LBP-04-04

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:
Ann Marshall Young, Chair
Anthony J. Baratta
Thomas S. Elleman

In the Matter of

DUKE ENERGY CORPORATION

(Catawba Nuclear Station, Units 1 and 2)

Docket No's. 50-413-OLA, 50-414-OLA

ASLBP No. 03-815-03-OLA

March 5, 2004

MEMORANDUM AND ORDER
(Ruling on Standing and Contentions)

This proceeding involves the February 2003 application of Duke Energy Corporation (Duke), to amend the operating license for its Catawba Nuclear Station to allow the use of four mixed oxide (MOX) fuel lead test assemblies at the station. In August 2003 Petitioners Nuclear Information and Resource Service (NIRS) and Blue Ridge Environmental Defense League (BREDL) filed petitions to intervene and requests for hearing in response to a July 2003 Federal Register notice concerning this application. Supplemental Petitions and Contentions were filed in October and December, 2003, and March 2004. In this Memorandum and Order we rule on 17 non-security-related contentions of the Petitioners, denying some and admitting others, some in combined form. The Board will rule separately on certain security-related contentions submitted by BREDL.

I. Background

License Amendment Request

Duke sought the original license amendment at issue in this proceeding, relating to both the McGuire Nuclear Station, Units 1 and 2, and the Catawba Nuclear Station, Units 1 and 2, in a February 27, 2003, letter. 68 Fed. Reg. 44,107 (July 25, 2003); Letter from M.S. Tuckman, Executive Vice President, Duke Power, to NRC (Feb. 27, 2003) [hereinafter LAR]. In September 2003 Duke revised the LAR to restrict the request to the Catawba facility. Letter from M.S. Tuckman to NRC (Sept. 23, 2003). In the LAR Duke seeks to modify certain technical specifications (TSs) to enable the use of four MOX fuel lead test assemblies in the Catawba plant, and also requests exemption from certain NRC regulations.

Duke has submitted its LAR as “part of the ongoing United States – Russian Federation plutonium disposition program,” a “nuclear nonproliferation program [the goal of which] is to

dispose of surplus plutonium from nuclear weapons by converting the material into MOX fuel and using that fuel in nuclear reactors." LAR at 2. Duke is part of a consortium, Duke Cogema Stone and Webster (DCS), that has contracted with the Department of Energy (DOE) to perform various functions associated with this program. LAR, Attachment 3 at 3-2. DCS, according to Duke, "will provide for the design, construction, operation, and deactivation of a [MOX] Fuel Fabrication Facility (MFFF)," in which DCS "will process PuO_2 powder supplied by [DOE], blend it with depleted UO_2 powder, and fabricate it into MOX fuel pellets," which would then be loaded into MOX fuel assemblies. *Id.* (MOX fuel contains "a mixture of plutonium and uranium oxides (PuO_2 and UO_2) with plutonium providing the primary fissile isotopes." *Id.* at n. 1.) Duke states that, "[f]ollowing NRC approval of required license amendments, the fuel assemblies will be used in the McGuire and Catawba Nuclear Stations with core fractions up to 40% MOX fuel." *Id.* The latter are referred to as "batch" quantities of MOX fuel.

The four lead test assemblies at issue in this proceeding will, assuming approval of the LAR at issue herein, be manufactured, not in the planned MFFF, but "under the direction of Framatome ANP." *Id.* Duke's plans:

> . . . call for [the] four lead assemblies to be irradiated for a minimum of two cycles to confirm acceptability of the planned MOX fuel assembly design, verify the validity of Duke's models to predict fuel assembly performance, and confirm the applicability of the European database to Duke's use of MOX fuel. Poolside post-irradiation examination (PIE) is planned to verify selected mechanical properties of the lead assemblies. In addition, some or all of the lead assemblies will undergo a third cycle of irradiation to assure that the lead assembly burnup bounds the planned batch fuel burnup. Examination of one or more fuel rods in a hot cell is planned at the completion of the lead assembly irradiation program.

Id. at 3-2 – 3-3.

The technical specification sections that would be modified if the LAR is approved include the following: two relating to storage of the MOX fuel lead test assemblies in the spent fuel storage racks (Section 3.7.15, "Spent Fuel Assembly Storage," and Section 4.3, "Fuel Storage"); one that would be revised to allow the use of MOX fuel in addition to the currently-specified slightly-enriched uranium dioxide fuel, as well as the use of fuel rod cladding

with an "M5^{TM} zirconium alloy that has a different material specification than the materials currently referenced in the TS" (Section 4.2, "Reactor Core"); one that would be revised to include additional methodologies that would be used to develop the limits included in the Core Operating Limits Report (Section 5.6.5, "Core Operating Limits Report"); and, finally, the TS Bases section, for which certain associated changes have been proposed. 68 Fed. Reg. 44,107 (July 25, 2003).

Filing of Initial Petitions

Following the July 2003 Federal Register publication of notice of opportunity for hearing on the LAR, Nuclear Information and Resources Service (NIRS) and Blue Ridge Environmental Defense League (BREDL) submitted, on August 21 and 25, 2003, respectively, petitions to intervene and requests for hearing under the aegis of 10 C.F.R. § 2.714. *See* Nuclear Information & Resource Service's Request for Hearing and Petition to Intervene (Aug. 21, 2003) [hereinafter NIRS Petition]; Blue Ridge Environmental Defense League's Hearing Request and Petition to Intervene (Aug. 25, 2003) [hereinafter BREDL Petition]. Duke and the NRC Staff filed answers to these intervention petitions on September 9 and 15, 2003, respectively. *See* Answer of Duke Energy Corporation to the Petitions to Intervene and Requests for Hearing of [NIRS] and [BREDL] (Sept. 9, 2003) [hereinafter Duke 9/9/03 Answer]; NRC Staff's Answer to [NIRS] and [BREDL's] Petitions for Leave to Intervene and Requests for Hearing (Sept. 15, 2003) [hereinafter Staff 9/15/03 Answer]. In these answers both Duke and the Staff recognize the representational standing of NIRS and BREDL. *See* Duke 9/9/03 Answer; Staff 9/15/03 Answer.

Establishment of Licensing Board and Preliminary Proceedings

On September 17, 2003, an Atomic Safety and Licensing Board was established to preside over the proceeding. *See* 68 Fed. Reg. 55,414 (Sept. 25, 2003). Shortly thereafter, the Licensing Board issued a scheduling order, in which, among other things, the participants were offered several dates in November and December 2003 for the initial prehearing conference in

this proceeding. Order (Setting Deadlines, Schedule, and Guidance for Proceedings) (Sept. 23, 2003). Based on the availability of all participants and a courtroom, the prehearing conference was subsequently scheduled to be held on December 3 and 4, 2003, in Charlotte, North Carolina, which is in the vicinity of the Catawba plant. Order (Setting Prehearing Conference Dates and Location) (Oct. 1, 2003). On October 3, 2003, the Board granted BREDL's request for extension of the deadlines for amended and supplemented petitions, finding that concerns for efficiency and avoidance of delay, on the one hand, and the need to ensure adequate opportunity for the petitioners to introduce matters of safety or environmental concern, on the other, were not in conflict in this proceeding since an extension would occasion no delay in light of the December 2003 dates for oral argument. The Board also extended the deadline for responses to the amended and supplemented petitions. Order (Granting Request for Extension of Time) (Oct. 3, 2003); *see* [BREDL's] Request for Extension of Time to File Supplemental Petition to Intervene (Sept. 29, 2003); Duke Energy Corporation's Opposition to BREDL's Request for an Extension of Time (Sept. 30, 2003); NRC Staff's Opposition to BREDL's Request for an Extension of Time (Oct. 2, 2003).

Supplemental Petitions

The petitioners filed supplemental petitions, containing various non-security-related contentions, on October 21, 2003, in accordance with the deadline set in the Board's October 3 Order. *See* [BREDL's] Supplemental Petition to Intervene (Oct. 21, 2003) [hereinafter BREDL 10/21/03 Contentions]; Contentions of [NIRS] (Oct. 21, 2003) [hereinafter NIRS Contentions]. In these filings, BREDL submitted nine contentions, and NIRS proffered five contentions. Staff and Duke Responses to Petitioners' supplemental petitions were received on November 10 and 11, 2003, respectively. *See* NRC Staff's Response to [BREDL's] Supplemental Petition to Intervene and [NIRS's] Contentions (Nov. 10, 2003) [hereinafter Staff 11/10/03 Response]; Answer of Duke Energy Corporation to "[BREDL]'s Supplemental Petition to Intervene" and the "Contentions of [NIRS]" (Nov. 11, 2003) [hereinafter Duke 11/11/03 Answer]. The Staff

opposes the admission of all but parts of two of BREDL's original, October 21, 2003, contentions (BREDL Contention 7, Inappropriate Use of SPDEIS for Conclusion that Impacts are Significant; BREDL Contention 5, Failure to Consider New Information Showing Viability of Alternatives, to the extent of agreeing that Duke should consider the alternative of its Oconee plant in its Environmental Report), and all of NIRS's contentions. *See generally* Staff 11/10/03 Response; Tr. 456; NRC Staff's Reply to Blue Ridge Environmental Defense League's Response to Board Questions (Dec. 19, 2003) at 9 n.6 [hereinafter Staff 12/19/03 Reply]. Duke opposes all of the petitioners' contentions. *See generally* Duke 11/11/03 Answer.

Oral argument was heard on the October contentions on December 3-4, 2003, in Charlotte, in accordance with various preliminary guidance principles established by the Board on the conduct of the argument. Tr. 71-576; Order (Regarding Provision of LAR and Other Documents, and Conduct of Oral Argument) (Nov. 20, 2003). Order (Regarding Motion for Protective Order and General Conduct of Oral Argument) (Dec. 1, 2003) [hereinafter Board 12/1/03 Order]. Meanwhile, BREDL submitted four late-filed contentions on December 2, 2003, and, pursuant to a schedule proposed by the participants at the Board's direction, various other filings, including responses to BREDL's December 2 contentions, were also submitted during December 2003, and addressed in a series of Orders and conferences. *See* [BREDL's] Second Supplemental Petition to Intervene (Dec. 2, 2003) [hereinafter BREDL 12/2/02 Contentions]; Order (Regarding Telephone Conference, Deadlines and Scheduling Issues) (Dec. 8, 2003) [hereinafter Board 12/8/03 Order]; Tr. 577-614; Blue Ridge Environmental Defense League's Response to Board Questions (Dec. 12, 2003) [hereinafter BREDL 12/12/03 Filing]; NRC Staff's Response to Board's Question Regarding Executive Order 12114 (Dec. 12, 2003) [hereinafter Staff 12/12/03 Filing]; Order (Regarding Deadlines and Scheduling Issues) (Dec. 15, 2003) [hereinafter Board 12/15/03 Scheduling Order]; Duke Energy Corporation's Reply To Responses To Board Questions (Dec. 19, 2003) [hereinafter Duke 12/19/03 Reply]; NRC Staff's Reply to [BREDL's] Response to Board Questions (Dec. 19, 2003) [hereinafter

Staff 12/19/03 Reply]; [BREDL's] Reply to NRC Staff Regarding Applicability of Executive Order 12114 (Dec. 19, 2003) [hereinafter BREDL 12/19/03 Reply]; Answer of Duke Energy Corporation to the "[BREDL's] Second Supplemental Petition to Intervene" (Dec. 23, 2003) [hereinafter Duke 12/23/03 Answer]; NRC Staff Opposition to BREDL's Second Supplemental Petition to Intervene (Dec. 24, 2003) [hereinafter Staff 12/24/03 Opposition].

In its December 8, 2003, Order the Board, in addition to addressing various other matters, set a deadline of 30 days from the date a party receives any new information, for the filing of any late-filed or amended contentions based on such information. Board 12/8/03 Order at 3.

Oral argument was heard on BREDL's December 2, 2003, Contentions on January 15, 2004, in Charlotte. *See* Order (Providing Notification of Location for January 15, 2004, Oral Argument) (Dec. 31, 2003); Tr. 615-826.

Related Security Matters and Contentions

In addition to the non-security-related contentions addressed in this Memorandum and Order, various security-related issues have arisen in this proceeding. The first such matter that was brought to this Board was Duke and the Staff's October 8, 2003, proposed Motion for Protective Order, relating to certain material deemed by the Staff to constitute Safeguards Information (SGI). Motion for Protective Order (Oct. 8, 2003) [hereinafter 10/8/03 Motion for Protective Order]. Because of various security-related concerns first raised by the Board upon receipt of the proposed Order, and subsequently addressed by the Staff during October and November, the Board did not approve or issue the first proposed protective order submitted by the Staff and Duke.[1] On November 26, 2003, the Staff filed a new motion for a protective

[1] Based on certain security concerns relating to the Motion for Protective Order, the Board on October 9 issued an Order scheduling a telephone conference for October 10 to address these concerns. Order (Addressing Certain Security Issues and Scheduling Telephone Conference) (Oct. 9, 2003). During the October 10 conference, Tr. 1-46, the Staff indicated that, despite the October 8 motion, "there may be some concern" such that the Staff was "not ready to give . . . a final decision" on certain

order. *See* NRC Staff's Motion for Protective Order (Nov. 26, 2003) [hereinafter Staff 11/26/03 Motion for Protective Order].[2] BREDL filed an Objection to the Staff's proposed protective

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issues relating to the proposed protective order. Tr. 6-7. This related to the possibility of applying Category 1 facility standards to Catawba with regard to the LAR, which the Staff was not ready to decide at that point, and which, according to Staff counsel, "could cause a delay in the proceedings." Tr. 12-15.Staff counsel indicated that it would try to provide notification of the relevant classification by October 23, and that "the 30th of October would probably be the latest date [the Staff] anticipate[d] . . . getting back to the Board." Tr. 42-44. Counsel agreed to notify the Board and all participants, no later than October 15, of when the Staff expected to make a determination on the classification level of the material in question. Tr. 36. Two tentative dates were set for another telephone conference — October 23 and 30 — the final scheduling of which would depend on when the Staff made its determination. Tr. 43-44; *see* Order (Confirming Matters Addressed at October 10, 2003, Telephone Conference) (Oct. 10, 2003). On October 15, 2003, Staff counsel sent the Board a letter, stating that the Staff expected to make its determination as to the classification level of the material in question "on or about December 5, 2003." Letter from Antonio Fernández, Counsel for NRC Staff, to Administrative Judges (Oct. 15, 2003).Thereafter, the Board issued an Order on October 16, 2003, setting the next telephone conference for October 23, the earlier of the two tentative dates, in order to avoid further delay; and indicating that the schedule for the Staff's classification level determination, and its impact on the conduct of this proceeding, along with any other appropriate matters, would be addressed at this conference. Order (Scheduling October 23, 2003, Telephone Conference) (Oct. 16, 2003). At the October 23 conference, various scheduling matters, including those related to security issues, were addressed. Tr. 47-70.

[2] The Staff's new motion and proposed protective order addressed the same material as the earlier proposed order did — primarily, a September 15, 2003, document submitted by Duke in support of its LAR, describing additional security measures it proposes to implement relating to the anticipated presence and irradiation of the MOX lead test assemblies at the Catawba plant. Staff 11/26/03 Motion for Protective Order at 1; *see* 10/8/03 Motion for Protective Order. Duke's September 15 submittal, most of which has been designated by the Staff as containing Safeguards Information, consists of a transmittal letter and 7 attachments, including a proposed revision to Duke's existing security and contingency plan, and a related request for exemptions from certain NRC regulations. *See* Staff 11/26/03 Motion for Protective Order at 1; Letter from M.S. Tuckman, Duke Energy Corporation, to Document Control

order on December 10, 2003; thereafter argument was heard on the proposed order and related issues both during the December 3-4 oral argument and in a December 11 telephone conference, and a revised Protective Order was issued December 15, 2003. [BREDL]'s Objection to Proposed Protective Order (Dec. 10, 2003); Memorandum and Order (Protective Order Governing Duke Energy Corporation's September 15, 2003 Security Plan Submittal) (Dec. 15, 2003) [hereinafter 12/15/03 Protective Order]; *see* Board 12/1/03 Order; Tr. 547-68, 577-614; Board 12/15/03 Scheduling Order.[3]

Various other security-related matters were also addressed during January and February, 2004, in several Orders, telephone conferences, and two closed hearings held on

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Desk, NRC (Sept. 15, 2003) [hereinafter Duke 9/15/03 Security Submittal].

[3] In its December 15 Scheduling Order, among the matters addressed were deadlines for security-related contentions and dates for oral argument on them, as well as the matter of assistance with security issues for the Board and participants. The revised Protective Order issued the same date contained an attached Nondisclosure Affidavit to be signed by all persons who would be granted access to Safeguards Information under the protective order. The information covered by the Protective Order and Nondisclosure Affidavit includes "(1) the September 15, 2003 Security Plan Submittal or any supplements or amendments thereto, including Requests for Additional Information (RAIs) or responses to RAIs relating to that submittal; and (2) any information obtained, developed, or created by virtue of these proceedings, in any form, that is not otherwise a matter of public record and that deals with or describes details of the Security Plan Submittal." 12/15/03 Protective Order at 2. Also under the Protective Order, any individual must have a "need to know" any protected information that he or she may be shown, and any disputes regarding any "need to know" determinations are to be resolved by determination of the Licensing Board. *Id.* at 3-4.

January 21 and February 13, 2004, to address certain "need to know" and other security-related issues raised by BREDL on January 13, and considered in part during the January 15, 2003, oral argument. *See* [BREDL]'s Request for Need to Know Determination and Motion for Extension of Deadline for Filing Security Contentions (Jan. 13, 2004) (designated as "May Contain Safeguards Information"); Order (Scheduling *In Camera* Oral Argument on Blue Ridge Environmental Defense League's Request for Need to Know Determination and Motion for Extension of Deadline for Filing Security Contentions) (Jan. 20, 2004); Memorandum (Providing Notice of Granting BREDL Motion for Need to Know Determination and Extension of Deadline for Filing Security-Related Contentions) (Jan 29, 2004); [BREDL]'s Emergency Motion for Access to NRC Staff Meeting on February 6, 2004 (Feb. 3, 2004)[4]; Memorandum and Order (Ruling on BREDL Motion Regarding Staff February 6, 2004, Meeting with Duke Energy and Request for Need to Know Determination) (Feb. 4, 2004); Memorandum and Order (Ruling on BREDL Motion for Need to Know Determination Regarding Classified Documents) (Feb. 17, 2004); *see also* Tr. 621-43, 746-63, 947-1010, 1164-1217.

On February 2, in response to the Board's request, the Commission appointed Mr. Robert B. (Barry) Manili, of the Materials, Transportation and Waste Security Division, Division of Nuclear Security, Office of Nuclear Security and Incident Response (NSIR), to be the "representative to advise and assist the Atomic Safety and Licensing Board with respect to security classification of information and the safeguards to ve observed in this proceeding,

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[4] We note with regard to BREDL's motions that BREDL's counsel, Ms. Curran, and expert, Dr. Lyman, have obtained from the NRC, after undergoing appropriate investigation, "L" level security clearances that allow them access to certain safeguards and classified information in regard to which they have a "need to know." *See Duke Cogema Stone & Webster* (Savannah River Mixed Oxide Fuel Fabrication Facility) (Dec. 18, 2002) (unpublished) (hereinafter Duke Cogema 12/18/02 Order).

pursuant to 10 C.F.R. § 2.904." Order (Feb. 2, 2004); *see* Request to Commission (Seeking Designation of Representative to Advise and Assist Licensing Board With Respect to Classification of Information and Safeguards to Be Observed) (Jan. 23, 2004). On February 18, 2004, the Commission issued a Memorandum and Order reversing the Board's January 29 and February 4, 2004, decisions. CLI-04-06, 59 NRC___.

On March 3, 2004, BREDL filed a Safeguards document containing its security-related contentions, oral argument on which has been scheduled for March 18, 2004. *See* Order (Regarding Deadlines and Scheduling Issues) (March 5, 2004) (unpublished).

II. Analysis

A. Standing

A petitioner's standing, or right to participate in a Commission licensing proceeding, is grounded in Section 189a of the Atomic Energy Act (AEA), 42 U.S.C. § 2239(a)(1)(A), which requires the NRC to provide a hearing "upon the request of any person whose interest may be affected by the proceeding." The Commission has implemented this requirement in its regulations at 10 C.F.R. § 2.714.[5]

When determining whether a petitioner has established the necessary "interest" under section 2.714, licensing boards are directed by Commission precedent to look for guidance to

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[5] The citation to 10 C.F.R. § 2.714 is to the former section number that was in effect prior to a significant revision to the agency's 10 C.F.R. Part 2 rules of practice and procedure, which became effective February 13, 2004. Under part of this revision, the provisions of § 2.714 were moved to a new section, § 2.309. *See* 69 Fed. Reg. 2182, 2220-22 (Jan. 14, 2004). Because this proceeding commenced prior to the effective date of the revision, the former Part 2 rules still apply here, and we use the former numbering throughout this Memorandum and Order.Under the former § 2.714(a)(2), an intervention petition must set forth with particularity "the interest of the petitioner in the proceeding, how that interest may be affected by the results of the proceeding, including the reasons why petitioner should be permitted to intervene, with particular reference to the factors in paragraph (d)(1)," along with "the specific aspect or aspects of the subject matter of the proceeding as to which petitioner wishes to intervene." 10 C.F.R. § 2.714(a)(2). Subsection (d)(1) provides in relevant part that the Board shall consider the following three factors when deciding whether to grant standing to a petitioner:(i) The nature of the petitioner's right under the [AEA] to be made a party to the proceeding.(ii) The nature and extent of the petitioner's property, financial, or other interest in the proceeding.(iii) The possible effect of any order that may be entered in the proceeding on the petitioner's interest.

judicial concepts of standing. *See, e.g., Yankee Atomic Electric Company* (Yankee Nuclear Power Station), CLI-98-21, 48 NRC 185, 195 (1998); *Quivira Mining Co.* (Ambrosia Lake Facility, Grants, New Mexico), CLI-98-11, 48 NRC 1, 5-6 (1998); *Georgia Institute of Technology* (Georgia Tech Research Reactor, Atlanta, Georgia), CLI-95-2, 42 NRC 111, 115 (1995). According to these concepts, to qualify for standing a petitioner must allege (1) a concrete and particularized injury that is (2) fairly traceable to the challenged action and (3) likely to be redressed by a favorable decision. *See, e.g., Steel Co. v. Citizens for a Better Environment*, 523 U.S. 83, 102-04 (1998); *Kelley v. Selin*, 42 F.3d 1501, 1508 (6th Cir. 1995). These three criteria are commonly referred to, respectively, as "injury in fact," causality, and redressability. The requisite injury may be either actual or threatened, *Yankee*, CLI-98-21, 48 NRC at 195 (citing, e.g., *Wilderness Society v. Griles*, 824 F.2d 4, 11 (D.C. Cir. 1987)), but must arguably lie within the "zone of interests" protected by the statutes governing the proceeding -- here, either the AEA or the National Environmental Policy Act (NEPA). *See Yankee*, CLI-98-21, 48 NRC at 195-196; *Ambrosia Lake Facility*, CLI-98-11, 48 NRC at 6.

As indicated above, both Duke and the Staff recognize the representational standing of BREDL and NIRS. *See* Duke 9/9/03 Answer at 8-10; Duke 11/11/03 Answer at 8-9; Staff 9/15/03 Answer at 5-8; Staff 11/10/03 Response at 3. We likewise find that both BREDL and NIRS, having members who live in the vicinity of the Catawba plant (generally within 20 miles) and who have submitted declarations authorizing BREDL or NIRS to represent their interests, have established “representational standing” to participate in this proceeding under AEA section 189a and the Commission’s rules. *See Yankee*, CLI-98-21, 48 NRC at 195; *Georgia Tech*, CLI-95-2, 42 NRC at 115; *Florida Power & Light Company* (Turkey Point Nuclear Generating Plant, Units 3 and 4), LBP-01-6, 53 NRC 138, 146-50 (2001), *aff’d* CLI-01-17, 54 NRC 3 (2001).

B. <u>Contentions</u>

Standards for Admissibility of Contentions

To intervene in an NRC proceeding, a Petitioner must, in addition to demonstrating standing, submit at least one contention meeting the requirements of 10 C.F.R. § 2.714(b),(d).[6] *Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 333 (1999); *Yankee Atomic Electric Co.* (Yankee Nuclear Power Station), CLI-96-7, 43 NRC 235, 248 (1996). The failure of a contention to comply with any one of these requirements is grounds for dismissing the contention. *Arizona Public Service Company* (Palo Verde Nuclear Generating Station, Units 1, 2, and 3), CLI-91-12, 34 NRC 149, 155-56 (1991). In addition, nontimely filings may not be entertained unless we find that a balancing of the following factors from 10 C.F.R. § 2.714(a)(1) so warrants:

> (i) Good cause, if any, for failure to file on time.
> (ii) The availability of other means whereby the petitioner's interest will be protected.
> (iii) The extent to which the petitioner's participation may reasonably be expected to assist in developing a sound record.

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[6] The standards at § 2.714(b), (d), provide in relevant part as follows:(b)(2) Each contention must consist of a specific statement of the issue of law or fact to be raised or controverted. In addition, the petitioner shall provide the following information with respect to each contention:(i) A brief explanation of the bases of the contention.(ii) A concise statement of the alleged facts or expert opinion which support the contention and on which the petitioner intends to rely in proving the contention at the hearing, together with references to those specific sources and documents of which the petitioner is aware and on which the petitioner intends to rely to establish those facts or expert opinion.(iii) Sufficient information (which may include information pursuant to paragraphs (b)(2)(i) and (ii) of this section) to show that a genuine dispute exists with the applicant on a material issue of law or fact. This showing must include references to the specific portions of the application (including the applicant's environmental report and safety report) that the petitioner disputes and the supporting reasons for each dispute, or, if the petitioner believes that the application fails to contain information on a relevant matter as required by law, the identification of each failure and the supporting reasons for the petitioner's belief. On issues arising under the National Environmental Policy Act, the petitioner shall file contentions based on the applicant's environmental report. The petitioner can amend those contentions or file new contentions if there are data or conclusions in the NRC draft or final environmental impact statement, environmental assessment, or any supplements relating thereto, that differ significantly from the data or conclusions in the applicant's document. * * *

(d) . . . [A] ruling body or officer shall, in ruling on--. . . .(2) The admissibility of a contention, refuse to admit a contention if:(i) The contention and supporting material fail to satisfy the requirements of paragraph (b)(2) of this section; or(ii) The contention, if proven, would be of no consequence in the proceeding because it would not entitle petitioner to relief.

(iv) The extent to which the petitioner's interest will be represented by existing parties.
(v) the extent to which the petitioner's participation will broaden the issues or delay the proceeding.

The Commission has stated that the "contention rule is strict by design," having been "toughened . . . in 1989 because in prior years 'licensing boards had admitted and litigated numerous contentions that appeared to be based on little more than speculation.'" *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 1 and 3), CLI-01-24, 54 NRC 349, 358 (2001) (citing *Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 334 (1999)).

Thus, petitoners must do more than merely make unsupported allegations. Any petitioner must "read the pertinent portions of the license application, including the Safety Analysis Report and the Environmental Report, state the applicant's position and the petitioner's opposing view," and "explain[ ] why they have a disagreement with [the applicant]." *Millstone*, CLI-01-24, 54 NRC at 358 (citing the Statement of Considerations (SOC) for the 1989 amendments to the contention requirements, 54 Fed. Reg. 33,168, 33,170 (Aug. 11, 1989)); 54 Fed. Reg. at 33,171. Contentions must *specifically* state the issues a petitioner wishes to raise and, in addition to providing support for each contention in the form of expert opinion, document(s), and/or a fact-based argument at least, a petitioner must provide reasonably specific and understandable *explanation* and *reasons* to support its contentions. *See Duke Energy Corporation* (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 341-342 (1999).

As the Commission has explained:
It is surely legitimate for the Commission to screen out contentions of doubtful worth and to avoid starting down the path toward a hearing at the behest of Petitioners who themselves have no particular expertise -- or expert assistance -- and no particularized grievance, but are hoping something will turn up later as a result of NRC Staff work.

Id. at 342. Nor will mere reference to documents provide an adequate basis for a contention. *Baltimore Gas & Electric Co.* (Calvert Cliffs Nuclear Power Plant, Units 1 and 2), CLI-98-25, 48 NRC 325, 348 (1998).

The contention rule does not require "a specific allegation or citation of a regulatory violation," *Millstone*, CLI-01-24, 54 NRC at 361, but an admissible contention "must *explain*, *with specificity*, particular safety or legal reasons requiring rejection of the contested [licensing action]," *id.* at 359-60 (emphasis added). Moreover, a petitioner is obliged, under 10 C.F.R. § 2.714(b)(2)(iii), either "to include references to the specific portion of the application . . . that the petitioner disputes and the supporting *reasons* for each dispute," *id.* (emphasis added), or, if a contention alleges that an application "fails to contain information on a relevant matter as required by law," *id.*, to identify "each failure and the supporting *reasons* for the petitioner's belief." *Id.* (emphasis added); *see Millstone*, 54 NRC at 361-62. The Commission has in addition advised that a petitioner has "an ironclad obligation to examine the publicly available documentary material pertaining to the facility in question with sufficient care to enable the petitioner to uncover any information that could serve as the foundation for a specific contention." 54 Fed. Reg. at 33,170 (quoting from *Duke Power Co.* (Catawba Nuclear Station, Units 1 and 2), ALAB-687, 16 NRC 460, 468 (1982), *vacated in part on other grounds,* CLI-83-19, 17 NRC 1041 (1983)).

In the SOC to the 1989 amendments the Commission provides guidance in interpreting and applying the contention admissibility standards — guidance which is entitled to "special weight" in adjudication proceedings. *Long Island Lighting Company* (Shoreham Nuclear Power Station, Unit 1), ALAB-900, 28 NRC 275, 290-291 (1988), *review declined*, CLI-88-11, 28 NRC 603 (1988). The Commission notes in the SOC that the requirement of 10 C.F.R. § 2.714(b)(2)(ii) "does not call upon the intervenor to make its case at this stage of the proceeding, but rather to indicate what facts or expert opinions, be it one fact or opinion or

many, of which it is aware at that point in time which provide the basis for its contention." 54 Fed. Reg. 33,168, 33,170 (Aug. 11, 1989). Further, the Commission notes:

> . . . "[A] protestant does not become entitled to an evidentiary hearing merely on request, or on a bald or conclusory allegation that such a dispute exists. The protestant must make a minimal showing that material facts are in dispute, thereby demonstrating that an 'inquiry in depth' is appropriate."
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> . . . . The Commission expects that at the contention filing stage the factual support necessary to show that a genuine dispute exists need not be in affidavit or formal evidentiary form and need not be of the quality necessary to withstand a summary disposition motion.

54 Fed. Reg. at 33,170-33,171 (quoting from *Connecticut Bankers Ass'n v. Board of Governors,* 627 F.2d 245, 251 (D.C. Cir. 1980).

It is, however, the petitioner's obligation to formulate a contention and provide the information necessary to satisfy the basis requirement of the rule. *Duke Energy Corporation* (Oconee Nuclear Station, Units 1, 2, and 3), CLI-98-17, 48 NRC 123, 125 (1998). A "contention's proponent, not the licensing board, is responsible for formulating the contention and providing the necessary information to satisfy the basis requirement" of the rule. *Statement of Policy on Conduct of Adjudicatory Proceedings*, CLI-98-12, 48 NRC 18, 22 (1998).

Finally, contentions are necessarily limited to issues that are germane to the application pending before the Board, *Yankee*, CLI-98-21, 48 NRC at 204 n.7, and are not cognizable unless they are material to matters that fall within the scope of the proceeding for which the licensing board has been delegated jurisdiction as set forth in the Commission's notice of opportunity for hearing. *Public Service Co. of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-316, 3 NRC 167, 170-71 (1976); *see also Commonwealth Edison Co.* (Zion Station, Units 1 and 2), ALAB-616, 12 NRC 419, 426-27 (1980); *Commonwealth Edison Co.* (Carroll County Site), ALAB-601, 12 NRC 18, 24 (1980).

To summarize, a contention must:

A. under § 2.714(b)(2), consist of a *specific* statement of the issue of law or fact the petitioner wishes to raise or controvert; and

B. under § 2.714(b)(2)(i), be supported by a brief *explanation* of the factual and/or legal basis or bases of the contention, which goes beyond mere allegation and speculation, is *not* open-ended, ill-defined, vague or unparticularized, and *is* stated with reasonable specificity; and

C. under § 2.714(b)(2)(ii), include a statement of the alleged facts or expert opinion (or both) that support the contention and on which the petitioner intends to rely to prove its case at a hearing, which must also be stated with reasonable specificity; and

D. also under § 2.714(b)(2)(ii), include references to those specific sources and documents of which the petitioner is aware and on which the petitioner intends to rely to establish the facts it alleges and/or the expert opinion it offers, which must also be stated with reasonable specificity and, at a minimum, consist of a fact-based argument sufficient to demonstrate that an inquiry in depth is appropriate, and illustrate that the petitioner has examined the publicly available documentary material pertaining to the facility(ies) in question with sufficient care to uncover any information that could serve as a foundation for a specific contention; and

E. under § 2.714(b)(2)(iii), provide sufficient information to show that a *genuine dispute* exists with the applicant on a *material* issue of law or fact (i.e., a dispute that actually, specifically, and directly challenges and controverts the application, with regard to a legal or factual issue, the resolution of which "would make a difference in the outcome of the licensing proceeding"), 54 Fed. Reg. at 33,172), which includes either:

1. *references to the specific portions of the application* (including the applicant's environmental report and safety report) that the petitioner disputes *and the supporting reasons for each dispute*, or

2. if the petitioner believes that the application fails to contain information on a relevant matter as required by law, the *identification of each failure and the supporting reasons for the petitioner's belief* ; and

See Duke Energy Corp. (McGuire Nuclear Station, Units 1 and 2, Catawba Nuclear Station, Units 1 and 2), LBP-02-4, 55 NRC 49, 67-68 (2002); *see also* LBP-03-03, 57 NRC at 64.

Also, as indicated in the text of § 2.714(b)(2)(iii), for issues arising under NEPA, contentions must be based on the applicant's environmental report, and the petitioner can

amend such contentions or file new contentions "if there are data or conclusions in the NRC draft or final environmental impact statement, environmental assessment, or any supplements relating thereto, that differ significantly from the data or conclusions in the applicant's document." And under § 2.714(d)(2)(ii), in ruling on a contention a Licensing Board must refuse to admit a contention if, assuming the contention were proven, it would be of no consequence in the proceeding because it would not entitle the petitioner to specific relief.

Discussion and Rulings on Contentions

In light of the preceding discussion, we now address the petitioners' contentions. We first address a grouping of contentions that center around the same sets of issues, and then consider the remaining contentions individually.

BREDL Contentions Relating to MOX fuel behavior, and Impact of Differences Between MOX and LEU Fuel Behavior on DBA Analysis and Potential for Releases Under NEPA

BREDL Contentions 1, 2, 6, 7, 10, 11, and 12 raise two related groups of issues. One group of issues has to do with how differences between the behavior of low enriched uranium (LEU) fuel and MOX fuel could impact the design basis accident analysis for Catawba; the other concerns how the same differences could impact severe accident consequences and potential releases under the National Environmental Policy Act (NEPA). More specifically, the first group of issues deals with whether Duke in its LAR has adequately considered those aspects of MOX fuel behavior that are different from LEU fuel behavior in the calculations Duke has used to support its assertion that there is essentially no difference between MOX and LEU fuel performance during a design basis accident (DBA). The second group of issues — that having to do with severe accident consequences and potential releases under NEPA — goes to whether any differences in MOX fuel behavior would have any impact on the potential for, magnitude of, and/or consequences of any releases from Catawba, and whether Duke has in its LAR adequately quantified the risk to the environment that could result from the use of the MOX fuel lead test assemblies at Catawba.

The root of all these contentions is BREDL's assertion that Duke has failed to account for differences in MOX and LEU fuel behavior (both known differences as well as recent information on possible differences) and to account for and quantify the impact of such differences on both the DBA analysis for Catawba, and the potential for releases and their consequences, under NEPA.

Because the factual and technical questions involved in the above-listed contentions overlap to a large degree, and also appear to us to focus on the central substantive set of issues raised in the contentions now before us, we consider first in our analysis the contentions that raise these dual "threads" of inquiry together, as a group, prior to addressing the remaining contentions submitted by the petitioners. Before, however, moving into an in-depth analysis of this group of contentions, an overview of the contentions themselves perhaps best illustrates the related nature of the issues addressed therein:

BREDL 1. Failure to Provide Quantitative Information in Risk Impact Analysis

Duke's risk impact analysis is inadequate, because it presents the results of its analysis in qualitative terms only.

BREDL 2. Inappropriate use of SPDEIS for Estimate of Consequence Increase

Duke has failed to support its claim that the increase in severe accident consequences associated with the MOX LTA loading will not be significant.

BREDL 6. Failure to Provide Quantitative Information in Support of Assertions re Environmental Impacts.

Duke fails to provide quantitative support for its assertion that the consequences of a severe accident involving use of LTA MOX fuel assemblies will increase 0.3% at most.

BREDL 7. Inappropriate use of SPDEIS for Conclusion that Impacts are Insignificant.

Duke has failed to support its claim that the increase in severe accident consequences associated with the MOX LTA loading will not be significant.

BREDL 10. Failure to account for uncertainties in MOX fuel assembly behavior during Loss of Coolant Accidents.

Duke's safety analysis for design-basis loss-of-coolant accidents ("LOCAs") in Section 3.7 of the LTA license amendment application is inadequate, because it fails to account for uncertainties in the technical understanding of the behavior of MOX fuel during LOCAs that may lead to significant deviations from low-enriched uranium ("LEU") fuel behavior.

BREDL 11. Failure to consider uncertainties in MOX fuel assembly behavior on the probabilities and consequences of severe accidents.

Duke's analysis of the impact of the plutonium MOX LTAs on the probabilities and consequences of severe accidents is inadequate, because it fails to account for uncertainties in the technical understanding of the behavior of MOX fuel during severe accidents that may lead to significant deviations from low-enriched uranium ("LEU") fuel behavior.

BREDL 12. Failure to consider effects of plutonium MOX fuel characteristics on severe accident potential.

BREDL characterizes Contentions 1, 2, 10, and 11 as safety issues under the Atomic Energy Act (AEA) and implementing regulations, and Contentions 6, 7, and 12 as issues arising under the National Environmental Policy Act (NEPA). Again, as indicated above, the root of all these contentions is that Duke has failed to account for certain asserted differences in MOX and LEU fuel behaviors, and for the impact of such asserted differences on both the Catawba DBA analysis and the potential for releases under NEPA.

In the next several sections of this Memorandum, we summarize BREDL's bases for this group of contentions; discuss the responses of Duke and the NRC Staff on the admissibility of these contentions; state our rulings; and provide our reframing of the contentions we find admissible in two consolidated contentions, renumbered as Contentions I and II.

BREDL Contentions 1, 2, 6, 7, 10, 11, and 12 — Bases

BREDL 1. Failure to Provide Quantitative Information in Risk Impact Analysis

Duke's risk impact analysis is inadequate, because it presents the results of its analysis in qualitative terms only.

BREDL in Contention 1 challenges Duke's risk impact analysis in Section 3.8 of the LAR. BREDL in this contention relies on the first two paragraphs of Section 3.8, which contain the following language:

> The use of four MOX fuel lead assemblies (out of a total of 193 fuel assemblies in the core) will not significantly change the risk to public health and safety that is posed by operation of . . . Catawba.
>
> Duke uses probabilistic risk assessment (PRA) analyses to evaluate the risk to public health and safety due to operation of its nuclear plants. PRA analyses quantify the probability and consequences of severe accidents that involve core melt and containment failure events. Key considerations in PRA analyses are equipment requirements to prevent core melt (success criteria); ice melt times, containment pressurization rates, and potential containment failures (containment performance); and doses to the public (offsite consequences). The attributes of MOX fuel that impact these areas are fundamentally similar to uranium fuel, as discussed below.

LAR, Attachment 3 at 3-36; BREDL 10/21/03 Contentions at 4. Asserting that Duke provides only qualitative arguments for its claim that the probability of a severe accident will not significantly increase, BREDL contends that Duke "does not attempt to calculate the changes in core damage frequency (CDF) and Large Early Release Frequency (LERF) associated with the proposed license amendment." BREDL 10/21/03 Contentions at 5. BREDL argues that by failing to provide quantitative calculations, "Duke's risk analysis fails to provide an adequate basis for the NRC to conclude that the increases in core damage frequency or risk are 'small and consistent with the intent of the Commission's Safety Goal Policy Statement,' an important criterion for risk-informed decision-making." *Id.* (citing Regulatory Guide 1.174, Revision 1, entitled "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" at 1.174-6 (2002) [hereinafter Reg. Guide 1.174]).

BREDL 2. Inappropriate use of SPDEIS for Estimate of Consequence Increase

Duke has failed to support its claim that the increase in severe accident consequences associated with the MOX LTA loading will not be significant.

In Contention 2, also relating to section 3.8 of the LAR, BREDL challenges Duke's statement that the "potential impact [from use of MOX lead test assemblies] on offsite consequences from severe accidents would range from about minus 0.1% to plus 0.3% compared to LEU fuel." LAR, Attachment 3 at 3-37; *see* BREDL 10/21/03 Contentions at 5. Noting that Duke apparently relies on scaled results, based on figures for offsite consequences from severe accidents with a 40% MOX fuel core that are found in DOE's November 1999 Surplus Plutonium Disposition Final Environmental Impact Statement (SPDEIS), BREDL alleges the following problems: (1) incorrect scaling of the figures, with Duke dividing by an incorrect factor of 40 rather than the correct factor of 20 (leading to a result "from between (-) 0.2% to (+) 0.7%"); (2) the outdated nature of DOE's calculation of consequences; (3) Duke's not taking into account published research noting flaws in DOE's analysis (including an article of Dr. Lyman on public health risks associated with MOX fuel use), according to which the DOE calculation uses "uniformly low values for actinide release fractions," which are "parameters with large uncertainties"'; and (4) the current impossibility of fully evaluating the risk impact of the proposed MOX lead test assemblies LAR using Reg. Guide 1.174, "because the NRC staff has not completed final guidance on how [Reg. Guide] 1.174 can be applied in the case of MOX fuel use." *Id.* at 5-6.

BREDL asserts that "[i]n order to evaluate the overall impact on risk of the MOX LTA license amendment, it is necessary to know which accidents will be most affected, and how the increase in probability and consequences will change," and that "in order to make that assessment, Duke must use its own up-to-date PRA, and provide the results of its calculations, including the details of the consequence assessment." *Id*. at 6-7 (citing, *inter alia*, E. Lyman, "Public Health Risks of Substituting Mixed-Oxide for Uranium Fuel in Pressurized Water

Reactors," *Science & Global Security* 9 at 33-79 (2001) [hereinafter Lyman 2001 *Science* Article]).

> **BREDL 6. Failure to Provide Quantitative Information in Support of Assertions re Environmental Impacts.**
>
> Duke fails to provide quantitative support for its assertion that the consequences of a severe accident involving use of LTA MOX fuel assemblies will increase 0.3% at most.

> **BREDL 7. Inappropriate use of SPDEIS for Conclusion that Impacts are Insignificant.**
>
> Duke has failed to support its claim that the increase in severe accident consequences associated with the MOX LTA loading will not be significant.

BREDL Contentions 6 and 7 address the same factual questions as those raised in BREDL Contentions 1 and 2, relating to the consequences of a severe accident using MOX LTAs, but in a NEPA context. In Contention 6 BREDL claims that Duke has not shown quantitative support for its statement, at section 5.6.3.2 of the Environmental Report (ER) of the LAR, that the consequences of a severe accident from the LAR will have a maximum increase of 0.3%. *Id*. at 13-14. Further, BREDL alleges, "[b]y describing environmental impacts in purely qualitative terms, when it also has the information in quantitative terms, Duke violates the requirement of [10 C.F.R. § 51.45(c)] that the analysis in an Environmental Report must quantify the various factors considered 'to the extent possible.'" *Id*. at 14. BREDL asserts that Duke must document its risk analysis by providing "all the details of its consequence assessment, including a full description of core inventory, release fractions, consequence modeling, techniques used, and a full accounting of uncertainties." *Id.*

In Contention 7, as in Contention 2, BREDL disputes Duke's claim that the radiological consequences of a severe accident would increase by no more than 0.3%, noting the asserted incorrect scaling of the SPDEIS figures, which BREDL alleges "misrepresents the environmental impacts of the proposed license amendment." *Id.* Thus, BREDL asserts:

> In order to evaluate the significance of the impacts of MOX LTA testing, it is necessary to know which accidents will be most affected, and how the increase in probability and consequences will change. In turn, in order to make that assessment, Duke must use its own up-to-date PRA, and provide the results of its calculations, including the details of the consequence assessment. Even if

the increase in consequences is no more than 2%, the change in risk could be significant for CDFs 100 times higher than what Duke assumed, as may be the case if sump recirculation is not available.

Id. at 15.

BREDL 10. Failure to account for uncertainties in MOX fuel assembly behavior during Loss of Coolant Accidents.

Duke's safety analysis for design-basis loss-of-coolant accidents ("LOCAs") in Section 3.7 of the LTA license amendment application is inadequate, because it fails to account for uncertainties in the technical understanding of the behavior of MOX fuel during LOCAs that may lead to significant deviations from low-enriched uranium ("LEU") fuel behavior.

BREDL 11. Failure to consider uncertainties in MOX fuel assembly behavior on the probabilities and consequences of severe accidents.

Duke analysis of the impact of the plutonium MOX LTAs on the probabilities and consequences of severe accidents is inadequate, because it fails to account for uncertainties in the technical understanding of the behavior of MOX fuel during severe accidents that may lead to significant deviations from low-enriched uranium ("LEU") fuel behavior.

BREDL 12. Failure to consider effects of plutonium MOX fuel characteristics on severe accident potential.

Contention 10, along with Contentions 11 and 12 (all three of which were filed on December 2, 2003), all arise out of information presented at an October 23, 2003, meeting the NRC Staff held with representatives of the French Institut de Radioprotection et de Sûreté Nucléaire (IRSN). In this meeting, A. Mailliat and J.C. Mélis presented slides relating to a proposal to do a series of tests at the Phébus experimental reactor in France, relating to MOX fuel. BREDL 12/2/03 Contentions at 3. BREDL argues that this proposal is highly significant "given NRC's dependence on foreign MOX data (or lack thereof) in evaluating MOX-related submittals." *Id.*

With regard to application of the late filing criteria of 10 C.F.R. § 2.714(a)(1) to Contentions 10, 11, and 12, BREDL contends that it had good cause for the late filing of Contentions 10, 11, and 12, stating that the slides from the October 23, 2003, IRSN presentation were not available to them until they were placed in NRC's CITRIX system on

November 4, within 30 days of which BREDL filed the contentions.[7] *Id.* at 11. BREDL also asserts that the October 2003 presentation not only raised new and significant different information not previously presented by the IRSN at earlier meetings in 2001 and 2002, it had as its primary purpose the presentation of a proposal and discussion of issues relating to plutonium MOX fuel and high burnup fuel. Tr. 647-58. Regarding the other four factors of 10 C.F.R. § 2.714(a)(1)(i)-(v), BREDL argues, first, that there are no other means available than this proceeding of "protecting its interest in ensuring that the testing of plutonium MOX lead test assemblies is conducted in a manner that adequately protects health and safety and complies with the environmental safeguards of NEPA." BREDL 12/2/03 Contentions at 11. Next, BREDL asserts that its participation in the proceeding "may reasonably be expected to assist in developing a sound record," through the testimony of Dr. Lyman, and that there are no other parties who can represent BREDL's interest in this regard. *Id.* Finally, BREDL argues that, while granting a hearing on the late-filed contentions "may broaden the proceeding somewhat, these effects will not be unreasonable, given that the contentions are being filed early in the proceeding," and that a balancing of the late-filing factors thus favors the admission of the contentions. *Id.*; *see also* Tr. 666-69.

Substantively, BREDL in Contention 10 challenges Duke's deterministic safety analysis for the impact of the MOX fuel lead assemblies (at sections 3.7.1 and 3.7.1.1 of the LAR), contending that it fails to take into account what BREDL asserts to be an inadequacy in the experimental database for MOX fuel performance during LOCAs. BREDL 12/2/03 Contentions at 3. BREDL argues that the proposed French tests both illustrate and address such "gaps" in the experimental database for both MOX fuel and high-burnup LEU fuel. *Id.* According to BREDL, the IRSN presentation suggests that MOX fuel relocation "would increase power and

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[7] At BREDL's request the slides were later placed in ADAMS, with the accession number ML032970642. BREDL 12/2/03 Contentions at 11.

negatively affect heat transfer, with a deleterious impact on important LOCA parameters," including increases in peak clad temperature (PCT) ("stated at the meeting to be 100° C higher"), clad oxidation ("stated at the meeting to be a 5%-10% increase in the oxide layer"), and clad hydrogen uptake. *Id.* at 3-4; *see* Tr. 644-45. BREDL states that the IRSN representatives pointed out that "this question is particularly important for end-of-life MOX fuel where power generation is not reduced, unlike for UO2 fuel." BREDL 12/2/03 Contentions at 4 (quoting IRSN slides at 21).

Further, BREDL asserts, the IRSN presentation suggested that "modern, low-tin, high ductility cladding materials, such as the M5 cladding that will be used in the MOX LTAs, will form bigger 'balloons' than conventional Zircaloy and are likely to have higher blockage ratios." *Id*. (citing IRSN slides at 24-25). This effect, BREDL argues, "combined with MOX-specific behavior, cannot be fully assessed in the absence of the integral LOCA MOX fuel-bundle tests that IRSN is proposing," and "[t]hus there is insufficient information to provide confidence that the MOX LTAs will not cause coolant blockage during a LOCA that could lead to an unacceptable loss of core coolable geometry and an uncontrolled core melt." BREDL 12/2/03 Contentions at 4. Because of these "unknowns regarding the behavior of MOX fuel during a LOCA," BREDL argues, "Duke lacks a factual basis for assuring that the existing emergency core cooling systems at Catawba will meet the acceptance criteria in 10 CFR 50.46," and its LAR should be denied. *Id.*

In Contention 11 BREDL relies on the basis provided for Contention 10, and makes many of the same arguments as in Contention 10, relating them to section 3.8 of the LAR and severe accidents instead of LOCAs, and citing a part of the IRSN presentation having to do with MOX fuel behavior during severe accidents. *See id*. at 5. BREDL asserts that the IRSN information indicates that "[p]henomena that could affect the consequences of severe accidents include both higher release rates and higher release fractions for both fission products and

actinides compared to LEU, as a result of the MOX fuel microstructure and different oxidation potential." *Id.* at 5-6. BREDL concludes, in Contention 11, with the following argument:

> . . . the use of plutonium MOX fuel at the Catawba nuclear plant appears to pose a risk that plant safety systems will not be adequate to stop a LOCA from progressing to a core melt. At a minimum, the different characteristics of MOX fuel and LEU raise substantial uncertainties with respect to the probabilities and consequences of severe accidents for the MOX LTA core. Because of the potential for a significant increase in severe accident risk, these uncertainties should be fully analyzed in Duke's MOX LTA [LAR].

Id. at 6.

BREDL in Contention 12 adopts and incorporates by reference the bases of Contentions 10 and 11, challenging Duke's discussion, in sections 5.6.3.1 and 5.6.3.2 of its ER, of the environmental impacts of both design basis and severe accidents. Pointing out that neither cited section of the ER discussed "the susceptibility of plutonium MOX fuel to slumping during a LOCA or the adverse effect that slumped fuel may have on the ability of the safety injection system to cool the entire core," BREDL asserts that the ER should address the significance of both of these characteristics "with respect to the potential for and consequences of a design basis accident or severe accident." BREDL 12/2/03 Contentions at 6-7.

BREDL Contentions 1, 2, 6, 7, 10, 11, and 12 — Duke and Staff Responses

Responses to BREDL Contention 1

Duke and the Staff oppose BREDL Contention 1 (which asserts inadequacy in Duke's risk impact analysis by virtue of its failure to provide quantitative information), both urging that the LAR is "not a risk-informed application" such that Reg. Guide 1.174 would even come into play. Duke 11/11/03 Answer at 15-16 (emphasis omitted); *see* Staff 11/10/03 Response at 6. Arguing that the Reg. Guide applies only to proposed licensing basis changes that go beyond current NRC Staff positions, etc., "where the proposal is based on an analysis grounded in probabilistic risk assessment," Duke asserts that its LAR is grounded in a traditional deterministic engineering evaluation, and therefore the Reg. Guide is inapplicable. Duke 11/11/03 Answer at 16. Duke notes that the LAR does introduce changes in fission products and source term, but that its engineering evaluation includes a safety analysis of the effects of the four MOX LTAs on the design basis transients and accidents described in the facility Updated Final Safety Analysis Report (UFSAR), and points out that its safety analysis, which is found at section 3.7 of Attachment 3 of the LAR, is not challenged by the contention. *Id.*

Duke asserts that it has demonstrated, using the traditional evaluation approach, that it meets applicable acceptance criteria for the design basis transients and accidents, including that radiological dose consequences will remain within the limits of relevant regulatory criteria. *Id.* Arguing that Contention 1 fails to show that any additional quantitative assessment of risk is required for the NRC to make the "reasonable assurance" of safety findings required under 10 C.F.R. §§ 50.92(a) and 50.57(a), Duke also states that BREDL has provided no basis to suggest that such an assessment is required to assure adequate protection of public health and safety. *Id.*

Duke states that the "risk assessment provided in Section 3.8 of the LAR is for information and perspective only." *Id.* at 17. Arguing that there is no NRC requirement for any assessment of changes in CDF or LERF, Duke argues further that the relief BREDL seeks in

Contention 1 — further quantitative risk analysis — would exceed NRC regulatory requirements, and that the basis offered by BREDL "does not establish how or why the relief could be granted in this proceeding." *Id.* at 16-17. Duke argues in addition that the factual premise for BREDL Contention 1 is flawed, because it is "readily apparent from the LAR that the proposed changes in the core (four assemblies) will not significantly change the decay heat produced, and will not increase the likelihood of design basis events or change the ability of the plant to mitigate the consequences of design basis events." *Id*. at 17 (citing LAR, Attachment 3, Section 3.7.2). Moreover, according to Duke, BREDL has provided no basis on which to assert that the proposed LAR would either change CDF or LERF materially or increase public health and safety risk significantly. *Id*. Thus, Duke argues, BREDL Contention 1 is inadmissible because it lacks a sufficient regulatory or factual basis to demonstrate the existence of a genuine dispute on a material issue, and because it would not entitle BREDL to any relief in this proceeding. *Id.*

The Staff largely concurs with Duke's arguments on BREDL Contention 1, agreeing that "[c]hanges in the CDF or LERF are not required to be addressed or calculated for this deterministic amendment," and that BREDL has shown no dispute as to a material fact or issue of law. Staff 11/10/03 Response at 7. Because the LAR "is not a risk-informed LAR," the risk analysis proposed by BREDL is "not necessary," nor is Reg. Guide 1.174 relevant, according to the Staff. *Id.* at 6-7. While the limited risk information submitted by Duke "may be looked at during the Staff's review," it "does not play a large role and is not a key component in the decision making process." *Id.* at 7.

Responses to BREDL Contention 2

Both Duke and the Staff also oppose admission of BREDL Contention 2 (regarding alleged inappropriate use of SPDEIS for estimate that severe accident consequence increase will not be significant), arguing that, because there is no requirement for licensees to design against severe accidents or to perform a risk assessment on safety and risk issues regarding severe accident consequences, BREDL Contention 2 fails to address any issues material to this proceeding. Duke 11/11/03 Answer at 18; Staff 11/10/03 Response at 8. The Staff also challenges the contention based on BREDL's failure to "specify any accident sequences, not previously analyzed by the applicant, that, because of irradiation of MOX LTAs, must be included in the LAR." Staff 11/10/03 Response at 8. In addition, besides arguing generally that the contention falls short of meeting the materiality and entitlement to relief requirements of 10 C.F.R. § 2.714, Duke 11/11/03 Answer at 18, Duke specifically responds to each of the problem areas raised by BREDL.

While Duke concedes that BREDL's challenge to its scaling calculation is quantitatively correct, it maintains that even if the change in public health risk from severe accidents did range, as BREDL contends, from minus 0.2% to plus 0.7%, that change is still not significant in the context of a PRA. Duke 11/11/03 Answer at 19. Duke supports this argument with a reference to a study of risks from severe accidents at five plants including Sequoyah, an ice condenser containment plant similar to Catawba. *Id.* at 19-20 n.40 (citing NUREG-1150, "Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants" (Dec. 1990). Noting that the NRC as part of this study had generated quantitative risk values and examined the uncertainty inherent in the results, Duke argues that, in the context of NUREG-1150's range of two orders of magnitude between the 5^{th} and 95^{th} percentile results, and difference of approximately a factor of 3 between the mean and the median, a change of less than 2% in risk is "much smaller than the uncertainty inherent in the calculations and therefore is not significant." *Id.* Accordingly, Duke argues, BREDL's revised numbers are not sufficient to

establish a genuine dispute on a material issue of fact as required by Section 2.714(b)(2)(iii). *Id.* at 19-20. Nor, Duke argues, is there any reasonable basis on which to conclude that the scaling aspect of the contention would entitle BREDL to any relief, given that "no public health risk assessment is even required [by the NRC] (as opposed to the analysis of changes in dose consequences discussed in Section 3.7 of the LAR)," and given that this basis asserts "only a change in risk of, at most, plus 0.7%." *Id.* at 20.

Regarding BREDL's challenge to the use of the SPDEIS, and claim that Duke's risk assessment calculation should have been based on the most recent version of Duke's own plant-specific PRA, Duke argues that this lacks a regulatory basis, as Duke is not required to perform any PRA -- qualitative or quantitative -- of the proposed amendment. *Id.* at 20. (Duke also states that BREDL did not challenge the SPDEIS when issued and suggests that this is not the proper forum to do so. *Id.* at 23.) With respect to the published reports critical of DOE's analysis, Duke avers that BREDL's broad references to two documents and its general assertion that DOE used parameters with large uncertainties do not provide a sufficient basis for an admissible contention or "establish a genuine, material issue that could make a difference in the outcome of this matter." *Id.* at 21-22. Citing case law for the proposition that broad references to documents are insufficient to support a contention without analysis and explanation of their significance, Duke questions BREDL's references and their significance, applying the same scaling analysis discussed above to Dr. Lyman's conclusions in his article to question their significance. *Id.* at 22-23.

Finally, both Duke and the Staff again argue that, because the present matter before the Staff does not involve a risk-informed licensing basis change but rather a deterministic review, Reg. Guide 1.174, which provides guidance to be used by the Staff in assessing risk-informed LARs, is irrelevant to the instant LAR. Duke 11/11/03 Answer at 24; Staff 11/10/03 Response at 8-9.

Responses to BREDL Contentions 6 and 7

Both Duke and the Staff argue that BREDL Contention 6 (which alleges failure to provide quantitative support for assertions on environmental impacts of severe accidents) is inadmissible; only Duke opposes Contention 7 (which alleges inappropriate use of SPDEIS to support conclusion that impacts will not be significant). With regard to the reliance on 10 C.F.R. § 51.45(c) in Contention 6, both Duke and the Staff question this section as authority for any requirement of a PRA or the detailed information sought by BREDL, and contend that it does not so require. Duke 11/11/03 Answer at 42; Staff 11/10/03 Response at 17. In addition, Duke argues that section 51.45(c) does not require a "risk analysis," and that 10 C.F.R. § 51.22(c)(9) categorically excludes LARs such as the instant one from the requirement for an environmental review, asserting that its LAR "involves no significant hazards consideration . . . , no significant changes in types or amounts of effluents . . . , and no significant increase in occupational exposures." Duke 11/11/03 Answer at 42-43 (citing LAR, Attachments 4 and 5 (at 5-6--5-7); *id.* at 44.

Further, Duke asserts that it does provide quantitative assessments of postulated accidents in section 3.7 of the LAR technical justification, quantitative results for changes in dose consequences from the use of four MOX LTAs in section 5.6.3.1 of the ER, and a quantitative assessment of the changes in consequences of severe accidents in section 3.8 of the LAR technical justification. *Id*. at 43. Duke also contends that its conclusions are "generally consistent with BREDL's own numbers — that is, a maximum 1.6% change in consequences associated with four lead assemblies." *Id.* at 45 n.72. The Staff supports Duke's arguments that it has provided sufficient quantitative data, and also asserts that BREDL has provided no facts or expert opinion "that would indicate that there would be changes to CDF or LERF." Staff 11/10/03 Response at 17-18.

Both Duke and the Staff argue that Contention 6 should be denied for failure to demonstrate a genuine dispute on a material issue of law or fact, and Duke in addition argues that BREDL seeks relief that cannot be granted. Duke 11/11/03 Answer at 45; Staff 11/10/03

Response at 18. In support of its argument for denial of Contention 6, Duke also cites the licensing board's denial of a contention asserting that section 51.45(c) required a PRA for the proposed MOX fuel fabrication facility. Duke 11/11/03 Answer at 44 (citing *Duke Cogema Stone & Webster*, LBP-01-35, 54 NRC 403, 448 (2001)). Finally, the Staff asserts that the contention is not supported by relevant facts or expert opinion. Staff 11/10/03 Response at 18.

The Staff, as indicated above, supports admission of Contention 7, except to the extent that it seeks a PRA from Duke. *Id.* at 18-19. According to the Staff, "[u]nlike contention 6 (which . . . without basis merely demands more quantitative analysis), contention 7 challenges the technical merit of Duke's conclusions relating to severe accident environmental impacts." *Id.* at 18. Duke, on the other hand, questions the basis for the contention that there could be a change in CDF "100 times higher than what Duke assumed," and asserts that the sump blockage issues is outside the scope of this proceeding given that the subject is being addressed in the context of Generic Safety Issue 191 (GSI-191). Duke 11/11/03 Answer at 46-47 (quoting BREDL 10/21/03 Contentions at 15).

Responses to BREDL Contentions 10, 11, and 12

Both Duke and the Staff oppose the admission of these three contentions (all based on the IRSN materials), arguing that BREDL has neither demonstrated good cause for their late filing, nor made a compelling showing on the remaining factors of 10 C.F.R. § 2.714(a)(1) to justify their lateness. Duke 12/23/03 Answer at 6-9; Staff 12/24/03 Opposition at 6-8. Duke and the Staff assert that the issues presented by the IRSN during the October 2003 meeting are not new issues and that the same issues had in fact been previously presented by the IRSN at NRC public meetings held in October 2001, February 2002, and in May 2002. Duke 12/23/03 Answer at 6-7; Staff 12/24/03 Opposition at 6. Duke points to the February 2002 meeting in particular, arguing that because BREDL's technical advisor, Dr. Lyman, attended and participated in that meeting and was apparently aware of the VERCORS source term tests discussed there long before 2002, Contention 10 is untimely. Duke 12/23/03 Answer at 6-9.

The Staff asserts that fuel relocation and its potential effects, and fuel behavior during a LOCA, are not new issues and that BREDL and Dr. Lyman "were or should have been aware of the issues long before the late-filed contentions were proposed." Staff 12/24/03 Opposition at 6. According to the Staff, BREDL has not met its obligation "to examine the application and publicly available information, and to set forth their claims at the earliest possible moment." *Id.* at 6-7 (citing *Duke Energy Corp.*, CLI-03-17, 58 NRC ___ (Dec. 9, 2003), slip op. at 11-12). The Staff in addition questions BREDL's ability to contribute to a sound record based on what it contends are BREDL's failures to "set out with as much particularity as possible the precise issues it plans to cover," summarize its witness' proposed testimony, and demonstrate that Dr. Lyman is an expert on the issues raised in the contention. *Id.* at 7.

In challenging the merits of Contention 10, Duke characterizes the IRSN presentation that forms the basis of BREDL's contention as a research proposal that neither addresses the application at issue nor takes a position on Duke's lead assembly proposal, nor demonstrates a "genuine dispute with Duke's proposal for MOX fuel lead assemblies." Duke 12/23/03 Answer at 10, 14. Duke and the Staff argue that the Board should attach no significance to the mere fact that IRSN wishes to conduct research into the effects of MOX fuel, which by itself is insufficient to provide a basis for an admissible contention. Staff 12/24/03 Opposition at 8; Duke 12/23/03 Answer at 10. The contention is further without merit, Duke argues, in that it: (1) ignores test results contrary to those it relies upon; (2) ignores that the VERCORS RT2 test was not a LOCA test; (3) makes no specific challenge to Duke's LOCA analysis; (4) ignores that the NRC Staff has previously raised fuel relocation as a generic issue but subsequently gave it a low priority and dropped it; (5) speculates without any basis on lead assembly power generation at end-of-life; (6) ignores the track record of M5 cladding; (7) speculates without basis regarding ballooning leading to a core-wide LOCA; and (8) does not address the fact that no European regulators have taken any action related to MOX fuel use based on the VERCORS tests. Duke 12/23/03 Answer at 10-15. For its part, the Staff asserts that BREDL's

statements and conclusions regarding the claimed effects of the use of MOX fuel are unsupported by any factual basis, and that Contention 10 should be rejected for failure to demonstrate a specific dispute on a material issue of law or fact. Staff 12/24/03 Opposition at 8.

Both Duke and the Staff submit that BREDL Contention 11 is also inadmissible because it fails to meet the materiality requirement of 10 C.F.R. § 2.714(b)(2)(iii), in that analysis of severe accidents is not a part of traditional deterministic analysis and is not required to be submitted in support of an LAR, such as Duke's, that is not risk informed. Duke 12/23/03 Answer at 17; Staff 12/24/03 Opposition at 9-10. Duke further challenges the conclusions drawn by BREDL from the IRSN presentation and notes that BREDL has not explained how the small amount of MOX fuel in the four lead test assemblies (which would comprise only 2% of the core) would substantively change either the performance of the emergency core cooling system (ECCS), or the probability or consequences of a severe accident. Duke 12/23/03 Answer at 18-19.

With regard to BREDL Contention 12, Duke claims that BREDL has not demonstrated how the ER's discussions of the consequences of both design basis and severe accidents would be substantively affected by consideration of the IRSN research proposal. *Id.* at 20-21. Duke further asserts that the underlying proposition of BREDL's contention — that an ER must somehow acknowledge and address every uncertainty or research proposal that could be related to an application under review — defies NEPA's "rule of reason." *Id.* at 21. Rather, Duke maintains, the ER's discussion of design basis and severe accident impacts fully complies with the requirements of 10 C.F.R. § 51.45(c). *Id*. For its part, the Staff argues that BREDL has provided no factual basis to support either its assertion that slumping would occur, or that if it were to occur, cooling of the core would be prevented. Staff 12/24/03 Opposition at 11.

Licensing Board Rulings on BREDL Contentions 1, 2, 6, 7, 10, 11, and 12

Timeliness

Before considering any of these contentions under the general admissibility standards of section 2.714(b), (d), we first address the question of timeliness regarding Contentions 10, 11, and 12. As discussed above, Duke and the Staff argue that admission of these three contentions should be denied based on their untimeliness, asserting that the issues they address are not new, and that BREDL has not fulfilled its duty to examine all publicly available material and present its claims at the earliest possible moment. Countering these arguments, BREDL asserts that the October 2003 IRSN presentation had a different purpose, and raised new and significant information not previously presented at the earlier 2001 and 2002 meetings cited by the Staff and Duke.

We have examined portions of NUREG/CP-0176, the Proceedings of the October 2001 Nuclear Safety Research Conference, cited by the Staff in its December 24, 2003, Response. In this document, the presentation cited by the Staff is described as a "Poster Paper." Staff 12/24/03 Opposition, Exhibit 1 at viii. We note at the outset that a "poster paper" is not generally understood to consist of an actual scheduled verbal presentation, and would not generally attract the same level of attention. More importantly, we observe that the cited poster paper does not present the specific quantitative information relied upon by BREDL from the 2003 slides, but rather discusses only qualitative results and assessments from various tests, stating that "there exists a few number of available results of such experiments with irradiated material." *Id.* at 431. For example, in the introduction to the paper, entitled "Need for Experimental Programmes on LOCA Issues Using High Burn-up and MOX Fuels," it is stated that "[u]ncertainties exist regarding how much the existing safety margins associated with peak clad temperature, clad oxidation, core coolability, clad residual ductility can be reduced by new fuels like the MOX one, burn up increases, the arrival of various alloys for fuel rod cladding." *Id.* at 429. It is further stated that "[a] better knowledge of specific phenomena associated to fuel effects is required in order to estimate the new margins and to resolve pending uncertainties related to the LOCA criteria." *Id*. at 429. Although the paper discusses a project involving a

series of integral in-pile experiments involving bundle geometries in the PHEBUS facility, *id.*, unlike the 2003 materials, no quantitative results are presented that suggest there is a real difference in the performance of MOX verses UO2 fuel.

We have also examined portions of the transcript of the May 3, 2002, Advisory Committee on Reactor Safeguards meeting cited by the Staff, in which various PHEBUS projects are discussed. *See* Transcript of Advisory Committee on Reactor Safeguards (ACRS) 492nd meeting, May 3, 2002, at 230 (ADAMS Accession no. ML021370418). Although there is discussion of fuel relocation and proposed testing with regard to the nature of fuel including MOX fuel, *id.* at 296-301 *et seq.*, again, no quantitative information of the sort provided in the 2003 presentation slides appears to have been provided at the 2002 ACRS meeting.

With regard to the VERCORS tests discussed by Duke, Dr. Lyman does reference the VERCORS source term tests with MOX fuel in his 2000 *Science & Global Security* paper. *See* Duke 12/23/03 Answer at 6-9; Lyman 2001 *Science* Article at 42-43. On the other hand, the reference to Dr. Lyman in the transcript of a February 2002 meeting of the Source Term Applicability Panel indicates that he had "just [come] in the door" during the third day of the meeting. Source Term Applicability Panel meeting, February 21, 2002, Transcript at 553 (ADAMS Accession no. ML020770207). Again, however, neither of these references appear to include the quantitative information provided in the October 2003 slides.

In light of the preceding circumstances, we find it difficult to see how one could gain the insight required to suggest the principles discussed by BREDL, until publication of the 2003 materials by the NRC in CITRIX. The 2003 slides clearly discuss certain quantitative differences observed in the tests and thereby provide demonstrative data to support BREDL's contentions.

More generally, with regard to the "good cause" criterion of section 2.714(a)(1)(i), we have considered all the participants' arguments in the context of how issues, similar to those in question in Contentions 10 through 12, customarily arise and are addressed in the scientific

community. In science, it frequently occurs that a new idea or concept is found to have precursors in the literature that pointed the way to the new idea. Often, however, a closer look will reveal that the earlier results were insufficiently developed for their importance to be recognized. Typically, contributions from more than one researcher combine to produce a new insight, with the pertinent contributions coming forth over a period of years. In a sense, there develops a sort of "critical mass" of information that is, as a practical matter, required in order for a new idea or technical result to be recognized. But this does not come about all at once, and indeed more usually develops over time.

In addition, even assuming there were earlier documents that specifically provided all the quantitative information provided in the 2003 IRSN slides, it often occurs that publications in the open literature may appear to be available to everyone, but real-life practicalities in fact make it difficult — to the point of being essentially impossible — to learn of and acquire all new information on any given subject. Conference proceedings can be particularly difficult to obtain and are often limited in their scope. For example, the Transactions of the American Nuclear Society, a conference proceeding, restricts articles to fewer than 1,000 words, so that articles can be quite limited in the information they provide. Some publications are available only for a fee and abstracting services may not reference keywords in all of the articles in a collection. Also, search engines may key on different key words in similar technical articles and some publications may not show up soon after publication, if at all. Thus, we do not find it meaningful to address the “good cause” factor in a vacuum, without taking into account these very real practical considerations.

In this context, and based on the preceding discussion, we find that BREDL had good cause under factor (i) of § 2.714(a)(1) for failing to file Contentions 10, 11, and 12 earlier than it did — 28 days after the 2003 slides were available. In addition, we find that the remaining factors also support the admissibility of these contentions. Clearly, there are no other means whereby BREDL’s interest could be protected, under subsections 2.714(a)(1)(ii) and (iv). With

regard to the third factor, we find that BREDL's participation with regard to the information at issue in Contentions 10 through 12 may reasonably be expected to assist in developing a sound record, through Dr. Lyman's testimony, given among other things his writing on related subjects and his expertise in the area. We further find that factors (i) through (iv) clearly outweigh any disadvantage based on the extent to which BREDL's participation will broaden the issues or delay the proceeding under § 2.714(a)(1)(v), particularly in light of certain limitations, discussed in the next section of this Memorandum, that we will place on the parties with regard to any admitted portions of the group of issues therein addressed.

Admissibility Under § 2.714(b), (d)

We begin our discussion of the admissibility of Contentions 1, 2, 6, 7, 10, 11, and 12 under the general criteria of 10 C.F.R. § 2.714(b), (d), by noting that all present quite specific statements of the issues of law and/or fact BREDL wishes to raise; all are supported by sufficient explanation, stated with reasonable specificity; and all rely on stated facts as well as the expert opinion of Dr. Lyman, which we find to be sufficient in all cases to support the contentions at issue. In addition, BREDL has provided specific references to various documents and authorities, including various portions of Duke's LAR.

Our primary focus in this group of contentions is on whether BREDL has shown genuine disputes on material issues of law and/or fact. After carefully considering and taking into account the arguments of BREDL, Duke and the Staff on these contentions, we find that some of the concerns raised do not rise to the level of genuine disputes on material issues of fact or law. We also note that Duke and the Staff have presented strong factual arguments with regard to several issues, which may become more pertinent in merits-based consideration of the issues in an evidentiary hearing — but the merits nature of which we do not find appropriate for consideration at this time. Overall, we find that BREDL has provided sufficient basis in the preceding collection of submitted contentions for several issues of material fact and law, on

which there are genuine disputes, and which are presented with sufficient specificity and support to render them admissible.

For example, in Contentions 2, 10, and 11, BREDL sets forth several areas of quite specific facts, related to the issue of the significance of the severe accident consequences associated with the proposed MOX LTA use. In addition, for the reasons stated by the Staff, we agree that at least that part of Contention 7 that challenges the technical merit of Duke's conclusions relating to severe accident environmental impacts is admissible.

On the other hand, we do not find any "incompleteness" of guidance on use of Reg. Guide 1.174 to support BREDL's contention that it is impossible to evaluate fully the risk impact of the proposed project. But because Duke itself has used probabilistic risk analysis to its benefit, *see* LAR, Attachment 3 at § 3.8, we are not inclined to exclude completely any evidence related to risk, within reasonable and practical limits.

Regarding the NEPA issues of whether the severe accident consequences associated with MOX LTA use will be significant, and whether Duke has, as required by 10 C.F.R. § 51.45(c) and argued in Contention 6, quantified all environmental factors "to the fullest extent practicable" in its ER, we find that BREDL has presented sufficient basis, facts and expert opinion to demonstrate a genuine dispute on these issues — one factual, one a combined legal/factual issue — which are clearly material to the proposal before us.

With specific respect to the issues presented in Contentions 10, 11, and 12, we find that BREDL has provided sufficient support from the IRSN materials to render admissible its contentions that Duke's safety analysis is inadequate in its discussion of LOCAs, and that the LAR inadequately addresses the potential for releases and the potential environmental impact of both design basis and severe accidents. Among the information BREDL describes from the IRSN materials, we note, for example, the following statements from BREDL's second set of contentions:

> The IRSN presentation points out that plutonium MOX fuel relocation has been observed at a lower temperature than LEU fuel relocation (stated at the meeting to be 200°C -300°C lower), i.e., that during a LOCA, the MOX fuel pellet column

> collapses into the lower part of the fuel rod sooner than LEU fuel. . . . This would increase power and negatively affect heat transfer, with a deleterious impact on important LOCA parameters[, including] increases in peak clad temperature (PCT) (stated at the meeting to be 100°C higher), clad oxidation (stated at the meeting to be a 5%-10% increase in the oxide layer) and clad hydrogen uptake. . . .

BREDL 12/2/03 Contentions at 3-4 (citations omitted).

> The IRSN presentation further points out that modern, low-tin, high ductility cladding materials, such as the M5 cladding that will be used in the MOX LTAs, will form bigger "balloons" than conventional Zircaloy and are likely to have higher blockage ratios.

Id. at 4 (citation omitted).

> Phenomena that could affect the consequences of severe accidents include both higher release rates and higher release fractions for both fission products and actinides compared to LEU, as a result of the MOX fuel microstructure and different oxidation potential.

Id. at 5-6 (citation omitted).

Based upon the preceding analysis, we find that significant portions (as specifically defined below) of BREDL Contentions 1, 2, 6, 7, 10, 11, and 12 meet the general contention admissibility standards of 10 C.F.R. § 2.714(b), (d). We have consolidated these portions, and reframed and renumbered them as set forth below, in order to provide for a more efficient hearing with regard to the admissible portions of the contentions, pursuant to our authority under 10 C.F.R. § 2.714(f)(1), (3), to condition intervention on terms that will further the interests of controlling the compass of the hearing and restricting duplicative and repetitive evidence and argument. So reframed, these contentions provide:

> **Contention I**: The LAR is inadequate because Duke has failed to account for differences in MOX and LEU fuel behavior (both known differences and recent information on possible differences) and for the impact of such differences on LOCAs and on the DBA analysis for Catawba.
>
> **Contention II**: The LAR is inadequate because Duke has (a) failed to account for the impact of differences in MOX and LEU fuel behavior (both known differences and recent information on possible differences) on the potential for releases from Catawba in the event of a core disruptive accident, and (b) failed to quantify to the maximum extent practicable environmental impact factors relating to the use of the MOX LTAs at Catawba, as required by NEPA.

The preceding consolidated and reframed contentions cover all issues that we find to be admissible within the grouping of contentions considered above, and we deny all portions not included within the contentions so reframed. We will, moreover, expect the parties to present their evidence in a manner that is limited to direct, to-the-point exposition of the issues defined in the reframed contentions.

We turn now to the remaining contentions submitted by the petitioners.

BREDL 3. Failure to Evaluate Containment Sump Failure

> The discussion of risk impacts of MOX fuel lead assemblies in Section 3.8 of the LTA application is incomplete, because it does not include an evaluation of the effect of containment sump failure on risk impacts of operating the Catawba nuclear power plan with four MOX fuel assemblies.

Relying on two documents that include statements relating to the vulnerability of ice condenser plants to containment sump failure, BREDL faults Section 3.8 of the LAR for not including "an evaluation of the effect of containment sump failure on risk impacts of operating Catawba with four MOX fuel assemblies." BREDL 10/21/03 Contentions at 7 (citing Union of Concerned Scientists, GSI-191 Impact on Catawba and McGuire (Aug. 14, 2003); Arthur Buslik, Risk Considerations Associated with GSI-191, "Assessment of Debris Accumulation on PWR Sump Performance" (Aug. 22, 2001)). Asserting that core damage frequency will increase as a result of a "previously unrecognized design flaw: failure to protect against containment sump clogging in the event of a loss of coolant accident ('LOCA')," BREDL argues further that, "[s]ince small-break LOCAs are the most probable class of LOCAs, this means that the potential for sump clogging has a greater impact on the LOCA CDF for ice condensers than for other [pressurized-water reactors]." BREDL 10/21/03 Contentions at 7-8. BREDL concludes:

> Although Duke has stated that the consequences of an accident would not increase appreciably as a result of MOX LTA fuel use, consequences must be taken together with accident probability in order to evaluate overall risk. In this case, the baseline core damage frequency may be much higher than was assumed in the Catawba PRA, thereby driving up the total risk impact associated with the increased consequences of a severe accident involving the MOX LTA core.

Id. at 8. Finally, noting that Duke has stated (in an August 7, 2003, letter to the NRC) that it is committed to dealing with the containment sump failure issue by the end of March 2004, BREDL argues that, until the issue is "resolved satisfactorily, . . . the application remains incomplete." *Id.*; *see also* Duke 11/11/03 Answer at 25-26 n.50.

Duke argues with regard to BREDL's proposed Contention 3 that, because the sump clogging issue is being addressed in a generic safety issue, it should not be considered in this proceeding. Duke 11/11/03 Answer at 25-26. Therefore, Duke also asserts, "[i]nherently, the NRC has determined that continuing operation pending resolution of these issues presents no undue risk." *Id.* at 25. Further, according to Duke, "[a]ny challenge to the adequacy of the existing licensing basis is an impermissible challenge to the Commission's regulations, and one for which relief would need to be pursued in accordance with 10 C.F.R. § 2.802." *Id.* at 25 (citing *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 and 3), CLI-01-24, 54 NRC 349, 364 (2001)). Because Contention 3 "does not address possible changes that might be caused by or relate to the use of four MOX fuel lead assemblies," Duke argues, "it fails to demonstrate a *genuine* dispute with respect to a *material* issue." Duke 11/11/03 Answer at 28 (emphasis in original). Finally, Duke asserts, "because the contention does not challenge the required safety analysis, it fails to demonstrate how the petitiioner would be entitled to any relief in this proceeding." *Id.*

The Staff challenges BREDL Contention 3 largely on the basis that "it contains no factual support for the bald assertion that somehow the type of fuel irradiated bears any relation to the sump clogging issue." Staff 11/10/03 Response at 9. Further, the Staff asserts, none of the documents cited by BREDL support its central argument that "the baseline core damage frequency could be 'much higher than was assumed in the Catawba PRA, thereby driving up the total risk impact associated with the increased consequences of a severe accident involving the MOX LTA core.'" *Id*. at 10 (quoting BREDL 10/21/03 Contentions at 8). And even if it is assumed "that BREDL has adequately supported their claims regarding core damage

frequency at Catawba as it relates to sump performance," according to the Staff, "BREDL still failed to provide any support for their bald assertion that there would be increased consequences of a severe accident if it involved a reactor using MOX LTAs." *Id.* Finally, the Staff argues that Contention 3 is inadmissible because there is "no requirement that sump clogging due to the use of MOX be considered as part of the accident analysis which supports the LAR," and because, since the LAR is "not a risk-informed amendment, the contention does not raise a genuine dispute regarding a material issue of fact or law," or provide a technical basis for its assertions." *Id*. at 11.

Licensing Board Ruling on BREDL Contention 3

We find that Contention 3 does not demonstrate a genuine dispute with respect to a material issue of law or fact in the context presented, because, as Duke argues, the contention does not address any changes that could be caused by the use of four MOX fuel lead assemblies themselves. Whatever the situation is now, or will be within the coming month, with regard to the sump clogging issue at Catawba, this issue is not relevant to measuring any increased impact on safety resulting from the use of the four MOX LTAs, which is the only question before us, in the context of this contention. We therefore deny this contention.

BREDL 4. Failure to Evaluate Future Use of MOX Fuel

The Environmental Report for the LTA application (Attachment 5) is deficient because it completely fails to address the environmental impacts of using batch quantities of MOX fuel in the Catawba and McGuire reactors. Duke's failure to address the impacts of MOX use in its Environmental Report is inconsistent with Council on Environmental Quality ("CEQ") regulations and judicial and NRC decisions interpreting NEPA, which require consideration of connected actions, as well as cumulative impacts.

BREDL in Contention 4 challenges Duke's "postponement," in Section 5.3.7 of its Environmental Report, of any evaluation of the environmental impacts of using batch quantities of MOX fuel until any future batch LAR, as "illegal segmentation of the decision-making process with respect to MOX fuel." BREDL 10/21/03 Contentions at 9. BREDL contends that the

"testing and use of MOX fuel" are "connected" and "interdependent" actions that should be considered together under NEPA. *Id.* at 9-10. In support of its argument, BREDL cites Duke's cover letter to its September 15, 2003, Security Submittal, which does not "limit[ ] the requested license amendment application to the period of MOX fuel testing." *Id.* at 10; *see* Duke 9/15/03 Security Submittal. BREDL asserts that this satisfies the NEPA tests for "ripeness" and "nexus" — i.e. that there be a concrete proposal for the other action (batch MOX fuel use), and that the proposal be connected to the action at issue such that it would be "unwise or irrational" not to go through, in this case, with batch MOX fuel use after LTA testing. *Id*. at 11.

Duke opposes BREDL Contention 4, asserting that any future proposal for batch MOX fuel use is only potential at this point, and depends on satisfactory lead assembly performance. Duke 11/11/03 Answer at 29-30 (citing *Duke Energy Co.* (McGuire Nuclear Station, Units 1 and 2, Catawba Nuclear Station, Units 1 and 2), CLI-02-14, 55 NRC 278, 298 (2002); *Kleppe v. Sierra Club*, 427 U.S. 390 (1976); *National Wildlife Federation v. FERC*, 912 F.2d 1471, 1478 (D.C. Cir. 1990)). Duke also cites the case of *Society Hill Towers Owners' Ass'n v. Rendell*, in which the Third Circuit rejected a claim that the impact of future development had to be considered along with a project for a hotel and parking garage in the city of Philadelphia, because it was not clear that the additional projects would ever be completed. Duke 11/11/03 Answer at 30-31 (citing *Society Hill Towers Owners' Ass'n v. Rendell*, 210 F.3d 168 (3rd Cir. 2000)). According to Duke, "[s]ubstantial uncertainties still surround the MOX fuel project." Duke 11/11/03 Answer at 31. These uncertainties include, Duke states, questions relating to the planned fuel fabrication facility and the success or failure of certain international agreements. Duke 11/11/03 Answer at 31-33. Duke states further that its "limited attempt at regulatory efficiency" in its September 2003 Security Submittal "does not commit Duke to file a 'batch' application, commit the NRC to approve 'batch use,' or make NRC authorization of 'batch use' any more certain or likely." *Id*. at 34.

It is possible that no LAR for batch use will ever be filed, Duke says. *Id*. "Should the lead assembly program reveal unexpected problems, Duke would not move forward with 'batch use' until the problems are resolved," Duke states, also suggesting that there is no "practical commitment" to batch use. *Id*. at 35 (citing *Webb v. Gorsuch*, 699 F.2d 157, 161 (4th Cir. 1983); *Airport Neighbors Alliance v. United States*, 90 F.3d 426, 433 (10th Cir. 1996)). Prior MOX demonstration programs have not led to large scale use of MOX fuel, Duke notes. *Id*. at 35-36 n.63. The lead assemblies testing does not, Duke asserts, "automatically trigger" future batch use; the testing can proceed even if batch use does not, and can be justified on its own, for its testing purpose. *Id*. at 36. Concluding, Duke states:

> The implication of the contention is that the NRC cannot approve a test program without also first evaluating full-scale implementation of the technology being tested — even where subsequent approvals will be required and will have full environmental review. The contention should be rejected as a matter of law.

Id. at 37 (citing 10 C.F.R. § 2.714(b)(2)(iii); *see id*. at 37 n. 66 (citing *Project Mgmt. Corp.* (Clinch River Breeder Plant), LBP-76-14, 3 NRC 430, 434 (1976)).

The Staff agrees with Duke that under *McGuire/Catawba*, the contention must be dismissed. Staff 11/10/03 Response at 11-12 (citing *McGuire/Catawba*, CLI-02-14, 55 NRC at 295). The Staff notes as well that it has "already communicated to Duke that it will only review its security related submittal in relation to the LTAs," and that any review relating to batch quantities "must be deferred until Duke makes a proposal for such use." *Id*. at 12 n.7 (citing Letter from Robert E. Martin to Michael S. Tuckman, Re: Mixed Oxide Fuel Assemblies (Oct. 31, 2003) (ADAMS Accession No. ML033040017) (Attachment 1)).

Licensing Board Ruling on BREDL Contention 4

We deny this contention because, under relevant precedent including the Commission's recent decision in the *McGuire/Catawba* license renewal proceeding, evaluation of future use of MOX fuel is neither required nor appropriate in this proceeding. The LAR involves only lead test assemblies, the results for which may or may not ultimately lead to future batch use of MOX fuel in Catawba. As Duke argues, any future proposal for batch use of MOX fuel is uncertain at this point, and not automatic. To be sure, there is "dependence," in that future batch use is *dependent on* a number of circumstances and factors, including the results of the lead test assemblies. But there is not "interdependence" going in both directions, nor is there "ripeness," as required under the case law discussed above, including, most recently, the Commission's decision in *McGuire/Catawba*, under which the issues relating to batch use of MOX fuel must be deemed not to be "ripe" until the LAR "proposal" for it is submitted. Although the Commission stated that "NIRS and BREDL are of course free to raise MOX-related safety and environmental issues . . . when and if Duke submits a license amendment application seeking permission to possess and use MOX fuel," *McGuire/Catawba*, CLI-02-14, 55 NRC at 297, we find that the more likely intent of this statement was that the issues that would be permissible to raise would be those directly related to whatever application is at issue at any given time.

Thus, while BREDL may raise issues relating to the lead test assemblies in this proceeding, it may not raise issues relating to batch use until an application for such use has been submitted. If there is a future license amendment request regarding batch use of MOX fuel, that will be the appropriate time to require the sought evaluation.

BREDL 5. Failure to Consider New Information Showing Viability of Alternatives
The Environmental Report is deficient because it fails to consider alternative nuclear power plants for testing and batch MOX fuel use, other than Catawba and McGuire.

BREDL in Contention 5 challenges Sections 5.2.2 and 5.7 of Duke's Environmental Report (ER), in which it is stated that no alternatives other than the proposed action or no-action are viable, with no explanation provided. BREDL 10/21/03 Contentions at 12. BREDL refers to two items of "new information," not considered in the SPDEIS, that "demonstrates that McGuire and Catawba are not appropriate choices for MOX fuel batch use, because of two significant previously unidentified design flaws that make them particularly vulnerable to accidents, including containment breach." *Id.* BREDL contends that this new information "compels a re-evaluation of conclusions previously reached in the SPDEIS." *Id.*

The first piece of new information cited by BREDL is NUREG/CR-6427, Assessment of the DCH [Direct Containment Heating] Issue for Plants with Ice Condenser Containments (April 2000), which deals with the problem of hydrogen ignition, a subject also currently pending with the Staff in their work on Generic Safety Issue 189 (GSI-189), and one which BREDL contends has not been addressed in any EIS. *Id*. at 12-13. The second piece of information is what BREDL characterizes as the particular vulnerability of ice condenser plants to reactor sump clogging accidents, another issue that has not been addressed in the SPDEIS. *Id.* at 13. BREDL asserts that these two items, "regarding the heightened vulnerability of the Catawba and McGuire containments to breach or rupture, and the heightened vulnerability of plant cooling systems to clogging, could significantly increase the overall risk of an accident" at Catawba in comparison to other plants, with MOX fuel use. *Id.* Therefore, BREDL asserts, this new information should be considered in a supplemental EIS. *Id.*

Duke and the Staff have opposed the admission of BREDL Contention 5, although the Staff modified its position during oral argument to the extent of agreeing that Duke should address the alternative of using Duke's Oconee plant for the MOX LTAs in its ER. Tr. 456; *see* Staff 12/19/03 Reply at 9 n.6. Duke asserts that under NEPA, the "only viable alternative" to its

LAR, the "proposed action," is the No Action alternative that is already covered by the LAR. Duke 11/11/03 Answer at 38-39.

Duke asserts further that this proceeding is limited to the LAR, and that the contention inappropriately seeks to evaluate alternatives that are "not presently available to either Duke or DOE and that are beyond the scope of the present environmental review." Duke 11/11/03 Answer at 38. Citing case law for a "rule of reason" in considering alternatives under NEPA, and that the analysis need not consider the environmental effects of alternatives that are "deemed only remote and speculative possibilities," Duke asserts that the premise, that other nuclear power plants are alternatives for the MOX lead assembly program, is "unfounded and speculative." *Id.* at 38-39. In addition, noting the requirement in 10 C.F.R. § 51.30(a) for only a "brief discussion" of alternatives, Duke argues that "BREDL seeks too much when it seeks to inject a full evaluation of currently existing generic safety issues into an environmental review for a site-specific amendment request." *Id*. at 40. Any increase in risk at Catawba due to the issues addressed in GSI-189 and GSI-191 "remains to be determined in the context of the GSIs and exists independent of MOX fuel lead assemblies," according to Duke. *Id.* at 40.[8] The issues in GSI-189 and GSI-191 are "outside the scope of this LAR," Duke asserts. *Id.* Finally, Duke argues that, to the extent the contention challenges DOE's SPDEIS, this is the wrong forum. *Id.* at 41.

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[8] Regarding the generic safety issues, Duke refers us to its arguments in opposition to BREDL contention 3, in which it cites what it characterizes as the NRC "longstanding practice" of "not address[ing] generic safety issues in individual licensing proceedings." Duke 11/11/03 Answer at 40; 25-26 (citing *Potomac Elec*. *Power Co.* (Douglas Point Nuclear Generating Station, Units 1 and 2), ALAB-218, 8 AEC 79, 85 (1974); *Duke Power Co*. (Catawba Nuclear Station, Units 1 and 2), ALAB-813, 22 NRC 59, 86 (1985); *Private Fuel Storage,* LBP-98-7, 47 NRC 142, 179 (1998)).

The Staff agrees that the NRC and this Board lack jurisdiction to address DOE's environmental responsibilities. Staff 11/10/03 Response at 14 n.9. The Staff also argues that "BREDL fails to establish a relationship between the ice condenser containment's alleged increased vulnerability and the irradiation of MOX," and that "generic safety issues that are not related to the use of MOX are not within the scope of this proceeding." *Id.* at 14. Finally, the Staff asserts that Duke is not required to evaluate alternative plants owned by other companies, stating that this is "not feasible, because neither Duke nor the NRC can initiate the application process to amend licenses of other reactors to allow the use of MOX," and notes that Duke did, in its September 23, 2003, letter from M. S. Tuckman, explain that the timing of the availability of the LTAs "supported the operational schedule at Catawba, thus explaining why McGuire was not a viable alternative." *Id.* at 14-15 (citing *Citizens Against Burlington v. Busey*, 938 F.2d 190, 198 (D.C. Cir. 1991), *cert. denied*, 502 U.S. 994 (1991)); 16; 14 n.10 (citing *Hydro Resources, Inc.*, CLI-01-04, 53 NRC 31, 55 (2001)).

Licensing Board Ruling on BREDL Contention 5

We agree with the argument that we do not have jurisdiction to consider in this proceeding alternatives not within the control of Duke, and deny this contention to this extent. As the Staff itself concedes, however, Duke does have control over the Oconee plant, and thus we find it appropriate to require analysis of this alternative in the environmental report, at least to the extent required for a "brief discussion" under 10 C.F.R. § 51.30(a). We therefore admit BREDL Contention 5 to this extent, reframed and renumbered as follows:

> **Contention III**: The Environmental Report is deficient because it fails to consider Oconee as an alternative for the MOX LTAs.

Within this context, we will permit BREDL and the other parties to present evidence relating to the comparative safety, practicability, and appropriateness of using the MOX lead test assemblies at Catawba and Oconee.

We turn now to a consideration of Contentions 9 and 13, both related to the shipment of the plutonium proposed to be used to fabricate the MOX LTAs.

BREDL 9. Failure to identify the quantity of plutonium to be shipped to France.
The LTA license amendment application fails to identify the quantity of plutonium that will be shipped to France for processing. This is a significant omission, in light of the significant discrepancy (40kg) between the amount of plutonium oxide that the DOE seeks to ship to France and the amount of plutonium needed to make four lead test assemblies. This discrepancy and its environmental impacts should be addressed before the LTA use permit is issued.

BREDL 13. Failure to adequately address the environmental impacts of plutonium shipments.
Duke's license amendment application must be rejected because it is not supported by an adequate analysis of the security-related environmental impacts of shipping plutonium to France, or the security-related impacts of shipping the LTAs from France back to the United States.

In Contention 9 BREDL cites the SPDEIS for the information that it takes about 100 kg of plutonium to make four MOX lead test assemblies, noting that DOE's export application to the NRC seeks permission to export up to 140 kg of weapons grade plutonium oxide powder to France. BREDL 10/21/03 Contentions at 16 (citing Letter from Edward J. Siskin, Assistant Deputy Administrator, Office of Fissile Materials Disposition, DOE, to Deputy Director, Office of International Programs, NRC (Oct. 1, 2003); SPDEIS at 2-63). BREDL challenges this, asserting that the "potential environmental impacts of 40 stray kilograms of plutonium falling into the wrong hands are enormous," and that "DOE should be required to explain this discrepancy before any permit is issued for LTA use." *Id.* at 16.

Duke opposes admission of this contention on the grounds that "[e]xport and other issues associated with transportation outside the United States are not within the scope of this Part 50 license amendment application." Duke 11/11/03 Answer at 51. These issues are appropriately addressed, Duke says, in the context of the Part 110 export license application. *Id.* at 51-52. Duke also notes that the export application addresses how any extra material will be handled, packaged, and returned to the U.S., and therefore there is no genuine issue in dispute. *Id.* at 52. The Staff agrees. Staff 11/10/03 Response at 20.

Contention 13 is presented as a substitute for BREDL's original Contention 8, which is withdrawn. BREDL 12/2/03 Contentions at 7 n.3. BREDL asserts that, although it is NRC policy not to address the environmental impacts of terrorist attacks, sabotage, or other acts or malice or insanity, DOE — having "affirmatively decided to address the environmental impacts of terrorist attacks" — is "subject to review for the reasonableness of its analysis." *Id*. at 7 n.4. BREDL asserts further that for a "number of reasons" DOE's 1996 Programmatic Environmental Impact Statement for Storage and Disposition of Weapons-Usable Fissile Materials (DOE/ES-229), and its November 2003 Supplemental Analysis, Fabrication of [MOX] Fuel Lead Assemblies in Europe (DOE/EIS-0229-SA3), are "completely inadequate to support the shipment of plutonium to and from France." *Id*. at 7-8; *see id*. at 9-10. Citing case law for its argument that "significant new circumstances or information" warrants preparation of a new EIS, BREDL asks that this be done, and that it be "published in draft form, so that members of the public can be involved in the decision-making process." *Id.* at 9-10 (citing *Marsh v. Or. Natural Res. Council*, 490 U.S. 360, 374 (1989); *Warm Springs Dam Task Force v. Gribble*, 621 F.2d 1017, 1023-24 (9th Cir. 1980); *Friends of the Clearwater v. Dombeck*, 222 F.3d 552, 558 (9th Cir. 2000)).

Duke and the Staff oppose admission of Contention 13, with Duke arguing, *inter alia*, that BREDL never substantively challenges the November 2003 Supplemental Analysis, that the Supplemental Analysis provides a detailed discussion of appropriate issues, that the transportation issues raised in the contention are outside the scope of this proceeding because they apply to DOE and not Duke (noting that BREDL has petitioned to intervene in the DOE export license application proceeding), and that Commission precedent in any event precludes consideration in this proceeding of the issues. Duke 12/23/03 Answer at 22-26 (citing *Private Fuel Storage* (Independent Spent Fuel Storage Installation), CLI-02-25, 56 NRC 340 (2002); *Duke Cogema Stone & Webster* (Savannah River Mixed Oxide Fuel Fabrication Facility), CLI-02-24, 56 NRC 335 (2002)). The Staff agrees, also citing two additional Commission

decisions to the same effect. Staff 12/24/03 Response at 11-13 (citing *Duke Energy Corp*. (McGuire Nuclear Station, Units 1 & 2, Catawba Nuclear Station, Units 1 & 2), CLI-02-26, 56 NRC 358 (2002); *Dominion Nuclear Connecticut, Inc.* (Millstone Power Station, Unit 3), CLI-02-27, 56 NRC 367 (2002)).

Licensing Board Ruling on BREDL Contentions 9 and 13

We find these contentions to relate to an activity within the control of DOE, which is not before us in this proceeding. Although Duke reliance on DOE information may be relevant in appropriate circumstances in this proceeding, these contentions speak to what DOE "should be required to explain," and given that we do not have jurisdiction over DOE in this proceeding, the contention must be denied.

NIRS 1. Duke's proposed plan is lacking key benchmarks

NIRS Contention 1 is concerned with the absence of key benchmarks in Duke's LAR, notably "documentation of the plutonium oxide process history and content" and "independent certification of the test fuel." NIRS Contentions at 2. Because of uncertainties about the differences between reactor-grade and weapons-grade fuel behavior and reactor control, NIRS asserts that these benchmarks are necessary, "[i]n order to show in the future that the present tests are representative, or bounding of future large-scale use of weapons plutonium fuel." *Id*.

The first of these benchmarks is necessary, NIRS argues, because the weapons-grade plutonium "will come from multiple processes and will have to be treated to remove impurities and other materials in order to make the MOX fuel." *Id.* at 3. According to NIRS, the majority of the U.S. material to be converted to MOX fuel comes from bomb parts known as "pits," consisting of an alloy of plutonium and other elements including gallium, it is therefore "important to know whether the plutonium oxide that would be used to make the test fuel was ever in the pit form." *Id.* NIRS cites documents produced at Los Alamos National Laboratory and the NRC for the proposition that gallium "may attack the zirconium alloy metal of the fuel cladding," and that the effects of small parts of gallium on fuel and cladding behavior "have not

been fully assessed." *Id.* (citing Arjun Makhijani, Technical Aspects of the Use of Weapons Plutonium as Reactor Fuel, posted at http://www.ieer.org/sdafiles/vol_5/5-4/moxmain4.html; and "NRC Staff White Paper on Mixed Oxide Fuel Use in Commercial Light Water Reactors," posted at http:/www.nrc.gov/materials/fuel-cycle-fac/mox/pdf/ml993620025.pdf). Noting studies that indicate that low amounts of gallium (low parts per million) will not lead to significant interaction with cladding, NIRS argues that it is important to document the level of gallium and other contaminants, for future use in consideration of any batch loading of MOX fuel into the Catawba reactor. NIRS Contentions at 3-4 (citing D.F. Wilson et al., Behavior of Zircaloy Cladding in the Presence of Gallium, Oak Ridge National Laboratory, 1999).

NIRS also challenges the quality assurance of the proposed fuel assemblies, noting Duke's statement in Section 3.5.4 of the LAR that Framatone ANP has responsibility for the "entire fuel assembly fabrication process" for the LTAs, and questioning whether this includes quality certification of the test fuel pellets and rods in addition to the assemblies. NIRS Contentions at 4. Citing various concerns about fuel pellet quality including inconsistent diameters, inhomogeneities or plutonium clusters in MOX fuel, lack of experience with producing fuel pellets from weapons-grade plutonium, and past difficulties validating MOX products, NIRS asserts that "the parameters associated with these first assemblies are particularly important" and support its call for independent certification of the test fuel. *Id.* at 5-6.

Duke and Staff Response to NIRS Contention 1

Duke and the Staff claim that NIRS Contention 1 is beyond the scope of the present LAR and proceeding because it focuses upon a "potential future application addressing batch use." Duke 11/11/03 Answer at 53-54; *see also* Staff 11/10/03 Response at 21-22. Duke asserts that it has provided sufficient information in its LAR to address any safety issues and environmental impacts related to *this* LAR, and suggests, further, that:

> . . . if in connection with a batch assembly application NIRS believes that the lead assemblies are not representative of the batch assemblies proposed to be authorized *at that time*, NIRS would have a potential issue related to *that*

> approval (subject to the requirements of 10 C.F.R. § 2.714(b)(2) for an admissible contention) . . . .

Duke 11/11/03 Answer at 53-54 (emphasis in original). Whether or not data from the present LAR would be useful or support a future batch-use amendment application, Duke argues that "there is no NRC requirement that use of lead assemblies of any type of fuel can only be authorized if the data generated will prove useful to the fuel vendor or the licensee in the future." *Id.* at 55.

Specifically, Duke contends that, with regard to plutonium oxide and "parts per million" of gallium, it has gone further in incorporating a specification "limiting gallium to *parts per billion* — orders of magnitude below the concern identified as a basis for the contention." *Id*. at 55 (emphasis in original); *see id.* at 55-56 (citing LAR, Attachment, § 3.5; LAR, Reference 1, Framatone *MOX Fuel Design Report* [hereinafter Fuel Design Report]). Thus, Duke argues, there is no genuine dispute for litigation in this proceeding. *Id*.

Regarding the issue of quality certification of the fuel pellets, Duke states, among other things, that the lead assemblies will be manufactured by Framatome under a quality assurance program that must meet 10 C.F.R. Part 50, Appendix B, and that it has provided responses to Staff Requests for Additional Information (RAIs) relating to this as well, neither of which circumstances NIRS Contention 1 engages or suggests will be inadequate. *Id.* at 57-58 (citing LAR, Attachment 3, § 3.5.4; Letter to NRC from M. Tuckman (Oct. 1, 2003) (ADAMS #ML032880370)). Duke argues that there is no factual or regulatory basis to mandate independent certification of the MOX fuel assemblies. Duke 11/11/03 Answer at 60. For these and other reasons, Duke argues that NIRS has shown no basis for its contention regarding quality assurance, and no basis for further relief in this proceeding. *Id.*

According to the Staff, NIRS's arguments about the source of the plutonium oxide are outside the scope of this proceeding, and instead a matter falling within DOE's jurisdiction. Staff 11/10/03 Response at 22. The Staff cites Attachment 3 to the LAR and the Framatome report as indicating "that the elements enumerated by NIRS are already a part of the MOX fuel

design and certification program," and refers specifically to page 14 of the Fuel Qualification Plan and the Fuel Design Report, both provided by Duke, for information about the specification for the isotopic and impurity range and design of the MOX fuel, respectively. Staff 11/10/03 Response at 22.

The Staff asserts that the physical form of the original material (i.e., the "pit") and where it came from "is not relevant to the Staff's assessment of the fuel"; rather, "[o]nly the composition of the fuel provided for use in the reactor is important." *Id.* The Staff points out that, because gallium is an impurity that does need to be limited, the material undergoes a chemical process called "aqueous polishing" before it can be processed, but that this is not relevant in this proceeding "because the process used for getting the material into the composition needed to meet the material specification will not impact how the fuel behaves." *Id.* at 22-23 (citing Fuel Design Report, §§ 3.2.1, 3.2.2, 3.2.3).

The Staff also refers to Duke's RAI responses, which are asserted to provide "further clarification with respect to the breadth of the quality assurance program as it related to the fabrication process," and notes that all hardware and materials will come from qualified suppliers who "will be performing their activities affecting quality in accordance with a quality assurance program that has been reviewed and approved" to assure that they meet the "stringent requirements of 10 C.F.R. Part 50, Appendix B." *Id.* at 23. In addition, Duke's own quality assurance program is also required to meet Part 50, Appendix B, which contains explicit requirements for "independent assessment of activities affecting quality." *Id.* at 24-25. Therefore, the Staff argues, NIRS Contention 1 is without basis, demonstrates no genuine dispute regarding a material issue of law or fact, and should be rejected. *Id.* at 25.

Licensing Board Ruling on NIRS Contention 1

We find that NIRS has not demonstrated in this contention a genuine dispute on a material issue of law or fact. Given the specification, cited by Duke, that gallium content is limited to parts per billion, the support provided by NIRS, relating to parts per million, fails. With regard to the quality certification issue, likewise, we find no genuine dispute on a material issue. The entire basis of this part of the contention is premised on an inadequate quality assurance program, but insufficient support has been provided to establish a genuine dispute on this issue, given the quality assurance requirements cited by Duke and the Staff, which are not disputed by NIRS. We therefore deny NIRS Contention 1.

NIRS 2. Provisions for Irradiated MOX Test Assemblies

In its Contention 2, NIRS cites specific characteristics of irradiated MOX fuel — higher thermal power, slower decay rate than LEU fuel, more fissile plutonium than LEU waste — as well as "uncertainties about the impact of burnup on the fuel rods" and "any complications from inhomogeneities and possible residues from other nuclear bomb ingredients," to bolster its claim that a plan is required for the ongoing monitoring of irradiated MOX fuel waste until Duke is informed about the "eventual disposition of high-level waste." NIRS Contentions at 6-7. As support, NIRS cites a publication from the National Academy Press, entitled "Management and Disposition of Excess Weapons Plutonium: Reactor-Related Options." NIRS Contention at 6 n.8. NIRS also claims that there is no "provi[sion] for lower density packaging for transport in the event that a repository becomes available." NIRS Contentions at 7.

Both Duke and the Staff argue that NIRS Contention 2 is inadmissible, suggesting that this contention lacks supporting facts or expert opinion, basis, and the specificity required of an admissible contention. Duke 11/11/03 Answer at 60-62; Staff 11/10/03 Response at 26. The Staff adds that it previously accepted "the M5 cladding material that will be used for the MOX LTAs," and explains that this M5 cladding has been applied to European reactors with MOX fuel. Staff 11/10/03 Response at 26. Aside from contesting NIRS' broad reference to the

National Academy of Sciences book, Duke characterizes this contention as posing only questions and uncertainties, which fail to show "how these four [MOX fuel] assemblies would pose a significant challenge to the Catawba spent fuel pool." Duke 11/11/03 Answer at 60-61. Duke also views NIRS's transportation concerns as lacking a basis sufficient to demonstrate a genuine dispute, as being outside the scope of the current LAR, and as being the responsibility of DOE and thus appropriate for consideration in a different proceeding (such as the DOE environmental impact statement for the proposed high level waste responsitory at Yucca Mountain). *Id.* at 62.

Licensing Board Ruling on NIRS Contention 2

We find this contention lacks the specificity required for an admissible contention. Apart from a general reference to one document, NIRS has provided no facts or expert opinion to support the contention, sufficient to provide a basis that would make it admissible. We therefore deny NIRS Contention 2.

NIRS 3. Duke's License Amendment Underscores Regulatory Gap Between NRC and DOE: Duke's License Amendment Precedes The Department of Energy's Fulfillment of It's [sic] Responsibility Under [NEPA]

In this contention NIRS asserts that because the irradiation of the LTAs "depend upon the shipment of the weapons-grade plutoniuim to France," this transportation should be considered in this proceeding. NIRS Contentions at 7. NIRS notes DOE's export license application, but asserts that there is no EIS addressing this shipment, and that this "regulatory gap" must likewise be considered in this proceeding. *Id.*

Duke and the Staff assert that NIRS Contention 3 fails to meet the requirements of 10 C.F.R. § 2.714(b), (d). *See* Staff 11/10/03 Response at 27-28; Duke 11/11/03 Answer at 47-51. For its part, the Staff argues that NIRS Contention 3 lacks specificity and insufficiently states the relief being sought. Staff 11/10/03 Response at 27-28. Duke and the Staff point out that Contention 3 is misdirected because the proper forum for such concerns is DOE's pending Part 110 export license application, which is a separate proceeding subject to its own regulations.

Id. at 27; Duke 11/11/03 Answer at 47-50. Duke also states that any NEPA requirements applicable to the transportation of feed material to France instead involve DOE, and defends the sufficiency of its own Environmental Report. Duke 11/11/03 Answer at 48. Duke and the Staff also argue that no relief could be granted relative to this contention in this proceeding. Staff 11/10/03 Response at 27; Duke 11/11/03 Answer at 48. Duke adds that "export licensing matters under 10 C.F.R. Part 110 are explicitly excluded from the scope of the Commission's environmental regulations in 10 C.F.R. Part 51," and that Commission precedent relating to export licensing as well supports denial of this contention. Duke 11/11/03 Answer at 50-51 (citing *Westinghouse Electric Corp.* (Exports to the Philippines), CLI-80-15, 11 NRC 672 (1980) (citing *Edlow International*, CLI-76-6, 3 NRC 563, 584 (1976)).

Licensing Board Ruling on NIRS Contention 3

As with BREDL Contentions 9 and 13, this contention relates to an activity within the control of DOE, which is not before us in this proceeding. Given that we do not have jurisdiction over DOE in this proceeding, the contention must be denied.

NIRS 4. Only the No Action Alternative is Consistent with the Overall Goal for Plutonium

In this contention NIRS asserts that the "No Action" alternative, or not undertaking the MOX LTA proposal, is necessary because the U.S.-Russian Federation plutonium disposition program will not increase security with regard to the plutonium. NIRS Contentions at 7-8. NIRS claims that "the bomb plutonium remains relatively easy to recover for nuclear weapons use, until after irradiation." *Id.* at 8. In support of this statement NIRS cites a report from Arms Control Today, a publication of the Arms Control Association in Washington, D.C. *Id.* at 8 n.12 (citing article found at the following website: http://www.armscontrol.org/act/2003_01-02/mox_janfeb03.asp?print). NIRS also cites former NRC Commissioner Victor Gilinsky, who has written that "recycling the plutonium in civilian reactors is a particularly bad answer," because disposal of it will take a long time — 20 to 30 years — and because there is a "significant risk of theft and the subsequent hostile use of this

material as it is taken out of storage, transported, and processed." *Id*. at 9 (quoting America's Plan to Dispose of Weapons-Grade Plutonium, Atoms for Peace or a Gift to Terrorists?, found at the following website: http://www.aei.org/events/filter.,eventID.298/summary.asp).

NIRS argues that it is "not credible to support the weapons MOX program as a means of non-proliferation." *Id.* at 9. Further, NIRS asserts, "[w]hile NRC may not be in the position to reverse decisions made by other federal agencies, it does have the authority and the responsibility under the Atomic Energy Act [AEA] to engage US nuclear policy matters and should work to end this fatally flawed and dangerous program." *Id.* at 9-10. The first step in doing this, NIRS urges, would be "to select the No Action Alternative, and deny this license amendment." *Id.* at 10.

Duke and the Staff oppose NIRS Contention 4, with the Staff arguing that the bases offered by NIRS are outside the scope of this proceeding, and that, "at this stage of the amendment review process," no relief could be granted, as the Board is without authority to direct the Staff to deny the application "at this juncture." Staff 11/10/03 Response at 28-29. Duke agrees that the relief desired by NIRS cannot be provided, resting its argument on NEPA, pointing out NEPA's "essentially procedural" nature, under which an agency is not mandated to reach a particular result if a proposed action complies with all safety requirements under the AEA, and noting that the discussion of the "No Action" alternative may be brief. Duke 11/11/03 Answer at 65-66 (citing, *inter alia*, *Vt. Yankee Nuclear Power Corp. v. Natural Res. Def. Council*, 435 U.S. 519, 558 (1978); *Kelley v. Selin*, 42 F.3d 1501, 1512 (6th Cir. 1995); *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989); *Northeast Nuclear Energy Co*. (Millstone Nuclear Power Station, Unit 3), CLI-01-3, 53 NRC 22, 44 (2001)).

Duke also argues that the contention "merely sets forth NIRS's opposing view of the MOX fuel program, rather than alleging any specific perceived deficiencies in Duke's LAR," as it must do to support an admissible contention. Duke 11/11/03 Answer at 62-63 (citing *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), LBP-82-76, 16 NRC

1029, 1035 (1982); *Philadelphia Elec. Co.* (Peach Bottom Atomic Power Station, Units 2 and 3), ALAB-216, 8 AEC 13, 20-21 (1974)).

Licensing Board Ruling on NIRS Contention 4

Although the "No Action" alternative is a valid issue under NEPA, and although NIRS has provided support from very respectable sources for its contention, we do not find that the support NIRS offers provides the necessary specificity to render the contention admissible. Although NIRS makes reference to dangers of theft, it does not specify in any way how such theft could occur, and thus the contention fails.

We note that NIRS has, in this contention, raised various national policy issues. Undoubtedly, these are significant issues. They do not, however, support an admissible contention before us in this proceeding, which is governed by the contention admissibility requirements quoted and discussed at some length above. These sorts of policy questions are more appropriate for determination by the Commission in its oversight role with regard to the civilian use of nuclear materials in the U.S. Therefore, while we will not address these sorts of issues in this proceeding, NIRS may choose to present these issues to the Commission, separately.

NIRS 5. An Environmental Impact Statement is Needed to Inform This Decision

Licensing Board Ruling:

In Contention 5 NIRS provides extensive argument that the LAR at issue involves a "major federal action" that warrants the preparation of an EIS. NIRS Contentions at 10-16. Without speaking to the merits of NIRS' arguments, we do not go into this argument herein, because we agree with the Staff that the contention is premature, given that the Staff has not decided whether the LAR is a major federal action or whether to generate an EIS or Environmental Assessment (EA). Staff 11/10/03 Response at 30-31 (citing *Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), LBP-99-25, 50 NRC 25, 39 (1999)). As the Staff proposes, we therefore dismiss NIRS Contention 5 without prejudice, leaving the door open for a late-filed contention, should the Staff issue an EA in lieu of an EIS. *See* Staff 11/10/03 Response at 30-31 (citing *Pacific Gas & Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), LBP-93-1, 37 NRC 5, 36 (1993)).

III. CONCLUSION

A. Standing and Admitted Contentions

In conclusion, although we find that both BREDL and NIRS have established standing to participate in this proceeding, we conclude that only BREDL has provided admissible contentions, which we consolidate, reframe, and admit, as follows:

> **Contention I**: The LAR is inadequate because Duke has failed to account for differences in MOX and LEU fuel behavior (both known differences and recent information on possible differences) and for the impact of such differences on LOCAs and on the DBA analysis for Catawba.
>
> **Contention II**: The LAR is inadequate because Duke has (a) failed to account for the impact of differences in MOX and LEU fuel behavior (both known differences and recent information on possible differences) on the potential for releases from Catawba in the event of a core disruptive accident, and (b) failed to quantify to the maximum extent practicable environmental impact factors relating to the use of the MOX LTAs at Catawba, as required by NEPA.
>
> **Contention III**: The Environmental Report is deficient because it fails to consider Oconee as an alternative for the MOX LTAs.

B. Settlement

Commission regulations recognize that it is in the public interest for particular issues or an entire matter to be settled, and encourage parties and licensing boards to seek fair and reasonable settlements. 10 C.F.R. § 2.759. To the degree the issues in this proceeding may be amenable to this, we encourage the parties to seek such settlement of any or all of the contentions that we admit in this Memorandum and Order, and that may subsequently be admitted, and advise the parties that they may jointly contact the Board Chair if they wish to have a Licensing Board Panel-appointed Settlement Judge or Mediator assist in this endeavor.

IV. ORDER

In light of the foregoing discussion, and based upon the entire record of this proceeding to date, it is, this 5th day of March, 2004, ORDERED:

1#. BREDL (Reframed) Contentions I , II, and III are hereby admitted as contentions in this proceeding, as set forth and described above in this Memorandum and Order. The request of BREDL for a hearing on these contentions, as reframed, is hereby granted, and BREDL is hereby admitted as a party to this proceeding.

2. The remaining BREDL contentions are hereby rejected.

3. All of NIRS' contentions are rejected, for the reasons stated above, and as a result, NIRS is not admitted as a party to this proceeding.

4. A telephone conference will be convened on March 16, 2004, at 1:30 p.m., to address various scheduling, administrative and other appropriate matters, including discovery, the evidentiary hearing, the hearing of limited appearance statements, and other issues, all of which are addressed in greater detail in an unpublished Order also issued this date.

5. This Order is subject to appeal in accordance with the provisions of 10 C.F.R. § 2.714a(a)-(c). Any petitions for review meeting applicable requirements set forth in that section must be filed within 10 days of service of this Memorandum and Order.

It is so ORDERED.

THE ATOMIC SAFETY
AND LICENSING BOARD

_____
Ann Marshall Young, Chair
ADMINISTRATIVE JUDGE

_____
Anthony J. Baratta
ADMINISTRATIVE JUDGE

_____
Thomas S. Elleman
ADMINISTRATIVE JUDGE

Rockville, Maryland

March 5, 2004[9]

[9] Copies of this Order were sent this date by Internet e-mail or facsimile transmission, if available, to all participants or counsel for participants.