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February 1995

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NUCLEAR REGULATORY COMMISSION ISSUANCES

February 1995

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The summaries and headnotes preceding the opinions reported herein are not to be deemed a part of those opinions or have any independent legal significance.

MASTER

U.S. NUCLEAR REGULATORY COMMISSION

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COMMISSIONERS

Ivan Selin, Chairman
Kenneth C. Rogers
E. Gail de Planque

B. Paul Cotter, Jr., Chief Administrative Judge, Atomic Safety and Licensing Board Panel

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COMMISSION

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Ivan Selin, Chairman
Kenneth C. Rogers
E. Gail de Planque

In the Matter of

Docket Nos. 70-00270-MLA
30-02278-MLA
(TRUMP-S Project)
(Byproduct License No. 24-00513-32;
Special Nuclear Materials License
No. SNM-247)

THE CURATORS OF THE
UNIVERSITY OF MISSOURI

February 28, 1995

The Commission considers appeals from both the Initial Decision and a Reconsideration Order issued by the Presiding Officer in this Subpart L proceeding involving two materials license amendment applications filed by the University of Missouri. In those two orders, the Presiding Officer concluded that the University's possession and use of the materials at issue were consistent with the public health and safety, did not harm the common defense and security, and therefore satisfied the requirements of the AEA. However, in order to decrease further the risks associated with such possession and use, the Presiding Officer imposed certain additional safety conditions on the Licensee.

The University appealed to the Commission the Presiding Officer's imposition of these additional conditions. The Intervenors appealed the Presiding Officer's rulings that the license amendments satisfied the requirements of the AEA; questioned his authority to issue the order on reconsideration; challenged numerous of his procedural rulings; and appealed his decision to exclude three of their proffered areas of concern.

For the most part, the Commission reaches the same conclusions as the Presiding Officer, but in some instances follows a line of reasoning different from

his. The Commission affirms LBP-91-31, 34 NRC 29 (1991), and LBP-91-34, 34 NRC 159 (1991) with certain modifications, and thereby approves the University's license amendment applications, subject to certain conditions. More specifically, the Commission concludes that the Presiding Officer had jurisdiction to issue his order on reconsideration; affirms his conclusions regarding all procedural issues raised on appeal as well as his decision to exclude three areas of concern; concludes that the risk of dispersion of radioactive material from the TRUMP-S experiments is acceptably small; and both modifies and supplements the fire safety conditions that the Presiding Officer imposed upon the University.

ADJUDICATORY BOARDS: JURISDICTION (RETENTION)

ADMINISTRATIVE TRIBUNALS: JURISDICTION

COMMISSION JURISDICTION: APPEAL

LICENSING BOARD/PRESIDING OFFICER: JURISDICTION

MOTION FOR RECONSIDERATION

**RULES OF PRACTICE: JURISDICTION (PRESIDING OFFICER);
MOTIONS FOR RECONSIDERATION; RECONSIDERATION
PETITIONS**

A presiding officer has jurisdiction to consider a timely motion for reconsideration filed after the issuance of an initial decision but before the timely filing of appeals.

ATOMIC ENERGY ACT: SAFETY FINDINGS

LICENSE AMENDMENT APPLICATION

MATERIALS LICENSE UNDER PART 30: STANDARDS

MATERIALS LICENSE UNDER PART 70: STANDARDS

**NRC: HEALTH AND SAFETY RESPONSIBILITIES;
RESPONSIBILITIES UNDER AEA**

For the Commission to grant a materials license or license amendment, it must find that (1) the applicant's proposed equipment and facilities are adequate to protect health and minimize danger to life or property; and (2) the applicant is qualified by training and experience to use the material for the purpose requested in such a manner as to protect health and minimize danger to life or property and to comply with the Commission's regulations. The test for the grant or denial

of such a license or amendment is not simply whether there is a deficiency or omission in the application.

ATOMIC ENERGY ACT: SAFETY FINDINGS

LICENSE AMENDMENT APPLICATION

MATERIALS LICENSE UNDER PART 30: STANDARDS

MATERIALS LICENSE UNDER PART 70: STANDARDS

NRC: HEALTH AND SAFETY RESPONSIBILITIES; RESPONSIBILITIES UNDER AEA

A plainly deficient application calls into question an applicant's competence and *bona fides* — matters that certainly pertain to the question whether to approve the application.

REGULATORY GUIDES: APPLICATION

NUREGs and Regulatory Guides, by their very nature, serve merely as guidance and cannot prescribe requirements. Although conformance with regulatory guides will likely result in compliance with specific regulatory requirements, nonconformance with such guides does not equate to noncompliance with the regulations.

LICENSE AMENDMENT APPLICATION

MATERIALS LICENSE APPLICATION: NEED TO SUBMIT SAFETY PROCEDURES

The Commission does not require that proposed safety procedures to protect health and minimize danger to life or property be included in a materials license amendment application if they have already been submitted to the Commission in previous applications associated with the same NRC license. Sections 70.21(a)(3) and 30.32(a) of the Commission's regulations expressly permit an applicant to incorporate by reference any information contained in previous applications, statements, or reports filed with the Commission.

REGULATIONS: RETROACTIVE APPLICATION

A rule has retroactive effect if an act lawful at the time it was done is rendered unlawful and the actor called to account for a completed, now-condemned deed in the halls of justice. Although the issue of "retroactivity" generally arises in

situations where the government attempts to apply a statute or regulation prior to its enactment date or *promulgation date*, the issue is logically just as relevant to situations in which the government or a party attempts to apply a new regulation to events that transpired prior to the regulation's *effective date*.

REGULATIONS: RETROACTIVE APPLICATION

The Commission did not intend for 10 C.F.R. §§ 30.32(i) and 70.22(i) to be applied retroactively so as to require the rejection of previously filed applications that did not contain the newly required emergency plan information.

REGULATIONS: RETROACTIVE APPLICATION

A regulation should not be applied retroactively if the agency indicates a contrary intent.

REGULATIONS: RETROACTIVE APPLICATION

The rule of statutory construction that a court is to apply the law in effect at the time it renders its decision does not alter the well-settled presumption against application of the class of new statutes that would have genuinely "retroactive" effect.

COMMISSION PROCEEDING: APPELLATE REVIEW

RULES OF PRACTICE: ISSUES ON APPEAL

The Commission may ignore arguments inadequately briefed on appeal.

ADMINISTRATIVE TRIBUNALS: AUTHORITY

EVIDENCE: AFFIDAVITS

LICENSING BOARD/PRESIDING OFFICER: AUTHORITY

**RULES OF PRACTICE: ADMISSIBILITY OF EVIDENCE;
EVIDENCE**

The Commission's regulations and practice do not preclude an applicant from submitting post-application affidavits into the record of a materials licensing proceeding. Such affidavits fall within the types of documents that the Presiding Officer has the discretion to allow into the record pursuant to section 2.1233(d), viz., "additional documentary data, informational material, or other written

evidence.” The Commission’s practice of permitting the licensee to file such supplemental supporting evidence in a Subpart G proceeding applies equally well to a Subpart L proceeding.

EVIDENCE: AFFIDAVITS

MATERIALS LICENSE APPLICATION

**RULES OF PRACTICE: ADMISSIBILITY OF EVIDENCE;
EVIDENCE**

Affidavits submitted during a hearing are explanatory material offered to aid in the understanding of the underlying applications; they do not constitute amendments to the applications.

ADJUDICATORY HEARINGS: EVIDENCE

ADMINISTRATIVE TRIBUNALS: AUTHORITY

EVIDENCE: REBUTTAL

**LICENSING BOARD/PRESIDING OFFICER: AUTHORITY TO
QUESTION PARTIES**

**RULES OF PRACTICE: EVIDENCE (REBUTTAL); REBUTTAL
EVIDENCE**

The Presiding Officer in a Subpart L proceeding has broad discretion to determine the point at which the intervenors have been accorded sufficient opportunity to respond to all issues of importance raised by the licensee. If the Presiding Officer needs information to compile an adequate record, he may obtain it by posing questions pursuant to section 2.1233(a).

**RULES OF PRACTICE: SUBPART L (INFORMAL HEARING
PROCEDURES)**

The Commission’s intent in promulgating Subpart L was to decrease the cost and delay for the parties and the Commission and to empower presiding officers to manage and control the parties’ written submissions.

RULES OF PRACTICE: SUBPART L (INFORMAL HEARING PROCEDURES)

ADMINISTRATIVE TRIBUNALS: AUTHORITY

LICENSING BOARD/PRESIDING OFFICER: AUTHORITY TO QUESTION PARTIES; DISCRETION IN MANAGING PROCEEDING; RESPONSIBILITIES (DEVELOPMENT OF RECORD)

RULES OF PRACTICE: EVIDENCE (REBUTTAL); REBUTTAL EVIDENCE

Subpart L does not accord intervenors the right to speak last regarding the issues in a materials license proceeding. Section 2.1233(a) of Subpart L expressly accords the Presiding Officer the discretion both to determine the sequence in which the parties present their arguments, documentary data, informational material, and other supporting written evidence, and to offer individual parties the opportunity to provide further data, material, and evidence in response to the Presiding Officer's questions.

ADJUDICATORY HEARINGS

ATOMIC ENERGY ACT: HEARING REQUIREMENT (MATERIALS LICENSE); HEARING RIGHT

NRC: ADJUDICATORY RESPONSIBILITIES

RULES OF PRACTICE: HEARING REQUIREMENT (MATERIALS LICENSE)

A Subpart L proceeding satisfies the Atomic Energy Act's requirement for an agency hearing.

ADJUDICATORY HEARINGS

ADMINISTRATIVE PROCEDURE ACT

NRC: ADJUDICATORY RESPONSIBILITIES

RULES OF PRACTICE: HEARING REQUIREMENT (MATERIALS LICENSE)

Section 7(c) of the Administrative Procedure Act does not apply to informal hearings conducted pursuant to Subpart L. Instead, the intervenors are entitled only to some sort of procedures for notice, comment, and a statement of reasons for the agency action.

DUE PROCESS: OPPORTUNITY FOR RESPONSE

Generalized health, safety, and environmental concerns do not rise to the level of liberty or property interests that are protected by the due process clause.

RULES OF PRACTICE: HEARING REQUIREMENT (MATERIALS LICENSE); SUBPART L (INFORMAL HEARING PROCEDURES)

The parties to a Subpart L proceeding have no right to require a formal hearing. Rather, the Commission alone has the authority to require such a hearing. 10 C.F.R. § 2.1209(k). Under Subpart L's procedures, the Commission will generally exercise this authority only in situations where the Presiding Officer requests permission to conduct a formal adjudication using the rules of Subpart G. However, Subpart L contemplates that a presiding officer would only rarely request permission to conduct a formal adjudication.

COMMISSION PROCEEDING: APPELLATE REVIEW

RULES OF PRACTICE: ISSUES ON APPEAL

Appeals lie only from unfavorable actions by the Presiding Officer, not from *dictum* in an initial decision with which the party disagrees but which has no operative effect.

RULES OF PRACTICE: SUBPART L (INFORMAL HEARING PROCEDURES); ORAL PRESENTATIONS

In promulgating Subpart L, the Commission contemplated that the Presiding Officer would base his decision on a written record. Consequently, the Commission accorded the Presiding Officer wide discretion to decide whether oral presentations are necessary to create an adequate record. 10 C.F.R. § 2.1235(a). The Commission anticipated that, in the vast majority of situations, the Presiding Officer would not allow oral presentations.

RULES OF PRACTICE: SUBPART L (INFORMAL HEARING PROCEDURES)

ADJUDICATORY BOARDS: CONDUCT OF PROCEEDINGS

LICENSING BOARD/PRESIDING OFFICER: RESPONSIBILITIES (DEVELOPMENT OF RECORD); RESPONSIBILITIES (EXAMINATION OF WITNESSES)

RULES OF PRACTICE: BOARD QUESTIONS; CROSS-EXAMINATION

Parties have no fundamental right to cross-examination even in a formal Subpart G proceeding. The Commission has made clear that, in a Subpart L proceeding, the responsibility for the examination of all witnesses rests with the Presiding Officer, not with the parties.

ADJUDICATORY BOARDS: AUTHORITY OVER STAFF ACTION

ADMINISTRATIVE TRIBUNALS: AUTHORITY

LICENSING BOARD/PRESIDING OFFICER: AUTHORITY; REVIEW OF NRC STAFF'S ACTIONS

As a general matter, the Commission's licensing boards and presiding officers have no authority to direct the Staff in the performance of its safety reviews.

ADJUDICATORY BOARDS: AUTHORITY OVER STAFF ACTION

LICENSING BOARD/PRESIDING OFFICER: REVIEW OF NRC STAFF'S ACTIONS

RULES OF PRACTICE: BURDEN OF PROOF

Because the licensee rather than the Staff bears the burden of proof in a licensing proceeding, the adequacy of Staff's safety review is, in the final analysis, not determinative of whether the application should be approved. Consequently, it would be pointless for the presiding officer to rule upon the adequacy of Staff's review.

COMMISSION: AUTHORITY

COMMISSION PROCEEDING: APPELLATE REVIEW

The Commission itself has the authority to vacate licensing actions or ask for further Staff review, and has exercised that authority on appropriate occasions.

**NRC STAFF: NO OBLIGATION TO EXPLAIN DETERMINATIONS;
NO OBLIGATION TO MAKE FINDINGS OF FACT**

The NRC Staff has no obligation either to provide an explanation of its determination to approve a materials license amendment application or to make findings of fact in support of that determination.

**NRC STAFF: NO OBLIGATION TO PREPARE SAFETY
EVALUATION REPORT**

SAFETY EVALUATION REPORT

The NRC Staff is not required to prepare a safety evaluation report prior to approving a materials license amendment application.

**ENVIRONMENTAL ASSESSMENT: NO OBLIGATION OF STAFF
TO PREPARE**

**ENVIRONMENTAL IMPACT STATEMENT: NO OBLIGATION OF
STAFF TO PREPARE**

**NEPA: ENVIRONMENTAL ANALYSIS; ENVIRONMENTAL
ASSESSMENT; ENVIRONMENTAL IMPACT STATEMENT (NEED)**

NRC: RESPONSIBILITIES UNDER NEPA

**NRC STAFF: NO OBLIGATION TO PREPARE ENVIRONMENTAL
ASSESSMENT OR ENVIRONMENTAL IMPACT STATEMENT**

Although the NRC Staff must prepare an environmental impact statement (EIS) addressing any major action taken by the Commission that may significantly affect the quality of the human environment (42 U.S.C. § 4332(2)(C) (1988); 10 C.F.R. Part 51), neither NEPA nor the Commission's regulations require the Staff to prepare an EIS if the federal action's effect on the environment is not significant.

NEPA: REQUIREMENT FOR IMPACT STATEMENT

REGULATIONS: COLLATERAL ATTACK ON

RULES OF PRACTICE: WAIVER OF RULES OR REGULATIONS

Although an argument that a regulatory exemption contravenes NEPA constitutes a prohibited collateral attack on the regulation at issue, a party to a Subpart L proceeding may file a petition for waiver of the bar on collateral attacks against the Commission's regulations (10 C.F.R. § 2.1239(b)).

ATOMIC ENERGY ACT: SAFETY FINDINGS

NRC: ADJUDICATORY RESPONSIBILITIES; HEALTH AND SAFETY RESPONSIBILITIES; RESPONSIBILITIES UNDER AEA

The Commission is not a general fire safety or occupational health agency. Its responsibility is directed to the hazards associated with nuclear materials rather than to all questions of fire safety at licensed facilities.

RULES OF PRACTICE: ADMISSIBILITY OF AREAS OF CONCERN; AREAS OF CONCERN (ADMISSIBILITY)

The Commission's Subpart L procedural regulations impose upon the intervenors the burden of showing that an area of concern is germane to the subject matter of the proceeding (10 C.F.R. § 2.1205(g)), i.e., it must fall within the range of matters that are properly subject to challenge in a proceeding.

ATOMIC ENERGY ACT: COMMON DEFENSE AND SECURITY; NON-PROLIFERATION

NUCLEAR PROLIFERATION

PROLIFERATION

RULES OF PRACTICE: ADMISSIBILITY OF AREAS OF CONCERN; AREAS OF CONCERN (ADMISSIBILITY)

An intervenor arguing that an activity would be "inimical to the common defense and security" is not limited to arguing that the project would contravene a particular regulatory guidance, regulation, statute, or treaty. An intervenor is not entitled, however, to litigate this area of concern unless the specific "common defense and security" risk asserted is reasonably related to, and would arise as a *direct* result of, the specific license amendments that the applicant asks the Commission to approve.

DECOMMISSIONING FUNDING PLAN

FINANCIAL QUALIFICATIONS (DECOMMISSIONING)

Sections 30.35(a) and 70.25(a) of the Commission's regulations generally require a materials license applicant to submit a decommissioning funding plan if the amount of unsealed byproduct material or unsealed special nuclear material to be licensed exceeds certain levels. However, sections 30.35(c)(2) and 70.25(c)(2) provide specific exceptions to the requirements of sections 30.35(a)

and 70.25(a) for any holder of a license issued on or before July 27, 1990. Such a licensee has a choice of either (1) filing a decommissioning plan on or before July 27, 1990, or (2) filing a Certification of Financial Assurance on or before that date and then filing a decommissioning funding plan in its next license renewal application.

DECOMMISSIONING FUNDING PLAN

FINANCIAL QUALIFICATIONS (DECOMMISSIONING)

If a materials licensee is a governmental entity, then sections 30.35(f)(4) and 70.25(f)(4) dictate the terms of its decommissioning Certification of Financial Assurance. Both of these sections state that financial assurance for decommissioning may be provided, "[i]n the case of . . . State . . . government licensees, [by] a statement of intent containing a cost estimate for decommissioning or an amount based on the Table in paragraph (d) of this section, and indicating that funds for decommissioning will be obtained when necessary." The Commission expressly intended that this provision apply to state universities.

TECHNICAL ISSUES DISCUSSED

The following technical issues are discussed: Accident dose estimates; Americium; Curie content (disclosure of); Emergency plan (sufficiency); Emergency Planning and Community Right-to-Know Act; Emergency procedures; Emergency support operations; Entrainment of radionuclides; Financial qualifications (decommissioning); Fire detection measures; Fire protection measures; Fire suppression measures; Hazardous chemicals; NUREG-1140; NUREG/CR-5055; Occupational radiation exposures; Projected occupational doses; Plutonium; Plutonium processing and fuel fabrication plant; Qualifications of licensee's staff; Radioactive waste storage; Radiological monitoring; Radiological releases; Reactor control room staffing; Regulatory Guide 1.145; Regulatory Guide 10.3; Regulatory Guide 10.5; Regulatory Guide 2.6; Regulatory Guide 3.66; Release of radioactive materials to unrestricted area; Requirement to describe curie content of materials in SNM license amendment application; Requirement to describe weight content of materials in SNM license amendment application; Risk of dispersion of radioactive materials; Safety standards; Waste disposal; "TRU" waste.

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MEMORANDUM AND ORDER

Introduction and Summary

On March 19 and April 5, 1990, the Nuclear Regulatory Commission Staff ("NRC Staff") issued two license amendments to the Curators of the University of Missouri ("Licensee" or "the University"). These amendments collectively authorized the Licensee to possess and use certain specified quantities of uranium (depleted in U-235), neptunium-237 (Np-237), americium-241 (Am-241), and plutonium-239/240 (Pu-239/240). The amendments were effective upon issuance and, except for a brief period during the pendency of this proceeding, have remained in effect.

Three organizations and ten individuals filed motions to intervene and requests for hearing.¹ The Intervenor objected to the amendments on the grounds that their issuance would be inconsistent with the public health and safety, would damage the common defense and security of the country, and would therefore violate the requirements of section 182a of the Atomic Energy Act ("AEA"), 42 U.S.C. §§ 2232(a) (1988). In response to the Intervenor's filings, the Commission appointed a Presiding Officer to conduct an informal hearing pursuant to Subpart L of the Commission's procedural regulations in 10 C.F.R. Part 2. The Presiding Officer admitted six of the Intervenor's nine areas of concern and developed a voluminous record — receiving seventy affidavits and declarations into evidence.

On July 10, 1991, the Presiding Officer issued a Final Initial Decision in which he concluded that the University's possession and use of the radioactive elements (as authorized by the amendments) were consistent with the public health and safety, did not harm the common defense and security, and therefore satisfied the requirements of the AEA. However, in order to decrease further the risks associated with such possession and use, the Presiding Officer imposed certain additional safety conditions on the Licensee. LBP-91-31, 34 NRC 29, *clarified*, LBP-91-34, 34 NRC 159 (1991). The University appealed to the Commission the Presiding Officer's imposition of these additional conditions; the Intervenor appealed the Presiding Officer's rulings that the license amendments satisfied the requirements of the AEA, challenged numerous of the Presiding

¹ The three organizations are the Missouri Coalition for the Environment, the Mid-Missouri Nuclear Weapons Freeze, Inc., and Physicians for Social Responsibility/Mid-Missouri Chapter (collectively "Intervenor Organizations"). The individual Intervenor are Jeff Stack, Richard Smith, Amy Smith, Steve Jacobs, Marion Mace, Therese Folsom, Betty Aulabaugh, Diana Nomad, Clyde Wilson, and Kathleen Morrison (collectively "Individual Intervenor"). We will refer to both groups as "Intervenor," except where it is necessary to distinguish between their positions.

Officer's procedural rulings, and appealed his decision to exclude three of their proffered areas of concern.²

This appeal raises numerous and complex issues, some quite technical. The record and pleadings are voluminous. To address the issues raised on appeal, the Commission has found it necessary in some instances to examine not only the Final Initial Decision and the appeal briefs, but also to delve in considerable detail into the underlying administrative record itself and to take official notice of various technical documents (pursuant to 10 C.F.R. § 2.743(i)).³ For the most part, we have reached the same conclusions as the Presiding Officer, but in some instances have followed a line of reasoning different from his.⁴ For the reasons set forth below, we affirm LBP-91-31 and LBP-91-34 with certain modifications, and thereby approve the University's license amendment applications, subject to certain conditions. More specifically, we conclude that the Presiding Officer had jurisdiction to issue his order on reconsideration (LBP-91-34); we affirm his conclusions regarding all procedural issues raised on appeal as well as his decision to exclude three areas of concern; we conclude that the risk of dispersion of radioactive material from the TRUMP-S experiments is acceptably small; and we modify and supplement the fire safety conditions that the Presiding Officer imposed upon the University.

We wish to emphasize at the outset that, although the total amount of material at issue (about 10.7 curies (Ci) and 527 grams) is quite small — particularly when compared to the amounts generally at issue in our power reactor licensing proceedings, we do not consider the TRUMP-S material's potential for harm to be trivial. Both the Presiding Officer and the Intervenors have expressed concern regarding the harm that could occur if these radionuclides were released into the atmosphere. LBP-91-31, 34 NRC at 36 (relying on figures in Intervenors' Exhibit No. 1, Declaration of TRUMP-S Review Panel, dated Oct. 14, 1990, at 10-11, attached to Intervenors' Written Presentation, dated Oct. 15, 1990); II-IB at 53-54. We share the Presiding Officer's and the Intervenors' concern regarding the TRUMP-S materials' potential for harm. The lengthy and detailed analysis in our decision today reflects our careful review of this matter.

² In this order, the Commission will use the following abbreviations for the five appellate briefs: U Mo IB = Licensee's [Initial] Brief on Appeal; U Mo RB = Licensee's Response Brief; IS-IB = [Initial] Brief on Appeal of Intervenor Organizations; II-IB = [Initial] Brief on Appeal of Individual Intervenors; I-RB = Joint [Response] Brief of Intervenors and Individual Intervenors.

³ See *infra* notes 29 (EPA Report), 31 (HEW Handbook), 36 (DOE Manual), 84 (NRC Staff approval), 97 (NRC Staff Letter approving Emergency Plan), and 130 (SER); and text at p. 108 (license renewal documents) and 157 (Hazards Summary Report).

⁴ An appellate administrative forum may affirm a lower forum's ruling for reasons not espoused by the lower forum. See, e.g., *Washington Public Power Supply System* (WPPSS Nuclear Project No. 2), ALAB-722, 17 NRC 546, 548 (1983).

Background

I. THE LICENSE AMENDMENTS

The University filed applications for amendments to two licenses — Special Nuclear Material and Source Material License No. SNM-247 (dated February 20, 1990) and Broad Scope Byproducts License No. 24-00513-32 (dated March 9, 1990). The NRC Staff granted these two applications, issuing Amendment No. 12 to the former license on March 19, 1990, and Amendment No. 74 to the latter license on April 5, 1990.⁵

Collectively, the amendments permit the University to conduct certain basic research on the chemistry of uranium, neptunium, plutonium, and americium in their pure forms. The ultimate objective of this research is to develop inexpensive electrochemical means to reduce the volume of radioactive waste currently required to be stored in high-level nuclear waste disposal facilities, by extracting 99% of the long-lived transuranic elements ("TRU", i.e., americium, neptunium, and plutonium) and uranium from the shorter-lived radioactive elements in spent fuel without generating liquid radioactive waste. After this process, the extracted, highly concentrated TRU would be stored in high-level nuclear waste disposal facilities (just as it is currently stored). However, the remaining low-TRU, high-level radioactive waste (i.e., the vast majority of the original TRU-tainted radioactive wastes) could be stored for long enough to allow the shorter-lived fission products to decay to low levels, and could then be disposed of as low-level waste for substantially less cost than the current expense of disposing of the entire original TRU-tainted wastes in high-level nuclear waste disposal facilities.

The research is part of the Transuranic Management by Pyropartitioning Separation ("TRUMP-S") Project, for which Rockwell International Corporation ("Rockwell") is the principal contractor and the University is a subcontractor. The University is currently conducting the TRUMP-S research in the Alpha Laboratory, located in the basement of the University of Missouri Research Reactor ("MURR") building on its Columbia, Missouri campus. The University constructed this laboratory specifically for the purpose of working with small quantities of alpha-emitting elements (i.e., one gram or less of americium, plutonium, or neptunium in any experiment). These elements, when not in use, are stored in the fuel vault of the MURR facility.

⁵ On July 7, 1993, at the University's request, the Staff terminated License No. SNM-247. On the same date the Staff included the SNM materials in the University's newly issued Broad Scope Materials License No. 24-00513-39. See Board Notification 93-19, submitted by Staff into the record on Aug. 2, 1993. However, with one exception (see p. 108 *infra*), these changes do not affect the merits of the parties' arguments in the instant proceeding.

Prior to the issuance of these two amendments, the two above-cited licenses authorized the University to possess and use

293+ grams of plutonium in sealed sources, 250 kilograms ("kg") of natural uranium in any form, 40 millicuries ("mCi") of Am-241 in any form, 5+ curies ("Ci") of Am-241 in sealed sources, and 5 mCi of Np-237 in any form.

Response of Licensee to Request for Hearing and Stay Pending Hearing, dated May 25, 1990, at 3-4.

Amendment No. 12 to License No. SNM-247 authorized the University to possess and use 500 grams (0.2 mCi) of depleted uranium in any form and 10 grams (710 mCi) of Pu-239/240 in any form. Amendment No. 74 to License No. 24-00513-32 increased the University's authorized quantities of Np-237 in any form to 10 mCi (approximately 14 grams) and its authorized quantity of Am-241 in any form to 25 Ci (approximately 7 grams). Response of Licensee to Request for Hearing and Stay Pending Hearing, dated May 25, 1990, at 3-4, 8-9. However, the University does not anticipate using all of the quantities authorized in the two amendments. Rather, it expects to use in its TRUMP-S project less than 75 grams of depleted uranium (in pure form) and less than 10 grams each of neptunium, plutonium, and americium (all in pure form). Response of Licensee to Request for Hearing and Stay Pending Hearing, dated May 25, 1990, at 4-5. According to the University, the total mass of elements used in any TRUMP-S experiment will not exceed one gram. See Licensee's Exhibit No. 2, Affidavit of Dr. Susan M. Langhorst Regarding NUREG-1140 and Intervenor's Dispersion Concentrations, dated Nov. 13, 1990, at 8-9 ¶¶ 18-19 & nn. 6-7.

II. HEARING PURSUANT TO SUBPART L AND THE INITIAL DECISIONS

As noted above, ten individuals and three organizations sought, and were granted, Intervenor status in this proceeding. The Presiding Officer admitted six areas of concern raised by the Intervenor. Briefly stated, these admitted areas of concern are (1) inadequacy of fire safety procedures, (2) absence of a buffer zone to protect the public in case of accident, (3) inadequacy of administrative controls for the TRUMP-S project, (4) inadequacy of the University's emergency plan, (5) absence of either an Environmental Assessment ("EA") or an Environmental Impact Statement ("EIS"), and (6) lack of specificity as to the responsibilities of personnel involved in the TRUMP-S project. At the outset of this proceeding, the Presiding Officer rejected three other areas of concern — specifically, the effects of the project upon nuclear proliferation, the alleged inadequacy of the University's nuclear waste disposal plan, and the University's alleged failure

to comply with the Commission's regulations regarding decommissioning. See LBP-90-18, 31 NRC 559, 567-70 (1990), and unpublished Memorandum and Order (Admitting Parties and Deferring Action on a Stay), slip op. at 3-7, issued Aug. 28, 1990.

After an informal hearing, the Presiding Officer issued two Initial Decisions. The First Initial Decision, dated April 15, 1991, imposed the following four conditions upon the University: the installation of an automatic fire sprinkler system in the Alpha Laboratory, the installation of an additional filter in the exhaust system of the argon glove box in the Laboratory, the replacement of the glass window in the Laboratory with a wire glass window, and a reduction in the amount of Am-241 which the University was authorized to possess and use (from 25 to 10 Ci). LBP-91-12, 33 NRC 253, *reviewed sua sponte*, CLI-91-7, 33 NRC 295 (1991).

The Presiding Officer's Final Initial Decision, issued July 10, 1991, disposed of all remaining issues in this proceeding. In that decision, the Presiding Officer rejected all of the Intervenor's areas of concern on their merits. Specifically, he (1) found that the fire safety procedures were generally safe (34 NRC at 94-96); (2) rejected, on the ground that the Intervenor had failed to demonstrate any inadequacy in the University's fire procedures, the claim that a buffer zone was needed (*id.* at 104); (3) concluded that the Intervenor had failed to show any serious lack of administrative controls (*id.* at 96-100); (4) found that the University's emergency planning was adequate to ensure the safety of the public (*id.* at 100-02); (5) concluded that the Commission's regulations did not require the preparation of either an EA or an EIS (*id.* at 102); and (6) found that the Intervenor had failed to show any problems regarding the responsibilities of personnel involved in the TRUMP-S Project (*id.* at 102-08).

Based on the record, however, the Presiding Officer did impose three conditions on the University to enhance fire safety. First, he required the University to take one of the following alternative actions: (1) Disclose existing procedures (or adopt new procedures) that would ensure certain acceptable levels of fire loading and continuity of burnable material in the basement outside the Alpha Laboratory; (2) Propose procedures for ensuring a new, safer maximum fire loading (and continuity) and demonstrate by analysis or expert testimony that the new maximum fire loading (and continuity) will prevent a credible fire from spreading into the Alpha Laboratory from outside the laboratory; and (3) Install an automatic fire sprinkler system in the rectangular portion of the basement immediately adjacent to the Alpha Laboratory and extending from the laboratory to the hot cell. See *id.* at 90, 130.

Under any of these three alternatives, combustible-fuel vehicles would be banned from the basement while actinides were in use in the laboratory. The Presiding Officer concluded that, once this first requirement was satisfied through the implementation of any of these three options, a major fire in or affecting the

Alpha Laboratory would not be credible and that, consequently, the issuance of the license amendments to the University would be consistent with the Commission's duty to protect health and minimize danger to life or property. *Id.* at 37, 90.

Second, the Presiding Officer required the University to amend its TAM-62 (one of the standard operating procedures for TRUMP-S Actinide Measurements) to eliminate any suggestion that a fire in the glove box is not a safety concern.⁶ *Id.*

Third, the Presiding Officer required that the University disclose to Staff the actual amounts of two contaminants (Pu-241 and Am-241) which are contained in the University's 10-gram plutonium sample authorized under License No. SNM-247, and that the Staff then "review the submitted amendment and amend the license to reflect accurately" those amounts as the maximum authorized quantities of those two elements.⁷ *Id.*

III. THE UNIVERSITY'S MOTION FOR PARTIAL RECONSIDERATION

On July 22, 1991, the University sought partial reconsideration of the Final Initial Decision on two grounds. First, the University requested clarification that it was not bound in perpetuity to the particular safety-enhancing option it initially chose to implement, but could instead elect to use any of the three options at any time. Second, the University sought clarification or modification that the requirement regarding combustible-fuel vehicles would be satisfied if a second worker accompanied and monitored the use of such a vehicle (specifically, a forklift) to ensure that its movements did not jeopardize equipment or facilities such as the Alpha Laboratory.

The Intervenors filed a response opposing the University's Motion for Partial Reconsideration. They argued, among other things, that the Presiding Officer lacked authority to consider the University's motion.

On August 5, 1991, in response to the University's motion for reconsideration, the Presiding Officer issued a Memorandum and Order clarifying (and also correcting portions of) his July 10, 1991 Final Initial Decision. LBP-91-34, 34 NRC 159. In the August 5, 1991 order, the Presiding Officer granted the University's first request, on the condition that at least one of the three alternatives

⁶TAM-62 stated that "[t]he small amounts of materials used in the TRUMP-S experiments eliminate fire as a concern." See TAM-62, Intervenors' Exhibit No. 11, at 1, attached to Intervenors' Written Presentation. Insofar as the Commission can discern from its records, the University has not complied with this requirement. We therefore instruct the University to certify to the Commission, within 30 days of the issuance date of this Order, that it has complied with this portion of the Presiding Officer's Order.

⁷According to the Commission's records, the University has not complied with this requirement.

be in effect at any time. The Presiding Officer considered such a "sequential implementation of relief" to be "entirely reasonable." *Id.* at 161. The Presiding Officer denied the University's second request. He explained that his purpose in excluding the gasoline-powered forklift from the basement was to remove "a source of fire that might exceed the expected fire loading or not be easily controlled by a water sprinkler system." *Id.* at 161-62. Finally, the Presiding Officer rejected the Intervenors' argument that he lacked authority to consider the University's Motion for Reconsideration. *Id.* at 160-61.

IV. THE INSTANT APPEALS

The University and the Intervenors filed timely Notices of Appeal on July 24 and 25, 1991, respectively.⁸ The University challenged the Presiding Officer's prohibition of the use of combustible-fuel vehicles in the MURR facility basement while actinides were in use in the Laboratory. It also sought from the Commission further revision or clarification of the Presiding Officer's ruling regarding the option of installing a sprinkler system in the rectangular portion of the basement immediately adjacent to the Laboratory.

The Intervenors argued on appeal that the Presiding Officer had erred in failing to recognize that the central issue in this case was whether the applications were deficient, rather than whether the amendments were consistent with the protection of public health and the minimization of danger to life or property; that he had erred in failing to conclude that the University's two applications were deficient in numerous respects; that the Presiding Officer's procedural rulings had deprived the Intervenors of a fair hearing; that he had improperly excluded three areas of concern (decommissioning, waste disposal, and nuclear proliferation); and, finally, that the NRC Staff had failed to review the applications adequately and to make the required findings with regard to the applications.

⁸ Because the parties filed their appeals to the Commission prior to the July 29, 1991 effective date of the regulation replacing "appeals as of right" with "petitions for review" from Licensing Board decisions, we treat this case as an appeal as of right pursuant to the now-rescinded 10 C.F.R. §§ 2.1253 and 2.762 (1991). See Final Rule, "Procedures for Direct Commission Review of Decisions of Presiding Officers," 56 Fed. Reg. 29,403 (June 27, 1991); Proposed Rule, "Options and Procedures for Direct Commission Review of Licensing Board Decisions," 55 Fed. Reg. 42,947, 42,948-49 (1990). Compare 10 C.F.R. §§ 2.786, 2.1253 (1994).

Analysis

I. THE PRESIDING OFFICER'S JURISDICTION TO ISSUE LBP-91-34

On appeal, the Intervenor's contend that their submittal of Notices of Appeal to the Commission on July 25, 1991, had the effect of depriving the Presiding Officer of all jurisdiction over the proceeding as of July 25 and that, consequently, the Presiding Officer lacked jurisdiction to issue LBP-91-34 on August 5, 1991, addressing the University's July 22, 1991 motion for reconsideration. IS-IB at 2. The Presiding Officer addressed this issue in LBP-91-34:

When there is no motion for reconsideration, all the issues have been transferred to the appeal body, which is the only authority with jurisdiction over the pertinent issue. However, the rules expressly provide for an exception to the transfer of jurisdiction by providing for motions for reconsideration. 10 C.F.R. §§ 2.1259, 2.771. Since the rule expressly permits a motion for reconsideration to be filed within 10 days, the licensing board or presiding officer necessarily has jurisdiction to decide such a motion.

34 NRC at 160-61 (footnote omitted). We agree with the Presiding Officer's conclusion that he had jurisdiction to issue LBP-91-34.

Although the Commission's (now-defunct) Atomic Safety and Licensing Appeal Board Panel had addressed somewhat similar questions in several prior cases, neither it nor the Commission has ever directly confronted the precise issue at bar in this proceeding, i.e., whether a presiding officer has jurisdiction to consider a timely motion for reconsideration filed after the issuance of an initial decision but before the timely filing of appeals.

Intervenor's claim that two Appeal Board decisions support their contention that the Presiding Officer lost jurisdiction over this proceeding prior to his issuance of LBP-91-34. *See* Intervenor's Response to Licensee's Motion for Partial Reconsideration of Final Initial Decision, dated Aug. 1, 1991, at 1-2; Intervenor's Response to Licensee's Motion for Extension of Time for Filing Papers, dated July 29, 1991. For the following reasons, we conclude that neither case is apposite.

In the first cited case, *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit 1), ALAB-699, 16 NRC 1324 (1982), the Appeal Board ruled that jurisdiction to address the motion to reopen rests with the Appeal Board rather than the Licensing Board in situations where a post-trial motion to reopen the record is submitted after the filing of exceptions to a final decision of the Licensing Board (the equivalent to the appeals of the Presiding Officer's Final Initial Decision in the instant case). *Id.* at 1327. However, the Appeal Board in *TMI* expressly "[l]eft for another day" the issue whether the Licensing Board

would have had jurisdiction to rule on a motion to reopen filed after the issuance of an initial decision but before the filing of exceptions. *Id.* at 1327 n.6. The issue currently before us involves a post-trial motion that was filed on July 22, 1991 — after the issuance of the July 10, 1991 Final Initial Decision but before the July 24 and 25, 1991 filing of the three appeals. It is therefore analogous to the issue that the Appeal Board left for another day. Consequently, *TMI* provides no guidance on the issue at bar.

Similarly, in the second decision cited by the Intervenor, *Georgia Power Co.* (Vogtle Electric Generating Plant, Units 1 and 2), ALAB-859, 25 NRC 23 (1987), the Appeal Board ruled only that the Licensing Board lacked jurisdiction to impose a license condition based on information submitted by a party subsequent to both the issuance of the Licensing Board's initial decision and the filing of the notice of appeal with the Appeal Board. *Id.* at 27.⁹ As in *TMI*, the *Vogtle* Appeal Board was not faced with the instant procedural issue.

However, in a decision not cited by the Intervenor, *Philadelphia Electric Co.* (Limerick Generating Station, Units 1 and 2), ALAB-726, 17 NRC 755 (1983), the Appeal Board addressed an issue quite similar to the one now at bar. Specifically, the Appeal Board was faced with the question of "which adjudicatory body [i.e., the Licensing Board or the Appeal Board] has jurisdiction to rule on a motion to reopen filed at the same time as or after issuance of an initial decision but before an appeal has been taken." *Id.* at 757. The Appeal Board ruled that, "until exceptions to an initial decision have been filed, jurisdiction to rule on a motion to reopen resides with the licensing board" and that the subsequent timely filing of exceptions "do[es] not serve to oust the Licensing Board of jurisdiction over the reopening motion." *Id.* at 757 & n.4.

The Appeal Board in *Limerick* offered two justifications for these rulings, both of which are equally applicable to the instant case. First, the Appeal Board noted that, as a practical matter, the Licensing Board's extensive prior involvement in the case rendered it better suited to make the initial ruling on the merits of a motion that addressed the factual predicate of the Licensing Board's own initial decision. This reasoning is as applicable to a motion for reconsideration as it is to a motion to reopen the record. This is because both pleadings address matters that underlie the Licensing Board's (or presiding officer's) decision and with which the trial-level decisionmaker is therefore far more familiar. Second, the Appeal Board held that, because exceptions had not yet been filed, there was simply no appeal in existence that would trigger the Appeal Board's

⁹The Appeal Board reached a similar conclusion in *Philadelphia Electric Co.* (Limerick Generating Station, Units 1 and 2), ALAB-823, 22 NRC 773, 775 (1985).

jurisdiction.¹⁰ We conclude that the same is true here: the Presiding Officer retained jurisdiction to decide the timely filed motion to reconsider despite the later-filed appeals.

II. PRESIDING OFFICER'S RULINGS

A. The Presiding Officer Did Not Err in Defining the Central Legal Issue in This Proceeding

In the Final Initial Decision, the Presiding Officer ruled that the central issue raised by the Intervenors is whether the University can provide adequate assurances that its TRUMP-S experiments are safe and will not credibly cause fatalities or illness to the general public in the event of an accident. LBP-91-31, 34 NRC at 36. The Presiding Officer concluded that the answer to this question turns on the answers to the following two subsidiary questions:

- (1) [Are] the applicant's proposed equipment and facilities . . . adequate to protect health and minimize danger to life or property; [and]
- (2) [Is t]he applicant . . . qualified by training and experience to use the material for the purpose requested in such manner as to protect health and minimize danger to life or property [and to comply with the regulations in 10 C.F.R. Part 70].

Id. at 42 (footnotes omitted; final set of brackets in original text).

Intervenors disagree with the Presiding Officer's definition of the central legal issue in this proceeding. They contend that, under 10 C.F.R. § 2.1233(c), the parties and the Presiding Officer are limited to addressing whether there is a "deficiency or omission in the license application." The Intervenors complain that the Presiding Officer has instead used this Subpart L proceeding to litigate health and safety issues that Subpart L was never designed to address (IS-IB at 20-25; II-IB at 10) and assert that the University's applications are so deficient as to be "empty application[s]" (IS-IB at 21).

The Presiding Officer's characterization of the central issue accurately reflects the statutory and regulatory findings necessary for the Commission to grant a license or license amendment. By contrast, the Intervenors' characterization confuses these ultimate safety findings with the pleading requirements that an

¹⁰ *Id.* at 757-58. See also *Commonwealth Edison Co.* (Byron Nuclear Power Station, Units 1 and 2), ALAB-659, 14 NRC 983, 985 (1981) (*dictum* that, pursuant to accepted appellate practice, an appeal period should be tolled while a trial tribunal considers a motion for reconsideration of the appealed decision or order). This reasoning also forms a basis for the Commission's current version of section 2.786(b)(6). That section, which is not applicable to the instant proceeding, provides that "[a] petition for review [in a Subpart G proceeding] will not be granted as to issues raised before the presiding officer on a pending motion for reconsideration." 10 C.F.R. § 2.786(b)(6). Civil practice in the federal courts is essentially the same as ours. See 9 James W. Moore *et al.*, *Moore's Federal Practice* ¶ 110.08[3] at 59-60 & n.5, ¶ 204.12[1] at 4-67 to 4-69 (1993).

Intervenor must satisfy in making its initial written presentation in a Subpart L proceeding. Their characterization also overlooks the fact that an application for an NRC materials license or license amendment is not automatically rejected whenever the NRC Staff or an Intervenor finds an omission or error in the application. If such applications were automatically rejected, then there would have been no need for the Commission to require each Intervenor to specify "what relief is sought with respect to each deficiency or omission." 10 C.F.R. § 2.1233(c). We emphasize, however, that in focussing on ultimate safety questions, we by no means sanction the filing of "empty" or "bare-bones" applications. A plainly deficient application calls into question an applicant's competence and *bona fides* — matters that certainly pertain to the question whether to approve the application. But, as explained below, we do not agree with the Intervenor that the University's applications are "empty."

B. The Presiding Officer Did Not Err in Making Certain Challenged Procedural Rulings

The Intervenor raises numerous assertions of procedural error. The most significant are Intervenor's claims that the Presiding Officer erred in sustaining the Staff's acceptance of the University's "bare-bones application[s]," which were too cursory and flawed to inform the Intervenor of the basis for the Licensee's applications; that the University provided the necessary detail and supporting evidence only after the Intervenor had submitted their written presentation challenging the applications; that the Presiding Officer erred in failing to strike this late-filed evidence; and that the Presiding Officer compounded this last error by improperly denying the Intervenor any opportunity to file rebuttal evidence. IS-IB at 12, 24; II-IB at 10; I-RB at 1, 18-19. Intervenor also argues that the Presiding Officer erred in denying their motions for discovery, oral presentation, cross-examination, and a formal hearing, and in refusing to consider the adequacy of the NRC Staff's review of the University's applications. For the reasons set forth below, we affirm each of the Presiding Officer's challenged procedural rulings and agree with him that the University's two applications are not "empty application[s]" as claimed by the Intervenor. We also conclude that he fairly applied the Subpart L procedural rules to this case.

1. The Presiding Officer Did Not Err in Concluding That the Licensee's Applications Were Neither Incomplete Nor Flawed

The Intervenor asserts that the University's applications were incomplete or flawed in the following four respects: first, the applications were not accompanied by certain supporting documents that, according to the Intervenor,

are required by the Commission; second, the University in its applications failed to demonstrate that its personnel were qualified to conduct the TRUMP-S experiments in a manner consistent with the public health and safety, as required by the Commission's regulations; third, the SNM application failed to include two radionuclides in their lists of licensed materials; and fourth, the SNM application inaccurately described the curie content of certain nuclear materials at issue. IS-IB at 50-68. For the reasons set forth below, we conclude that the University's applications were sufficient to pass regulatory muster. (We also conclude, for the reasons set forth in Section II.B.3 below, that the Presiding Officer gave the Intervenor ample opportunity to respond to the license amendment applications.)

a. Failure to Provide the Required Supporting Documents

i. SAFETY ANALYSIS

During the hearing, the Intervenor complained that the University's applications were deficient in that they had failed to include a safety analysis or accident analysis, as allegedly called for in Part 3 of Regulatory Guide 10.3, "Guide for the Preparation of Applications for Special Nuclear Material Licenses of Less Than Critical Mass Quantities" (Rev. 1, April 1977). See Intervenor's Written Presentation at 15; Intervenor's Exhibit No. 1, *supra* p. 87, at 15 ¶53. The Presiding Officer rejected this contention on the grounds that Regulatory Guide 10.3 contains no such a requirement, or even a requirement that the applicant certify its belief that there is an adequate assurance of safety for the licensed activity. 34 NRC at 106.

On appeal, the Intervenor reiterate their earlier complaint. IS-IB at 8, 30-31. The only citation that the Intervenor offer on appeal in support of this alleged requirement is page 8 of NUREG-1140, "A Regulatory Analysis on Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licenses" (1988). According to the Intervenor, the absence of a safety analysis (or comparable analysis) precludes the Licensee from making the necessary demonstration that the equipment and facilities provide an adequate assurance of safety.¹¹

We reject the Intervenor's argument. The Intervenor are mistaken in their contention that our Regulatory Guides and NUREGs contain provisions indicating the need for a "safety analysis." Part 3 of Regulatory Guide 10.3

¹¹ It is unclear whether the Intervenor intend to refer specifically to the absence of a formal "Safety Analysis Report" or are instead alluding to the absence of some more general kind of safety analysis. Their specific reference to a "Safety Analysis Report" in their Written Presentation (at 15) suggests the former, while the general language in the Intervenor Organizations' Appeal Brief (at 8 and 30-31) and Written Presentation (at 42) suggests the latter. We note that a Safety Analysis Report is a creature of Part 50 of our regulations (specifically 10 C.F.R. § 50.34(b)), and is consequently irrelevant to the University's license amendment applications, which were submitted under Parts 30 and 70.

merely states that "[a]ll items should be completed in sufficient detail for the NRC to determine that the applicant's equipment, facilities, and radiation protection program are adequate to protect health and minimize danger to life and property." *Id.* at p. 10.3-2. NUREG-1140 contains similarly general language regarding safety, stating only that "[t]he NRC requires applicants to evaluate possible accidents." The record clearly indicates that the University made such an evaluation.¹²

Moreover, it is well established (and in fact acknowledged by the Intervenor¹³) that NUREGs and Regulatory Guides, by their very nature, serve merely as guidance and cannot prescribe requirements. *See, e.g., Carolina Power and Light Co.* (Shearon Harris Nuclear Power Plant), ALAB-852, 24 NRC 532, 544-45 (1986). *See also* Regulatory Guide 10.3 at 1 n., which states that "Regulatory Guides are not substitutes for regulations, and compliance with them is not required." Although conformance with regulatory guides will likely result in compliance with specific regulatory requirements, nonconformance with such guides does not equate to noncompliance with the regulations. *Petition for Emergency and Remedial Action*, CLI-78-6, 7 NRC 400, 406-07 (1978), *reconsideration denied*, CLI-80-21, 11 NRC 707 (1980). Only statutes, regulations, orders, and license conditions can impose requirements upon applicants and licensees. However, neither the AEA nor the Commission's regulations and orders nor the University's licenses impose any "safety analysis" requirement upon the University.

¹² *See, e.g.,* Licensee's Exhibit No. 1, Affidavit of Daniel J. Osetek Regarding Safety of the TRUMP-S Project, dated Nov. 13, 1990; Licensee's Exhibit No. 3, Affidavit of Dr. J. Steven Morris Regarding Safety Analysis, dated Nov. 13, 1990; Affidavit of Dr. J. Steven Morris Regarding Errors in Petitioners' Analyses, dated June 14, 1990, and the attached "Summary of the TRUMP-S accident analysis at the University of Missouri Research Reactor (MURR)[.] June 5, 1990 Revision," both of which are appended as Attachment A to Licensee's Motion for Leave to File an Answer to "Reply Memorandum of Petitioners in Support of Request for Hearing and Stay Pending Hearing," dated June 15, 1990; document (described as a "guidance draft") styled "Safety Analysis for MURR Alpha Laboratory Operations[.] TRUMP-S," included as pages 463-76 and 424-37 of Intervenor's Exhibit No. 19, dated Oct. 15, 1990. *See also* document (described as a "draft revision") styled "Emergency Plan for TRUMP-S at MURR" at 2, included as page 421 of Intervenor's Exhibit No. 19, *supra*; Licensee's Written Presentation, dated Nov. 14, 1990, at 43, 46-48, 53-55 (discussing the University's safety analyses).

Moreover, two other organizations (Rockwell and DOE) that are working with the University on the TRUMP-S Project have also conducted or reviewed safety analysis examinations of that project. *See* Letter to Mr. M.J. Gabler, Rockwell International Corp., from Kenneth R. Quitoriano, Nuclear Energy Division, Department of Energy, dated July 20, 1990, at 1 ("A Safety Analysis Report was completed and reviewed"), attached as page A-19 (and labeled "Plaintiff's Exhibit 8") to Intervenor's Application for Temporary Stay to Preserve the Status Quo, dated Aug. 20, 1990; "Findings and Observations from the TRUMP-S Readiness Review at MURR," dated April 12, 1990 (in which a review board of personnel from both Rockwell and the University indicated that "[t]he safety analysis for abnormal operating conditions was reviewed[;] the consequences and prevention/mitigation for abnormal operating conditions were reviewed[;] and [t]he safety analysis showed that an NRC unusual event will not occur"), included as page 196 of Intervenor's Exhibit No. 19, *supra*.

¹³ *See* Intervenor's Written Presentation at 10.

ii. SAFETY PROCEDURES

On appeal, the Intervenorers reiterate their earlier arguments (which the Presiding Officer did not specifically address) that the University's failure to include proposed safety procedures in its two license amendment applications rendered those applications deficient. IS-IB at 8, 58-59. *See also* Intervenorers' Written Presentation at 21-22; Intervenorers' Exhibit No. 1, *supra* p. 87, at 12 ¶42 and 16 ¶54(d); Intervenorers' Response to Licensee's Written Presentation, dated Dec. 24, 1990, at 17, 25-26. In support of this contention, the Intervenorers cite three authorities (or groups of authority).

First, the Intervenorers rely on 10 C.F.R. § 70.22(a)(8), which provides that an application for a Part 70 license shall contain "[p]roposed procedures to protect health and minimize danger to life or property (such as procedures to avoid accidental criticality, procedures for personnel monitoring and waste disposal, post-criticality accident emergency procedures, etc.)" But the Commission does *not* require that "[p]roposed procedures to protect health and minimize danger to life or property" be included in the amendment request *if* they have already been submitted to the Commission in previous applications associated with the same NRC license. In fact, the Commission's regulations expressly permit an applicant to incorporate by reference any information contained in previous applications, statements, or reports filed with the Commission. 10 C.F.R. §§ 70.21(a)(3), 30.32(a). The Commission's regulations thereby avoid both the imposition of needless expense on the applicant and the unnecessary submission of additional copies of documents already in the Commission's possession.

The University submitted just such information when it proffered its *Handbook of Radiological Operations* (April 1988) ("*Handbook*") to the Commission as part of the University's January 16, 1989 application for renewal of License No. SNM-247.¹⁴ This *Handbook* is the University's guide in all matters relating to radiation protection and control. The *Handbook* includes specific procedures (e.g., emergency procedures, procedures with respect to the radioactive waste disposal program, procedures for opening packages containing radioactive material, rules for laboratory practice), as well as the University's commitments to implement certain essential elements of the radiation safety program (e.g., requirements for personnel monitoring, protective apparel, posting of warning signs and notices, leak test of sealed sources).¹⁵ Intervenorers do not attack the

¹⁴ NRC Staff submitted the *Handbook* to the Presiding Officer in this proceeding on August 16, 1990. We also note that, according to Intervenorers' Exhibit No. 19, *supra* note 12, at page "o" (table of contents), the University made the *Handbook* available to the Intervenorers nearly two months earlier — on June 26, 1990.

¹⁵ Because the limited amount of special nuclear material authorized under License No. SNM-247 is insufficient to create a criticality accident, the University did not need to (and, in fact, did not) include criticality or post-criticality procedures or requirements in the *Handbook*. *See* 10 C.F.R. § 70.24(a); Regulatory Guide 10.3 at page 10.3-2 § 3.2.

Handbook as inadequate to cover the additional materials that are the subject of the University's two materials license amendment applications.

By providing these procedures and commitments to the Commission, the University has satisfied the filing requirements of 10 C.F.R. § 70.22(a)(8). Because the University had already provided this information to the Commission in the January 16, 1989 application for renewal of License No. SNM-247, the University was not also required to attach this same information to the amendment applications contested by the Intervenors.¹⁶

In addition to the Intervenors' reliance on 10 C.F.R. § 70.22(a)(8) to support their contention regarding safety procedures, they also rely generally on Part 30 of the Commission's regulations. However, Intervenors identify no regulatory section therein requiring a licensee to include safety procedures as part of its license amendment application, and we find no such requirement in that Part of our regulations.¹⁷ Consequently, we conclude that the Intervenors' reliance on Part 30 is misplaced.

Finally, the Intervenors rely on Regulatory Guide 10.3, Regulatory Guide 10.5,¹⁸ and Proposed Revision 2 to Regulatory Guide 10.5. We conclude that the Intervenors' reliance on these documents is misplaced. As explained in the immediately preceding section, Regulatory Guides do not impose requirements upon licensees but instead set forth *one* way in which a licensee or applicant can comply with our regulations. They do not purport to spell out the *only* way (or all permissible ways) in which to comply. For the reasons discussed earlier in this section, we conclude that the University satisfied our regulatory requirements regarding safety procedures notwithstanding that it used an approach (i.e., submittal of its *Handbook*) which was different from the approach set forth in the Regulatory Guides to which the Intervenors point. Consequently, the University's amendment applications cannot be found deficient for failure to

¹⁶ Furthermore, the University and the Intervenors have also submitted to the Commission a number (though not all) of the University's TAMs, Standard Operating Procedures ("SOPs"), and Facility Emergency Procedures ("FEPs") that are relevant to the TRUMP-S Project and the Alpha Laboratory. See Intervenors' Exhibit No. 19, *supra* note 12, at 387-419 (TAM 80-89, 91), 443-46 (SOP VIII.8 through VIII.8.3); Affidavit of Walter A. Meyer, Jr. Regarding Emergency Planning, dated Oct. 29, 1990, ("Meyer Emergency Planning Affidavit"), Attachment 5 (SOP VIII.8 through VIII.8.3), appended to "Licensee's Submittal in Accordance with 'Memorandum of Conference Call of October 19, 1990,'" dated Oct. 30, 1990; Intervenors' Exhibit No. 11 (TAM-62), *supra* note 6; Intervenors' Exhibit No. 12, accompanying Intervenors' Written Presentation (FEP-3, and FEP-3(a) (draft)); Meyer Emergency Planning Affidavit, *supra*, Attachment 3 (FEP-3(a)); Meyer Emergency Planning Affidavit, *supra*, Attachment 4 (Standing Order 90-8 (regarding FEP-3(a))). In addition, the University has provided the Commission with numerous descriptions of its safety procedures and precautions. See, e.g., Licensee's Exhibit No. 9, Affidavit of Dr. Susan M. Langhorst Regarding Adequacy of Safety Procedures, Administrative Controls and Licensee's Personnel Qualifications ("Langhorst Personnel Qualifications Affidavit"), dated Nov. 13, 1990, at 2-6 ¶¶ 5-22, attached to Licensee's Written Presentation, dated Nov. 14, 1990; Application for Amendment to License No. SNM-247 at 17-21, and Application for Amendment to License No. 24-00513-32 at 17-22 (Staff submitted both of these applications into the record on June 21, 1990.)

¹⁷ Section 30.32(a) does refer to Form 313, which in turn specifies that the applicant should proffer its "radiation safety program." The University did so. See Application for Amendment to License No. SNM-247 at 17-21; Application for Amendment to License No. 24-00513-32 at 17-22.

¹⁸ Regulatory Guide 10.5, "Applications for Type A Licenses of Broad Scope" (Rev. 1, December 1980).

"comply" with Regulatory Guides 10.3 and 10.5, much less with the *proposed* revisions to Regulatory Guide 10.5.

iii. EMERGENCY PLAN¹⁹

Throughout the proceeding below, the Intervenor asserted that the University should have filed an emergency plan with its two applications, and that its failure to do so rendered those applications fatally defective. The Intervenor base their argument on the requirements set forth in 10 C.F.R. §§ 30.32(i) and 70.22(i). These regulations establish a screening threshold above which an emergency plan needs to be considered. This threshold is derived from the Protective Action Guides ("PAGs") of the Environmental Protection Agency ("EPA"). The regulations provide that an application to possess the kinds of radioactive materials at issue in this proceeding must contain either (i) an evaluation showing that the maximum dosage for a person offsite will not exceed the threshold limits or (ii) an emergency plan for responding to the release of radioactive material.²⁰

In both his Final Initial Decision and an earlier interlocutory order, the Presiding Officer concluded that these two regulations did not apply to applications (such as the University's) which were filed (and approved) prior to the regulations' April 7, 1990 effective date. LBP-91-31, 34 NRC at 43 n.20, 100, 124; LBP-90-45, 32 NRC at 455-56. Although the Presiding Officer acknowledged that the Commission had required certain designated licensees to file emergency plans at the time these two regulations went into effect, he concluded that the University had not been so designated. LBP-91-31, 34 NRC at 124, *referring to* Final Rule, "Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees," 54 Fed. Reg. 14,051 (Apr. 7, 1989).

On appeal, the Intervenor reiterate their earlier argument that the emergency plan was required by sections 30.32(i) and 70.22(i). IS-IB at 50-57; II-IB at 19. In support, the Intervenor contend that the effective date is irrelevant because "[n]ewly adopted regulations control the disposition of pending applications, unless the regulations expressly state the contrary." IS-IB at 52. *See also id.* at 56. The Intervenor rely principally upon four decisions of the United States

¹⁹In this section of the Order, we address only the procedural issue whether the University's two instant applications are governed by the filing requirements established in our emergency planning regulations. In sections II.C.1 and II.C.4 of this Order, below, we address the Intervenor's substantive arguments regarding the adequacy of the emergency plan that the University prepared (and that the NRC Staff has repeatedly approved) for the entire MURR facility.

²⁰We note, but do not rely on the fact, that on April 16, 1993, the NRC Staff completed an evaluation under 10 C.F.R. § 30.32(i)(1)(i), in which Staff concluded that the maximum dosage for a person offsite would not exceed the threshold limits. Staff conducted this evaluation as part of its consideration of the Application for Renewal of the University of Missouri Broad Scope License No. 24-00513-32, dated Feb. 27, 1992, that the Staff approved on July 7, 1993. No intervenors have challenged that approval.

Supreme Court.²¹ Although the Intervenor do not expressly say so, they are in essence asking the Commission to apply the two regulations retroactively to the University.²² We reject the Intervenor's arguments and affirm the Presiding Officer's conclusion that the University was not required to include an emergency plan in its two applications.

The Presiding Officer is correct that the Commission did not intend for the regulations at issue to be applied retroactively so as to require the rejection of previously filed applications that did not contain the newly required emergency plan information. It is axiomatic that a new law should not be applied with retroactive effect if there is "statutory direction to the contrary." See, e.g., *Bradley*, 416 U.S. at 711, 715 & n.21. This axiom applies not only to statutes but also to regulations. See *Thorpe*, 393 U.S. at 281-82; *Bradley*, 416 U.S. at 715; *Ziffrin*, 318 U.S. at 78. The language of the two regulations in question, together with their effective date, provide the Commission's regulatory equivalent to a "statutory direction to the contrary." The regulations expressly require that the application must contain either an emergency plan or an evaluation of dose effects. The statement of consideration to the final rule specified that these regulations (and therefore their above-described requirement) were not to become effective until April 7, 1990. 54 Fed. Reg. at 14,051, 14,057. It nowhere suggested that pending applications would have to be amended to meet the new rule's requirements. There was, in short, no indication of a Commission intent to act retroactively.²³

²¹ *Bradley v. School Board of City of Richmond*, 416 U.S. 696 (1974); *Thorpe v. Housing Authority of City of Durham*, 393 U.S. 268 (1969); *Linkletter v. Walker*, 381 U.S. 618 (1965); *Ziffrin, Inc. v. United States*, 318 U.S. 73 (1943). In addition, the Intervenor cite two Appeal Board decisions. However, because our analysis of Supreme Court precedent is dispositive of the instant issue, we need not address the Appeal Board decisions. Finally, the Intervenor assert that the emergency plan was also required by three of the Commission's NUREG documents. For the reasons already discussed, NUREGs cannot impose requirements upon licensees.

²² "A rule has retroactive effect if 'an act lawful at the time it was done' is 'rendered unlawful and the actor called to account for a completed, now-condemned deed in the halls of justice.'" *American Mining Congress v. EPA*, 965 F.2d 759, 769 (9th Cir. 1992) (quoting *Ralis v. RFE/RL, Inc.*, 770 F.2d 1121, 1127 (D.C. Cir. 1985)). Although the issue of "retroactivity" generally arises in situations where the government attempts to apply a statute or regulation prior to its enactment date or promulgation date, the issue is logically just as relevant to situations in which the government or a party attempts to apply a new regulation to events that transpired prior to the regulation's effective date.

²³ We note that the rule of statutory construction articulated in the Supreme Court cases cited by the Intervenor — that "a court is to apply the law in effect at the time it renders its decision" (*Bradley*, 416 U.S. at 711; *Thorpe*, 393 U.S. at 281) — nevertheless "did not alter the well-settled presumption against application of the class of new statutes that would have genuinely 'retroactive' effect." *Landgraf v. USI Film Products*, 114 S. Ct. 1483, 1503 (1994) (construing *Bradley*). See also Final Rule, "Revision of License Fee Schedule," 49 Fed. Reg. 21,293, 21,296 (May 21, 1984) ("The concept of impermissible retroactivity applies only to those cases where a new law or rule is applied to transactions completed in the past, prior to the new rule, where the rights and obligations of the parties already have been fixed"). The applicability of this conclusion to the instant proceeding is unaffected by the fact that the two regulations at issue are procedural rather than substantive in nature. As the Supreme Court indicated in *Landgraf*:

[T]he mere fact that a new rule is procedural does not mean that it applies to every pending case. A new rule concerning the filing of complaints would not govern an action in which the complaint had

(Continued)

In sum, we conclude that, although the University was free to submit applications in February and March 1990 which would comply with regulations that became effective only in April 1990, it was not required to do so.

iv. ENVIRONMENTAL REPORT

On appeal, the Intervenors offer two bases for their assertion that the University's applications should have included an environmental report. First, they contend that the University's use of inexperienced students and other personnel working with highly toxic pyrophoric transuranics will result in a significant increase in the potential for radiological accidents and that, under 10 C.F.R. § 51.60(b)(2)(v), an environmental report is therefore required. IS-IB at 61. *See also* Written Presentation of Intervenors at 24. Second, the Intervenors argue that the Alpha Lab is a "plutonium processing plant" as the term is defined in 10 C.F.R. § 70.4 and that the University's applications must therefore include an environmental report. IS-IB at 61. We disagree with both of these contentions.

Regarding the Intervenors' first argument, we note that the regulation on which they rely provides that an applicant must prepare an environmental report for any application for an amendment that would authorize or result in "a significant increase in the potential for . . . radiological accidents." We find no such significant increase in accident potential. The University has submitted record evidence, uncontradicted by the Intervenors, that the students who work on the TRUMP-S Project are trained by experienced authorized users of the subject materials; that their training as to TRUMP-S procedures and their experience in working with radioactive materials are documented; and that such documentation must be reviewed and approved by not only an authorized user but also the Reactor Health Physics Manager and the Isotope Use Subcommittee of the Reactor Advisory Committee. *See* Langhorst Personnel Qualifications Affidavit, *supra* note 16, at 20 ¶42. We agree with the Presiding Officer's conclusion that "it is appropriate to use students in the manner in which the University is using them." LBP-91-31, 34 NRC at 97. Consequently, we conclude that the increased-risk assumption underlying the Intervenors' first argument is incorrect and that the University's omission of an environmental report does not render its application in noncompliance with section 51.60(b)(2)(v).

already been properly filed under the old regime, and the promulgation of a new rule of evidence would not require an appellate remand for a new trial.

114 S. Ct. at 1502 n.29. *See also id.* at 1505 n.34 (majority opinion); 1525 (Scalia, J., concurring); 2 J. Sutherland, *Statutes and Statutory Construction* § 41.04 at 349 (1986).

We also cannot accept the Intervenor's second contention, viz., that the Alpha Lab is a "plutonium processing plant" as the term is defined in 10 C.F.R. § 70.4 and that the University's applications must therefore include an environmental report. Although the Intervenor cites no regulatory authority for this contention, we assume that they intended to rely on 10 C.F.R. § 70.21(f), which provides that an applicant seeking to possess and use special nuclear material must file an environmental report if the material would be used, *inter alia*, for processing and fuel fabrication. In section II.B.5.b.iii below, we consider and reject a similar argument, i.e., that the NRC Staff should have prepared an EA or EIS on the ground that the Alpha Lab is a "fuel fabrication and processing plant" as that term is defined in section 70.4. For the same reasons, we reject the Intervenor's instant contention.

b. Failure to Describe Fully in the SNM License Amendment Application the Curie Content of the Materials

The University, in its SNM license amendment application, sought authority to possess and use "10 grams/710 millicurie Plutonium." See Application for Amendment to License No. SNM-247, dated Feb. 20, 1990, at 1. (See p. 111, *infra*, regarding the sample's origin.) The Intervenor objected that the MURR staff did not know (or concealed) the fact that the 10 grams of plutonium would contain a radiation quantity of far more than the 0.710 Ci specified in the University's application. Specifically, the Intervenor was referring to record evidence that the activity from Pu-241 and Am-241 will increase the activity of the plutonium material by approximately 1.21 and 0.07 Ci, respectively.²⁴ See Intervenor's Exhibit No. 20, Declaration of TRUMP-S Review Panel, dated Dec. 24, 1990, at 11-14; Intervenor's Response to Licensee's Written Presentation, dated Dec. 24, 1990, at 10-11.

In his Final Initial Decision, the Presiding Officer concluded that "[i]t would have been preferable" for the University to have listed Am-241 and Pu-241 in its SNM license amendment application and he ordered them to provide the necessary information to enable NRC Staff to amend that license accordingly. He concluded, however, that this omission was not fatal to the application. LBP-91-31, 34 NRC at 98-100. On appeal, the Intervenor argues that the University's failure to include the activity level of Pu-241 and Am-241 in the SNM license amendment application renders the application itself incomplete. IS-IB at 30. For the reasons set forth below, we agree with the Presiding Officer's conclusion that the omission of these two trace contaminants does not constitute a material defect in the application.

²⁴ The activity of a radioisotope is the number of nuclear transformations (i.e., decay) occurring in a given quantity of material during a given period of time. The curie is a measurement of a radioisotope's activity.

i. BACKGROUND

Section 70.22(a)(4) of the Commission's regulations required the University to identify in its applications "[t]he name, amount and specification (including the chemical and physical form and, where applicable, isotopic content) of the special nuclear material the applicant proposes to use or produce." 10 C.F.R. § 70.22(a)(4). The Commission has interpreted this requirement as follows:

The special nuclear material requested should be identified by isotopes; chemical or physical form; activity in curies, millicuries, or microcuries; and mass in grams. Specification of isotope should include *principal isotope* and *significant contaminants*. *Major dose-contributing contaminants* present or expected to build up are of particular interest.

Regulatory Guide 10.3 § 4.3 (emphasis added).

The Commission expects an applicant to disclose the activity of all *principal* radioisotopes present in licensed material. However, for the following reasons, the Commission does not expect an applicant also to disclose trace contaminants and decay products. The transuranic radioisotopes licensed by the Commission are obtained by neutron radiation of heavy elements — a process that generally produces multiple radioisotopes of the same chemical element.²⁵ Because the production of isotopically pure samples of radioisotopes is virtually impossible, the Commission bases its safety analysis on the principal radioisotopes with the potential of producing the greatest exposures. The Commission, when reviewing applications, does not ignore the trace contaminants and decay products associated with the principal radioisotopes, but rather views the principal isotope in the context of the properties of not only that isotope but also its daughter products and any commonly mingled trace isotopes. Because the safety considerations for the principal isotope will encompass the intermingled trace elements, the Commission's normal licensing practice is not to require licensees and applicants to list trace contaminants on their applications. This is standard Commission practice, well known throughout the industry.²⁶

With this background in mind, we turn to the issue whether the University's SNM license amendment application was deficient for failure to list both Pu-241 and Am-241 as "significant contaminants" or "major dose-contributing contaminants" (as those terms are used in Regulatory Guide 10.3).

²⁵ Radioisotopes of the same chemical element differ only by the number of neutrons in the nucleus of the element.

²⁶ See Affidavit of John E. Glenn, dated Dec. 4, 1990, at 3-4 ¶¶ 4-6, attached to "NRC Staff Response to Intervenor's Motion for Reconsideration of Memorandum and Order of November 1, 1990 and Emergency Order That Staff Hold in Abeyance Order of November 1," dated Dec. 5, 1990 ("NRC Staff Response"). See also Affidavit of Dr. William J. Adam, dated Dec. 5, 1990, at 3 ¶ 7, attached to NRC Staff Response; Licensee's Exhibit No. 15, Affidavit of Dr. Susan M. Langhorst Regarding Relative Radiological Risk Associated with Trace Americium-241 in Plutonium Standard, dated Nov. 16, 1990, at 8-9 ¶ 15, attached to Licensee's Response to Intervenor's Motion for Reconsideration . . . and Emergency Order . . . Part I, dated Nov. 21, 1990.

ii. Pu-241

In examining the question whether the SNM license amendment application should have listed 0.012 gram²⁷ (1.21 Ci) of Pu-241 as a significant contaminant contained in the 10-gram (0.71 Ci) sample of Pu-239/Pu-240, we are faced with the following dilemma. On the one hand, the relatively small weight of Pu-241 (0.012 gram) contained in the 10 grams of Pu-239/Pu-240 might suggest that Pu-241 constitutes merely a trace isotope and therefore need not be listed in the application. On the other hand, because Pu-241 (with a half-life²⁸ of 14.4 years) decays much faster than Pu-239 or Pu-240 (with half-lives of 24,065 and 6537 years, respectively),²⁹ the activity per unit gram of Pu-241 is approximately 1671 and 454 times higher than the activity of Pu-239 and Pu-240, respectively. Consequently, even a trace amount (0.012 gram) of Pu-241 can result in an activity (1.21 Ci) higher than that of Pu-239/Pu-240 (here, 0.71 Ci). This line of reasoning might suggest that Pu-241 should have been listed as a "significant contaminant" in the application, based on the comparatively high level of the radioisotope's activity.

To resolve this problem, the Commission will examine the health hazard or dose contribution of Pu-241 as compared to those of Pu-239 and Pu-240. We conclude, for the reasons set forth below, that the comparative contribution of the contaminant Pu-241 is insignificant, that the SNM application's omission of Pu-241 is consistent with the provisions of Regulatory Guide 10.3, and that the omission consequently does not reflect adversely on the qualifications of the University's personnel.

The principal isotopes of Pu-239 and Pu-240 are both strong alpha particle emitters, whereas Pu-241 is primarily a beta particle emitter.³⁰ The typical energy of the Pu-239/Pu-240 alpha particle is almost 1000 times greater than the average energy of the beta particles emitted in the decay of Pu-241.³¹ Once

²⁷ See Affidavit of Dr. J. Steven Morris Regarding Plutonium Content, dated Oct. 29, 1990 ("Morris Plutonium Affidavit"), at 7, Table 2, attached to Licensee's Submittal in Accordance with "Memorandum (Memorandum of Conference Call of October 19, 1990)," filed Oct. 30, 1990. That table sets forth the isotopic composition (wt %) and curies per 10 grams for New Brunswick Laboratory Certified Reference Material 127 (formerly National Bureau of Standards Standard Reference Material 945) — the source of the University's plutonium sample — based on the 1975 Los Alamos National Laboratory analysis, with the decay corrected to September 1990. For Pu-241, the wt % is given as 0.116, which translates to 0.0116 gram, or a roundoff of 0.012 gram.

²⁸ The half-life of a radioisotope is the time required for a radioactive substance to lose 50% of its activity by decay. Each radionuclide has a unique half-life.

²⁹ Federal Guidance Report No. 11, "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion," EPA-520/1-88-020, at 113 (EPA Sept. 1988).

³⁰ The decay of Pu-241 is almost entirely through beta emissions, with only 0.00245% through alpha emissions. See Morris Plutonium Affidavit, *supra* note 27, at 6 ¶14.

³¹ See U.S. Department of Health, Education, and Welfare, *Radiological Health Handbook* at 372-73 (Rev. ed., January 1970). See also Morris Plutonium Affidavit, *supra* note 27, at 12 ¶29; Affidavit of William J. Adam, *supra* note 26, at 3 ¶4. Because none of the three plutonium isotopes of interest is a strong emitter of gamma

(Continued)

the plutonium enters the body, the higher-energy alpha particles will cause far more damage to the body tissue than will the beta particles. Therefore, Pu-239 and Pu-240 present a great deal more significant health hazard than does Pu-241.³² Consequently, to compare meaningfully the relative health hazard or dose contribution of Pu-241 with those of Pu-239 and Pu-240, we must first convert the beta dose of Pu-241 (1.21 Ci) into the equivalent activity level for an alpha-emitter such as Pu-239 and Pu-240.

A comparison of the annual-limits-on-intake ("ALI") values of 0.006 microcurie (μ Ci) each for Pu-239 and Pu-240 with the 0.3- μ Ci limit for Pu-241 reveals that Pu-241 is only 1/50th as hazardous as Pu-239 or Pu-240³³ — as the Intervenor acknowledges.³⁴ Therefore, 1.21 Ci of beta radiation from Pu-241 is equivalent to only 0.024 Ci of alpha radiation from Pu-239/Pu-240 (or 3.0% of the total activity of the sample³⁵) in terms of health hazard or dose contribution. This is the same analytical approach that the University used to justify its decision not to list Pu-241 (*see* Morris Plutonium Affidavit, *supra* note 27, at 12-14 ¶¶ 29-33), and is also similar to NRC Staff's approach (*see* Affidavit of Dr. William J. Adam, *supra* note 26, at 3 ¶ 4; *see generally* Affidavit of John E. Glenn, *supra* note 26, at 4-6 ¶¶ 6-9).

Given this low (3%) contribution level of Pu-241 and the very high margin of error in measuring Pu-239/Pu-240,³⁶ the listing of Pu-241 would provide

particles (which are far more penetrating than alpha or beta particles and which are therefore a more hazardous external source of radiation), the principal health risk from those three isotopes stems from internal exposure (i.e., by inhalation or ingestion) rather than external exposure.

³² *See* Affidavit of John E. Glenn, *supra* note 26, at 5 ¶ 8. *See also* Affidavit of Dr. William J. Adam, *supra* note 26, at 3 ¶ 4; Licensee's Exhibit No. 15, *supra* note 26, at 3-4 ¶ 6.

³³ ALI is the derived permissible limit for the amount of radioactive material taken into the body of an adult worker by inhalation or ingestion in a year. The ALI can be found in Table 1 of Federal Guidance Report No. 11, *supra* note 29, at 31 *et seq.* *See also* NUREG-1140 at 80, Table 13 ("Quantities of Radioactive Materials Requiring Evaluation of the Need for Offsite Emergency Preparedness (Based on 1 rem effective dose equivalent outside the building)"), which lists the Pu-241 content threshold for such evaluation as 100 Ci and, by contrast, lists the Pu-239 and Pu-240 thresholds at 2 Ci — 50 times lower.

³⁴ *See* "Intervenor's Motion for Reconsideration of Memorandum and Order of November 1, 1990 (Licensee's Partial Response Concerning Temporary Stay) and Emergency Order that Staff Hold in Abeyance Order of November 1; Part 1," dated Nov. 12, 1990, at 9.

³⁵ The total dose contribution/health hazard is assigned as follows:

	Equivalent Activity (in mCi)	% of Total Dose Contribution/Health Hazard
Pu-239/Pu-240	0.710	88.3
Pu-241	0.024	3.0
Am-241	0.070	8.7
TOTAL	0.804	100.0

³⁶ It is quite difficult to assess with any accuracy the internal dose attributable to plutonium intake if the assessments are taken only during a short period of time after the intake. Such assessments have an inherently high margin of error. *See* U.S. Department of Energy, *Radiological Control Manual* at p. 1-21 ¶ 8 (DOE/EH-0256T, June 1992). In our opinion, the high margin of error associated with the timely assessment of plutonium intake (i.e., Pu-239/Pu-240 + Pu-241) renders the 3% dose contribution of Pu-241 insignificant by comparison.

no helpful knowledge to a dosimetrist attempting to measure, or a doctor seeking to treat, an individual's radiation intake. Moreover, such a list could confuse isotope suppliers by suggesting that a licensee is authorized to receive a radioisotope both as a contaminant and as a principal radioisotope. See Affidavit of John E. Glenn, *supra* note 26, at 2-4 ¶3-6. Finally, as explained at p. 105, *supra*, such a listing would not assist the Commission and its Staff in deciding whether to grant an application.

For the reasons set forth above, we conclude both that the University's omission of Pu-241 from its application's list of radionuclides will not compromise any aspect of the applicant's radiological safety program³⁷ and that the dose contributions associated here with Pu-241 are insignificant when compared with the other dose contributions at issue in the University's SNM license amendment application. Consequently, we cannot accept the Intervenor's argument that the University's SNM license amendment application is deficient due to the University's decision not to list Pu-241 as a "significant contaminant."

iii. Am-241

We find that the question whether Am-241 should have been listed separately in the University's SNM license amendment application is moot. On Feb. 27, 1992, the University submitted an Application for Renewal of [its] Broad Scope License No. 24-00513-32. In that application (which was never challenged), the University sought permission to combine its then-existing Part 70 SNM License (which did not list Am-241) and its Part 30 Materials License (which did list Am-241) into a new all-inclusive Broad Scope Materials License (which did list Am-241), and then to terminate its SNM License. On July 7, 1993, the Staff included the SNM materials in the University's newly issued Broad Scope Materials License No. 24-00513-39 and simultaneously terminated License No. SNM-247 (see Amendment No. 18 to License No. SNM-247). As a consequence, the byproduct materials license amendment's reference to Am-241 was incorporated into the new Broad Scope Materials License No. 24-00513-39 — the license that currently covers the University's SNM material.

c. Failure to Demonstrate Adequate Qualifications of Personnel

The Presiding Officer in his Final Initial Decision rejected the Intervenor's argument that the University had failed to satisfy its obligation under sections 30.33(a)(3) and 70.23(a)(2) to demonstrate that its personnel were qualified

³⁷ Moreover, because Pu-241 cannot be inhaled or ingested by an individual unless Pu-239/Pu-240 has also escaped from the glove box, the safety measures that would prevent the release of the principal isotopes Pu-239/Pu-240 would also prevent the release of Pu-241.

through training and experience to use the material for the requested purpose. LBP-91-31, 34 NRC at 95, 96-97, 99-100, 101, 107. On appeal, the Intervenor challenge the Presiding Officer's conclusion. IS-IB at 59-61. For the reasons set forth below, we affirm the Presiding Officer's conclusion.

**i. ACCURACY OF THE LICENSEE'S DESCRIPTION OF THE PLUTONIUM
SAMPLE'S RADIOISOTOPES AND CURIE CONTENT**

As noted above, the University, in its SNM license amendment application, sought authority to possess and use "10 grams/710 millicurie Plutonium." See Application for Amendment to License No. SNM-247, dated Feb. 20, 1990, at 1. The Intervenor asserted that MURR staff did not know (or concealed) the fact that the 10 grams of plutonium would contain a radiation quantity of far more than the 0.710 Ci specified in the University's application. According to the Intervenor, this display of ignorance (or deception) demonstrated the incompetence of the University's personnel. See, e.g., Intervenor's Response to Licensee's Written Presentation, dated Dec. 24, 1990, at 17-18.

In his Final Initial Decision, the Presiding Officer concluded that "it would have been preferable to disclose" in the SNM application the 1.21 Ci of Pu-241, but he nevertheless rejected the Intervenor's argument that this omission was fatal to the application and he accordingly refused to adopt the Intervenor's position regarding the University personnel's qualifications. LBP-91-31, 34 NRC at 98-100. On appeal, the Intervenor contend that the Presiding Officer erred in concluding that the University's omission of this information does not cast doubt on the qualifications of the University's personnel. IS-IB at 59-60. We have examined this issue thoroughly and agree with the Presiding Officer's conclusion.

We reject the Intervenor's suggestion that the University's personnel may have been ignorant of the existence of Pu-241 and Am-241 in the Pu-239/Pu-240 sample. See *id.* at 60.³⁸ The record in fact demonstrates that the University deliberately decided not to list Pu-241 or Am-241 in its SNM application because it did not consider either radionuclide to be a significant trace contaminant required to be listed under our regulations. See, e.g., Morris Plutonium Affidavit, *supra* note 27, at 4 ¶¶ 8, 9; Licensee's Exhibit No. 15, *supra* note 26, at 4 ¶ 8; Licensee's Submittal in Accordance with "Memorandum (Memorandum of Conference Call of October 19, 1990)," filed Oct. 30, 1990, at 5; Licensee's Response to "Intervenor's Motion for Reconsideration . . . and Emergency

³⁸ Nor do we find in the record even the slightest evidence to support the Intervenor's suggestion that the University's personnel may have attempted to "conceal[]" these radionuclides' existence from the Commission. See *id.*

Order . . . Part I," dated Nov. 21, 1990, at 5 n.2 and 10-11. *See also* U Mo RB at 86.

The University's conclusion in this regard was shared by the NRC Staff. *See* NRC Staff Response, *supra* note 26, at 5; Affidavit of John E. Glenn, *supra* note 26, at 4 ¶¶6, and 6 ¶¶9, 10, and 7 ¶11; Affidavit of Dr. William J. Adam, *supra* note 26, at 3-4 ¶¶6, 7. We agree with the NRC Staff that, consistent with the University's decision not to list Pu-241 or Am-241 and contrary to the Intervenor's understanding, it is not the general practice of the scientific community to identify the activity of all radioisotopes present in licensed material, including trace elements down to microcurie quantities. Affidavit of John E. Glenn, *supra* note 26, at 2 ¶3. Thus, the omission of separate listings of Pu-241 and Am-241 in the University's SNM application does not indicate any lack of qualification of the University's personnel. Nor is there any other record evidence to suggest such a lack of qualification.

To the contrary, we find that the record amply supports the conclusion that the personnel are highly qualified in education, training, and experience to engage in the TRUMP-S Project research. The University has provided extensive information regarding the training and experience of those personnel,³⁹ and the Intervenor's have chosen not to challenge the accuracy or relevance of that information. We also express our confidence in the training program established by the University for the participants in the TRUMP-S Project. *See* Langhorst Personnel Qualifications Affidavit, *supra* note 16, at 11-12 ¶¶32-33, 35; *id.* at 15-16 ¶39(2)-(8).

ii. ACCURACY OF THE DESCRIPTION OF THE PLUTONIUM SAMPLE'S WEIGHT CONTENT

The Intervenor's assert that MURR staff were ignorant of the fact that the content of the plutonium could not possibly be 94.42 wt % Pu-239 and 5.58 wt % Pu-240 (the numbers used in the University's SNM application). According

³⁹ *See* the resumes of Dr. Gary J. Ehrhardt, Mr. John P. Ernst, Mr. Stephen L. Gunn, Dr. Roland A. Hultsch, Dr. Langhorst, Mr. Walter A. Meyer, Mr. Jeff J. Roy, Mr. Jamieson G. Shotts, Dr. Albert Y. Sun, and Dr. Kurt R. Zinn, all of which are attached as Appendix B to each of the two subject license amendment applications (submitted by Staff into the record on June 21, 1990); Affidavit of Dr. J. Steven Morris at 1-2 ¶¶1-3, attached to "Licensee's Submittal in Accordance with 'Memorandum (Memorandum of Conference Call of October 19, 1990),' " dated Oct. 30, 1990; Affidavit of Mr. Walter A. Meyer, Jr. at 1-3 ¶¶1-7, attached to "Licensee's Submittal in Accordance with 'Memorandum (Memorandum of Conference Call of October 19, 1990),' " dated Oct. 30, 1990; Resume of Mr. Walter A. Meyer, Jr., attached to "Licensee's Submittal in Accordance with 'Memorandum (Memorandum of Conference Call of October 19, 1990),' " dated Oct. 30, 1990; Langhorst Personnel Qualifications Affidavit, *supra* note 16, at 6-20 ¶¶23-43; Licensee's Written Presentation, which includes numerous other affidavits containing background information and resumes for many of the other TRUMP-S personnel. *See also* the "brief resumes" of Dr. T.S. Storvick, Dr. D.G. Retzlaff, Dr. Paul R. Sharp, Dr. Dabir S. Viswanath, found at pp. 8-10 of the "Engineering, Chemistry, and MURR Program Support of the Rockwell International TRUMP-S Project: A Proposal submitted to Rockwell . . . by The Curators of the University of Missouri (January 1990)," submitted into the record as part of Intervenor's Exhibit No. 19, *supra* note 12.

to the Intervenor, this display of ignorance indicates the incompetence of the University's personnel. IS-IB at 59. Earlier in this proceeding, the Intervenor asserted that the University's figures failed to reflect the almost-certain presence of Pu-241, Pu-242, and Am-241 in the plutonium sample. Intervenor's Exhibit No. 1, *supra* p. 87, at 6-9 (especially ¶¶ 23, 25). The Intervenor is apparently proffering on appeal a "condensed" version of this earlier assertion; they believe the presence of these three other radionuclides in the plutonium sample belies the University's conclusion that Pu-239 and Pu-240 together account for 100% of the sample's weight.

The evidence in the record on this issue does not call into question the competence of the MURR staff. The plutonium sample at issue came from the New Brunswick Laboratory Certified Reference Material 127 (formerly National Bureau of Standards Standard Reference Material 945). Morris Plutonium Affidavit, *supra* note 27, at 3 ¶6(3). The New Brunswick Laboratory indicated in its Form DOE-CH393 that it was shipping 4.72 grams of Pu-239 and 0.279 gram of Pu-240 to Rockwell, the TRUMP-S Project's principal contractor. Morris Plutonium Affidavit, *supra* note 27, at 5 ¶12, and Attachment 3 thereto (Shipping Form dated May 12, 1989). A simple mathematical calculation reveals that the Pu-239 constitutes 94.42% of the total plutonium weight and that Pu-240 constitutes the remaining 5.58%.⁴⁰

Moreover, the University has acknowledged that it knew from the outset that there would be some Pu-241, Pu-242, and Am-241 in the sample,⁴¹ but that they were omitted from the application's list of radionuclides because the University did not consider them to be "significant" "dose-contributing contaminants" as those terms are used in section 4.3 of Regulatory Guide 10.3. Morris Plutonium Affidavit, *supra* note 27, at 4 ¶8. *See generally* Section II.B.1.b, *supra*. Such a conclusion was rational (and indeed has been adopted by the Commission in Section II.B.1.b, *supra*, regarding Pu-241 and Pu-242) and thus cannot be

$$\begin{array}{lcl}
 \text{Pu-239:} & \frac{4.72}{4.72 + 0.279} = \frac{4.72}{4.99} & = 0.9442 \\
 \text{Pu-240:} & \frac{0.279}{4.72 + 0.279} = \frac{0.279}{4.99} & = 0.0558
 \end{array}$$

The Intervenor has submitted no evidence that would contradict the University's conclusions regarding the chemical makeup of its plutonium sample. They have merely offered two tables setting forth the weight percentages of radionuclides in weapons-grade plutonium samples — *not* the sample used by the University. Intervenor's Exhibit No. 1, *supra* p. 87, at 7 ¶17. Because (as the Intervenor themselves state) the chemical "[c]omposition will vary sample to sample" (*id.*), the information in the two tables does not refute the University's conclusion regarding the percentage of Pu-239 and Pu-240 in its own plutonium sample.

⁴¹ The University provided two different sets of calculations yielding the weight percentage of *all five* radionuclides as of September 1990: Pu-239 (94.42% and 94.2%); Pu-240 (5.58% and 5.52%); Pu-241 (<0.1% and 0.116%); Pu-242 (<0.1% and 0.018%); and Am-241 (<0.1%). Morris Plutonium Affidavit, *supra* note 27, at 6-7 ¶¶ 15-16.

considered to reflect adversely on the competence of the University's staff. For all these reasons, we reject the Intervenor's argument.

iii. OTHER ALLEGED INSTANCES OF LICENSEE'S IGNORANCE

Next, the Intervenor's point to other alleged examples of the University staff's ignorance: (1) the need for sprinklers inside and outside of Alpha Lab; (2) the need for wire glass in the window of the lab; (3) the need for an additional testable-in-place HEPA filter; and (4) the fact that oxygen in the glove box creates danger of fire, especially when a pyrophoric material such as metallic plutonium is in use. IS-IB at 60. According to the Intervenor, these provide further evidence that the University's personnel are not qualified to conduct the activities contemplated in the University's two license applications.

We do not see how these examples have any relevance to the question whether the University's staff "is qualified by training and experience" to experiment with the elements at issue in this proceeding. See 10 C.F.R. §§ 30.33(a)(3), 70.23(a)(3). Intervenor's first and second arguments, reduced to their essence, amount to nothing more than a conclusion that the University staff is unqualified to conduct the TRUMP-S experiments because the University disagrees with the Intervenor and the Presiding Officer on the need for sprinklers and wire glass. Regarding the Intervenor's third assertion, we agree with the Presiding Officer that an additional testable-in-place HEPA filter was not required for safety, and that the absence of such an additional filter did not constitute a design flaw in the laboratory. See LBP-91-31, 34 NRC at 103-04. None of these arguments, in sum, persuades us that the University's personnel are unqualified.

The Intervenor's fourth assertion — that the University was ignorant of the fact that oxygen in the glove box increases the risk of fire — would, if true, call into question the competence of the employees. But the assertion is plainly not true. The University personnel's awareness of the oxygen issue is evidenced by both the University's decision to conduct the TRUMP-S experiments in an inert glove box (in which the oxygen content is typically less than 0.1 part per million (ppm)) and the University's installation of an oxygen detection system that triggers alarms in both the Alpha Laboratory and the reactor control room when the oxygen level reaches 7 ppm. To put this 7-ppm figure in perspective, we note from the record that an oxygen level this low will not permit combustion of ordinary materials; that a level of 10,000 ppm or less will preclude plutonium from either reaching combustion or continuing to burn (absent additional heat);

that a level of 80,000 ppm or less will preclude smoldering; and that a level of 150,000 ppm or less will result in the extinguishing of flames.⁴²

On a related matter, we conclude that, notwithstanding the Intervenor's cursory assertions to the contrary (II-IB at 55-56), graduate students may appropriately participate in the TRUMP-S experiments. These students receive the requisite radiation protection training required by 10 C.F.R. Part 19,⁴³ and will be working under the guidance of authorized users (professors and certified health physicists).⁴⁴

2. *The Presiding Officer Did Not Err in Refusing to Strike Certain Affidavits Filed by Licensee*

Intervenors complain on appeal that the Presiding Officer erred in refusing to strike seven affidavits filed by the University on January 28, 1991.⁴⁵ Specifically, Intervenors complain that the University belatedly submitted these affidavits only after the Intervenor had submitted their October 15, 1990 written presentation, thereby denying the Intervenor the opportunity to address those affidavits in that written presentation. On February 12, 1991, the Intervenor moved to strike the seven affidavits. The Presiding Officer denied the motion to strike. See unpublished Memorandum and Order (Intervenors' Motion for Clarification, etc.), issued March 12, 1991, slip op. at 1. In the Final Initial Decision, the

⁴² See Meyer Emergency Planning Affidavit, *supra* note 16, at 9 ¶29; Licensee's Exhibit No. 3, *supra* note 12, at 17 ¶42; Licensee's Exhibit No. 5, Affidavit of Dr. C. Leon Krueger, appended to Licensee's Written Presentation, dated Nov. 13, 1990, at 3 ¶11.

⁴³ See Application for Amendment to License No. SNM-247 at 20-21; Application for Amendment to License No. 24-00513-32 at 21-22. See generally University of Missouri Central Radiation Safety Committee's *Handbook*, *supra* p. 99.

⁴⁴ See Licensee's Written Presentation at 70-71; Langhorst Personnel Qualifications Affidavit, *supra* note 16, at 19 ¶39(8), and 20 ¶42; Response of Licensee to Request for Hearing and Stay Pending Hearing, dated May 25, 1990, at 21; University of Missouri Central Radiation Safety Committee's *Handbook*, *supra* p. 99, at 2-5 to 2-6 § 2.2.5.

⁴⁵ IS-IB at 13, 21-28; II-IB at 58. Specifically, the Intervenor refers to the affidavits from

Robert G. Purington regarding fire protection at the Alpha Laboratory;
Daniel J. Osetek regarding the appropriate dispersion model;
Dr. Susan M. Langhorst regarding the appropriate dispersion model;
William Markgraf, the Fire Chief of Columbia, Missouri, regarding various fire protection issues;
Veryl G. Eschen regarding the argon glove box exhaust system;
Dr. J. Steven Morris regarding actinide release fractions, the Alpha Laboratory, the HEPA filters in the glove box exhaust line, maximum credible accident, the isotopic composition of plutonium, epidemiology, and the sufficiency of the documents provided to the Intervenor; and
Walter A. Meyer, regarding the MURR facility emergency plan, the facility emergency procedures FEP 3 and FEP 3(a), the fire department's willingness and capability to fight a fire involving radioactive materials, postulated fires in the Alpha Laboratory general basement area, the applicability of National Fire Protection Association ("NFPA") practices to the Alpha Laboratory, the Columbia Fire Department's equipment, and fire protection methods.

See IS-IB at 24. These seven affidavits were denoted as Licensee's Exhibit Nos. 16-22, and accompanied the Licensee's Jan. 28, 1991 Response to Intervenor's Rebuttal.

Presiding Officer also made the following indirect reference to his denial of the Intervenor's motion to strike:

It is general practice at the NRC to permit applicant to amend its application papers to remedy defects that may be disclosed during the pendency of a proceeding

LBP-91-31, 34 NRC at 110, *quoting* LBP-90-38, 32 NRC 359, 364 (1990).

On appeal, the Intervenor's take issue with the Presiding Officer's above-quoted language. They contend that the Presiding Officer, in denying their motion to strike the seven affidavits, confused the informal Subpart L proceedings with the formal Subpart G proceedings. According to the Intervenor's, the "general practice" to which the Presiding Officer alluded applies only to Subpart G proceedings, since there is very little experience under Subpart L.

To the extent the Intervenor's intend to argue that our regulations and practice preclude the University from submitting post-application affidavits into the record, we disagree. Such affidavits fall within the types of documents that the Presiding Officer has the discretion to allow into the record pursuant to section 2.1233(d), viz., "additional documentary data, informational material, or other written evidence."⁴⁶

Moreover, we see no reason why the Commission's practice (to which the Presiding Officer was apparently referring) of permitting the licensee to file supplemental supporting evidence in a Subpart G proceeding should not apply equally well to a Subpart L proceeding.⁴⁷ The regulations in Subpart L not only provide for the submittal of such information at the discretion of the Presiding Officer but also require the Presiding Officer to consider such information in preparing the Initial Decision.⁴⁸

3. *The Presiding Officer Did Not Err in Denying the Intervenor's Motion to Submit Rebuttal Evidence*

On January 30, 1991, the Presiding Officer *sua sponte* gave the Intervenor's permission to seek leave to submit additional evidence to rebut the Licensee's

⁴⁶ The Intervenor's themselves acknowledge that "[e]vidence does not 'modify a license application.'" Intervenor's Motion to Strike Irrelevant and Unreliable Matters, dated Nov. 26, 1990, at 2.

⁴⁷ As noted earlier, this does not mean that the Commission sanctions the filing of patently deficient or "bare-bones" applications.

⁴⁸ The Intervenor's also take issue with what they consider to be the Presiding Officer's characterization of the University's affidavits as "amend[ments]" to the two applications. IS-IB at 25-26. *See generally* Intervenor's Response to Licensee's Written Presentation, dated Dec. 24, 1990 at 3-5. We believe that the Presiding Officer intended his use of the words "amend its application papers" to refer to *all* papers submitted by the Licensee in support of its application, and that his words did not refer only to the application. In any event, regardless of the Presiding Officer's intended meaning, we view the University's affidavits as explanatory material offered to aid in the understanding of the applications, not as amendments to the applications. (Because the Commission rejects the characterization of the affidavits as "amendments" to the University's application, we need not reach the Intervenor's arguments that are premised upon that characterization. *See* IS-IB at 25-28.)

January 28, 1991 evidentiary submission (consisting of the seven affidavits discussed above). The Presiding Officer required, however, that any such submittal by the Intervenor

(1) list[], with document and page references, specific facts or arguments *that have appeared for the first time* in "Licensee's Response to Intervenor[s]' Rebuttal," and (2) for each fact listed, stat[e] what Intervenor desire to show and that they have a witness or a citation to a legal authority or recognized code to support that showing. If Intervenor wish, they may attach affidavits which will be received in the written record only if their motion is granted.

Unpublished Memorandum and Order (Motion to Show Cause), issued Jan. 30, 1991, slip op. at 1-2 (emphasis in original). Intervenor accepted the Presiding Officer's invitation and moved for leave to file rebuttal evidence in response to these seven affidavits. *See* Intervenor's Motion for Leave to Respond to New Facts and Arguments in Licensee's Response to Intervenor's Rebuttal, dated Feb. 12, 1991.

In an unpublished order issued March 12, 1991, the Presiding Officer deferred ruling on the motion to file rebuttal evidence.⁴⁹ In the Final Initial Decision, the Presiding Officer denied the Intervenor's motion for leave to file rebuttal evidence. LBP-91-31, 34 NRC at 110, 119. He based this ruling on his interpretation of Subpart L and on his conclusion that the Intervenor had had numerous opportunities to respond concerning all issues of importance. *Id.* at 110, 113. The Presiding Officer also based his ruling on the conclusions that the Intervenor's request for leave to submit rebuttal evidence was too general and that it failed to suggest the nature of the rebuttal evidence that they would proffer. *Id.* at 113. *See generally id.* at 113-19.

On appeal, the Intervenor object to the Presiding Officer's denial of their motion to respond to the University's seven affidavits. According to the Intervenor, the Presiding Officer's ruling enabled the University to circumvent the Intervenor's right to public notice and opportunity for comment. Specifically, the Intervenor assert that the University filed an "empty application" (IS-IB at 21) and only later submitted the affidavits that it should have included as part of its original application, and which the Intervenor had no opportunity to rebut. *Id.* at 21, 23, 24; II-IB at 58-59. The Intervenor complain that the Presiding Officer's ruling consequently denied them their hearing rights under section 189 of the AEA, as well as their alleged rights to file rebuttal evidence under section 556(d) of the Administrative Procedure Act ("APA") and the Due Process Clause

⁴⁹ *See* unpublished Memorandum and Order (Intervenor's Motion for Clarification, etc.), issued March 12, 1991, slip op. at 2:

I am not now permitting a further response to Licensee's [filings] by Intervenor, choosing instead to limit the response to answers to my questions. After I receive the answers, I will decide what further action may be appropriate.

of the Fifth Amendment of the United States Constitution. II-IB at 45, 57, 59, 60; IS-IB at 21.⁵⁰ In a related argument, the Intervenor's also assert that the Presiding Officer's ruling reversed the burden of proof on the "public health and safety" issues by admitting into evidence the Licensee's affidavits but not permitting Intervenor's the opportunity to respond. IS-IB at 13, 55.

For the reasons set forth below, we conclude that the Presiding Officer's ruling neither violated any right Intervenor's had to rebut the University's submissions nor reversed the burden of proof on the issues of "public health and safety."

To begin with, the Presiding Officer *did* give the Intervenor's every chance to make their case, including the filing of rebuttal evidence. Transcript of Conference held June 27, 1990, at 44. The Intervenor's were given — and took full advantage of — just such an opportunity to rebut the University's written presentation.⁵¹ In addition, the Presiding Officer on his own motion gave the Intervenor's permission to seek leave to submit additional rebuttal evidence to deal with the University's final evidentiary submission of January 28, 1991. Unpublished Memorandum and Order (Motion to Show Cause), issued Jan. 30, 1991, slip op. at 1-2 (quoted at p. 115, above). The Presiding Officer indicated that he would allow such additional rebuttal evidence *if* the Intervenor's satisfied certain conditions (intended principally to ensure that the Intervenor's evidence responded solely to facts or arguments appearing for the first time in the University's January 28 submission). But, as the Presiding Officer reasonably concluded, the Intervenor's subsequent request for leave to submit rebuttal evidence was too general, failed to suggest the nature of the rebuttal evidence that they would proffer, dealt with issues that the Intervenor's had previously had ample opportunity to address, were irrelevant, were unnecessary for an adequate record, and/or suffered from other shortcomings. See LBP-91-31, 34 NRC at 113-19.

To the extent that Intervenor's are contending that the Presiding Officer abused his discretion in denying the Intervenor's motion for leave to file rebuttal evidence, we disagree. We conclude that the Presiding Officer was well within his "broad discretion"⁵² to conclude both that the Intervenor's had already been accorded ample opportunity to respond to all issues of importance and that, if he needed any further information to compile an adequate record, he could obtain

⁵⁰ Intervenor's do not, however, argue on appeal that Subpart L is unconstitutional.

⁵¹ See Intervenor's Response to Licensee's Written Presentation, dated Dec. 24, 1990, and accompanying Declarations of Henry Ottinger, Mark Haim, Donald W. Wallace, and the "TRUMP-S Review Panel." See also "Intervenor's Motion to Strike Affidavit of Dr. Susan M. Langhorst, Marked Licensee's Exhibit 15, Filed with Licensee's Response to 'Intervenor's Motion for Reconsideration . . . and Emergency Order . . . Part I,' Dated November 15, 1990," dated Dec. 12, 1990.

⁵² Final Rule, "Informal Hearing Procedures for Materials Licensing Adjudications," 54 Fed. Reg. 8269 (Feb. 28, 1989) ("Final Subpart L Rule").

it by posing questions pursuant to section 2.1233(a).⁵³ The Intervenor's ample opportunity to address the issues in this case is demonstrated by their numerous and voluminous filings. During this proceeding, the Intervenor has submitted seventy-nine filings and twenty-one evidentiary exhibits. The Presiding Officer's decision denying the Intervenor's request to file additional evidence was fully consistent with the Commission's intent in promulgating Subpart L, i.e., to decrease the cost and delay for the parties and the Commission and to empower presiding officers to manage and control the parties' written submissions.⁵⁴

The Intervenor's argument, when reduced to its essence, is simply that they were unfairly disadvantaged by the manner in which the Presiding Officer exercised his discretion to determine the sequence of filings and to prohibit filings, i.e., that he gave the University the last word. However, Subpart L does not accord Intervenor the right to speak last regarding the issues in a materials license proceeding.⁵⁵ Nor do the other statutory or constitutional provisions cited in the Intervenor's briefs. The Intervenor points to section 189a(1) of the AEA, 42 U.S.C. § 2239(a)(1), and to section 7(c) of the APA, 5 U.S.C. § 556(d).⁵⁶ But these provisions do not advance the inquiry: this Subpart L proceeding is the agency hearing guaranteed by the AEA, and the APA provision simply does not apply to informal hearings like this one (*see further discussion at section II.B.4, infra*).

The Intervenor also errs in claiming a denial of due process under the Fifth Amendment. Neither group of Intervenor has provided any analysis whatever explaining why the Subpart L hearing procedures followed in this case fail to conform to the due process requirements of the Fifth Amendment. They provide merely cursory references to "due process clause of the Fifth Amendment of the United States Constitution" or to portions of that phrase. II-IB at 45, 57, 59, 60.

⁵³ See LBP-91-31, 34 NRC at 110, 113-19. In fact, the Presiding Officer on three occasions did exercise this authority to pose questions to various parties. See LBP-91-12, 33 NRC 253, 257 (1991); unpublished Memorandum and Order (Questions), dated Feb. 26, 1991; unpublished Memorandum and Order (Question), dated May 22, 1991.

⁵⁴ Final Subpart L Rule, *supra* note 52, 54 Fed. Reg. at 8275. Cf. Final Rule, "Informal Hearing Procedures for Nuclear Reactor Operator Licensing Adjudications," 55 Fed. Reg. 36,801, 36,803 (Sept. 7, 1990). Although this case has proved complex and lengthy, the size of the record could have been substantially larger, the costs even greater, and the delay even longer, had the Presiding Officer totally abandoned his case management responsibilities and permitted the parties to submit all the filings they might have wished. See generally *Rockwell International Corp.* (Rocketdyne Division), ALAB-925, 30 NRC 709, 718 (1989) ("[B]y 'informalizing' these [Subpart L] adjudications, the Commission did not intend, in our view, to encourage 'free-form' litigation by any of the participants . . ."), *aff'd*, CLI-90-5, 31 NRC 337 (1990).

⁵⁵ Section 2.1233(a) of Subpart L expressly accords the Presiding Officer the discretion both to determine the sequence in which the parties present their "arguments[,] documentary data, informational material, and other supporting written evidence" and to offer individual parties the opportunity to provide further data, material, and evidence in response to the Presiding Officer's questions. 10 C.F.R. § 2.1233(a).

⁵⁶ This section of the APA provides that:

A party is entitled to present his case or defense by oral or documentary evidence, to submit rebuttal evidence, and to conduct such cross-examination as may be required for a full and true disclosure of the facts.

More to the point, however, the Intervenor base their argument on an incorrect legal premise. Generalized health, safety and environmental concerns (such as those that the Intervenor assert) simply do not rise to the level of liberty or property interests that are protected by the due process clause.⁵⁷ *City of West Chicago v. NRC*, 701 F.2d 632, 645 (7th Cir. 1983); *Sequoyah Fuels Corp.* (Sequoyah UF₆ to UF₄ Facility), CLI-86-17, 24 NRC 489, 495-98 (1986); *Kerr-McGee Corp.* (West Chicago Rare Earths Facility), CLI-82-2, 15 NRC 232, 256-57 (1982).⁵⁸

4. The Presiding Officer Did Not Err in Denying the Intervenor's Request for Oral Presentations, Cross-Examination, and Formal Hearing

Throughout this proceeding, the Intervenor repeatedly requested that the Presiding Officer authorize oral presentations and cross-examination of witnesses — in essence, to conduct a formal evidentiary hearing.⁵⁹ The Presiding Officer in his Final Initial Decision concluded that there were insufficient reasons to justify oral presentation or a formal evidentiary hearing. LBP-91-31, 34 NRC at 37, 111-12, 127. On appeal, the Intervenor complain that the Presiding Officer should have sought the Commission's permission under section 2.1209(k) to conduct a formal hearing or, at the very least, should have granted their request for oral presentation and cross-examination on a wide variety of issues (II-IB at 60-70; I-RB at 18), such as the willingness of the Columbia Fire Department

⁵⁷ Even if the Intervenor's interests were protected by due process, the Intervenor have nevertheless failed to discuss the remaining two factors that the Supreme Court has held must be analyzed and balanced when presenting such due process arguments:

the risk of an erroneous deprivation of such interest through the procedures used, and the probable value, if any, of additional or substitute procedural safeguards; and . . . the Government's interest, including the function involved and the fiscal and administrative burdens that the additional or substitute procedural requirements would entail.

Mathews v. Eldridge, 424 U.S. 319, 335 (1976). See also *Sequoyah Fuels Corp.* (Sequoyah UF₆ to UF₄ Facility), CLI-86-17, 24 NRC 489, 495-98 (1986).

⁵⁸ In an argument related to their contentions regarding rebuttal evidence, the Intervenor assert that the unfairness of denying further rebuttal was compounded by the fact that discovery is barred in Subpart L proceedings. IS-IB at 12; II-IB at 59; I-RB at 18. Section 2.1231(d) expressly prohibits discovery in a Subpart L proceeding. 10 C.F.R. § 2.1231(d); *Rockwell International Corp.* (Rocketdyne Division), ALAB-925, 30 NRC 709, 716 (1989). We see no unfairness in such a result. The right to discovery is not required under the APA even for formal adjudicatory hearings, much less for informal hearings under the AEA. See 5 U.S.C. § 554 (1988); Final Subpart L Rule, *supra* note 52, 54 Fed. Reg. at 8270. Moreover, given the thoroughness with which the Intervenor have participated in this proceeding, we hardly think that this unavailability of discovery has hampered their ability to advance their case.

⁵⁹ See, e.g., Intervenor's Motion for Order Recommending Formal Hearing, or in the Alternative Requiring Oral Presentations, dated Nov. 14, 1990; Intervenor's Motion for Reconsideration of Memorandum and Order of November 1, 1990: Part II, dated Nov. 16, 1990, at 9-10; Intervenor's Response to Reply of NRC Staff Affiant [Dr.] Amarendranath Datta to Questions posed in Memorandum and Order of May 22, 1991, dated June 11, 1991, at 22-23; Intervenor's Renewed Motion for Order Recommending Formal Hearing, or in the Alternative Requiring Oral Presentations (Part I), dated June 20, 1991; Intervenor's Renewed Motion for Order Recommending Formal Hearing, or in the Alternative Requiring Oral Presentations (Part II), dated June 27, 1991; Intervenor's Written Presentation at 59-60.

to fight a fire involving the release of radioactivity (II-IB at 60-61, 64); what was "really observed," "really believed," and "really said" by various of the Licensee's expert witnesses (*id.*); the credibility of Dr. Morris (*id.* at 60, 65-66); and the accuracy of Dr. Langhorst's characterization of NUREG-1140 (*id.* at 66). For the reasons set forth below, we disagree with the Intervenor's position regarding each of the three requested procedures.

a. Formal Hearing

The formal on-the-record hearing provisions of the APA do not apply to the Commission's informal proceedings such as those addressing materials license amendment applications.⁶⁰ The Intervenor is instead entitled only to "some sort of procedures for notice, comment, and a statement of reasons" for the agency action.⁶¹ They have received as much.

Moreover, under our regulations, the parties to a Subpart L proceeding have no right to require a formal hearing. Rather, the Commission alone has the authority to require such a hearing. *See* 10 C.F.R. § 2.1209(k). Under Subpart L's procedures, the Commission will generally exercise this authority only in situations where the Presiding Officer requests permission to conduct a formal adjudication using the rules of Subpart G.⁶² However, Subpart L contemplates that a presiding officer would only rarely request permission to conduct a formal adjudication. Proposed Subpart L Rule, 52 Fed. Reg. at 20,091. For the reasons set forth in our discussions below regarding oral presentations and cross-examination, we find nothing in the record to suggest that the Presiding Officer abused his discretion in declining to seek the Commission's permission to conduct a formal hearing.⁶³

⁶⁰ *Kerr-McGee Corp. (West Chicago Rare Earths Facility)*, CLI-82-2, 15 NRC 232, 247-256 (1982), *aff'd sub nom. City of West Chicago v. NRC*, 701 F.2d 632, 641-45 (7th Cir. 1983) (in which both the Commission and the United States Court of Appeals for the Seventh Circuit discussed this issue in great detail and concluded that the AEA does not mandate formal, trial-type hearings in materials license proceedings). *See generally Union of Concerned Scientists v. NRC*, 920 F.2d 50, 53 (D.C. Cir. 1990) (the AEA "nowhere describes the content of a hearing or prescribes the manner in which this 'hearing' is to be run"). Moreover, the Commission has itself expressly stated that Subpart L procedures are not subject to the APA's formal hearing requirements. Final Subpart L Rule, *supra* note 52, 54 Fed. Reg. at 8270.

⁶¹ *Independent U.S. Tanker Owners Comm. v. Lewis*, 690 F.2d 908, 922-23 (D.C. Cir. 1982), and authority cited therein. *See also* Edles and Nelson, *Federal Regulatory Process: Agency Practice and Procedures*, § 5.4 IV at 107 (2d ed. 1992).

⁶² *See* 10 C.F.R. § 2.1209(k). *See also Safety Light Corp. (Bloomsburg Site Decontamination)*, CLI-92-13, 36 NRC 79, 87 (1992). Moreover, the Commission does not have to grant the Presiding Officer's request.

⁶³ In a related argument, Intervenor's take issue with the Presiding Officer's view that "not having seen and heard the witnesses also is advantageous." 34 NRC at 129. Intervenor's argue that the Presiding Officer's statement contravenes the general principle of law that oral evidence is superior to written evidence. II-IB at 66-68. The Intervenor's argument is inappropriately raised on appeal. Appeals lie only from unfavorable actions by the Presiding Officer, not from *dictum* in an initial decision with which the party disagrees but which has no operative effect. *Duke Power Co. (Cherokee Nuclear Station, Units 1, 2, and 3)*, ALAB-482, 7 NRC 979, 980 (1978). We therefore need not rule on this argument.

b. Oral Presentations

In promulgating Subpart L, the Commission contemplated that the Presiding Officer would base his decision on a written record. *See generally* 10 C.F.R. § 2.1233. *See also* Proposed Subpart L Rule, 52 Fed. Reg. at 20,091. Consequently, the Commission accorded the Presiding Officer wide discretion to decide whether oral presentations are “necessary to create an adequate record.” 10 C.F.R. § 2.1235(a). *See also* 10 C.F.R. § 2.1209(i). The Commission anticipated that, in the vast majority of situations, the Presiding Officer would not allow oral presentations.⁶⁴ As previously noted, the record in this proceeding is voluminous, and the Intervenor has taken full advantage of their many opportunities to present evidence — filing literally dozens of affidavits and declarations. *See* text following note 53, *supra*. Consequently, we find no reason to conclude that the Presiding Officer abused this discretion in denying the Intervenor’s request for oral presentations.

c. Cross-Examination

We reach a similar conclusion regarding the Presiding Officer’s exercise of his discretion to preclude oral cross-examination. Parties have no fundamental right to cross-examination even in a formal Subpart G licensing proceeding. Final Subpart L Rule, *supra* note 52, 54 Fed. Reg. at 8270; *Southern California Edison Co.* (San Onofre Nuclear Generating Station, Units 2 and 3), CLI-82-11, 15 NRC 1383, 1384 (1982) (“Cross-examination is not such a ‘fundamental right’ that any denial constitutes prejudicial error *per se*”). The Commission has made clear that, in a Subpart L proceeding, “the responsibility for the examination of all witnesses rests with the Presiding Officer,”⁶⁵ not with the parties.

The Presiding Officer was well within his “broad discretion” (Final Subpart L Rule, *supra* note 52, 54 Fed. Reg. at 8269) to conclude that cross-examination was unnecessary and that he could obtain any further necessary information by posing questions pursuant to section 2.1233(a).⁶⁶ We defer to the Presiding Officer’s judgment.

⁶⁴ Final Subpart L Rule, *supra* note 52, 54 Fed. Reg. at 8274 (“oral presentations should be necessary only in those rare instances in which the written presentations leave unresolved issues that the presiding officer finds can be decided only after having oral presentations”).

⁶⁵ Final Subpart L Rule, *supra* note 52, 54 Fed. Reg. at 8274. *See also* *Rockwell International Corp.* (Rocketdyne Division), ALAB-925, 30 NRC 709, 716 (1989), *aff’d*, CLI-90-5, 31 NRC 337 (1990) (referring to “examination solely by the presiding officer”). Even prior to the promulgation of Subpart L, the Commission generally did not permit “traditional trial-type cross-examination” by the parties in informal proceedings. *See Sequoyah Fuels Corp.* (Sequoyah UF₆ to UF₄ Facility), CLI-86-17, 24 NRC 489, 497 n.5 (1986).

⁶⁶ In fact, the Presiding Officer on three occasions did exercise this authority to pose questions to various parties. *See* LBP-91-12, 33 NRC 253, 257 (1991) (posing questions to Intervenor and NRC Staff; unpublished Memorandum and Order (Questions), dated Feb. 26, 1991 (posing questions to Licensee Intervenor and NRC Staff); unpublished Memorandum and Order (Question), dated May 22, 1991.

5. *The Presiding Officer Did Not Err in Refusing to Consider the Adequacy of the Staff's Review of the University's Two Applications*

Intervenors assert that the NRC Staff's review of the University's license amendment applications constituted nothing more than a rubber-stamp approval, that the Presiding Officer erred in not setting aside the amendments and remanding the applications to Staff for additional review and findings, and that the Commission itself should therefore take the steps that the Presiding Officer avoided. Specifically, the Intervenors claim that Staff failed (1) to make certain required findings of fact and to explain the basis for its approval of the applications; (2) to prepare a safety evaluation report ("SER"); (3) to prepare either an EA or an EIS; and (4) to consider numerous other factors that Intervenors consider relevant. IS-IB at 9, 62-68, referring to LBP-91-31, 34 NRC at 108-09. See also Intervenors' Written Presentation at 27-30. For the following reasons, we reject all of these arguments.

a. *The Presiding Officer Was Not Obligated to Consider the Adequacy of Staff's Safety Review*

As a general matter, the Commission's licensing boards and presiding officers have no authority to direct the Staff in the performance of its safety reviews. *Carolina Power and Light Co.* (Shearon Harris Nuclear Power Plant, Units 1, 2, 3, and 4), CLI-80-12, 11 NRC 514, 516 (1980); *Rockwell International Corp.* (Rocketdyne Division), ALAB-925, 30 NRC 709, 721-22 (1989), *aff'd*, CLI-90-5, 31 NRC 337 (1990). Moreover, the University rather than the Staff bears the burden of proof in this proceeding. Consequently, the adequacy of Staff's safety review is, in the final analysis, not determinative of whether the application should be approved.⁶⁷ Given these facts, it would have been pointless for the Presiding Officer to rule upon the adequacy of Staff's review. *Louisiana Power and Light Co.* (Waterford Steam Electric Station, Unit 3), ALAB-812, 22 NRC 5, 56 (1985).

Moreover, even assuming *arguendo* that Staff did conduct an insufficient review, a denial of a meritorious application on that ground would be grossly unfair — punishing the applicant for an error by Staff. The subject of

⁶⁷ See *Florida Power and Light Co.* (St. Lucie Nuclear Power Plant, Unit 1), ALAB-921, 30 NRC 177, 186 (1989); *Louisiana Power and Light Co.* (Waterford Steam Electric Station, Unit 3), ALAB-812, 22 NRC 5, 56 (1985); *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-728, 17 NRC 777, 807, *review declined*, CLI-83-32, 18 NRC 1309 (1983). See generally Final Rule, "Rules of Practice for Domestic Licensing Proceedings — Procedural Changes in the Hearing Process," 54 Fed. Reg. 33,168, 33,171 (Aug. 11, 1989) ("With the exception of NEPA [National Environmental Policy Act] issues, the sole focus of the hearing is on whether the application satisfies NRC regulatory requirements, rather than the adequacy of the NRC Staff performance"). Although the above-cited cases address nuclear power plant licensing applications, the principle for which those cases are cited applies equally to NRC materials licensing amendment proceedings such as this case.

the litigation in this proceeding is the University's entitlement to the license amendments, not the adequacy of Staff's review of those amendments. For these reasons, we reject Intervenor's argument that the Presiding Officer erred in not setting aside the amendments and remanding the applications to the Staff.

b. The Commission Declines to Exercise Its Authority to Set Aside the Amendments and Remand the Applications to Staff

The Commission itself has the authority to vacate licensing actions or ask for further Staff review, and has exercised that authority on appropriate occasions. *Carolina Power and Light Co.* (Shearon Harris Nuclear Power Plant, Units 1, 2, 3, and 4), CLI-80-12, 11 NRC 514, 516-17 (1980). However, for the second and third reasons stated in the immediately preceding section, as well as the additional reasons set forth below, we decline to take those actions in this proceeding.

i. THE STAFF HAD NO OBLIGATION EITHER TO PROVIDE AN EXPLANATION OF ITS DETERMINATION TO APPROVE THE LICENSE AMENDMENTS OR TO MAKE FINDINGS OF FACT IN SUPPORT OF THAT DETERMINATION

Intervenor's are incorrect in concluding that the Staff, in its review of license amendment applications, had an obligation to make specific findings of fact or to explain its approval of those license amendments. Although such findings and explanation might have been helpful to both the Presiding Officer and the parties, they are not required under our orders, policy statements, and regulations. Moreover, such findings and explanation, while useful in the earlier stages of a proceeding, would decrease in importance as the record develops, and would ultimately be completely superseded by the Presiding Officer's (and, later, our own) findings of fact and conclusions of law. In any event, the Staff's approval of the University's two applications implies the conclusion by the Staff that the Licensee's applications satisfied the requirements of the AEA.⁶⁸

⁶⁸ Moreover, the mere fact that the NRC Staff did not prepare a written explanation of its decision to approve the license amendments does not mean that Staff failed to make the findings required under the AEA. Each year, Staff handles approximately 5000 materials license actions (such as applications for license amendments, license renewals, and new licenses) — a responsibility it could not meet were it required to prepare written explanations of each licensing decision.

ii. THE STAFF WAS NOT REQUIRED TO PREPARE A SAFETY
EVALUATION REPORT

During the hearing, Intervenor's complained that the Staff improperly failed to prepare an SER.⁶⁹ The Intervenor's argue both that sections 70.23 and 30.33 of our regulations require the Staff to prepare such a document, and that the Staff's standard practice was to prepare an SER, as evidenced by its issuance of such a document when issuing the amendment to Rockwell's TRUMP-S license in an earlier proceeding. Intervenor's Exhibit No. 1, *supra* p. 87, at 12-13, citing "Safety Evaluation Report, License Amendment Application Dated December 22, 1989, Re Use of Plutonium in the TRUMP-S Program," Docket No. 70-25, dated March 9, 1990. The Presiding Officer, in his Final Initial Decision, rejected this line of argument and concluded instead that the "Staff . . . is not required to issue a safety evaluation" report. LBP-91-31, 34 NRC at 106. *See also id.* at 109. On appeal, the Intervenor's assert that this ruling was erroneous. IS-IB at 31.

The Presiding Officer is correct. The Intervenor's argument regarding the necessity for an SER is essentially a variation on its more general argument, already rejected above, that the Staff must file specific written findings of fact or explanations for its decisions. We reject the SER contention on the same grounds as we rejected the more general argument. The Commission's orders, policy statements, or regulations, do not impose upon the Staff the duty of preparing an SER in a materials license amendment proceeding. Moreover, Intervenor's reliance upon sections 30.33 and 70.23 of the Commission's regulations is misplaced. Those sections merely provide that the Commission will not approve a special nuclear materials license or a specific byproduct material license unless it first determines that the applicant's qualifications, proposed procedures, equipment, and facilities are adequate "to protect health and minimize danger to life or property." 10 C.F.R. §§ 30.33(a)(2) and (3), 70.23(a)(2), (3), and (4). The Staff impliedly made just such findings by approving the applications. The Presiding Officer has more explicitly made them during this proceeding. And the Commission today expressly makes those findings itself.

⁶⁹ *See, e.g.*, Intervenor's Application for Temporary Stay to Preserve Status Quo, dated Aug. 20, 1990, at 8; Intervenor's Exhibit No. 1, *supra* p. 87, at 12-13; Intervenor's Response to Licensee's Written Presentation, dated Dec. 24, 1990, at 23.

The Staff acknowledges that it prepared no SER. *See* Letter from Colleen Woodhead, Counsel for NRC Staff, to Judges Bloch and Linenberger, dated June 21, 1990.

iii. THE STAFF WAS REQUIRED TO PREPARE NEITHER AN ENVIRONMENTAL IMPACT STATEMENT NOR AN ENVIRONMENTAL ANALYSIS

Pursuant to section 102(2)(C) of NEPA and the Commission's regulations implementing that Act, the Staff must prepare an EIS addressing any major action taken by the Commission that may significantly affect the quality of the human environment. 42 U.S.C. § 4332(2)(C) (1988); 10 C.F.R. Part 51. However, neither the statute nor the regulations require the Staff to prepare an EIS if the federal action's effect on the environment is not "significant." The Commission has excused the Staff from preparing EISs, EAs, or findings of no significant impact ("FONSIs") regarding any

category of actions which do not individually or cumulatively have a significant effect on the human environment and which the Commission has found to have no such effect in accordance with the procedures set out in § 51.22, and for which, therefore, neither an environmental assessment nor an environmental impact statement is required.

10 C.F.R. § 51.14(a). Under one such categorical exclusion, the Staff is not required to prepare an EIS or EA for any "amendment . . . of materials licenses . . . authorizing . . . [u]se of radioactive materials for research and development and for educational purposes." 10 C.F.R. § 51.22(c)(14)(v). Dr. William J. Adam, the Staff's Senior License Reviewer responsible for reviewing the University's license applications, stated in an affidavit that the Staff had relied on this categorical exclusion to justify the conclusion that no environmental assessment was necessary. Affidavit of Dr. William J. Adam, dated July 26, 1990, at 2, attached to IS-IB at A-2.

The Intervenor's disagree with Dr. Adam's conclusion and assert instead that the provisions of section 51.22(c)(14)(v) are overridden by those of section 51.20(b)(7). II-IB at 51-55, *citing* 10 C.F.R. § 51.20(b)(7). *See generally* IS-IB at 9. The latter section requires the preparation of an EIS prior to the "[i]ssuance of a license to possess and use special nuclear material for processing and fuel fabrication" pursuant to Part 70 of the Commission's regulations. According to the Intervenor's, the experiments at the Alpha Lab involve the possession and use of such materials and the laboratory therefore falls within the definition, in 10 C.F.R. § 70.4, of a "plutonium processing and fuel fabrication plant":

[A] plant in which the following operations or activities are conducted: (1) Operations for manufacture of reactor fuel containing plutonium including any of the following: (i) Preparation of fuel material; (ii) formation of fuel material into desired shapes; (iii) application of protective cladding; (iv) recovery of scrap material; and (v) storage associated with such operations; or (2) Research and development activities involving any of the operations described in paragraph (1) of this definition except for research and development activities utilizing unsubstantial amounts of plutonium.

Intervenors assert that the Alpha Lab's proposed research and development activities would use 10 grams of fuel material plutonium — "a very substantial amount" — and that, consequently, the laboratory does not fall within the exception set forth at the end of the above-quoted definition. II-IB at 52-55. To support their conclusion regarding substantiality, the Intervenors point out that the approximately 2 Ci of plutonium to be used in the laboratory are 1,000,000 times the amount that can cause a significant likelihood of cancer; that this amount equates to approximately 40,000,000 permissible body burdens; that it is 2000 times greater than the threshold requiring decommissioning plans (*citing* section 70.25(a)); and that it is sufficiently high to require emergency planning in addition to that generally required of licensees (*citing* section 70.22(i)). II-IB at 53-54. *See also* Intervenors' Exhibit No. 1, *supra* p. 87, at 10-11.

Intervenors also rely on the following language from the Commission's Statement of Considerations to the final rule promulgating section 70.4: plutonium processing and fuel fabrication plants "typically process kilogram quantities of plutonium." Final Rule, "Plutonium Processing and Fuel Fabrication Plants," 36 Fed. Reg. 17,573, 17,574 (Sept. 2, 1971) (emphasis added). *See also* Proposed Rule, "Plutonium Processing and Fuel Fabrication Plants," 36 Fed. Reg. 9786 (May 28, 1971). According to the Intervenors, the Commission's use of the word "typically" reflects the Commission's recognition that such plants may also process quantities of less than 1 kilogram. II-IB at 54-55. From the above line of argument, the Intervenors conclude that the laboratory qualifies as a "plutonium processing and fuel fabrication plant" as defined in section 70.4, and that the Staff consequently erred in failing to prepare an EIS as required by section 51.20(b)(7).⁷⁰

The Presiding Officer disagreed with the Intervenors' position and instead concluded both that the amount of plutonium (and other actinides) to be used in the TRUMP-S experiments constituted "unsubstantial quantities" for purposes of sections 70.4 and 51.20(b)(7), and that the laboratory would therefore not constitute a "plutonium processing and fuel fabrication plant." LBP-91-31, 34 NRC at 42-43, 102. We agree with the Presiding Officer that the laboratory is not a plutonium processing and fuel fabrication plant, and that Staff therefore was not required to prepare either an EA or an EIS.

We first observe that the University's research and development activities do not appear to involve any of the operations described in part (1) of the above-quoted definition in section 70.4. We also conclude, for the reasons set forth

⁷⁰The Intervenors also expressed their belief that the regulatory exemption contravenes NEPA. However, they correctly recognized that such a position constitutes a prohibited collateral attack on section 51.22 and that, consequently, they cannot raise that challenge in this proceeding. II-IB at 52. *See American Nuclear Corp.* (Revision of Orders to Modify Source Materials Licenses), CLI-86-23, 24 NRC 704, 708-10 (1986). Although the Intervenors could have filed a petition for waiver of the bar on collateral attacks against our regulations (*see* 10 C.F.R. § 2.1239(b)), they did not avail themselves of this opportunity.

below, that the amount of material with which the University is experimenting is not sufficiently substantial to qualify the laboratory as a plutonium processing and fuel fabrication plant under sections 70.4 and 51.20(b)(7). The Commission did not further define the phrase "unsubstantial amounts of plutonium" when it adopted section 70.4 in 1971. Nor has the Commission focused on the meaning of the phrase in any subsequent decisions or rulemakings. The Commission's only comment regarding this term appears in the Statements of Consideration to the Proposed Rule and Final Rule, and indicates that the "plants for the conduct of plutonium fuel research and development activities . . . typically process kilogram quantities of plutonium." Final Rule, "Plutonium Processing and Fuel Fabrication Plants," 36 Fed. Reg. 17,573, 17,574 (Sept. 2, 1971); 36 Fed. Reg. 9786 (May 28, 1971) (Proposed Rule, containing identical language).

The Commission, in offering this observation, was simply referring to the fact that most of these plants process a substantial volume of plutonium, i.e., quantities that are measured in kilograms rather than in smaller units of measurement. Our understanding is confirmed by the underlying Staff paper submitted for the Commission's consideration in 1971 regarding the proposed rule on plutonium processing and fuel fabrication plants.⁷¹ (The proposed rule's language on this matter was identical to the language that the Commission adopted in the Final Rule.) When the Commission added the subject definition to section 70.4 and issued the Statement of Considerations, it was contemplating only eleven plants that had not been designed to resist adverse natural phenomena such as tornadoes. *See* SECY-R 188 at 8, 22-23. Most of these plants were considered "large-scale fabrication plants" with 50-60 kilograms of plutonium in process at any time. *Id.* at 3, 18, 19. The possession limits of the eleven plants ranged from 750 kilograms down to 5 kilograms. *See id.* at 27.

The Commission was in no way suggesting that a laboratory such as the Alpha Lab which conducts experiments using only a small fraction of these amounts should be considered to be a plutonium processing and fuel fabrication plant. As reflected in the Staff paper that accompanied the draft Proposed Rule at issue, the Commission expressly intended to *exclude* from the scope of section 70.4 "smaller-scale plutonium operations such as the fabrication of sources and small thermoelectric batteries, analytical laboratory work, and other types of research activities which involve much smaller quantities of dispersible plutonium in their process." *Id.* at 7 ¶14. The Staff considered such facilities to "have a much more limited risk to health and safety in off-site areas" and therefore concluded

⁷¹ *See* SECY-R 188, "Proposed Amendments to Part 70: Pre-Construction Review of Plutonium Processing and Fuel Fabrication Plants," dated March 17, 1971 ("SECY-R 188"), at 8, 22-23. In 1987, the Commission released SECY-R 188 to the public as a result of a Freedom of Information Act request, and the document has subsequently been available in the Commission's public document room. FOIA-THOMAS 87-40-870103 (8707200235).

that it was "not necessary to conduct a detailed analysis of the effects of natural phenomena for currently licensed activities of these types." *Id.* at 21.⁷²

iv. THE STAFF WAS NOT REQUIRED TO CONSIDER VARIOUS OTHER FACTORS

Finally, the Intervenors cursorily assert that Staff failed to consider: (1) the public health and safety; (2) adequacy of the equipment; (3) adequacy of the site; (4) adequacy of administrative controls; (5) adequacy of emergency plans; (6) whether Rockwell was controlling the University's actions; and (7) problems regarding Am-241. IS-IB at 9, 62-68. We cannot see how the Intervenors were harmed by Staff's alleged silence on these issues,⁷³ especially given the Presiding Officer's thorough examination of all but the sixth factor (a matter irrelevant to this proceeding). As noted above, this litigation concerns the applicant's entitlement to the license amendments, not the adequacy of Staff's review of the amendment applications. The University, not the Staff, bears the burden of proof on the issues listed above. Therefore, the adequacy of Staff's initial review is, in the final analysis, not dispositive of whether the application should be approved. Finally, we reiterate that the Intervenors have had extensive opportunities to respond to the University's positions regarding all relevant issues in this proceeding.

C. The Risk of a Dispersion of Radioactive Materials Is Acceptably Small

Throughout this proceeding, the Intervenors have asserted that the Alpha Lab does not meet fire safety standards and that a fire in the Lab could result in a serious dispersion of radioactive material. In his Final Initial Decision, the Presiding Officer rejected the Intervenors' arguments. He concluded that, if the University would abide by several safety requirements in addition to those specified in its license amendment applications, then the planning and construction of the Alpha Lab and the procedures for handling the radioactive

⁷² Having rejected the Intervenors' argument on the basis of the language and regulatory history of section 70.4 itself, we do not need to go further afield and examine the two allegedly analogous regulations (sections 70.25(a) and 70.22(i)) upon which the Intervenors also rely. We similarly need not examine the allegedly analogous regulations cited by the University in support of its position that the amount of plutonium at issue is "unsubstantial." See, e.g., Letter from Maurice Axelrad (counsel for the University) to Presiding Officer Bloch, dated April 2, 1991 (citing 10 C.F.R. § 140.3(h)); Licensee's Written Presentation at 78-79 (citing 10 C.F.R. §§ 70.22(h)(1), 70.24(a), 73.6(c), 150.11; and Regulatory Guide 10.3 § 1.1).

⁷³ We note that the NRC Staff was not totally silent on environmental/safety issues during the hearing. For instance, Staff filed an affidavit addressing the necessity of HEPA filtration in the Alpha Lab (Aug. 21, 1990), a brief and two supporting affidavits addressing safety-related issues regarding the trace contaminants in the University's plutonium sample (Dec. 5, 1990); and two briefs and two supporting affidavits addressing fire safety issues (May 17 and June 6, 1991).

elements would together provide an "adequate assurance of [fire] safety." LBP-91-31, 34 NRC at 52, 61. He viewed the probability of a severe fire, leading to offsite dispersion of actinides, as "minuscule" and "not credible." *Id.* at 60; *see also id.* at 36, 53-54, 77, 88-89.

We are not as sure as the Presiding Officer that we can altogether discount the risk of such fires as "minuscule" and "not credible." The Presiding Officer did not examine the likelihood of such a fire starting in any of three possible locations: the glove boxes inside the Alpha Lab, the remainder of the Alpha Lab, and the remainder of the MURR facility basement. Nor did he examine the likelihood of the fire spreading to any of the three locations where the actinides might be located: the MURR facility vaults, the Alpha Lab, and the route between the vaults and the Alpha Lab. Inquiries into these questions would be necessary before ruling out all consideration of such fires.

The Presiding Officer was correct in general, however, in finding that the chances of a severe fire are very small. The scarcity of ignition sources, the MURR staff's ability to curtail the Alpha Lab's oxygen (through ventilation control), the low level of fire loading, the relative lack of fuel continuity, the small heat release rate of the fuel in the Alpha Lab, the fire prevention, detection, and suppression measures employed by the University, and finally the fire barriers present in the Alpha Lab all strongly suggest that the probability of a severe fire is quite small.

We expect that the University will take all steps necessary to protect the licensed materials from a fire, however unlikely, but we have decided that we need not measure the fire risk precisely. This is because, even in a worst-case scenario (i.e., a fire leading to offsite radiation exposures), we find that the risk to the public from a fire affecting the TRUMP-S materials is still acceptably small.

Before discussing the technical issue of offsite dose, we will address in Part C.1 the Intervenor's concerns regarding the MURR Facility Emergency Plan,⁷⁴ and will conclude that we may appropriately consider the Emergency Plan in examining the offsite dose issue. In Part C.2, we will turn to the question of the maximum offsite inhalation dose levels that could reasonably be expected at various distances in the aftermath of a fire involving TRUMP-S materials and, in Part C.3, we will address the question whether those dose levels would be less than the levels contemplated by the MURR Emergency Plan. We will conclude that the former dose levels are less than the latter ones. In Part C.4, we will explain how and why two sections of the Emergency Plan require modification

⁷⁴ "Emergency Plan for the University of Missouri Research Reactor Facility," Facility License No. R-103, Docket No. 50-186 (Dec. 8, 1989) (hereinafter "Emergency Plan" or "MURR Emergency Plan"). The University made the MURR Emergency Plan available to the Intervenor on June 26, 1990 (Meyer Emergency Planning Affidavit, *supra* note 16, at 4 n.1), and the NRC Staff submitted the MURR Emergency Plan to the Presiding Officer in this proceeding on August 16, 1990.

in order to ensure that the Plan adequately protects the public from a release of TRUMP-S materials in the event of a fire. Finally, in Part C.5, we will examine the additional fire safety conditions already imposed by the Presiding Officer, and also those requested by the Intervenor.

1. Consideration of the MURR Facility Emergency Plan

The MURR Facility Plan addresses a wide range of emergency situations and focuses principally on those with the potential for causing radiological hazards affecting the health and safety of the MURR staff and the general public. It outlines the objectives to be met by the various emergency procedures (which are more detailed than the Emergency Plan and are established to implement its goals) and defines the authority and responsibilities of the individuals charged with meeting these objectives. It covers all activities within the MURR facility, including the reactor containment and the laboratories within the MURR building. Consequently, it applies to the TRUMP-S experiments being conducted in the Alpha Laboratory. MURR Emergency Plan at 1 § 1.0, 21 § 9.6, 23; Meyer Emergency Planning Affidavit, *supra* note 16, at 4 ¶ 12, 10 ¶ 33.

The MURR Emergency Plan establishes the Facility Emergency Organization (the group of individuals who are to be on site at the time of an emergency) and the Emergency Support Organization (groups that may be called upon for assistance, depending upon the specific type of emergency), and spells out their responsibilities. MURR Emergency Plan at 6; Meyer Emergency Planning Affidavit, *supra* note 16, at 5 ¶¶ 14-15. It provides for the activation of these organizations in an emergency. MURR Emergency Plan at 11 §§ 4.0-4.2. It also provides for a hierarchy of individuals responsible for the direction of the University's response to a radiological emergency, and sets forth those responsibilities as well. MURR Emergency Plan at 4-5 §§ 2.1-2.2; Meyer Emergency Planning Affidavit, *supra* note 16, at 5-6 ¶ 16.

The Emergency Plan describes the different classes of emergency situations, grouping accidents according to the potential severity of offsite radiological consequences. For each of these classes, the Emergency Plan specifies emergency action levels, radiological assessment actions, corrective actions, and protective actions. MURR Emergency Plan at 8-10 §§ 3.0-3.4, 12-15 §§ 5.0-5.3.4, 25-27 (Table I); Meyer Emergency Planning Affidavit, *supra* note 16, at 6 ¶ 17. It also describes each of the emergency facilities and equipment, and indicates how each can assist the University in responding to a radiological emergency. MURR Emergency Plan at 16-18 §§ 6.0-6.6. Finally, the Emergency Plan addresses the issues of recovery from a radiological emergency and the maintenance of emergency preparedness. *Id.* at 18-20 §§ 7.0-8.4.

The Intervenor object to consideration of the MURR Facility Emergency Plan, although the Presiding Officer relied on it to some extent. *See, e.g.*, LBP-91-31, 34 NRC at 54, 101. For the reasons set forth below, we disagree with the Intervenor's objections, decline to reverse the Presiding Officer's decision to rely on the MURR Emergency Plan, and will ourselves take the MURR Emergency Plan into consideration when examining the dose/dispersion issues. However, as discussed in Part C.4 of this Order, we will require that the University (i) modify its MURR Emergency Plan to take into account the activities in the Alpha Lab by revising its emergency classes and action levels and (ii) refrain from conducting any experiments in the Alpha Lab unless the reactor control room is staffed in the manner specified in this Order.

a. Alleged Need for Two Emergency Plans

Before discussing the detailed arguments proffered by the Intervenor, we offer an initial observation applicable to their overarching contention that the Commission should require the MURR facility to have two emergency plans — one applicable to the TRUMP-S materials and one applicable to the research reactor. Nothing in our rules requires separate emergency plans for each activity undertaken in a single facility. In this case, one emergency plan for both the MURR reactor and TRUMP-S (and other) materials is sensible. A licensee's procedures to respond to a radiological incident should be as simple, clear, and easy to remember as possible. Requiring two separate emergency response plans for the same building might undermine that important principle and actually increase the chance for human error in responding to a radiological incident.

b. Alleged Failure to Discuss the Effect of Radioactive Materials Becoming Airborne

Intervenor assert that the Meyer Emergency Plan Affidavit fails to address the effect of radioactive materials becoming airborne. II-IB at 22. This omission does not trouble us. The affidavit, which provides a detailed description of the MURR Emergency Plan, can hardly be faulted for failing to discuss a matter that the Emergency Plan itself is not required to address. The Intervenor's argument apparently reflects the Intervenor's misunderstanding of the level of detail that the Commission requires of an Emergency Plan. As stated in Regulatory Guide 2.6,

[I]t is not practicable to develop a completely detailed plan encompassing every conceivable type of emergency situation The plans should be the expression of the *overall concept* of operation that describes how the elements of advance planning have been considered and the provisions that have been made to cope with emergency situations.

Regulatory Guide 2.6, "Emergency Planning for Research and Test Reactors," at p. 2.6-1 § B (Rev. 1, March 1983) (emphasis added.)

The stated purpose of the MURR Emergency Plan, which fits the above-quoted description well, is to "outline[] the objectives to be met by the emergency procedures and define[] the authority and responsibilities to achieve such objectives." Emergency Plan at 21 § 9.6. *See also* Meyer Emergency Planning Affidavit, *supra* note 16, at 10 ¶ 33 ("The MURR Facility Emergency Plan is written in broad terms to encompass emergency situations that may occur in the course of operating the reactor or in the laboratories within the MURR facility"). The level of detail sought by the Intervenor is instead appropriate for the Emergency Procedures that implement the Emergency Plan, but need not be included in the Plan itself.⁷⁵

Moreover, our examination of the record shows that the MURR staff has seriously considered the effect of radioactive materials becoming airborne. *See* Meyer Emergency Planning Affidavit, *supra* note 16, at 15-16 ¶¶ 50-55. Emergency self-contained breathing apparatuses are available to firefighters and MURR personnel and would protect them from inhaling any radioactive contamination. *See id.* at 8 ¶ 23, 15-16 ¶¶ 50-52; "TRUMP-S Fire Protection Issues" at 7, appended as Attachment A to Licensee's Exhibit No. 22, Affidavit of William Markgraf, Columbia Fire Chief, Responding to Portions of Intervenor's Rebuttal, dated Jan. 28, 1991; Licensee's Exhibit No. 20, Affidavit of Walter A. Meyer, Jr. Responding to Portions of Intervenor's Rebuttal, dated Jan. 28, 1991, at 19 ¶ 48, 20 ¶ 50. Further, the University has implemented a number of procedures for the Alpha Laboratory to alert the reactor operators in the control room, and the firefighters, that radioactive materials could have become airborne.⁷⁶

c. Alleged Failure to Show How the Released Transuranics Would Be Detected

Intervenor criticizes the Emergency Plan for failing to specify the means by which transuranic releases will be detected. II-IB at 24. However, this level of detail is appropriate to the University's emergency procedures rather than to its Emergency Plan. Moreover, the University's TAM procedures have set out a number of methods to ensure the detection of any transuranics that may

⁷⁵ *See* Regulatory Guide 2.6, *supra*, at p. 2.6-2 § C.5. The adequacy of the Emergency Procedures is not an issue before us in this proceeding.

⁷⁶ *See* SOP (Standard Operating Procedure) VIII.8.1 (entire), appended to Meyer Emergency Planning Affidavit, *supra* note 16, as Attachment 5; SOP VIII.8.2 § 4 and SOP VIII.8.3 § 5, both of which are appended to Meyer Emergency Planning Affidavit, *supra* note 16, as Attachment 5. *See also* Meyer Emergency Planning Affidavit, *supra* note 16, at 12 ¶ 35(5), describing TAM-71 ("High Airborne Radioactivity"). SOPs give direction to the control room operators, while TAMs give direction to the laboratory personnel. *See* Licensee's Written Presentation at 41.

leave the glove box.⁷⁷ The detection of either a "Loss of Facility Argon Supply" (TAM-61) or "High Oxygen in the Argon Glove Box" (TAM-62) would indicate leaks in the glove box — a situation that could result in possible releases of transuranics. Also, "High Airborne Radioactivity" (TAM-71) would indicate that radioactivity had been detected at either the Alpha Laboratory room monitor or the Alpha Laboratory exhaust monitor.

In a related argument, the Intervenor critics the Emergency Plan for its failure to demonstrate adequate alpha detection equipment. II-IB at 24. We reject this argument on two grounds. The MURR facility does in fact contain alpha detection equipment.⁷⁸ Moreover, the gamma detectors in the facility⁷⁹ will supplement the alpha detectors by revealing indirectly any radioactive releases of alpha-emitters. As we have discussed in section II.B.1.b.ii of this Order, the alpha-emitting plutonium sample used in the TRUMP-S experiments contains measurable amounts of the gamma-emitting Am-241. Consequently, the presence of any plutonium that may leave the glove box can be detected indirectly by a gamma detection instrument.⁸⁰ Similarly, the samples of Am-241, Np-237, and U-235 (all of which also emit alpha radiation) emit gamma radiation that can be easily detected.

d. Alleged Failure to Demonstrate the Presence of Smoke Detectors in Some Areas of the Basement

Intervenors criticize the Emergency Plan for its failure to demonstrate the presence of smoke detectors in "some areas of the basement." II-IB at 24. The Intervenor's failure to specify the areas of the basement with which they are concerned precludes us from responding as specifically as we would prefer.⁸¹ However, to the extent that the Intervenor intended to refer to the Alpha Lab, we cannot accept their position. The University has submitted record evidence that:

⁷⁷ These TAM procedures are described in the Meyer Emergency Planning Affidavit, *supra* note 16, at 11-12 ¶35.

⁷⁸ See Licensee's Exhibit No. 4, Affidavit of Chester B. Edwards, Jr., Regarding the Adequacy of Alpha Laboratory Equipment, Fire-Related Features in the Alpha Laboratory and General Basement Area, and the Storage and Transfer of Actinide and Archived Materials, dated Nov. 13, 1990, at 3 ¶13 (listing an Alpha 3 Radiation Air Monitor as part of the equipment in the Alpha Lab). See also University of Missouri Central Radiation Safety Committee's *Handbook*, *supra* p. 99, at 3-3 § 3.2.2 (Survey Procedures); Application for Renewal of the University of Missouri Broad Scope License No. 24-00513-32, dated Feb. 27, 1992, at 61-62 § 9.3.

⁷⁹ University of Missouri Central Radiation Safety Committee, *Handbook*, *supra* p. 99, at 3-3 § 3.2.2 ("Survey Procedures").

⁸⁰ Intervenor also argue that the Emergency Plan is flawed because it fails to indicate that the University has installed backup emergency monitors that detect alpha particles. II-IB at 24. We reject this argument on the same grounds as stated in the text above.

⁸¹ The Commission would be justified in ignoring this argument on the ground that it was inadequately briefed on appeal. See, e.g., *Public Service Co. of Oklahoma* (Black Fox Station, Units 1 and 2), ALAB-573, 10 NRC 775, 786-87 (1979).

The Alpha Laboratory is . . . equipped with smoke detectors within the Laboratory and a heat sensor within the argon glove box. Alarms for these sensors are displayed locally at the Alpha Laboratory on a 4 zone fire alarm panel and sounded remotely in the reactor control room⁸²

More specifically, inside the Alpha Laboratory, there are smoke detectors mounted on the ceiling, a smoke detector mounted inside the laboratory exhaust duct, and smoke detectors mounted on the ceiling above the loft area. Activation of any of these detectors will trigger an alarm at a local alarm panel that will in turn activate an alarm in the reactor control room.⁸³ Finally, we note that City of Columbia Fire Department ("CFD") officials have toured the Alpha Laboratory and concluded that the fire safeguards and precautions are adequate. Meyer Emergency Planning Affidavit, *supra* note 16, at 10 ¶32; Letter from Frank W. Barfield, CFD Fire Marshal, to Chester B. Edwards, Jr., MURR, dated April 13, 1990, appended as Attachment 1 to Licensee's Exhibit No. 25, *supra* note 82.

To the extent that the Intervenor's argument was instead intended to refer to fire detection capability in areas of the basement other than the Alpha Lab, we find nothing in the record on the matter.

e. Involvement of the Fire Department

The Intervenor's raise three arguments regarding the Emergency Plan's provisions for communication with and involvement of the CFD. They first contend that the University's emergency plan is a sham because the University merely plans to call the CFD to the facility and then discuss what should be done. II-IB at 20-21. Second, the Intervenor's criticize the Emergency Plan for failing to address the possibilities that the radiation levels might be so high that a fire commander would refuse to order his crews to approach the fire (*id.* at 22) or that firefighters would themselves refuse to fight a fire in a facility where scientists had been experimenting with unsealed transuranics (*id.* at 25). Third, the Intervenor's criticize the Emergency Plan for failing to describe a means and commitment to notify the CFD when necessary. *Id.* at 24. We see no merit in any of these three arguments.

⁸² Meyer Emergency Planning Affidavit, *supra* note 16, at 9 ¶28. Accord Licensee's Exhibit No. 25, Affidavit of Chester B. Edwards, Jr. Responding to Question III, at 3 ¶6, appended to Licensee's Response to Presiding Officer's Questions, dated March 26, 1991. See also Licensee's Exhibit No. 1, *supra* note 12, at 10 ¶26.6 ("two smoke detectors are present in the laboratory"); Licensee's Exhibit No. 4, *supra* note 78, at 4 ¶14 (regarding the presence of a fusible link heat detector in the glove box); Application for Amendment to License No. 24-00513-32 at 10 and Application for Amendment to License No. SNM-247 at 10, each of which describes the smoke detector and fire alarm for the Alpha Laboratory.

⁸³ Meyer Emergency Planning Affidavit, *supra* note 16, at 9 ¶28; Licensee's Exhibit No. 4, *supra* note 78, at 4 ¶14 (there is a fusible link heat detector in the glove box that will activate a local alarm and reactor control room alarm if the temperature in the glove box were to exceed 136°F (58°C)).

Based on our review of the record (and, in particular, both the Emergency Plan and the Meyer Emergency Planning Affidavit), we conclude that the Emergency Plan, far from being a sham, provides a strong assurance of safety regarding any fires that might affect the Alpha Lab or the TRUMP-S materials.⁸⁴ The Emergency Plan provides for specific fire-safety and fire-suppression actions by the MURR staff and also provides for professional fire suppression activities by the CFD. The Meyer Emergency Planning Affidavit describes these provisions in considerable detail, and our review of the Plan itself confirms the accuracy of the description in that affidavit. In addition to the Emergency Plan, the University has adopted FEP 3, dealing generally with fire procedures for the MURR facility, and also FEP 3(a), Standing Order 90-6, three Standard Operating Procedures, and five TAMs, all of which set forth appropriate responses specifically addressing a fire in the Alpha Lab. *See* Meyer Emergency Planning Affidavit, *supra* note 16, at 10-12 ¶¶33-35, and Attachments 3-5 thereto. Based on our review of the Emergency Plan and these procedures (or the summaries of them⁸⁵), we are convinced that the University has established adequate measures for responding to a fire in the Alpha Lab (e.g., immediate fire suppression measures, contacting the CFD, securing and isolating the lab, shutting down the reactor).

Nor can we agree with the Intervenor that the CFD would refuse to fight a fire that potentially involved radioactive materials. The Presiding Officer considered Intervenor's argument, reviewed their evidence, and found that the CFD could be relied upon to fight a fire in the Alpha Lab. LBP-91-31, 34 NRC at 90-91, 94. We can find no reason to disturb that finding. The CFD has a longstanding cooperative relationship with the MURR staff,⁸⁶ pursuant to which the CFD would respond to *any* fires that may occur at the MURR facility.⁸⁷ To this end, the City of Columbia has provided written assurances to the University since 1982 that the CFD "will respond to fires or other emergency situations should they occur at the research reactor."⁸⁸ Moreover, CFD Battalion Chief Erman L.

⁸⁴ In this respect, we note that the NRC Staff has repeatedly reviewed the MURR Emergency Plan (or changes thereto) and found them to be in full compliance with Part 50 of our regulations. *See* Meyer Emergency Planning Affidavit, *supra* note 16, at 5 ¶13; Letter to Dr. J. Steven Morris, University of Missouri, from Alexander Adams, Jr., NRR, dated Jan. 25, 1990, submitted by Staff to the Presiding Officer on August 16, 1990. We also note that the NRC Staff most recently reapproved changes to the Emergency Plan on May 16, 1994.

⁸⁵ Only one of these TAMs (TAM-62) was submitted into the record, despite the fact that the Licensee and the Intervenor had copies (or access to copies) of all five TAMs.

⁸⁶ The University consulted with the CFD both when constructing the Alpha Laboratory (Meyer Emergency Planning Affidavit, *supra* note 16, at 7 ¶20.3, 10 ¶32) and when developing the Emergency Plan and the procedures to implement that Plan (*id.* at 2 ¶5).

⁸⁷ *See* "TRUMP-S Fire Protection Issues," *supra* p. 131, at 2.

⁸⁸ Letter to Director, University of Missouri Research Reactor (MURR) Facility from Raymond A. Beck (Columbia City Manager), dated Feb. 19, 1990, appended as Attachment 2 to Meyer Emergency Planning Affidavit, *supra* note 16; Letter to Director, University of Missouri Research Reactor Facility from Michael R. Sanford (Columbia Deputy City Manager), dated Aug. 24, 1982, attached as Appendix A to the MURR Facility Emergency Plan. *See also* Meyer Emergency Planning Affidavit, *supra* note 16, at 6 ¶18.

Call has further confirmed the CFD's intentions in this respect by stating under oath that:

According to the [CFD]'s copy of the MURR Emergency Plan, discussions with MURR officials, and on-site exercises which I had participated in[,] . . . the [CFD] w[ill] perform fire duties in response to an alarm at the MURR. These duties would include fighting a fire which could involve radioactive materials at the MURR facility, including the Alpha Lab[.]. Firefighting would be under the direction of the Department's Incident Commander with the advice of the University's Emergency Director. . . . Each attack crew would have a health physics team member assigned to them to advise of radiation dangers and answer questions about the immediate area they were in.

Affidavit of Fire Battalion Chief Erman L. Call, dated Oct. 24, 1990, Exhibit A, appended to "Licensee's Submittal in Accordance with 'Memorandum (Memorandum of Conference Call of Oct. 19, 1990),' " dated Oct. 30, 1990.

To ensure that the CFD can fight such a fire effectively, the MURR staff has provided both radiological and facility familiarization training for CFD personnel and has also included the CFD in the biennial NRC-required emergency response drills.⁸⁹ Firefighters are provided protective clothing⁹⁰ and self-contained breathing apparatus⁹¹ that give adequate protection from inhaled or ingested radiation from the radioactive materials available for release from a fire in the Alpha Lab. See Meyer Emergency Planning Affidavit, *supra* note 16, at 16 ¶52. Consequently, we consider it unlikely that such a firefighter would receive a dose, from inhalation or ingestion, even approaching the 25- to 100-rem limit specified in the Environmental Protection Agency's Protective Action Guides for firefighters.⁹²

⁸⁹ The University is committed to conduct training sessions for CFD personnel at least biannually. See Emergency Plan at 19 §§ 8.1, 8.2; Meyer Emergency Planning Affidavit, *supra* note 16, at 7 ¶20, 12-13 ¶¶37-39. Such training would include MURR facility orientation and a review of selected health physics procedures specifically relevant to the MURR facility. See Letter to Director, University of Missouri Research Reactor (MURR) Facility from Raymond A. Beck (Columbia City Manager), dated Feb. 19, 1990, appended as Attachment 2 to Meyer Emergency Planning Affidavit, *supra* note 16. See also Meyer Emergency Planning Affidavit, *supra* note 16, at 7 ¶20, 12 ¶37, 13 ¶39.

⁹⁰ Licensee's Exhibit No. 20, *supra* p. 131, at 19-20 ¶¶49-50.

⁹¹ See Meyer Emergency Planning Affidavit, *supra* note 16, at 8 ¶23, 15 ¶50; "TRUMP-S Fire Protection Issues," *supra* p. 131, at 7; Licensee's Exhibit No. 20, *supra* p. 131, at 19 ¶48, 20 ¶50.

⁹² The U.S. Environmental Protection Agency's *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents* at p. 2-10, Table 2-2 (EPA 400-R-92-001, Oct. 1991), provides that individuals such as firefighters performing emergency services may receive whole-body doses in excess of 25 rem, as long as the services are performed on a voluntary basis and the firefighter is fully aware of the risks involved. See also U.S. Nuclear Regulatory Commission Response Technical Manual ("RTM-93"), NUREG/BR-0150, Vol. 1, p. L-8 (Rev. 3, November 1993); MURR Emergency Plan at 12 § 5.0.1. Similarly, the NFPA recommends that firefighters be allowed to receive a one-time whole-body dose of no more than 100 rem in life-threatening situations and 25 rem to protect a facility, eliminate the escape of effluents, or control fires. See NFPA, *Fire Protection Handbook* at p. 10-125 (16th ed. 1986), relevant portions appended to Licensee's Exhibit No. 20 (*supra* p. 131) as Attachment B; NFPA 801, "Recommended Fire Protection Practice for Facilities Handling Radioactive Materials," at p. B-5 § 2-3.2(f) (1986), appended as Attachment 2 to Intervenor's Exhibit No. 21, Declaration of Donald W. Wallace, dated

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We likewise consider it unlikely that a firefighter would receive more than a very small external dose. The University has correctly pointed out that the only risk of external exposure to the firefighters would come from the gamma radiation. Such exposure would be, at worst, minimal. For instance, 1 gram of the Am-241 sample (the maximum amount that the University would use in any one experiment in the Alpha Lab) in the unshielded glove box would subject a firefighter to a direct gamma-particle dose of less than 100 mrem/hr at a distance of 10 feet.⁹³ This level hardly constitutes a significant radiological hazard to firefighters. *See* note 92, *supra*, and associated text.

In sum, given the substantial training and protective equipment given to CFD firefighters, as well as the CFD's longstanding relationship with the MURR, we see no reason to doubt the CFD's cooperation in a fire emergency.

We similarly find no merit in the Intervenor's third assertion — that the Emergency Plan fails to describe a means and commitment to notify the CFD of a fire. Section 6.5 ("Communications Equipment") of the MURR Emergency Plan provides that:

Provisions for communication by public telephone have been made with all Emergency Support Organizations⁹⁴ Emergency notification rosters shall be posted at strategic locations as specified in the Activation of Onsite Emergency Organization Procedure. The rosters shall include telephone numbers for required staff, University Emergency Support Organizations, *Off-site Emergency Support Organization*, and Emergency related State and Federal agencies.

Emergency Plan at 17-18 (emphasis added). In addition, section 8.2 of the Emergency Plan provides that, at least biennially, the University will conduct drills that will test these communication links and notification procedures. *Id.* at 19. The above-cited portions of the Emergency Plan comport with the recommendations of "American National Standard for Emergency Planning for Research Reactors," ANSI/ANS-15.16-1982, at 6. For all of the reasons stated above, we find this language to be a sufficient indication of both the means by which the University would notify the CFD and the University's commitment to do so.

Dec. 24, 1990. *See also* NFPA 802, "Recommended Fire Protection Practice for Nuclear Research Reactors," at 802-5 to 802-6 § 2-2.6 (1988), relevant portions appended as Attachment C to Licensee's Exhibit No. 20 (*supra* p. 131). *Cf.* Licensee's Exhibit No. 23, NFPA 801, "Recommended Fire Protection Practice for Facilities Handling Radioactive Materials," at Appendix B, p. 801-21 § B-3.3(f) (1991) (providing for 75-rem and 25-rem limits), appended to Licensee's Response to Presiding Officer's Questions, dated March 26, 1991.

⁹³ The gamma dose rate from the trace amounts of Am-241 in the Pu-239/240 sample would be lower by several orders of magnitude.

⁹⁴ The Emergency Support Organizations include not only the CFD but also the University's Health Physics Services, the University's Police, the University Hospital and clinics, and the University News Bureau. MURR Emergency Plan at 6 § 2.3; Meyer Emergency Plan Affidavit, *supra* note 16, at 5 ¶ 15.

f. Alleged Failure to Discuss Mitigation of the Consequences of a Fire

Intervenors criticize the Emergency Plan for failing to show what would be done to mitigate the consequences of a fire, and for claiming that this is to be decided later. II-IB at 24. Although the Intervenors do not explain the meaning of the phrase "done to mitigate the consequences of a fire," we assume that they intend to refer to the specific actions that the University and the CFD would take to combat a fire.⁹⁵ If this is indeed what the Intervenors meant, then their criticism not only reflects a pervasive misunderstanding of the level of detail necessary in an Emergency Plan (*see* discussion in section II.C.1.b, *supra*) but it also is undermined by the record in this proceeding.

As we discussed in the preceding section, the procedures, training, equipment, and cooperative arrangements all are in place to permit the MURR and the CFD to deal effectively with a fire emergency. Moreover, the University and the CFD have conducted frequent drills testing the effectiveness of the MURR Emergency Plan. According to the Meyer Emergency Planning Affidavit, *supra* note 16, at 12 ¶38:

There have been five emergency action drills performed under the Emergency Plan that was approved by the NRC in 1984. . . . Approximately once every two years, the drills include representatives of each Emergency Support Organization (both the University of Missouri personnel and the CFD participate). . . . Each of the biennial drills involving the Emergency Support Organizations (including the CFD) has included an exercise on fighting a fire involving radioactive materials.

In short, we find that the degree of advance planning to mitigate fire consequences is entirely adequate.

g. Alleged Problems with the Separation of Onsite and Offsite Emergency Procedures

The University has prepared separate procedures to address onsite and offsite consequences of an emergency at the MURR facility. The University addresses the former in its FEPs, TAMs, and SOPs,⁹⁶ and the latter in its Site Emergency

⁹⁵ The Commission would be justified in ignoring this argument on the ground that it was inadequately briefed on appeal. *See, e.g., Public Service Co. of Oklahoma* (Black Fox Station, Units 1 and 2), ALAB-573, 10 NRC 775, 786-87 (1979).

⁹⁶ Meyer Emergency Planning Affidavit, *supra* note 16, at 2 ¶6. As noted in note 76 above, SOPs give direction to the control room operators, while TAMs give direction to the laboratory personnel. *See* Licensee's Written Presentation at 41.

Although the University made most of its FEPs, SOPs, TAMs, etc., available to the Intervenors, the parties introduced relatively few into the record. *See* Intervenors' Exhibit No. 19, *supra* note 12, at 387-419 (TAM 80-89, 91), 443-46 (SOP VIII.8 through VIII.8.3); Meyer Emergency Planning Affidavit, *supra* note 16, Attachment 5 (SOP VIII.8 through VIII.8.3); Intervenors' Exhibit No. 11, *supra* note 6 (TAM-62); Intervenors' Exhibit No. 12,

(Continued)

Procedures ("SEPs"). Intervenor's assert that the University's separation of these onsite and offsite emergency procedures is "poorly planned and unnecessarily complicated." II-IB at 21.

We agree with the University that the public health and safety are not compromised by the separation of FEPs from the SEPs. As explained in the Meyer Emergency Planning Affidavit, the University developed the SEPs "to handle communicating and coordinating with off-site organizations if a facility emergency is determined to have potential for offsite radiological consequences." Meyer Emergency Planning Affidavit, *supra* note 16, at 2 ¶6. *See also* U Mo RB at 68. However, the probability of an incident at the MURR facility that would require the implementation of these offsite SEPs (i.e., either a core melt or a large TRUMP-S fire) is extremely low. As a result, practically all radiological incidents that may occur at the MURR could be adequately handled pursuant to the onsite FEPs. Under such circumstances, the Intervenor's proposed merger of the FEPs and SEPs might result in the unnecessary (and wasteful) use of outside emergency response resources in emergencies with no offsite consequences. Certainly, there is no indication in the record — and no argument by the Intervenor's (except in the most conclusory of terms) — that a merger of onsite and offsite procedures is necessary to provide adequate protection.

h. Alleged Failure to Submit the Plan to the Proper Authorities for Approval

The Intervenor's complain that the University failed to submit the Plan to the proper authorities for approval. Specifically, they argue that the University failed to submit it to the Local Emergency Planning Committee 60 days prior to submitting it to the Commission and, assuming that the plan was anything more than the reactor Emergency Plan, that the University also failed to submit it to the Commission. II-IB at 24. *See also* Intervenor's Written Presentation at 19, 49, and Intervenor's Exhibit No. 1, *supra* p. 87, at 14 ¶50, 15 ¶54(b), both of which documents cite 10 C.F.R. §§ 70.22(i)(3)(xiii), 30.32(i)(3)(xiii), and the Emergency Planning and Community Right-to-Know Act, 42 U.S.C. §§ 11,001-11,050 (1988) ("Right-to-Know Act").

We disagree with the Intervenor's position. Regarding their first argument, the two regulations upon which the Intervenor's rely did not become effective until April 7, 1990, subsequent to the University's filing of the two applications and the NRC Staff's issuance of the two license amendments. *See* Part II.B.1.a(iii), *supra*. Consequently, the University was not required to comply

supra note 16 (FEP-3, and FEP-3(a) (draft)); Meyer Emergency Planning Affidavit, *supra* note 16, Attachment 3 (FEP-3(a)); Meyer Emergency Planning Affidavit, *supra* note 16, Attachment 4 (Standing Order 90-8, (regarding FEP-3(a)).

with those regulations in connection with the two license amendments at issue in this proceeding.

Moreover, it is unclear whether the Right-to-Know Act pursuant to which these two regulations were promulgated even applies to the University. That statute requires certain facility owners and operators to submit to the appropriate local emergency planning committee a material safety data sheet for each "hazardous chemical" located at the facility, as defined in the Occupational Safety and Health Act of 1970 ("OSHA") and its implementing regulations. 42 U.S.C. § 11,021(a)(1). OSHA requires "employers" to prepare such sheets. Reading the Right-to-Know Act and OSHA together, the former statute seemingly applies only to an owner or operator who is also an "employer" under OSHA. 42 U.S.C. § 11,021(a)(1), (2). The definition of "employer" in OSHA expressly excludes states or their political subdivisions. 29 U.S.C. § 652(5) (1988); 29 C.F.R. § 1910.2(c). The University is a part of the government of the State of Missouri. Mo. Const. of 1945, art. 9, § 9; Mo. Rev. Stat. § 172.020 (1986); *Barish v. Director of Revenue*, 872 S.W.2d 167, 171 (Mo. App. 1994).

In any event, the Right-to-Know Act clearly does not apply to the materials at issue in this proceeding. That statute's definition of "hazardous chemicals" expressly excludes "substance[s] . . . used . . . in a research laboratory . . . under the direct supervision of a technically qualified individual." 42 U.S.C. § 11,021(e)(4). The Alpha Laboratory is obviously a research laboratory and, for the reasons set forth in Part II.B.1.c, *supra*, the Intervenor has failed to show that the personnel associated with that laboratory are not "technically qualified."

Regarding the Intervenor's second argument (i.e., that the University failed to submit its emergency plan to the Commission) the MURR Facility Emergency Plan has been approved six times by the NRC Staff,⁹⁷ and "applies to all activities within the MURR Facility, which includes both the reactor containment and the laboratories within the MURR building."⁹⁸ Thus, the agency-approved MURR Emergency Plan already covers the facilities where the TRUMP-S experiments are taking place. And, as we shall explain in Part II.C.3 *infra*, the consequences of a TRUMP-S accident are well within the parameters of the MURR Emergency Plan. Consequently, the MURR Facility Emergency Plan need not be resubmitted to the Commission for approval to encompass the TRUMP-S experiment. Such experiments are already covered under the Plan.

⁹⁷ See Licensee's Exhibit No. 20, *supra* p. 131, at 3 ¶6; Letter to Dr. James J. Rhyne, Director, [University of Missouri] Research Reactor Facility, from Alexander Adams, Jr., NRR, dated Feb. 8, 1993.

⁹⁸ Meyer Emergency Planning Affidavit, *supra* note 16, at 21 ¶74 (emphases added). See also *id.* at 10 ¶33; Licensee's Exhibit No. 20, *supra* p. 131, at 2 ¶4.1; Emergency Plan at 1.

i. The Emergency Plan's Alleged Failure to Satisfy the Commission's Regulatory Requirements

The Intervenor argues that the Emergency Plan fails to satisfy any of the requirements of 10 C.F.R. §§ 30.32(i)(3) and (4) and 70.22(i). II-IB at 23. In Section II.B.1.a.iii of this Order, the Commission has determined that these new emergency planning regulations — which took effect only after the University had submitted its two instant materials license amendment applications — do not apply to those applications. Consequently, from a procedural perspective, the question whether the MURR Emergency Plan satisfies the requirements of these two regulations is irrelevant to the issues in this proceeding. Nevertheless, despite the procedural adequacy of the University's two applications, we could still impose upon the University a requirement that it satisfy the provisions of the two regulations cited above, if we were to conclude that such action was necessary to protect the public health and safety. As explained elsewhere in this Order, however, we do not reach such a conclusion. Rather we find that, given the conditions imposed by this Order, the University's possession and use of the radionuclide samples at issue pose no undue danger to the public health and safety.

j. Alleged Failure to Identify and Analyze Types of Accidents

The Intervenor contends that the Emergency Plan fails either to identify types of TRUMP-S accidents or to analyze them. II-IB at 23. But, as we have already held, nothing in our regulations required the University to develop a special emergency plan dealing with the TRUMP-S experiment. The University's general plan is sufficient to encompass the TRUMP-S work. As it happens, however, the record does contain ample information and analysis regarding such accidents. The affidavits of Daniel J. Osetek⁹⁹ and Dr. J. Steven Morris¹⁰⁰ as well as the Meyer Emergency Planning Affidavit all contain detailed discussions on this subject.

k. Alleged Failure to Furnish Dimensions to Scale of the Basement, to Show the True Combustibles, and to Identify Clearly the Location of the Firefighting Equipment

Intervenor argues that the Emergency Plan failed to furnish to-scale dimensions of the basement, to show the true combustibles, and to identify clearly the

⁹⁹ Licensee's Exhibit No. 1, *supra* note 12.

¹⁰⁰ Licensee's Exhibit No. 24, Affidavit of Dr. J. Steven Morris Responding to Question II, dated March 25, 1991, attached to Licensee's Response to Presiding Officer's Questions, dated March 26, 1991.

location of the firefighting equipment. II-IB at 23. The Intervenor again display a misunderstanding of the nature of an Emergency Plan. It simply does not need to include this level of detail.¹⁰¹ We also note that the University has provided a detailed description of firefighting equipment in the Alpha Laboratory and in the immediate area adjacent to the Alpha Laboratory. See Meyer Emergency Planning Affidavit, *supra* note 16, at 8-10 ¶¶27-32.

l. Alleged Failure to Define Responsibilities

The Intervenor asserts that the Emergency Plan is flawed because it fails to identify the precise responsibilities of various individuals (presumably those on the MURR Emergency Response Team). II-IB at 24. We disagree. Once again, this level of detail is unnecessary in the Emergency Plan. Moreover, the University has conducted repeated drills to ensure that each individual on an emergency response team knows his or her responsibilities during a fire. Between 1984 and 1990, the University has conducted five actual emergency response drills, each of which "has included an exercise on fighting a fire involving radioactive materials." Meyer Emergency Planning Affidavit, *supra* note 16, at 12-13 ¶38.

m. Alleged Failure to Describe Adequate Training to Fight a Fire

The Intervenor argues that the Emergency Plan is flawed in that it fails to describe adequate training to fight a fire. II-IB at 24. As discussed above, such a description is unnecessary in an Emergency Plan. Moreover, the City of Columbia firefighters have been trained and retrained in the radiation safety measures required to fight a fire at MURR. See Meyer Emergency Planning Affidavit, *supra* note 16, at 12-13 ¶38. Finally, because the source term of a MURR accident envelopes that of a TRUMP-S accident, the type of training provided to the firefighters to fight a reactor fire would, except for minor adjustments, also be adequate to fight a TRUMP-S fire.¹⁰²

n. Alleged Failure to Describe the Kinds of Information to Be Given to Offsite Response Organizations

The Intervenor criticizes the Emergency Plan for failing to describe the types of information to be given to offsite response organizations. II-IB at 24. Again, the Intervenor misunderstands the nature of the Emergency Plan. It is not

¹⁰¹ At best, the arguments relate to the adequacy of the University's emergency procedures, an issue not before us in this proceeding.

¹⁰² See Section II.C.3, *infra*.

intended to be a detailed road map setting forth all the minutiae of emergency response. Moreover, the University has repeatedly conducted drills to ensure that offsite response organizations have the information necessary to meet their responsibilities effectively.

o. Other Alleged Omissions

The Intervenors criticize the Emergency Plan for its failure to describe how the facility will be restored to safe use after the accident, and also how the University would cope with reentry, avoid radioactive material being tracked out, and dispose of any water that had been contaminated with transuranics. II-IB at 24.

Contrary to the Intervenors' assertion, the Emergency Plan does address "recovery" operations for restoring the facility to safe use. Specifically, section 7.0 of the Plan states:

The Recovery Organization will be the Emergency Organization. The Emergency Director shall assess the potential radiological affects [*sic*] to onsite and offsite personnel before returning access to portions of the facility that have been evacuated because of the emergency and the Emergency Organization shall determine [that] the radiological conditions within these affected areas are safe before access to them is restored.

During recovery . . . , procedures shall be written and approved for handling significant evolutions before they are performed.

The Commission agrees with the approach taken in the Plan on recovery operations. By far the greater emphasis should be placed on preventing an accident, rather than recovering from an accident. However, in the unlikely event of an accident, recovery operations will depend upon site-specific information such as the extent and location of contamination. Based on this information, the University can then develop procedures directed at the site-specific situation. *See* Meyer Emergency Planning Affidavit, *supra* note 16, at 16 ¶55; ANSI/ANS-15.16-1982, *supra* p. 136, at 7 ("It is not practicable to plan detailed recovery actions for all conceivable situations").

As for the problem of radioactive material being tracked out of the facility, the University employs a Health Physics Manager who presumably would follow routine health physics procedures (e.g., the issuance of a radiation work permit) to prevent the spread of contamination. *See* MURR Emergency Plan at 5 § 2.1.

Finally, the MURR facility has a 25,000-gallon contaminated-water collection system. *See* Licensee's Exhibit No. 20, *supra* p. 131, at 18 ¶44. This system has the capacity to collect for more than 2 hours the full drainage of water from the sprinkler heads in the Alpha Lab. *See* Letter from Dr. Susan M. Langhorst, Manager, Reactor Health Physics [University of Missouri], to Mr. John Jones,

Region III, NRC, dated July 3, 1991, at 1. Although the University may need to develop special disposal procedures (depending on the contamination level of the water in particular situations), such special procedures need not be included in the Emergency Plan (or even the emergency procedures). Rather, the University should develop such procedures directed at the site-specific situation.

p. Arguments Addressed Elsewhere in This Order

Intervenors assert that the Emergency Plan fails to take into account the TRUMP-S Project. II-IB at 23. We address this argument in Section II.C.3 of this Order, *infra*.

Intervenors argue that the "Emergency Classes" and "Action Levels" in the Emergency Plan are inadequate for effective fire department response to a fire involving TRUMP-S materials. *Id.* at 21. The Intervenors also assert that the Emergency Plan is insufficient to protect against a fire in the Alpha Lab because the reactor control room will not be attended at all times. *Id.* at 25-27; I-RB at 16-17. (The Intervenors do not, however, expressly present this second argument as a challenge to the MURR Emergency Plan.) We address these two arguments in Section II.C.4 of this Order, *infra*.

2. The Maximum Expected Offsite Inhalation Dose Level That Could Result from the Release of TRUMP-S Radionuclides in a Fire

We will now analyze the potential radiological ramifications of a fire that released into the atmosphere portions of the TRUMP-S samples. The Presiding Officer did not reach this question because of his conclusion that the risk of fire is not credible. Our analysis, however, *assumes* a fire, as we are not as confident as the Presiding Officer that the risk of fire is "minuscule." *See* p. 128, *supra*. Because we are analyzing a major technical issue unaddressed by the Presiding Officer, we must perforce embark upon a more detailed technical discussion than ordinarily seen in adjudicatory decisions.

We will first set forth the standard that we will apply in determining the maximum expected offsite inhalation dose level.¹⁰³ We will then determine what maximum expected offsite inhalation dose level would be expected to result from the release of radionuclides in a fire.

¹⁰³ In the unlikely event of an airborne release of radionuclides into the air (assumed to be in the form of a cloud), an individual member of the general public may receive a dose through inhalation, direct or indirect ingestion, and/or direct radiation exposure (i.e., either from the ground [ground shine] or from the air [immersion]). In such an event, by far the most predominant dose would be attributable to inhalation.

a. *The Standard for Determining the Maximum Expected Offsite Inhalation Dose Level*

Throughout this proceeding, the Intervenor's have asserted that the Commission, when calculating the maximum concentration downwind of the MURR facility in the case of a maximum credible accident involving TRUMP-S material, should not rely on NUREG-1140 (discussed below). According to the Intervenor's, the NRC Staff prepared NUREG-1140 using assumptions inapplicable to dispersion modelling. II-IB at 43, 46, 48. Instead, the Intervenor's urge the Commission to use the dispersion model set forth in Regulatory Guide 1.145 for dispersion greater than 100 meters¹⁰⁴ and the Halitsky model for dispersion within a 100-meter radius.¹⁰⁵

We conclude that NUREG-1140 provides the most appropriate approach to use in determining the maximum expected offsite inhalation dose level in the event of a TRUMP-S accident. The equation set forth in NUREG-1140 to calculate the inhalation dose represents the Commission's standard generic equation for making dose assessments in situations involving releases from facilities of materials licensees (such as the University). NUREG-1140 was issued relatively recently, in 1988, and was subject to extensive peer review. Intervenor's' view notwithstanding, there is no reason for the Commission not to employ its own well-considered methodology set forth in NUREG-1140 in assessing offsite dose consequences of hypothetical accidents involving materials licensees such as the University of Missouri.

i. **THE EQUATION IN NUREG-1140 IS A GENERIC EQUATION AND IS BASED ON ASSUMPTIONS APPLICABLE TO DISPERSION MODELLING**

The inhalation dose ($D(r)$) is the dose received by an individual member of the general public who is standing at a distance r from the point of an accidental release and is inhaling a particular radionuclide. Simply stated, the inhalation dose ($D(r)$, in units of rem) is equal to the total amount of radionuclides inhaled (in units of μCi) multiplied by that particular radionuclide's dose conversion factor (in units of $\text{rem}/\mu\text{Ci}$). NUREG-1140 expresses this inhalation dose in an equation that takes into account the time and form of exposure, distance from

¹⁰⁴ II-IB at 46, citing Regulatory Guide 1.145, "Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants" (Rev. 1, November 1982; reissued February 1983).

¹⁰⁵ II-IB at 46; Intervenor's' Exhibit No. 20, *supra* p. 104, at 21-22 ¶81, citing James Halitsky, "Gas Diffusion Near Buildings," ASHRAE Trans. 69, #1855, at 464-85 (1963). The Intervenor's did not submit this article into the record.

the source, and breathing rate.¹⁰⁶ The differences in the parties' conflicting calculations of $D(r)$ are attributable to differences in their assumptions when assigning quantities to the various terms in the NUREG-1140 equation — a matter to which we now turn.

ii. THE NUMERICAL VALUES TO BE ASSIGNED TO THE ELEMENTS IN THE NUREG-1140 EQUATION

In examining the four terms used to calculate $D(r)$ in NUREG-1140's equation (*see* note 106, *supra*), we observe that both the University and the Intervenor agree upon the numerical values to be assigned to the terms B (breathing rate) and DCF (dose conversion factor). Neither the University nor the Intervenor challenge NUREG-1140's quantity of 2.66×10^{-4} m³/sec for the breathing rate B . *See* NUREG-1140 at 12. *See also* Licensee's Exhibit No. 16, Affidavit of Susan M. Langhorst Responding to Portions of Intervenor's Rebuttal, dated Jan. 28, 1991, at 7 ¶14 (citing, without criticism, the use of this figure in NUREG-1140), 15 n.22, and Attachment 1. Likewise, both the University and the Intervenor use NUREG-1140's figure of 530 rem/μCi as the DCF for Am-241.¹⁰⁷ NUREG-1140 at 80, Table 13. *See* Licensee's Exhibit No. 16, *supra*, at 15 n.22, and Attachment 1 thereto; Intervenor's Exhibit No. 20, *supra* p. 104, at 12 ¶39.

The differences in the result of $D(r)$ calculated by the University and the Intervenor are due solely to the differences in the assumptions used for assigning values to Q and χ/Q . We now turn our attention to those two values.

¹⁰⁶ $D(r) = (DCF) \times (B) \times (\chi/Q) \times Q$

where: DCF (the dose conversion factor) is a mathematical conversion factor that translates the amount of radioactivity from any particular radionuclide entering the body into the amount of dose received by the body (in rem/Ci inhaled); B is a normal breathing rate (in cubic meters per second (m³/sec)); χ/Q is the concentration at distance r per total activity released (in seconds per cubic meter (sec/m³)); Q is the total quantity of actinides released during the release period (in units of Ci).

Underlying this equation are two very conservative release and exposure assumptions. *See* NUREG-1140 at 13; RTM-93, *supra* note 92, at p. H-25. They give no credit for the dose reductions attributable to the many fire detection and suppression measures that are present in the MURR basement (*see* Section II.C.1.d of this Order, *supra*, and Section II.C.5.a.ii of this Order, *infra*) or to the record evidence that the City of Columbia Fire Department would reach a fire at the MURR facility within 10 minutes. Licensee's Exhibit No. 20, *supra* note 85, at 22 ¶56; Meyer Emergency Planning Affidavit, *supra* note 16, at 14 ¶45. Furthermore, no individual member of the general public would, as a practical matter, stand in the middle of a smoke cloud for one full hour without moving to avoid smoke inhalation.

¹⁰⁷ All parties agree that the dispersion of Am-241 is the limiting case (i.e., the worst-case scenario) for a release of TRUMP-S materials. *See, e.g.*, Licensee's Exhibit No. 16, *supra* p. 145, at 17 ¶24a; Licensee's Exhibit No. 24, *supra* note 100, at 54 ¶51 Table 2; Intervenor's Exhibit No. 20, *supra* p. 104, at 24 ¶92.

(a) Release Quantity (Q)

The "release quantity" (Q) of TRUMP-S materials is the amount of actinides (measured in curies) that would be released into the atmosphere outside of the MURR facility as a result of a fire or other accident¹⁰⁸ and deposited into an unrestricted area¹⁰⁹ to which a member of the general public could have access. However, some of the actinides that would be separated from their source and released into the glove box (i.e., entrained) as a result of a fire would remain in the MURR facility due to natural aerosol removal processes such as diffusion (for plateout) or sedimentation (for settling). See SECY-94-302, "Source Term-Related Technical and Licensing Issues Pertaining to Evolutionary and Passive Light-Water-Reactor Designs," Attachment 1 at 12 (Dec. 19, 1994). Consequently, the release quantity (Q) would necessarily be less than the total amount of entrained actinides (Q_{total}).

To obtain an accurate estimate of the release quantity (Q), the quantity of entrained actinides must be reduced by the quantity of actinides that "plate out" or otherwise fail to escape the facility. This is accomplished by multiplying the amount of entrained actinides (available at the time of release) by a "release fraction" (RF) — i.e., $Q = Q_{\text{total}} \times RF$.¹¹⁰ The University and the Intervenor disagree on the values that should be assigned to both Q_{total} and RF .

(i) Total quantity (Q_{total})

The University proposes that the Commission consider Q_{total} to be the maximum amount of radioactive material that the University is entitled to use in the Alpha Lab at any one time. The University points out that, although it is authorized under its license to possess up to 10 Ci (approximately 2.9 grams)

¹⁰⁸ See RTM-93, *supra* note 92, at H-55, H-65.

¹⁰⁹ At the time relevant to this proceeding, our regulations defined the term "unrestricted area" as "any area access to which is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials, and any area used for residential quarters." 10 C.F.R. § 20.3(a)(17) (1989) ("old Part 20 regulations"). See also 10 C.F.R. § 20.1003 (1994) ("new Part 20 regulations").

¹¹⁰ The release fraction is "that portion of materials in inventory likely to be dispersed in a severe real accident." NUREG-0767, "Criteria for Selection of Fuel Cycle and Major Materials Licenses Needing Radiological Contingency Plans," at 5 (March 1981; reprinted April 1987). RF is expressed mathematically by the equation:

$$RF = (\text{amount of actinides entrained}) \times (1 - f)$$

where (f) is the fraction of the total actinides that remains within the MURR facility due to natural aerosol removal processes, and which consequently do not escape the building into the atmosphere.

of Am-241,¹¹¹ it has committed to use no more than 1 gram (or 3.43 Ci)¹¹² of Am-241 for its experiment at any given time.¹¹³ Consequently, the University urges us to assign a value of 1 gram to Q_{total} . See Licensee's Exhibit No. 2, *supra* p. 89, at 8 ¶18 n.6.

By contrast, the Intervenor's argue that the Commission should consider the entire 10 Ci of licensed radioactive material. II-IB at 34. Intervenor's rely on language in NUREG-1140 indicating that the material being considered in that document could be scattered among as many as 500 locations, with the result that a fire could reach only a small fraction of the quantities licensed and would therefore result in only an insubstantial release. *Id.*, citing NUREG-1140 at 90-93. Intervenor's assert that, contrary to the assumption used in NUREG-1140, all the TRUMP-S material will be located at a single location — in the MURR facility — thereby rendering the entire 10 Ci vulnerable to a fire. II-IB at 34.

We will use the University's proposed amount of 1 gram (or 3.43 Ci) of Am-241 as Q_{total} . The Intervenor's argument in favor of using the University's full possession limit for Am-241 fails to take into account the reasons underlying the Staff's statement in NUREG-1140 that the "[e]ntire possession limit [is] assumed to be involved" in an emergency. NUREG-1140 at 17. The Staff in NUREG-1140 was attempting to bound all materials licensees that *might* need an emergency plan. However, as Staff lacked site-specific information for those materials licensees, it was constrained to calculate the offsite doses based on the full possession limit of materials licenses. The Staff in NUREG-1140 fully recognized that site-specific information for individual licensees would render Staff's calculation overly conservative *as to those licensees*. *Id.*

We conclude that the University's storage of the bulk of the actinides in a fireproof vault constitutes just such site-specific information. This means that, at any given moment following the University's separation of the samples into

¹¹¹ See Licensee's Response to Intervenor's Rebuttal, dated Jan. 28, 1991, at 75-76. See also note 107, *supra* (regarding Am-241 being the worst-case scenario with which we are concerned).

¹¹² The 3.43-Ci/gram value for the specific activity (SpA) of Am-241 is computed as follows:

$$\text{SpA} = \frac{3.578 \times 10^5}{(\text{Half Life}) (\text{Atomic Mass})} \quad \text{in units of Ci/g}$$

$$\text{where} \quad \begin{array}{l} \text{Half Life} = 432.2 \text{ years} \\ \text{Atomic Mass} = 241 \end{array}$$

$$\text{SpA} = \frac{3.578 \times 10^5}{432.2 \text{ years} \times 241} = 3.43 \text{ Ci/g}$$

Equation from: HHS, *Radiological Health Handbook* at 103 (Rev. ed., January 1970).

Half-Life from: Federal Guidance Report No. 11, "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors For Inhalation, Submersion, and Ingestion," EPA-520/1-88-020 at 114 (EPA, September 1988).

Atomic Mass from: Knolls Atomic Power Lab., *Chart of the Nuclides* (14th ed., April 1988).

¹¹³ Licensee's Exhibit No. 16, *supra* p. 145, at 16-17 ¶24a.

1-gram units in 1990, no more than 1 gram of actinide would be outside safe storage and susceptible to dispersion by fire. Therefore, based on the site-specific information provided in the record of this proceeding, we conclude that the use of 1 gram as the Q_{total} is justified (especially given the University's commitment to use no more than that amount at any one time for the experiment)¹¹⁴ and is also fully consistent with the methodology and underlying rationale of NUREG-1140.

(ii) Release Fraction (RF)

The University and the Intervenor also disagree on the appropriate value for RF. The University's consultant, Mr. Osetek, indicated that RFs for burning plutonium would fall within the range 2.8×10^{-8} to 5.3×10^{-4} . Licensee's Exhibit No. 1, *supra* note 12, at 7 ¶2. Dr. J. Steven Morris of the University proffered a value of 10^{-6} , which is a product of multiplying the following two factors — the fraction of available actinides that would be entrained (10^{-4}) and the fraction of those entrained actinides that would be expected to pass through one HEPA filter (10^{-2}).¹¹⁵ In contrast, the Intervenor's expert, Professor James C. Warf, indicated that RF would fall between 10^{-4} and 4×10^{-1} .¹¹⁶ Professor Warf also asserted that "[n]o one really knows what actual release fractions would be experienced in a fire." *Id.*

In resolving the RF question, the Commission will use a ground release of Am-241 as the limiting case for its analysis,¹¹⁷ and will rely on the figure in NUREG-1140. Of all the publications on RF quoted by both the University and the Intervenor, NUREG-1140 is the only technical document that specifically addresses accidental releases at materials facilities (as opposed to power reactors). It is also the only document that has undergone the public notice and comment process¹¹⁸ as well as technical peer reviews. Moreover, NUREG-1140 has repeatedly referred to the RF studies of Schwendiman and

¹¹⁴ As a condition for our approval of the instant license amendments, we require the University to use no more than 1 gram of the subject actinides at any one time in TRUMP-S experiments.

¹¹⁵ Licensee's Exhibit No. 24, *supra* note 100, at 48 ¶35. Dr. Morris assumed that one of the Alpha Lab's four HEPA filters would remain intact during and after a fire.

¹¹⁶ James Warf, "Comments on the Affidavit of Daniel J. Osetek 'Regarding Safety of the TRUMP-S Project,'" dated Dec. 9, 1990, appended as Attachment A to Intervenor's Exhibit No. 20, *supra* note 34. The TRUMP-S Review Panel derived much of its data from experiments on entrainment which, as previously noted, does not equate with RF.

¹¹⁷ See note 107 *supra*.

¹¹⁸ NUREG-1140 was the basis for the rulemaking proceeding that resulted in the promulgation of the current versions of 10 C.F.R. §§ 30.32(i) and 70.22(i), discussed earlier in this Order. See Final Rule, "Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees," 54 Fed. Reg. 14,051 (Apr. 7, 1989). In the Statement of Considerations that accompanied that Final Rule, we expressly approved NUREG-1140's method for calculating doses. *Id.* at 14,058.

Mishima — two scientists whose writings were cited repeatedly by both the University and the Intervenor.

NUREG-1140 specifies 10^{-3} as the *RF* for Am-241,¹¹⁹ and we will therefore use this figure. The 10^{-2} mitigation factor provided by the HEPA filter would be relevant only to a release of actinides through the stack. The Commission declines to give the University similar credit for the HEPA filter in the event of a ground release — the worst-case scenario that we are now considering.¹²⁰

(b) Concentration per Release Rate (χ/Q)

The Intervenor and the University also disagreed on the appropriate χ/Q values for various distances (r) from the release point ($r = 0$). The University argued that NUREG-1140 contains the appropriate dispersion model for determining all χ/Q values. See Licensee's Exhibit No. 16, *supra* p. 145, *passim*; Licensee's Exhibit No. 2, *supra* p. 89, *passim*. The Intervenor argued that, for $r \geq 100$ meters, χ/Q must be calculated from NRC Regulatory Guide 1.145 and that, for r less than 100 meters, χ/Q should be calculated using Halitsky's dispersion model. See notes 104 and 105, *supra*. For the reasons set forth below, we again follow NUREG-1140's approach.

(i) Alleged Requirement That the Commission Use the Dispersion Model Set Forth in Regulatory Guide 1.145 for Dispersions Exceeding 100 Meters

The Intervenor first argue that, in estimating offsite dose beyond 100 meters from the MURR facility, the Commission *must* use the dispersion model provided in Regulatory Guide 1.145 to estimate the offsite dose from a release resulting from a fire in the Alpha Laboratory. II-IB at 43, 46. The Commission finds the Intervenor's first argument unpersuasive for the following two reasons.

¹¹⁹ NUREG-1140 at 80, 93. See also RTM-93, *supra* note 92, Table H-12 at p. H-50 (also using 10^{-3} as the *RF* for Am-241). The *RF* figure of 10^{-3} is highly conservative. The figure is a worst-case release fraction, was determined from experiments designed to maximize releases, and involved the placement of finely powdered material on top of a large amount of combustible material. NUREG-1140 at 17. By contrast, the relatively small quantity of combustible material in the Alpha Lab (along with numerous other factors) renders such a worst-case release highly unlikely. The conservatism of this number is even further highlighted by the fact that the *actual* *RF* for the Rocky Flats fire involving hundreds of kilograms of plutonium (an element to which NUREG-1140 assigns the same estimated *RF* as for Am-241) was verified empirically to be only about 10^{-8} . *Id.* at 44, 69.

¹²⁰ This conservative approach is consistent with our pronouncement in Final Rule, "Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees," 54 Fed. Reg. 14,051, 14,057 (Apr. 7, 1989):

In general, credit would not be given for filters because the accidents on which the need for emergency preparedness is based are severe accidents such as large fires, possibly with explosions, in which the filters are assumed to be destroyed or the release is assumed to occur through an unprotected release path, such as a hole burned in the roof of the building.

See also NUREG-1140 at 17 ("[n]o credit is generally given for design or operating features that could reduce releases . . . [e.g.,] filter systems during a fire").

First, as we noted earlier in this Order, NUREGs and Regulatory Guides serve merely as guidance and do not prescribe requirements on licensees;¹²¹ they simply are not binding in a legal sense. The Commission and its Staff are not limited therefore to considering only one dispersion model any more than the licensees are required to base their dose/dispersion arguments on only one dispersion model. For the dispersion model in Regulatory Guide 1.145 (or, for that matter, in NUREG-1140) to become a binding rule of law, the Commission would have to promulgate it as a regulation.¹²²

Second, Regulatory Guide 1.145 was never intended to address accidents at a materials licensee's facility. As indicated by its title ("Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants"), Regulatory Guide 1.145 was directed instead at accidents at nuclear power plants. Consequently, even if the Regulatory Guide's dispersion model were binding on the Commission in its examination of power plants, the model would not be binding on our examination of materials licenses, which are more appropriately analyzed under the rubric of NUREG-1140.

(ii) *Alleged Appropriateness of Using the Halitsky Model for Dispersions*

Up to 100 Meters

We disagree with the Intervenor's that the Halitsky model is more appropriate to use than the NUREG-1140 model when estimating dispersions up to 100 meters from the MURR facility. In 1988, the NRC Staff issued a NUREG that proffered a new methodology to assess offsite ground releases from nuclear power reactors for distances close to the release point, where building wake effect becomes important. NUREG/CR-5055, "Atmospheric Diffusion for Control Room Habitability Assessments" (May 1988). This new methodology was based on *empirical data* for ground releases for distances close to the release point (e.g., 10 to 100 meters) and therefore took into consideration building wake effects. These two significant features render this methodology more accurate than the one used in the Halitsky model 25 years earlier (and also the ones used in both Regulatory Guide 1.145 and NUREG-1140). Moreover,

¹²¹ See p. 98 *supra*. Regulatory Guides (such as 1.145) provide one methodology that the Staff would accept as proof that a licensee was complying with a particular NRC requirement. Other methodologies are acceptable, provided that a licensee furnishes sufficient justification.

¹²² The Commission has chosen not to codify dispersion models for either nuclear power reactors or nuclear materials. Many models assess public health hazard indicators such as dose, criticality, and radioactivity concentration in the environment. The errors in the final numbers produced by a model are dependent on computational accuracy as well as the errors in the model's fundamental assumptions and input parameters. Each model will have its own strengths and weaknesses, and will describe certain site-specific situations better than others. A generic model, such as the one in Regulatory Guide 1.145, must be extremely conservative if it is to bound all site-specific situations. By contrast, a site-specific model may appropriately include more realistic (i.e., less conservative) parameters. To date, no model can describe all site-specific situations accurately — or even all such situations better than the other models.

a comparison of χ/Q values derived using the more accurate NUREG/CR-5055 methodology with those derived using the NUREG-1140 methodology shows that, for distances between 10 and 100 meters, NUREG-1140's χ/Q values are the more conservative.

(iii) *Alleged Use of a "Magic Number" in NUREG-1140*

Finally, the Intervenor argues that the Commission should not rely on NUREG-1140 because that NUREG assumed a "magic number" of 10^{-6} as the maximum intercept fraction when calculating the inhalation dose,¹²³ and because this "magic number" was based on "realistic" rather than conservative assumptions.¹²⁴ According to the Intervenor, this "rule of thumb" or "magic number" is less precise than a good dispersion model such as Regulatory Guide 1.145 or the Halitsky model. II-IB at 46-47. *See also* Intervenor's Exhibit No. 20, *supra* p. 104, at 24-25 ¶94. The Intervenor misread NUREG-1140. The "magic number" was not used to calculate the χ/Q values provided in NUREG-1140, nor do we use it in calculating the χ/Q value in the instant proceeding.

b. *Computation of the Maximum Expected Offsite Inhalation Dose Level*

Once the standard for determining the dose level is established, it is possible to compute the maximum expected offsite inhalation dose level at various distances from the MURR facility.¹²⁵ Those dose levels turn out to be extremely

¹²³ The Intervenor is referring to the Staff's statement in NUREG-1140 at 10-11, that "[t]he intercept fraction for inhalation of 10^{-6} is considered to be about the maximum value likely to be inhaled in an accident" for a person standing at "a distance of 100 meters for the entire duration of the accident. . . . In other words, a person on the plume centerline is assumed to inhale at most about one-millionth of the material released."

¹²⁴ *See* NUREG-1140 at 16, where the Staff stated that "[t]he Commission's policy is that, 'Emergency planning should be based on realistic assumptions regarding severe accidents'" (*citing* NUREG-0885, "U.S. Nuclear Regulatory Commission Policy and Planning Guidance - 1985," at 6 (Issue 4, 1985)).

¹²⁵ First, the fundamental equations set forth *supra* at note 106 and p. 146:

$$\text{Inhalation Dose } (D(r)) = (DCF) \times (B) \times (\chi/Q) \times (Q)$$

$$\text{Release Quantity } (Q) = (Q_{\text{total}}) \times (RF)$$

are combined to yield the following expression of the dose rate:

$$D(r) = (DCF) \times (B) \times (\chi/Q) \times (Q_{\text{total}}) \times (RF).$$

Next, the five factors on the right side of this equation are replaced by the following numbers that are appropriate to reflect both a release of Am-241 (the limiting case) and the value of χ/Q at various distances from the Alpha Lab:

$$(DCF) = 530 \text{ rem}/\mu\text{Ci} \quad (\text{NUREG-1140 at 80, Table 13}).$$

$$(B) = 2.66 \times 10^{-4} \text{ m}^3/\text{sec} \quad (\text{NUREG-1140 at 12}).$$

$$(Q_{\text{total}}) = 3.43 \text{ Ci} \quad (\text{see note 112 } \textit{supra}).$$

$$(RF) = 10^{-3} \quad (\text{NUREG-1140 at 80, Table 13}).$$

$$(\chi/Q) = 3.3 \times 10^{-3} \text{ sec}/\text{m}^3 \text{ for } r = 100 \text{ m}$$

$$2.1 \times 10^{-3} \text{ sec}/\text{m}^3 \text{ for } r = 150 \text{ m}$$

$$1.6 \times 10^{-3} \text{ sec}/\text{m}^3 \text{ for } r = 200 \text{ m}$$

$$5.8 \times 10^{-4} \text{ sec}/\text{m}^3 \text{ for } r = 400 \text{ m}$$

$$(\text{NUREG-1140 at 13 (for meteorology condition F, 1 m/sec, no buoyancy)}).$$

small¹²⁶ — in fact, on the order of one-tenth those that might result from a hypothetical reactor accident at the University of Missouri's research reactor. See p. 153, *infra*.

3. *A Comparison of the Maximum Expected Offsite Inhalation Dose Levels with the Dose Levels Contemplated by the MURR Emergency Plan*

Now that the expected dose levels at various radii offsite have been determined, we turn to the question whether those levels are bounded by (i.e., less than) the dose levels contemplated by the MURR Emergency Plan. In comparing the two, we will also address the question whether the Emergency Plan can properly be considered to encompass the activities of the Alpha Lab (which was constructed after the Emergency Plan was written). The answer to each question is in the affirmative.

During the hearing, the University claimed that "[t]he MURR Facility Emergency Plan applies to all activities within the MURR Facility, which includes . . . the laboratories within the MURR building," and that the TRUMP-S experiments being conducted within the MURR building are consequently covered by the MURR Emergency Plan. Meyer Emergency Planning Affidavit, *supra* note 16, at 21 ¶74. The Intervenor dispute this assertion, arguing instead that the Emergency Plan was created before TRUMP-S was even thought of and consequently cannot "relate" to these experiments. II-IB at 23.

The Intervenor is correct in asserting that the University developed its MURR Facility Emergency Plan prior to beginning the TRUMP-S Project. However, this fact alone does not itself discredit the Emergency Plan as inadequate to cover an accident in the Alpha Lab involving TRUMP-S materials.

The Commission concludes that the Emergency Plan is sufficient to cover such an accident. Because the Emergency Plan is adequate to protect the public from a research reactor accident (and the NRC Staff has repeatedly found that it is — see note 84, *supra*), then *a fortiori* the Plan is sufficient to protect the public from a release of TRUMP-S materials. The principal hazards associated with an accident involving TRUMP-S material would stem from the inhalation or ingestion of strong alpha-emitting radionuclides.¹²⁷ By contrast, a research

¹²⁶ 1.60 rem at 100 meters, 1.02 rem at 150 meters, 0.77 rem at 200 meters, and 0.28 rem at 400 meters from the MURR facility.

¹²⁷ Both plutonium and uranium are principally alpha-emitters.

The University has correctly pointed out that the only risk of external exposure to the firefighters would come from the gamma radiation. Such exposure would be, at worst, minimal. For instance, 1 gram of Am-241 (the maximum amount that the University would use in any one experiment in the Alpha Lab) in the unshielded glove box would provide a direct dose to a firefighter of less than 100 mrem/hr at a distance of 10 feet. As noted earlier in this Order, this would hardly constitute a significant radiological hazard to firefighters. See p. 136, *supra*.

reactor release would include not only alpha-emitters but also noble gases, iodines, and other particulates such as cesium (none of which are principally alpha-emitters). Because the activity and diversity of radioactive materials in the research reactor's source term are much higher than the activity and diversity of the radioactive materials used in the TRUMP-S experiments, a release from a worst-case accident involving the MURR research reactor has a greater potential for harm to the public than does a worst-case accident involving TRUMP-S materials.

To demonstrate this point, we compare how two such hypothetical releases would affect a person standing approximately 500 feet from the MURR facility.¹²⁸ Under conditions of atmospheric inversion, a leakage from the reactor's containment building would result in a whole-body dose of roughly 10 rad (here, the same as 10 rem)¹²⁹ during a one-hour exposure period at a 500-foot radius.¹³⁰ By contrast, a release of actinides from the Alpha Lab would result in only a 1.02-rem whole-body dose during the same 1-hour period at approximately the same distance of 150 meters (492 feet). See pp. 151-52 of this Order, *supra*.

Viewed another way, if the University were applying today to add the Alpha Laboratory to a facility that did *not* already have an emergency plan, then the University would be required to submit for Commission approval an emergency plan that, among other things, provided for the evacuation of individuals who could be exposed to one or more rem if they remained in place for an hour after an accidental release. See NUREG-1140 at iv, 14. In the case of the Alpha Lab, this evacuation area would extend out to a radius of approximately 150 meters. However, the University has instead chosen to build the Alpha Lab in the MURR facility — a building with an agency-approved emergency plan that includes an evacuation area considerably larger than the one that would be required for a stand-alone Alpha Lab. Consequently, the MURR Facility Emergency Plan already provides all the protection (and more) that an emergency plan for the Alpha Lab would offer.

¹²⁸ Both the hypothetical reactor release and the hypothetical TRUMP-S release would take place at virtually the identical physical location, i.e., within the MURR facility.

¹²⁹ The number of rem equals the number of rad multiplied by a quality factor that reflects the type of radioactive emission. For noble gases (which would be the principal radioactive emission during the first hour of a reactor accident), the quality factor is 1. Consequently, in such an event, the number of rad would be equal to the number of rem.

¹³⁰ See "Safety Evaluation by the Test & Power Reactor Safety Branch, Division of Reactor Licensing," dated July 27, 1966, at 17 (the first 2-hour exposure at a radius of 500 feet would result in a person receiving less than a 20-rad whole-body dose). This document is part of the administrative record in AEC Docket No. 50-186, involving the University's July 1, 1965 application for authorization to operate MURR. The Safety Evaluation has been available in the Public Document Room since at least 1974. See "[Notice of] Proposed Issuance of Amendment to Facility License, Curators of the University of Missouri, Docket No. 50-186," 39 Fed. Reg. 19,801 (June 4, 1974).

4. *Changes Required in the MURR Facility Emergency Plan*

Although the Commission has determined that the MURR Emergency Plan does "relate" to the TRUMP-S experiments and is sufficient to bound effectively the dose levels resulting from an accident involving the materials used in those experiments, we have identified two features of the Emergency Plan that require clarification in order to ensure that the Plan adequately protects the public from a release of TRUMP-S materials in the event of a fire.

a. *The "Emergency Classes" and "Action Levels" in the Reactor Emergency Plan*

Intervenors argue that the "Emergency Classes"¹³¹ and "Action Levels"¹³² in the Reactor Emergency Plan are inadequate to ensure an effective fire department response to a fire involving TRUMP-S materials. II-IB at 21. We reject the Intervenors' argument as presented, on the ground that the University's methodology for classifying potential accidents was not intended to provide direction to the CFD on how to fight the fire. See Meyer Emergency Planning Affidavit, *supra* note 16, at 15-16 ¶¶ 51-53. However, for the reasons set forth below, we agree with the premise underlying the Intervenors' argument, i.e., that the University needs to describe its emergency classes and action levels more precisely in order to reflect adequately certain differences between the nature of the fires that might affect the MURR research reactor and nature of the fires that might affect nuclear materials in the MURR laboratories (including fires involving TRUMP-S material). To understand the importance of these

¹³¹ The MURR Emergency Plan defines "Emergency Classes" as "classes of accidents grouped by severity level for which predetermined emergency measures should be taken or considered." Emergency Plan at 21. This definition comports with that in ANSI/ANS-15.16-1982, *supra* p. 136, at 1. For purposes of this Order and proceeding, the terms "Emergency Class" and "Emergency Classification" are synonymous.

Nuclear power reactors have four emergency classes. These are, from the least to the most severe: Class 1 — Notification of Unusual Event; Class 2 — Alert; Class 3 — Site Area Emergency; and Class 4 — General Emergency. See 10 C.F.R. Part 50, Appendix E, § IV.C, and authority cited therein. By contrast, research reactors generally have only the first three of these emergency classes, and materials facilities have only the second and third of these emergency classes. See 10 C.F.R. §§ 30.32(i)(3)(iii), 70.22(i)(3)(iii) (specifying the two emergency classes for materials licenses); 10 C.F.R. §§ 30.4, 70.4 (defining the two emergency classes for materials licenses); RTM-93 at A-32 to A-33 (specifying the two emergency classes for materials licenses); 10 C.F.R. Part 50, Appendix E n.2 at 734 (1994) (referring to Regulatory Guide 2.6, "Emergency Planning for Research and Test Reactors" (Rev. 1, March 1983) which, at 2.6-1, in turn refers to the discussion in ANSI/ANS-15.16-1982, *supra*, at 3, 5, regarding the three emergency classes for most research reactors). Therefore, given that the emergency classes for a research reactor completely encompass the emergency classes for a materials facility, an emergency plan that covers a large research reactor will perforce also cover a materials laboratory located within the reactor facility.

¹³² The Emergency Plan defines "Emergency Action Levels" as "specific instrument readings, or observations; radiological dose or dose rates; or specific contamination levels of airborne, waterborne, or surface-deposited radioactive materials that may be used as thresholds for establishing emergency classes and initiating appropriate emergency measures." Emergency Plan at 21. This definition comports with that in ANSI/ANS-15.16-1982, *supra* p. 136, at 1. For purposes of this Order and proceeding, the terms "Emergency Action Levels" and "Action Levels" are synonymous.

differences, one must first understand the reasons why the classifications that the Commission assigns to reactor fires differ from those that we assign to materials fires. To that end, we offer the following background information.

As indicated in note 131 *supra*, the Commission has established four different classes of emergency for reactors — “NOUE,” “Alert,” “Site Area Emergency,” and “General Emergency.” Each of these classes is associated with particular action levels. “[F]acility emergencies, such as prolonged fires” affecting research reactors are classified as “NOUEs” *See* ANSI/ANS-15.16-1982, *supra* p. 136, at 3.¹³³ By contrast, the least serious fire in a materials facility such as the Alpha Lab requires the higher classification of “Alert.” This is because the amount of time available to mitigate the effects of a materials facility fire would presumably be shorter than the time available to mitigate the effects of an equally serious fire affecting the reactor.¹³⁴ For this reason, materials facilities may not use NOUE as an emergency class for fires, but instead must use either the “Alert” or “Site Area Emergency” classes.

The Commission’s Fuel Cycle and Materials Incident Emergency Classification scheme (the scheme applicable to the University’s materials licenses), as set forth in the Commission’s Response Technical Manual (RTM-93, *supra* note 92), specifies that a “Site Area Emergency” involving a materials facility includes a

[s]ignificant release possibly approaching EPA PAG levels. Radiation and contamination levels may require restricting areas offsite. Environmental sampling and offsite monitoring required.

while an “Alert” would include only

[p]ossible minor releases well below EPA PAG exposure levels. Environmental sampling and some offsite monitoring may be required.

RTM-93 at A-32 to A-33 (emphasis added).

With this background in mind, we turn to the classification scheme set forth in the MURR Emergency Plan. The Emergency Plan indicates that “[*s*]ignificant releases of radioactive materials as a result of experiment failures” is one of the situations that would qualify as merely an “Alert” rather than as a “Site Area Emergency.” Emergency Plan at 10 § 3.3 (emphasis added). To the extent that

¹³³ ANSI/ANS-15.16-1982 is relied upon in Regulatory Guide 2.6, “Emergency Planning for Research and Test Reactors” at 2.6-1 (Rev. 1, March 1983), which in turn is relied upon in 10 C.F.R. Part 50, Appendix E n.2.

¹³⁴ Compare Final Rule, “Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees,” 54 Fed. Reg. 14,051, 14,056 (April 7, 1989) (“in many instances, it would not be possible to reduce exposures offsite [due to a fire at a materials facility] because there would not be enough time”), with ANSI/ANS-15.16-1982, *supra* p. 136, at 3 (“There is usually time available to take precautionary and corrective steps to . . . mitigate the consequences” of a reactor accident).

this language applies to a fire involving materials licensed pursuant to 10 C.F.R. Part 30 or 70, the language is inconsistent with the above-quoted definitions from our Response Technical Manual.¹³⁵

The University's classification scheme also describes the following action level as a "NOUE:"

[p]rolonged fire or explosion within the facility that can result in a release of radioactivity that would cause *exposures* of the public or Staff *approaching 1 rem whole body or 5 rem thyroid*.¹³⁶

To the extent that this language applies to a fire involving materials licensed pursuant to 10 C.F.R. Part 30 or 70, the language is inconsistent with the above-quoted definitions from the Response Technical Manual. The "NOUE" action level's reference to "exposures . . . approaching 1 rem" equates to a similar reference in the "Response Technical Manual's definition of "Site Area Emergency," in which the Commission referred to a "release possibly approaching EPA PAG [exposure] levels" — levels that are 1-5 rem. See Environmental Protection Agency, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents* at p. 2-6, Table 2-1 (EPA 400-R-92-001, October 1991).

To correct these inconsistencies, we require that the University modify its MURR Emergency Plan in the following two respects. First, the Emergency Plan's classification scheme must clarify that the current "NOUE" action level 5 applies only to a reactor fire, and not to a laboratory fire involving nuclear materials. Compare MURR Emergency Plan at 25-26, Table 1, "NOUE" action level 5. Second, the classification scheme must clarify that either a "prolonged fire" affecting nuclear materials or a "significant release possibly approaching EPA PAG levels" of such materials would constitute a "Site Area Emergency." Compare MURR Emergency Plan at 25-26, Table 1, "NOUE" action level 5.

b. Attendance in the Reactor Control Room

On appeal, the Intervenor's argue that the University's fire response planning is insufficient to protect against a fire in the Alpha Lab because the reactor control room will be understaffed, or even unattended, at certain times. II-IB at 25-27; I-RB at 16-17. The University responds that the safety of the Alpha Lab would be enhanced by the fact that its various smoke, heat, and

¹³⁵ We note, however, that the language is perfectly adequate to the extent that it applies to fires affecting the MURR reactor. See ANSI/ANS-15.16-1982, *supra* p. 136, at 3 ("Situations that may lead to [an "Alert"] class include . . . significant releases of radioactive materials as a result of experimental failures").

¹³⁶ MURR Emergency Plan at 25-26, Table 1, "NOUE" action level 5 (emphasis added). We recognize that the University's reference to "5 rem thyroid" would apply only to a reactor release. See p. 153, *supra*.

radioactivity alarms would be continuously monitored by three reactor operators in the MURR facility during all modes of operation (including shutdown for maintenance or refueling).¹³⁷ We agree with the Intervenor on this point. Two of the University's germane licensing documents indicate that the reactor would, at times, be completely unattended.

The first of these documents is the MURR facility's own *Hazards Summary Report* (July 1, 1965), which the University submitted to the Commission in support of its application for a Class 104 Utilization Facility License.¹³⁸ That document indicates that only one operator is required to be in the control room during normal operations of the reactor (with another in the vicinity), that a minimum of two operators is required to be on duty during preoperational checkout, operation, and shutdown procedures, and that the control room is left unattended when the reactor is shut down. *Hazards Summary Report* ¶¶ A.4.3(2), 12.2.6, 11.8.2, and A.4.4(5). The second document is one of the MURR facility's technical specifications, which provides that "[t]here will be two facility staff personnel at the facility during reactor operation. One of these persons must be a licensed reactor operator or senior reactor operator and the second person must be knowledgeable of the facility." License No. R-103, AEC Docket No. 50-186, Technical Specification No. 6.1.i, dated July 9, 1974, at 8 of 8 (emphases added).

Regarding the Intervenor's concerns about understaffing of the control room during TRUMP-S experiments, we consider the probability of accidents occurring simultaneously in the MURR reactor and the Alpha Lab to be too low to justify a requirement that the University add another person to the Control Room staff during the operation of the reactor for the sole purpose of monitoring the Alpha Lab alarms. Such an addition would be contrary to health and safety in that it would increase both the personnel and the potential distractions in the Control Room without contributing to the Control Room's principal purpose — reactor safety.

This concern does not apply, however, to the periods when the Reactor Control Room is not staffed at all. Under those circumstances, we will require that, whenever TRUMP-S experiments are being conducted, the University place at least one TRUMP-S experimenter in the Alpha Lab and also ensure that a second person who is familiar with the MURR facility in general and

¹³⁷ U Mo RB at 73 n.40. See also Licensee's Exhibit No. 25, *supra* note 82, at 3 ¶6; Licensee's Exhibit No. 24, *supra* note 100, at 11, 35, 44; Licensee's Exhibit No. 20, *supra* p. 131, at 21 ¶55; Meyer Emergency Planning Affidavit, *supra* note 16, at 9 ¶28-29, 14 ¶44-45; Licensee's Exhibit No. 1, *supra* note 12, at 10 ¶26.6; Licensee's Written Presentation at 41; Application for Amendment to License No. 24-00513-32 at 10 and Application for Amendment to License No. SNM-247 at 10, each of which describes the smoke detector and fire alarm for the Alpha Laboratory (Staff submitted these two applications into the record on June 21, 1990).

¹³⁸ The Intervenor submitted other portions of this same document as Exhibit No. 4 to their Motion for Leave to Submit Evidence Respecting Critical Safety Failures Identified in Site Inspection of May 18, 1991, dated May 22, 1991.

the Control Room and Alpha Lab in particular (such as a Health Physicist or Reactor Operator) is present in the MURR facility. As an alternative, the University may assign this latter individual to the Alpha Lab or the Reactor Control Room (to monitor the Alpha Lab's alarms), and also require that the TRUMP-S experimenter be present in the MURR facility. The presence of these two individuals will ensure that sufficient staff is available to monitor for a fire (either directly by watching the interior of the Alpha Lab or indirectly by observing the Alpha Lab annunciators in the Reactor Control Room), and to react to any such fire (by using the fire extinguisher and calling the onsite and/or offsite emergency response organizations).

Finally, when no TRUMP-S experiments are being conducted and the Reactor Control Room is unstaffed, the University must ensure either that at least one person who is familiar with the MURR facility in general and the Control Room and Alpha Lab in particular is present in the MURR facility or that any actinide sample within the glove box is placed in a fireproof container.¹³⁹

5. *Additional Fire Safety Conditions Imposed by the Presiding Officer or Requested by the Intervenors*

In his Final Initial Decision, the Presiding Officer required the University to take one of the following three actions:

Disclose procedures (or adopt new procedures) that ensure a fire loading and continuity of burnable materials (in the basement outside the Alpha Laboratory) that will assure conditions equivalent to those observed by Mr. Purington; [n.111] [or]

Propose procedures ensuring a new maximum loading (and continuity), higher than observed by Mr. Purington, and demonstrate by analysis or expert testimony that the new maximum loading (and continuity) will prevent a credible fire from spreading into the Alpha Laboratory from outside; or

Install an automatic fire sprinkler system in the rectangular area outside the Alpha Laboratory. [n.112]

- n.111: Vehicles that rely on combustible fuels must, of course, be effectively excluded from the basement during any time actinides are in use in the laboratory.
- n.112: If this is done, further changes in procedures are unnecessary *except* for the effective exclusion of vehicles with combustible fuel from the basement while actinides are in use in the laboratory. . . .

¹³⁹ The conditions set forth in the last two paragraphs of this section's text are consistent with the University's existing commitment to staff the MURR control room 24 hours a day, every day of the year, with NRC-licensed reactor operators. See Licensee's Exhibit No. 25, *supra* note 82, at 3 ¶6; Licensee's Exhibit No. 24, *supra* note 100, at 11; Licensee's Exhibit No. 20, *supra* p. 131, at 21 ¶55; Meyer Emergency Planning Affidavit, *supra* note 16, at 9 ¶28, 14 ¶44; Licensee's Written Presentation at 41.

LBP-91-31, 34 NRC at 90 (emphasis and footnotes in original). *Accord id.* at 130. In his Order on Reconsideration, the Presiding Officer offered a clarification of his phrase "while actinides are in use":

"In use" means that actinides are actively being used in some way in the laboratory, such as for an experiment or for cutting into different portions for subsequent experimentation. The phrase was not intended to exclude all gasoline-powered vehicles from the MURR basement during the entire duration of the experimental period. The presence of small amounts of contamination in the glove box and associated filters, due to routine operations, would not require exclusion of the vehicle.

There is, of course, the chance of an unanticipated accident, such as a spill of powdered actinide. In such an event, Licensee would be expected to take appropriate extraordinary precautions, which generally would require exclusion of gasoline-powered vehicles from the vicinity of a large spill. The purpose of excluding a combustible-fuel vehicle is to exclude a source of fire that might exceed the expected fire loading or not be easily controlled by a water sprinkler system.

LBP-91-34, 34 NRC at 161-62.

On appeal, the Intervenor urge the Commission to impose still more conditions upon the University (I-RB at 34-37). Conversely, the University asserts that the Presiding Officer's requirement (especially his restrictions on the use of combustible-fueled vehicles) is too harsh and should be relaxed (U Mo IB, *passim*).

The Commission, of course, is not a general fire safety or occupational health agency. With regard to fire safety, the Commission's role is limited. Our responsibility is directed to the hazards associated with nuclear materials rather than to all questions of fire safety at licensed facilities. It is from this perspective that we examine the fire-safety conditions imposed by the Presiding Officer and evaluate the additional conditions advocated by the Intervenor. In general, we find that the Presiding Officer properly insisted that the University take all reasonable measures to prevent fires affecting the Alpha Lab and the TRUMP-S materials.

a. Fire Prevention Procedures

**i. PROHIBITION OF THE OPERATION OF COMBUSTIBLE-FUEL VEHICLES
WHILE ACTINIDES ARE IN USE IN THE LABORATORY**

As noted above, in two of the three choices that he offered to the University, the Presiding Officer included a prohibition against combustible-fuel vehicles in the basement while actinides are in use. LBP-91-31, 34 NRC at 90 nn.111-112 and at 130 nn.199-200; LBP-91-34, 34 NRC at 161-62. The University requests that we rescind this condition on the ground that it is unduly burdensome.

U Mo IB at 2, 21-37. For the reasons stated below, we approve the condition, but modify it in one significant respect.

Any heavy self-propelled vehicle operating next to the Alpha Laboratory wall has the potential to breach the wall and degrade it as an effective fire barrier, and also conceivably to damage the sprinkler system (depending upon the location of the sprinkler heads and branch lines). In addition, a self-propelled vehicle using combustible fuel has the potential to supply a flammable liquid fuel and an ignition source to the laboratory area. Based on these two potential consequences, either of which could promote the spread of fire into the Alpha Laboratory, we agree with the Presiding Officer that restrictions on the use of such vehicles are prudent.

We do not think it necessary, however, to ban combustible-fuel vehicles from the entire basement. Rather, we limit this restriction to the rectangular basement area south of the Alpha Laboratory while separation or experimentation with actinides is taking place in the laboratory. We do not require that the University exclude combustible-fuel vehicles from the other areas of the basement during such experimentation or separation. This revision limits the prohibition to the location in which it is needed, i.e., the area adjacent to the Alpha Laboratory.

Because the University expects to use the combustible-fuel forklift primarily (if not exclusively) to conduct activities in portions of the basement remote from the Alpha Laboratory (*id.* at 31-32 & n.31), our requirement does not impose undue burdens on the Alpha Laboratory, the TRUMP-S experiments, or the University.

ii. PROHIBITION OF THE ACCUMULATION OF COMBUSTIBLES ANYWHERE IN THE BASEMENT

The Intervenors urge us to prohibit the accumulation of combustibles anywhere in the basement. I-RB at 35. We decline to go so far. For the following reasons, we conclude that the present fire loading¹⁴⁰ in the basement is significantly less than that required to pose a threat to the wall or doors separating the basement from the Alpha Laboratory.

For a basement-area fire sufficiently large both to raise the air temperature in the entire basement to very high temperatures and to sustain that high

¹⁴⁰ Mr. Purington defines "fire load" as "the amount of fuel available for combustion in any given fire area. Typically this value is given in terms of pounds of combustibles per square foot of floor area (lb/ft²).\" Licensee's Exhibit No. 19, Affidavit of Robert G. Purington Regarding Fire Protection at the Alpha Laboratory, dated Jan. 28, 1991, at 11. Combustible weight is given in equivalent pounds of wood, and is therefore referred to as "equivalent combustible weight."

temperature, we must assume that the *entire* "derated" fire load¹⁴¹ of the basement (other than the Alpha Laboratory) would become involved in the fire. Applying the appropriate industry standards, we conclude that the basement's derated fire load is insufficient to provide enough fuel for a fire to breach the Alpha Lab's doors or walls.¹⁴²

In addition, the sprinklers outside the laboratory will lower the temperatures in the loft and wall area and will prevent the fire rating from being exceeded.¹⁴³ When we consider these facts, together with the installation of sprinkler coverage inside the Alpha Laboratory,¹⁴⁴ the placement of fire extinguishers in the

¹⁴¹ In the Licensee's fire loading calculation, combustibles contained in metal enclosures were "derated" in accordance with NFPA, *Fire Protection Handbook*, *supra* note 92, at pp. 7-112 to 7-113 (1986). The basis for derating is the fact that ordinary combustibles that are entirely or largely enclosed in steel containers will not burn completely and therefore will not contribute their full heat of combustion to the fire load. *Id.* at p. 7-112. The degree of derating is a function of the ratio of the weight of the enclosed combustibles to the weight of the total combustibles. In the MURR basement, the equivalent combustible weight of enclosed combustibles is 9747.5 lbs (out of a total equivalent combustible weight of 10,474.8 lbs). "Fire Load Calculation" at 2, appended as Attachment A to Licensee's Exhibit No. 20, *supra* p. 131. This results in a combustible ratio of 0.93 (i.e., $9747.5 \div 10,474.8$). The derating factor for ratios in excess of 0.8 is 0.1. *See* NFPA, *Fire Protection Handbook*, *supra*, at p. 7-113.

To determine the total derated fire load, the derated and nonderated portions of the fire load are added, and then this sum is divided by the square footage of the MURR basement. The nonderated portion of the fire load equals the total fire load of 10,474.8 lbs less that portion of the total fire load which is subject to derating, i.e., 9747.5 lbs. This difference equals 727.3 lbs. The derated portion of the fire load equals the portion of that total fire load which is subject to derating, i.e., 9747.5 lbs, multiplied by the rating factor of 0.1. This yields a derated load of 974.7 lbs. The addition of the non-derated load of 727.3 lbs and the derated load of 974.7 lbs yields a total derated fire load of 1702 lbs. Finally, this sum is divided by 3424 ft² (the square footage of the MURR basement) to compute the fire load per square foot — 0.5 lbs/ft². (Even without derating, the fire load is still quite small — 3.05 lbs/ft² ($10,474.8 \text{ lbs} \div 3424 \text{ ft}^2$).)

¹⁴² For ordinary combustibles such as the ones in the MURR basement (*see* Licensee's Exhibit No. 4, *supra* note 78, at 3-5 ¶¶ 13-15, and 8-9 ¶¶ 35, 37, 38; Licensee's Exhibit No. 5, *supra* note 42, at 3-4 12-13; "Fire Load Calculation," *supra* note 141, at 2), fire load can be related to fire severity as determined by the standard time-temperature curve using tables such as Table 7-9B of the NFPA's *Fire Protection Handbook*, *supra* note 92, at p. 7-111. The smallest fireloading shown in that table is 5 lbs/ft², resulting in a maximum fire severity of 30 minutes. Given that the basement's derated fire loading (0.5 lbs/ft²; *see* note 141, *supra*) is only one-tenth of the level necessary to support (i.e., provide fuel for) the 30-minute fire in Table 7-9B, we conclude that the basement's fire load could not support a fire of sufficient duration to breach the Alpha Lab's doors (rated at 20 minutes; *see* Licensee's Exhibit No. 4, *supra* note 78, at 6 ¶22) or walls (rated at 40 minutes; *see* "Fire Resistance Calculations for the Alpha Laboratory" at 5, appended as Attachment A to Licensee's Exhibit No. 24, *supra* note 100).

¹⁴³ *See* Letter from T. Lew Pitchford and Dr. Susan M. Langhorst (University of Missouri) to Mr. John Jones (NRC Region III), dated July 3, 1991, at 1; U Mo IB at 38 (providing a brief description of the new automatic sprinkler system). *See also* Application for Renewal of the University of Missouri Broad Scope License No. 24-00513-32, dated Feb. 27, 1992, at 59 ¶9.3 (the Licensee has installed an automatic wet pipe sprinkler system in the Alpha Laboratory, entry airlock, loft area, and adjacent basement area).

¹⁴⁴ *See* note 143, *supra*.

laboratory and MURR basement,¹⁴⁵ the licensee's fire-related procedures,¹⁴⁶ the routine fire-related housekeeping measures,¹⁴⁷ the installation of smoke/heat/fire detectors,¹⁴⁸ and the routine fire safety patrols,¹⁴⁹ we conclude that the prohibition proposed by the Intervenor is unnecessary.

b. Fire Detection

In the event that part or all of the sprinkler system becomes inoperable, the University proposed to take one of the following two compensatory measures: either post a 24-hour fire watch in the location covered by the inoperable portion(s) of the sprinkler system, or adopt new procedures relating to fire loading and continuity (as permitted in the Final Initial Decision). U Mo IB at 38-39, *referring to* LBP-91-31, 34 NRC at 90, 130. We will require that a fire watch be in effect whenever both of the following two situations exist: (a) experiments or separation are in progress in the Alpha Laboratory and (b) any part of the sprinkler system located in or immediately outside the Alpha Lab is inoperable. However, because the alternative condition regarding the establishment of new procedures is too ill-defined to provide any ascertainable level of protection, we do not approve it.

¹⁴⁵ The laboratory contains two 5-pound halon extinguishers, one dry chemical extinguisher, and one MET-L-X extinguisher (for combustible metals). In addition, four 5-pound CO₂ extinguishers and one dry chemical extinguisher are located in the basement area where the Alpha Laboratory is housed. Meyer Emergency Planning Affidavit, *supra* note 16, at 8-9 ¶¶27, 30; Licensee's Exhibit No. 19, *supra* note 140, at 19 ¶8. We consider these extinguishers to be adequate for the laboratory size, nature of combustibles, and potential ignition sources in the laboratory. See NFPA, *Fire Protection Handbook*, *supra* note 92, at 20-14 to 20-15 (Table 20-2A, providing the characteristics for various types and sizes (weights) of portable fire extinguishers; these characteristics include the range of stream, the duration of discharge, and the UL classification), and p. 20-23 (Table 20-2B, providing basic extinguisher requirements in terms of maximum travel distance to extinguishers and maximum size of area to be protected per extinguisher for Class A hazards (ordinary combustibles)). However, to state the obvious, fire extinguishers qualify as a mitigating factor only when personnel are in the laboratory.

¹⁴⁶ For instance, the University's Emergency Procedures provide for notification of the reactor control room as to nature and location of the fire and also notification of the Columbia Fire Department. See FEP-3(a), Control Room Response to Alpha Laboratory Fire, appended as Attachment 3 to Meyer Emergency Planning Affidavit, *supra* note 16.

¹⁴⁷ See Licensee's Exhibit No. 5, *supra* note 42, at 6 ¶20.

¹⁴⁸ Inside the Alpha Laboratory, there are smoke detectors mounted on the ceiling, a smoke detector mounted inside the laboratory exhaust duct, and smoke detectors mounted on the ceiling above the loft area. In addition, activation of the automatic sprinkler system will trigger an alarm. Each of these will activate an alarm at a local alarm panel that will in turn activate an alarm in the reactor control room. See Meyer Emergency Planning Affidavit, *supra* note 16, at 9 ¶28; Licensee's Exhibit No. 25, *supra* note 82, at 3 ¶6; Licensee's Exhibit No. 1, *supra* note 12, at 10 ¶26.6 ("two smoke detectors are present in the laboratory"), appended to Licensee's Written Presentation; Application for Amendment to License No. 24-00513-32 at 10 and Application for Amendment to License No. SNM-247 at 9, each of which describes the smoke detector and fire alarm for the Alpha Laboratory; Application for Renewal of the University of Missouri Broad Scope License No. 24-00513-32, dated Feb. 27, 1992, at 59 §9.3.

¹⁴⁹ See Licensee's Exhibit No. 24, *supra* note 100, at 11; Licensee's Exhibit No. 20, *supra* p. 131, at 21 ¶55, 22 ¶58b.

c. Fire Suppression

The Intervenor urge the Commission to require that the University install sprinklers in the entire MURR facility or, at the very least, in the entire basement. I-RB at 34. Given the basement's fire loading as described in the record, we do not believe that the installation of sprinklers in the remaining areas of the basement is necessary.

The installation of a wet-pipe automatic sprinkler system in the laboratory and adjacent rectangular area of the basement¹⁵⁰ undoubtedly has reduced the likelihood of a serious fire affecting the Alpha Laboratory. However, because of the need for a high degree of reliability in the sprinkler system, we will require that the licensee follow the requirements for valve supervision as specified in NFPA 801, "Recommended Fire Protection Practice for Facilities Handling Radioactive Materials," and shall inspect, test, and maintain the system in accordance with NFPA 25, "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems."

D. The Presiding Officer Did Not Err in Excluding the Intervenor's Other Areas of Concern

1. Nuclear Proliferation and the Common Defense and Security

In an order issued June 15, 1990, the Presiding Officer excluded from consideration the Intervenor Organizations' sixth area of concern, regarding nuclear proliferation (and also waste disposal). LBP-90-18, 31 NRC 559, 569-70 (1990). *See also* unpublished Memorandum and Order (Motion to Strike Portions of Intervenor's Rebuttal), issued Jan. 23, 1991, slip op. at 3. In an order dated August 28, 1990, he rejected similar arguments proffered by the Individual Intervenor. Unpublished Memorandum and Order (Admitting Parties and Deferring Action on Stay), issued Aug. 28, 1990, slip op. at 5-7. Intervenor had argued to the Presiding Officer that the "public interest" precluded the Commission from approving the University's license applications because the University's project would be "inimical to the common defense and security" and would exacerbate the nation's nuclear waste disposal problems.¹⁵¹

More specifically, the Intervenor contended that the University's research project would, if successful, adversely affect efforts to restrain nuclear prolifer-

¹⁵⁰ See documents cited in note 143, *supra*.

¹⁵¹ Intervenor Organizations' "Reply Memorandum . . . in Support of Request for Hearing and Stay Pending Hearing," dated June 12, 1990, at 14-15, *citing* AEA § 57, 42 U.S.C. § 2077(c)(2) and 10 C.F.R. § 70.31(d); Individual Intervenor's Petitions for Leave to Intervene [and] Request for Stay, dated Aug. 6, 1990, at 4-6, 9; Intervenor Organizations' Request for Hearing and Stay Pending Hearing, dated May 10, 1990, at 5. *See also* Intervenor's Written Presentation at 53-55; Intervenor's Request for Hearing and Stay Pending Hearing, dated Nov. 2, 1990, at 5.

ation. They reasoned that the project, if it resulted in a useful process, would lead to commerce in large amounts of separated weapons-usable materials. According to the Intervenor, such commerce would carry with it the risk that the nuclear material could be diverted for warheads which could be sold in the black market and/or used by terrorists.¹⁵² The Intervenor further asserted that the extraction of transuranics from the nuclear waste would undermine the government's efforts to obtain international agreement to the renewal of the Non-Proliferation Treaty.¹⁵³

In his June 15 and August 28, 1990 orders, the Presiding Officer rejected this entire line of argument on grounds of relevance. He concluded that it was improper for him to consider the project's effect on nuclear proliferation unless the project would violate a treaty, law, regulation, or Commission guidance, and that the Intervenor had pointed to no such violation. LBP-90-18, 31 NRC at 570 (regarding law or treaty); unpublished Memorandum and Order (Admitting Parties and Deferring Action on a Stay), issued Aug. 28, 1990, slip op. at 6 (regarding regulations or guidance). The Presiding Officer also ruled that the project did not violate the general provisions of either section 57 of the AEA or section 70.31(d) of the Commission's regulations, each of which prohibits issuance of NRC licenses that would be "inimical to the common defense and security." LBP-90-18, 31 NRC at 570 n.9, *citing* AEA § 57, 42 U.S.C. § 2077(c)(2) (1988), and 10 C.F.R. § 70.31(d). In the Final Initial Decision, the Presiding Officer referred to his earlier ruling in LBP-90-18, but did not discuss the issue further. LBP-91-31, 34 NRC at 34 n.*, 102 n.145.

On appeal, the Intervenor reiterates many of their earlier arguments. IS-IB at 5, 13-14. Intervenor also challenges the Presiding Officer's ruling that the test for consideration of issues related to common defense and security is whether the licensee would violate a law or treaty, or whether the project is illegal. According to the Intervenor, the test is instead simply whether the project is inimical to the common defense and security. Finally, the Intervenor argues that, contrary to the Presiding Officer's ruling denying the admissibility of this area of concern, the Commission's Subpart L procedural regulations require Intervenor only to describe an area of concern, not to brief it fully. *Id.* at 14, *quoting* Final Subpart L Rule, *supra* note 52, 54 Fed. Reg. at 8272. For the reasons set forth below, we accept the Intervenor's position as to the proper litmus test for consideration of an argument regarding nuclear proliferation, but

¹⁵² Intervenor Organizations' "Reply Memorandum . . . in Support of Request for Hearing and Stay Pending Hearing," dated June 12, 1990, at A-16 and A-20 ("Declaration of James C. Warf and Daniel O. Hirsch" at 3 and 7); Intervenor Organizations' Request for Hearing and Stay Pending Hearing, dated May 10, 1990, at 5. *See also* Intervenor's Written Presentation at 53-55; Intervenor's Exhibit No. 16, Declaration of George Bunn, dated Aug. 28, 1990, at 3, attached to Intervenor's Written Presentation.

¹⁵³ Individual Intervenor's Petitions for Leave to Intervene [and] Requests for Stay, dated Aug. 6, 1990, at 4. *See also* Intervenor's Written Presentation at 55; Intervenor's Exhibit No. 16, *supra* note 152, at 3. The Intervenor raised several other related arguments before the Presiding Officer, but did not preserve them on appeal.

nevertheless reject the Intervenor's position that they should have been allowed to litigate this area of concern.

The Commission's Subpart L procedural regulations impose upon the Intervenor the burden of showing that this area of concern is "germane to the subject matter of [this] proceeding." 10 C.F.R. § 2.1205(g) (1992). In other words, it must "fall generally within the range of matters that are properly subject to challenge in [this] proceeding." Final Subpart L Rule, *supra* note 52, 54 Fed. Reg. at 8272. We agree with the Intervenor that they may argue that the TRUMP-S project is "inimical to the common defense and security," and not just that the project would contravene a particular regulatory guidance, regulation, statute, or treaty. The Intervenor is also correct in their view that they may address whether weapons-usable material will be properly protected from theft or diversion. *See generally Georgia Power Co.* (Vogtle Electric Generating Plant, Units 1 and 2), CLI-93-16, 38 NRC 25, 41 (1993) (refusing to read a procedural regulation in such a way that would "have the unintended effect of prohibiting petitioners from raising issues otherwise germane to a proceeding").

Intervenor is not entitled, however, to litigate this area of concern unless the specific "common defense and security" risk asserted by the Intervenor in this proceeding is reasonably related to, and would arise as a *direct* result of, the specific license amendments that the University asks the Commission to approve in this proceeding. *See United States Department of Energy* (Clinch River Breeder Reactor Plant), CLI-82-23, 16 NRC 412 (1982), *rev'd and remanded per curiam on other grounds sub nom. Natural Resources Defense Council v. NRC*, 695 F.2d 623 (D.C. Cir. 1982), in which the Commission rejected the contention that "going forward with the breeder reactor program would increase the threat of a nuclear war and complicate non-proliferation problems." 16 NRC at 425. In *Clinch River*, the Commission found this argument "irrelevant . . . because the initiation of site preparation activities [the action at issue in that proceeding] [would] not lead *directly* to the production of plutonium or commit the Commission to authorize construction of [the Clinch River Breeder Reactor]." *Id.* (emphasis added). The Commission and the federal courts have applied the same principle in determining whether a party has standing to participate in a proceeding. *See, e.g., Lujan v. Defenders of Wildlife*, ___ U.S. ___, 112 S. Ct. 2130, 2136 (1992); *Transnuclear, Inc.* (Ten Applications for Low-Enriched Uranium Exports to EURATOM Member Nations), CLI-77-24, 6 NRC 525, 531 (1977); *Edlow International Co.* (Agent for the Government of India on Application to Export Special Nuclear Material), CLI-76-6, 3 NRC 563, 570 (1976), *rendered moot on appeal, Natural Resources Defense Council v. NRC*, 580 F.2d 698 (D.C. Cir. 1978) (*per curiam*).

Here, the University's proposed research does not lead "directly" to nuclear weapons proliferation. Rather, the research is many steps removed from even the possibility of such proliferation. First, even if the University's initial research

is successful, Congress or DOE may still choose (for policy, economic, or other reasons) not to authorize the additional research necessary to render the process commercially viable. Second, if such a second round of research is authorized, it still may not be successful. Third, if the second round of research is both authorized and successful, the federal government and industry may still choose not to use the process, again due to policy, economic, or other considerations (such as the availability of a more preferable means of nuclear waste disposal). And fourth, if the federal government and industry do choose to use the process, the government can still regulate the use and distribution of the process so as to preclude the nuclear weapons proliferation that the Intervenor's fear. Only at this fifth stage would the Intervenor's concerns about proliferation and safeguards become ripe for concern. We are loath to halt basic research in its tracks on the purely speculative ground that its fruits may someday be put to improper use.

It will be up to future policymakers to decide whether and how to use the results of the University's research. The policymakers' future decision may be the proximate cause of the Intervenor's concerns, but the basic research itself cannot be. The connection is simply too remote and speculative, being premised upon the future third-party activities that are unrelated to the specific activities authorized by the license amendments. Consequently, we conclude both that the Intervenor's "proliferation" area of concern is not a direct consequence of the proposed license amendments (or the Commission's approval thereof), and that the Presiding Officer correctly excluded it from the scope of this proceeding.

2. Disposal of TRU and Mixed Wastes

The University in both of its amendment applications indicated that most of the waste to be generated during the TRUMP-S Project will be contamination-control and cleanup waste (such as Kimwipes, gloves, and contaminated clothing) containing either depleted uranium or less than 100 nanocuries of plutonium per gram of waste, and that this waste would be incorporated into the MURR Radwaste Program for disposal through a radioactive waste broker. The University also proposed to package, label, and store separately any TRU wastes,¹⁵⁴ and expected DOE to accept and dispose of these wastes. Finally, the University indicated that all wastes would ultimately be processed so as to be nonhazardous and that, consequently, none would qualify as mixed waste. Application for Amendment to License No. SNM-247, dated Feb. 20, 1990, at 18-19; Application for Amendment to License No. 24-00513-32, dated March 9, 1990, at 19-20.

¹⁵⁴ Because the TRUMP-S experiments create no new TRU, they will yield no TRU waste *per se*. The term "TRU waste" refers instead to items on which TRU has been deposited (e.g., Kimwipes, gloves, and contaminated clothing) as a result of the TRUMP-S experiments.

The Individual Intervenors, in their Petition for Leave to Intervene, presented as one of their areas of concern the issue of waste disposal. Specifically, they argued that no waste disposal sites are currently licensed to receive the TRU and mixed wastes that the University's TRUMP-S Project will generate, and that the University may therefore be constrained to store such wastes on site at least into the next century — a situation that the University is not equipped to handle. Individual Intervenors' Petitions for Leave to Intervene [and] Requests for Stay, dated Aug. 6, 1990, at 3-4.

The Presiding Officer declined to admit this area of concern. He reasoned that the Individual Intervenors had cited no regulatory authority requiring the Licensee to include its waste disposal plan in its application, and that the Presiding Officer knew of no such authority. Unpublished Memorandum and Order (Admitting Parties and Deferring Action on a Stay), issued Aug. 28, 1990, slip op. at 4. The Presiding Officer also noted that the Licensee had responded to Individual Intervenors' argument by explaining in detail how it plans both to limit the radioactivity of its wastes and to dispose of such wastes. *Id.* at 5, citing Response of Licensee to "Petitions for Leave to Intervene; Requests for Stay," dated Aug. 20, 1990, at 6-14.

On appeal, the Individual Intervenors contend that the Presiding Officer erred in excluding this area of concern. They essentially reiterate their prior arguments — specifically asserting that the project will generate TRU and mixed wastes; that no sites currently exist in which to dispose of either; that the University cannot lawfully ship the transuranic wastes and must therefore store them indefinitely on site; and that it is not equipped to do so. According to the Individual Intervenors, these facts raise questions respecting hazards of accidents such as fire or other exposure, are therefore "germane to the subject matter of the proceeding," and should not have been excluded. II-IB at 8, *quoting* 10 C.F.R. § 2.1205(g).

Individual Intervenors take particular issue with the Presiding Officer's reasoning, viz., that the Intervenors had not cited any regulatory authority that would require the University to include its waste disposal plan in its application. Individual Intervenors contend that Subpart L contains no provision mandating such a citation of authority, and that the Intervenors should be permitted to raise this area of concern if it relates to the question whether the amendments provide an adequate assurance of safety and minimize danger to life. II-IB at 8.

The Commission affirms the Presiding Officer's decision to exclude the "waste disposal" area of concern. Given DOE's firm commitment to take any TRU and mixed waste,¹⁵⁵ DOE's current possession of the available technology

¹⁵⁵ See Letter from Kenneth R. Qutoriano, Project Manager, Nuclear Energy Division, Department of Energy, to Mr. M.J. Gabler, Program Manager, Technology Programs, Rocketdyne Division, Rockwell International Corp., dated July 30, 1990, at 1.

to manage at least 67 tons of spent fuel,¹⁵⁶ the small potential amount of such waste at issue here,¹⁵⁷ and the University's experience in handling mixed waste,¹⁵⁸ we cannot conclude that there is any realistic danger in the University keeping such waste on site until DOE is in a position to collect it or that the Presiding Officer erred in excluding the "waste disposal" area of concern.¹⁵⁹

3. Decommissioning

The Presiding Officer in his Final Initial Decision denied the Intervenor's requests to accept their area of concern regarding the decommissioning of the Alpha Lab. LBP-91-31, 34 NRC at 125-26. On appeal, the Intervenor presents two substantive arguments regarding the University's "failure" to file a decommissioning plan. For the reasons set forth below, we disagree with both arguments.¹⁶⁰

The Intervenor's principal substantive argument on appeal is that the University's failure to file a decommissioning funding plan as part of its two license amendment applications renders them fatally flawed. IS-IB at 15, 16; II-IB at

¹⁵⁶ Waste Confidence Decision Review, 55 Fed. Reg. 38,474, 38,503 (Sept. 18, 1990).

¹⁵⁷ While there is some indication that the University expects that the TRUMP-S project will yield no mixed or TRU waste at all, the record also indicates that the project might yield one barrel of TRU waste per year. Compare Response of Licensee to "Petitions for Leave to Intervene; Requests for Stay," dated Aug. 20, 1990, at 8-9, 11 with Excerpts on TRUMP-S from the Minutes of the February 14, 1990 Meeting of the Isotope Use Subcommittee of the Reactor Advisory Committee at 2, appended as Attachment 3 to Langhorst Personnel Qualifications Affidavit, *supra* note 16 ("Waste estimates for Phase I are . . . 1 barrel of TRU wastes. Continuation of the project should result in 1 additional barrel of TRU/year").

¹⁵⁸ See "Engineering, Chemistry, and MURR Program Support of the Rockwell International TRUMP-S Project: A Proposal Submitted to Rockwell International . . . by The Curators of the University of Missouri . . ." at 19 (January 1990), submitted as Intervenor's Exhibit No. 19, *supra* note 12, at 22.

The University of Missouri-Columbia has in place a mixed waste management program based upon the Joint EPA/NRC "Guidance on the Definition and Identification of Commercial Mixed Low Level Radioactive and Hazardous Wastes" (January 8, 1987, Office of Solid Waste and Emergency Response, EPA, Directive Number 9432.00-2). The University established this waste program in early 1988 through the University Office of Environmental Health and Safety to meet the NRC and EPA requirements for managing and disposing of mixed wastes. Procedures have been established to provide for the storage, processing, and disposition of mixed waste in similar form to that expected to be generated by the TRUMP-S project. The experience that the MURR Operations and Health Physics staffs have in handling and shipping low-level waste (including Class B waste shipments of irradiated metal hardware), combined with the mixed waste experience provided by the Office of Environmental Health and Safety, will provide sufficient expertise to safely and effectively manage the mixed waste stream from this project.

¹⁵⁹ Individual Intervenor also complain that the Presiding Officer's decision to exclude the "waste disposal" area of concern was improperly based upon "an *ex parte* presentation of evidence" by the University regarding its plans to limit the radioactivity of the wastes and to dispose of such wastes. II-IB at 8-9 (alluding to the Presiding Officer's consideration of the Response of Licensee to "Petitions for Leave to Intervene; Requests for Stay," dated Aug. 20, 1990). We cannot find that the Presiding Officer improperly considered or based his ruling upon the University's August 20, 1990 Response. Although it is true that the Presiding Officer alluded to such evidence in his August 28, 1990 unpublished Memorandum and Order, his ruling to exclude the "waste disposal" area of concern was based exclusively upon "the absence of any support in the regulations" for the Intervenor's argument. Unpublished Memorandum and Order (Admitting Parties and Deferring Action on a Stay), dated Aug. 28, 1990, *slip op.* at 5.

¹⁶⁰ Because of our view on the meaning of our decommissioning regulations, we need not reach the Intervenor's procedural arguments (IS-IB at 15-17, 30; II-IB at 6-7).

3-7; I-RB at 37. More specifically, the Intervenor's assert that the University's requested authorization level of 25 Ci (later reduced to 10 Ci) of Am-241 exceeds the 10^{-3} -Ci minimum level for which such a plan is required under 10 C.F.R. § 30.35(a). Intervenor's argue that the Licensee is not excused from this requirement by the provisions of section 30.35(c) (permitting certain licensees to file a Certification of Financial Assurance in lieu of a decommissioning funding plan). According to the Intervenor's, section 30.35(c) does not apply to byproduct materials license amendment applications which, like the University's application, seek authority to possess and use more than 10^{-4} Ci of unsealed americium. Similarly, Intervenor's argue that Licensee's requested authorization level of 2 Ci of plutonium exceeds the 10^{-3} -Ci minimum level for which a decommissioning funding plan is required under section 70.25(a). II-IB at 3-4.

The Intervenor's are, of course, correct in arguing that sections 30.35(a) and 70.25(a) of our regulations generally require a materials license applicant to submit a decommissioning funding plan if the amount of unsealed byproduct material or unsealed special nuclear material to be licensed exceeds certain levels. They are also correct in arguing that, in the instant proceeding, the amount of materials at issue in this proceeding exceeds the levels specified in sections 30.35(a) and 70.25(a). However, the Intervenor's fail to recognize that sections 30.35(c)(2) and 70.25(c)(2) provide specific exceptions to the requirements of sections 30.35(a) and 70.25(a) for any holder of a license issued on or before July 27, 1990, and that the University falls squarely within this regulatory exception (having received its byproducts materials license, its SNM license, and the two instant amendments to those licenses prior to that date). Such a licensee has a choice of either (1) filing a decommissioning plan on or before July 27, 1990, or (2) filing a Certification of Financial Assurance on or before that date and then filing a decommissioning funding plan in its next license renewal application.

If such a licensee is a governmental entity, then sections 30.35(f)(4) and 70.25(f)(4) dictate the terms of its certification. Both of these sections state that financial assurance for decommissioning may be provided, "[i]n the case of . . . State . . . government licensees, [by] a statement of intent containing a cost estimate for decommissioning or an amount based on the Table in paragraph (d) of this section, and indicating that funds for decommissioning will be obtained when necessary." In the Statement of Considerations to the Final Rule in which these regulations were promulgated, the Commission expressly indicated its intent that this provision apply to state universities. *See* Final Rule, "General Requirements for Decommissioning Nuclear Facilities," 53 Fed. Reg. 24,018, 24,037 (June 27, 1988). *See also* Proposed Rule, "Decommissioning Criteria for Nuclear Facilities," 50 Fed. Reg. 5600, 5607 (Feb. 11, 1985).

By letter dated June 15, 1990, the University provided the Commission with precisely the kind of statement described in sections 30.35(f)(4) and 70.25(f)(4)

— a fact that the Intervenor do not deny. The certification also included all of the contents specified in Regulatory Guide 3.66, viz., it identified the facilities for which the University guaranteed financial assurance, stated the amount of money that the regulations required to be set aside to pay for decommissioning, included the required statement that these “funds will be requested and obtained sufficiently in advance of decommissioning to prevent delay of required activities,” and included evidence of the authority of the University’s Vice President to sign the Certification.¹⁶¹ Consequently, we conclude that the University complied with the Commission’s filing requirements regarding decommissioning.¹⁶²

The Intervenor’s second substantive argument (or cluster of arguments) is that the University’s certification of financial assurance promises nothing and fails to identify the source of the funding; and that, even assuming that the University could assure the requisite funding through an appropriations vote by the state legislature, such a vote would be *ultra vires* because it would violate article III, section 37 of the Missouri Constitution. II-IB at 4 n.1. The Intervenor are apparently not arguing that the University’s certification failed to comply with the Commission’s relevant regulations (sections 30.35 and 70.25). Instead the Intervenor are, in essence, contending that those regulatory provisions are themselves insufficient to protect the public health and safety. This assertion constitutes an improper collateral attack upon our regulations.¹⁶³

We also read in this second argument a related complaint that the certification does not provide an ironclad guarantee that decommissioning funds will be available when the time comes to decommission the Alpha Lab. The Commission

¹⁶¹ Regulatory Guide 3.66 (Task DG-3002), “Standard Format and Content of Financial Assurance Mechanisms Required for Decommissioning under 10 CFR Parts 30, 40, 70, and 72,” § 3.2.4 at p. 3-25 and Exhibit No. 3-9 at p. 3-26 (June 1990). See also *id.* § 3.1.2 at p. 3-2.

The Intervenor have conceded that the University’s certification “does fulfill some of the requirements of . . . [R]egulatory [G]uide [3.66].” Intervenor’s Response to Licensee’s Written Presentation, dated Dec. 24, 1990, at 19. Although the Intervenor asserted before the Presiding Officer that the University had failed to satisfy the alleged requirement of Regulatory Guide 3.66 (i.e., that the University notify the Missouri General Assembly of its decommissioning funding responsibilities (*id.*)), the Intervenor have not raised this argument on appeal.

¹⁶² We also note that the University submitted a full decommissioning funding plan as part of its February 28, 1992 Application for Renewal of its Broad Scope License No. 24-00513-32. (The Staff approved the University’s Application on July 7, 1993, and no Intervenor have challenged that approval.) The University’s submittal may well render the Intervenor’s first argument moot.

¹⁶³ 10 C.F.R. § 2.1239(a). See also *American Nuclear Corp.* (Revision of Orders to Modify Source Materials Licenses), CLL-86-23, 24 NRC 704, 708-10 (1986). Although the Intervenor could have filed a petition for waiver of the bar on collateral attacks against the regulations (see 10 C.F.R. § 2.1239(b)), they did not avail themselves of this opportunity.

considered such a "guarantee" approach in the proposed rule for establishment of decommissioning criteria,¹⁶⁴ but expressly rejected it in the final rule:

The intention of the proposed rule is that these State and Federal licensees should, early in their facilities' lifetime, be aware of the eventual decommissioning of the facility, specifically its cost, and make their funding bodies aware of those eventual costs. The provisions of the rule requiring naming a guarantor of funds may be subject to misinterpretation. Accordingly, the proposed rule is being modified to indicate that Federal and State licensees should provide a statement of intent that they have an estimate of the cost to decommission their facilities and that they will obtain funds when necessary for decommissioning.

Final Rule, "General Requirements for Decommissioning Nuclear Facilities," 53 Fed. Reg. 24,018, 24,037 (June 27, 1988). *See also* 10 C.F.R. §§ 30.35(f)(4) and 70.25(f)(4). Consequently, we reject the Intervenor's "guarantee" position as either inconsistent with, or an improper collateral attack upon, the Commission's regulations.

III. THE PARTIES' AND PRESIDING OFFICER'S OBSERVATIONS REGARDING SUBPART L

In the final section of the Final Initial Decision, the Presiding Officer offered his "Reflections on Subpart L," and invited the parties to provide their own opinions on that subject to the Chief Administrative Judge of the Licensing Board Panel. LBP-91-31, 34 NRC at 128-29. The parties used their appeal briefs as a vehicle to inform the Commission directly of their views as to how well (or poorly) Subpart L had worked in this proceeding. *See* U Mo IB at 39-44; I-RB at 18-21.

Initial Decisions and appeals therefrom are intended to address the parties' real cases and controversies, not more general questions of regulatory philosophy and practice. The parties should instead employ the rulemaking process to address the latter issues.¹⁶⁵ Consequently, we do not consider in this Decision the Presiding Officer's and the parties' reflections on Subpart L.

¹⁶⁴ Proposed Rule, "Decommissioning Criteria for Nuclear Facilities," 50 Fed. Reg. 5600, 5606 (Feb. 11, 1985): Another potential funding method . . . is for a licensee . . . to obtain a guarantee that the local, state, or Federal government will assume financial responsibility for decommissioning the facility. This would most likely be possible when the licensee is a local, State, or Federal agency or a state-affiliated organization such as a university or hospital.

See also id. at 5614 and 5622 (text of proposed sections 30.35(e)(4) and 70.25(e)(4)).

¹⁶⁵ *See Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), CLI-89-8, 29 NRC 399, 416, *reconsideration denied*, CLI-89-9, 29 NRC 423 (1989).

Conclusion

1. The Commission affirms in part and modifies in part LBP-91-31 and LBP-91-34, as discussed above.

2. *Conditions.* The Commission grants the University of Missouri's two license amendment applications, subject to the following conditions:

- a. As specified in section II.C.5 of this Order, the University must take the following fire safety measures:
 - i. Combustible-fuel vehicles must not operate in the rectangular basement area south of the Alpha Laboratory while separation or experimentation with actinides is taking place in the laboratory.
 - ii. A fire watch must be in effect whenever both (a) experiments or separation are in progress in the Alpha Laboratory and (b) any part of the sprinkler system located in or immediately outside the Alpha Lab is inoperable.
 - iii. The licensee must follow the requirements for valve supervision as specified in NFPA 801 ("Recommended Fire Protection Practice for Facilities Handling Radioactive Materials") and must inspect, test, and maintain the system in accordance with NFPA 25 ("Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems").

These three requirements replace the first two options in Ordering Paragraph 1 of the Final Initial Decision (LBP-91-31, 34 NRC at 130).

- b. As specified in Section II.C.4.a of this Order, the University must modify the Emergency Classes and Action Levels in its MURR Facility Emergency Plan in the following two respects:
 - i. The Emergency Plan's classification scheme must indicate that the current "NOUE" action level 5 applies only to a reactor fire, and not to a laboratory fire involving nuclear materials.
 - ii. The classification scheme must clarify that either a "prolonged fire" affecting nuclear materials or a "significant release possibly approaching EPA PAG levels" of such materials would constitute a "Site Area Emergency."
- c. As specified in Section II.C.4.b of this Order: Whenever TRUMP-S experiments are being conducted and the Reactor Control Room is unstaffed, the University must place at least one TRUMP-S experimenter in the Alpha Lab and must also ensure that a second person who is familiar with the MURR facility in general and the Control Room and Alpha Lab in particular (such as a Health Physicist or Reactor Operator) is present in the MURR facility. As an alternative, the University may

assign this latter individual to the Alpha Lab or the Reactor Control Room (to monitor the Alpha Lab's alarms), and also require that a TRUMP-S experimenter be present in the MURR facility.

Moreover, when no TRUMP-S experiment is being conducted and the Reactor Control Room is unstaffed, the University must ensure either that at least one person who is familiar with the MURR facility in general and the Control Room and Alpha Lab in particular is present in the MURR facility or that any actinide sample within the glove box is placed in a fireproof container.

- d. As specified in section ILC.2.a.ii(a)(i) of this Order, the University is permitted to use no more than 1 gram of the subject actinides at any one time in TRUMP-S experiments.

3. To effectuate the conditions set forth in Ordering Paragraph 2 above, NRC Staff is instructed to issue conforming changes to the University's license.

4. *Additional Requirement.* As specified in Part II of the "Background" portion of this Order, the University must certify, within 30 days of the issuance date of this Order, that it has complied with the requirement imposed by the Presiding Officer concerning TAM-62.

5. *Extended Deadline for Petitions for Reconsideration.* Because of the unusual length of this opinion, we exercise our discretion to extend the deadlines for petitions for reconsideration and answers thereto, specified in 10 C.F.R. § 2.1259(b) (*incorporating* 10 C.F.R. § 2.771). Petitions for reconsideration must be filed no later than 30 days after the issuance date of this Decision. Answers in opposition to, or in support of, any such petitions must be filed no later than 32 days thereafter.

6. *Filing Requirements Applicable to Petitions for Reconsideration.* In the event that the Intervenor Organizations and the Individual Intervenors each wish to file a Petition for Reconsideration, they shall file one joint petition. In the event that the Intervenor Organizations and the Individual Intervenors wish to file an answer to a Petition for Reconsideration filed by the University, they shall file one joint answer. Each Petition for Reconsideration or Answer to such petition shall not exceed 30 pages in length.

7. *Effective Date.* If no petition for reconsideration is filed, this Order will take effect upon the expiration of the 30-day period for filing such petitions. If one or more petitions for reconsideration are filed, then this Order takes effect upon the issuance of a Commission decision on reconsideration.

It is so ORDERED.

For the Commission

JOHN C. HOYLE
Acting Secretary of the
Commission

Dated at Rockville, Maryland,
this 28th day of February 1995.

**Directors'
Decisions
Under
10 CFR 2.206**

DIRECTORS' DECISIONS

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF ENFORCEMENT

Joseph R. Gray, Acting Director

In the Matter of

Docket Nos. 50-245
50-336
50-423

NORTHEAST UTILITIES
(Millstone Nuclear Power Station)

February 22, 1995

The Acting Director of the Office of Enforcement has denied petitions filed by Carmela V. Marien and Marianne W. Nerricio requesting that accelerated enforcement action be taken against Northeast Utilities (NU). The Petitioners requested that this action be taken against NU for willful violations of the employee protection provisions of 10 C.F.R. § 50.7. As grounds for their request, the Petitioners asserted that they were retaliated against for engaging in protected activities consisting of raising concerns regarding a computer system being used in the execution of NU's fitness-for-duty program. The reasons for the denial are fully set forth in the Decision.

DIRECTOR'S DECISION UNDER 10 C.F.R. § 2.206

I. INTRODUCTION

On August 21, 1993, Carmela V. Marien and Marianne W. Nericcio (Petitioners) filed separate requests for an immediate investigation and accelerated enforcement action against Northeast Utilities (Licensee) for alleged willful violations of the employee protection provisions of 10 C.F.R. § 50.7. As grounds for these requests, Petitioners assert that they have been retaliated against for engaging in protected activities consisting of raising concerns regarding a computer system being used in the execution of the Licensee's fitness-for-duty program.

II. DISCUSSION

In April 1993, while employed by Northeast Utilities at the Millstone Nuclear Power Station as an Occupational Health Administrator, Ms. Marien was asked to use a new computer program in the administration of the plant's fitness-for-duty program that is required by NRC regulations in 10 C.F.R. Part 26. In using the program, Ms. Marien observed that there were certain problems with the personnel security aspects of the computer program and reported these problems to her management and, following questioning by an NRC inspector, to the NRC. In her petition, Ms. Marien alleges that, subsequent to her identification of such problems: (1) three of her managers/supervisors would not speak to her at a meeting on the subject on May 12, 1993; (2) a manager made harassing statements to her at a June 8, 1993 meeting among fitness-for-duty staff, and (3) she received a whistle in the interoffice mail.

Ms. Nericcio similarly was asked to use the new computer program and, subsequent to her use of the program, supported Ms. Marien in her identification and pursuit of the concerns about the program. In her petition, Ms. Nericcio alleges that, subsequent to her identification of the problems relating to the computer program used for fitness-for-duty: (1) three of her managers/supervisors would not speak to her at a meeting on the subject on May 12, 1993; (2) at a June 8, 1993 meeting on the subject, one of her managers chastised her for discussing her concerns with the NRC; and (3) she received a whistle in the interoffice mail. Petitioners assert that these actions constitute harassment, intimidation, and retaliation for reporting concerns about the fitness-for-duty computer program.

In June 1993, Ms. Marien and Ms. Nericcio filed complaints with the Department of Labor, stating that the harassing statements that were made to them during the June 8, 1993 meeting constituted retaliation for engaging in activities protected under the Energy Reorganization Act. On June 27, 1994, after conducting a hearing on the matter, a DOL Administrative Law Judge (ALJ) concluded that Petitioners had not established that a violation occurred in that they had not shown that the Licensee had taken any adverse action against them. According to the ALJ, Petitioners had testified that, with the exception of the alleged harassing statements, they had suffered no other form of retaliation such as reassignment, loss of pay, adverse performance evaluation, or denial of a vacation. The ALJ could not determine whether the alleged harassing statements had actually been made and he concluded that the statements themselves, if they actually were made, were not sufficient to constitute adverse action against Petitioners. The ALJ recommended dismissal of the complaints and his recommendation is pending before the Secretary of Labor.

With respect to the Petitioners' receiving whistles in interoffice mail, the ALJ stated that neither of the individuals was able to prove the source of these

whistles or their meaning, that Ms. Marien testified that she thought it was a joke, and that no one came forward to acknowledge having sent the whistles. The ALJ concluded that "two anonymous whistles in the mail are so ambiguous that I cannot draw any conclusion from the mere fact that they were sent to Complainants." I agree with the ALJ's conclusion and, in these instances, can attach no significance to the Petitioners' having received whistles in the interoffice mail.

The NRC Office of Investigations (OI) opened an evaluation of Petitioners' allegations on July 9, 1993, and upgraded the evaluation to a full investigation on February 2, 1994. OI reviewed the administrative and evidentiary records developed in the Department of Labor proceeding and conducted interviews of selected witnesses. Interviewees who were present at the May 12, 1993 meeting did not corroborate that Petitioners were shunned by management at that meeting. Interviewees who were present at the June 8, 1993 meeting did not corroborate Ms. Marien's claim that she was harassed at that meeting or Ms. Neruccio's claim that she was chastised at that meeting for discussing her concerns with NRC. In short, OI was not able to substantiate that Petitioners were subjected to harassment and intimidation for raising concerns about the Licensee's fitness-for-duty computer program. On October 31, 1994, OI issued a report concluding that Petitioners' allegations of retaliation for engaging in protected activities could not be substantiated.

On the basis of the ALJ's decision and OI's findings in these matters, I conclude that the Petitioners' allegations of harassment, intimidation, and discrimination are unfounded. Accordingly, these allegations provide no basis for the NRC to take accelerated action as requested by the Petitioners.

Ms. Marien also stated that she had disagreed with the Licensee's decision to transfer an employee's medical records to the Corporate Medical unit, and asserted that the Licensee's decision not to raise Ms. Marien's concern to the next level of management for review constituted retaliation for participation in protected activities. This matter appears not to have been raised in Ms. Marien's original complaint to the DOL and, therefore, neither the DOL ALJ nor NRC's Office of Investigations considered the issue. However, the Licensee did address it in a letter to the NRC dated December 7, 1993, responding to the petitions and stated that the records were transferred at the request of the individual whose records they were. In these circumstances, I cannot conclude that the decision not to raise Petitioner's concern to the next level of management constituted retaliation.

III. CONCLUSION

Based on the findings of the Department of Labor Administrative Law Judge and the NRC Office of Investigations, and a review of the Licensee's

December 7, 1993 response to the petitions, I have concluded that the Petitioners' allegations that they were retaliated against for engaging in protected activities were not substantiated. For these reasons, Petitioners' allegations provide no basis for the NRC to take accelerated enforcement action against the Licensees. Therefore, Petitioners' requests for accelerated enforcement action are denied.

A copy of this Decision will be filed with the Secretary of the Commission for the Commission to review in accordance with 10 C.F.R. § 2.206(c). As provided by that regulation, the Decision will constitute final action of the Commission 25 days after issuance, unless the Commission, on its own motion, institutes a review of the Decision within that time.

FOR THE NUCLEAR
REGULATORY COMMISSION

Joseph R. Gray, Acting Director
Office of Enforcement

Dated at Rockville, Maryland,
this 22d day of February 1995.