Exh 8 at J-5 - J-8; A Exh 46 at 38, TR 5414. Most significantly, the uncontroverted record evidence shows that the risk (the product of the probability and the consequences) associated with Staff's HCDA classes does not change in progressing from Class 1 to Class 2, 3 or 4. A Exh 46 at 37-39, TR 5413-15. Thus, contrary to Intervenors' argument, both Staff and Applicants considered an appropriate range of accidents.[67/]

B. THE IMPLICATIONS OF LONG TERM EVACUATION WERE PROPERLY CONSIDERED -- EXCEPTIONS 45, 38, 39 AT 38-39

Intervenors argue that the implications of long term evacuation of nearby facilities in the event of SSST releases were not properly considered. Intervenors' Brief at 38. In

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67/ Intervenors also mention without discussion that a "risk aversion weighting factor" should have been taken into account. The uncontroverted record demonstrates that use of such a factor would be inappropriate. A W Clare, TR 5169, 5190-91, 5196.

particular, Intervenors argue that (1) in the event of an SSST release, evacuations would occur at dose levels below the protective action guidelines PAG's and (2) the Board did not consider the national security implications of long term evacuation of the Y-12 plant.[68/]

The doses at nearby DOE facilities resulting from the SSST release at CRBRP are well below both the PAG's and DOE occupational standards. A Exh 47 at 9-11, TR 5429-31; S Exh 18 at 6-7, TR 5688-89. The Board properly found that long term evacuation of nearby facilities including Y-12 is not expected to be required. PID, Finding No. 51. Intervenors have cited no evidence to refute this finding. In light of the fact that there would be no long term evacuation of the Y-12 plant, there was no need for the Board to consider the national security implications of long term evacuation of Y-12.

68/ While the PAG's are EPA recommendations with no legal force, they are considered acceptable by the NRC for emergency planning purposes. PID, Finding No. 50. Although a decision to evacuate could be made for dose levels below those contained in the PAGs, the SSST doses are sufficiently low that evacuvation would not be required even for the short term. SW Soffer, TR 5661. Intervenors also claim that the analysis of the long term impact of accidents at nearby facilities from an SSST release was "arbitrary and capricious" because there is no bone dose PAG. Intervenors apparently fail to understand that the PAG's deal only with "trip" levels for short term emergency planning actions. Long term evacuation is governed by contamination levels. The record clearly demonstrates that the contamination levels at nearby facilities in the event of an SSST release are far below DOE occupational radiation standards, including bone surface and red bone marrow standards, and would not require long term evacuation of any nearby facilities. A Exh 47 at 8-12, TR 5428-32. It should be noted that the issue of the need for a bone dose PAG, if any, will be considered by the Board as part of its review of emergency planning issues in the CP proceedings. See PID at 30.

III. INTERVENORS' ARGUMENTS CONCERNING SAFEGUARDS -- CONTENTIONS 4 AND 6(b)(4) [69]

Intervenors argue that the Board erred in its consideration of safeguards issues[70] since: (a) there is no DOE commitment to comply with the requirements of its own safeguards Orders; (b) the Staff's analysis "involved nothing more than a comparison of regulations;" and (c) the analysis of safeguards at the reprocessing facility was inadequate.[71]

A. DOE IS FULLY COMMITTED TO IMPLEMENTING EFFECTIVE SAFEGUARDS AT CRBRP FUEL CYCLE FACILITIES -- EXCEPTIONS 47-48 AT 41-42

Intervenors' claim, without any factual support in the record, that there is no assurance DOE will abide by its own regulatory requirements and implement effective safeguards at the CRBRP fuel cycle facilities.[72] Intervenors admit that Applicants

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69/ The arguments addressed herein encompass Intervenors' Exceptions 46-52 at pages 40-48 of Intervenors' Brief.

70/ Intervenors make a general claim that the criteria chosen by the Staff do not provide "assurance that the CRBRP and its supporting fuel cycle facilities would have safeguards and physical security systems which would meet the Commission's regulations." Intervenors' Brief at 40. As for CRBRP, compliance with NRC regulations is not required until the operating license proceeding. 10 C.F.R. § 50.34(d). As for the fuel cycle facilities, the record shows that DOE safeguards Orders are equivalent to or more stringent than NRC requirements. As shown in Section IIIA., infra, DOE is committed to compliance with its Orders.

71/ Significantly, Intervenors do not make any serious claim that the Board's consideration of safeguards at the CRBRP is in error. Rather, Intervenors limit their exceptions primarily to the Board's findings regarding safeguards at the proposed CRBRP fuel cycle facilities. Intervenors apparently agree with the conclusions in the FES Supplement and the PID that the safeguards risks at CRBRP are negligible.

72/ Intervenors' Brief at 42.

have committed in their Environmental Report to comply with DOE safeguards Orders, and to implement effective safeguards at the proposed CRBRP fuel cycle facilities. Intervenors' Brief at 42. Nevertheless, Intervenors claim that there are "no additional written assurances that commitments will be honored." Id. (Emphasis added)[73/]

Applicants' witnesses reaffirmed their written commitments in the ER under questioning by both Intervenors and the Board. A W Penico, TR 3450-3452, 3470; A W Hammond, TR 3452-3455. Applicants' commitments were reviewed by the NRC Staff and the Staff concluded that the commitments could and would be met. S W Gaskin, TR 3721-3722; S W Dube, TR 3683-3684, 3706; S Exh 8 at A 3. The Board, having heard and questioned Applicants' witnesses, and having fully considered the record evidence,

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73/ Intervenors also claim that DOE's safeguards Orders "are so general, they mean little in terms of safeguards effectiveness." Intervenors' Brief at 42. Intervenors' assertions regarding DOE safeguards Orders simply ignore the uncontradicted record evidence. All DOE CRBRP fuel cycle facilities will implement safeguards systems consisting of a physical security system and a materials control and accounting system ("MC&A") in accordance with DOE Orders 5630 and 5632 and DOE threat guidance requirements. A Exh 39 at 50-77, TR 3524-3551; A Exh 35, Vol. 2, Chapter 5.7 at 5.7-41-42; A W Hammond, TR 3307-3309; S W Jones, TR 3620-3621; S W Dube, TR 3719-3720. DOE threat guidance requirements for like materials are as high or higher than the counterpart requirements of the NRC. S W Jones, TR 3620-3621, 3627. Safeguards designed in accordance with DOE's requirements will provide a level of protection against theft and sabotage that is at least as high as that provided by safeguards designed in accordance with NRC's requirements. S Exh 8 at E-3; A Exh 35, Vol. 2, Chapter 5.7 at 5.7-41; S Exh 10 at 12, TR 3744. Thus, even if Applicants' commitment were limited to complying with DOE requirements, that commitment when implemented, would necessarily result in effective safeguards systems at all CRBRP fuel cycle facilities.

properly dismissed Intervenors' speculative arguments that DOE might unlawfully violate its own regulatory requirements or fail to honor its commitments.[74/]

B. THE STAFF PERFORMED AN ADEQUATE REVIEW OF SAFEGUARDS RISKS -- EXCEPTION 49 AT 43

Intervenors claim that the Board's finding that safeguards risks associated with the CRBRP fuel cycle are not significantly different than those associated with other fuel cycles is in error because the Staff's analysis involved nothing more than a comparison of DOE and NRC regulations.[75/] Intervenors' Brief at 43.

Contrary to Intervenors' claim, the Staff conducted a systems level review of DOE's proposed safeguards systems and technology and evaluated those systems in the context of DOE and NRC regulations. S Exh 10 at 7-9, TR 3739-3741. That review considered existing technology and, with the exception of Near Real Time Accounting ("NRTA"),[76/] (S W Dube, TR 3721), gave no credit concerning effectiveness for DOE's continuing research and development efforts.

Intervenors are simply in error in stating that the CRBRP fuel cycle presents "new and different kinds of risks."

74/ FID at 46.

75/ Intervenors cite TR 3604-3605 for the proposition that NRC's entire analysis consisted merely of a comparison of regulations. Nowhere on the cited pages, or anywhere else in the record, did NRC make such a statement.

76/ As to NRTA, the Staff concluded that the basic technology had been demonstrated and could be implemented. S W Hurt, TR 3690-3691.

Intervenors base this conclusion entirely on the fact that CRBRP fuel will contain plutonium.[77] Intervenors fail to point out, however, that the Licensing Board explicitly found, based upon evidence of actual experience, that the CRBRP and its fuel cycle do not present unusual risks.[78]

C. THE BOARD'S CONCLUSION REGARDING THE ENVIRONMENTAL IMPACTS OF SAFEGUARDING REPROCESSING FACILITIES FOR CRBRP WAS FULLY SUPPORTED BY THE RECORD AND CLEARLY CORRECT -- EXCEPTION 51 AT 44-46.

Intervenors claim that the analysis of safeguards at the reprocessing facility is deficient in three respects:[79] (1) the

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77/ Intervenors' Brief at 43.

78/ PID, Finding 110. Intervenors also ignore the uncontradicted record evidence that the reprocessing activities planned for CRBRP fuels are essentially comparable to the ongoing activities in existing DOE programs and facilities. A Exh 39 at 71-72, TR 3545-3546; A W Hammond, TR 3405-3406. In addition, throughputs of plutonium substantially equal to those planned for the Developmental Reprocessing Plant (DRP), are presently being achieved and the plutonium effectively safeguarded in the U.S. military programs. A Exh 39 at 75-76, TR 3549-3550; A W Hammond, TR 3436-3437.

79/ Intervenors also argue that the Staff failed to conduct an independent analysis of safeguards at DOE fuel cycle facilities but instead merely took Applicants' assessment of safeguards effectiveness at "face value". Intervenors' Brief at 44. Contrary to Intervenors' assertion, the NRC Staff presented a well qualified panel of expert witnesses who reviewed the descriptions of the safeguards systems at DOE fuel cycle facilities and arrived at an independent judgment as to the effectiveness of those systems for deterring and preventing acts of theft or sabotage. S Exh 10 at 1-14, TR 3733-3746; S Exh 8 at E-4 through E-17. In arguing that the Staff failed to conduct an independent analysis, Intervenors are effectively claiming that the NRC Staff may not rely on factual information furnished by Applicants in arriving at an independent judgment regarding safeguards at CRBRP and the fuel cycle facilities. Intervenors' Brief at 44. In fact, NRC regulations specifically require the Applicants to provide such factual information to the Staff in both the Environmental Report and the PSAR. 10 C.F.R. §§ 50.34, (Continued)

Developmental Reprocessing Plant (DRP) is in the conceptual design stage and represents a "best case"; (2) the Staff failed to look at other alternative facilities in the event DRP is not built; and (3) if DRP is built, certain R&D successes will be required to assure an effective safeguards system.80/

Although the DRP is at present in a conceptual design stage, as the Board found and the record shows, the analysis of safeguards at DRP represents a bounding rather than a best case analysis. PID, Finding 92; A Exh 39 at 21-21a, TR 3494-3495. Moreover, alternatives to the DRP, which demonstrated that the analysis of the DRP is bounding, were expressly considered by the Board. PID, Finding 92.81/

51.20. Consistent with these regulations, the Staff independently reviewed and analyzed that information and arrived at an independent judgment.

80/ Intervenors also note that there are no quantitative design goals for the DRP inventory balances. Intervenors' Brief at 45. That fact has no bearing on the qualitative analysis of safeguards inpacts. The record evidence clearly demonstrates that the reprocessing activities planned for DRP are essentially comparable to the activities ongoing in existing DOE programs and facilities. A Exh 39 at 71-72, TR 3545-3546. The safeguards systems proposed for DRP were independently evaluated by the NRC Staff which found that "the concepts and technologies for physical security systems for this type of facility are sufficiently developed that the DRP can be effectively protected." S Exh 8 at E-13. Intervenors introduced no evidence challenging this conclusion.

81/ The following alternatives were considered: (a) a small facility dedicated exclusively to CRBRP and FFTF fuels with approximately 15 tons per year capacity and (b) a breeder fuels head-end capability add-on to an existing LWR fuels reprocessing plant. A Exh 39 at 21, TR 3494. The small dedicated facility can easily be safeguarded using conventional safeguards techniques. A Exh 39 at 21(a), TR 3495. Both the DRP and the head-end add-on to an existing high capacity LWR reprocessing plant would require more extensive safeguards systems and might utilize advanced techniques, particularly in the area of MC&A. The DRP, which has not yet

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As to Intervenors' argument that "certain R&D successes will be required to assure an effective safeguards system", the only technology intended for use at DRP which is not already in place involves the measurement capabilities for Near Real Time Accounting ("NRTA"). S W Hurt, TR 3694. NRTA is not even required by NRC regulations, but is an additional capability which DOE intends to provide for DRP.[82/] S W Hurt, TR 3694. In fact, NRTA components have been thoroughly tested by DOE and are now available for deployment in DOE's facilities, including

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been built, represents the highest safeguards cost. A Exh 39 at 21(a), TR 3495; PID, Finding 92.

82/ Intervenors' statement that further R&D work on NRTA is subject to budgetary constraints ignores the fact that NRC does not require NRTA. S W Hurt, TR 3694.

DRP.[83] A W Hammond, TR 3335-3339; S W Dube, TR 3688-3690; S W Hurt, TR 3690-3691.

IV. INTERVENORS' ARGUMENTS CONCERNING THE CRBRP FUEL CYCLE -- CONTENTIONS 6(b)(1) AND 6(b)(3) [84]

83/ Intervenors make a number of other safeguards arguments which deserve only brief attention. First, Intervenors argue that MC&A and physical security systems must be independently effective against threats of theft or sabotage. Intervenors' Brief, Exception 52 at 46. NRC regulations simply do not require that MC&A and physical security must be independently effective. See 10 C.F.R. § 73. And, as both Applicants' and Staff's experts testified, the two systems are not intended, by either DOE or NRC, to be independently effective. A W Hammond, TR 3363, 3432; S W Hurt, TR 3694-3695; S W Dube, 3698-3699; A Exh 18 at 6, TR 3738. Rather, the two systems are complementary and are intended to, and will, in combination, provide effective protection against theft or sabotage. S W Dube, TR 3698-3699. Second, Intervenors also complain that the Board excluded Intervenors' evidence "with respect to this question of independent effectiveness" thus preventing Intervenors from presenting their case on this issue. The evidence excluded by the Board consisted of one paragraph which began with the statement "[C]urrent Commission material accounting practices are fundamentally flawed.", I Exh 12 at 33, TR 3920. The paragraph then goes on to criticize Commission safeguards policy. The Board properly excluded this "evidence" as a challenge to current NRC regulations. Intervenors also broadly challenge various rulings made by the Licensing Board limiting discovery or excluding evidence regarding safeguards. Intervenors' Brief at 48. The Board's rulings complained of by Intervenors addressed two issues: a) first, whether Intervenors were entitled to obtain discovery or introduce testimony on the adequacy of safeguards in place at all DOD, DOE and NRC nuclear facilities in the United States and abroad, and b) whether Intervenors could introduce "evidence" that existing NRC threat guidance is inadequate. As to the former issue, in its August 27, 1976 decision, the Commission rejected Intervenors' Contention 11 which, inter alia, attempted to raise this same generic question. United States Energy Research and Development Administration (Clinch River Breeder Reactor Plant), CLI-76-13, 6 NRC 67, 84 (August 27, 1976). As to the latter issue, under 10 C.F.R. § 2.758, the Board was justified in striking the testimony as a challenge to Commission regulations.

84/ The arguments addressed herein encompass Intervenors' Exceptions 53, 54, 55, 56, 57, 59, 63, 58, 60, 61, 62, 64, and 95 at pages 49-56 of Intervenors' Brief.

Intervenors argue that Staff's and Applicants' analyses of the fuel cycle were inadequate in that: (a) the environmental impacts of CRBRP reprocessing facilities were not properly analyzed; and (b) the impacts of CRBRP waste management activities were not properly considered. Intervenors' Brief at 49-56.

A. THE ENVIRONMENTAL IMPACTS OF CRBRP REPROCESSING FACILITIES WERE PROPERLY ANALYZED -- EXCEPTIONS 53, 54, 55, 56, 57, 59, 63 AT 49-54

Intervenors contend that Applicants and Staff should have analyzed the environmental impacts of reprocessing at alternative facilities to the proposed DRP. Intervenors' Brief at 52. In particular, Intervenors argue that 1) the releases from the DRP do not bound releases from alternative reprocessing facilities;[85/] 2) the containment factor used by the Staff for the CRBRP fuel reprocessing facility was overestimated by a factor of 10;[86/] and 3) the DRP environmental impacts do not bound those from the Savannah River or Hanford facility because they do not take into account liquid effluents, transuranic ("TRU") releases, or accidental or bypass leakage.[87/]

85/ Intervenors' Brief at 52-53.

86/ Id. at 54.

87/ Id. at 54-55.

1. The Environmental Impacts of the DRP Releases Bound Those of Alternative Reprocessing Facilities -- Exceptions 57, 59 and 63 at 52-53.

The Applicants' analysis was based on their plan for carrying out reprocessing of fuel at the DRP.[88/] Two isotopes, tritium and carbon-14, dominate the estimated radiological impacts associated with reprocessing, providing over 90 percent of the whole body dose.[89/] S Exh 14 at 22, TR 4465; A Exh 43 at 13, TR 4336. The Staff's source term conservatively assumed the total release of the entire quantities of these isotopes present during reprocessing.[90/] Since the Staff assumed that all of the

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88/ The Staff independently evaluated the likely environmental impact of the DRP, drawing upon previous analyses of licensed reprocessing facilities, and other information on government facilities, NRC projections of radionuclide inventories, and plant separation factors. S Exh 14 at 15, TR 4458; S Exh 8 at D-12 to D-17.

89/ Intervenors' Brief. Exceptions 53-56 at 50-51 and at 53, 54, and 55, suggests that if Intervenors' plutonium isotopics argument were credited, and the resultant factor of 2-4 increase in bone surface dose were considered, the conclusions drawn from whole body dose would not be valid. The basic elements of Intervenors' plutonium isotopics argument have been addressed in Section ID.3.a., supra. Even assuming that high burnup plutonium were used in CRBRP and that a factor of 2-4 increase in bone surface dose resulted, the increase in dose would not be significant and the conclusions drawn from whole body dose would be unaffected. Intervenors' own testimony shows that if bone surface dose due to plutonium were increased by a factor of 2-4, it would still constitute less than one percent of the total bone surface dose from the dominant isotopes tritium and carbon-14. I Exh 13 at 28, TR 4594.

90/ The actual tritium releases would be a factor of 10 less and the actual carbon-14 releases a factor of 2 to 10 less than those used by the Staff. A Exh 43 at 13-14, TR 4336-37. The net effect of the Staff's assumptions is that the FES estimate of the U.S. total body population dose due to reprocessing is a factor of about 5 higher than the expected doses. A Exh 43 at 15, TR 4338; S Exh 8 at D-12 to D-17.

tritium and carbon-14 in the fuel would be released to the environment and since those isotopes account for virtually all of the impacts, the Staff's estimated impacts would not be exceeded no matter what reprocessing facility was used or where it was located. A W Sherwood and Yarbro, TR 4250-51. Therefore, the Board was justified in finding that the environmental analysis of the DRP with an assumed total release of tritium and carbon G-14 bounds the impacts for any potential alternative reprocessing facility. S W Lowenberg, TR 4405-06; A Exh 35, Vol. 2, Chapter 5.7 at 5.7-14; S Exh 8 at D-15 to D-17.

2. Operational Experience at Hanford and Savannah River -- Exception 58 at 54.

Intervenors argue that, based on their calculations from operational experience at Hanford and Savannah River, the containment factor for the CRBRP fuel reprocessing facility should be a factor of 10 less optimistic than that estimated by the Staff. Intervenors' Brief at 54.

The plutonium containment factor used by the Staff for reprocessing was shown to be conservative.[91] S Exh 8 at D-10 to

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91/ The factor was based on the assumption that exhaust gases would pass through a series of high-efficiency particulate air (HEPA) filters, with each filter having an efficiency of at least 99.95 percent. S Exh 8 at D-11. Such filter applications and performance values are consistent with a substantial base of experience in plutonium handling facilities. S W Lowenberg and Clark, TR 4435-37; S W Lowenberg, TR 6084-86. Even if Applicants and Staff have overestimated containment capability by a factor of 10, an improvement of this magnitude can be achieved simply by the application of standard, proven engineering techniques. Effluents can be reduced significantly by adding additional banks of HEPA filters. Addition of only one bank of filters would improve containment by a factor of 1000. Alternatively, an improve-
(Continued)

D-15; A Exh 35, Vol. 2, Chapter 5.7 at 5.7-22 to 5.7-25, 5.7-79; I Exh 13 at 29-30, TR 4595-96. In contrast, Intervenors' calculations were shown upon cross-examination to be incomplete and of questionable reliability. I W Cochran, TR 4562-66.[92/]

3. Liquid Effluents, TRU Releases, and Accidental or Bypass Leakage -- Exceptions 60-62 at 54-55

Intervenors argue that the DRP environmental impacts do not bound those from the Savannah River[93/] or Hanford facility because they do not take into account liquid effluents, TRU releases or accidental or bypass leakage. Intervenors' Brief at 55; Exceptions 60-62. No evidence was presented indicating that

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ment in containment by a factor of 10 could be achieved simply by increasing pipe or duct size, thus allowing material to more readily settle out of air streams. S W Clark, TR 4430-32; S Exh 8 at 12-61 to 12-62.

92/ The Board found that the Intervenors' calculations neither confirmed nor refuted the assumed plutonium containment factor values. PID Finding 134 Intervenors also claimed to have calculated "lifetime plutonium gaseous releases from the SRP" to be a factor of 4000 higher than projected DRP releases, in contrast to calculated recent releases which Intervenors claim are a factor of 10 higher. (Intervenors' Brief at 54) Both calculations are of questionable reliability (I W Cochran, TR 4562-66) and there is no reason why the Board should rely upon either one. Intervenors admittedly are unaware of the nature of releases over the "lifetime" period. I Exh 13 at 33, TR 4599.

93/ Intervenors state that there is no evidence "that the DOE would make any changes in the SRP if it were used to reprocess CRBR fuel." Intervenors' Brief at 54. This allegation is completely irrelevant to Intervenors' exception, which deals with releases from the DRP. In any case, DOE has regulations and guidelines comparable to the NRC's concerning operation of fuel cycle facilities. S W Clark, TR 4434-35. It is reasonable to assume that DOE will follow its own regulations. Moreover, in the case of the DRP, which is considered bounding, DOE has committed to follow NRC as well as DOE regulatory guides. A Exh 35 at 5.7-8, 5.7-11, 5.7-12; S W Clark, TR 4390-93, S W Lowenberg, TR 4434-35.

such releases would be significant. On the contrary, the Staff judged that environmental effects of operations at Savannah River or Hanford were not significantly different than those at the DRP. S Exh 8 at D-17. The impacts of all releases from Savannah River or Hanford, including liquid effluents, have been "very small." Id. TRU releases were included in the releases considered and judged to be insignificant.[94/] The record also contains uncontroverted expert testimony that total bypass of filters would be highly unlikely and that bypass of one stage of filtration does not adversely affect later stages. S W Lowenberg, TR 4437.

B. WASTE MANAGEMENT ENVIRONMENTAL IMPACTS WERE ADEQUATELY CONSIDERED -- EXCEPTIONS 64 AND 95 AT 55-56.

Intervenors claim that the Board erred in striking portions of Intervenors' testimony regarding "the significant uncertainties surrounding the potential radiological releases from CRBR waste management activities" and in not taking into account these alleged uncertainties. Intervenors' Brief at 55-56. Intervenors were not constrained from litigating the issue of what the impacts of waste management in the CRBRP fuel cycle would be. I Exh 13 at 35-37, TR 4601-03. On the contrary, Intervenors striken testimony, dealt exclusively with the generic

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94/ S Exh. 8 at D-12-D-17; S W Branagan, TR 4411; A W Sherwood, TR 4265-66; S W Lowenberg, TR 4434.

issue of whether a safe method for disposal of nuclear waste could ultimately be found.[95] I Exh 13 at 37-44, TR 4603-4610.

In striking the testimony, the Board complied with the Commission's policy direction to Licensing Boards (47 Fed. Reg. 50591, 50593 (November 1, 1982)) and the Commission's previous direction concerning the Proposed Rulemaking on the Storage and Disposal of Nuclear Waste (Waste Confidence Rulemaking), 44 Fed. Reg. 61372 (October 25, 1979). The Board's ruling is buttressed by the Commission's May 17, 1983, Rulemaking on the Storage and Disposal of Nuclear Waste (Waste Confidence Rulemaking) Slip Op. (May 16, 1983), in which it found, inter alia, "reasonable assurance that safe disposal of high level radioactive waste and spent fuel in a mined geologic repository is technically feasible."[96] Id. at 5. The Board was correct in finding that

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95/ It also drew no distinction between waste management problems for the nuclear fuel cycle in general and unique problems associated with the CRBRP. Intervenors' argument that the striken testimony does not challenge the Table S-3 regulation and the Commission's rulemaking is misplaced. The testimony in question deals exclusively with the generic issue of feasibility of nuclear waste storage, see, e.g.,. I Exh 13 at 37, TR 4603 (no basis for high confidence that radioactive waste will be safely sequestered); at 38, TR 4604 ("uncertainties associated with HLW disposal"); at 40, TR 4606 (questioning of the Table S-3 zero-release assumption); and at 42, TR 4608 ("uncertainty regarding the technical feasibility and safety of a long term waste repository").

96/ Recently, the United States Supreme Court approved the generic consideration of waste storage issues by the Commission, including the consideration of uncertainties. Baltimore Gas & Electric Co. v. NRDC, 51 U.S.L.W. 4678 (1983). See also Disposal of High-Level Radioactive Wastes in Geological Repositories, Technical Criteria, 48 Fed. Reg. 28194 (June 21, 1983).

the testimony dealt with generic issues addressed by the Commission and was beyond the purview of the Licensing Board.

V. INTERVENORS' ARGUMENTS CONCERNING ALTERNATIVE SITES -- CONTENTIONS 5(a) AND 7(c) 97/

Intervenors argue that the Board: (a) improperly considered the evidence of accident risks at the alternative sites; and (b) erred in finding that no offsetting benefits compensate for delays in moving to alternative sites. Intervenors' Brief at 57-62. In reality, Intervenors are simply arguing that the Board did not strike a proper balance among the factors affecting consideration of alternative sites. As shown below, the Board was clearly correct.

A. RELOCATION TO AN ALTERNATIVE SITE WOULD NOT RESULT IN SUBSTANTIAL ACCIDENT RISK REDUCTIONS -- EXCEPTIONS 65-67 AT 57-60

Intervenors allege that "at least five of the alternative sites considered are, all other considerations being equal, environmentally preferable to the Clinch River site." The basis for this claim is that accident risks at the alternative sites would be reduced by factors of 3 to 24, which Intervenors allege is significant no matter how low the actual risk. Intervenors' Brief at 57-58.

As a preliminary matter, Intervenors have incorrectly stated the standard of review for evaluating alternative sites. The standard for the Board's consideration of alternative sites

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97/ The arguments addressed herein encompass Intervenors' Exceptions 65, 66, 67, 68, 69, and 70 at pages 57-62 of Intervenors' Brief.

was "whether or not substantially better alternatives are likely to be available." United States Energy Research and Development Administration (Clinch River Breeder Reactor Plant), CLI-76-13, 6 NRC 67, 92 (1976).

Intervenors argue that offsite doses resulting from accidents would be less at the alternative sites based on more favorable meteorology and population density. Id. These consequences, standing alone, are not important. Rather, it is necessary to consider whether the meteorology and population density differences give rise to significant differences in risk.[98/] In this regard, the uncontroverted record evidence shows that: a) the doses at the Clinch River site meet the site suitability dose guidelines for any design basis accident, S W Soffer, TR 4818; S Exh 1 at III-10; A Exh 1 at 47-52; b) the effects of routine releases at the Clinch River site are already so small that a further reduction would not constitute a significant reduction in risk, A Exh 45 at 14-15 TR 4746-47; and c) the risk

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98/ Intervenors' also claim in Exception 68 that the Staff incorrectly concluded that numerical differences in population between the Clinch River site and alternative sites were not significant because they all fell below the trip level for "low population densities" set in Regulatory Guide 4.7. Intervenors' Brief at 60-61. The Staff calculated population densities for the seven alternative sites, and concluded that the numerical differences in population between the Clinch River site and each of the alternative sites were not significant. (S Exh 15 at 22, TR 4886). The CRBRP population density is well below the 500 persons per square mile "trip" level of Regulatory Guide 4.7. The Clinch River site and the alternative TVA and DOE sites all have population densities below the trip levels. A Exh 45 at 13, TR 4745. When viewed against the low risk of severe accidents at the Clinch River site, any differences in population density as may exist between Clinch River and the alternative sites are insignificant. S Exh 15 at 22-33, TR 4886-87.

of severe accidents beyond the design basis is already low and a further reduction would not constitute a significant reduction in risk. A Exh 45 at 14-15, TR 4746-47; S W Soffer, TR 4789; S Exh 8, App. J. Accordingly, from the standpoint of radiological risk, the alternative sites are not substantially better than the Clinch River site.[99/]

B. THE BOARD PROPERLY CONSIDERED THE BENEFITS OF ALTERNATIVE SITES -- EXCEPTION 70 AT 82

Intervenors claim that the Board erred in not finding benefits to offset the delays involved in moving to an alternative site. The benefits claimed are reduction in radiological dose consequences and unspecified "other environmental impacts."

99/ The cases cited by Intervenors simply do not support their argument. In both Boston Edison Company (Pilgrim Nuclear Power Station Unit 2), ALAB-749, 7 NRC 774 (1978) and in Florida Power and Light Company (St. Lucie Unit No. 2), ALAB-355, 3 NRC 830 (1976), the Staff's environmental analyses were found to be inadequate because no alternative sites had been examined. The record shows that numerous alternative sites were considered. See, e.g., A Exh 45 at 5-10, TR 4737-4742. In addition, transferring to an alternative site would significantly increase project costs and delay project completion. S Exh 8 at 9-12-9-14; S Exh 16 at 16, TR 4922; A Exh 37, Vol. 4, App F at F-31 and App G at G-28; A Exh 37, Vol. 4, App E at E-11-E-19; App F at F-28, App G at G-25- G-26; S Exh 8 at 9-12; S Exh 16 at 14 TR 4920. Moreover, the project objective of utility participation and demonstration in a utility environment is not likely to be met at the alternative DOE sites. A Exh 37, Vol. 4, App F at F-8, F-30; S Exh 16 at 15, TR 4921. Therefore, based on both environmental, programmatic, and economic considerations the Board was justified in finding that no alternative site would be substantially better. Intervenors also argue that the Board erred in not finding that alternative TVA sites would meet the programmatic objective of utility participation. Intervenors' Brief, Exception 69 at 61-62. Given the insigificant difference in radiological risk between the Clinch River site and those alternative TVA sites and the increased cost associated with transferring, there was no reason for the Board to make such a finding.

Intervenors' Brief at 62. For the reasons presented in Section V(A)., supra, this argument is without merit.

VI. INTERVENORS' ARGUMENTS CONCERNING PROGRAMMATIC OBJECTIVES AND DESIGN ALTERNATIVES -- CONTENTIONS 7(a) AND 7(b) [100/]

Intervenors argue that the Board erred (a) in not finding that an alternative steam generator testing program would be a substantially better design approach; and (b) in finding that the CRBRP program is reasonably likely to meet its objective of demonstrating economic feasibility. Intervenors' Brief at 62-4.

A. NO ALTERNATIVE STEAM GENERATOR PROGRAM WOULD BE A SUBSTANTIALLY BETTER DESIGN APPROACH -- EXCEPTION 71 AT 62-63

Intervenors argue that the steam generator testing program should be revised to include full scale prototype testing because of the "uncertainty concerning the ability of the steam generator to withstand sharp temperature transients." Intervenors Brief at 61-62. Intervenors' argument is based solely on the contents of a GAO letter critical of the CRBRP steam generator testing program.[101/]

The GAO technical consultant (who had more than 30 years experience with LMFBR's and steam generators) flatly disagreed

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100/ The arguments addressed herein encompass Intervenors' Exceptions 71, 72, 73 at pages 62-64 of Intervenors' Brief.

101/ See Revising the Clinch River Breeder Reactor Steam Generating Testing Program Can Reduce Risk, GAO/EMD-82-75, May 25, 1982, Attachment to I Exh 22, TR 6250-60. Neither the GAO letter nor any of its contents were supported by expert testimony.

with GAO's conclusions. As noted in the GAO letter, the consultant concluded that based on the technical design and testing program, there is no technical justification for delaying the CRBRP by instituting an alternative testing program.[102/] Indeed, not one technically qualified expert witness voiced any concern over the CRBRP steam generator test program. The expert testimony does show that the test program relies on more than 20 years of already completed, ongoing or planned testing and incorporates lessons learned from operating LFMBR steam generators as well as LWR steam generator experience. A W Longenecker, TR 6325; S Exh 21 at 8, TR 6529. The test program includes model and prototype testing as well as full scale plant unit testing. S Exh 21 at 9, TR 6530, 6531; I Exh 22, TR 6253. Based on the technical design and the extensive testing performed to date, the technical risk of a major design defect going undetected and requiring significant redesign is very small.[103/] S Exh 21 at 10-11, TR 6328; 6531-32; PID at 157-158.

102/ As GAO noted, a revision of the steam generator testing program would delay the CRBRP by approximately 45 months. I Exh 22, TR 6256.

103/ While the Board had some question regarding sharp temperature transients which it intends to explore at the Construction Permit phase of hearings, the uncertainties did not appear as insuperable problems to the Board. PID Finding 98. They certainly did not alter the evidence that the no alternative steam generator testing approach would be substantially better in achieving program objectives in a more timely manner.

B. THE CRBRP IS REASONABLY LIKELY TO DEMONSTRATE THE ECONOMIC FEASIBILITY OF A LMFBR IN A UTILITY ENVIRONMENT -- EXCEPTIONS 72-73 AT 64.

Intervenors allege that "[t]here is absolutely no evidence in the record indicating that CRBR will demonstrate the economic feasibility of a central station LMFBR in a utility environment." Intervenors' Brief at 64. (Emphasis in original). As an initial point, Intervenors have incorrectly stated the standard which the program must meet. Applicants need not show that the CRBRP "will demonstrate" its objectives, but only that the CRBRP is "reasonably likely" to meets its objectives. See United States Energy Research and Development Administration, (Clinch River Breeder Reactor Plant), CLI-76-13 6 NRC 67, 81, 91-92 (August 27, 1976). And, as the Commission noted in that decision, the benefit of the project (and hence the CRBRP objectives) "flows from the informational needs of the broader LMFBR Program." Id. at 77.

In order to satisfy the objective of economic feasibility, DOE has established a comprehensive cost information system for capturing detailed data on costs, materials, quantities and performance which can be used to project or extrapolate the costs and economics to commercial scale LMFBR plants. A Exh 58 at 25, TR 6431. The Staff agrees with Applicants that the CRBRP system will meet this objective (S W Long, TR 6476-77), as did the Board. PID Finding 207. As the record establishes, the "informational needs" of the LMFBR Program are already being served by the cost data derived from CRBRP. Those data have been used in the development of the next

generation Large Developmental Plant (LDP) cost estimate, and in extrapolation to the cost and economics of commercial-sized LMFBR plants. A Exh 58 at 24-25, TR 6430-31. Under these circumstances, the Board correctly found that the economic information from CRBRP was reasonably likely to satisfy the informational needs of the LMFBR program and thus meet the economic feasibility objective.

VII. INTERVENORS' ARGUMENT CONCERNING DOE'S MEANS FOR SUPPLYING FUEL -- EXCEPTIONS 76, 95 AT 64-66.

Intervenors contend that the Board erred in refusing to admit Intervenors' Contention 17. This contention sought to contest DOE's means of supplying fuel for CRBRP. Intervenors' Brief at 64-66.

In seeking to question whether there will be sufficient fuel to operate CRBRP, Intervenors attempted to raise programmatic planning issues which have been entrusted solely to DOE.[104/] In its decision of August 27, 1976, the Commission itself rejected in toto Intervenors' Contention 11, which like Contention 17 questioned the availability of fuel. In that Contention, Intervenors alleged the following:

> 11. ... The Applicants' and Staff's analysis are inadequate with respect to
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> * * * *

104/As the Commission noted in its decision of August 27, 1976, the "licensing process must be tailored in this case to avoid the Commission's substituting its judgment for that of ERDA with respect to the broad planning decisions embodied in the LMFBR statement. ... " United States Energy Research and Development Administration, supra at 84. In effect, Intervenors, by attempting to challenge the availability of fuel for CRBRP, are challenging the very need for the Project itself.

(c) The availability, costs and benefits of a breeder reactor fuel cycle to support the CRBR or a commercial LMFBR economy. (Emphasis added.)

In its August 27, 1976 decision, the Commission noted that this contention "would challenge the bases for ERDA's conclusions concerning the need for an LMFBR program and the validity of ERDA's environmental assessments,"[105/] and concluded that "the Licensing Board should exclude Contention 11."[106/]

VIII. THE BOARD PROPERLY REJECTED INTERVENORS' CONTENTION THAT ALARA SHOULD APPLY TO ACCIDENTS -- EXCEPTION 77 AT 66. 107/

Intervenors argue that the Board erred in refusing to admit Contention 22, which attempted to apply the "as low as reasonably achievable" (ALARA) principle to offsite doses resulting from accidents. Intervenors' Brief at 66. Intervenors admit that, under the Commission regulations, the ALARA principle deals only with "routine releases,"[108/] but nevertheless contend

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105/ United States Energy Research and Development Administration supra at 73.

106/ Id. at 93. The Board also was correct in striking those portions of Intervenors' testimony which, despite the Board's earlier rejection of Contention 17, sought to address the manner in which DOE would supply fuel for CRBRP. Contrary to Intervenors' statements, that testimony did no more than question how and where CRBRP would obtain fuel. See I Exh 13 at 6-16, TR 4572-82. It did not concern either the impacts associated with isotopic concentration of CRBRP fuel or alternative reprecessing facilities, both of which were fully explored on the record under Contention 6. See Sections I.C.6. and I[illegible], supra.

107/ The arguments addressed herein encompass Intervenors' Exceptions 77 at page 66 of Intervenors Brief.

108/ See 10 C.F.R. § 50.34a(a).

that it should be applied to accidental exposures because it is a "fundamental tenet of the health physics profession." Id. Intervenors have cited no record evidence to support this argument which conflicts with Commission policy.[109/]

IX. THE BOARD PROPERLY LIMITED THE PARTICIPATION OF INTERVENORS' TECHNICAL ADVISOR -- EXCEPTIONS 88 AND 89 AT 66-88. [110/]

Intervenors claim that the Board erred in denying their motions to permit Dr. Thomas Cochran to act as an "expert interrogator."[111/] Intervenors' Brief at 66-68.

Under 10 C.F.R. § 2.733, the presiding officer may permit cross-examination by an individual only "where it would serve the

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109/ Rulemaking Hearing on Numerical Guidelines for Design Objectives and Limiting Conditions for Operation to Meet the Criterion "As Low As Practicable" for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents, CLI-75-5, 1 NRC 277, 285 (1975); see 40 Fed. Reg. 58847 (December 19, 1975); see also, 47 Fed. Reg. 7023 (February 17, 1982).

110/ The arguments addressed herein encompass Intervenors Exceptions 88 and 89 at pages 66-68 of Intervenors' Brief.

111/ Intervenors contend that as a result of the Licensing Board's ruling on their oral motion they were somehow "seriously prejudiced." Id. Intervenors make no similar claim of prejudice as to the Board's denial of their written motion filed on October 20, 1982. During the course of these proceedings, Intervenors have been represented by at least four attorneys who had ample time to review all prefiled testimony and prepare for cross-examination. Intervenors also engaged in discovery of unprecedented scope and deposed virtually all of Applicants' and Staff's witnesses prior to the start of hearings. Thus, Intervenors plainly had sufficient information and time to prepare fully for cross-examination. In addition, Intervenors waited until the opening day of hearings to request that Dr. Cochran be allowed to cross-examine and then the only justification was that they had assumed that he would be allowed to do so. TR 1244-1246. Under these circumstances, any alleged disadvantage suffered by Intervenors was solely of their own making.

purpose of furthering the conduct of the proceeding" and only after finding inter alia "that the individual is qualified by scientific or technical training or experience to contribute to the development of an adequate decisional record. ... "[112/]

In its Order of November 1, 1982, the Board noted Dr. Cochran's extensive involvement in the proceedings and in particular, the fact that Dr. Cochran had testified at length as an expert witness. Board Order at 7-8. On the basis of extensive and longstanding observation,[113/] the Board concluded that the use of Dr. Cochran as an expert interrogator would not be helpful to the Board and would not further the conduct of the hearing. Board Order at 6-7. In light of the Board's findings, it can hardly be said that the Board abused its discretion in denying Dr. Cochran the privilege of acting in the role of an objective expert witness and the adversarial role of a cross-examiner.[114/]

112/ Appendix A to 10 C.F.R. Part 2, § (v)(C)(8) specifically states that the procedure in 10 C.F.R. §2.733 "is a privilege, not a right and may be granted to further the conduct of the hearing."

113/ The depositions conducted by Dr. Cochran have frequently been characterized by questioning which is argumentative, redundant and non-technical. See, e.g., Intervenors' Deposition of Edward Branagan (Oct. 13, 1982). His testimony as an expert witness in the August hearings, on several occasions, was argumentative and non-responsive. See, e.g., TR 2955-67, 2976-82.

114/ Intervenors' claim that the Board's denial in this case was inconsistent with a decision in Texas Utilities Generating Company (Comanche Peak Steam Electric Station, Units 1 and 2), LBP-81-22, "chaired by the same Licensing Board Chairman". Intervenors' Brief at 67. The record is to the contrary. In Comanche Peak, cross-examination by an expert witness was allowed because the party to be cross-examined

(Continued)

X. THE BOARD PROPERLY LIMITED THE INTRODUCTION OF ACRS STATEMENTS AND REPORTS -- EXCEPTIONS 93 AND 94 AT 68-69 115/

Intervenors argue that the Board erred in striking portions of Intervenors' testimony which directly relied upon the contents of ACRS reports and hearing transcripts. Intervenors' Brief at 68-69. Intervenors' characterize the Board's ruling as holding "that anything which the ACRS touches is 'off limits' in a licensing proceeding." Intervenors' Brief at 68.

On the contrary, the Board merely ruled that ACRS deliberations were inappropriate for introduction in a licensing hearing for the truth of the matters asserted. TR 7094-7104. The Board's ruling was based upon Arkansas Power and Light Company (Arkansas Nuclear One Unit 2), ALAB-94, 6 AEC 25, 32 (1973), which held that an ACRS report could not be assigned any independent probative value. Id. In an attempt to circumvent that holding, Intervenors rely upon Gulf States Utilities Company (River Bend Station, Units 1 and 2), ALAB-444, 6 NRC 760, 766 (1977). River Bend does not overrule by implication the holding

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had not prefiled testimony, thus denying opposing counsel the opportunity to prepare for technical cross-examination, and although the witness' previous testimony was included in panel testimony it had not "loomed that significantly." TR 7320-7328. In contrast, all testimony in this proceeding was prefiled, thus permitting counsel to prepare for cross-examination with the aid of technical or scientific experts. In addition, Dr. Cochran was Intervenors' primary "expert" witness on virtually every contention. Intervenors gratuitously assert that counsel for Intervenors were aware of numerous earlier NRC proceedings at which cross-examination by expert interrogators had been allowed, without citation to any proceedings other than Comanche Peak. Intervenors' Brief at 67.

115/ The arguments addressed herein encompass Intervenors Exceptions 93 and 94 at pages 68-69 of Intervenors Brief.

in Arkansas Power and Light that "the report cannot be treated as having been admitted into evidence for the truth of any of the statements therein." 6 AEC at 32. River Bend merely notes that participants are not precluded from raising issues arising from ACRS deliberations. The Board's ruling was entirely consistent with Commission case law, and did not prejudice Intervenors.[116/]

CONCLUSIONS

For the reasons stated in the foregoing, the Appeal Board should affirm the Licensing Board's February 28, 1983 PID.

Respectfully Submitted,

George L. Edgar
Attorney for
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DATED: July 22, 1983

William D. Luck
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116/ Intervenors do not argue that any issues were foreclosed. Intervenors maintain that the ACRS transcripts and reports merely formed the basis for Intervenors' testimony, and that Intervenors could be cross-examined on their use of ACRS information. Intervenors' Brief at 69. In fact, consideration of Intervenors' testimony demonstrates that the ACRS deliberations were introduced to demonstrate the truth of the matter stated. See, e.g., I Exh 3 at 58-59, TR 2867-68; I Exh 14 at 11-12, TR 6061-62. If, however, Intervenors did not introduce the ACRS deliberations for the truth of the matter stated, then they have no basis for objecting to their removal from the record since no information of evidentiary value would have been lost. In either case, Intervenors were not prejudiced by the Board's ruling.

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING APPEAL BOARD

In the Matter of UNITED STATES DEPARTMENT OF ENERGY PROJECT MANAGEMENT CORPORATION TENNESSEE VALLEY AUTHORITY (Clinch River Breeder Reactor Plant)	Docket No. 50-537

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