

42

JUN 17 1982

NOTE TO: Homer Lowenberg

SUBJECT: REVISIONS OF 1977 RESPONSES TO COMMENTS ON THE CRBR  
DRAFT ENVIRONMENTAL STATEMENT

Updated responses to comments made on the 1977 version of the  
CRBR Draft Environmental Statement are attached. It is our under-  
standing that the new responses will be incorporated in a revised  
Chapter 11, "Discussion of Comments Received on the Draft Environmental  
Statement."

Bob Dube

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1. Comment (EPA)

INTRODUCTION AND CONCLUSIONS

The Environmental Protection Agency (EPA) has reviewed the U.S. Nuclear Regulatory Commission's Draft Environmental Impact Statement (draft statement) issued on February 11, 1976, in conjunction with the application of the Project Management Corporation and the Tennessee Valley Authority (TVA) for a permit to construct the Clinch River Breeder Reactor Plant (CRBRP). The U.S. Energy Research and Development Administration (ERDA) is also part owner of the plant and will have overall management responsibility. The proposed plant will be located in Roane County, Tennessee, about 25 miles west of Knoxville, on the north side of the Clinch River. The site is within the city limits of Oak Ridge but is owned by the United States of America and is presently in custody of TVA. The purpose of the proposed plant will be to demonstrate the feasibility and acceptability of LMFBR central electric power stations, and to confirm the value of the LMFBR for conserving natural (uranium) resources. The reactor core will be cooled by liquid sodium metal instead of the more conventional coolant - water, and is specially designed to enhance the production of plutonium, which can be recycled as nuclear fuel. The plant will produce 975 megawatts thermal initially and up to 1121 megawatts with future core designs. Waste heat will be rejected via a mechanical-draft, wet cooling tower which draws makeup water from, and discharges blowdown to, the Clinch River.

EPA has declared the CRBRP a "new source" in terms of Section 306 of the Federal Water Pollution Control Act Amendments of 1972 (FWPCA). As such, Section 511 of the Act charged EPA with fulfilling the requirements of the National Environmental Policy Act of 1969, including that for environmental impact statements. Thus, EPA joins NRC in having such responsibilities for nuclear facilities. However, as the two agencies have agreed in the "Second Memorandum of Understanding" (40 Fed. Reg. 60115 Dec. 31, 1975), NRC is to prepare the impact statements with assistance from EPA in water quality, aquatic impacts and other areas where EPA has jurisdiction and expertise. Toward this end, EPA has met (October 6 and November 6, 1975) with the NRC staff and Battelle consultants to discuss various aspects of the CRBRP and to exchange data and information. EPA's concerns and assessments aired in those meetings have generally been well addressed in the draft statement. We appreciate the cooperation extended to EPA during its preparation and look forward to continued cooperative efforts with NRC through the issuance of the final statement on this project and beyond.

After a thorough review of the draft statement, we have identified several areas where, in our opinion, the assessment or presentation of the potential impacts of the CRBRP is inadequate. Our major conclusions are as follows:

1. Our review indicated the draft statement to be inadequate with respect to its treatment of reactor core disruptive accidents,

since design basis accidents have not been defined, hence the safety-design requirements have not yet been finalized for the CRBRP. We are pleased to note, however, the recent public statement by NRC staff that they plan to take steps to correct this deficiency prior to issuance of the final environmental statement.

2. In addition to the safety design question above, we also found that a number of other issues were not treated definitively in the draft statement, but rather were noted as being uncertainties or problems for which detailed solutions are not yet available, but which would be answered or resolved in the future. We regard these omissions as deficiencies which limit the accuracy of the description of the environmental impact of the plant. Some examples were (1) the use of criteria such as 10 CFR Part 100, which applies primarily to LWR's, and 10 CFR Part 50, Appendix I, which applies exclusively to LWR's in place of specific corresponding LMFBR criteria, which have not as yet been developed; (2) the general approach to safeguards, which relies heavily on the convictions of the NRC staff that solutions can be provided for specific problems as the technology develops and the problems are identified; (3) the disposition of the spent sodium cold traps, which will contain large amounts of radioactivity, possibly in combination with metallic sodium, has not yet been determined; (4) the coolant medium for the spent fuel transport casks has not yet been determined; and (5) the disposal site for

radioactive waste generated at the plant has not yet been determined.

Old Response

11.7.25 Safeguards Approach (EPA, A-17, Item 2 (2))

The DES states that the safeguards-related environmental impact of other fuel cycle activities stemming from the CRBRP operation would be substantially dependent upon the nature of the activities and their relationship to the CRBRP fuel cycle and a detailed assessment of this impact is precluded by future uncertainties associated with supporting fuel cycle activities. Paragraph 5.2 of Appendix E to the DES refers to the NRC determination that the safeguards framework of existing and proposed regulations, as discussed in the Commission's statement of November 14, 1975,\* permit the discharge of its responsibilities to protect the public health and safety and the common defense and security insofar as existing licensed plutonium facilities are concerned. Paragraph 5.2 also notes that the CRBRP could be supplied by either existing fuel facilities or by future facilities. Therefore, if a decision is made to defer or deny the wide-scale use of mixed oxide, it appears that existing facilities could produce CRBR fuel. While experience and continuing study may indicate areas where revisions to Commission regulations applicable to these facilities should be made, the production of CRDRP mixed oxide fuel in conjunction with these activities should not involve substantially different safeguards issues or costs.

New Response

The safeguards portions of the 1977 CRBR Final Environmental Statement have

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\* (See footnote on page 7-18.)

been updated and substantially revised. In the updated version the staff's assessment does not rely heavily on the assumption that new safeguards technologies will be developed.

2. Comment (NRDC)

7.3 Safeguards Considerations

The safeguards discussion represents one of the most irresponsible section of the DRAFT. Nowhere is it mentioned that safeguards are presently under intensive study by the NRC and that the eventual use of plutonium as a fuel hinges upon the outcome of these ongoing studies. NRC special Safeguards Study is designed:

1. To determine safeguard objectives.
2. To determine the nature and size of the threat.
3. To determine the nature of the safeguards system required to reduce the risk to the level of the objectives.
4. To determine the monetary cost of an adequate safeguards system.
5. To determine the societal cost of such a system in terms of civil liberties and institutional changes.

The DRAFT does not even mention the civil liberties and institutional changes associated with safeguards and yet, these are central items in the current debate over the virtue of utilizing plutonium as a fuel. To ignore this issue is an outright violation of NEPA wherein responsible opposing views are to be presented. To ignore the fact that GESMO and the decision on plutonium recycle is in abeyance pending completion of the study of safeguards is inexcuseable and irresponsible. Obviously the

decision on Pu-recycle is central to the LMFBR and this should have been fully discussed in this draft. If for no other reason (and there are many) this DRAFT should be withdrawn and rewritten.

We would like to incorporate by reference here all of the safeguard related comments submitted by ourselves and others with respect to the Draft EIS on the LMFBR Program (WASH-1535) and with respect to the Draft GESMO (WASH-1327). These should be considered as an integral part of our comments on the DRAFT, and we request that the Staff give the same consideration to these as it gives to the comments herein.

The DRAFT (pages 7-13, 7-14, and Appendix E) makes reference to existing safeguards regulation. We are convinced that these regulations are totally inadequate and wish to incorporate by reference our petition to NRC requesting the agency to undertake emergency measures to upgrade the existing safeguards.\*

Our views on the inadequacies of the domestic safeguards program are summarized in our recent testimony before the House Committee on Interior, Subcommittee on Energy and the Environment of the Committee on the Interior and Insular Affairs (Enclosure 5).

Old Response

11.7.26 Effect of Safeguards Studies on Use of Plutonium (NRDC, A-59)  
The purpose of the DES was to evaluate the environmental impact of the CRBRP; it was not intended to evaluate the LMFBR/program in its entirety or the wide scale use of plutonium as a fuel. Information relative to safeguards studies was included in paragraphs 5.2, 5.3 and 5.4 of

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\* Natural Resources Defense Council Petition for Adoption of Emergency Safeguard Measures or, Alternatively, for Revocation of Licenses, February



Appendix E to the DES. Additional material has been included in Section 7.3.1 of the FES. The staff believes that physical protection programs and materials accountability measures designed to meet the requirements of existing and proposed regulations will provide adequate assurance for the protection of the CRBRP against sabotage and theft of special nuclear material. Therefore, we believe that the environmental impact of safeguards for the CRBRP can be rationally judged at this time and is not dependent on programmatic type studies. Safeguards considerations for the proposed wide scale use of mixed oxide fuels will be addressed in a supplement to GESMO.

11.7.27 Civil Liberties and Institutional Changes Associated with Safeguards  
(NRDC, A-59)

The NRC does not believe that an effective safeguards system would result in violations of civil liberties or in institutional changes. This conclusion is based on experience gained during the application of a comprehensive security program during 30 years of protecting restricted data. These programs included the use of armed guards and security clearances for employees and were implemented without violation of the fundamental rights of individuals.

11.7.28 Petition for Adoption of Emergency Safeguards (NRDC, A-59)

By letter of March 22, 1976 the Director of the Office of Nuclear Material Safety and Safeguards made a detailed response to this petition by NRDC which was dated February 2, 1976. That response specifically stated that a determination has been made that "your requests for emergency and



summary action are not warranted by the evidence presently available." There have been no developments which would warrant any change in this position.

New Response

In the years since this comment was received, several of the issues raised have been addressed by the NRC. The NRC safeguards objective was specified in the following Commission statement, issued in May 1976:

"Safeguards measures are designed to deter, prevent or respond to (1) the unauthorized possession or use of significant quantities of nuclear materials through theft or diversion; and (2) sabotage of nuclear facilities. The safeguards program has as its objective achieving a level of protection against such acts to insure against significant increase in the overall risk of death, injury, or property damage to the public from other causes beyond the control of the individual."

The nature of the safeguards threat to nuclear facilities has been studied extensively by the NRC and conclusions have been published in NUREG-0703, "Potential Threat to Licensed Nuclear Activities for Insiders (Insider Study)", July 1980 and in NUREG-0414, "Safeguarding a Domestic Mixed Oxide Industry Against a Hypothetical Subnational Adversary", May 1978. In addition, the current version of the physical security regulations in 10 CFR Part 73 contains a specification of the threat that must be used by NRC licensees as a design basis (10 CFR 73.1). Economic costs of safeguards and societal impacts were also discussed in

NUREG-0414. This report concluded that the safeguards measures required to protect a mixed oxide (MOX) industry are not likely to have severe societal effects or to cost more than the safeguards required for the non-MOX nuclear industry.

The NRDC comment includes the statement that existing NRC safeguards regulations are inadequate. Upgraded physical security requirements for nuclear power reactors (10 CFR 73.55) and facilities possessing formula quantities of special nuclear material (10 CFR 73.45 and 73.46) have been published since this comment was received. The staff believes that the CRBRP can be adequately safeguarded under the current regulations. It should be noted, however, that the NRC will not license the conversion, fuel fabrication, or reprocessing facilities, nor will the NRC license transportation activities related to the CRBR. The staff has performed a general assessment of the Applicants' proposed safeguards systems for licensed and unlicensed CRBR fuel cycle activities. This assessment is contained in Appendix E.

3. Comment (Environmental Council on Nuclear Power)

11. On page E-17, reference is made to plutonium accountability. It is difficult to conceive of how safeguards can be effective if measurement

uncertainty can be as high as 1% for any plant process. Perhaps some discussion of how past performances in this field have worked out would be in order.

Old Response

11.12 APPENDIX E - SAFEGUARDS RELATED TO THE CRBRP FUEL CYCLE AND  
TRANSPORTATION OF RADIOACTIVE MATERIALS

11.12.1 Plutonium Accountability (ECNP, A-46, Item 11)

ECNP's comment concerning the reference on DES page E-17 to plutonium accountability reads as follows: "It is difficult to conceive of how safeguards can be effective if measurement uncertainty can be as high as 1% for any plant process."

The overall safeguards program is made up of a number of diverse and redundant systems which, when combined, are designed to provide a high degree of protection against the theft or diversion of plutonium and highly enriched uranium. These activities fall into two broad categories: physical security and material control. Physical security--including physical barriers, intrusion alarms, and armed guards--provides the first line of safeguards protection. Material control--comprised of access controls, containment, and material accounting--reinforce the protection provided by physical security measures and provides a quantitative basis for material accountability. Material control measures are especially effective against internal diversion where the participants have authorized passage through barriers and access to material in the normal course of business.

The material accounting system can deter and detect, but not prevent, the theft or diversion of material. The accounting system should be capable of continuously tracking the location and the movement of all discrete items and containers of SNM on inventory and of monitoring the in-process inventory for indications of diversion. Through shipper-receiver comparisons, data monitoring programs, and periodic physical inventory checks, the accounting system provides positive assurance that SNM is indeed present. Should a significant loss of material occur, the system should be capable of identifying the general location and the quantity of material involved. The accounting system provides backup detection capability for theft and diversion which circumvent detection capabilities provided by physical security and other material control measures. Internal audits are directed to assuring that records have not been falsified.

All physical measurements are subject to measurement uncertainty. The 1% uncertainty referenced in the comment is specified in the regulations as a limit value for one type of plant over a single inventory period. Materials in most fuel cycle plants are controlled within a 0.5% limit for measurement uncertainty. Because these errors tend to randomize over time, the cumulative uncertainty for a number of inventory periods will be less than the percentage limit specified for a single period. Nevertheless, reliance cannot be placed solely on material accounting to detect theft and diversion because the effectiveness of the system is limited by timeliness and measurement uncertainties. Accordingly, NRC requires in-depth protection systems to prevent, deter, detect, and defeat any attempt to illicitly remove nuclear material from facilities. (Additional

responses to comments on safeguards are in Section 11.7 for convenience of the reader, the bulk of the discussion in DES Appendix E has been moved to Section 7.3 in the FES).

New Response

The comment received from ECNP refers to page E-17 of the previous DES and states that: "It is difficult to conceive of how safeguards can be effective if measurement uncertainty can be as high as 1% for any plant process."

The safeguards systems for the CRBR fuel cycle facilities will employ a variety of material control and accounting (MC&A) components as well as extensive physical security measures. These are broadly described in Appendix E. Physical security measures, such as access controls, intrusion detection systems, response forces, and communications systems, are viewed as the first line of defense against theft, diversion, or sabotage. Material control measures, such as monitoring programs and SNM containment systems, reinforce the protection provided by physical security and provide a background against which material accounting systems can function effectively. A material accounting system performs measurements and maintains records in order to provide positive assurance that all SNM is present. Should a loss occur, accounting systems must be able to determine the general location of a loss and estimate the amount of SNM involved. As a secondary function, accounting systems provide backup loss detection capabilities and help ensure that the physical security and material control systems are not being circumvented.

The 1% measurement uncertainty mentioned in the comment is apparently a reference to the NRC requirement (see 10 CFR 70.51 for details) that

a reprocessing licensee must establish a limit of error on a 6-month inventory difference of no more than 1% of the plant's plutonium throughput. In 1977 it was generally assumed that a licensed reprocessing facility would be used to support the CRBR. The facility that the Applicant is now proposing to use, the Developmental Reprocessing Plant, will not be licensed by the NRC and hence will not be subject to NRC regulations. The same is true for the plutonium conversion and fuel fabrication facilities. In the CRBR Environmental Report the Applicant has specified the expected limits of error for each of these plants: 0.5% of throughput for bimonthly balances in the conversion and fabrication facilities and 0.7% of throughput for yearly balances in the reprocessing plant. In addition to the conventional material accounting capabilities described by these figures, the Applicant has stated that the conversion, fabrication, and reprocessing facilities will be equipped with prompt accounting systems to provide more sensitive and rapid indications of material loss.

#### 4. Unsolicited Changes

##### Old Changes

Summary and conclusions 3(d), Section 5.1 and Section 10.1.1.4 - The reference to security restrictions has been removed based upon TVA's practice of unlimited access to all areas outside the plant fence during operation. Access during construction would be limited by construction activity.

Section 7.3 - For clarification of NRC safeguards considerations, the discussion in this section now includes most of the material that was in Appendix E of the DES.

Revisions

These statements are not relevant to the revised Environmental Statement and can be deleted.



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## WIM ACTIVITIES FOR CRBR

1. REVIEW WIM SECTIONS OF EIS SUBMITTAL FROM DOE
2. REVIEW WIM SECTIONS OF SAFETY REPORT IF PARTICIPATION IS REQUIRED
3. PREPARE WIM SECTIONS FOR EIS
4. COORDINATE WITH CONTRACTOR FOR INDEPENDENT REVIEW AND ANALYSIS OF CRBR/WIM ACTIVITIES

THE WIM REVIEW WILL BE FOCUSED ON THE UNIQUE WASTES GENERATED FROM CRBR OPERATIONS AND FUEL CYCLE ACTIVITIES. DIFFERENCES BETWEEN HLW'S GENERATED FROM LWR'S AND THE CRBR, IF ANY, WILL BE EVALUATED. UNIQUE LLW'S FROM ROUTINE OPERATIONS OF THE CRBR INCLUDE BOTTLED KR GAS, Na COLD TRAP WASTES, AND LIQUID Na CONTAMINATED WASTES FROM DECONTAMINATION OPERATIONS AND DECOMMISSIONING. UNIQUE WASTES GENERATED IN THE FUEL CYCLE OPERATIONS INCLUDE BOTTLED KR GAS AND TRU CONTAMINATED WASTES. TRU CONTAMINATED WASTES WILL BE GENERATED FROM REPROCESSING AND FUEL FABRICATION.