

May 27, 2016

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
)
)
SOUTHERN NUCLEAR OPERATING CO.) Docket Nos. 52-025 & 52-026
)
(Vogtle Electric Generating Plant, Units 3 and 4))

NRC STAFF ANSWER TO PETITION FOR LEAVE
TO INTERVENE AND REQUEST FOR HEARING

INTRODUCTION

Pursuant to 10 C.F.R. §§ 2.323 and 2.309, the staff of the U.S. Nuclear Regulatory Commission (Staff) hereby responds to “Petition for Leave to Intervene and Request for Hearing by the Blue Ridge Environmental Defense League (BREDL or Petitioner) and its chapter Concerned Citizens of Shell Bluff (CCSB) regarding Southern Nuclear Operating Company’s (Southern, Applicant, licensee) Request for a License Amendment (LAR) and Exemption for Containment Hydrogen Igniter Changes, LAR-15-003” dated May 2, 2016 (Petition).¹ For the reasons set forth in detail below, although Petitioner has demonstrated standing pursuant to 10 C.F.R. § 2.309(d), Petitioner does not present an admissible contention in accordance with the requirements of 10 C.F.R. § 2.309(f)(1). Accordingly, the Petition should be denied.

¹ See Petition for Leave to Intervene and Request for Hearing by the Blue Ridge Environmental Defense League and its chapter Concerned Citizens of Shell Bluff regarding Southern Nuclear Operating Company’s Request for a License Amendment and Exemption for Containment Hydrogen Igniter Changes, LAR-15-003 (May 2, 2016) (Petition). BREDL submitted its petition on May 2, 2016, on the docket for a different proceeding. On May 3, 2016, a docket was created for this proceeding and BREDL resubmitted its petition. The Staff does not challenge the timeliness of the filing.

BACKGROUND

A. License Amendment Background

On February 6, 2015, Southern submitted an application to amend the combined licenses (COLs) for Vogtle Electric Generating Plant (VEGP) Units 3 and 4, COL Nos. NPF-91 and NPF-92, respectively (Application).² The licensee requests the addition of two hydrogen igniters near the in-containment refueling water storage tank (IRWST) roof vents. Specifically, the LAR explains that the proposed changes that are the subject matter of the proceeding “modify the design of the hydrogen ignition subsystem by adding two additional igniters.”³ The igniter placement is based on the potential pathway of hydrogen during a postulated severe accident scenario and the igniter placement criteria in Updated Final Safety Analysis Report (UFSAR) Table 6.2.4-6.⁴ The LAR states that “the proposed changes to add two hydrogen igniters in the identified locations are consistent with the criteria in Table 6.2.4-6 and therefore do not alter the design function of the igniters, have no effect on any analysis or analysis method, and do not affect the performance or controls of hydrogen control functions.”⁵

Granting the LAR would also reorganize control of the hydrogen igniters, clarify the controls available for the hydrogen igniters at workstations in the main control room and the remote shutdown room, and make changes to maintain consistency within various licensing documents.⁶ The proposed changes would revise the VEGP UFSAR including the Tier 1 UFSAR, Tier 2 UFSAR, the COL Appendix C, Inspections, Tests, Analyses and Acceptance Criteria (ITAAC), and the VEGP Technical Requirements Manual (TRM).⁷ Because the LAR

² See Southern Nuclear Operating Company Vogtle Electric Generating Plant Units 3 and 4 Request for License Amendment and Exemption: Containment Hydrogen Igniter Changes (LAR-15-003), letter from Southern Nuclear Operating Company (February 6, 2015) (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15037A715) (Application).

³ Application at 3.

⁴ *Id.* at 11.

⁵ *Id.* at 12.

⁶ *Id.* at 3.

⁷ See *id.* According to NRC regulations, Tier 1 information is “the portion of the design-related information contained in the generic DCD that is approved and certified by” Appendix D of 10 C.F.R. Part 52. Tier 2

includes changes to Tier 1 information, pursuant to the requirements of 10 C.F.R. § 52.63, the Application also included a request for an exemption.⁸

On March 2, 2016, the Nuclear Regulatory Commission (NRC) published a notice of the receipt of the Application in the Federal Register.⁹ The notice stated that the NRC has made a proposed determination that the LAR involves no significant hazards consideration, and sought public comment on that proposed determination.¹⁰ The notice also provided an opportunity to request a hearing.¹¹

On May 2, 2016, BREDL filed its Petition along with 30 member declarations (Standing Declarations) and the supporting expert declaration of Arnold Gundersen (Gundersen Declaration).¹² Petitioner offers two contentions opposing the license amendment request which address: “1) the danger presented by the poorly conceived modifications posed by the LAR, and 2) the failure of the NRC to properly incorporate the experience gained from previous hydrogen explosions in its license for Vogtle.”¹³

information is “the portion of the design-related information contained in the generic DCD that is approved but not certified by” Appendix D of 10 C.F.R. Part 52. 10 C.F.R. Part 52, Appendix D, Section II. E-D. Departures from plant specific Tier 1 information require an exemption pursuant to 10 C.F.R. §§ 52.63(b)(1) and 52.98(f). 10 C.F.R. Part 52, Appendix D, Section VIII.A.4. The conditions under which a license amendment is required for a departure from plant specific Tier 2 information are described in 10 C.F.R. Part 52, Appendix D, Section VIII.5.b.

⁸ See Application at 3; see *also* 10 C.F.R. Part 52, Appendix D, Section VIII. A.4.

⁹ See Vogtle Electric Generating Plant, Units 3 and 4: License amendment application; opportunity to comment, request a hearing, and petition for leave to intervene, 81 Fed. Reg. 10,920 (Mar. 2, 2016).

¹⁰ *Id.*

¹¹ *Id.*

¹² See Petition; see *also* Declaration of Arnold Gundersen to Support the Petition for Leave to Intervene and Request for Hearing by the Blue Ridge Environmental Defense League Regarding Southern Nuclear Operating Company’s Vogtle Electric Generating Plant Units 3 and 4 Request for License Amendment and Exemption: Containment Hydrogen Igniter Changes (LAR-15-003) (May 2, 2016) (Gundersen Declaration); see *also* Standing Declarations in Support of Petition for Leave to Intervene and Request for Hearing by the Blue Ridge Environmental Defense League and its Chapter Concerned Citizens of Shell Bluff Regarding Southern Nuclear Operating Company’s Request for a License Amendment and Exemption for Containment Hydrogen Igniter Changes, LAR-15-003 (May 2, 2016) (Standing Declarations).

¹³ Petition at 7.

B. Regulatory Background

Given the subject matter of the Petitioner's contentions, the remainder of the Background section of the NRC Staff answer will summarize the relevant NRC regulations governing hydrogen control in containment, as well as the reviews related to that subject that have already been performed for the AP1000 design certification and incorporated by reference into the licensing basis for VEGP Units 3 and 4.

As explained in the Discussion section of the answer, because in most respects Petitioner is ultimately challenging either the NRC regulatory framework for hydrogen control or analyses that the Commission has resolved by rulemaking for the AP1000 design, Petitioner has failed to show that those claims are within the scope of this proceeding.¹⁴ Because all of the remaining bases for Petitioner's contentions are insufficient to meet the NRC's contention admissibility requirements, Petitioner has failed to present an admissible contention.

Accordingly, BREDL's Petition should be denied.

a. Regulatory Background for Hydrogen Control

The NRC's regulatory framework for hydrogen control is found in Criterion 41, Containment Atmosphere Cleanup, of the General Design Criteria (GDC) in Appendix A of 10 C.F.R. Part 50, and in 10 C.F.R. § 50.44, Combustible gas control for nuclear power reactors. Criterion 41 states that

[s]ystems to control fission products, hydrogen, oxygen, and other substances which may be released into the reactor containment shall be provided as necessary to reduce, consistent with the functioning of other associated systems, the concentration and quality of fission products released to the environment following postulated accidents, and to control the concentration of hydrogen or oxygen and other substances in the containment atmosphere following postulated accidents to assure that containment integrity is maintained.¹⁵

¹⁴ *Infra* at Discussion, Section III.

¹⁵ Criterion 41, 10 C.F.R. Part 50, Appendix A.

Specific requirements for water-cooled reactors licensed after October 16, 2003, are found in 10

C.F.R. § 50.44(c). This regulation states that all such reactors must:

- (1) have a capability for ensuring a mixed atmosphere¹⁶ during design-basis and significantly beyond design-basis accidents;
- (2) have an inerted atmosphere,¹⁷ or ... limit hydrogen concentrations in containment during and following an accident that releases an equivalent amount of hydrogen as would be generated from a 100 percent fuel clad-coolant reaction, uniformly distributed, to less than 10 percent (by volume) and maintain containment structural integrity and appropriate accident mitigating features;
- (3) [for c]ontainments that do not rely upon an inerted atmosphere, . . . be able to establish and maintain safe shutdown and containment structural integrity with systems and components capable of performing their intended functions during and after exposure to the environmental conditions created by the burning of hydrogen. Environmental conditions caused by local detonations of hydrogen must also be included, unless such detonations can be shown unlikely to occur. The amount of hydrogen to be considered must be equivalent to that generated from a fuel clad-coolant reaction involving 100 percent of the fuel cladding surrounding the active fuel region;
- (4) [provide equipment]
 - i. for monitoring oxygen in containments that use an inerted atmosphere for combustible gas control
 - ii. for monitoring hydrogen in containment; and
- (5) [include] an analysis that demonstrates containment structural integrity. This demonstration must use an analytical technique that is accepted by the NRC and include sufficient supporting justification to show that the technique describes the containment response to the structural loads involved. The analysis must address an accident that releases hydrogen generated from 100 percent fuel clad-coolant reaction accompanied by hydrogen burning. Systems necessary to ensure containment integrity must also be demonstrated to perform their function under these conditions.¹⁸

The requirements in 10 C.F.R. § 50.44(c) were established as the result of a rulemaking completed in 2003.¹⁹ As discussed in the Statement of Considerations (SOC) for the rule, the

¹⁶ Mixed atmosphere means that the concentration of combustible gases in any part of the containment is below a level that supports combustion or detonation that could cause loss of containment integrity. 10 C.F.R. § 50.44(a)(2).

¹⁷ An inerted atmosphere is a containment atmosphere with less than 4 percent oxygen by volume. 10 C.F.R. § 50.44(a)(1).

¹⁸ 10 C.F.R. § 50.44(c).

¹⁹ Combustible Gas Control in Containment, 68 Fed. Reg. 54,123 (Sept. 16, 2003) (final rule).

earliest version of 10 C.F.R. § 50.44 was promulgated in 1978 and was based on a postulated loss-of-coolant accident (LOCA) that released hydrogen equivalent to 5 percent oxidation of the fuel cladding.²⁰ 10 C.F.R. § 50.44 was amended in 1981 and 1985 to add additional requirements.²¹ As the rule existed in 2000, reactors were required to provide a means for control of hydrogen gas generated, following a LOCA, by

- (1) Metal-water reaction involving the fuel cladding and reactor coolant;
- (2) Radiolytic decomposition of the reactor coolant; and
- (3) Corrosion of metals.²²

Additional requirements, both for all reactors and for reactors with specific containment designs, were found in the remainder of the rule.²³

As described in the SOC for the 2003 rule, the NRC embarked on a research program following the 1985 amendment to 10 C.F.R. § 50.44 that resulted in an improved understanding of combustible gas behavior following severe, beyond-design-basis accidents.²⁴ In 2001, in response to this research, to policies regarding risk-informing the rules in 10 C.F.R. Part 50, and to petitions for rulemaking from outside the agency, the NRC initiated the rulemaking that resulted in the current version of 10 C.F.R. § 50.44.²⁵ The result of the rulemaking was to eliminate those parts of the earlier regulation that related to design-basis LOCAs, which were determined not to release hydrogen in risk-significant quantities, and to orient regulatory requirements towards severe, beyond-design-basis accidents and scenarios that would be bounding for less severe accidents.²⁶ Among the specific changes made were elimination of

²⁰ *Id.* at 54,123.

²¹ *Id.* at 54,123-24.

²² 10 C.F.R. § 50.44(a)(1)-(3) (2000).

²³ *See generally* 10 C.F.R. § 50.44(b)-(h) (2000).

²⁴ 68 Fed. Reg. at 54,124, citing NUREG-1150, *Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants* (Dec. 31, 1990) (ADAMS Accession No. ML040140729).

²⁵ 68 Fed. Reg. at 54,124-25.

²⁶ *Id.* at 54,125-26.

language related to radiolytic decomposition of water, corrosion of metals, and 5 percent oxidation of cladding, and imposition of the requirement regarding 100 percent fuel cladding-coolant reaction now found in 10 C.F.R. § 50.44(c)(2), (3) and (5) for future reactor applications. The latter requirement was found to be representative of significant beyond design basis accidents.²⁷

b. Design Certification and COL Reviews for the AP1000 and VEGP Units 3 and 4

As documented in the NRC's safety evaluation report for the initial design certification of the AP1000 design, the design certification applicant, Westinghouse Electric Company (WEC), provided analyses related to hydrogen generation and control that complied with the post-2003 version of 10 C.F.R. § 50.44 in support of the design certification rulemaking.²⁸ As described in the AP1000 Design Control Document (DCD) and the NRC's initial Safety Evaluation Report (SER) for the design, the AP1000 has a hydrogen ignition subsystem consisting of 64 igniters designed to promote hydrogen burning at low concentrations, with igniters placed where hydrogen may be released, where it may flow, and where it may concentrate.²⁹ The design also includes a hydrogen concentration monitoring subsystem that the NRC determined complies with the requirements of GDC 41 and 10 C.F.R. § 50.44.³⁰ The igniters are manually actuated from the control room, and control room staff monitor hydrogen concentrations prior to actuation.³¹ The DCD for the AP1000 also includes igniter location criteria as Tier 2

²⁷ As discussed in the SOC for the 2003 revision of 10 C.F.R. § 50.44, requirements related only to relatively small hydrogen releases from design-basis accidents that would not lead to early containment failure (within 24 hours) were removed from the rule. See 68 Fed. Reg. at 54,126, 54,130. In responding to public comment on this change, the NRC referred to research concluding that the risk associated with hydrogen combustion was from severe accidents. *Id.* at 54,133.

²⁸ See NUREG-1793, *Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design*, Initial Report, at 6-64 to 6-65 & 6-71 (Sept. 30, 2004) (ADAMS Accession No. ML043570339) (NUREG-1793); see also AP1000 Design Control Document, Rev.19, Chapter 6, Engineered Safety Features, Tier 2 Material (Jun. 13, 2011) (ADAMS Accession No. ML11171A500) (AP1000 DCD).

²⁹ See NUREG-1793 at 6-66; see also AP1000 DCD at Chapter 6, Engineered Safety Features, Section 6.2.4.2.3, Hydrogen Ignition Subsystem, Tier 2 Material.

³⁰ See NUREG-1793 at 6-70 to 6-71.

³¹ AP1000 DCD at Chapter 19, Appendix D, Probabilistic Risk Assessment, Section 19D.6.1.8, Hydrogen Control, Tier 2 Material.

information.³² The NRC evaluated the placement of the igniters, including in and around the IRWST, and found that adequate igniter coverage existed to ensure that the requirements of 10 C.F.R. §50.44(c) were met.³³ The NRC also evaluated Westinghouse's analyses of containment atmosphere mixing (including the potential for stratification)³⁴ and of the hydrogen concentration monitoring system,³⁵ and determined that both complied with GDC 41 and 10 C.F.R. § 50.44.³⁶

The AP1000 design was amended following its initial certification, and the NRC issued a supplemental SER in 2011 that evaluated these amendments.³⁷ With respect to the hydrogen control system, the design certification amendment made minor changes to the location of several hydrogen igniters to accommodate other changes made as the detailed design of the AP1000 was developed, leaving the total number of igniters at 64.³⁸ Other aspects of the hydrogen control system design and supporting analyses remained unchanged. The NRC reviewed the proposed changes, determined that they were consistent with the igniter location criteria in the DCD, and found that the new locations were acceptable and did not change any relevant analyses or the performance of the system.³⁹

The Vogtle application incorporated those portions of the DCD for the AP1000 design that related to the hydrogen control system, without any departures, exemptions, or site-specific information.⁴⁰ Under the finality provisions of 10 C.F.R. § 52.63(a)(1), the NRC may not impose new requirements on the certification information in a certified design, absent specific circumstances detailed in the rule. Accordingly, information related to the hydrogen control

³² AP1000 DCD at Chapter 6, Engineered Safety Features, Table 6.2.4-6, Igniter Location, Tier 2 Material.

³³ See NUREG-1793 at 6-67 to 6-68.

³⁴ *Id.* at 6-68 to 6-70.

³⁵ *Id.* at 6-70 to 6-71.

³⁶ *Id.* at 6-71.

³⁷ NUREG-1793, *Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design, Supplement 2* (Aug. 5, 2011) (ADAMS Accession No. ML112061231) (NUREG-1793, Supplement 2).

³⁸ *Id.* at 6-73.

³⁹ *Id.*

⁴⁰ NUREG-2124, *Final Safety Evaluation Report Related to the Combined Licenses for Vogtle Electric Generating Plant, Units 3 and 4*, at 6-14 (Sept. 30, 2012) (ADAMS Accession No. ML120460976).

system in the AP1000 DCD is not subject to challenge in this proceeding except to the extent that it falls within the narrow scope of the changes proposed in the LAR — the proposed addition of two hydrogen igniters directly outside the IRWST roof vents to address a potential hydrogen pathway in a specific severe accident scenario.⁴¹

DISCUSSION

I. LEGAL STANDARDS

In accordance with Section 189a. of the Atomic Energy Act (AEA), “the Commission shall grant a hearing upon the request of any person whose interest may be affected by the proceeding, and shall admit any such person as a party to such proceeding.”⁴² The Commission will grant a request for hearing if the petitioner meets the standing requirements of 10 C.F.R. § 2.309(d) and submits at least one admissible contention pursuant to 10 C.F.R. § 2.309(f).⁴³

Petitioner’s hearing request must contain:

- (i) The name, address and telephone number of the requestor or petitioner;
- (ii) The nature of the requestor's/petitioner's right under the Act to be made a party to the proceeding;
- (iii) The nature and extent of the requestor's/petitioner's property, financial or other interest in the proceeding; and
- (iv) The possible effect of any decision or order that may be issued in the proceeding on the requestor's/petitioner's interest.⁴⁴

i. Standing to Intervene

To obtain standing to intervene, a petitioner “must demonstrate that it has an interest that may be affected by the proceeding.”⁴⁵ In evaluating whether the petitioner has

⁴¹ Application at 3, 11-12; *see also Commonwealth Edison Co.* (Dresden Nuclear Power Station, Unit 1), CLI-81-25, 14 NRC 616, 624 (1981).

⁴² 42 U.S.C. § 2239(a)(1)(A).

⁴³ *See* 10 C.F.R. § 2.309(a).

⁴⁴ 10 C.F.R. § 2.309(d).

⁴⁵ *See Florida Power and Light Co.* (Turkey Point Nuclear Generating Units 3 and 4), CLI-15-25, 82 NRC 389, 394 (2015).

demonstrated the requisite interest required by the regulations, the Commission applies contemporaneous judicial concepts of standing.⁴⁶ To demonstrate standing is met, “a petitioner must (1) allege an injury in fact that is (2) fairly traceable to the challenged action and (3) is likely to be redressed by a favorable decision.”⁴⁷ Further, the injury alleged must be “to an interest arguably within the zone of interests protected by the governing statute”— here, the AEA or the National Environmental Policy Act (NEPA).⁴⁸ The petitioner has the burden to demonstrate standing requirements are met.⁴⁹ However, a licensing board making a standing determination will “construe the [intervention] petition in favor of the petitioner.”⁵⁰

An organization may satisfy the standing criteria either by demonstrating that the licensing action at issue will impact the interests of the organization (organizational standing) or its members (representational standing).⁵¹ To obtain organizational standing, an organization must be able to intervene in its own right, “satisfy[ing] the same standing requirements as individuals seeking to intervene.”⁵² Therefore, an organization “must demonstrate a palpable injury in fact to its organizational interests that is within the zone of interests protected by the AEA or NEPA” to be granted organizational standing.⁵³ To claim representational standing on behalf of its members, “the organization must show how at least one of its members may be

⁴⁶ See *id.*; see also *Calvert Cliffs 3 Nuclear Project, LLC, & UniStar Nuclear Operating Services, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-09-20, 70 NRC 911, 915 (2009).

⁴⁷ *Turkey Point*, CLI-15-25, 82 NRC at 394; *Sequoyah Fuels Corp. and General Atomics* (Gore, Oklahoma Site), CLI-94-12, 40 NRC 64, 71 (1994); *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 560-61 (1992).

⁴⁸ *Calvert Cliffs*, CLI-09-20, 70 NRC at 915 (citing *Cleveland Electric Illuminating Co.* (Perry Nuclear Power Plant, Unit 1), CLI-93-21, 38 NRC 87, 92 (1993) (internal quotations omitted)).

⁴⁹ See *Commonwealth Edison Co.* (Zion Nuclear Power Station, Units 1 and 2), CLI-00-5, 51 NRC 90, 98 (2000).

⁵⁰ *Turkey Point*, CLI-15-25, 82 NRC at 394 (quoting *Georgia Institute of Technology* (Georgia Tech Research Reactor, Atlanta Georgia), CLI-95-12, 42 NRC 111, 115 (1995) (internal quotations omitted)).

⁵¹ See *Yankee Atomic Elec. Co.* (Yankee Nuclear Power Station), CLI-98-21, 48 NRC 185, 195 (1998).

⁵² *Consumers Energy Co.* (Palisades Nuclear Power Plant), CLI-07-18, 65 NRC 399, 411 (2007).

⁵³ *Crow Butte Resources, Inc.* (License Amendment for the North Trend Expansion Project), LBP-08-6, 67 NRC 241, 271 (2008) (citing *Hydro Resources, Inc.* (2929 Coors Road, Suite 101, Albuquerque, NM 87120), LBP-98-9, 47 NRC 261, 271 (1998)); see also *Metropolitan Edison Company, et al* (Three Mile Island Nuclear Station, Unit No. 1) CLI-83-25, 18 NRC 327, 332 (1983).

affected by the licensing action, must identify the member, and must show that the organization is authorized to represent that member.”⁵⁴ Moreover, “[t]he member seeking representation must qualify for standing in his or her own right; the interests that the representative organization seeks to protect must be germane to its own purpose; and neither the asserted claim nor the requested relief must require an individual member to participate in the organization's legal action.”⁵⁵

In some circumstances, the Commission recognizes a presumption based on proximity where a petitioner lives in or frequents the area within a 50 mile radius of a site.⁵⁶ Where the proximity presumption is deemed applicable, the petitioner need not meet ordinary requirements for standing.⁵⁷ The proximity presumption has been recognized by the Commission in “proceedings for construction permits, operating licenses, or significant amendments thereto such as the expansion of the capacity of a spent fuel pool.”⁵⁸ For the presumption to apply, the proposed action must present “a clear potential for offsite consequences.”⁵⁹ A petitioner must demonstrate that “the kind of action at issue, when considered in light of the radioactive sources at the plant, justifies a presumption that the licensing action could plausibly lead to the offsite release of radioactive fission products.”⁶⁰ “Absent situations involving such obvious potential for offsite consequences,” the petitioner must meet ordinary requirements for standing.⁶¹

⁵⁴ *International Uranium (USA) Corp.* (White Mesa Uranium Mill), CLI-01-21, 54 NRC 247, 250-51 (2001) (citing *Power Authority of the State of New York* (James A. FitzPatrick Nuclear Power Plant and Indian Point, Unit 3), CLI-00-22, 52 NRC 266, 293 (2000)).

⁵⁵ *Palisades*, CLI-07-18, 65 NRC at 409.

⁵⁶ See *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant Units 3 and 4), LBP-01-6, 53 NRC 138, 147 (2001) (citing *Florida Power & Light Co.* (St. Lucie, Units 1 and 2), CLI-89-21, 30 NRC 325, 329 (1989)).

⁵⁷ See *Turkey Point*, LBP-01-6, 53 NRC at 147.

⁵⁸ *St. Lucie*, CLI-89-21, 30 NRC at 329; see also *Calvert Cliffs*, CLI-09-20, 70 NRC at 914-15 (recognizing the proximity presumption as applicable in combined license application proceedings).

⁵⁹ *St. Lucie*, CLI-89-21, 30 NRC at 329; see also *Commonwealth Edison Co.* (Zion Nuclear Power Station, Units 1 & 2), CLI-99-04, 49 NRC 185, 191 (1999).

⁶⁰ *Exelon Generation Co., LLC & PSEG Nuclear, LLC* (Peach Bottom Atomic Power Station, Units 2 & 3), CLI-05-26, 62 NRC 577, 581 (2005).

⁶¹ *St. Lucie*, CLI-89-21, 30 NRC at 329-30.

ii. Legal Standards for Contention Admissibility

Contention admissibility requirements are set forth in 10 C.F.R. § 2.309(f) of the Commission's Rules of Practice. To be admissible, a newly proffered contention must satisfy the 10 C.F.R. § 2.309(f)(1) general contention admissibility requirements, which are that the contention must:

- (i) Provide a specific statement of the issue of law or fact to be raised or controverted . . . ;
- (ii) Provide a brief explanation of the basis for the contention;
- (iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding;
- (iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding;
- (v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which the petitioner intends to rely at hearing, together with references to the specific sources and documents on which the requestor/petitioner intends to rely to support its position on the issue; and
- (vi) . . . provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact. This information must include references to 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 belief⁶²

The 10 C.F.R. § 2.309(f)(1) requirements should "focus litigation on concrete issues and result in a clearer and more focused record for decision."⁶³ The Commission has stated that it "should not have to expend resources to support the hearing process unless there is an issue that is appropriate for, and susceptible to, resolution in an NRC hearing."⁶⁴ The Commission has

⁶² 10 C.F.R. § 2.309(f)(1).

⁶³ Changes to Adjudicatory Process, 69 Fed. Reg. 2,182, 2,202 (Jan. 14, 2004) (final rule).

⁶⁴ *Id.*

emphasized that the rules on contention admissibility are “strict by design.”⁶⁵ Failure to comply with any of these requirements is grounds for the dismissal of a contention.⁶⁶ Attempting to meet these requirements by “[m]ere ‘notice pleading’ does not suffice.”⁶⁷

II. THE NRC STAFF DOES NOT OPPOSE BREDL’S DEMONSTRATION OF STANDING

BREDL contends that the proximity presumption supports its standing in this proceeding because the license amendment at issue poses a clear potential for offsite consequences and a number of its members authorizing representation⁶⁸ live within 25 miles of the site.⁶⁹ As described more fully below, considering the submitted Standing Declarations of BREDL’s members and BREDL’s assertions that the granting of the license amendment will pose a clear potential for offsite consequences in the form of hydrogen accumulation and breach of containment, the Staff does not contest BREDL’s demonstration of representational standing in this proceeding.

As required to assert representational standing, BREDL identifies at least one member in the Standing Declarations authorizing BREDL’s representation in this license amendment

⁶⁵ *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 & 3), CLI-01-24, 54 NRC 349, 358 (2001), *petition for reconsideration denied*, CLI-02-01, 55 NRC 1 (2002).

⁶⁶ *See Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-99-10, 49 NRC 318, 325 (1999).

⁶⁷ *Amergen Energy Co., L.L.C.* (Oyster Creek Nuclear Generating Station), CLI-06-24, 64 NRC 111, 119 (2006).

⁶⁸ According to the Petition, “BREDL and its chapters are unitary, with a common incorporation, financial structure, board of directors and executive officer.” Petition at 2-3. It therefore does not appear that the petitioners here seek party status for the Chapter Concerned Citizens of Shell Bluff (CCSB) independent of BREDL. However, to the extent that is the petitioners’ intent, CCSB’s standing must be established separately. *See Tennessee Valley Auth.* (Bellefonte Nuclear Plant Units 1 and 2), LBP-10-07, 71 NRC 391, 414 (2010). In order to obtain organizational standing, CCSB must show, among other requirements, that it has been authorized to represent the interests of at least one of its members in the proceeding. *See id*; *see also Tennessee Valley Auth.* (Sequoyah Nuclear Plant, Units 1 & 2), LBP-13-08, 78 NRC 1, 7-8 (2013). While the member affidavits submitted by the petitioners assert each individual’s membership in both BREDL and CCSB, CCSB cannot meet organizational standing requirements because none of the affidavits specifically authorizes representation by CCSB, only by BREDL.

⁶⁹ Petition at 4 (citing *Entergy Nuclear Vermont Yankee L.L.C and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), LBP-04-28, 60 NRC 548, 553-54 (2004)).

proceeding.⁷⁰ Further, BREDL's intervention in this proceeding is germane to the purpose of the organization.⁷¹ BREDL's stated organizational purpose of encouraging government agencies and citizens to conserve and protect natural resources and public health is consistent with its position as a representative in this proceeding.⁷²

Moreover, the Petitioner asserts that the proposed license amendment would cause members to suffer "a distinct and palpable harm that constitutes injury-in-fact within the zone of interests arguably protected by the governing statutes."⁷³ In particular, BREDL's petition states that "[t]he purpose of the hydrogen ignition system is to prevent levels of hydrogen created by a reactor accident from reaching concentrations sufficient to cause a breach of containment" and that the "[g]ranteeing of the LAR by the NRC could allow conditions leading to unsafe levels of hydrogen."⁷⁴ The Standing Declarations identify this same particularized harm stating that "[f]ailure of the hydrogen ignition system could lead to the rupture of the containment structure, releasing radioactive contamination and endangering me and other residents of Shell Bluff."⁷⁵ For purposes of assessing standing, the Staff does not dispute that Petitioner alleges that the granting of the proposed LAR entails clear potential for offsite consequences in the form of hydrogen accumulation and potential for breach of containment.⁷⁶

In addition to alleging a concrete particularized injury, Petitioner provides declarations of individuals living within 25 miles of the site, including some declarations of individuals living

⁷⁰ See Standing Declarations. Each of the 30 Standing Declarations provided states: "I have authorized Blue Ridge Environmental Defense League to represent my interests in this proceeding by filing arguments opposing the issuance of a License Amendment by Southern Nuclear Operating Company."

⁷¹ *Palisades*, CLI-07-18, 65 NRC at 409 ("the interests that the representative organization seeks to protect must be germane to its own purpose").

⁷² Petition at 2.

⁷³ *Id.* at 4.

⁷⁴ *Id.* at 4.

⁷⁵ See Standing Declarations.

⁷⁶ See Petition at 4. In making a standing determination, "whether the petitioner is ultimately correct on the merits is a generally a distinct issue from the threshold question of standing for purposes of the proximity presumption." See *Southern Nuclear Operating Company, Inc.* (Vogtle Electric Generating Plant, Units 3 and 4), LBP-16-05, 83 NRC __, __ (April 29, 2016) (slip op. at 11) (citing *Int'l Uranium (USA) Corp.* (White Mesa Uranium Mill), CLI-02-10, 55 NRC 251, 255-56 (2002)).

within seven miles of the site, to support the application of the proximity presumption.⁷⁷ In proximity presumption cases where a petitioner has provided a basis to assert “an obvious potential for offsite consequences,” the Commission will decide “the appropriate radius on a case-by-case basis” by “taking into account the nature of the proposed action and the significance of the radioactive source.”⁷⁸ Considering the Petitioner’s assertion that granting the LAR presents the potential for offsite consequences from a breach of containment, and that the declarations include individuals living as close as seven miles to the site, the Staff does not challenge the application of the proximity presumption in this circumstance.⁷⁹

For the reasons discussed above, the Staff does not contest the Petitioner’s demonstration of representational standing in this proceeding through application of the proximity presumption.

III. THE PROPOSED CONTENTIONS ARE INADMISSIBLE

i. Proposed Contention 1

In Proposed Contention 1, BREDL asserts that the requested license amendment intended to mitigate “the threat of a hydrogen buildup and subsequent explosion” actually “introduces a new threat to the already vulnerable AP1000 containment by placing Vogtle Units 3 and 4 hydrogen igniters possibly near the location of excess concentrations of hydrogen.”⁸⁰ BREDL contends that the Application fails to include the “prudent and required evaluations” including: “1) an applicability determination evaluation, 2) a safety-security interface evaluation, 3) a construction impacts evaluation and 4) a 10 CFR 50.59-like screening evaluation.”⁸¹

Further, BREDL claims that Southern has not evaluated the potential for “detonation or deflagration shock wave” that could occur “if one of the proposed igniters causes backflow into a

⁷⁷ See Petition at 5.

⁷⁸ See *Peach Bottom*, CLI-05-26, 62 NRC at 580-81.

⁷⁹ See *id.*

⁸⁰ Petition at 8; Gundersen Declaration at 6.

⁸¹ Petition at 10.

sub-compartment.”⁸² Petitioner also asserts that the “[e]xperience in Japan is illustrative of the unanticipated problems that have been created by the LAR placing hydrogen igniters near a source of hydrogen based simply on “engineering judgment” and not a root cause analysis.”⁸³ In support of its claims, the Petitioner references the Gundersen Declaration, which in turn cites to two Fairewinds presentations regarding the sufficiency of AP1000 containment and a World Nuclear Association (WNA) report discussing severe accident analyses of the Fukushima Daiichi accident.⁸⁴

Staff Response: For the reasons set forth below, Proposed Contention 1 is inadmissible because it fails to explain why the issues raised are material to the findings that the NRC must make in this proceeding; is insufficiently supported by alleged facts or expert opinion; makes assertions outside the scope of this proceeding; and fails to identify a genuine dispute with the Application regarding a material issue of law or fact, contrary to the requirements of 10 C.F.R. § 2.309(f)(1)(iii)-(vi).

The AP1000 design has a hydrogen control system that consists of hydrogen igniters and passive autocatalytic recombiners (PARs).⁸⁵ The hydrogen igniters make up a subsystem present “to address the possibility of an event that results in rapid production of large amounts of hydrogen such that the rate of production exceeds the capacity of the [PARs].”⁸⁶ As explained in the LAR, hydrogen igniters create deliberate ignition sources that allow for small, controlled, volumetric burns to remove hydrogen and oxygen early in an accident before they can accumulate to levels large enough to challenge containment integrity or equipment.⁸⁷ Through

⁸² *Id.*; Gundersen Declaration at 12 (“If the NRC allows the proposed poorly designed hydrogen igniter modification to be implemented at Vogtle Units 3 and 4, a gross containment failure from a detonation shock wave in a sub-compartment is likely to occur”).

⁸³ Petition at 9.

⁸⁴ Gundersen Declaration at 8, 12.

⁸⁵ Application at 3; AP1000 DCD at Chapter 6, Engineered Safety Features, Section 6.2.4, Containment Hydrogen Control System, Tier 2 Material.

⁸⁶ Application at 3.

⁸⁷ *Id.*

design reviews, the Applicant identified additional locations nearer the potential pathway previously identified in the severe accident analysis that could result in the discharge of steam and hydrogen from the automatic depressurization system (ADS) spargers into the IRWST.⁸⁸ According to the Applicant, the proposed addition of two hydrogen igniters to the 64 already included in the subsystem design seeks to mitigate potential hydrogen accumulation near the IRWST if this hydrogen pathway were to occur during a severe accident.⁸⁹ Furthermore, the Applicant acknowledges that existing models lack the sensitivity to distinguish between the 64 existing igniters and the two additional igniters proposed in the LAR.⁹⁰ The proposed location of the additional igniters is outside of and at the IRWST roof vents, which is “as close to the source as feasible so the hydrogen can be burned as it is released from the vent and mixes with oxygen.”⁹¹ As stated in the LAR, the Applicant used the igniter placement criteria set forth in UFSAR Table 6.2.4-6 which “are a part of the licensing basis for the hydrogen control design for the AP1000” to select the proposed location of the additional igniters.⁹² Notably, “[o]ne of these criteria states that igniters should be located as close as feasible to the source of hydrogen.”⁹³

Petitioner asserts that Southern relies solely on “engineering judgement” to place the additional hydrogen igniters and that the addition introduces an unanalyzed threat to containment integrity.⁹⁴ Contrary to the Petitioner’s assertions, the LAR explains that the placement of the additional hydrogen igniters was in accordance with the licensing basis of AP1000 design and was not based solely on engineering judgment.⁹⁵ The LAR specifically references the igniter location criteria of UFSAR Table 6.2.4-6 to explain the proposed location

⁸⁸ *Id.* at 4.

⁸⁹ *Id.*

⁹⁰ *Id.*

⁹¹ *Id.*

⁹² *Id.* at 11; See also Updated Final Safety Analysis Report, Chapter 6, Enhanced Safety Features, Table 6.2.4-6 (Sheet 1 of 3), Igniter location (April 17, 2015) (ADAMS Accession No. ML15194A462) (UFSAR).

⁹³ *Id.* “In locations where the potential hydrogen release location can be defined, i.e. above the IRWST spargers, at IRWST vents, etc., igniter coverage is provided as close to the source as feasible.”

⁹⁴ Petition at 8.

⁹⁵ Application at 11-12.

of the additional hydrogen igniters.⁹⁶ In the case of a license amendment, the scope of the proceeding is limited to “health, safety or environmental issues fairly raised by [the license amendment].”⁹⁷ To the extent that BREDL challenges the placement of the proposed hydrogen igniters solely on the generic basis that the igniters are near a source of hydrogen, that claim is outside the scope of this proceeding pursuant to 10 C.F.R. § 2.309(f)(1)(iii) because it ultimately seeks to challenge the underlying licensing basis for VEGP Units 3 and 4 with respect to the use of hydrogen igniters generally and the criteria for hydrogen igniter placement.⁹⁸

Moreover, the hydrogen control system as a whole was analyzed extensively at the design certification stage for the AP1000 and the analysis was incorporated by reference at the combined license stage for the VEGP Units 3 and 4.⁹⁹ Southern specifically states in the LAR that “[t]he proposed changes to add two hydrogen igniters in the identified locations are consistent with the criteria in Table 6.2.4-6 and therefore do not alter the design function of the igniters, have no effect on any analysis or analysis method, and do not affect the performance or controls of hydrogen control functions.”¹⁰⁰ BREDL does not engage with the Applicant’s stated technical justification for the addition of and placement of the two proposed hydrogen igniters in containment. Ultimately, the Petitioner fails to explain why the proposed addition of two hydrogen igniters entails a safety concern with the technical justification for the LAR that is distinguishable from the technical basis for the prior analysis of hydrogen igniters completed during the design certification and incorporated by reference in the licensing basis for VEGP Units 3 and 4. In failing to acknowledge the Applicant’s rationale or reliance on prior analyses of

⁹⁶ *Id.* at 4, 11-12.

⁹⁷ *Dresden*, CLI-81-25, 14 NRC at 624 (1981).

⁹⁸ 10 C.F.R. § 2.309(f)(1)(iii); *see also* UFSAR at Chapter 6, Enhanced Safety Features, Table 6.2.4-6 (Sheet 1 of 3), Igniter location. Petitioner does not challenge the choice of hydrogen igniters to mitigate this potential scenario but instead challenges the use of hydrogen igniters for hydrogen control generally. The use of hydrogen igniters for hydrogen control and mitigation was approved by as part of the AP1000 design certification. *See* AP1000 DCD at Chapter 6, Engineered Safety Features, Section 6.2.4.2.3, Hydrogen Ignition Subsystem, Tier 2 Material.

⁹⁹ *Supra* at Background, Section B.b.

¹⁰⁰ Application at 12.

hydrogen igniters in VEGP Units 3 and 4, BREDL fails to raise a genuine dispute with the application as required under 10 C.F.R. § 2.309(f)(1)(vi).

Petitioner also argues that the Applicant has failed to perform “prudent and required evaluations” in the LAR.¹⁰¹ In making this claim, Petitioner relies on four evaluations recommended in an interim staff guidance document, COL-ISG-025.¹⁰² However, these four evaluations are not regulatory requirements, but rather staff guidance intended to assist a licensee “that desires to depart from its [current licensing basis] . . . to evaluate and determine if the desired plant change or modification requires NRC approval.”¹⁰³ In other words, these evaluations provide guidance to assist a licensee that is considering changes to its facility in determining what change process may be appropriate under 10 CFR Part 52.¹⁰⁴ In this proceeding, the Applicant has already determined that there is a need for an amendment and an associated exemption. The Petitioner fails to explain why the preliminary evaluations identified in the ISG are relevant to an already-submitted LAR, much less why those evaluations would alter Southern’s analysis or conclusions. In any event, guidance provided in an ISG does not constitute a regulatory requirement, for the contents of a LAR or otherwise. For these reasons, the Petitioner fails to demonstrate that this claim is material to the findings that Staff must make pursuant to 10 C.F.R. § 2.309(f)(1)(iv).

The Petition describes the AP1000 design as “vulnerable” and states that “[t]he AP1000 containment is already within 1 pound per square inch of its design limit without considering the additional pressure that would be created by either a detonation or deflagration shock wave.”¹⁰⁵

¹⁰¹ Petition at 10.

¹⁰² *Id.* at 6; COL-ISG-025, *Interim Staff Guidance on Changes during Construction Under 10 CFR Part 52*, at 1 (Aug. 7, 2013) (ADAMS Accession No. ML13045A125) “The licensee’s evaluation process comprises several successive steps, including an applicability determination evaluation, the safety-security interface evaluation, the construction impacts evaluation and the 10 CFR 50.59-like screening evaluation.”

¹⁰³ COL-ISG-025, at 1.

¹⁰⁴ *Id.*

¹⁰⁵ Petition at 10; Gundersen Declaration at 11. On its face, the statement acknowledges that the AP1000 design meets its design pressure basis. Moreover, the Staff notes that the design basis pressure standard is not equivalent to the standard for severe accident pressure loads. SECY 93-087 recommends

Petitioner's expert claims that "the AP1000 containment was flawed well before the disaster at Fukushima Daiichi."¹⁰⁶ As support, two presentations by Fairewinds are referenced which assert the potential for weaknesses in the AP1000 containment.¹⁰⁷ However, it is well established that a proposed contention cannot raise issues outside the scope of the proceeding, which is limited here to the issues raised by the license amendment.¹⁰⁸ To the extent that the Petitioner generically alleges that the certified design of the AP1000 containment is flawed, the contention is outside the scope of the proceeding pursuant to 10 C.F.R. 2.309(f)(1)(iii).¹⁰⁹

Petitioner references the events at Fukushima Dai-ichi to demonstrate the dangers of the proposed license amendment. However, as described below, Petitioner does not adequately demonstrate the relevance of the proffered information about Fukushima Dai-ichi to the license amendment at issue, thereby failing to offer a dispute within the scope of the proceeding, identify material relevant to the findings that the Staff must make, or assert a genuine dispute with the application as required by 10 C.F.R. § 2.309(f)(1)(iii), (iv), and (vi).

American Society of Mechanical Engineers Service Level C limits be met for the more likely severe accident challenges for steel containments. See SECY-93-087, *Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor Designs*, at 18 (Apr. 2, 1993) (ADAMS Accession No. ML003708021). These pressure limits, which are met for AP1000, are significantly higher than the design pressure and thus, contrary to the Petitioner's implication, the pressure analyses already completed for the AP1000 encompass severe accident pressure loads.

¹⁰⁶ Gundersen Declaration at 11.

¹⁰⁷ Gundersen Declaration at 12. Fairewinds is a nuclear energy education based organization. The first presentation referenced in the Gundersen Declaration was presented to the ACRS in June of 2010 and is entitled "Post Accident AP1000 Containment Leakage." The second presentation is entitled "Nuclear Containment Failures: Ramifications for the AP1000 Containment Design" and it was created in December of 2010 to supplement and clarify the first presentation. These presentations discuss the potential for a "chimney effect" allowing the release of radioactive material from the AP1000 containment. However, because the Petitioner does not demonstrate how these presentations bear on any concern that would be attributable to the changes in the license amendment at issue, these claims represent a generalized challenge to the sufficiency of the AP1000 containment, which is outside the scope of the proceeding.

¹⁰⁸ See 10 C.F.R. § 2.309(f)(1)(iii); see also *Dresden*, CLI-81-25, 14 NRC at 624.

¹⁰⁹ The AP1000 design was codified as a rule in 2007 and amended in 2011. See Part 52—Licenses, Certifications, and Approvals for Nuclear Power Plants, 72 Fed. Reg. 49,517 (Aug. 28, 2007); see also Part 52—Licenses, Certifications, and Approvals for Nuclear Power Plants, 76 FR 82,102 (Dec. 30, 2011). Accordingly, the design certification rule is not subject to challenge in this proceeding without a waiver (see 10 C.F.R. § 2.335); without a waiver, any such challenge is accordingly outside the scope of the proceeding pursuant to 10 C.F.R. § 2.309(f)(1)(iii).

During the Fukushima Dai-ichi incident, hydrogen explosions at 3 units occurred after the build-up of hydrogen gas in primary containment moved from the drywell to secondary containment.¹¹⁰ The reactors at Fukushima Dai-ichi are GE Boiling Water Reactors (BWRs) with a Mark 1 containment.¹¹¹ In contrast, VEGP Units 3 and 4 are licensed under the AP1000 design.¹¹² The NRC staff evaluated the AP1000 design in light of the events at Fukushima Dai-ichi and concluded that the AP1000 containment varied from the BWR Mark 1 containment enough to warrant a different mitigation response for hydrogen control.¹¹³ Therefore, the NRC directed that VEGP Units 3 and 4 implement certain beyond-design-basis mitigation strategies after the event pursuant to the near-term task force (NTTF) recommendations.¹¹⁴ In order to allege a genuine dispute with the application on the basis of this information, BREDL must state with particularity why the events at Fukushima are relevant and applicable to this license

¹¹⁰ SECY-11-0093, *Recommendations for Enhancing Reactor Safety in the 21st Century: The Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident*, United States Nuclear Regulatory Commission, at 9 (Jul. 12, 2012) (ADAMS Accession No. ML111861807).

¹¹¹ See *Fukushima Accident*, World Nuclear Association (May 16, 2016), available at <http://www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/fukushima-accident.aspx> (WNA Report).

¹¹² See *generally* Combined License - Vogtle Electric Generating Plant Unit 3, Southern Nuclear Operating Company Inc., Georgia Power Company, Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, City of Dalton, Georgia, Docket Number 52-025, License No. NPF-91 (Feb. 10, 2012) (ADAMS Accession No. ML14100A135); see *generally* Combined License - Vogtle Electric Generating Plant Unit 4, Southern Nuclear Operating Company Inc., Georgia Power Company, Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, City of Dalton, Georgia, Docket Number 52-026, License No. NFP-92 (Feb. 10, 2012) (ADAMS Accession No. ML14100A135).

¹¹³ SECY-11-0093 at 41-42. "BWR facilities with Mark I and Mark II containment structures are required to operate their containments with inerted atmospheres. . . PWR facilities with large dry containments do not control hydrogen buildup inside the containment structure because the containment volume is sufficient to keep the pressure spike of potential hydrogen deflagrations within the design pressure of the structure."

¹¹⁴ See EA-12-049, *Issuance of Order to Modify Licenses With Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events* (Mar. 12, 2012) (ADAMS Accession No. ML12073A195). VEGP Units 3 and 4 were not directed to address hydrogen control measures in this Order because the near-term task force concluded that the AP1000 design did not require immediate mitigation measures in this regard. See SECY-11-0093 at 42. Staff recently submitted its "final assessment and closure of Fukushima-related Tier 3 recommendations regarding . . . hydrogen control and mitigation." See SECY-16-0041, *Closure of Fukushima Tier 3 Recommendations Related to Containment Vents, Hydrogen Control, and Enhanced Instrumentation* at 4 (March 31, 2016) (ADAMS Accession No. ML16049A088) (concluding that "additional capabilities for hydrogen control and mitigation inside and outside reactor containment buildings would not provide a substantial safety enhancement and therefore additional regulatory enhancements are not warranted").

amendment proceeding. BREDL has not done so. Petitioner fails to acknowledge the differences between the BWR Mark 1 containment at Fukushima Dai-ichi and the AP1000 containment at VEGP 3 and 4, let alone explain why concerns about the Mark 1 are material to the LAR. Nor does the Petitioner explain why the post-accident hydrogen control measures addressed by the NTTF recommendations have any bearing on the evaluation of the AP1000 design information at issue in the present LAR. For these reasons, the Petitioner fails to demonstrate how any of these references to the Fukushima Dai-ichi accident support its contentions about the license amendment at issue pursuant to 10 C.F.R. § 2.309(f)(1)(iii), (iv), and (vi).

BREDL also alleges that there could be a “detonation or deflagration shockwave if one of the proposed igniters causes backflow into a sub-compartment,” referencing “backflow” that occurred at Fukushima Dai-ichi as support for this potential phenomena.¹¹⁵ The Gundersen Declaration quotes a portion of an overview of the Fukushima Dai-ichi accident by the WNA that discusses “backflow” that occurred when attempts were made to vent primary containment.¹¹⁶ In sum, the WNA concludes that the “backflow” leading to the hydrogen explosions at Fukushima Dai-ichi was a result of failed venting that caused hydrogen to move out of primary containment and into the reactor building.¹¹⁷ The function of hydrogen igniters is the controlled burning of hydrogen and oxygen in small quantities to prevent hydrogen accumulation.¹¹⁸ However, as indicated in the Application, all of the hydrogen igniters in the AP1000 design are located inside containment and do not create a pathway to secondary containment.¹¹⁹ Furthermore, nothing in the WNA information cited by the Petitioners indicates that the failed venting at Fukushima Dai-ichi that caused “backflow” involved hydrogen igniters.¹²⁰ Consequently, Petitioner fails to

¹¹⁵ Petition at 10; Gundersen Declaration at 8.

¹¹⁶ See Gundersen Declaration at 8; see also WNA Report.

¹¹⁷ WNA Report.

¹¹⁸ Application at 3.

¹¹⁹ *Id.* at 3.

¹²⁰ WNA Report.

explain any logical connection between its references to “backflow” as seen at Fukushima Dai-ichi and the addition of two hydrogen igniters as proposed in the LAR. To support an admissible contention, “a petitioner must provide documents or other factual information or expert opinion that set forth the necessary technical analysis to show why the proffered bases support its contention.”¹²¹ Even if submitted by an expert, mere speculation or bare or conclusory assertions will not support the admission of a proposed contention.¹²² By failing to demonstrate the relevance or applicability of its proffered information about “backflow” to the license amendment at issue, Petitioner fails to offer factual or expert support for its contention as required by 10 C.F.R. § 2.309(f)(1)(v) and does not assert a genuine dispute with the application as required by 10 C.F.R. § 2.309(f)(1)(vi).

For the reasons outlined above, Proposed Contention 1 is inadmissible because it fails to explain why the issues raised are material to the findings that the NRC must make in this proceeding; is insufficiently supported by alleged facts or expert opinion; makes allegations outside the scope of this proceeding; and fails to identify a genuine dispute with the Application regarding a material issue of law or fact, contrary to the requirements of 10 C.F.R. § 2.309(f)(1)(iii)-(vi).

ii. Proposed Contention 2

Contention 2 asserts that “[r]ather than performing a rigorous gaseous diffusion and flame propagation analysis, the [Applicant] chose to place two hydrogen igniters in a ‘likely area’ by relying upon the personal ‘engineering judgment’ of its engineers. A much more rigorous

¹²¹ *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), LBP-98-7, 47 NRC 142, 180 (1998) (citing *Georgia Institute of Technology* (Georgia Tech Research Reactor, Atlanta, Georgia), LBP-95-6, 41 NRC 281, 305, *vacated in part and remanded on other grounds*, CLI-95-10, 42 NRC 1, *aff’d in part*, CLI-95-12, 42 NRC 111 (1995) (A petitioner is obligated “to provide the [technical] analyses and expert opinion” or other information “showing why its bases support its contention”)).

¹²² See *USEC Inc. (American Centrifuge Plant)*, CLI-06-10, 63 NRC 451, 472 (2006); see also *Fansteel, Inc. (Muskogee, Oklahoma Site)*, CLI-03-13, 58 NRC 195, 203 (2003).

analysis is warranted.”¹²³ The contention includes five specific assertions regarding alleged deficiencies, which are discussed below. Contention 2 is supported by the declaration of Arnold Gundersen who discusses “conjectures and *possible* theories about the formation of hydrogen in an atomic reactor containment,” various issues related to the Fukushima accident in Japan and the Space Shuttle Challenger, and the concept of “engineering judgment” in general.¹²⁴

Staff Response: Neither the overall statement of Contention 2 nor any of the five specific assertions raises an admissible issue under the contention pleading standards of 10 C.F.R. § 2.309(f)(1). First, many of the issues raised were resolved as part of the design certification rulemaking for the AP1000 and are therefore outside the scope of and immaterial to the license amendment proceeding and therefore inadmissible under 10 C.F.R. § 2.309(f)(1)(iii)-(iv). Adjudicatory challenges to matters resolved as part of the AP1000 rulemaking are also inadmissible under 10 C.F.R. § 2.335(a), which bars challenges to NRC rules and regulations absent a waiver or exception. Second, some of the claims impermissibly challenge NRC regulations in 10 C.F.R. § 50.44 and are also inadmissible under 10 C.F.R. § 2.335(a) absent a waiver or exception. The Petitioner has not requested a waiver or exception to the AP1000 rule or 10 C.F.R. § 50.44 here, and 10 C.F.R. § 2.335(a) therefore bars contentions that challenge these rules or seek to impose requirements beyond those found therein.¹²⁵ Finally, the remainder of the assertions in Contention 2 are simply restatements of issues raised in Contention 1, and inadmissible for the reasons discussed above.¹²⁶

¹²³ Petition at 11.

¹²⁴ Gundersen Declaration at 7-14 (emphasis in original).

¹²⁵ See *Turkey Point*, LBP-01-6, 53 NRC at 151 (citing *Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 334 (1999); *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), CLI-89-8, 29 NRC 399, 416-17 (1989); *Long Island Lighting Co.* (Shoreham Nuclear Power Station, Unit 1), CLI-87-12, 26 NRC 383, 395 (1987)).

¹²⁶ *Supra* at Discussion, Section III.i.

The Petitioner's first assertion is that "the LAR assumes concentration of hydrogen is uniform throughout the AP1000 containment" and that it ignores the potential for stratification.¹²⁷ As described above, this topic was resolved as part of the design certification rulemaking for the AP1000 design.¹²⁸ The applicant for the AP1000 design presented its analyses for the generation of hydrogen in containment, mixing of the containment atmosphere, and potential for stratification; the NRC then performed confirmatory calculations and found those analyses acceptable.¹²⁹ Adding two more hydrogen igniters to the 64 already included in the AP1000 design does not change any aspect of the analyses of hydrogen generation, mixing of the containment atmosphere, or potential for stratification, which remain as they appear in the AP1000 DCD, and those analyses are not the subject of Southern's requested departures and exemption in the present proceeding. For these reasons, the Petitioner's first assertion raises an issue that is outside the scope of and immaterial to this proceeding, and it is therefore inadmissible under 10 C.F.R. §2.309(f)(1)(iii)-(iv).

The Petitioner's second assertion is that the Applicant "hypothesizes that the only source of hydrogen is emitted from the reaction between zirconium and water."¹³⁰ As discussed above, this is the only source of hydrogen new reactor applicants are required to analyze under the current version of 10 C.F.R. § 50.44(c)(2), (3), and (5).¹³¹ Under the provisions of that regulation, applicants for new light-water reactors licensed after 2003 are required to analyze severe accidents assuming 100 percent fuel clad-coolant reaction accompanied by hydrogen burning, and to demonstrate containment integrity under those conditions.¹³² As noted above, the applicant for the AP1000 design performed this analysis, as required by NRC regulations, in

¹²⁷ Petition at 11; Gundersen Declaration at 7.

¹²⁸ *Supra* at Background, Section B.a.

¹²⁹ NUREG-1793 at 6-68 to 6-70. *See also* AP1000 DCD at Chapter 6, Engineered Safety Features, Tier 2 Material.

¹³⁰ Petition at 12; Gundersen Declaration at 7.

¹³¹ *Supra* at Background, Section B.a.

¹³² *See* 10 C.F.R. § 50.44(c)(5).

its application for design certification.¹³³ To the extent that the Petitioner is asserting that additional analyses beyond those required by 10 C.F.R. § 50.44(c) must be performed,¹³⁴ such a claim impermissibly challenges the Commission's regulations and is therefore inadmissible under 10 C.F.R. § 2.335(a). Even if it were not interpreted as a challenge to 10 C.F.R. § 50.44(c), the Petitioner's second assertion still raises an issue that was resolved in the AP1000 rulemaking and likewise not subject to challenge in this proceeding per 10 C.F.R. § 2.335(a). For these reasons, the second assertion is outside the scope of and immaterial to this proceeding and therefore fails to meet the requirements of 10 C.F.R. § 2.309(f)(1)(iii)-(iv).

The Petitioner's third assertion is that "other sources of hydrogen production are ignored."¹³⁵ The Petitioner does not even specify which sources those might be, contrary to the contention pleading rules in 10 C.F.R. § 2.309(f)(i)-(ii) that require a specific statement of the issue to be raised and a brief explanation of its basis. Furthermore, as with the second assertion, this assertion ignores both the specific requirements of the current version of 10 C.F.R. § 50.44(c) for new reactor applicants, which provides for a bounding hydrogen production analysis and specifically does not require others, and the fact that a hydrogen production analysis meeting the requirements of 10 C.F.R. § 50.44(c) was performed as part of the AP1000 design certification and is not altered by the LAR. As noted above, matters resolved in the AP1000 rulemaking are outside the scope of this proceeding and not material to the decision the NRC must make regarding the LAR. The Petitioner has not requested a waiver of either 10 C.F.R. § 50.44(c) itself or the design certification rule for the AP1000, and contentions challenging NRC rules are barred by 10 C.F.R. § 2.335(a) absent such a waiver. Accordingly, the Petitioner's third assertion, like the second, is inadmissible under both the contention pleading rules of 10 C.F.R. § 2.309(f)(1) and the restrictions of 10 C.F.R. § 2.335(a).

¹³³ *Supra* at Background B.b.; see also NUREG-1793 at 6-67 to 6-68.

¹³⁴ *Supra* n. 125.

¹³⁵ Petition at 12; Gundersen Declaration at 7.

The Petitioner's fourth assertion is that "radiolytic decomposition of water has been ignored as a source of both hydrogen and oxygen, and concrete degradation from contact with corium creates both hydrogen and oxygen, called the Molten Core Concrete Interaction (MCCI)."¹³⁶ The first part of this claim, related to radiolytic decomposition of water, amounts to another request that the Applicant perform hydrogen production analyses not required by 10 C.F.R. § 50.44, and this claim is therefore inadmissible under 10 C.F.R. § 2.309(f)(1) and 10 C.F.R. § 2.335(a) for the same reasons as the second and third assertions; additionally, as noted above, an analysis of radiolytic decomposition of water is among those analyses that the NRC specifically removed from the requirements of 10 C.F.R. § 50.44 in the 2003 rulemaking.¹³⁷ To the extent the Petitioner is arguing that MCCI is merely another potential source of hydrogen and oxygen that the Applicant must analyze in the LAR, it is also inadmissible under 10 C.F.R. § 2.309(f)(1) and 10 C.F.R. § 2.335(a) for the same reasons as the Petitioner's second and third assertion.

However, the Petitioner's concern about MCCI is inadmissible for a different reason as well, because it is a phenomenon that cannot occur unless the steel reactor vessel has already been breached, and if that is Petitioner's assertion it amounts to a challenge to another issue previously resolved in the AP1000 design certification and outside the scope of the LAR. Namely, as required by 10 C.F.R. § 50.44(c)(5), new reactor applicants must demonstrate containment structural integrity even under severe accident conditions of 100 percent fuel clad-coolant reaction accompanied by hydrogen burning. An analysis related to maintenance of containment integrity under these conditions was performed and found acceptable as part of the AP1000 design certification.¹³⁸ To the extent the Petitioner intends to challenge this analysis, such a challenge is outside the scope of this proceeding and therefore inadmissible under 10

¹³⁶ Petition at 12; Gundersen Declaration at 8.

¹³⁷ *Supra* at Background, Section B.a.; see 68 Fed. Reg. at 54,126.

¹³⁸ See NUREG-1793 at 6-66.

C.F.R. § 2.309(f)(1)(iii). To the extent the Petitioner intends to assert instead that the addition of two more hydrogen igniters, in addition to the 64 already found in the AP1000 design, introduces new hazards in the event that the reactor vessel has been breached for reasons unrelated to combustible gases, this assertion is inadmissible for the reasons discussed in relation to Contention 1 above.¹³⁹

Finally, the Petitioner asserts that the Applicant “ignores the possibility that the igniter can create a flame that blows back through the [IRWST] roof vents along the steam generator dog house wall into the sub-compartment causing a serious detonation.”¹⁴⁰ As support for the assertion that such a scenario is possible, the Petitioner’s expert presents a series of statements related to the nuclear accident at the Fukushima Daiichi power plant in Japan, and to NASA’s Space Shuttle Challenger mission, as well as a general critique of the concept of “engineering judgment.”¹⁴¹ However, with respect to Fukushima, the Petitioner’s expert discusses explosions that occurred in reactor buildings after containment had already been breached, in a plant with BWR reactors and Mark 1 containments. He makes no attempt to explain how these events or statements represent a specific deficiency with the hydrogen control system in containment for the AP1000 design, let alone with the specific change in the LAR. The rest of the statements in this portion of the Gundersen Declaration represent generalizations about engineering and statements generically urging caution, and the Petitioner makes no attempt to link them to the specific changes in the LAR under consideration. Because of the general nature of this assertion and the lack of any specific arguments related to the LAR, this assertion violates the contention pleading rules in 10 C.F.R. § 2.309(f)(i)-(ii) that require a specific statement of the issue to be raised and a brief explanation of its basis. Further, because

¹³⁹ *Supra* at Discussion, Section III.i.

¹⁴⁰ Petition at 12; Gundersen Declaration at 8-9.

¹⁴¹ Gundersen Declaration at 8-14.

the fifth assertion in Contention 2 is a restatement of Contention 1 and relies on similar support, it is inadmissible pursuant to 10 C.F.R. § 2.309(f)(1)(iii)-(vi) for the reasons discussed above.¹⁴²

For the reasons set forth above, to the extent Contention 2 presents new claims in addition to those previously raised in Contention 1, it is inadmissible under the provisions of 10 C.F.R. § 2.309(f)(1) and 10 C.F.R. § 2.335. The remaining portions of Contention 2 merely restate claims made in Contention 1 and are inadmissible for the reasons discussed in relation to that contention.¹⁴³

¹⁴² *Supra* at Discussion, Section III.i.

¹⁴³ *See id.*

CONCLUSION

For the reasons above, although the Staff does not contest BREDL's demonstration of standing in this proceeding, BREDL has not submitted an admissible contention. Accordingly, the Petition should be denied.

Respectfully submitted,

/Signed (electronically) by/

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Dated at Rockville, Maryland
this 27th day of May, 2016

Dated at Rockville Maryland,
this 27th day of May, 2016

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

In the Matter of

SOUTHERN NUCLEAR OPERATING CO.

(Vogtle Electric Generating Plant, Units 3 & 4)

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Docket Nos. 52-025 & 52-026

CERTIFICATE OF SERVICE

I hereby certify that the "NRC STAFF ANSWER TO PETITION FOR LEAVE TO INTERVENE AND REQUEST FOR HEARING" has been filed through the E-Filing system this 27th day of May, 2016.

/Signed (electronically) by/

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Dated at Rockville, Maryland
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