

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE SECRETARY

In the Matter of Southern Nuclear Operating Company License Amendment Application for Combined License NPF-91 Vogtle Electric Generating Plant Unit 3

Docket No. 52-025-LA-3

December 7, 2020

**DECLARATION OF ARNOLD GUNDERSEN TO SUPPORT THE
MOTION TO REOPEN PROCEEDING AND REQUEST TO AMEND
CONTENTION 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
UNIT 3 AUXILIARY BUILDING WALL 11 SEISMIC GAP REQUIREMENTS,
LAR-20-001**

I, Arnold Gundersen, declare as follows:

1. My name is Arnold Gundersen. I am sui juris. I am over the age of 18-years-old.
2. The Blue Ridge Environmental Defense League (BREDL) and its chapter Concerned Citizens of Shell Bluff have retained Fairewinds Associates, Inc to issue an expert report in support of the Parties' *Declaration Of Arnold Gundersen To Support The Motion To Reopen Proceeding And Request To Amend Contention 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 Unit 3 Auxiliary Building Wall 11 Seismic Gap Requirements, Lar-20-001*. I have specifically been retained to examine the NRC's Freedom of Information Act (FOIA) response to the Blue Ridge Environmental

Defense League in the case against Southern Nuclear Operating Company Vogtle Electric Generating Plant Units 3 for License Amendment and Exemption: Unit 3 Auxiliary Building Wall 11 Seismic Gap Requirements (LAR-20-001).

3. I earned my Bachelor Degree in Nuclear Engineering from Rensselaer Polytechnic Institute (RPI) cum laude. I earned my Master Degree in Nuclear Engineering from RPI via an Atomic Energy Commission Fellowship. Cooling tower operation and cooling tower plume theory were my area of study for my Master's Degree.
4. I began my career as a reactor operator and instructor in 1971 and progressed to the position of Senior Vice President for a nuclear licensee prior to becoming a nuclear engineering consultant and expert witness. My Curriculum Vitae is Attachment 1.
5. I have testified as an expert witness to the Nuclear Regulatory Commission (NRC) Atomic Safety and Licensing Board (ASLB) and Advisory Committee on Reactor Safeguards (ACRS), in Federal Court, the State of Vermont Public Service Board, the State of Vermont Environmental Court, the Florida Public Service Commission, and the California Public Utility Commission (CPUC).
6. I am an author of the first edition of the Department of Energy (DOE) Decommissioning Handbook.
7. I have more than 49-years of professional nuclear experience, *including and not limited to*: Cooling Tower Operation, Cooling Tower Plumes, Consumptive Water Loss, Nuclear Plant Operation, Nuclear Management, Nuclear Safety Assessments, Reliability Engineering, In-service Inspection, Criticality Analysis, Licensing, Engineering Management, Thermohydraulics, Radioactive Waste Processes, Decommissioning, Waste Disposal, Structural Engineering Assessments, Nuclear Fuel Rack Design and Manufacturing, Nuclear Equipment Design and Manufacturing, Prudency Defense, Employee Awareness Programs, Public Relations, Contract Administration, Technical Patents, Archival Storage and Document Control, Source Term Reconstruction, Dose Assessment, Whistleblower Protection, and NRC Regulations and Enforcement.

8. I am employed as the chief engineer for Fairewinds Associates, Inc, an expert witness and paralegal services firm specializing in nuclear engineering, nuclear operations, and nuclear power plant safety analysis and assessment.
9. My declaration examines and analyzes the technical issues regarding the License Amendment Application by Southern Nuclear Operating Company, [herein called SNC] to receive an exemption allowing it to modify the Vogtle Unit 3 Auxiliary Building Wall 11 Seismic Gap Requirements (LAR-20-001).

Supplemental Declaration and Expert Witness Testimony of Arnold Gundersen

10. On November 6, 2020, the NRC provided a belated FOIA response to BREDL containing four heavily redacted documents previously unavailable for my analysis in my Declaration filed with the NRC Atomic Safety Licensing Board (ASLB) on May 11, 2020. I have reviewed this new information and concluded that this newly provided information supports and amplifies the technical concerns I expressed in my previous declaration and expert report for BREDL's contention.

Broad Conclusions

- 10.1. The recently provided Nuclear Regulatory Commission (NRC) partial response to the Blue Ridge Environmental Defense League (BREDL) Freedom of Information Act (FOIA) request provides evidence that the NRC staff possessed this information before the ASLB pre-hearing conference. Moreover, the information withheld *actually supports BREDL's License Amendment Request (LAR) contention*. It appears that NRC staff chose to withhold that information from BREDL, and possibly also from the ASLB.
- 10.2. Southern Nuclear Company (SNC) has portrayed its Vogtle Unit 3 LAR request for a change in the seismic gap requirements as a *static dimension*

change. SNC claims that the gap is a simple construction error, is stationary, and will not move any further.

- 10.3. BREDL filed a FOIA request for hearing documents May 11, 2020, in preparation for the preliminary hearing conference on July 1, 2020. Yet, the FOIA response that was belatedly provided to BREDL for my expert technical analysis clearly shows that the wall in question *continues to move due to the unanticipated and unmeasured dishing of the Vogtle 3 foundation*.
- 10.4. Given that the information now provided shows precisely what I described: that the wall in question *continues to move due to the unanticipated and unmeasured dishing of the Vogtle 3 foundation*, it is my professional opinion that the Southern Nuclear Company (SNC) LAR request would not have been approved if the correct information had been provided by either SNC or the NRC staff as required by federal statute.
- 10.5. Moreover, the evidence shows that these technical facts, upon which I disagreed with SNC, were known to the NRC and *withheld from the ASLB record*. These documents and the NRC staff's assessment were not provided to BREDL, and it appears they also were not provided to the ASLB.
- 10.6. Even more disturbing is that the document finally provided, following months and months of delayed response by the NRC to BREDL's FOIA request, is quite heavily redacted. Ironically, the NRC deliberately redacted its conclusions to its safety analysis for the LAR. In addition, it did not provide the document before the pre-hearing, actual hearing, and even delayed providing the partial analyses for months. The rest of the technical data has been withheld by both SNC and NRC.
- 10.7. *It is inconceivable the NRC*, which was spun off and statutorily chartered to be the public's (people's) advocate separately from the original Atomic Energy Commission (AEC) – now Department of Energy (DOE) – should withhold

documents from the parties representing the public that this agency was formed to protect.

10.8. *Finally*, it is appalling that a federal agency like the NRC would purposely withhold critical safety information on the most expensive and most controversial atomic power reactor ever built in the United States: SNC's Vogtle Unit 3.

10.9. SNC's design and partial construction of the Vogtle 3 atomic power reactor have already cost Georgia ratepayers almost 30 billion dollars, yet critical safety information has been purposely withheld from the public review process. The NRC purposely redacted the very safety information required for my technical analysis and was requested in a FOIA request by BREDL as the legal representative for stakeholders and declarants in this legal process.

10.10. Moreover, since both SNC and NRC were aware of the critical safety information, the NRC's redactions of its review of safety-related conclusions were designed to avoid disclosure to BREDL, the ASLB, and the public as required by federal statute.

Background

11. As I noted in my first Declaration for BREDL, the scope of my expert opinion was limited *due to a paucity of data provided in the records available to me from the NRC PDR (Public Document Room)*.

12. BREDL filed a timely FOIA request for additional information. However, *I believe that the NRC was unresponsive in a timely manner. Information that was withheld, some of which is finally available in the FOIA response, shows that SNC's LAR 20-001 raised serious safety concerns within the NRC, causing an NRC review that unearthed information supporting BREDL's contention, yet these were never provided to BREDL before the ASLB held its pre-hearing*

12.1. BREDL filed my Declaration entitled *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 Request For License Amendment Vogtle Unit 3 Auxiliary Building Wall 11 Seismic Gap Requirements (LAR-20-001)* in support of BREDL's contention concerning LAR-20-002 dated [05/11/2020].

12.2. The Atomic Safety and Licensing Board (ASLB) held a preliminary hearing on 07/1/2020, and the ASLB issued a ruling against BREDL on 08/10/2020.

FOIA Documents:

13. On November 6 of 2020, the NRC *belatedly sent BREDL four documents that are only partially responsive to BREDL's FOIA* filed May 11, 2020. The NRC finally produced these documents six months after the submittal of my Declaration supporting BREDL's contention. On September 22, 2020, NRC did send BREDL 167 pages of preliminary papers. *These four documents are:*

13.1. A two-sentence cover letter from Amitava Ghosh to Joseph Colaccino dated Thu, 23 Apr 2020 21:22:27 +0000 transmitting item 13.2 below.

13.2. A two-page management briefing PowerPoint presentation from April 23, 2020, entitled *Management Briefing DEX 4-23-20 Revised Clean*. The NRC heavily redacted this document before its release to BREDL for my review. From its style, the document appears to be a PowerPoint presentation presented at an NRC management briefing. The document is entitled *LAR 20-001, Seismic GAP Between Annex Building and Nuclear Island, Vogtle 3*.

13.3. A two-sentence cover letter from Amitava Ghosh to Joseph Colaccino dated Thu, 23 Apr 2020 21:10:22 +0000. This document was sent five minutes earlier than item 1 above and transmitted item 13.4 below and appears to be an earlier rough draft of item 13.2 above.

13.4. This document is a three-page draft of a management briefing with marginal notes of the second revision of the PowerPoint presentation from April 23, 2020. It is entitled *Management Briefing DEX 4-23-20 Revised.docx*. Once again, the document BREDL received is heavily redacted. Additionally, we did not receive the original document or the first revision of this document in the NRC's FOIA response.

FOIA Overview:

14. In my capacity as an expert in this case, I reviewed and analyzed documents detailed above in paragraphs numbered 13.1 through 13.4.

15. *The contents of these four previously withheld documents add credence to and support BREDL's contention as detailed in my Declaration.* Had these documents been available when the BREDL contention was filed, and at the ASLB hearing, they would have given verified support to my original expert report, assertions, and conclusions. These documents provide convincing evidence that Southern Company's *LAR 20-001* makes the site and the reactor under construction patently unsafe to operate and therefore should have been unequivocally rejected by the NRC ASLB.

15.1. *Furthermore, it appears that the NRC staff failed to make their concerns known to the ASLB during the pre-hearing conference. I believe this is negligence on the part of a federal agency that appears to support the NRC's apparent goal of finally licensing and operating Vogtle 3 despite known safety flaws.*

16. BREDL has not contracted me to rewrite my entire previous analysis provided in my Declaration. Instead, I was asked to supplement that initial report to identify the specific technical information areas that the NRC staff withheld from BREDL.

16.1. The details and documents withheld by the NRC support my analyses and safety concerns as detailed in my Declaration and support BREDL's original contention filed in May 2020.

16.2. From my objective analysis of the four documents identified above, it appears that the NRC staff withheld critical information concerning the sinking foundation at Vogtle Unit 3, not only from BREDL but also from NRC management, the OIG attorneys who represented the Staff at the ASLB hearing, and the ASLB itself.

16.3. A *Timeline of Events* leading up to BREDL's current filing indicates that the NRC Staff had presented a summary PowerPoint to NRC management dated April 23, 2020. BREDL filed its contention on May 11, 2020, without this information.

16.3.1. The NRC filed its reply brief in June 2020 without identifying the information it was aware of two months earlier.

16.3.2. The ASLB took oral testimony from the NRC on July 1, 2020, and once again, the NRC failed to acknowledge information it had in its possession since April 2020.

16.3.3. At no time was this information made available to BREDL, me, or to my knowledge to the ASLB.

16.3.4. Now, six-months after the PowerPoint presentation was developed and after the ASLB already made the ruling on August 10, 2020, the NRC has finally responded to the BREDL FOIA request with a FOIA response that included only four highly redacted documents.

17. Analysis of New FOIA Information:

17.1. In the document that I will refer to as Item 13.4¹, the NRC states that "*the staff could not determine the seismic gap predicted in future*".

¹ This document is a three-page draft of a management briefing with marginal notes of the second revision of the PowerPoint presentation from April 23, 2020. It is entitled *Management Briefing DEX 4-23-20 Revised.docx*. Once again, the document BREDL

17.1.1. This vital quote concerning the ongoing dishing of Vogtle Unit 3 was not present in the document listed as the formal presentation to NRC management.

17.1.2. The quote “*the staff could not determine the seismic gap predicted in future*” was not discussed with BREDL and was not given to BREDL either before or during the prehearing conference.

17.1.3. Additionally, it also appears that the ASLB had not received this memo that “*the staff could not determine the seismic gap predicted in future*” either before or during the pre-hearing conference.

17.1.4. As discussed in my original Declaration, I contend that dishing is worsening and that walls inside Vogtle Unit 3 will move much further in the future.

17.1.5. Previously, I identified that this basemat foundation failure is a significant safety risk, and the information recently provided in the NRC’s FOIA response further supports my original contention.

17.2. In the document that I will refer to as Item 13.2², the NRC states that:

17.2.1. “*A margin of 1/16” between a Cat I structure (NI), and a non-safety structure (Annex Building) in the North-South direction can reduce further due to continued settlement.*” This newly provided statement supports the nexus of BREDL’s LAR contention, which is that the

received is heavily redacted. Additionally, we did not receive the original document or the first revision of this document in the NRC’s FOIA response.

² A two-page management briefing PowerPoint presentation from April 23, 2020, entitled *Management Briefing DEX 4-23-20 Revised Clean*. The NRC heavily redacted this document before its release to BREDL for my review. From its style, the document appears to be a PowerPoint presentation presented at an NRC management briefing. The document is entitled *LAR 20-001, Seismic GAP Between Annex Building and Nuclear Island, Vogtle 3*.

walls inside Vogtle 3 continue to move because of the ongoing dishing of the Nuclear Island (NI).

17.2.2. *“There is no settlement data between these two structures in the North-South direction...”* Incredibly, it appears that SNC has not been monitoring the dishing of the Vogtle 3 Nuclear Island (NI).

17.2.3. *The Nuclear Island (NI) is the heart of the entire Vogtle Unit 3 complex. Without a sound basemat foundation, Vogtle Unit 3 does not meet any seismic criteria and does not satisfy Vogtle’s original license conditions. The dishing that occurs with the sinking of the foundation is one of the most enormous safety flaws I have ever observed and analyzed at any atomic power reactor in the country.*

17.2.4. *“the predicted settlement is significantly different than (sic) what has been observed in the licensee document.”* The NI is dishing at a “significantly different” rate than the rate that SNC had anticipated when it originally applied for its license, informing us and the NRC that the initial seismic analysis for Vogtle Unit 3 is significantly flawed.

17.2.5. *“The seismic gap between Cat 1 and Cat II (Annex Building) structure is small. Potential Safety significance occurs if the gap between Cat 1 and Cat II closes to zero because there is no analysis presented showing that a zero gap will not affect the structural integrity of the CAT I structure by the Licensee.”*

17.2.5.1. Continued dishing will cause walls to continue to move closer together, yet the SNC LAR has failed even to acknowledge or analyze this basemat foundation failure.

17.2.6. *“...the ESEA staff noted that **the margin is extremely small (only 1/16”)**”* 1/16 of an inch over the original 3-inch seismic gap is approximately 2%. It

is impossible to believe that SNC's seismic analysis is accurate within a 2% error band. **[Emphasis Added]**

17.2.7. *"SNC needs either (1) to provide a realistically predicted settlement affecting the seismic gap in the North-South direction from the remaining loadings of the completed structures or (2) to address that the zero gap is acceptable based on an analysis demonstrating that a Cat II structure (Annex Building) will not affect the structural integrity of the Cat I Nuclear Island during an SSE."* This newly provided statement supports the nexus of BREDL's LAR contention, which was that the LAR was incomplete and that the walls inside Vogtle 3 continue to move because of the ongoing dishing of the Nuclear Island (NI).

17.3. *"... **[the conclusion is redacted]**... Therefore the staff has another issue of using predicted settlement to assess the seismic gap during a Safe Shutdown Earthquake"* Whatever this second new issue is remains unknown to BREDL, to me, and possibly to the ASLB. **[Emphasis and Statement Added to Describe Redactions in Document]**

17.3.1. The redaction by the NRC of its own analytical conclusion is puzzling.

17.3.2. The NRC FOIA response claims that this second major LAR safety-related issue is somehow proprietary.

17.3.3. The predicted settlement is NOT a proprietary issue; it is a significant safety flaw involving the Nuclear Island's entire basemat foundation.

17.3.4. The statement: *"Therefore the staff has another issue of using predicted settlement to assess the seismic gap during a Safe Shutdown Earthquake"* indicates that NRC and SNC anticipate that the seismic gap will worsen over time. Therefore, the NRC should have rejected SNC's LAR because it contained incomplete information.

- 17.3.5. These ASLB hearing process and the entire licensing process are a statutorily authorized process meant to protect the public, the investors, the employees, the State of Georgia, and the whole southeastern part of the U.S. from a major nuclear catastrophe.
- 17.3.6. Ignoring the basemat foundation flaws to the Nuclear Island is equivalent to the regulators in Japan and TEPCO ignoring the necessity of creating a tsunami wall to protect the shoreline pumps and assure cooling protection in an event, like the earthquake-induced tsunami, that might cause a meltdown.
- 17.4. Information provided in the NRC's response to BREDL's FOIA proves that the NRC staff and line management were aware of and expressed significant concerns about LAR 20-001.
- 17.4.1. None of this information was publicly available to me when I prepared my expert report.
- 17.4.2. Moreover, from the way the docket was handled and information was parsed, it also appears that the NRC staff did not inform the OIG attorneys or the ASLB in preparation for or during the prehearing conference.
- 17.5. Had the FOIA response information been available to BREDL in a timely manner, as it should have been, and made available for me as an independent expert witness *rather than withheld*, my conclusion then would have mirrored my conclusion today.
18. The NRC issued documents, *sent belatedly in response to BREDL's FOIA request, prove that a significant safety flaw exists at Vogtle Unit 3 in Georgia. Moreover, the documents support BREDL's original contention that the Nuclear Island at Vogtle Unit 3 is unstable, is dishing at an alarming rate, and will sink further in the future.*
- 18.1. These technical findings show that the Nuclear Island's unstable and flawed basemat foundation will stress Safety Related systems and structures.

18.2. The recently issued documents released to BREDL in response to its FOIA are minimal at best. It is appalling how heavily redacted these technical documents are, all in a “fake claim” that this material is proprietary.

ASLB Reliance on Integrity of NRC Review and Response

19. Despite ample evidence to the contrary, Judge Bollwerk and the Nuclear Regulatory Commission (NRC) Atomic and Safety Licensing Board (ASLB) have the misconception that the NRC Staff have provided truthful and complete information to fulfill its charter protecting public health and safety rather than protecting the corporate interests of the nuclear industry.

19.1. Judge Bollwerk stated his expectation of complete honesty from the NRC Staff on pages 3/4/5/6 of the attachment to the Memorandum and Order. His supplement to the Memorandum and Order support the fact that the ASLB expected and indeed required the NRC Staff to fully, honestly and fairly represent to the ASLB their actual safety concerns based upon the totality of the information they used in reaching their conclusions:

“As to the NRC Staff’s access to the SNC information the Staff used to make a docketing decision about the SNC application, this seemingly would be shaped by the Staff’s guidance regarding its application acceptance/docketing process. Under that guidance, the Staff is to consider whether (1) the application is complete in scope, such that there are no “significant analyses or evaluations missing” from the application; and (2) the information and analyses provided in support of the application evidence any “significant, obvious problems.” **Those instructions also indicate that if the scope of the application is incomplete or the information is insufficient, the application must be considered unacceptable such that it should be returned to the applicant or an additional opportunity provided to supplement the application before docketing.....** Thus, in contrast to the NRC Staff’s recently revised post-docketing license application review instructions that permit the Staff to utilize non-docketed information accessed via an applicant portal, nothing in the acceptance review instructions appears to authorize the Staff when making a docketing decision to consider applicant information not in the possession of the agency. **All this suggests that in preparing a hearing request challenging**

a license application, a petitioner such as BREDL, while arguably not entitled to access more applicant information than the Staff had before it in making its docketing determination, also would not be entitled to any less, either by virtue of the information being publicly available in the agency's licensing docket (or otherwise publicly accessible in its ADAMS document management system) or via an appropriate protective order in the case of any docketed non-public information... While in this instance the access afforded BREDL to SNC documentary material seemingly was in accord with agency regulatory procedures and the Staff's own review process guidance,¹⁰ for the hearing opportunity afforded "interested persons" by the Atomic Energy Act to remain meaningful, it also is apparent that the Staff must continue to "turn square corners" in ensuring hearing requestors have appropriate access to applicant information provided to the agency for use in the license process. application review process." [Emphasis Added]

19.2. The FOIA response to BREDL by the NRC shows that Judge Bollwerk's confidence in the NRC staff's integrity is misplaced.

Previous Erroneous Statements from NRC Staff and SNC

20. The information that the NRC staff and Southern Nuclear Company (SNC) provided to the ASLB in their briefs and at the pre-hearing conference was inaccurate, incomplete, and untruthful. Had the ASLB known about the staff's concerns and misrepresentations that I have identified above, I believe that it would have found the LAR to be incomplete, nuclear safety standards violated, and that SNC has not completed the requisite engineering analyses about the complexities of the flawed Nuclear Island.

21. The following section has some poignant examples delineating where the ASLB relied upon assertions by both SNC and the NRC staff that are inaccurate, incomplete, and untruthful. However, the statements that are inaccurate, incomplete, and untruthful, are not limited to the examples below:

21.1. In rejecting BREDL's contention, submitted to the NRC on May 11, 2020, I note that on page 25 of the ASLB's August 10, 2020 MEMORANDUM AND

ORDER (Denying Intervention Petition and Terminating Proceeding) the ASLB relied upon incorrect information and stated that:

“At the same time, contrary to 10 C.F.R. § 2.309(f)(1)(vi), BREDL does not show a genuine dispute with the LAR on a material issue. As SNC points out, the LAR does not **“suggest or indicate that either the [gap] nonconformance or the modification is in response to settlement issues.”** SNC Answer at 20. But even if this LAR did ask for a change in accepted differential settlement for Vogtle 3, which it does not, **BREDL’s assertions that settlement was not considered in the design of Vogtle 3 are unsupported** and do not show a genuine dispute. The UFSAR for Vogtle 3 does contain values for total and differential settlement.⁵² The UFSAR acknowledges that differential settlement could impact the tilt of the nuclear island buildings and describes the limit of acceptable differential settlement.⁵³ And SNC has not sought to alter these settlement findings.” **[Emphasis Added]**

21.2. The information recently gleaned from the recent NRC FOIA response makes a mockery out of statements contained in the Hearing Transcript, Page 58, lines 16-23, Judge Bollwerk, quoting SNC's reply brief:

“However, Mr. Gundersen provides no specific support showing how the SASSI analysis are insufficient, and more importantly, why the SASSI analysis did not support the LAR's conclusion that the gap -- I'm sorry -- that **the greater than 1 inch gap between the nuclear island and annex building will still be maintained an SSE**, safe shutdown earthquake event. Hearing Transcript, Page 58, Lines 16-23.” **[Emphasis Added]**

21.3. The information recently gleaned from the NRC FOIA response shows that at hearing the NRC deliberately provided false statements that are contained in the Hearing Transcript Page 64, lines 7-17, Attorney Ezell representing NRC staff.

“As discussed in the license amendment request, this type of settlement would tend to cause the auxiliary building wall to slightly lean away from the annex building wall. **That settlement to date to would tend, if anything, to increase the seismic gap, not decrease it**, which shows that the Petitioner's settlement concerns do not raise a genuine dispute with the licensee on a material issue of fact and instead relates to matters already analyzed in previous proceedings rather than a license amendment

request at issue in this proceeding. Hearing Transcript Page 64, lines 7-17.” **[Emphasis Added]**

21.4. The information recently gleaned from the recent NRC FOIA response creates an evidentiary trail of false statements by Southern Nuclear Company that are contained in the Hearing Transcript Page 61, lines 19-25 in a conversation between Judge Abreu and Attorney Blanton of SNC.

“JUDGE ABREU: Okay. And from what you told us and from what we’ve seen in the documents, **it appears that this is basically just a bulge, that there is no component of wall tilt** that is causing the need to request the change in the gap. **Is that correct?** Hearing Transcript Page 24–25

MR. BLANTON: **Yes, that's correct.**

Hearing Transcript, Page 61, lines 19-25 **[Emphasis Added]**

NRC FOIA Response Amplifies Seismic Issues Identified by BREDL

22. The newly provided information in the NRC’s FOIA response also highlights the significance of BREDL’s previously identified concerns about the seismic response of the Nuclear Island (NI) because its dishing has never been analyzed by either the NRC nor SNC.

22.1. These concerns were summarized by BREDL in Mr. Zeller’s prepared remarks on Pages 21, 22, and 23 of the ASLB Hearing Transcript. Mr. Zeller’s remarks and my earlier expert comments were significant, yet ignored by the ASLB when it issued its opinion. However, the lack of analysis, and indeed supporting data, for the NI’s seismic response in the event of an earthquake is painfully obvious in newly provided FOIA response. As Zeller previously stated:

“Comparing apples to oranges, issuing a differential settlement, both SNC and NRC confuse or mischaracterize BREDL’s argument regarding the occurrence of dishing. The UFSAR acknowledges that the differential settlement under the nuclear island foundation could cause the base mat

buildings to tilt. Differential settlement shows up again and again. That's NRC's answer I quoted from at 24. Further, the NRC states, design-specific parameters for Vogtle Unit 3 address expected settlement citing AP1000 DCD Section 3A542. But the discussion centers on differential settlement and bounding parameters for the nuclear island. The stated final safety analysis report and plant-specific design control documents cited by NRC discuss a differential settlement throughout, not dishing. The difference is critical to understanding the safety concerns raised in our petition. Differential settlement is linear. With differential settlement, the base is not level but it stays flat. Dishing is different. It is curved. Dishing creates unanalyzed stresses. Our petition states that to dismiss concerns about one phenomenon by confusing it with a similar but critically different process would sidestep the safety issues we have identified. In this license amendment request, Southern Company states, nuclear island base mat has deflected more at the center and less at the perimeter. It continues. Theoretically -- this is Southern Company. Theoretically, this suggests that the nuclear island tends to tilt away from the annex building. That is from the license amendment request 20-001 at page 8. In this application, Southern Company has admitted that the sinking is not linear, more at the center, less at the perimeter. Arnold Gundersen made reference to such in his declaration supporting our petition for intervention and it is part of Contention 2. However, SNC attempts to limit the scope to a change in wall and not to the dishing of the base mat. They brought up dishing without using the term in the license amendment request. They admit that tension at the bottom of the base mat is different than compression at the top. According to SNC, this is representative of dishing. That's from Southern Nuclear Company's answer at 21. Nuclear island basemat is sinking more in the middle. We would not have known that without this license amendment request. There still is no publicly available data on the rate of sinking, but we now know as a result of the license amendment request that it is nonlinear. An Applicant must satisfy the requirements of 10 CFR 50.90 and demonstrate that the requested amendment meets all applicable regulatory requirements and acceptance criteria and does not otherwise harm public health and safety nor the common defense and security. And 10 CFR 52.97(b) controls NRC's review of license amendment. A mere theory about why buildings in the nuclear island are shifting does not meet these requirements.”

22.2. BREDL’s previous analysis and the missing seismic data, identified in the LAR, AND finally provided six months later in the FOIA response, prove that a Stop Work Order by the NRC is critical to the health and safety of the people of Georgia and the southeastern United States. The order should remain in effect

until the seismic response of the Nuclear Island (NI) that includes dishing of the basemat is finally analyzed on the Vogtle Unit 3 project.

Final Summation

23. Well before the ASLB pre-hearing conference, the NRC staff and SNC possessed information that was different than what was presented by SNC and the NRC in the LAR and to the ASLB. The information the NRC Staff and Southern Nuclear Company withheld from intervenor and stakeholder representative Blue Ridge Environmental League (BREDL) was obtained via the NRC in response to a FOIA request submitted by BREDL on May 11, 2020, and not produced for BREDL and its expert until November 6, 2020.
24. As the expert witness who reviewed this material, who provided the original Declaration about the unresolved dishing issues, sinking Nuclear Island, and flawed basemat foundation, I have also submitted numerous Declarations and Expert Reports to the NRC, ASLB, ACRS, U.S. Federal Court, numerous public service commissions and public utility commissions, as well state legislatures, and many other state and local agencies and even overseas to numerous government and judicial bodies. I have never seen such a flawed and inaccurate, incomplete and untruthful filing in my 49-years working and testifying in the nuclear regulatory arena – both in support of nuclear industry vendors and utilities and against them when they have flawed filings or malicious coverups. One such example is the series of expert reports and testimonies I have repeatedly given in cases around the country, such as that at Vermont Yankee when I identified that Entergy Senior Executives lied to Vermont state regulators about the condition of its underground piping.
25. In my professional opinion, the NRC response to BREDL's FOIA request was overdue, delinquent, and redacted in an effort by the NRC to obfuscate the evidence requested.

- 25.1. Moreover, the new documents containing the LAR filing information and assessment provided by the NRC in response to BREDL's FOIA shows that the prior data and testimony received from NRC Staff and SNC in the prehearing, hearing, and material LAR filings made before the Atomic Safety and Licensing Board were wholly inaccurate, incomplete and untruthful.
- 25.2. The exhibits finally turned over to BREDL for review by BREDL and by me as its expert, but long after a ruling had already been made by ASLB, substantiates that the evidentiary material was unlawfully and illegally withheld from the ASLB License Amendment Review process, *thereby tainting the entire evaluation.*
- 25.3. The Code of Federal Regulations makes it clear that all evidence must be presented to all parties and all scientifically-based data must receive a wholly legitimate and genuine hearing of all and any evidence in order to protect public health and safety.
- 25.4. Had BREDL received this information in full and in time to present the evidentiary trail to the ASLB pre-hearing conference, I believe that the ASLB would not have approved the LAR due to the lack of data, incomplete application, and complete lack of substantial analyses regarding the unstable Nuclear Island basemat foundation at Vogtle Unit 3.
- 25.5. More dishing is occurring, there is no analyses of these issues, and the hearing officials received an incomplete and inaccurate engineering filing. The redactions show that there is more information covered up both the NRC and SNC.
- 25.6. I believe the malfeasance uncovered in this process proves that a complete reanalysis of Nuclear Island dishing and seismic movement must be implemented immediately at Vogtle Unit 3 for the unit, its auxiliary buildings, and its flawed basemat foundation that is sinking.

25.7. Let me refresh your memory with an excerpt from my original testimony:

“The Condition and Construction History of the Vogtle Unit 3 Nuclear Power Plant

The condition of the Vogtle Unit 3 foundation is critical to the safe operation of this nuclear power plant because all systems, structures, walls and components are attached and depend upon its integrity to assure public health and safety as well as reliable operation. **The interaction between the Vogtle Unit 3 foundation and the soil underneath it, is the first and most important design parameter that assures public safety during the entire operating life of this atomic power reactor.**

According to the 2012 license amendment by Southern Nuclear Operating Company (SNC) for changes to be made to the foundation basemat³ concrete and rebar, the foundation is of critical safety importance.

The nuclear island structures, consisting of the containment, shield building, and auxiliary building are founded on the 6-foot-thick, cast-in-place, reinforced concrete basemat foundation. The basemat provides the interface between the nuclear island structures and the supporting soil. The basemat transfers the load of nuclear island structures to the supporting soil. The basemat transmits seismic motions from the supporting soil to the nuclear island. Resistance to sliding of the concrete basemat foundation is provided by soil friction.... Soil-structure interaction (SSI) sensitivity analyses ... were performed using the Vogtle **best estimate soil profile** and seismic input.⁴” Declaration of Arnold Gundersen⁵ **[Emphasis Added]**

Conclusions

26. In Conclusion and relying on my 49-years of nuclear engineering analysis, given the outrageous defects and cost overruns already present at the Vogtle Unit 3 nuclear

³ For those not familiar with the term basemat: According to the American Society of Mechanical Engineers, the “Nuclear Island (NI) basemat is a very thick reinforced concrete mat sitting on sub-grade soil to function as one-piece-foundation to support all super-structures anchored above the basemat.”

<https://asmedigitalcollection.asme.org/ICONE/proceedings-abstract/ICONE25/57808/V002T03A038/251926>

⁴ <https://www.nrc.gov/docs/ML1221/ML12215A084.pdf>, page 3

⁵ *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 Request For License Amendment Vogtle Unit 3 Auxiliary Building Wall 11 Seismic Gap Requirements (LAR-20-001)*

power plant project, it would behoove the NRC and ASLB to recommend a stop-work order until the most essential safety feature of this reactor is reanalyzed and proven to withstand the seismic issues it would encounter during its 40 to 60-year lifespan.

27. Such action would show that the Nuclear Regulatory Commission is fulfilling its regulatory responsibility to protect people [public health] and communities [safety] first rather than line the pockets of nuclear corporations and industry lobbyists.
28. Finally, such action would preclude a Fukushima-style debacle in the U.S., especially with an atomic reactor like the riskier one-of-a-kind AP-1000 design used at Vogtle purchased with ratepayer and taxpayer funds. And it would protect the people of Georgia and the southeastern United States.
29. The new FOIA material provides info that supports and amplifies the significance and accuracy of BREDL's contention and disproves assertions in filings and oral testimony by NRC and SNC that the ASLB relied on to reach its erroneous conclusion.

–END–

Attachments:

Attachment 1 – Curriculum Vitae

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 7th day, December 2020 in Charleston, South Carolina

_____/s/_____

Arnold Gundersen, MSNE, RO
Chief Engineer, Fairewinds Associates, Inc

**UNITED STATES OF AMERICA
U.S. NUCLEAR REGULATORY COMMISSION
BEFORE THE SECRETARY**

In the Matter of:
SOUTHERN NUCLEAR OPERATING CO.
License Amendment Application for
Combined Licenses NPF-91
Vogtle Electric Generating Plant Unit 3

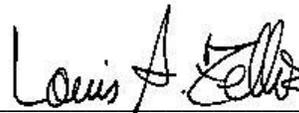
Docket No. 52-025-LA-3

CERTIFICATE OF SERVICE

I hereby certify that the

**DECLARATION OF ARNOLD GUNDERSEN TO SUPPORT THE
MOTION TO REOPEN PROCEEDING AND REQUEST TO AMEND
CONTENTION 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
UNIT 3 AUXILIARY BUILDING WALL 11 SEISMIC GAP REQUIREMENTS,
LAR-20-001**

has been filed through the Electronic Information Exchange system
this 7th day of December, 2020.



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