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DESCRIPTION OF DOCUMENT: Public Comments Invoking the "rule of reason" to the present disagreement about the most appropriate modeling methodology for application to FENOC's Davis-Besse SAMA analyses is blatantly dismissive of the concept that the present methods are inappropriate and outdated and that there are indeed alternative modeling methods that would be quite reasonable to use.

Another example involves issues surrounding the Modular Accident Analysis Program, or MAAP code. This contention is discussed by FENOC in its Answer to "Contention 4b: FirstEnergy's SAMA Analysis Minimizes the Potential Amount of Radioactive Release in a Severe Accident," pages 92 to 98; by NRC staff in its Answer at "*i. Joint Petitioners' Claim that MAAP is Inappropriate Does Not Raise a Material Issue,*" beginning at its Answer on page 79; and by Joint Petitioners under the designation THE SAMA ANALYSIS FOR DAVIS-BESSE MINIMIZES THE POTENTIAL AMOUNT OF RADIOACTIVE RELEASE IN A SEVERE ACCIDENT (Petition and Request, Page 108).

Joint Petitioners explained that the source terms used by FENOC to estimate the consequences of severe accidents (radionuclide release fractions generated by the Modular Accident Analysis Progression, MAAP) are consistently smaller for key radionuclides than the release fractions specified in NUREG-1465 and its recent revision for high-burnup fuel.

The radioactivity source term used results in lower consequences than would be obtained from NUREG-1465 release fractions and release durations. New research is not required. Joint Petitioners' alternative model is reliable. Instead, independent studies and a study by the Brookhaven National Laboratory, cited in Joint Petitioners' contention, showed use of the MAAP code is unreliable due to significantly underestimating collective dose. (J. Lehner et al., "Benefit Cost Analysis of Enhancing Combustible Gas Control Availability at Ice Condenser and Mark III Containment Plants," Final Letter Report, Brookhaven National Laboratory, Upton, NY, December 23, 2002, p. 17. ADAMS Accession Number ML031700011, cited on page 113 of Joint Petitioners' December 27, 2010 Petition and Request)

We would demonstrate this at the hearing. Joint Petitioners' alternative model is applicable to SAMA analyses and adaptable for evaluating the SAMA analysis cost-benefit conclusions. The effect of alternative source codes for evaluating SAMA analysis cost-benefit conclusions has been demonstrated at other sites. As an example, Dr. Edwin Lyman, Senior Scientist at the Union of Concerned Scientists (UCS), has performed such an alternative analysis for Entergy's Indian Point nuclear power plant (Units 2 and 3) near New York City, which has also been the subject of an ongoing license extension proceeding before an NRC ASLB since April 30, 2007.

Yet another example involves issues surrounding the MELCOR Accident Consequence Code System, or MACCS2 risk consequence code. This contention is discussed by FENOC at "Contention 4c: The MACCS2 Code Used in FirstEnergy's SAMA Analysis Is 'Outdated and Inaccurate, '" pages 98 to 105 of FENOC's Answer; by NRC staff between pages 58 to 79, including issues of the MACCS2 code being outdated or obsolete from page 58 to 61; and by Joint Petitioners under the designation THE SAMA ANALYSIS FOR DAVIS-BESSE USES AN OUTDATED AND

INACCURATE PROXY TO PERFORM ITS SAMA ANALYSIS, THE MACCS2 COMPUTER PROGRAM (Page 115).

The Applicant's SAMA analysis uses MELCOR Accident Consequence Code System (MACCS2) computer program. Joint Petitioners stated the plain fact that there is no NRC

regulation *requiring* the use of that code, or any other particular code. It was FENOC's choice. There are other consequence computer codes in use for nuclear accidents around the world. Again, research is not necessary.

Further, Joint Petitioners explained that it is reasonable to require FENOC to update the code if, as we shall demonstrate, it provides the "wrong" answer by significantly underestimating offsite consequence costs.

The <u>user</u> (FENOC is this instance) <u>controls what is put into the consequence code</u> – the meteorological data, decay chain data, the dose conversion factor file data, the population input file data, and the data that go into the COMIDA 2 model. The MACCS2 code's OUTPUT file does the averaging and ranks the data into a cumulative distribution function (CDF) – the mean, 50th quartile, 90th quartile, 95th quartile, peak consequence, peak probability, and peak trial. FENOC chose to take the mean value; and, <u>there is no NRC rule requiring the mean</u>. The mean is the wrong choice, as it underestimates consequences. A mean divides the sum by the number of entries. There are thousands of individual data entries so that dividing the sum by so many entries unreasonably dilutes the results. Further, FENOC multiplied the mean by its estimate of the probability of the accident scenario.

The point is that FENOC's choices – inputs and choice of averaging and probability – resulted in significantly underestimating costs. It is not unreasonable to require further analysis using different data and parameters.

Lastly, it is obvious that FENOC has time to do a proper analysis; Davis Besse's license does not expire for over six more years, so <u>they clearly have time to do so</u>.

MOTIONS TO INTERVENE - REQUIREMENTS

Joint Petitioners largely covered this issue in the foregoing Introduction to this section of its Combined Reply regarding CONTENTION FOUR: SEVERE ACCIDENT COST UNDERESTIMATED.

However we shall take this opportunity to address points raised by FENOC. FENOC argues that "Contention 4 lacks adequate support in the form of alleged facts or expert opinion, in contravention of 10 C.F.R. [Part] 2.309(f)(1)(v)." (FENOC Answer, Page 80)

Joint Petitioners quite clearly met this standard. Joint Petitioners provided genuine disputes and did not rest upon mere allegations or denials; rather disputes raised were supported by ample references to experts, government documents and site specific studies.

Expert testimony is not required at this stage in the proceeding. If it were so, most members of the public, non-profit public interest groups, and local governments would be unable to file due to lack of resources. The very limited resources of these groups necessarily must be preserved for expert witnesses required at the summary disposition and hearing stage of these proceedings. Surely it is not the intent of the NRC Commission to restrict initial participation only to insiders with deep pockets?

What FENOC forgets is that we are at the initial stage of the proceeding (not the summary disposition or hearing stage) and are following requirements to introduce with sufficient particularity areas that the Applicant must defend against.

UNCERTAINTY

An example of FENOC's attack on Contention Four for "[lack of] adequate support in the form of alleged facts or expert opinion, in contravention of 10 C.F.R. [Part] 2.309(f)(1)(v)" is its allegation that "Contention 4f Lacks Adequate Factual or Expert Support" (FENOC Answer, Page 131). FENOC makes this claim against Joint Petitioners' challenge to its treatment of uncertainty in its SAMA analyses.

In defense of its treatment of uncertainty, FENOC argues that it performed a number of sensitivity analyses to account for uncertainty. At FENOC's Answer, Page 132, Footnote 567, it states:

With regard to the cost-benefit evaluation, seven sensitivity cases were investigated. These cases examined: (1) the impacts of assuming damaged plant equipment is repaired and refurbished following an accident, (2) a lower discount rate, (3) a higher discount rate, (4) higher on-site dose estimates, (5) higher total on-site cleanup costs, (6) higher costs for replacement power, and (7) a higher non-internals event hazard groups' multiplier. Further details on the sensitivity cases are provided ER Appendix E, Section E.8.

However, Joint Petitioners have clearly refuted the value of these studies, as they relied on the exact same flawed methodology. Repeating the same mistakes over and over does not provide the correct answer or, in this case, demonstrate that they properly accounted for uncertainty.

Joint Petitioners fully appreciate that there is uncertainty. For example, source term, meteorological conditions and evacuation (protective action measures cannot be definitively predicted to be occurring at any given time and must be addressed probabilistically in SAMA analyses). But NEPA requires an honest probabilistic analysis based on available, reliable and up-to-date models. FENOC failed to do so, the dispute that forms the very heart of this contention. Further, there is no basis to the argument that there may be no way to assess through mathematical or precise model-to-model comparisons, how alternative models would change the SAMA analysis results. Some assessments may necessarily be qualitative, based simply upon expert opinion. But this argument seems to undercut the very value of mathematical simulation models in general as a method to assess the impacts of nuclear reactor radioactivity emissions offsite in a severe accident. Surely the ASLB does not believe this.

Finally, FENOC questions (at its Answer, Page 131) why Joint Petitioners cited Dr. Edwin Lyman's testimony in the Indian Point (Units 2 and 3) license extension proceeding, and how it applies to this Davis-Besse license extension proceeding. Joint Petitioners cited Dr. Lyman's testimony to emphasize the importance of scientific conservatism, as embodied in 95th percentile confidence levels as opposed to mean values. Joint petitioners insist that such confidence levels are necessary to adequately "protect people and the environment" against the hazards of radioactivity, to successfully mitigate against severe accidents.

SECTION-BY-SECTION REBUTTAL

FENOC and NRC staff make similar arguments; therefore Joint Petitioners reply to NRC staff's Answer would be applicable here below, as appropriate.

FENOC's Arguments Against "Contention 4a: Use of Probabilistic Risk Assessment Techniques," (Pages 83 to 92 of FENOC's Answer); Joint Petitioners' "FENOC'S USE OF PROBABILISTIC MODELING UNDERESTIMATED THE TRUE CONSEQUENCES OF A SEVERE ACCIDENT" (Joint Petitioners' Petition and Request, December 27, 2010, beginning on Page 104)

In this contention, Joint Petitioners assert that FENOC's use of probabilistic modeling underestimated the deaths, injuries, and economic impact likely from a severe accident by multiplying consequence values, irrespective of their amount, with very low probability numbers, making the consequence figures appear minimal. FENOC's claim that this contention is inadmissible is incorrect.

At Page 89 of its Answer, FENOC states:

Petitioners' citation to a 1985 decision involving Indian Point also is inapposite. Specifically, Petitioners note that the Board stated that "the Commission should not ignore the potential consequences of severe-consequence accidents by always multiplying those consequences by low probability values." But the Board's statement is taken out of context. In that decision (which pre-dates the SAMA analysis requirement in Part 51 by more than a decade), the Board noted that, due to the high population density near Indian Point, "a low probability accident at Indian Point may result in greater consequences than the same accident at another site." The Board did *not* hold that it is inappropriate to consider the probability of a severe accident in assessing the associated risk. In fact, in that proceeding, the Commission instructed the Board to consider serious accidents with "equal attention" to both probabilities and consequences. This is consistent with the definition of risk articulated by the Commission and used in numerous nuclear regulatory contexts, including SAMA analysis. [FENOC's reference to footnotes removed by Joint Petitioners]

Joint Petitioners take issue with several aspects of FENOC's argument. First is its apparent attempt to downplay population density risks at Davis-Besse. Davis-Besse's neighbors include: Detroit, Michigan; Toledo and Cleveland, Ohio; and Windsor, Ontario. These major metropolitan areas are all located within 50 miles of Davis-Besse. Given such population density, a severe accident at Davis-Besse, certainly one involving a radiological release, would likely result in large, not small, consequences.

In addition to population density, Davis-Besse's Lake Erie shoreline location raises additional risks. Lake Erie serves as the headwaters for the drinking water supply for many millions of people downstream, not only in the U.S. and Canada, but also in numerous Native American and First Nations. Toronto, Ontario and Montreal, Quebec – two of the largest metropolitan areas in all of Canada, are downstream of Davis-Besse on the Great Lakes and St. Lawrence River. A severe accident at Davis-Besse, especially one involving a radiological release, would result not in small, but rather large, consequences of an international scope to downstream drinking water supplies. Such large consequences of international scope to downstream drinking water – and also agricultural irrigation water -- supplies would also extend, of course, to the northern shore of Lake Erie itself.

Due to such risks of an "international incident" involving a catastrophic radiological release into the Great Lakes (drinking water supply for 40 million people altogether in both countries, engine for one of the biggest regional economies on the entire planet, and heart of one of the world's largest trading partnerships between the U.S. and Canada), FENOC and NRC itself must much more seriously address the risks of an intentional terrorist attack at Davis-Besse, as opposed to the flippant bureaucratic dismissal embodied by FENOC's response to "Alleged Need to Consider Intentional Acts" at its Answer, Page 86. To do otherwise is to risk unimaginable peril. FENOC's argument, and NRC's policy position, effectively assumes that the risk of a terrorist attack at Davis-Besse is zero. As shown by the events of September 11, 2001, such a risk calculation is dead wrong. As alluded to by the title of Dr. Edwin Lyman's report, Chernobyl on the Hudson? The Health and Economic Impacts of a Terrorist Attack at the Indian Point Nuclear Plant, (Union of Concerned Scientists, September 2004, available at http://www.ucsusa.org/nuclear power/nuclear power risk/sabotage_and attacks_on reactors/im pacts-of-a-terrorist-attack.html), Joint Petitioners are determined to do prevent a Chernobyl on the Great Lakes – as by intervening in this proceeding, and demanding that accurate SAMA analyses be carried out by FENOC in order to prevent a severe accident - or attack - from ever taking place at Davis-Besse. And of course, an element of Joint Petitioners' Contentions One (Wind), Two (Solar), and Three (Solar and Wind Combined) is that those renewable energy

alternatives to Davis-Besse would not incur the risks of severe accidents or attacks unleashing catastrophic amounts of radioactivity into the Great Lakes Basin to blow with the wind and flow with the water to fallout downstream and downwind over vast areas.

Joint Petitioners do not disagree with the reasoning behind the cited Commission instruction to the ASLB in the 1980s Indian Point proceeding cited above, that regarding serious accident risk, "equal attention" should be paid "to both probabilities and consequences." In fact, that is the very definition of risk itself.

However, FENOC misconstrues Joint Petitioners' challenge. Joint Petitioners are not "enemies" of probability determinations. But Joint Petitioners are "enemies" of FENOC's systemic underestimation of risk probabilities due to its flawed models and methodologies. FENOC has consistently underestimated risk in its SAMA calculations by inappropriately and improperly underestimating probability values, as Joint Petitioners have shown in Contention Four. FENOC has then multiplied consequences by improperly and inappropriately low probability values to arrive at seemingly low overall risk values. In fact, FENOC determined that not a single one of the Severe Accident Mitigation Alternatives it had considered in its ER SAMA analysis proved to be cost-beneficial.

In refuting Joint Petitioners' dispute regarding probabilistic modeling, FENOC cites from the *Pilgrim* license extension proceeding. That ASLB deemed such a challenge inadmissible because the "use of probabilistic risk assessment and modeling is obviously accepted and standard <u>practice</u> in SAMA analyses." (FENOC Answer, Page 85, Emphasis added) However, this is Davis-Besse's license extension proceeding, not Pilgrim's. Further, we underscore the key word "<u>practice</u>." It is a <u>practice</u>, not a rule. Joint Petitioners agree that probability must be taken into consideration, but with due caution. That is why we referenced Kamiar Jamali's (DOE Project Manager for Code Manual for MACCS2) Use of Risk Measures in Design and Licensing Future Reactors (an attachment to our Petition and Request). Jamali made clear that "PRA" (probabilistic risk assessment) uncertainties are <u>so large and unknowable</u> that it is a huge mistake to use a single number coming from them for any decision regarding adequate protection. "Examples of these uncertainties include probabilistic quantification of single and common-cause hardware or software failures, occurrence of certain physical phenomena, human errors of omission and commission, magnitudes of source terms, radionuclide release and transport, atmospheric dispersion, biological effects of radiation, dose calculations, and many others." (Jamali, Page 935, Emphasis added)

Also, human error is not considered in PRAs. PRAs project into the future and come up with some very small number that an accident scenario only is likely to occur in so many hundreds-to-thousands of years. But no U.S. commercial reactor has operated for more than 42 years (Oyster Creek, 1969 to 2011), so actual experience is absent from which to base predictions. Uncertainty must be respected by making certain that appropriate and up-to-date methods and assumptions are used in the analysis. FENOC has not done so.

FENOC's argument misinterprets the GEIS. FENOC argues that "This challenge to NRC regulations is impermissible under 10 C.F.R. [Part] 2.335, as the NRC has determined "As a general matter...[in Part 51]...that 'the *probability weighted* consequences of atmospheric releases fallout onto open bodies of water, releases to ground water, and societal and economic impacts from severe accidents are small for all plants,' but that alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives." (FENOC,

Answer, Page 84, citing 10 C.F.R. Part 51, Subpart A, App. B, Table B-1, emphasis added by FENOC). FENOC surmises that "Any contention asserting that this supplemental site-specific mitigation analysis must ignore risk and focus only on accident consequences necessarily implies that the NRC's underlying codified impact analysis improperly considered risk." (FENOC, Answer, Page 84)

However, FENOC's conclusion is wrong. FENOC misinterprets what the GEIS says. The GEIS says not that accident consequences are small, but after going through the "probability weighted consequences," that <u>they then appear small</u>. Therefore, we conclude that the GEIS supports our dispute regarding FENOC's choice to multiply the "mean" by the "weighted probability" in the MACCS2 OUTPUT file.

Finally, FENOC argues that Joint Petitioners' claim that the use of probabilistic modeling is improper for considering intentional malevolent acts (such as terrorist attacks) because "the Commission concluded that NEPA 'imposes no legal duty on the NRC to consider intentional malevolent acts...in conjunction with commercial power reactor license renewal applications." (FENOC, Answer, Page 87, citing *Oyster Creek* and *Pilgrim*). And, further, that the GEIS concluded that "the core damage and radiological release from such acts would be no worse than the damage and release expected from internally initiated events." (FENOC, Answer, Page 87, citing *Oyster Creek*) However, that argument fails in that the consequences of an accident scenario must be analyzed, to determine the potential severity; nothing excludes severe "accidents" that happen to result from a terrorist attack, or other malevolent intentional act. Absent a site specific PRA at Davis-Besse to determine its specific vulnerabilities and potential accident consequences, the actual risk at Davis-Besse is unknown. FENOC's Arguments Against "Contention 4b: FirstEnergy's SAMA Analysis Minimizes the Potential Amount of Radioactive Release in a Severe Accident" (FENOC Answer, Page 92 to 98), Joint Petitioners' THE SAMA ANALYSIS FOR DAVIS-BESSE MINIMIZES THE POTENTIAL AMOUNT OF RADIOACTIVE RELEASE IN A SEVERE ACCIDENT (beginning on Petition and Request, December 27, 2010, Page 108)

In this contention, Joint Petitioners assert that FENOC's SAMA analysis for Davis-Besse minimizes the potential amount of radioactive release in a severe accident. FENOC's claims – that "This contention also is inadmissible because it raises issues beyond the scope of this proceeding, lacks adequate factual or legal support, and fails to raise a genuine dispute on a material issue of fact or law, in contravention of 10 C.F.R. [Part] 2.309(f)(1)(iii)-(iv) (FENOC Answer, Page 92) – is incorrect.

Irradiated Nuclear Fuel Pool Accidents

FENOC (Page 92) argues that no mitigation analysis is required for irradiated nuclear fuel pool accidents, an argument similar to its one above regarding terrorist attacks/malevolent acts. Joint Petitioners have clearly established the dispute.

We noted specifically that although 10 C.F.R. [Part] 51.53(c)(3)(ii)(L) does not provide a definition of severe accidents, the GEIS, which provides the factual background for the SAMA requirement in the regulations, <u>does</u> define a "severe accident." According to Section 5.2.1 of NUREG 1437 "General Characteristics of Accidents," the "term 'accident' refers to any unintentional event outside the normal plant operational envelope that results in a release or the potential for release of radioactive materials into the environment" and " 'severe'...[includes] those involving multiple failures of equipment or function and, therefore, whose likelihood is generally lower than design basis accidents but where consequences may be higher..."

(Emphasis added). This section recognizes the potential for a severe accident in which there are

"releases substantially in excess of permissible limits for normal operation."

The term "accident" refers to any unintentional event outside the normal plant operational envelope that results in a release or the potential for release of radioactive materials into the environment. Generally, the U.S. Nuclear Regulatory Commission (NRC) categorizes accidents as "design basis" (i.e., the plant is designed specifically to accommodate these) or "severe" (i.e., those involving multiple failures of equipment or function and, therefore, whose likelihood is generally lower than design-basis accidents but where consequences may be higher), for which plants are analyzed to determine their response. *The predominant focus in environmental assessments is on events that can lead to releases substantially in excess of permissible limits for normal operation. Normal release limits are specified in the NRC's regulations* (10 C.F.R. Part 20 and 10 C.F.R. Part 50, Appendix A). GEIS, 5.2.1, Italics added by Joint Petitioners.

Section 5 focuses on potential consequences to determine whether or not a potential

accident is severe – and thus within the scope of a Severe Accident Mitigation Analysis. The question is not whether the source of the Severe Accident is the first or second largest inventory of radioactive materials. Perhaps FENOC confused Section 6 of the GEIS with Section 5. Section 6 deals with *normal operations* (see, for example, Section 6.1, "Accidental releases...could conceivably result in releases that would cause moderate or large radiological impacts. Such conditions are beyond the scope of regulations controlling normal operations..."

(Emphasis added)

Section 5, <u>not</u> Section 6, deals with severe accidents. Nothing in Section 5 excludes severe accidents involving what is, at Davis-Besse, the largest inventory of radioactive materials – the irradiated nuclear fuel storage pool. Due to 40 years of operations by 2017, the "inventory of radioactive materials" in Davis-Besse's irradiated nuclear fuel storage pool will be many times that contained in its reactor core. FENOC dismisses the fact that interactions between the irradiated nuclear fuel storage pool and the reactor need to be studied in the context of severe accidents. Its argument is foolish on its face. FENOC says, at Answer Page 93, that "Petitioners' reference to a study prepared by Dr. Gordon Thompson ["Risks of Pool Sabotage of Spent Fuel at Pilgrim Nuclear Power Station and Vermont Yankee, A Report for the Massachusetts Attorney General," by IRSS, at 12, 16, May 2006, available at ADAMS Accession No. ML061630088] and the Shearon Harris license amendment proceeding lend no support to their contention that FirstEnergy must examine interactions between the reactor and the spent fuel pool in its SAMA analysis." First, it is not the Joint Petitioners' responsibility to demonstrate proof at this state of the proceeding; and second, the interactions between the reactor and the pool apply at Davis-Besse – one does not need to have a nuclear engineering degree to figure that out. FENOC has raised the issue of a "single, discrete electric generation source" time and time again in its Answer to challenge Joint Petitioners' contentions that renewable sources of electricity such as solar PV and wind power especially in combination together, and interconnected, as well as connected to storage devices (Joint Petitioners' Contentions One, Two, and Three). However, if Davis-Besse nuclear power plant itself is to be considered "a

single, discrete electric generation source," must not the irradiated nuclear fuel storage pool be included in that definition? The reactor could not operate without somewhere to discharge its thermally hot and radioactively lethal irradiated nuclear fuel every 18 to 24 months, so that it can thermally cool and radioactively decay for at least five years. Thus, interactions between the reactor and the pool must be addressed, including in FENOC's SAMA analysis.

FENOC also states "Petitioners also argue, without any factual or expert support, that 'the offsite cost risk of a pool fire is substantially higher than the offsite cost of a release from a core damage accident." FENOC must be familiar with such studies as Robert Alvarez, Jan Beyea, Klaus Janberg, Jungmin Kang, Ed Lyman, Allison Macfarlane, Gordon Thompson, Frank N. von Hippel, "Reducing the Hazards from

Stored Spent Power-Reactor Fuel in the United States," Science and Global Security, 11:1-51, [January] 2003; Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants (NRC, NUREG-1738, 2001); and many others. To put this dispute in some context, around 200 tons of nuclear fuel in the Chernobyl Unit 4 core exploded on April 26, 1986, and then – along with its graphite moderator – burned for ten days. But there were already 557 tons of irradiated nuclear fuel stored at Davis-Besse by spring 2010, according to the U.S. Department of Energy's February 2002 Final Environmental Impact Statement for the Yucca Mountain, Nevada dumpsite. DOE's FEIS went on to project that if Davis-Besse operates for a total of 50 years (that is, till 2027), it will generate over 900 tons of irradiated nuclear fuel. But of course, FENOC has applied to NRC for permission to operate not 50 years, but 60. Given that Davis-Besse generates from 20 to 30 metric tons of irradiated nuclear fuel every year it operates, another decade of operations would add yet another 200 to 300 metric tons of irradiated nuclear fuel stored on-site. Altogether, well over 1,000 tons of irradiated nuclear fuel could accumulate at the Davis-Besse site over the course of 60 years of operations. Despite the presence of a growing number of dry storage casks (which have their own problems), Davis-Besse's pool remains filled to capacity (well beyond the original design capacity, due to multiple re-rackings) with many hundreds of tons of irradiated nuclear fuel. Given that irradiated nuclear fuel discharged from Davis-Besse's core every 18 to 24 months during refueling outages must be stored in the pool for a minimum of five years, accident and attack risks involving Davis-Besse's pool will continue to be a significant safety and security issue for as long as Davis-Besse

operates, and in fact longer – until the pool is emptied of its ultra-hazardous contents (at which time the risks will shift over to problematic dry casks, risky transport by road, rail, or waterway, etc.) The Chernobyl nuclear catastrophe that began nearly 25 years ago, but will continue to unfold for centuries and millennia due to the radioactive contamination of vast regions, has shown how much damage 200 tons of nuclear fuel exploding and burning for ten days can do. Thus, an even greater quantity of irradiated nuclear fuel stored in Davis-Besse's pool cannot be dismissed as having zero risk whatsoever, or even as having less risk than Davis-Besse's operating reactor core, containing as it does less nuclear fuel than the pool (albeit significantly higher in many "shorter-lived" hazardous radioisotopes that have yet to radioactively decay).

MAAP Code

FENOC incorrectly found inadmissible Petitioners' dispute regarding its use of the MAAP code to generate source terms. FENOC improperly and incorrectly alleges that "Petitioners have provided no facts or expert opinion to establish that FirstEnergy has used the MAAP code improperly, or that the use of alternative source terms would have resulted in the identification of additional potentially cost-beneficial SAMAs for Davis-Besse." (FENOC Answer, Page 97)

Joint Petitioners are not required to prove our case at this juncture – this is not summary disposition.

Joint Petitioners referenced multiple sources in their contention. Examples included NRC, Brookhaven National Laboratory, and J. Schaperow.

FENOC's objection that "Petitioners' failure to meet their burden in this regard is particularly glaring given the widespread use and acceptance of MAAP code in the nuclear industry." (FENOC Answer, Page 98) But two wrongs don't make a right. "Strength in numbers" is not a valid defense of a flawed code. Groupthink, a word coined in the early 1950s, was modeled after Orwell's "doublethink" from his novel 1984. Groupthink is defined by the World English Dictionary as meaning "a tendency within organizations or society to promote or establish the view of the predominant group." Just because MAAP is broadly used does not necessarily mean that it is free from the flaws we allege. In fact, closed-mindedness is not a healthy attitude to criticism, especially in realms as significant to public safety as the nuclear power industry.

NRC staff's Answer (at Page 80) agrees with Joint Petitioners' position that the MAAP code has not been formally reviewed and approved by NRC. NRC staff says:

The Staff recognizes that Joint Petitioners have provided some support for the argument that MAAP may lead to lower consequences when compared to source terms generated by NRC Staff. *Id.* at 114. Specifically, the studies Joint Petitioners reference indicate that MAAP may lead to lower consequences when compared to the source terms in NUREG-1465. *Id.* Joint Petitioners also note that "[i]t has been previously observed that MAAP generates lower release fractions than those derived and used by NRC in studies such as NUREG-1150," *id.* At 113, which uses "the Source Term Code Package [NRC's state-of the art methodology for source term analysis at the time of NUREG-1150] and MELCOR." *Id.* at 113 (quoting a Brookhaven National Laboratory study that independently analyzed the costs and benefits of one SAMA in the Catawba and McGuire license renewal proceeding).

NRC staff also expresses agreement that "Joint Petitioners are correct that the MAAP

code has not been formally reviewed and approved by the NRC," (Answer, Page 80) thus, that its

use is not required.

FENOC's Arguments Against "Contention 4c: The MACCS2 Code Used in FirstEnergy's SAMA Analysis Is "Outdated and Inaccurate" (FENOC's Answer, Pages 98 to 105), Joint Petitioners' contention designated "THE SAMA ANALYSIS FOR DAVIS-BESSE USES AN OUTDATED AND INACCURATE PROXY TO PERFORM ITS SAMA ANALYSIS, THE MACCS2 COMPUTER PROGRAM" (Joint Petitioners' Petition and Request, December 27, 2010, beginning at Page 115) Petitioners assert that the SAMA analysis FENOC uses for Davis-Besse utilizes an outdated and inaccurate proxy, the MACCS2 computer program.

FENOC incorrectly argues that this contention is inadmissible because it "lacks an adequate factual basis," and that "Petitioners fall short of establishing the materiality of their claims or a genuine dispute with FirstEnergy on a material issue of law or fact." (Answer, Page 98) It is clear that FENOC, like NRC staff, forgets that this is the preliminary pleading stage of these proceedings and that we are neither in the summary disposition nor hearing stage, as explained above.

For example, one material dispute of law or fact that we clearly establish is that "The cost formula and assumptions contained in the MACCS2 underestimates the costs likely to be incurred as a result of a severe accident, explained in greater detail further below." (Petition and Request, Page 116) And, most certainly, we fulfilled our pledge to provide greater detail in the Petition further below.

For example, in the following section of our Petition and Request, we dispute the straight-line Gaussian plume model that is embedded in the ATMOS module of the code. This model calculates air and ground concentrations, plume size, and timing information for all plume segments as a function of downwind distance. FENOC acknowledges (Answer, Page 108) that the straight-line Gaussian plume is inextricably embedded in the MACCS2 model when it states: "the straight-line Gaussian ATMOS model cannot be replaced without replacing the MACCS2 code itself." In that particular section of our SAMA related contention, we dispute the assumptions regarding cleanup and health costs embedded in the code. In yet another section of our SAMA related contention, we dispute the ACCS2 output file.

Joint Petitioners devoted separate sections to these subparts because each subpart contributes to the whole or fundamental dispute that FENOC's Environmental Report is inadequate because it underestimates the true cost of a severe accident at Davis-Besse in violation of 10 C.F.R.51.53 (C)(3)(II)(L) and further, and more accurate, analysis by FENOC is called for.

It is telling that even FENOC admits that "...there is no specific legal requirement that an applicant use the MACCS2 code in its SAMA analysis..." (Answer, Page 99)

FENOC argues, opposing Joint Petitioners' assertion that the MACCS2 code is not quality assured and was developed for research purposes and *not* licensing purposes, that the contention "also lacks a sound factual basis." (Answer, Page 100) However, Joint Petitioners' key and relevant factual dispute was provided by an article written by David I. Chanin. Mr. Chanin wrote the FORTRAN for the MACCS and MACCS2 codes. He specifically wrote the referenced paper because, as described in an endnote:

The QA distinctions between an NQA-1 "licensing code" and a "research code" like MACCS2 have been emphasized in light of the fact that MACCS2 calculations are being used to support the Severe Accident Mitigation Alternatives (SAMA) analyses required for the license renewal of commercial nuclear power plants. It seems to me that the code's QA shortcomings and the lack of input justifications are again being ignored, just as they were prior to DNFSB TECH-25 and the veritable firestorm that soon followed. D.C.]

FENOC's criticism of Petitioners' statement that "there is no explanation of exactly how [MACCS2] works" – that the contention "is spurious and reflects Petitioners' failure to meet their pleading obligation," (Answer, Page 101) is incorrect. They argue that the *MACCS2 User's Guide* explains how it works and that Joint Petitioners must have known that because they reference the *User's Guide*. However, what Joint Petitioners know is what is and what is not in the *Guide* – information, and lack thereof, that FENOC apparently has missed.

FENOC's Arguments Against "Contention 4d: Use of the Gaussian Plume Model in the ATMOS Module of MACCS2" (Answer, Page 105 to 115), Joint Petitioners' Contention Designated "USE OF AN INAPPROPRIATE AIR DISPERSION MODEL, THE STRAIGHT-LINE GAUSSIAN PLUME, AND METEOROLOGICAL DATA INPUTS THAT DID NOT ACCURATELY PREDICT THE GEOGRAPHIC DISPERSION AND DEPOSITION OF RADIONUCLIDES AT DAVIS-BESSE'S GREAT LAKES SHORELINE LOCATION" (beginning on Page 116 of Petition and Request, December 27, 2010) In this Contention, Joint Petitioners challenge the use of an inappropriate air dispersion model, the straight-line Gaussian plume, and meteorological data inputs that did not accurately predict the geographic dispersion and deposition of hazardous radionuclides at Davis-Besse's Great Lakes shoreline location.

FENOC properly acknowledges that Joint Petitioners pled a number of disputes that include: the straight-line Gaussian plume model; sea breeze; plumes remaining concentrated over water resulting in "hot spots;" terrain effects; input data restricted to one year; and input data from one source, the onsite meteorological tower. FENOC does not take issue with Joint Petitioners' dispute that the meteorological input data came solely from the onsite meteorological tower. Therefore, we can conclude that they agree with Joint Petitioners that disputes on these various issues exist.

FENOC, like NRC staff, forgets that requirements for a Petition to Intervene and Request for a Hearing are very different from those at summary disposition or a hearing. It is clear that these issues have been pled and that FENOC has been properly forewarned of what to expect at hearing. Examples abound.

FENOC incorrectly states, at Answer Page 106, that "Petitioners scattershot references to the technical literature—wholly unsubstantiated by any expert opinion—do not constitute adequate factual support for the contention." Not true. Joint Petitioners provided more than adequate support for a pleading, including a plethora of citations to government studies, site specific studies, and more general but applicable research published in prestigious journal articles.

FENOC argues that "Petitioners again provide no factual or expert support for their assertion as to why data collected at the Davis-Besse site meteorological tower would not reflect any 'sea breeze' present in the site vicinity." (Answer, Page 114) FENOC likewise argues that "Petitioners' argument that the MACCS2 code is inappropriate because it fails to account for the behavior of plumes over water similarly falters for lack of adequate support." (Answer, Page 110) In addition, FENOC argues (Answer, Page 111) that our dispute that the straight line model

is inappropriate and cannot account for changes in terrain simply referred to an EPA Guidance that "does not address radiological modeling for a severe reactor accident," but "Instead, it addresses modeling of air pollution dispersion under the Clean Air Act." Are we to believe that gaseous and particulate radionuclides are not hazardous air pollutants? A common thread to FENOC's various arguments above is that they <u>forget the central issue at this stage of the proceeding – what is and what is not required at the pleading stage.</u>

FENOC in its arguments makes repeated reference to commentary and decisions in prior proceedings, especially to the on-going SAMA adjudicatory contentions in the license extension proceeding at Pilgrim Nuclear Power Station in Massachusetts (Answer, Pages 107-112, and 115). However these references are irrelevant. Those decisions were dependent on exactly what the intervenor(s) <u>there</u> did or did not plead or prove, and have nothing to do with whether a contention should be admitted <u>here</u>.

For example, at its Answer Page 112, FENOC cites the Commission as noting "the relevant inquiry 'is not whether there are 'plainly better' atmospheric dispersion models,' but rather, whether the 'SAMA analysis resulted in erroneous conclusions on the SAMAs found cost-beneficial to implement..." (*Pilgrim*, CLI-10-11, slip op. at 37) But the above reference refers to the Commission's Remand of the SAMA contention back to the ASLB on March 26, 2010. That Petitioner's (Pilgrim Watch's) Motion to Intervene was filed in May 2006, and was admitted by the ASLB in October 2006. It should have been clear to FENOC that pleading requirements are far less than at the <u>remanded hearing stage</u>.

Next, regarding FENOC's allegation that "the document that Petitioners' (sic) cite to support their 'terrain effects' claim actually shows that the straight-line modeling limitation serves to *increase* conservatism," (FENOC Answer, Page 113, Emphasis in original) we find it telling that FENOC, in its repeated citations from the *Pilgrim* license extension proceeding, chose only to very selectively quote from intervenor Pilgrim Watch's SAMA filings; but avoided, for example, Pilgrim Watch's Brief in Response to CLI-09-11, at 11, that responded to the Commission's request for briefing on whether the straight-line Gaussian plume model was conservative. It is unnecessary to respond here. Suffice it to say, we will provide evidence at the

required stage here and, like at *Pilgrim*, present factual evidence that indeed the straight-line Gaussian plume is NOT conservative.

The core issue in Joint Petitioners' contention is the FENOC did not choose a reasonable methodology, and there are models that are appropriate, up-to-date, reliable, and suitable to Davis-Besse's site that would be reasonable – examples were provided.

At (5) on Page 113 of its Answer under "Meteorological Monitoring Data," FENOC refutes our dispute that one year of meteorological data from a single collection point is insufficient. FENOC argues "Petitioners again provide no factual or expert support for their assertion as to why data collected at the Davis-Besse site meteorological tower would not reflect any 'sea breeze' present at the site vicinity." (Answer, Page 114) Petitioners are not required to defend or prove our case here. However we will provide a short response for the benefit of the ASLB - an appetizer. Seasonal wind distributions can vary greatly from one year to the next. The simple fact is that measurements from a single anemometer will not provide sufficient information to project how an accidental release of a hazardous material would travel. For example, a "sea breeze" (or "lake breeze" given Davis-Besse's Lake Erie shoreline location) effect will not be identified by a single onsite meteorological tower in cases when the sea breeze is just developing and for cases when the onshore component winds do not reach entirely from the ground to the anemometer height; instead, the anemometer would likely indicate an offshore wind indication. Further, in MACCS2 Guidance Report June 2004 Final Report page 3-8:3.2 Phenomenological Regimes of Applicability, it says that basing wind direction on the single onsite meteorological tower data ignores "shifting wind patterns away from the site including temporary stagnations, re-circulations, and wind flow reversals that produce a different plume trajectory."

FENOC's Arguments Against "Contention 4e: Assessment of the Economic Consequences of a Severe Accident, Including Decontamination, Cleanup, and Health Costs" (Answer, Pages 115 to 130), Joint Petitioners' contention designated USE OF INPUTS THAT MINIMIZED AND INACCURATELY REFLECTED THE ECONOMIC CONSEQUENCES OF A SEVERE ACCIDENT, INCLUDING DECONTAMINATION COSTS, CLEANUP COSTS AND HEALTH COSTS, AND THAT EITHER MINIMIZED OR IGNORED A HOST OF OTHER COSTS (beginning on Page 135 of the Petition and Request, December 27, 2010)

In this contention, Joint Petitioners challenge the use of inputs that minimized and inaccurately reflected the economic consequences of a severe accident, including decontamination costs, cleanup costs and health costs, and that either minimized or ignored a host of other costs.

FENOC, like NRC staff, mistakenly believes that we are at the Summary Disposition stage of this process. Not so. Please refer again to the initial discussion of what is required, above.

FENOC argues that "Contention 4e" is inadmissible. They could not be more mistaken.

Decontamination and Cleanup Costs:

It is apparent that FENOC does not want to touch this issue any more than NRC, EPA or DHS want to take responsibility for cleanup, or industry to admit/advertise that Price-Anderson does not cover cleanup costs, only damages. It is the big "Elephant in the Room." These revelations came to public light for the first time thanks to reporter Doug Guarino at *Inside EPA*, who uncovered the truth in November 2010 via the Freedom of Information Act.

However FENOC's arguments are ludicrous and disjointed on their face. Again we were not required to prove our case at this contention stage, or to provide an exhaustive list of possible bases, but simply to provide sufficient alleged factual or legal bases to support the contention and do so at the outset. We did – ample references, for example, were provided to government documents and the FENOC license extension application's ER SAMA section.

Inexplicably, FENOC believes that we are at summary disposition and says (at 91) that, "Petitioners' arguments lack sufficient specificity, lack adequate factual or legal support, and do not establish a genuine material dispute." (Answer, Page 116) It is clear that FENOC either does not want to understand the issue or that they understand it only too well and base their argument upon misrepresentations of Joint Petitioner's motion. For example:

FENOC spends considerable time muddying the waters about the differences between plutonium dispersal from weapons versus reactor accident. FENOC states at Page 117:

The Site Restoration Study indicates only that certain decontamination data may not be applicable to a *plutonium dispersal* accident. For example, it states that "[a]Imost all of the prior work in the U.S. and abroad on methods and effectiveness of radiological decontamination has been focused on fission products, and on time frames and conditions that have *limited applicability to decontamination after a plutonium-dispersal accident*." That document makes no such assertion with respect to a reactor accident. (Emphasis by FENOC)

It is clear that we did not ask for FENOC to base its analyses on plutonium dispersal in a nuclear weapons accident; instead, we made plain that a large problem with the MACCS2's code was that it, like its predecessor WASH-1400, assumes that the same methodology used to clean-up weapons events will be used after a severe nuclear reactor accident. The methods in MACCS2 (fire hosing and plowing under fields) are modeled assuming that they will be used to clean-up nuclear reactor accidents. Joint Petitioners explained why this is not acceptable for Davis Besse's site. Radionuclides from reactor accidents differ from those released by a nuclear bomb explosion; therefore, they could not be cleaned up in the same manner, as quickly, or cheaply. Further, because plowing under fields and fire hosing does not cleanup the radionuclides, but simply moves them into the groundwater or deeper into the soil to once again reappear (as in food crops and drinking water) and contaminate the area and its living beings, this method will not be acceptable to local officials and the public.

FENOC has a most interesting definition of "conservatism." They claim, at Page 118, that moving contamination from one place to another in the same geographical, contaminated area adds conservatism to the MACCS2 code and justifies its use, disputing Petitioner's.

FENOC misinterprets Petitioner's reference to SAND-96-0957 (beginning at Answer, Page 116). They imply that we were advocating basing cleanup on a plutonium event. To the contrary, Joint Petitioners properly referenced the DOE document simply to point out that there were alternative <u>models for cleanup</u> and that DOE had moved far beyond NRC to improve methodology.

FENOC (Answer, Pages 123-125) misconstrues decontamination issues. They avoid the point by failing to say what they put into the MACCS2 code. Did FENOC take the *Users Guide's* suggestion; and did FENOC use the sample problem data? These are questions to answer as we go forward in this proceeding.

FENOC apparently chooses to misunderstand Joint Petitioners' references to Luna and Reichmuth's referenced RDD studies for the US Department of Homeland Security. They were provided in the Petition and Request as a yardstick to indicate that if cleanup were properly assessed by FENOC in their SAMA, as required, that costs would be considerably higher, adding additional SAMAs as cost-beneficial. The studies provided likely costs per kilometer in urban to rural areas. Joint Petitioners thus logically concluded that "a severe accident at Davis-Besse is likely to result in huge costs; costs

not accounted for by FENOC, because of the type and magnitude of radionuclides released in comparison with a RDD type device." (Petition and Request, Page 140, December 27, 2010)

Health Costs:

Joint Petitioners dispute health costs used in the analysis – they were underestimated. The population dose conversion factor of \$2,000/person-rem used by FENOC to estimate the cost of the health effects generated by radiation exposure is based on a deeply flawed analysis and seriously underestimates the cost of the health consequences of severe accidents. Joint Petitioners supported its dispute with reference to government documents, the National

Academies of Sciences, and independent research reported in respected technical journals. We fully satisfied requirements at this pleading stage.

Petitioners argue that FENOC's "evacuation time input data into the code were unrealistically low and unsubstantiated; and that if correct evacuation times and assumptions had been used, the analysis would show far fewer numbers in the affected population will evacuate in a timely manner, increasing health-related costs." Petition and Request at Page 147. FENOC's claim that our dispute is inadmissible does not stand up.

FENOC refers to a sensitivity study on Page 124 of its Answer. However, their sensitivity studies, actually referred to throughout their Answer in addition to this Contention 4e relevant instance, simply entered different inputs into the same flawed model. To paraphrase Einstein, repeating the same mistake many times does not give a reliable answer. We supported our dispute as required at this stage and thereby satisfied our pleading. We are not required to prove our case at this time. Joint Petitioners note that <u>once more FENOC</u> referenced Pilgrim findings at Answer, Page 125. We remind the ASLB that a prior decision, that an Intervenor did not prove a contention at <u>another reactor</u> in another license extension adjudication process, has nothing to do with whether a contention should be admitted <u>here.</u>

FENOC dismisses the relevance of the CRAC-2 study cited by Joint Petitioners, stating (at Answer, Page 128): "Petitioners also do not explain the relevance of this almost 30-year old study—which used 1970 census data and the CRAC2 computer code..." It is certainly not Joint Petitioners' fault that NRC has not published an update to CRAC-2 since 1982. Significantly, NRC attempted to keep the information in CRAC-2 from the public – it took Congressman Ed Markey of Massachusetts to force NRC to make the report public in the first place. We must also hasten to add that we have tremendous concerns that the update NRC is undertaking, State of the Art Reactor Consequence Calculations, so-called, raises serious concerns, yet again, that flawed modeling will lead to serious underestimates of radiological risks to the public. Joint Petitioners cited CRAC-2 to emphasize the very serious consequences that could result in Detroit/Windsor,

Toledo, or Cleveland – depending on which way the wind happened to be blowing when the catastrophic radiological release at Davis-Besse takes place – and hence the importance of preventing such a release in the first place, as through doing accurate SAMA analyses and taking the appropriate cost-beneficial actions in response, as FENOC is supposed to do.

Myriad Other Economic Costs

Joint Petitioners allege that FENOC failed to include a myriad of other economic costs including "the business value of property;" loss and/or damage to infrastructure; costs of job training, unemployment costs, and litigation; and underestimated the value of farm land, for example, by not considering the value of the farm property for development purposes as opposed to agricultural, and farm land assessments are intentionally very low to encourage farming and open space. Contrary to FENOC, the issue is properly pled, and provides sufficient notice to them that this is a dispute to prepare for further down the road in this proceeding.

FENOC's Arguments Against "Contention 4f: Statistical Analysis of Data" (Answer Page 130 to 134), Joint Petitioners' contention designated as USE OF INAPPROPRIATE STATISTICAL ANALYSIS OF THE DATA, SPECIFICALLY THE APPLICANT CHOSE TO FOLLOW NRC PRACTICE, NOT NRC REGULATION, REGARDING SAMA ANALYSES BY USING MEAN CONSEQUENCE VALUES INSTEAD OF, FOR EXAMPLE, 95TH PERCERNTILE VALUES (beginning on Page 149 of Petition and Request, December 27, 2010).

In this contention, Joint Petitioners challenge the use of inappropriate statistical analysis of the data - specifically the Applicant chose to follow NRC practice, not NRC regulation, regarding SAMA analyses by using mean consequence values instead of, for example, 95th percentile values. Thereby this important dispute is raised at the outset.

As Joint Petitioners have previously explained, the MACCS2 code's OUTPUT file does the averaging and ranks the data into a cumulative distribution function (CDF, not to be confused with Core Damage Frequency) -50^{th} quartile, mean, 90^{th} quartile, 95^{th} quartile, etc. FENOC chose to take the mean value; and, there is <u>no NRC rule requiring the mean</u>. The mean is the wrong choice, for it underestimates consequences. A mean divides the sum by the number of entries. There are thousands of individual data entries so that dividing the sum by so many entries unreasonably dilutes the results. Further FENOC multiplied the mean by their estimate of the probability of the accident scenario. The point is that FENOC's choices – inputs and choice of averaging and probability – resulted in significantly underestimating costs.

In summary, Joint Petitioners satisfied pleading requirements for Contention 4 and we look forward to proving our case at the appropriate stages in the process ahead.

Final Miscellaneous Points

FENOC more than once raised the issue that Joint Petitioners had copied their Contention Four from work done by other intervenors in earlier license extension proceedings. But this was certainly no secret – Joint Petitioners announced this at the very beginning of Contention Four, thanking New England Coalition and Friends of the Coast for their groundbreaking work at the Seabrook proceeding. Joint Petitioners were remiss in not thanking Pilgrim Watch and Riverkeeper for their even earlier groundbreaking work at *Pilgrim* and *Indian Point*, for it too was cited by Joint Petitioners.

At Page 82, FENOC charges that Joint Petitioners "may not fully understand" their own contention, portraying it thus as "frivolous." What FENOC needs to "fully understand" is that Joint Petitioners, and area residents they represent, will not silently accept the serious radiological risks that the aging and deteriorating Davis-Besse atomic reactor inflicts on the region. Hence our Petition and Request.

At Page 85, Footnote 357, FENOC obfuscates the meanings of "risk" and "consequence." If a severe accident in fact does happen, that is, probability of risk equals 100%, then the consequences of course will not be "small." The definition of risk is probability multiplied by consequence. 100% probability times consequence equals risk.

At Page 87, FENOC cites NRC's GEIS conclusion that "the core damage and radiological release from such [intentional] acts would be no worse than the damage and release expected from internally initiated [accidental] events." FENOC adds that the U.S. Court of Appeals for the Third Circuit affirmed this conclusion. But Joint Petitioners must agree with Dr.

Ed Lyman of UCS, whose report "Chernobyl on the Hudson?" we cited. Intentional acts of terrorism targeted at a nuclear power plant would be designed to maximize radiological releases. Equating this with accidents seems to us a fallacious assumption.

At Page 90, FENOC argues that New York City's dense population raises different risk considerations at Indian Point than the population density surrounding Davis-Besse. However, Joint Petitioners insist that the dense populations represented by Detroit/Windsor, Toledo, Cleveland, etc. require that the utmost precautions be taken to prevent radiological releases at Davis-Besse, whether due to accidents or attacks, as by accurate SAMA analyses and appropriate cost-beneficial actions in response.

FENOC accuses Joint Petitioners of copying, "nearly verbatim," from intervenor Riverkeeper in the Indian Point proceeding. Joint Petitioners freely admitted, as already mentioned, at the very beginning of their Contention Four, that New England Coalition and Friends of the Coast's Petition at Seabrook formed the model for its SAMA contention at Davis-Besse.

At Page 98, FENOC states "Petitioners' failure to meet their burden in this regard is particularly glaring given the widespread use and acceptance of the MAAP code in the nuclear industry." Joint Petitioners must point out that "widespread use and acceptance" does not necessarily mean it is correct, conservative, or protective of safety and environment. Joint Petitioners have mentioned the risks of "groupthink" above. The "widespread use and acceptance" of flammable "fire barriers" across the nuclear power industry does not make that practice right or acceptable or safe. Likewise, the deployment of irradiated nuclear fuel dry casks across the industry that violate basic quality assurance principles does not make that practice right, safe, or acceptable. Also, "widespread use and acceptance" of the illusion that Yucca Mountain would "solve" the 54 year old problem of what to do with forever deadly commercial irradiated nuclear fuel did not make it so, as the project's recent cancellation has revealed. These are but three of countless examples from the nuclear power industry that could be mentioned, including flaws with the MAAP code, as Joint Petitioners have here contended.

This same reasoning applies to FENOC's citation, on Page 107, of a recent Commission ruling that "the straight-line Gaussian plume model used in the ATMOS module of MACCS2 has been an accepted analytical approach for plume dispersion analyses in the nuclear industry for several decades." Again, long-time, widespread acceptance does not necessarily make something right. Hence Joint Petitioners' contention. By the way, FENOC's reference to "the Commission recently confirmed that MACCS2—not AERMOD or CALPUFF—is 'the most current, established code for NRC SAMA analysis'" is troubling to Petitioners. A several-decade-old, flawed code being "the most current, established code for NRC SAMA analysis" is troubling.

Similarly, FENOC's dismissal of Joint Petitioners' concerns about lack of quality assurance on the MAACS2 code is reflective of a dangerous attitude apparent across the nuclear establishment regarding the safety significance of QA. QA problems, as mentioned just above, have been identified with dry cask storage, as by industry whistleblower Oscar Shirani, and NRC inspector Ross Landsman. But they have also been identified repeatedly at DOE's Yucca Mountain Project, by the GAO. Beyond Nuclear, Citizens Environment Alliance of Southwestern Ontario, and Don't Waste Michigan – Petitioners in this proceeding – have contended serious QA problems with the Fermi 3 new reactor proposal 30 miles northwest of Davis-Besse at Detroit Edison's Fermi nuclear power plant site, an issue that will now be heard by the ASLB. FENOC's dismissal of QA's significance – as by its implication at Page 100 that NRC can do a lesser job of QA than DOE (that a SAMA analysis is to be held to a lesser standard than a DOE Documented Safety Analysis) – is reflective of a troubling trend apparent across the nuclear power industry and its regulatory agency. The fact that FENOC identified not one single SAMA that proved cost-beneficial seems to echo this trend.

FENOC's assertion at Page 101 that "A SAMA analysis is not safety-related" perplexes and troubles Joint Petitioners. It seems to indicate a perilous disregard by FENOC of the safety significance of SAMA analyses, and may explain why and how FENOC found not a single SAMA to be cost-effective. Of course the public bears the ultimate risk of such decisions by FENOC, while FENOC saves money at the expense of public risk.

Beginning on Page 108, FENOC's dismissal of experts cited by Joint Petitioners regarding the Great Lakes sea breeze effect is unacceptable. Joint Petitioners re-affirm that the NOAA NWS and Dr. Heidorn should be recognized as the experts that they are on this significant Great Lakes meteorological dynamic. It should also be emphasized that, whereas New England Coalition and Friends of the Coast at Seabrook, as well as Pilgrim Watch at Pilgrim, identified the significance of sea breeze effect for the dense population of metro Boston, in this proceeding, Joint Petitioners point to the significance of Great Lakes sea breeze dynamics for the dense populations in metro area such as Detroit/Windsor, Toledo, and Cleveland.

At Page 112, FENOC complains that Joint Petitioners did "not include as an exhibit or provide with a reference link" DOE's *MACCS2 Guidance*. But NRC and DOE were at one time the same agency (AEC), and are still closely affiliated, so we assumed that NRC had instant access to this document, and thus so does FENOC, which must work with its regulator NRC on an ongoing basis to fulfill NRC regulations.

Regarding Footnote 512 on Page 117 of FENOC's Answer, about 1% of irradiated nuclear fuel is comprised of plutonium that has built up during the course of the nuclear chain reaction in Davis-Besse's reactor core. Likewise, even reactor fuel in the core undergoing fissioning will contain some quantity of plutonium, which builds up over time to that 1% level. Any plutonium is significant because its various istopes are ultra-hazardous. As Joint Petitioners have mentioned earlier, Davis-Besse had 557 metric tons of irradiated nuclear fuel stored on-site, in both the pool and dry casks, as of spring 2010. If Davis-Besse operates for a total of 50 years, that amount will grow to over 900 metric tons. And if operated a decade beyond that, as FENOC has applied to NRC for permission to do, the amount of irradiated fuel at Davis-Besse could grow to more than 1,000 metric tons. 1% of 1,000 metric tons is 10 metric tons of plutonium, or 10,000 kilograms of plutonium. Typical nuclear weapons contain "only" several kilograms of plutonium, at most. Thus, the amount of plutonium at Davis-Besse would represent thousands of nuclear weapons' worth. It would be available for release to the environment in the event of a severe accident. This establishes clearly the significance of a potential plutonium release from Davis-Besse in the event of a severe accident. However, it must be kept in mind that plutonium isotopes represent just a handful of the hundreds of hazardous radioactive isotopes that would be released by Davis-Besse in the event of a severe accident, isotopes that are not even present in undetonated nuclear weapons.

FENOC at Page 120 of its Answer cites a Commission statement claiming that "acknowledged difficulties of the Chernobyl clean-up may largely have been due to poor training, lack of equipment, and a nearly complete break-down in leadership." Petitioners would point to the U.S. experience in the aftermath of Hurricane Katrina as an example of how such difficulties could be experienced right here at home in the aftermath of a nuclear power plant disaster as well. *Inside EPA's* November 2010 revelations about ongoing disputes between NRC, EPA, and FEMA over which agency would lead a post accident clean up, and where funding would come from to do the clean up, show that authority in this country is indeterminate. And if FENOC and NRC assume that the U.S. military could be called upon to take part in dealing with a severe nuclear accident at Davis-Besse and its aftermath, it should be kept in mind that, as with the USSR in 1986, the U.S. military is stretched thin due to its current war in Afghanistan, not to mention its additional current war in Iraq.

At Page 122-123 of its Answer, FENOC charges that "Petitioners here do not furnish *any* alleged facts, documentary support, or expert opinion – i.e., anything beyond pure assertion – for their "loss of economic activity" argument." Petitioners are surprised by FENOC's ignorance of economic activity in northwest Ohio where Davis-Besse is based. This includes not only the recreation and tourism associated with the Lake Erie Islands, the abundant fisheries to be found in Lake Erie, but also the industrial base represented by the combined Detroit/Windsor, Toledo, and Cleveland metro areas, including, as mentioned elsewhere in this filing, the largest factory for solar PV panel production in the world, FirstSolar in Perrysburg, Ohio. In fact, the Great Lakes region, of which northwest Ohio is a part, is one of the biggest regional economies on the planet. The "loss of economic activity" at risk if Davis-Besse suffers a severe accident is self-evident.

In response to FENOC's repeated complaints that Joint Petitioners merely copied, or cut and paste, their Contention Four from other intervenors in other proceedings, we must respond that those living in glass houses should not throw stones. The NRC OIG in 2007 reported that, in the context of reactor license extensions, NRC staff had copied, at times nearly verbatim, from nuclear utility ERs, in preparation of NRC environmental documents presented as independent analyses. Later, NRC OIG also documented that NRC staff had destroyed working documents that led up to, and supposedly justified, their decisions to grant license extensions. Nuclear utilities receiving license extensions after such NRC staff "cut and paste" performances benefitted, of course, by receiving the license extensions despite less than independent NRC staff safety and environmental analyses. It should be kept in mind that NRC is a federal agency, with a billion dollar plus annual budget, and over 4,000 staff at its disposal. Joint Petitioners, on the other hand, are small non-profit organizations, whose total *annual* budgets, if added together, represent much less than what FENOC makes in a single day, in net profit, at Davis-Besse. Therefore, yes, groups like ours do work with similar groups across the country to pool resources and not "recreate the wheel" unnecessarily, such as we did on our SAMA contention.

We are also surprised at FENOC's complaint at Page 128 of its Answer, in regards to Joint Petitioners' citation of CRAC-2, that "This document is not attached to the Petition as an Exhibit, and counsel has been unable to locate a document with this title, author, and date that is readily available in the public domain. Nor do Petitioners identify the relevant pages of this document. Petitioners' failure in this regard deprives the Board and other participants of the ability to readily evaluate the accuracy (or inaccuracy) of Petitioners' characterization of the referenced document." CRAC-2 is a well known report within the nuclear power establishment. It is an NRC document. Its findings are clearly identifiable within the report.

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February 23, 2011

UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION Office of the Secretary

| In the Matter of: |) | Docket No. 50-346 |
|--|---|-------------------|
| FirstEnergy Nuclear Operating Company |) | |
| Davis-Besse Nuclear Power Station, Unit 1 |) | |
| (Regarding the Renewal of Facility Operating License NPF-003 for a 20-Year Period) |) | |
| |) | |
| |) | |

CERTIFICATION OF SERVICE

I hereby certify that a copy of the foregoing "JOINT INTERVENORS' COMBINED

REPLY IN SUPPORT OF PETITION FOR LEAVE TO INTERVENE (CORRECTED

VERSION)" was sent by me to the following persons via electronic deposit filing with the

Commission's EIE system this 23rd day of February, 2011:

Administrative Judge William J. Froehlich, Chair Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 E-mail: wjf1@nrc.gov

Administrative Judge Dr. William E. Kastenberg Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 E-mail: wek1@nrc.gov Office of the Secretary U.S. Nuclear Regulatory Commission Rulemakings and Adjudications Staff Washington, DC 20555-0001 E-mail: hearingdocket@nrc.gov

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Respectfully submitted,

<u>/s/ Kevin Kamps & submitted by Digital Certificate pro se on behalf of Petitioners</u>
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Genesky, Donielle

| From: | Kevin Kamps <kevin@beyondnuclear.org></kevin@beyondnuclear.org> | | |
|--------------|---|--|--|
| Sent: | Friday, January 23, 2015 8:31 PM | | |
| То: | Puco Docketing | | |
| Subject: | OPPOSITION COMMENT UNDER CASE # 14-1297-EL-SSO: Further Defense of Safe | | |
| - | Renewable Energy and Energy Storage Alternatives to Risky Davis-Besse 20-Year Licence | | |
| | Extension. | | |
| Attachments: | Reply appeal May 16 2011.pdf | | |

OPPOSITION COMMENT UNDER CASE # 14-1297-EL-SSO: Further Defense of Safe Renewable Energy and Energy Storage Alternatives to Risky Davis-Besse 20-Year Licence Extension.

Dear Public Utilities Commission of Ohio,

In further follow up to my two previous emailed submissions, I am now submitting for the record of this proceeding our further defense of contentions opposing the 20-year license extension sought by FirstEnergy Nuclear Operating Company (FENOC) at its age-degraded, problem-plagued Davis-Besse atomic reactor.

The attached JOINT INTERVENORS' BRIEF IN OPPOSITION TO FENOC'S NOTICE OF APPEAL AND BRIEF, dated May 16, 2011, was submitted in the U.S. Nuclear Regulatory Commission's licensing proceeding re: Davis-Besse License Renewal Application.

Contentions 1 to 3 involve renewable (wind and solar photovoltaic) power and energy storage alternatives to the 20-year license extension at Davis-Besse; Contention 4 involves Severe Accident Mitigation Alternatives (SAMA) analyses -- that is, the costs of severe accidents being underestimated by FENOC.

Our environmental coalition intervening against Davis-Besse's 20-year license extension includes: Beyond Nuclear; Citizen Environment Alliance of Southwestern Ontario; Don't Waste Michigan; and Green Party of Ohio.

Our legal counsel is Terry Lodge of Toledo, OH.

Our expert witness on renewables and energy storage alternatives is Dr. Al Compaan, professor emeritus and past chair of the Physics Dept. at University of Toledo.

Thank you.

Sincerely,

Kevin Kamps, Beyond Nuclear

Kevin Kamps Radioactive Waste Watchdog Beyond Nuclear 6930 Carroll Avenue, Suite 400 Takoma Park, Maryland 20912 Office: (301) 270-2209 ext. 1 Cell: (240) 462-3216 Fax: (301) 270-4000 <u>kevin@beyondnuclear.org</u> www.beyondnuclear.org

Beyond Nuclear aims to educate and activate the public about the connections between nuclear power and nuclear weapons and the need to abandon both to safeguard our future. Beyond Nuclear advocates for an energy future that is sustainable, benign and democratic.

May 16, 2011

UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION Before the Commission

| In the Matter of: |) | Docket No. 50-346 |
|--|---|-------------------|
| FirstEnergy Nuclear Operating Company |) | |
| Davis-Besse Nuclear Power Station, Unit 1 |) | |
| Regarding the Renewal of Facility Operating License NPE 003 for a 20 Year |) | |
| Period |) | |
| |) | |

JOINT INTERVENORS' BRIEF IN OPPOSITION TO FENOC'S NOTICE OF APPEAL AND BRIEF

I. INTRODUCTION

Beyond Nuclear, Citizens Environment Alliance of Southwestern Ontario, Don't Waste Michigan, and the Green Party of Ohio, intervenors (hereafter "Joint Intervenors" or "Intervenors") in this license renewal proceeding, hereby respond in opposition to FirstEnergy's "Notice of Appeal" and "Brief in Support" (hereinafter "App. Br.") from the ASLB's April 26, 2011 Memorandum and Order ("LBP-11-13"), whereby the Board admitted two contentions related to FirstEnergy's license renewal application ("LRA") for the Davis-Besse Nuclear Power Station, Unit 1 ("Davis-Besse"): (1) a reformulated and consolidated version of Contentions 1, 2, and 3 regarding renewable energy alternatives; and (2) a revised and narrowed version of Contention 4 regarding severe accident mitigation alternatives ("SAMAs").

The Intervenors support the ASLB rulings on the contentions and submit that the

Commission's review of the Davis-Besse renewal application will be improved through the hearing of the contentions admitted by the ASLB panel. Accordingly, the Commission should uphold LBP-11-13.

II. BACKGROUND

FirstEnergy refuted Intervenors' original Petition with (1) a shaky challenge over the Petition's incontestably timely filing (the Petition and some exhibits were EIE'd before the midnight filing deadline); (2) a pointless inquiry respecting whether the founding articles of Don't Waste Michigan were sufficiently expansile to authorize intervention against relicensing of Davis-Besse, which is visible to the naked eye from Monroe, Michigan across 25 miles of Lake Erie (they are); and (3) a jejeune Google-mapping divertissement wherein FirstEnergy and the NRC Staff alleged that two Canadian intervenor representatives lived 300 feet outside a 50-mile radius of the centerpoint of the reactor building at Davis-Besse (an argument which the ASLB supposed was "approximately 1000 feet past the point from which frivolous arguments are measured"). Now, FirstEnergy founders on the "clear error" and "abuse of discretion" requirements in its critique of the ASLB's reformulation and admission of two contentions. See, Progress Energy Florida, Inc. (Levy County Nuclear Power Plant, Units 1 and 2), CLI-10-02, CLI-10-2, 71 NRC (Jan. 7, 2010) (slip op. at 1); U.S. Department of Energy (High Level Waste Repository), CLI-09-14, 69 NRC (Jun 30, 2009) (slip op. at 4); Crow Butte Resources, Inc. (North Trend Expansion Area), CLI-09-12, 69 NRC ____ (Jun. 25, 2009) (slip op. at 8-9).

Having abandoned its initial meritless procedural arguments, FENOC now repairs to its

¹LBP-11-13 p. 13 fn. 79.

similarly indefensible arguments of substance. A focal thrust of FENOC's disquisition is that to have admissible contentions, Intervenors must articulate evidence sufficient to withstand summary disposition from the get-go (untrue), and that since some of the contentions' supportive evidence appeared in other licensing proceedings, Intervenors have wrought some faint insult on the license renewal process and so should be denied a forum in this particular proceeding. But the ASLB has rejected FENOC's vulpine maneuvers, transcended all supposititious indignity, and properly accorded Intervenors standing to pursue its reformulations of the original contentions.

III. LEGAL CONSIDERATIONS

A. Contention pleading and content

The NRC's duty to consider new and significant information before making licensing decisions is nondiscretionary. *Calvert Cliff's Coordinating Commission v. AEC*, 449 F.2d 1109, 1112 (D.C. Cir. 1971) (federal agencies are held to a "strict standard of compliance" with NEPA's requirements). See also *Silva v. Romney*, 473 F.2d 287, 292 (1st Cir. 1973).

At this preliminary stage, Intervenors do not have to submit admissible evidence to support their contention, but only to "provide a brief explanation of the basis for the contention," 10 CFR 2.309(f)(1)(ii), and "a concise statement of the alleged facts or expert opinions which support the petitioners' position." 10 CFR 2.309(f)(1)(v). The rule ensures that "full adjudicatory hearings are triggered only by those able to offer minimal factual and legal foundation support of their contentions." *Duke Energy Corp.* (Oconee Stations Units 1, 2 and 3), 49 NRC 328, 334 (1999) (emphasis added). The Commission has posited that "an intervener need not ... prove its case at the contention stage... The factual support necessary to show a genuine dispute need not be in affidavit or formal evidentiary form, or be of the quality necessary to withstand a summary disposition motion." *Matter of Georgia Institute of Technology*, 42 NRC 111 (1995). The requirement for showing of materiality is not intended to be overly burdensome; all that is needed is "a minimal showing that material facts are in dispute, indicating that a further inquiry is appropriate." *Id.*, citing *Gulf States Utilities Company*, (River Bend Station Unit 1), 40 NRC 43, 51(1994); Final Rule, "Rules of Practice for Domestic Licensing Proceedings-Procedural Changes in the Hearing Process," 54 <u>Fed. Reg</u>. 33,171 (Aug. 11, 1989). Though the Commission be "unwilling to throw open its hearing doors to petitioners who have done little in the way of research or analysis, provide no expert opinion, and rest merely on unsupported conclusions," *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2), CLI-02-17, 56 NRC 1, 8 (2002), where petitioners support a meritorious contention with diligent research, information, expert opinion and documents, the requirement for an adequate basis is more than satisfied.

B. Standard of review

The Commission must affirm Licensing Board rulings on the admissibility of contentions if the appellant "points to no error of law or abuse of discretion." *Dominion Nuclear Conn.,Inc.*, CLI-04-36, 60 NRC 631, 637, (2004), quoting *Private Fuel Storage, LLC*, (Independent Fuel Storage Installation), CLI-00-21, 52 NRC 261, 265 (2000). This standard is analogous to that utilized by courts of appeal reviewing trial court rulings on motions and is highly deferential. See *Engebretsen v.Fairchild Aircraft Corp.*, 21F. 3rd 721, 728 (6th Cir. 1994) ("We will find an abuse of discretion only when [we have] 'a definitive and firm conviction that the trial court committed a clear error of judgment," quoting *Logan v. Dayton Hudson Corp.*, 865 F. 2nd 789,

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790 (6th Cir. 1989)).

Thus, the standard of review of the Atomic Safety and Licensing Board is highly deferential; appellants must either show how the Licensing Board misinterpreted the law, or that the Licensing Board clearly abused its authority or committed a clear error of judgment.

Finally, the Commission's denial of review of a particular decision simply indicates that the appealing party "identified no 'clearly erroneous' factual finding or important legal error requiring Commission correction." *Hydro Res., Inc.*, LBP-06-1, 63 NRC 41, 59 n.15 (2006), *aff'd*, CLI-06-14, 63 NRC 510 (2006), (citing *Hydro Res., Inc.* (P.O. Box 15910, Rio Rancho, NM 87174), CLI-00-12, 52 NRC 1, 3 (2000) (quoting 10 C.F.R. § 2.786(b)(4), now §2.341(b)(4))).

IV. ISSUES AND ARGUMENT

It bears noting that the NRC Staff has *not* appealed LBP-11-13, despite having been assigned, as the federal actor for NEPA purposes, an enormous burden of compliance as a result of the ASLB's ruling. Perhaps this signals that the Staff will avoid the "losing proposition" of "blindly adopting the applicant's goals" and allow for the full consideration of alternatives required by NEPA. *Simmons v. Corps of Engineers*, 20 F.3d 664, 669 (7 Cir. 1997). NEPA requires the agency to "exercise a degree of skepticism in dealing with self-serving statements from a prime beneficiary of the project" and to look at the general goal of the project rather than only those alternatives by which a particular applicant can reach its own specific goals." *Id.*

A. <u>'Cloned' contentions</u>

FENOC complains that much of the content of the Joint Intervenors' contentions were copied from other license renewal proceedings. But the ASLB was not troubled with this. FENOC calls the contentions proposed by Intervenors "essentially clones of contentions submitted in other proceedings," arguing that those other proceedings involved expert testimony in support of the analogous contentions. App. Br. Pp. 4-5. Remarkably, FENOC's demeaning terminology utterly ignores the expert declaration of Dr. Alvin Compaan, Ph.D. in physics and longtime professor at the University of Toledo, who brought his wealth of scientific experience in creating and validating photovoltaic technology to bear in his declaration which specifically addresses the Davis-Besse region of interest, predicting the coming enormous deployment of photovoltaic and wind production of electricity in the Great Lakes region. Dr. Compaan's conclusions are discussed by the ASLB at LPB-11-13 p. 27.

Even if Intervenors have "cloned" their contentions, the FENOC jeremiad that "cutting and pasting" from another proceeding may result in the Intervenors not fully understanding a contention, and thus risking a frivolous filing, is a bit alarmist. Indeed, the ASLB has somewhat validated Intervenors by its rulings in LBP-11-13, proving that the Intervenors were right to draw upon their experience from studying other license renewal application proceedings, and applying that cross-experience directly to the Davis-Besse LRA proceeding. In those earlier license renewal proceedings, other reactors' (such as at Seabrook, Indian Point, and Pilgrim) license renewal applications contained identical, or very similar, flaws regarding various renewable energy alternatives, as well as SAMA analyses, as are contained in FENOC's LRA and ER in this Davis-Besse license extension application proceeding. Joint Intervenors made sure to apply those lessons learned from earlier proceedings directly to relevant sections of FENOC's inadequate LRA and ER. And so far, though it has the power to sanction frivolous behavior by the parties, the ASLB has apparently noted no displays of contumacy by the Joint Intervenors, whereas the

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Board has suggested that FirstEnergy came near to frivolous conduct in the manner of its opposition to the standing of Citizens Environment Awareness of Southwestern Ontario. LBP-11-13, p. 13, fn. 79.

The Joint Intervenors never made a secret that they borrowed ideas and arguments from other proceedings. They explicitly acknowledged, and thanked, environmental colleagues for their groundbreaking work in those proceedings in their Petition and supporting filings: New England Coalition on Nuclear Pollution and Friends of the Coast for the groundbreaking work performed in the Seabrook LRA proceeding on SAMA analyses; Pilgrim Watch for its groundbreaking SAMA analysis in the Pilgrim LRA proceeding. The intimation behind FENOC's use of the phrase "cutting and pasting" to describe Contention Nos. 1 and 4 is that Intervenors have plagiarized others' ideas. That is not a legitimate claim, given Intervenors' overt acknowledgments and gratitude to earlier intervenors. Indeed, Beyond Nuclear, an Intervenor here, restated in this case a wind power contention which it prepared and filed as an organizational intervenor in the Seabrook LRA proceeding. All contentions filed in the Davis-Besse LRA proceeding were specifically tailored to the instant proceeding, and refer to FENOC's own LRA and ER, as well as FirstEnergy's region of interest.

B. 'Cobbled together' factual bases

FirstEnergy also grouses that the Joint Intervenors "have cobbled together - and the Board has relied upon - an internet blog, draft reports, generic analyses, and 'concept' papers, among others, in an attempt to demonstrate that there are reasonable energy or severe accident mitigation alternatives that must be considered under NEPA." *Id.* p. 5. FENOC claims the ASLB's "acceptance" of such information comprises reversible error. *Id.*

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At bottom, the Commission does not require so extrusive a parade of proofs as First-Energy insists: "[A]n intervener need not ... prove its case at the contention stage... The factual support necessary to show a genuine dispute need not be in affidavit or formal evidentiary form, or be the quality necessary to withstand a summary disposition motion." 54 <u>Fed. Reg.</u> 33,168, 33,171. Intervenors' burden is simply "a minimal showing that material facts are in dispute, indicating that a further inquiry is appropriate." *Id.*, citing *Gulf States Utilities Company, supra*.

Intervenors met, and exceeded, the "minimal showing" requirement in their Petition.

C. The 'Alternatives' Contention: Quibbling over words

Focusing on Intervenors' three alternative energy contentions, which call for more serious NEPA treatment to be accorded commercial wind-generated electricity, photovoltaic electricity and a combination of the two, FENOC quibbles with the ASLB's reformulation wording,² as though the mere choice of language by the Board and FENOC's confusion over its scope should disqualify admission of a contention on the subject at all. But an appeal will lie only from unfavorable action taken by the Licensing Board, not from wording of a decision with which a party disagrees but which has no operative effect. *Duke Power Co.* (Cherokee Nuclear Station, Units 1, 2 & 3), ALAB-482, 7 NRC 979, 980 (1978). Even the fact that a Board made an erroneous ruling is not sufficient to warrant appellate relief. *Long Island Lighting Co.* (Shoreham Nuclear Power Station, Unit 1), ALAB-788, 20 NRC 1102, 1151 (1984), citing *Cleveland Elec*-

²"[FENOC's ER] fails to adequately evaluate the full potential for renewable energy sources, specifically wind power in the form of interconnected wind farms and/or solar photovoltaic power, in combination with compressed air energy storage, to offset the loss of energy production from Davis-Besse, and to make the requested license renewal action unnecessary. The FENOC Environmental Report (§ 7.2) treats all of the alternatives to license renewal except for natural gas and coal plants as unreas-onable and does not provide a substantial analysis of the potential for significant alternatives in the Region of Interest."

tric Illuminating Co. (Perry Nuclear Power Plant, Units 1 & 2), ALAB-443, 6 NRC 741, 756 (1977); *Long Island Lighting Co.* (Shoreham Nuclear Power Station, Unit 1), ALAB-827, 23 NRC 9, 11 (1986) (appeals should focus on significant matters, not every colorable claim of error); *Long Island Lighting Co.* (Shoreham Nuclear Power Station, Unit 1), ALAB-832, 23 NRC 135, 143 (1986), *rev'd in part on other grounds*, CLI-87-12, 26 NRC 383 (1987). A party seeking appellate relief must demonstrate actual prejudice - that the Board's ruling had a substantial effect on the outcome of the proceeding. *Long Island Lighting Co.* (Shoreham Nuclear Power Station, Unit 1), ALAB-788, 20 NRC 1102, 1151 (1984), citing *Louisiana Power & Light Co.* (Waterford Steam Electric Station, Unit 3), ALAB-732, 17 NRC 1076, 1096 (1983). See *Philadelphia Electric Co.* (Limerick Generating Station, Units 1 & 2), ALAB-863, 25 NRC 273, 278, 280 (1987) (intervenors failed to show any specific harm resulting from erroneous Licensing Board rulings).

The "harm" claimed by FENOC is that it must rely on a fair, plain reading of the reformulated contention to determine how to improve the SEIS. This is not cognizable "harm" and cannot - and should not - be redressed via FENOC's appeal.

D. Wind and Solar alternatives are not 'remote and speculative'

FirstEnergy further finds its procedural back up against the substantive future by arguing the sheer impossibility of wind and photovoltaic expansion in its region of interest by 2017, an especially fatuous quarrel, since the Fukushima nuclear power disaster in Japan has prompted its government to announce an historic abandonment of new nuclear electrical generation. Fukushima has triggered similar governmental responses in Germany and other countries. The global economy is about to ramp up to solar and wind in unprecedented fashion, and FENOC rhet-

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orically argues speciousness to avoid having to perform a comprehensive delineation of how bad things are becoming for the nuclear option in it Environmental Report.

FENOC repeatedly blurs the distinction between contention admissibility with summary disposition. Applicant's discussion of the capacity of the Norton CAES (compressed air storage) project is clearly an argument on the merits of the Intervenors' argument, which is not an appropriate discourse at this juncture. The declaration testimony of Intervenors' expert, Dr. Compaan, suggests that the CAES and/or other existing storage systems (such as the pumped reservoir facility near Ludington, Michigan can supply the necessary supplement to wind and solar to make them a viable baseload supply. Whether this claim is accurate remains to be adjudicated, but the fact that it is "reasonable" is proven by decades of inclusion of these devices in the current grid.

Contrary to FENOC's dreary prediction - which argues contention inadmissibility as though all the proofs for summary disposition truculence must be arrayed at the starting gate (App. Br. pp. 9-14) - the NRC has previously addressed the contents of an adequate discussion of solar and wind alternatives to a new nuclear plant. In *Calvert Cliffs 3 Nuclear Project, LLC and Unistar Nuclear Operating Services, LLC* (COLA for Calvert Cliffs Unit 3), LBP-10-24, Docket No. 52-016-COL (December 28, 2010), the ASLB discussed the bias of a DEIS that omitted serious consideration of wind and solar:

Intervenors maintain that the comparison in the DEIS between a new nuclear power plant and the combined alternative violates NEPA because it is inaccurate and incomplete. They have identified information indicating that the NRC Staff might have significantly underestimated the potential contribution of wind power and solar power to the combined alternative. If Intervenors are correct, then the DEIS's comparison of alternatives might well be incomplete or inaccurate because, by underestimating the contribution of power sources that produce little or no air emissions, it overestimates the

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air emissions the combined alternative would produce. The estimated level of air emissions influenced the DEIS's comparison of the combined alternative to the construction of a new nuclear power plant.

Id. pp. 48-49. Respecting the NRC staff's duty upon identification of serious factual errors or

omissions in the NEPA document, the Board declared:

If Intervenors' contention is upheld on the merits, they will have shown that the DEIS violates NEPA even if they have not shown precisely how the DEIS should be revised or what ultimate conclusion it should reach. Federal courts have held that *inaccurate, incomplete, or misleading information in an EIS concerning the comparison of alternatives is itself sufficient to render the EIS unlawful and to compel its revision*.[Emphasis supplied]. As the court of appeals explained in *Animal Defense Council v. Hodel*,

The Council alleges that the EIS was so filled with misinformation and incorrect cost figures that the Bureau must revise its EIS to adequately provide the public with an informed comparison of alternatives. Where the information in the initial EIS was so incomplete or misleading that the decisionmaker and the public could not make an informed comparison of the alternatives, revision of an EIS may be necessary to provide 'a reasonable, good faith, and objective presentation of the subjects required by NEPA.' *Johnston v. Davis*, 698 F.2d 1088, 1095 (10th Cir. 1983) (revision of EIS necessary where use of artificially low discount rate resulted in unreasonable comparison of alternatives to proposed project); *see also National Wildlife Federation v. Andrus*, 440 F.Supp. 1245, 1254 (D.D.C. 1977) (EIS deficient where several alternatives were not treated in the EIS and the EIS did not set forth reasons why these alternatives were rejected).

Thus, if the DEIS's analysis of the combined alternative significantly underestimates the potential contribution of wind and solar power, as Intervenors maintain, then the EIS fails in one of its essential functions - to provide the public and the decision maker with accurate information comparing the proposed action and its alternatives - and, as such, it cannot support an agency decision to issue the license. (Emphasis supplied)

Id. p. 50.

Thereafter, in NextEra Energy Seabrook LLC (Seabrook Station, Unit 1), LBP-11-02,

ASLBP No. 10-906-02-LR-BD01 (February 15, 2011), the ASLB addressed the "remote and

speculative" canard. The Seabrook Board found, as to a contention urging NEPA consideration

of offshore wind power, that the utility and NRC Staff "conflate[d] the merits of the contention with the adequacy of its pleading," *id.* p. 23, and that "whether an interconnected system of offshore wind farms constitutes a 'reasonable' alternative is the very issue on which the . . . petitioners seek a hearing. When a contention alleges the need for further study of an alternative, from an environmental perspective, 'such reasonableness determinations are the merits, and should only be decided after the contention is admitted."" *Id.* To be entitled to a hearing, the *NextEra* Board held, "petitioners need not demonstrate that they will necessarily prevail, but only that there is at least some minimal factual support for their position." *Id.* The ASLB in *NextEra* accepted that the petitioners had made the required minimal factual showing that commercial wind power "is a feasible alternative at the present time" and was not "remote and speculative," and that the obligation is "to consider alternatives as they exist and are likely to exist" [citation omitted]. *Id.* p. 25. That Board further opined that "we are not persuaded that, as a matter of law, an integrated system of offshore wind farms could not constitute a single, discrete source for baseload energy," and that it "seems to pose, at a minimum, a disputed question of fact." *Id.* p. 25.

Here, FirstEnergy seeks to make of the contention admission stage a substitute "trial by affidavit" in order to avoid the substantive consequences of having to definitively identify the soon-burgeoning direct competition of wind and solar with nuclear, *i.e.*, to admit, in the NEPA document, the positive prognosis for wind and photo-voltaic power, as opposed to incipiently anemic atomic energy. What is increasingly "remote and speculative" are not these incremental alternative power sources, but instead, how long nuclear utilities can hold back the *tsunami* of change that will forever dispel the "baseload" central-site power station anachronism.

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"The existence of a viable, but unexamined alternative renders an environmental impact statement inadequate." *Idaho Conservation League v. Mumma*, 956 F.2d 1508, 1519-20 (9th Cir. 1992). Agencies must "study. . . significant alternatives suggested by other agencies or the public. . . ." *DuBois v. U.S. Dept. of Agric.*, 102 F.3d 1273, 1286 (1st Cir. 1996), *cert. denied*, 117 S.Ct. 1567 (1997). Even an alternative which would only partially satisfy the need and purpose of the proposed project must be considered by the agency if it is "reasonable," *Natural Resources Defense Council v. Callaway*, 524 F.2d 79, (2nd Cir. 1975), because it might convince the decision-maker to meet part of the goal with less impact, *North Buckhead Civic Ass 'n v. Skinner*, 903 F.2d 1533, 1542 (11th Cir. 1990).

E. Davis-Besse-specific SAMA

FENOC claims that Joint Intervenors' Contention No. 4, which challenges FENOC's Severe Accident Mitigation Alternatives ("SAMA") analysis, is based entirely on non-specific references to technical documents. However, a plain reading of the Joint Intervenors' Petition reveals that the Intervenors explained each document's relevance, and connected their claims to specific portions of FENOC's LRA and ER. FENOC's arguments have been turned aside, and instead of appealing the admitted SAMA contention, a discovery opportunity should now be extended to the parties and FENOC's remedy should be confined to summary disposition. FENOC persistently makes new arguments that it could have and should have already made to the ASLB, or, worse, simply repeats arguments that it already did make. Nowhere has FENOC raised examples of egregious error or abuse of discretion by the ASLB sufficient to merit Commission intervention.

The basic assumptions of the SAMA in terms of costs in the case of a severe accident

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have to be reexamined in light of the Fukushima accident, and will be, in the form of the NRC's formal "lessons learned" process. Early indications certainly show that the Intervenors have correctly asserted that the SAMA cost assumptions made by FENOC were, in fact, "dramatically minimized." Additional data on these assumptions are being generated every day, and will be available as adjudication approaches.

V. CONCLUSION

It is germane to these proceedings that the claims of entities such as FENOC should be tested by the evolving realities injected into the proceedings by Intervenors, using studies, media accounts, blogs, draft reports, generic analyses, "concept" papers and other sources. Intervention and litigation of contentions from the public assures a higher-quality outcome than would otherwise be possible were FENOC and the NRC Staff left to their own devices. So far in this license renewal case, the ASLB has enforced the distinction between articulation of admissible contentions, and the adjudication of them. No clear error nor abuse of discretion has been shown by the ASLB in rendering LBP-11-13. That ruling should be allowed to stand.

Respectfully submitted,

<u>/s/ Terry J. Lodge</u> Terry J. Lodge, Esq. (OH #0029271) 316 N. Michigan St., Ste. 520 Toledo, OH 43604-5627 (419) 255-7552/Fax 255-8582 tjlodge50@yahoo.com

<u>/s/ Kevin Kamps</u> Kevin Kamps Beyond Nuclear 6930 Carroll Avenue, Suite 400 Takoma Park, MD 20912 Tel. 301.270.2209 ext. 1 Email: kevin@beyondnuclear.org

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May 16, 2011

UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION Before the Commission

| In the Matter of: |) | Docket No. 50-346 |
|---|---|-------------------|
| FirstEnergy Nuclear Operating Company |) | |
| Davis-Besse Nuclear Power Station, Unit 1 |) | |
| (Regarding the Renewal of Facility Operating License NPE-003 for a 20-Year |) | |
| Period) |) | |
| |) | |

CERTIFICATE OF SERVICE

We hereby certify that a copy of the foregoing "JOINT INTERVENORS' BRIEF IN OPPOSITION TO FENOC'S NOTICE OF APPEAL AND BRIEF" was sent by me to the following persons via electronic deposit filing with the Commission's EIE system this 16th day of May, 2011:

Administrative Judge William J. Froehlich, Chair Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 E-mail: wjfl@nrc.gov

Administrative Judge Dr. William E. Kastenberg Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 E-mail: wek1@nrc.gov

Office of the Secretary

U.S. Nuclear Regulatory Commission Rulemakings and Adjudications Staff Washington, DC 20555-0001 E-mail: hearingdocket@nrc.gov

Office of the General Counsel U.S. Nuclear Regulatory Commission Mail Stop O-15D21 Washington, DC 20555-0001 Brian G. Harris Megan Wright Emily L. Monteith E-mail: Brian.Harris@nrc.gov; Megan.Wright@nrc.gov; Emily.Monteith@nrc.gov Office of Commission Appellate Adjudication U.S. Nuclear Regulatory Commission Mail Stop: O-16C1 Washington, DC 20555-0001 E-mail: ocaamail@nrc.gov

Michael Keegan Don't Waste Michigan 811 Harrison Street Monroe, MI 48161 E-mail: mkeeganj@comcast.net Stephen J. Burdick Morgan, Lewis & Bockius LLP 1111 Pennsylvania Avenue, N.W. Washington, D.C. 20004 Phone: 202-739-5059 Fax: 202-739-3001 E-mail: sburdick@morganlewis.com

Respectfully submitted,

<u>/s/ Terry J. Lodge</u> Terry J. Lodge, Esq. (OH #0029271) 316 N. Michigan St., Ste. 520 Toledo, OH 43604-5627 (419) 255-7552 Fax 255-8582 tjlodge50@yahoo.com

<u>/s/ Kevin Kamps</u> Kevin Kamps Radioactive Waste Watchdog Beyond Nuclear 6930 Carroll Avenue, Suite 400 Takoma Park, MD 20912 Tel. 301.270.2209 ext. 1 Email: kevin@beyondnuclear.org

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Genesky, Donielle

| From: | Kevin Kamps <kevin@beyondnuclear.org></kevin@beyondnuclear.org> | | |
|--------------|--|--|--|
| Sent: | Friday, January 23, 2015 9:00 PM | | |
| То: | Puco Docketing | | |
| Subject: | OPPOSITION COMMENT UNDER CASE # 14-1297-EL-SSO: (#4) Fukushima-Related | | |
| | Safety Contentions in Opposition to Risky Davis-Besse 20-Year Licence Extension. | | |
| Attachments: | Reply DB FINAL[1].pdf | | |

OPPOSITION COMMENT UNDER CASE # 14-1297-EL-SSO: Fukushima-Related Safety Contentions in Opposition to Risky Davis-Besse 20-Year Licence Extension.

Dear Public Utilities Commission of Ohio,

In further follow up to my three previous emailed submissions, I am now submitting for the record of this proceeding, documentation of our Fukushima-related safety contentions in opposition to the 20-year license extension sought by FirstEnergy Nuclear Operating Company (FENOC) at its age-degraded, problem-plagued Davis-Besse atomic reactor.

Please find attached INTERVENORS' REPLY MEMORANDUM TO STAFF AND APPLICANT OPPOSITIONS TO ADMISSION OF NEW CONTENTION, dated Sept. 13, 2011.

The environmental coalition filing also discusses previously submitted (April, August, and September, 2011) filings re: Fukushima-related safety contentions in opposition to FENOC's License Renewal Application at Davis-Besse.

Our environmental coalition intervening against Davis-Besse's 20-year license extension includes: Beyond Nuclear; Citizen Environment Alliance of Southwestern Ontario; Don't Waste Michigan; and Green Party of Ohio.

Our legal counsel is Terry Lodge of Toledo, OH.

Thank you.

Sincerely,

Kevin Kamps, Beyond Nuclear

--Kevin Kamps Radioactive Waste Watchdog Beyond Nuclear 6930 Carroll Avenue, Suite 400 Takoma Park, Maryland 20912 Office: (301) 270-2209 ext. 1 Cell: (240) 462-3216 Fax: (301) 270-4000 Beyond Nuclear aims to educate and activate the public about the connections between nuclear power and nuclear weapons and the need to abandon both to safeguard our future. Beyond Nuclear advocates for an energy future that is sustainable, benign and democratic.

September 13, 2011

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UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

| In the Matter of | f |) | Docket No. 50-346 |
|-------------------------------|---|----------------|-------------------|
| First Energy Nu | Iclear Operating Co | ompany) | |
| (Davis-Besse N | nuclear rower Stati |) | |
| (Regarding the Operating Lice | Renewal of Facilit nse NPF-003 for a | y 20-Year) | |
| Period) | |) | |
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INTERVENORS' REPLY MORANDUM TO STAFF AND APPLICANT OPPOSITIONS TO ADMISSION OF NEW CONTENTION

Pursuant to 10 C.F.R. § 2.309(h)(2), the Intervenors hereby replyto the oppositions submitted by the Applicant, First Energy Nuclear Operating Company ("FENOC") and the U.S. Nuclear Regulatory Commission ("NRC") Staff to Intervenors' new contention seeking consideration of the environmental implications of the Fukushima Task Force Report. Intervenors respectfully submit that the arguments by Applicant and the NRC Staff regarding the timeliness and admissibility of the contention are without merit and the contention should be admitted.

The arguments raised by the applicant and the NRC Staff in response to Intervenors' contention are similar or identical to arguments made by the applicant and staff in response to

Fukushima Task Force Report-related contentions that were filed in other reactor licensing proceedings on the same day. Intervenors attach and incorporate by reference a Reply Memorandum which addresses the most common arguments that are made in the responses and was prepared by counsel for intervenors in the Turkey Point, Vogtle, and Watts Bar cases.¹ The Reply Memorandum also discusses the effect of the NRC Commissioners' recent decision regarding the Emergency Petition that was submitted by Intervenors and many other intervenors and petitioners in April 2011. *Union Electric Co., d/b/a/ Ameren Missouri* (Callaway Plant, Unit 2) et al., CLI-11-05, ____ NRC ___ (Sept. 96, 2011) ("CLI-11-05").²

Reply as to Public's Burden to Show Necessity for Changing Scope of NEPA Consideration

The point repeatedly ignored by the Applicant and Staff is that the burden placed on Intervenors or other members of the public to trigger consideration of new information is quite low, particularly when the NEPA process is, as here, not even consummated at the DEIS stage. "To [require an EIS], a plaintiff need not show that significant effects will in fact occur ... raising substantial questions whether a project may have a significant effect is sufficient." (Emphasis supplied). *Anglers of the Au Sable v. U.S. Forest Service*, Case #05-10152-BC (E.D. Mich. N.D. 2005) at 13-14, citing *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1149-50 (9th Cir.

¹The Reply Memorandum was prepared by the attorneys who represent the intervenors or petitioners in those cases: Diane Curran (counsel for the intervenor in the Diablo Canyon license renewal proceeding and Watts Bar operating license proceeding), Mindy Goldstein (counsel for some of the intervenors in the Vogtle and Vogtle Turkey Point COL proceedings), and Jason Totoui (counsel for some of the intervenors in the Turkey Point COL proceeding).

²Because the applicant and the NRC Staff have not had an opportunity to address the effect of CLI-11-05 on the timeliness and admissibility of Intervenors' [Petitioners'] contention, Intervenors [Petitioners] would not object to a response by the applicant and the Staff to their arguments regarding the relevance of CLI-11-05 to their contention.

1998) (EIS required if "substantial questions are raised" about effects on environmental quality). The Court must not "substitute [its] judgment of the environmental impact for the judgment of the agency, once the agency has adequately studied the issue." *Crounse Corp. v. Interstate Commerce Comm'n*, 781 F.2d 1176, 1193 (6th Cir. 1986). However, "[i]t is [the Court's] role . . . to determine whether the agency has, in fact, adequately studied the issue and taken a 'hard look' at the environmental consequences of its decision." *Id.* The harm NEPA seeks to prevent is complete when the agency makes a decision without considering information NEPA requires be placed before the decision-maker and public. *Sierra Club v. Marsh*, 872 F.2d 497, 500 (1st Cir. 1989). "The injury of an increased risk of harm due to an agency's uninformed decision is precisely the type of injury {NEPA} was designed to prevent." *Comm. to Save the Rio Hondo v. Lucero*, 102 F.3d 445, 448-49 (10th Cir. 1996).

ADAMS Reveals Complete Indifference in Licensing Deliberations To Implications of Fukushima for License Renewals Applications

Various sections of NRC staff's response³ claim that this new contention lacks specificity to this Davis-Besse license extension proceeding. However, the contention is one of omission. We are challenging the completeness of FENOC's License Renewal Application and Environmental Report in their entirety, for FENOC has not incorporated any "lessons learned" from the new and significant information revealed by the NRC Near-Term Fukushima Task Force Report dated July 12, 2011. It is FENOC's legal responsibility under NEPA to incorporate

³P. 4, "I. Intervenors Failed to Raise a Challenge to Davis-Besse's License Renewal Application or Environmental Report;" p. 14, "III. The NEPA Contention Does Not Raise a Material Issue;" p. 17, "B. The NEPA Contention Does Not Identify the Specific Portions of the Application It Challenges;" p. 19, "The NEPA Contention Does Not Raise a Material Contention with Respect to Severe Accidents;" p. 22, "D. The NEPA Contention Does Not Raise a Material Challenge to the SAMA Analysis;" and p. 24, "2. The NEPA Contention Does Not Raise a Material Dispute on Any Specific SAMA."

such new and significant information, as it is NRC's legal responsibility to incorporate such new and significant information in its own NEPA related documents, such as the DSEIS (Draft Supplemental Environmental Impact Statement) for the Davis-Besse license extension that is scheduled soon to be published, by October 2011 (see http://www.nrc.gov/reactors/operating/lice nsing/renewal/applications/davis-besse.html#licrenapp).

The contention is a contention of omission. A contention of omission is a claim, in the words of 10 C.F.R. § 2.309(f)(1)(vi), that "the application fails to contain information on a relevant matter as required by law . . . and the supporting reasons for the petitioner's belief." It was reasonable and appropriate for Intervenors to incorporate by reference the contention filed in the Seabrook license renewal application proceeding, to which intervenor Beyond Nuclear is also a party with standing, just as the organization is also a party to this Davis-Besse license renewal application proceeding. In both cases, the Applicant has failed to incorporate "lessons learned" from the NRC's Fukushima Task Force Near Term Report dated July 12, 2011 into the NEPA documents, including their respective Environmental Reports.

A PDF search on FENOC's 648 page long ER posted at NRC's website (http://www.n rc.gov/reactors/operating/licensing/renewal/applications/davis-besse/davis-besse-enviro.pdf) for the terms "Fukushima" and "Task Force" revealed that the Fukushima Daiichi accident is mentioned nowhere throughout the entire voluminous document. Although other task forces are mentioned a few places, no mention is made of the NRC's Fukushima Task Force, created shortly after the Fukushima nuclear catastrophe began on March 11, 2011, nor its Near-Term Report published on July 12, 2011. It appears that FENOC's ER, dated August 2010, has not been updated in any way, shape, or form since the catastrophe began on March 11, 2011, nor

since the NRC's Fukushima Task Force Near-Term Report published its findings on July 12, 2011. Likewise, FENOC's August 2010, 1810-page License Renewal Application posted at NRC's website (http://www.nrc.gov/reactors/operating/licensing/renewal/application s/davis-besse/davis-besse-lra.pdf) does not mention the Fukushima nuclear catastrophe, nor NRC's Fukushima Task Force Near-Term Report.

Regarding NRC staff's response at Section III.C., The NEPA Contention Does Not Raise a Material Issue/The NEPA Contention Does Not Raise a Material Contention with Respect to Severe Accidents (pages 19 to 22), Intervenors once again point out that NRC's GEIS (Generic Environmental Impact Statement for License Renewal of Nuclear Plants, NUREG-1437, posted at http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/), in its Main Report/Volume 1, likewise contains no updated reflecting NEPA significant "lessons learned" from the Fukushima Nuclear Catastrophe, as reflected in the NRC Near-Term Task Force Report (as of now, a Davis-Besse specific "Supplement" to the GEIS has not yet been produced, published, or posted to its website by NRC staff).

This is a significant omission that needs to be corrected to comply with NEPA. This is NRC's responsibility, not Intervenors'.

Regarding NRC staff's response at Section III.D., The NEPA Contention Does Not Raise a Material Issue/The NEPA Contention Does Not Raise a Material Challenge to the SAMA Analysis, 1. NEPA Does Not Require Implementation of Mitigation Measures, (pages 22-24), NRC staff argues that NEPA does not require that SAMA mitigation measures be implemented. However, NEPA does require that the costs and risks of not implementing mitigation measures be analyzed. FENOC has not analyzed the potentially catastrophic costs and risks that could be unleashed by a very long term station black out at Davis-Besse, whether caused by earthquake combined with flood (as has occurred at Fukushima Daiichi) or some other internal or external cause. Without examining the consequences that would result from a long term station blackout, meltdown, and catastrophic radioactivity release into the environment, FENOC has violated its legally binding NEPA obligations. Despite the lessons to be learned, and applied at Davis-Besse in its LRA and ER SAMA analyses, from the significant and new information coming from the Fukushima Daiichi Nuclear Catastrophe (which began on March 11, 2011, just ten days after the March 1, 2011 ASLB oral pre-hearing in Port Clinton, Ohio for this proceeding), such as reflected in the NRC Near-Term Task Force Report dated July 12, 2011, FENOC has done no such updated SAMA analyses. Given that the ASLB has not scheduled hearings on the admitted contentions (including SAMA contentions) in this proceeding until far into the future, and given that Davis-Besse's current operating license does not expire until March, 2017, there is plenty of time for FENOC to carry out such updated SAMAs based on the significant and new information contained in the NRC Near-Term Task Force Report. To not do such updated SAMA analyses is a dereliction of FENOC's NEPA-related obligations.

Regarding NRC staff's response at Section III.D., The NEPA Contention Does Not Raise a Material Issue/The NEPA Contention Does Not Raise a Material Challenge to the SAMA Analysis, 2. The NEPA Contention Does Not Raise a Material Dispute on Any Specific SAMA (pages 24 to 27), it is precisely the new and significant information revealed by the NRC Near-Term Task Force Report about the catastrophic consequences that could be unleashed by a long term station blackout, due to an earthquake and flood (as by a seiche on Lake Erie, immediately adjacent to Davis-Besse; in fact, in the early 1970s, during Davis-Besse's early construction activities, just such a seiche occurred on-site, causing significant flooding), that needs to be incorporated into new, carefully executed FENOC SAMAs. The Fukushima Daiichi Nuclear Catastrophe, months ago, had a ballpark figure of \$200 billion in property damage, recovery costs, etc. Since estimated radioactivity releases have been revised upward a number of times since March 11th, and since even this \$200 billion ball park figure is already months old, and radioactivity releases have continued since then, even this catastrophic figure will likely climb even higher. This is the very heart of the SAMA NEPA requirement, to determine if such catastrophic expenses can be prevented through relatively inexpensive fixes to the Davis-Besse vulnerabilities that could lead to such catastrophic damages. Yet FENOC has refused to undertake any such post-Fukushima "lessons learned" analysis. NRC's SDEIS will only be the weaker because of this, a violation of NEPA, since the new and significant information is at hand and ready to be applied here – thanks to the NRC Near-Term Task Force Report, for starters

The Allegedly Missing Fukushima-Driven Rulemaking

At fn. 12 of its response, the NRC Staff complains that it was not served a copy of the Intervenors' petition for rulemaking in light of the Fukushima Task Force report and the disaster itself. Intervenors will file that for record, but they attach hereto the email transmission to the NRC of August 11, 2011, by means of which they prove it was timely submitted to the NRC, and as well, the NRC's acknowledgement of receipt thereof. Respectfully submitted this 13th day of September 2011.

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REPLY MEMORANDUM REGARDING TIMELINESS AND ADMISSIBILITY OF NEW CONTENTIONS SEEKING CONSIDERATION OF ENVIRONMENTAL IMPLICATIONS OF FUKUSHIMA TASK FORCE REPORT IN INDIVIDUAL REACTOR LICENSING PROCEEDINGS

INTRODUCTION

The purpose of this Reply Memorandum is to address the most common arguments made in the U.S. Nuclear Regulatory Commission ("NRC") Staffs' and applicants' responses (collectively, the "Responses") opposing the admissibility of contentions that were submitted in over twenty NRC licensing and relicensing proceedings (collectively, the "Proceedings") on September 6, 2011. This Reply Memorandum also addresses the relevance of a decision issued by the NRC Commissioners shortly after the Responses were filed: *Union Electric Co., d/b/a/ Ameren Missouri* (Callaway Plant, Unit 2) et al., CLI-11-05, ____ NRC ___ (Sept. 9, 2011) ("CLI-11-05").

BACKGROUND

On August 11, 2011, intervenors and petitioners (collectively, "Intervenors") in over twenty proceedings submitted motions and contentions seeking consideration under the National Environmental Policy Act ("NEPA") of new and significant information presented by the NRC's Fukushima Task Force in its report, "Recommendations for Enhancing Reactor Safety in the 21st Century: the Near-term Task Force Review of Insights from the Fukushima Dai-ichi Accident" (July 12, 2011) (the "Task Force Report").¹ While the contentions addressed the particulars of each individual proceeding,

¹ Contentions were submitted in the following proceedings: Callaway Plant, Unit 2 (Docket No. 52-037-COL); Calvert Cliffs Nuclear Power Plant, Unit 3 (Docket No. 52-016-COL); Fermi Nuclear Power Plant, Unit 3 (Docket No. 52-033-COL); William

they all relied on the far-reaching conclusions and recommendations of the Task Force Report.

In all but one the proceedings, the applicants and the NRC Staff submitted

Responses on September 6, 2011. The Responses make very similar, if not identical,

arguments with respect to the timeliness and the admissibility of the contentions. Three

days after the Responses were filed, the NRC Commissioners also issued CLI-11-05,

which contains language that bears on the timeliness and admissibility of the contentions.

I. INTERVENORS' CONTENTIONS ARE TIMELY

All Responses argue that the contentions are not timely because they are late;

some argue the contentions were both late and premature. None of these arguments has

merit.

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Notably, some applicants and the NRC Staff (all of whom now argue that the

contentions are too late) previously contested the Emergency Petition to Suspend all

States Lee III Nuclear Station, Units 1 and 2 (Docket No. 52-018-COL and 52-019-COL); Columbia Generating Station (Docket No. 50-397-LR); Pilgrim Nuclear Power Station (Docket No. 50-293-LR); Indian Point Nuclear Generating Station, Units 2 and 3 (Docket Nos. 50-247-LR and 50-286-LR); Davis-Besse Nuclear Power Station, Units 1 (Docket No. 50-346-LR); Turkey Point, Units 6 and 7 (Docket Nos. 52-040-COL and 52-041-COL); Comanche Peak Nuclear Power Plant, Units 3 and 4 (Docket Nos. 52-034-COL and 52-035-COL); Seabrook Station, Unit 1 (Docket No. 50-443-LR); Diablo Canyon, Units 1 and 2 (Docket Nos. 50-275-LR and 50-323-LR); Bell Bend Nuclear Power Plant (Docket No. 52-039-COL); Shearon Harris Nuclear Power Plant, Units 2 and 3 (Docket Nos. 52-022-COL and 42-023-COL); Levy County Nuclear Power Plant, Units 1 and 2 (Docket Nos. 52-029-COL and 52-030-COL); Virgil C. Summer Nuclear Station, Units 1 and 2 (Docket Nos. 52-027-COL and 52-028-COL); South Texas Project, Units 3 and 4 (52-012-COL and 52-013-COL); Vogtle Electric Generating Plant, Units 3 and 4 (52-025-COL and 52-026-COL); Bellefonte Nuclear Power Plant, Units 3 and 4 (Docket Nos. 52-014-COL and 52-015-COL); Watts Bar, Unit 2 (Docket No. 50-391-OL); and North Anna, Unit 3 (52-017-COL). In addition, comments for filed in the following rulemaking proceedings: AP1000 Design Certification Amendment (NRC-2010-0131, RIN 3150-AI81); and ESBWR Design Certification Amendment (NRC-2010-0135, RIN-3150-AI85).

Pending Reactor Licensing Decisions pending Investigation of Lessons Learned from Fukushima Daiichi Nuclear Power Station Accident (the "Emergency Petition"), which was filed within thirty days of the Fukushima accident, on the ground that it was too early to determine the environmental significance of the event. *See, e.g.*, PG&E Opposition to Emergency Petition to Suspend Licensing Decisions and Proceedings at 8 (May 2, 2011). To the extent that the NRC Staff and applicants have made inconsistent arguments within the proceedings regarding timeliness, and submit Responses that argue both sides of the timeliness question, an Atomic Safety and Licensing Board has previously dismissed such "Catch-22" tactics as a "shell game, with the usual street-corner outcome: whatever guess the [Intervenors] make will prove wrong." *Shaw Area MOX Services* (Mixed Oxide Fuel Fabrication Facility), LBP-08-11, 67 NRC 460 at 502, n 15, 503 (2008).²

Regardless of the impermissible and inconsistent timeliness arguments made in the proceedings and Responses, the contentions are timely. The Responses argue that the contentions are late because they are based on the events of the Fukushima accident that occurred more than thirty days before the contentions were filed. While the Fukushima accident is relevant to the Task Force Report, it is the issuance of the Task Force's sweeping conclusions regarding the relevance of the Fukushima accident to NRC's regulatory program that serves as the basis for the contentions.

As the Commission found in CLI-11-05, while the Task Force Report does not justify a generic NEPA review, it is possible that new and significant information about

² In *MOX Services*, the applicant controlled the creation of and access to the information that petitioners used as a basis for ongoing contentions. While the applicants and the NRC Staff did not control the creation of or access to the Task Force Report, the significant similarity is that interested members of the public were unable to predict or control the timing of the development and release of new, significant information contained in the Report.

the environmental implications of the Fukushima accident may "come to light" and require consideration "as part of the ongoing preparation of application-specific NEPA documents" with respect to individual reactor license applications. CLI-11-05, slip op. at 30. At this point in time, neither the Commission nor the NRC Staff has yet undertaken its independent NEPA obligations to consider the question of whether the Task Force Report constitutes such new and significant information that must be considered in individual reactor licensing decisions. By submitting the Task Force Report-based contentions within thirty days of the issuance of the Task Force Report, the Intervenors have timely raised their concern regarding this failure to satisfy NEPA.

Some Responses also argue that the Task Force Report is not "new" for purposes of assessing timeliness, because the Task Force Report is simply a collection and summary of existing facts. *See, e.g.*, FPL Response (Turkey Point) at 11-12 (citing *Northern States Power Co.* (Prairie Island Nuclear Generating Plant, Units 1 and 2), CLI-10-27, 72 NRC_, slip op. at 7 (Sep. 30, 2010)); NRC Staff Response (Watts Bar 2) at 38-38. But the Task Force Report does not merely compile and organize certain pre-existing information, without further analysis. To the contrary, in the words of one applicant, the Task Force Report is a "short term and long term *analysis of the lessons that can be learned* from the Fukushima accident." FPL Response to Emergency Petition at 4 (May 2, 2011) (emphasis added).

Some Responses argue that the contentions are "premature" because the Commission may "moot" or "negate" the relief they seek. *See, e.g.,* FPL Response (Turkey Point) at 2-3, NRC Staff Response (Diablo Canyon) at 11. But future action by the Commission is only a possibility, and the Commission has not guaranteed that it will take action before licensing decisions are made, as required by NEPA. Whether the Commission might address the concerns of the Task Force Report at some point in the future is immaterial. The release or development of new and significant information, not future possible agency action, triggers the Commission's non-discretionary duty under NEPA.

The contentions are not only timely, but also meet the requirements for consideration of non-timely contentions in 10 C.F.R. § 2.309(c)(1). Most importantly, Intervenors have good cause for filing the contentions after the release of the Task Force Report. Given the lack of complete public information issued from Japan in the aftermath of the accident, and given the fact that the Task Force was chartered by the NRC Commissioners with the specific purpose of assembling information about the accident and subjecting it to analysis by some of the most highly qualified members of the NRC Staff, it was eminently reasonable for Intervenors to await and depend upon the Task Force Report for the contentions.

In sum, the contentions are timely because they are neither late nor premature. Additionally, as the contentions provide, they also meet the eight requirements for the consideration of non-timely contentions in 10 C.F.R. \S 2.309(c)(1).

II. NEPA REQUIRES THE SUPPLEMENTATION OF THE ENVIRONMENTAL REPORT, DRAFT ENVIRONMENTAL IMPACT STATEMENT, OR FINAL ENVIRONMENTAL IMPACT STATEMENT

The applicants and the NRC Staff devote surprisingly little attention to responding to the underlying basis for the contentions: that NEPA requires the environmental report, draft environmental impact statement, or final environmental impact statement (collectively, the "NEPA Documents") in each proceeding to be supplemented in light of the significant new information contained in the Task Force Report. Most of the NRC Staffs' Responses make the barest mention of NEPA, while many applicants provide only a cursory and flawed treatment of the law. Their strategies for evading NEPA fall into three basic categories: (1) attempts to avoid all treatment of safety issues within the context of NEPA by employing an overly narrow definition of environmental effects to exclude those impacts to public safety, (2) mischaracterizations of the contentions as contentions of inadequacy rather than omission, and (3) attempts to shift the agency's NEPA responsibilities onto the shoulders of Intervenors. Where the Responses do address NEPA, they incorrectly claim that the contentions are based upon no significant or new information. None of these arguments has merit.

A. <u>The Responses Mischaracterize the Public Safety Issues Raised in the</u> <u>Contentions to Avoid Addressing NRC's Responsibility to Consider These</u> <u>Issues in the NEPA Documents.</u>

A number of Responses claim that the contentions are inadmissible because they "attack" or seek an "overhaul" of NRC regulations. *See e.g.* FPL Response (Turkey Point) at 17-23, Entergy Response (Indian Point) at 18-21, Unistar Response (Calvert Cliffs) at 6-10, NRC Staff Response (Diablo Canyon) at 9-12, NRC Staff (Watts Bar 2) at 16, 20-22, TVA Response (Watts Bar 2) at 17. As the contentions make clear, Intervenors do not challenge the adequacy of NRC regulations to protect public health and safety under the Atomic Energy Act. Instead, the contentions question the sufficiency of the NEPA Documents because those documents make factual determinations that compliance with NRC safety regulations will ensure that environmental impacts of reactor accidents will be "SMALL," and the NRC's Task Force has called such determinations into question in its Report. NEPA requires consideration of the safety risks posed by nuclear reactors before final agency action. Indeed, an environmental impact statement must be prepared whenever a major federal action may have a significant effect on the human environment. 42 U.S.C. § 4321 *et seq*. The term "human environment" must "be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment." 40 C.F.R. § 1508.15. Moreover, the term "effect" is synonymous with "impact," and includes the ecological (such as effects on natural resources and on the components, structures, and functioning of affected ecosystems) as well as the aesthetic, historic, cultural, economic, social, and health impacts of a proposed action. 40 C.F.R. § 1508.8. The degree to which a project may affect public health or safety is thus a major consideration under the statute. *See* 40 C.F.R. § 1508.27.

Therefore, the Responses' attempts to dismiss the numerous public health and safety issues raised by the Task Force Report as being the subject of an impermissible rule challenge are unavailing, as they obscure the necessary role public health and safety issues play in the examination of a project's environmental impacts under NEPA.

Incredibly, some applicants not only read the analysis of "safety" issues out of NEPA, but attempt to avoid addressing Intervenors' claims by further arguing that because there is "no mention of any environmental reviews, either by applicants or by the Staff" the Task Force Report cannot provide support for the contention, "which seeks to raise environmental claims against the [NEPA Document]." FPL Response at 23; see also Entergy Response at 23 (asserting "the Task Force Report does not discuss NEPA issues at all"), NRC Staff Response (Watts Bar 2) at 30. NEPA requires supplementation of a NEPA Document whenever there is significant new information relevant to

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environmental concerns and bearing on the proposed action or its impacts. 40 C.F.R. § 1502.9(c)(1)(ii). The applicants' position that NEPA requires the consideration of new information for supplementation purposes only where such documents reference specific "environmental reviews" is unfounded and has no support in the law.

B. <u>The Responses Mischaracterize Intervenors' NEPA Contentions as</u> <u>Contentions of Inadequacy Rather Than of Omission</u>.

Throughout the Responses, applicants make numerous references to Intervenors' alleged failure to point to specific flaws in the NEPA documents. *See, e.g.*, FPL Response at 24-25; Entergy Response at 25-26; Unistar Response at 19-20, n. 12. For example, Florida Power & Light ("FPL") argues that the contention's reference to tsunami risks and seismic seiches does not dispute the findings of Turkey Point's Final Safety Analysis Report ("FSAR") and that the FSAR demonstrates that the units are not vulnerable to tsunamis. Therefore, according to FPL, Intervenors' flooding and seismic protection concerns do not raise any dispute on a significant issue with the application. *See* FPL Response at 24. FPL further argues that Intervenors' concerns with respect to spent fuel pool cooling do not demonstrate any genuine material dispute with the application because these issues are sufficiently addressed in the AP1000 DCD. *See* FPL Response at 25.

FPL's arguments completely miss the mark and are nothing more than an attempt to re-characterize the contention as one of inadequacy rather than of omission. Even a cursory reading of Intervenors' contention makes it abundantly clear that it is a contention of omission. The central thrust of the contention is that the Task Force Report constitutes "significant new information" under NEPA and the NEPA Documents need to be supplemented accordingly. The dispute is not that specific portions of the NEPA Documents contain a flawed analysis or reach false conclusions, but rather that the NEPA Documents fail entirely to consider the findings, recommendations, and conclusions of the Task Force Report. Therefore, the Responses' efforts to dismiss the contentions based on the content of specific sections of the NEPA Documents and arguments that those sections do not demonstrate a genuine material dispute are without merit.

C. <u>Applicants Erroneously Conflate Intervenors' Responsibilities under</u> <u>NEPA With Those of the Agency.</u>

Applicants attempt to conflate Intervenors' responsibilities under NEPA with those of the agency by arguing that the contentions must explain in detail how the NEPA Documents should use the information contained in the Task Force Report. For instance, FPL argues that the contention "do[es] not identify any error in any of [the NEPA Document's] analyses" and that it "provide[s] no information indicating that the probability or consequences of any accident scenario is greater than as assessed in the [NEPA Documents]," where it concerns the consequences of design basis accidents, consequences of severe accidents, and analyzing the cost and benefits of severe accident mitigation alternatives ("SAMA"). FPL Response (Turkey Point) at 29-30, 33; NRC Staff Response (Watts Bar 2) at 37. This argument highlights a fundamental misunderstanding of Intervenors' duties under NEPA by positing that before the NEPA Documents must be supplemented, Intervenors must demonstrate (1) that the new information will, in fact, result in different or greater environmental effects than those described in the NEPA Documents and, (2) precisely how the conclusions in the NEPA Documents should read. See Entergy Response at 23 ("Intervenors do not identify with the requisite specificity any substantial changes in the environmental analysis of the

proposed Indian Point license renewal action resulting from the Task Force recommendations").

Contrary to the applicants' arguments, Intervenors carry only the obligation of showing that the new information at issue is "significant," "relevant to environmental concerns," and has "bearing on the proposed action." 40 C.F.R. § 1502.9. Because Intervenors meet this burden, NRC has the responsibility to conduct supplemental environmental analyses and report the results in the NEPA Document. In this instance, however, applicants seek to require Intervenors to supply these analyses. As courts have made abundantly clear, "[it] is the agency, not an environmental plaintiff, that has a 'continuing duty to gather and evaluate new information relevant to the environmental impacts of its actions,' even after release of an [EA or EIS]." Friends of the Clearwater v. Dombeck, 222 F.3d 552, 559 (9th Cir. 2000) (quoting Warm Springs Dam Task Force v. Gribble, 621 F.2d 1017, 1023 (9th Cir. 1980)); See also Te-Moak Tribe v. Interior, 608 F.3d 592, 605-606 (9th Cir. 2010); Davis v. Coleman, 521 F.2d 661, 671 (9th Cir. 1975) ("[C]ompliance with NEPA is a primary duty of every federal agency; fulfillment of this vital responsibility should not depend on the vigilance and limited resources of environmental plaintiffs."). As the First Circuit remarked in Dubois v. U.S. Dept. of Agric., 102 F.3d 1273, 1291 (1st Cir. 1996), discussing the public's role under NEPA:

Such specifics are not required.... [T]he purpose of public participation regulations is simply to 'provide notice' to the agency, not to 'present technical or precise scientific or legal challenges to specific provisions' of the document in question.... Moreover, NEPA requires the agency to try on its own to develop alternatives that will 'mitigate the adverse environmental consequences' of a proposed project. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351 (1989).

Here, Intervenors have met their burden in demonstrating that the Task Force Report contains new and significant information that is relevant to environmental concerns and has a bearing on the proposed agency regulatory action. Thus NRC has the duty to evaluate this new information and, in conjunction with applicants, prepare supplemental NEPA Documents that rationally connect the facts found to the choices made. *Burlington Truck Lines v. United States*, 371 U.S. 156, 158 (1972) (holding that the agency must consider "relevant factors" and articulate "a rational connection between the facts found and the choices made").

This same fundamental misunderstanding of NEPA undermines applicants' arguments relating to SAMAs. Applicants assert that the NEPA Documents need not be supplemented with regard to the SAMA analyses because only through a rule change --which Intervenors are precluded from requesting in this forum -- can the Task Force recommendations on this issue be considered. *See, e.g.*, FPL Response (Turkey Point) at 35. As discussed above, this attempt to shift the focus to the NRC regulations ignores the clear requirements of NEPA. Applicants' further argument that the contentions fail to demonstrate that the cost-benefit analysis set out in the NEPA Documents for the proposed action will be affected by implementation of the Task Force Report fails for the same reason. *See, e.g.*, FPL Response at 37. It is not Intervenors' responsibility to explain how the cost-benefit analysis contained in the NEPA Documents would change. That responsibility lies with the NRC.

Finally, to the extent the applicants argue that NEPA's supplementation requirements do not apply to environmental reports ("ERs"), *see, e.g.*, FPL Response at 31, this argument also fails. Such a strained interpretation of the NEPA process as it applies to NRC decision-making is untenable for three reasons. First, to apply this interpretation would result in no conceivable trigger for the NRC to supplement its NEPA Documents when significant new information, excluded from consideration and analysis in the ER, becomes available in advance of EIS publication. Nor could Intervenors compel such action, as they would be time-barred from filing new contentions alleging the need to supplement a draft or final EIS because such information was available well before those documents were prepared. As mentioned above, this type of "Catch-22" must be precluded in order to ensure that NRC processes comply with NEPA. Shaw Area MOX Services, 67 NRC at 502. Second, to preclude evaluation of significant new information in the ER would limit the NRC's ability to adequately and timely consider and respond to new information relatively early in the decision-making process, before a significant amount of time and resources are expended in finalizing the project and developing the draft and final EIS for the action. Third, given that the NRC relies heavily on the contents of the ER to prepare its EIS, not including such information or analysis in the ER would create the potential for significant deficiencies in the resulting EIS. This would increase the likelihood for future litigation by parties seeking to cure these deficiencies. For all these legal and practical reasons, applicants' argument that supplementation does not apply to all NEPA Documents, including ERs, cannot stand.

D. <u>The Responses Incorrectly Claim the Contentions Are Based Upon No</u> <u>Significant New Information</u>

The applicants also claim the contentions are inadmissible because Intervenors have failed to present "significant new information," as required by 10 C.F.R. § 52.39(c)(v). See, e.g., Entergy Response (Indian Point) at 21-25; FPL Response (Turkey Point) at 30-34; Unistar at 14-18; PEF Response (Levy) at 13-14. The contentions, however, are based upon the new and significant information contained in the Task Force Report. The Applicants' efforts to use the Task Force Report to support a claim that the Task Force itself did not identify significant regulatory changes that represent significant new information in the context of NEPA requirements are simply incorrect.

Many of the Responses argue that the Task Force Report does not present new and significant information because it did not conclude that the recommended design basis changes are necessary at this time. *See, e.g.,* NRC Staff Response (Watts Bar 2) at 28, TVA Response (Watts Bar 2) at 23, NRC Staff Response (Diablo Canyon) at 13. This argument ignores the fact that such a conclusion is provisional, that is to say that the Task Force assumed the NRC would make the recommended regulatory reforms. Thus, the Task Force found that current regulatory requirements can support a reasonable assurance finding "until the actions set forth below have been implemented" and that continued operation of existing nuclear plants does not pose an immediate threat to public health and safety. That the Report contains provisional statements does not detract from or contradict the essential message of the Task Force Report that the NRC's program of *mandatory* safety regulations requires significant strengthening in order to provide, over the long term, adequate protection of public health and safety.³ It is this longer term, *i.e.,* the next 40 years or more, that is addressed by the NRC's licensing process and by the associated NEPA Documents.

CONCLUSION

For the foregoing reasons, the applicants' and NR Staff's oppositions to the Fukushima Task Force related contentions submitted by Intervenors.

³ See Task Force Report at 18 ("As new information and new analytical techniques are developed, safety standards need to be reviewed, evaluated, and changed, as necessary, to insure that they continue to address the NRC's requirements to provide reasonable assurance of adequate protection of public health and safety. The Task Force believes, based on its review of the information currently available from Japan and the current regulations, that the time has come for such change.")

Respectfully submitted,

Electronically signed by Diane Curran, Esq. Harmon, Curran, Spielberg & Eisenberg, L.L.P 1726 M Street NW, Suite 600 Washington, D.C. 20036 Telephone: (202)328-3500 Facsimile: (202)328-6918 E-mail: <u>dcurran@harmoncurran.com</u>

Electronically signed by Mindy Goldstein Turner Environmental Law Clinic Emory University School of Law 1301 Clifton Road Atlanta, GA 30322 Phone: (404) 727-3432 Fax: (404) 727-7851 Email: magolds@emory.edu

Electronically signed by Jason Totoiu Everglades Law Center PO Box 2693 Winter Haven, FL 33883 (561)568-6740 Jason@evergladeslaw.org

September 13, 2011

September 13, 2011

*

UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

| In the Matter of | |) | Docket No. 50-346 | |
|---|---|-----------------------|-------------------|--|
| First Energy Nuclear Operating Company (Davis-Besse Nuclear Power Station, Unit 1) | | mpany) m. Unit 1) | | |
| (| |) | | |
| | |) | | |
| * | * | * | * | |

CERTIFICATE OF SERVICE

I hereby certify that copies of "INTERVENORS' REPLY MORANDUM TO STAFF AND APPLICANT OPPOSITIONS TO ADMISSION OF NEW CONTENTION" have been served on the following persons via Electronic Information Exchange this 13th day of September, 2011:

Office of Commission Appellate Adjudication U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 E-mail: ocaamail@nrc.gov

U.S. Nuclear Regulatory Commission. Atomic Safety and Licensing Board Panel Mail Stop T-3F23 Washington, DC 20555-0001

William J. Froehlich, Chair Administrative Judge E-mail: William.froehlich@nrc.gov Nicholas G. Trikouros Administrative Judge E-mail: nicholas.trikouros@nrc.gov William E. Kastenberg Administrative Judge E-mail: wek1@nrc.gov Hillary Cain Law Clerk E-mail: hillary.cain@nrc.gov

Office of the Secretary of the Commission U.S. Nuclear Regulatory Commission Mail Stop O-16C1 Washington, DC 20555-0001 Hearing Docket E-mail: hearingdocket@nrc.gov Office of the General Counsel U.S. Nuclear Regulatory Commission Mail Stop O-15D21 Washington, DC 20555-0001 Edward L. Williamson, Esq. E-mail: edward.williamson@nrc.gov Lloyd B. Subin, Esq. E-mail: lloyd.subin@nrc.gov Brian Harris, Esq. E-mail: brian.harris@nrc.gov Brian P. Newell, Paralegal E-mail: brian.newell@nrc.gov OGC Mail Center : OGCMailCenter@nrc.gov

FirstEnergy Service Company. Mailstop: A-GO-15 76 South Main Street Akron, OH 44308 David W. Jenkins, Esq. E-mail : djenkins@firstenergycorp.com

Morgan, Lewis & Bockius Pennsylvania Avenue, NW Washington, D.C. 20004 Stephen Burdick, Esq. E-mail: sburdick@morganlewis.com Alex Polonsky, Esq. E-mail: apolonsky@morganlewis.com Kathryn M. Sutton, Esq. E-mail: ksutton@morganlewis.com Martin O'Neill, Esq. E-mail: martin.oneill@morganlewis.com Timothy Matthews, Esq. E-mail: tmatthews@morganlewis.com Mary Freeze, Legal Secretary E-mail: mfreeze@morganlewis.com Lisa Harris, Legal Secretary E-mail: lisa.harris@morganlewis.com

> <u>/s/ Terry J. Lodge</u> Terry J. Lodge (OH #0029271) 316 N. Michigan St., Ste. 520 Toledo, OH 43604-5627

(419) 255-7552 Fax (419) 255-8582 <u>Tjlodge50@yahoo.com</u> Counsel for Intervenors NRC Acknowledgement of Receipt of Petition for Rulemaking and Contention - Yaho... Page 1 of 1



NRC Acknowledgement of Receipt of Petition for Rulemaking and Contention

Monday, August 29, 2011 2:15 PM

- From: "Terry, Leslie" <Leslie.Terry@nrc.gov>
- To: "Tjlodge50@yahoo.com" <Tjlodge50@yahoo.com>
- Cc: "Bladey, Cindy" <Cindy.Bladey@nrc.gov>, "Inverso, Tara" <Tara.Inverso@nrc.gov>

Dear Mr. Lodge:

This e-mail is in reference to the petition for rulemaking entitled "Rulemaking Petition to Rescind Prohibition Against Consideration of Environmental Impacts of Severe Reactor and Spent Fuel Pool Accidents and Request to Suspend Licensing Decision," dated August 11, 2011, which you filed with the U.S. Nuclear Regulatory Commission (NRC). The petition is currently under review to determine if it meets the NRC's requirements for docketing under Title 10 of the *Code of Federal Regulations*, Section 2.802. We will notify you once a decision has been reached in this matter.

On August 11, 2011, you also submitted contentions regarding Davis-Besse and Fermi 3; and comments on the ESBWR Design Certification rulemaking. The NRC is currently reviewing your submissions and will notify you once a decision has been reached in this matter.

If you have any questions, please contact me on 301-492-3667 (e-mail: <u>Cindy.Bladey@nrc.gov</u>) or Leslie Terry on 301-492-3679 (e-mail: <u>Leslie,Terry@nrc.gov</u>).

Sincerely,

Cindy Bladey, Chief Rules, Announcements, and Directives Branch Division of Administrative Services Office of Administration

http://us.mc1620.mail.yahoo.com/mc/showMessage?sMid=49&fid=%2540S%2540Sea... 9/13/2011



Rulemaking on behalf of intervenors in Davis-Besse OL extension and Fermi 3 COL

Thursday, August 11, 2011 11:28 PM

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From: "Terry Lodge" <tjlodge50@yahoo.com>

- To: rulemaking.comments@nrc.gov
- Bcc: "Kevin Kamps" <kevin@beyondnuclear.org>, "Thomas Keegan" <mkeeganj@comcast.net> 2 Files (462KB)

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Genesky, Donielle

| From: | Kevin Kamps <kevin@beyondnuclear.org></kevin@beyondnuclear.org> | | |
|--------------|--|--|--|
| Sent: | Friday, January 23, 2015 9:28 PM | | |
| То: | Puco Docketing | | |
| Subject: | OPPOSITION COMMENT UNDER CASE # 14-1297-EL-SSO: (#5) Cracking-Related Safety | | |
| - | Contentions in Opposition to Risky Davis-Besse 20-Year Licence Extension. | | |
| Attachments: | FINAL Contention 5 Cracking January 10 2012.pdf | | |

OPPOSITION COMMENT UNDER CASE # 14-1297-EL-SSO: (#5) Cracking-Related Safety Contentions in Opposition to Risky Davis-Besse 20-Year Licence Extension.

Dear Public Utilities Commission of Ohio,

I have sent four previous emailed submissions re: Davis-Besse, vis a vis this proceeding.

I am now submitting for the record of this proceeding, our first Davis-Besse Shield Building concrete containment cracking related contention, titled MOTION FOR ADMISSION OF CONTENTION NO. 5 ON SHIELD BUILDING CRACKING, dated Jan. 10, 2012.

This document is posted online at <u>http://www.beyondnuclear.org/storage/Davis-Besse_Contention_5_Cracked_Shield_Building1.pdf</u>.

This document is also attached.

Our environmental coalition intervening against Davis-Besse's 20-year license extension includes: Beyond Nuclear; Citizen Environment Alliance of Southwestern Ontario; Don't Waste Michigan; and Green Party of Ohio.

Bowling Green, OH resident Phyllis Oster, a member of Beyond Nuclear, provides Beyond Nuclear standing in the Davis-Besse License Renewal Application proceeding.

Our legal counsel is Terry Lodge of Toledo, OH.

Given the catastrophic risks associated with Davis-Besse's severely cracked, and worsening, concrete containment Shield Building, we urge that PUCO not approve FENOC's request for a massive ratepayer bailout.

Thank you.

Sincerely,

Kevin Kamps, Beyond Nuclear

Kevin Kamps Radioactive Waste Watchdog Beyond Nuclear 6930 Carroll Avenue, Suite 400 Takoma Park, Maryland 20912 Office: (301) 270-2209 ext. 1 Cell: (240) 462-3216 Fax: (301) 270-4000 <u>kevin@beyondnuclear.org</u> <u>www.beyondnuclear.org</u>

Beyond Nuclear aims to educate and activate the public about the connections between nuclear power and nuclear weapons and the need to abandon both to safeguard our future. Beyond Nuclear advocates for an energy future that is sustainable, benign and democratic.

UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

| In the Matter of |) | |
|---|---|----------------------|
| | | Docket No. 50-346-LR |
| First Energy Nuclear Operating Company |) | |
| (Davis-Besse Nuclear Power Station, Unit 1) | - | January 10, 2011 |
| , |) | • |
| Regarding the Renewal of Facility | - | |
| Operating License NPF-003 for a 20-Year |) | |
| Period | | |
| |) | |
| | , | |
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<u>MOTION FOR ADMISSION OF CONTENTION NO. 5</u> <u>ON SHIELD BUILDING CRACKING</u>

*

Now come Beyond Nuclear, Citizens Environment Alliance of Southwestern Ontario (CEA), Don't Waste Michigan, and the Green Party of Ohio (collectively, Intervenors), by and through counsel, and move for the admission of a new Contention No. 5 related to the recently-discovered cracking phenomena involving the Davis-Besse reactor shield building.

Introduction

In the past 110 days, so-called "hairline" and other cracks in the concrete walls of the reactor shield building ("shield building") at Davis-Besse Nuclear Power Station, Unit 1 ("Davis-Besse"), have been identified and have prompted utility and NRC concern. One or more of the cracks, which are believed to have appeared in about the past nine (9) years, is acknowledged by First Energy Nuclear Operating Company ("FENOC") to be about 225 feet in length, running vertically to the top of the reactor shield building. As detailed below, recent information concerning the cracking phenomena that have just occurred and/or might be

continuing to occur warrant consideration of this development within the pending license renewal case. In light of the law as discussed in Parts I, II and III below, and the facts, as delineated in Part IV below, the cracking should be considered as an aging feature at Davis-Besse, which requires explicit plans for remediation and management. Further, the cracking should be analyzed within the forthcoming Supplemental Environmental Impact Statement for the plant.

I. The Shield Structure Is A Feature Requiring Aging-Management Review Of The Cracking Problem Must Be Addressed As Part Of The License Extension Determination

The Davis-Besse reactor shield building constitutes a "system [or] structure ... as delineated in [10 C.F.R.] §54.4. .. subject to an aging management review" because it "perform[s] an intended function ... without moving parts ... [and includes] the containment [and] containment liner. ..." 10 C.F.R. §54.21(a)(1).

The shield building and the steel liner within it are among those "[p]lant systems, structures, and components" which are "[s]afety-related systems [and] structures ... which are . .. relied upon to remain functional during and following design-basis events (as defined in 10 CFR 50.49 (b)(1)) to ensure the following functions - (i) The integrity of the reactor coolant pressure boundary; (ii) The capability to shut down the reactor and maintain it in a safe shutdown condition; or (iii) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in §50.34(a)(1), §50.67(b) (2), or §100.11 of this chapter, as applicable." 10 C.F.R. §54.4(a)(1).

The aging of materials is important during the period of extended operation, since certain components may have been designed upon an assumed service life of forty years. Florida Power & Light Co. (Turkey Point Nuclear Generating Plant, Units 3 & 4), CLI-01-17, 54 NRC 3, 7

(2001). Entergy Nuclear Generation Co. And Entergy Nuclear Operations, Inc. (Pilgrim Nuclear Power Station), LBP-06-24, 64 NRC 257, 276 (2006). Part 54 requires license renewal applicants to demonstrate how they will manage the effects of aging during the period of extended operation. *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 & 4), CLI-01-17, 54 NRC 3, 8 (2001). Applicants must demonstrate how their programs will manage the effects of aging in a detailed manner with respect to specific components and structures, rather than at a more generalized system level. *Entergy Nuclear Generation Co. And Entergy Nuclear Operations, Inc.* Supra at 64 NRC 275.

Sections 54.21 and 54.29 require that license renewal applications demonstrate by a preponderance of the evidence that aging management programs provide reasonable assurance that SSCs will continue to perform their intended functions consistent with the current licensing basis during the period of extended operation. Whether the reasonable assurance is met will be determined on a case-by-case basis using sound technical judgment. Reasonable assurance "is not susceptible to formalistic quantification (i.e., 95% confidence) or mechanistic application." *AmerGen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), LBP-07-17, 66 NRC 327, 340 (2007), aff'd CLI-09-07, 69 NRC 235 (2009)

II. Implications Of The Shield Building's Cracking Phenomena Must Be Analyzed Within the Supplemental Environmental Impact Statement

The National Environmental Policy Act (NEPA) requires disclosure of environmental impact assumptions and the basis for agency decisions in license renewal requests. In an attempt to fulfill its NEPA obligations, FirstEnergy Nuclear Operating Company (hereafter, FENOC) has prepared an Environmental Report (hereafter ER). The NRC later will publish a Supplemental Environmental Impact Statement (hereafter SEIS) based in part on FENOC's ER. The presumption is that agencies will adequately study the environmental issues which are engendered by the undertaking. *Crounse Corp. v. Interstate Commerce Comm'n*, 781 F.2d 1176 (6th Cir. 1986). The harm is complete when an agency makes a decision without sufficiently considering information NEPA requires be placed before the decision-maker and public. *Sierra Club v. Marsh*, 872 F.2d 497, 500 (1st Cir. 1989). The injury of an increased risk of harm due to an agency's uninformed decision is precisely the type of injury {NEPA} was designed to prevent." *Comm. to Save the Rio Hondo v. Lucero*, 102 F.3d 445, 448-49 (10th Cir. 1996).

The scope of the environmental review is defined by 10 C.F.R. Part 51, the NRC's "Generic Environmental Impact Statement [GEIS] for License Renewal of Nuclear Plants" (NUREG 1437 (May 1996)), and the initial hearing notice and order. *See, e.g., Vermont Yankee*, 2006 NRC Lexis 201 (ASLB 9/22/2006). The GEIS may, *prima facie*, place some environmental issues that might otherwise be germane in a license renewal proceeding "beyond the scope of a license renewal hearing." *Matter of Florida Power & Light Co.* (Turkey Point Nuclear Power Plant), CLI-01-17, 54 NRC 3, 15 (7/19/2001). These "Category 1" issues, which are classified in 10 C.F.R. Part 51, Subpart A, Appendix B, may nonetheless be raised when a petitioner demonstrates that "there is new and significant information subsequent to the preparation of the GEIS regarding the environmental impacts of license renewal." See *Turkey Point*, 54 NRC at 10-12; *see also* 10 C.F.R. § 51.53(c)(3)(iv) (new and significant information).

NEPA imposes continuing obligations on the NRC following completion of an environmental analysis. An agency that receives new and significant information casting doubt upon a previous environmental analysis must reevaluate the prior analysis. *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 374 (1989). This requirement is codified in NRC regulations at 10 C.F.R. §51.92(a). The NRC's license renewal application regulations also contain this obligation. 10 C.F.R. §51.53(c)(3)(iv) (ER must contain "any new and significant information regarding the environmental impacts of license renewal of which the applicant is aware"). The Commission has concluded that this applicant obligation extends to new and significant information even when such information pertains to a Category 1 issue. *See Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-02-14, 55 NRC 278, 290 (2002). In *Vermont Yankee*, 50-271-LR (9/22/2006) at

17-27, the Commission recognized:

... that even generic findings sometimes need revisiting in particular contexts. Our rules thus provide a number of opportunities for individuals to alert the Commission to new and significant information that might render a generic finding invalid, either with respect to all nuclear power plants or for one plant in particular. In the hearing process, for example, petitioners with new information showing that a generic rule would not serve its purpose at a particular plant may seek a waiver of the rule. See 10 C.F.R. § 2.758; see also note 3, *supra*, and accompanying text. Petitioners with evidence that a generic finding is incorrect for all plants may petition the Commission to initiate a fresh rulemaking. See 10 C.F.R. §2.802. Such petitioners may also use the Supplemental Environmental Impact Study (SEIS) notice-and-comment process to ask the NRC to forgo use of the suspect generic finding and to suspend license renewal proceedings, pending a rulemaking or updating of the GEIS. See 61 Fed. Reg. at 28,470; GEIS at 1-10 to 1-11.

With respect to the issues in Appendix B, Category 2 issues, (1) the applicant must make

a plant-specific analysis of environmental impacts in its Environmental Report, 10 C.F.R.

§51.53(c)(3)(ii), and (2) NRC Staff must prepare a Supplemental Environmental Impact

Statement (SEIS), id. § 51.95(c). Contentions implicating Category 2 issues ordinarily are

deemed to be within the scope of license renewal proceedings. See Turkey Point, 54 NRC at 11-

13; Matter of Amergen Energy Co. (Oyster Creek), 50-0219-LP, 2006 NRC Lexis 195 (Feb. 27,

2006).

According to 10 C.F.R. §51.53(c)(2), at the operating license stage, FENOC's

Environmental Report "must contain . . . (2) The report must contain a description of the proposed action, including the applicant's plans to modify the facility or its administrative control procedures" and "describe in detail the modifications directly affecting the environment or affecting plant effluents that affect the environment." Despite the "small" significance assigned to Category 1 "Postulated Accidents" at 10 C.F.R. Part 51, Subpart A, Appendix B, Intervenors contend that the rather unique cracking phenomenon at Davis-Besse suggests that this generic finding is inapplicable in this instance. Similarly, the potential for severe accidents might be implicated were the cracking to be accepted without any repair or other mitigation, such as replacement of the entire shield building. According to NRC interpretation, the analysis in the Generic Environmental Impact Statement for Category 2 "Severe Accidents" "has shown that one or more of the criteria of Category 1 cannot be met, and therefore additional plant-specific review is required."

The environmental review mandated by NEPA is subject to a rule of reason. While it need not include all theoretically possible environmental effects arising out of an action, it draws direct support from the judicial interpretation of the statutory command that the NRC is obliged to make reasonable forecasts of the future. *Northern States Power Co.* (Prairie Island Nuclear Generating Plant, Units 1 & 2), ALAB-455, 7 NRC 41, 48, 49 (1978); Hydro Res., Inc., LBP-04-23, 60 NRC 441, 447 (2004), *review declined*, CLI-04-39, 60 NRC 657 (2004).

III. Contention Admissibility Standards

Contention No. 5 is new, being filed in response to fast-emerging developments following discovery of cracking in the reactor shield building at Davis-Besse. The requirements for determining the timeliness of a new contention are set forth in 10 C.F.R. §2.309(f)(2), but 10 C.F.R. §2.309(c) is also potentially relevant given that it provides criteria for boards to apply in

-6-

deciding whether to admit "nontimely filings."

Section 2.309(f)(2) allows a new contention to be filed after the initial docketing with leave of the presiding officer upon a showing that (i) The information upon which the amended or new contention is based was not previously available; (ii) The information upon which the amended or new contention is based is materially different than information previously available; and (iii) The amended or new contention has been submitted in a timely fashion based on the availability of the subsequent information.

The regulations do not define or specify an exact number of days within which a new or amended contention must be filed in order to be considered "timely." Accordingly, unless a deadline has been specified in the scheduling order for the proceeding, the determination of timeliness is subject to a reasonableness standard that depends on the facts and circumstances of each situation. *Entergy Nuclear Vt. Yankee, LLC* (Vermont Yankee Nuclear Power Station), LBP-07-15, 66 NRC 261, 266 n.11 (2007). If the filing of a proposed new contention is not authorized by either alternative in §2.309(f)(2), then it may be evaluated under §2.309(c). Even if a petitioner is unable to show that the NRC Staff's NEPA document differs significantly from the ER, it "may still be able to meet the late filed contention requirements." *Sacramento Mun. Util. Dist.* (Rancho Seco Nuclear Generating Station), CLI-93-12, 37 NRC 355, 363 (1993).Similarly, if a contention based on new information fails to satisfy the three-part test of §2.309(f)(2)(i)–(iii), it may be evaluated under §2.309.

Section 2.309(c)(1) includes eight factors that boards must balance in evaluating nontimely intervention petitions, hearing requests, and contentions.¹ In *Crow Butte Res., Inc.*

¹The factors are: (i) Good cause, if any, for the failure to file on time; (ii) The nature of the [petitioner's] right under the Act to be made a party to the proceeding; (iii) The nature and extent of the

(North Trend Expansion Area), CLI-09-12, 69 NRC 535, 549 (2009), the Commission upheld the Licensing Board's finding that the petitioner demonstrated "good cause" for its late filing. The Commission affirmed that ""[g]ood cause' is the most significant of the late-filing factors set out at 10 C.F.R. § 2.309(c)." *Id.* at 549 n.61. If good cause is not shown, the board may still permit the late filing, but the petitioner must make a strong showing on the other factors. *See Pac. Gas and Elec. Co.* (Diablo Canyon Power Plant Independent Spent Fuel Storage Installation), CLI-08-1, 67 NRC 1, 5–8 (2008).

Intervenors assert that their bringing of this contention is timely. It is based on structural damage - cracks - which were noticed by FENOC's contractors or employees in September 2011 and soon reported to the NRC. The NRC initially kept the plant shut down for analytical work, but in early December 2011 allowed Davis-Besse to resume power generation. The NRC presently has established a February 28, 2012 deadline for provision by FENOC of a "root cause analysis" and further actions by regulator and utility. Only on January 5, 2012 was the public told by NRC Region III staff at a presentation convened at Camp Perry near the Davis-Besse plant that one or more cracks extended the full 225-foot height of the reactor shield building, that those cracks were numerous, and that the cracks were not confined to the architecturally "decorative" elements of the building (contrary to FENOC's repeated statements in the media throughout October, November and December 2011).

Moreover, the SDEIS for Davis-Besse has not yet been issued (although issuance may be

[[]petitioner's] property, financial or other interest in the proceeding; (iv) The possible effect of any order that may be entered in the proceeding on the [petitioner's] interest; (v) The availability of other means whereby the [petitioner's] interest will be protected; (vi) The extent to which the [petitioner's] interests will be represented by existing parties; (vii) The extent to which the [petitioner's] participation will broaden the issues or delay the proceeding; and (viii) The extent to which the [petitioner's] participation may reasonably be expected to assist in developing a sound record.

imminent). Hence by bringing this contention now, Intervenors are avoiding the procedural peril of sitting-and-waiting while in possession of information that should be included and analyzed in the NEPA document in this proceeding. *Cf. Private Fuel Storage*, LLC, LBP-00-27, 52 NRC at 223 (2000); *La. Energy Servs.*, *L.P.* (Claiborne Enrichement Center), LBP-94-11, 39 NRC 205, 212 (1994). And so far as Intervenors can tell at this juncture, the Davis-Besse ER does not address admitted cracking to the reactor shield building.

Contention No. 5 could not have been filed in December 2010, at the time Intervenors first petitioned to participate in this proceeding, because the contention is based entirely upon information and events that post-date the intervention petition. Analysis under § 2.309(f)(2)(i-iii) is to be conducted in the same manner as analysis under § 2.309(f)(2) of new or amended contentions based upon new information from Staff-created NEPA documents. Therefore, the new information must be materially different from the information that was previously available, and the ordinary contention admissibility criteria of § 2.309(f)(1) must be satisfied as well. *Exelon Generation Co.* (Early Site Permit for Clinton ESP Site), LBP-05-19, 62 NRC 134, 160-61 (2005).

An admissible contention under 10 C.F.R. §2.309(f)(1)(i)-(vi) must: (i) provide a specific statement of the issue of law or fact to be raised; (ii) provide a brief explanation of the basis for the contention; (iii) demonstrate that the issue raised is within the proceeding's scope; (iv) demonstrate that the issue raised 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, including references to specific sources and documents, that support the petitioner's position and upon which the petitioner intends to rely at hearing; and (vi) show that a genuine dispute exists on a material issue.

-9-

A petitioner does not have to prove its contentions at the admissibility stage. *Private Fuel* Storage, L.L.C. (Independent Spent Fuel Storage Installation), CLI-04-22, 60 NRC 125, 139 (2004). The factual support required is "a minimal showing that material facts are in dispute." All that is needed at this juncture is "alleged facts" and the factual support "need not be in affidavit or formal evidentiary form and need not be of the quality necessary to withstand a summary disposition motion." *First Energy Nuclear Operating Company* (Davis-Besse Nuclear Power Station, Unit 1), ASLBP No. 11-907-01-LR-BD01, LBP-11-13 at 17 (April 26, 2011) (slip op.).

The extensive factual recitation below will establish that a genuine dispute exists on an issue material to the license extension decision for Davis-Besse. The cracking and cracking-related phenomena raise valid aging-management and NEPA issues within the scope of this proceeding which must be addressed as part of the assurances the NRC is obliged to give concerning operational, safety and environmental obligations surrounding the re-licensing determination. Because all of the criteria for admissibility are present, Contention No. 5 is timely brought to this panel and should be admitted.

IV. Evidence in Support of Contention

In support of their Motion, Intervenors further state as follows:

 Intervenors were accorded representational standing by the Atomic Safety and Licensing Board in a Memorandum and Order issued earlier in this case. *FirstEnergy Nuclear Operating Company* (Davis-Besse Nuclear Power Station, Unit 1) LBP-11-13 at 30 (slip op.).

2. Intervenors propose the following new Contention No. 5:

Contention 5: Cracked Shield Building/Secondary Reactor Radiological Containment Structure Interveners contend that FirstEnergy's recently-discovered, extensive cracking of unknown origin in the Davis-Besse shield building/secondary reactor radiological containment structure is an aging-related feature of the plant, the condition of which precludes safe operation of the atomic reactor beyond 2017 for any period of time, let alone the proposed 20-year license period.

3. Intervenors state that there is a likelihood that the risks presented by the current cracks will only increase in the next few years. In addition to age-related worsening of the cracks already present, FENOC plans to perform a steam generator replacement in 2014 at Davis-Besse, as documented in its revised Environmental Report (ER). This will increase the risk that Davis-Besse's concrete shield building/secondary reactor containment structure will be subjected to new stresses and will display additional cracking and consequently will not adequately perform its safety- and security-related functions. Yet another hole will have to be cut into shield building structure to remove the radioactive large nuclear components (used, radioactive, dangerously degraded steam generators), and replace them with new large nuclear components (new steam generators).

4. FENOC describes its plans for the 2014 steam generator replacement as follows:

To perform the steam generator replacement, FENOC plans for a temporary construction opening approximately 24 feet wide by 39 feet high to be created in the Shield Building and freestanding Containment Vessel. The Shield Building is composed of reinforced concrete walls approximately two and one-half feet thick, and the free standing Containment Vessel is approximately 1.5 inches thick steel. The process of creating the opening would include activities such as removing concrete, cutting rebar, and cutting and removing a section of the steel Con-tainment Vessel. A hydro-demolition (high pressure water) process or other mechanical methods are being considered to remove the Shield Building concrete, and mechanical methods are being considered to cut the Containment Vessel opening. After installation of the new steam genera-tors, the openings would be sealed and the Containment Vessel and Shield Building returned to their original configurations and integrity.

Source: FENOC's revised Davis-Besse Environmental Report, pp. 3.2-1 thru 3.2-4.

5. This will be the *fourth* time that Davis-Besse's concrete shield building/secondary

reactor radiological containment structure will have been cut open, in order to remove large, used, degraded, radioactive nuclear components, and to replace them with new large nuclear components: a breach in the year 1970 (53 feet by 46 feet 6 inches in size); two reactor lid replacements (the first a decade ago, in 2002, the opening 23 feet 6 inches by 18 feet six inches in size; the second very recently, in late 2011, between October and December, 26 feet 3 inches by 35 feet 6 inches in size); and one replacement of steam generators, scheduled for 2014, that will necessitate yet another large breach in the concrete shield building. The first three breaches of the concrete shield building are documented on Slide #18, page 9, of the hardcopy handout entitled "Davis-Besse Nuclear Power Station, Nuclear Regulatory Commission, Public Meeting, January 5, 2012, NRC Informational Presentation," presented by Barry Allen (FENOC Site Vice President – Davis-Besse), Brian Boles (FENOC Director – Site Operations), and Ken Byrd (Director – Site Engineering) at Camp Perry in Port Clinton, Ohio. [posted online at http://www.beyondnuclear.org/storage/FENOC%20Slide%20Show%20January%205%2020121. pdf]

6. There might even be cause for one or more additional cuts into the shield building. As has been shown at the Palisades atomic reactor, a single replacement of steam generators was not enough. Palisades' previous owner, Consumers Power, admitted as long ago as spring, 2006 that Palisades atomic reactor needed a *second* steam generator replacement (although current owner Entergy has not done this over the past six years). [This is documented by Consumers Energy's briefing to State of Michigan regulators (the Michigan Public Service Commission) regarding its intention to sell the Palisades reactor as quickly as possible, revealing important problems

afflicting the plant, Slide 2 ("page 2"), May 10, 2006, posted online at http://www.nirs.org/reactorwatch/licensing/kampsconsbrifeinf051806.htm]

7. Considering FENOC's request to extend Davis-Besse operation for 20 years beyond 2017, it is conceivable that FENOC very well may need to replace its steam generators *yet again* after 2014. That would be the *fifth time* that there was a necessary cut through the reinforced concrete of the shield building, risking further contributions to the cracking.

8. Events unfolded rapidly after the shield building cracking was first publicly announced in fall 2011 by FirstEnergy and NRC. FENOC shut down Davis-Besse on October 1, 2011, in order to replace the reactor lid (for the second time in the past decade), reported in the Toledo Blade: [http://www.toledoblade.com/local/2011/09/30/Davis-Besse-to-shut-down-forreplace-vesselhead.html]. On October 10, 2011, while cutting a large hole (22 feet by 33 feet, according to the Cleveland Plain Dealer on October 12, 2011 [http://www.cleveland.com/bu siness/index.ssf/2011/10/nrc firstenergy_concerned_abou.html], but 26 feet 3 inches by 35 feet 6 inches, according to FENOC's own Jan. 5, 2011 slide show presentation at Camp Perry, cited above) in the shield building/secondary concrete containment structure so the large, radioactive nuclear component (the reactor's second, degraded lid, installed less than 10 years ago, between 2002 and 2004) could be removed, and replaced with a new large nuclear component (the reactor's third lid in a decade, manufactured by Areva of France, reportedly weighing 82 tons, measuring 17 feet in diameter and 8 feet high), subcontractors from Bechtel and Sargent & Lundy discovered cracks in the concrete shield building/secondary reactor radiological containment structure wall. A 30-foot-long crack, initially described by FENOC as "barely visible," or "hairline," was described as running parallel to and being closely associated with the

steel rebar of the shield building.[http://www.toledobla

de.com/Energy/2011/10/14/First-Energy-NRC-eye-hairline-crack-at- Davis-Besse.html]

9. In the *Toledo Blade*'s coverage, a FirstEnergy spokeswoman said the cause of the cracks was under investigation. She admitted that it was not clear whether the cracks had been there previously, or had been caused by the current cutting operation to make the hole in the shield building for the reactor lid transplant. Such questions and mysteries linger to the present day, and despite the unanswered questions, NRC has allowed the reactor to re-start.

10. In the Cleveland Plain Dealer article cited above, it was reported:

The significance of the crack is not clear at this point, NRC spokeswoman Viktoria Mytling said. "We will review what the company and its engineers find, and we are doing our own independent assessment," she said. *"We will have to resolve this issue before they re-start the reactor."*

(Emphasis added). However, NRC's "independent assessment" and "review" have proven to be woefully inadequate and NRC has allowed the reactor to re-start.

11. On October 14, 2011 the same FENOC spokeswoman cited above assured the Toledo

Blade that "We will make sure we fully understand the issue before we re-start the plant."

[http://www.toledoblade.com/news/2011/10/14/Crack-in-Davis-Besse-shield-buildingcontinues.

html] (Emphasis added). But even as of the date of this Contention filing in January 2012, neither

FENOC nor NRC "fully understand the issue," and yet FENOC has chosen to re-start Davis-Besse,

with NRC's blessing.

12. As reported by the *Toledo Blade* on October 20, 2011:

Utility experts "are performing a methodical, thorough evaluation" to determine the cause and extent of the crack to recommend a response, spokesman Jennifer Young said. "Those suggesting the Shield Building indication is cause for shutting down Davis-Besse clearly are doing so without having the facts around the issue," Ms. Young said. "Our assessment of the [crack] indication continues and the team has arrived at no conclusions at this time."

Ms. Young denied an assertion from Mr. Lodge, the attorney for four groups opposing the plant's license renewal, that multiple "micro-cracks" have been identified in the concrete structure, which the utility calls the Shield Building but is also referred to as an outer containment structure.

One "barely visible, crack-like indication" runs vertically along reinforcing steel near the building's surface and "veers a bit horizontally" near the top of an opening that a FirstEnergy contractor cut in the concrete Oct. 10, Ms. Young said.

A FirstEnergy contractor used hydro-demolition — high-pressure water jets — to make the opening through which the replacement reactor head is to be passed into the reactor chamber. A matching hole in the plant's steel containment building, inside the concrete, remains to be cut "in the next several days," the spokesman said....

"FirstEnergy and Davis-Besse place the highest value on safety, and we will have a full understanding of this indication, its implications, and actions we must take — if any — before the end of our scheduled outage," Ms. Young said.

(Emphases added). [http://www.toledoblade.com/Energy/2011/10/20/Activists-seek-city-

opposition-to-renewinglicense-for-Besse.html]. But it appears that any "methodical, thorough

evaluation' to determine the cause and extent of the crack to recommend a response," if

performed at all, has been largely to entirely withheld from public view, undermining rather than

assuring public confidence. Ms. Young of FENOC's assertion that the Intervenors' assertions of

"multiple 'micro-cracks'" in the shield building was mistaken, and that a single "barely visible,

crack-like indication" described the full extent of the problem, was itself mistaken, as FENOC

itself has been forced to admit. And Ms. Young's insistence that the utility "place[s] the highest

value on safety, and we will have a full understanding of this indication, its implications, and

actions we must take . . . before the end of our scheduled outage" has been belied by FirstEn-

ergy's rush to re-start Davis-Besse despite the lack of a full understanding of the extent, cause, or

safety significance of the cracking, or of mitigating actions that should be taken, all blessed by

the NRC.

13. Also on October 20, 2011, the NRC published its "Preliminary Notification of Event

or Unusual Occurrence - PNO-III-11-014" on "Davis-Besse Shield Building Indications." The

PNO reported information "current as of October 19, 2011 at 4:30 p.m. (EDT)." [ADAMS

Accession Number: ML11293A092.] NRC states in the PNO: "If there are any challenges

identified to the design function of the shield building they will have to be resolved before the

plant restarts." (Emphasis added). [http://www.beyondnuclear.org/storage/PNO%2010%2020%

202011%20Davis-Besse%20Shiled%20Building%20issue1.pdf]. From what little information

the public has been provided thus far, NRC's supposedly independent assessment of the safety

significance of the cracking appears to be woefully inadequate.

14. On October 21, 2011, the Toledo Blade reported about the PNO's publication:

Jennifer Young, a FirstEnergy spokesman, said such further investigation is under way. "The team is taking additional concrete samples in the area of the micro-crack indication and utilizing electronic testing to determine the depth of the indication," she said in a prepared statement. But the only crack discovered so far is in a "decorative architectural façade section of the building, which extends 18 inches from the main cylindrical portion of the building, giving it a scalloped look rather than a flat, round appearance."

That decorative façade is in addition to the 2-1/2 feet of reinforced concrete that surrounds the reactor's steel containment building, said Prema Chandrathil, an NRC spokesman in Chicago. So far, Ms. Chandrathil said, there is no evidence of any trouble with that structural concrete, described variously as the Shield Building — to protect the steel building from outside forces — or as an outer containment building to back up the steel structure.

"We have to understand how this happened and the full extent of it," she said. "At this point it appears to be in the architectural concrete."

...Dave Lochbaum, director of the Nuclear Safety Project at the Union of Concerned Scientists, said he *thought it odd that the access hole for installing the new reactor head would go through an area with decorative concrete*, unless there was no alternative, but approved of how the problem is being handled.

"They have to see if this is the only crack, or if it is the tip of the iceberg," Mr. Lochbaum said Friday. "They're right to do their homework."

(Emphases added).

15. As foreshadowed by Mr. Lochbaum's observation, evidence has appeared that indicates

the cracking actually involves not only 15 of 16 "architectural concrete" structures, but also of an inextricably intertwined relationship between those architectural structures and the rest of the concrete shield building itself. Mr. Lochbaum's expectation that FENOC and NRC were "do[ing] their homework" appears to have been dashed by a rush to re-start and a postponement, of the commitment to resolve significant safety-related questions until weeks, months, or even longer into the future, while letting the reactor re-start in the meantime. Despite its assurances, NRC did *not* require a full understanding of "how this happened and the full extent of it" before blessing FENOC's hasty re-start of Davis-Besse. (However, as indicated in paragraph 18 below, FENOC itself admitted additional cracks in *structural* parts of the concrete shield building, in a letter to investors on October 31, 2011.)

16. This wouldn't be the first time for such behavior devoid of "safety culture" at Davis-Besse. Nine years ago, NRC's Office of Inspector General, in the aftermath of the 2002 Davis-Besse Hole-in-the-Head Fiasco, reported that NRC itself – not only FENOC – had placed profits over safety, allowing the reactor pressure vessel lid to come within weeks, or even days, of rupturing due to deep corrosion. Had the lid breached, a "Loss-of-Coolant-Accident" or "LOCA" would have resulted, very possibly followed by a core melt down, and potentially a catastrophic radioactivity release into the environment. Speaking about the 2002 Davis-Besse reactor lid corrosion debacle, U.S. Representative Dennis Kucinich (Democrat-Ohio) said at a December 14, 2011 hearing of the U.S. House Oversight and Government Reform Committee,

The Government Accountability Office later called it "the most serious safety issue confronting the nation's commercial nuclear power industry since Three Mile Island." The Department of Justice said that FirstEnergy admitted that they "knowingly made false representations to the Nuclear Regulatory Commission (NRC) in the course of attempting to persuade the NRC that its Davis-Besse Nuclear Power Station was safe to operate beyond December 31, 2001."

[http://kucinich.house.gov/News/DocumentSingle.aspx?DocumentID=272516]. In an editorial published on October 12, 2011 – just two days after Bechtel and Sargent & Lundy subcontractors discovered the shield building cracking, but still before it had been revealed to the public and the media – the *Toledo Blade* ran an editorial entitled "Nuclear watchdog needed." They wrote: "The 2002 reactor-head event cost FirstEnergy a record \$33.5 million in fines for lying to the government. The former head of the U.S. Department of Justice's environmental crimes unit declared FirstEnergy showed 'brazen arrogance' and 'breached the public trust." [http://www.toledoblade.com/Editorials/2011/10/12/Nuclear-watchdogneeded.html].

17. Despite lessons that should have been learned, and despite assurances from within NRC and FENOC over the past decade, including that "safety culture" has been strengthened, and safety returned to its top priority status, NRC and FENOC's current actions belie their verbal assurances, and hark back to the "profit over safety" days of the Hole-in-the-Head debacle. The cracking phenomena suggest another round of "Radioactive Russian Roulette" at Davis-Besse. See the Beyond Nuclear backgrounder by that same title, posted online at http://www.beyondnuc lear.org/storage/Davis Besse Backgrounder.pdf

18. On November 1, 2011, the *Toledo Blade* reported:

More cracks were found in the concrete "shield building" at the Davis-Besse Nuclear Generating Station, including two areas of subsurface cracks "not associated" with cracks in the structure's architectural features, FirstEnergy said Monday in a letter to investors. The newly-discovered "indications" of cracks were identified during electronic testing and concrete sampling stemming from an initial discovery of a 30-foot hairline crack in the shield building that appeared after utility contractors cut a hole through its concrete for access to install a new reactor head. Davis-Besse has been shut down since Oct. 1 for that procedure.

The testing has revealed "similar subsurface hairline cracks in most of the building's architectural elements," which protrude up to 18 inches beyond the main structure of $2\frac{1}{2}$ -foot-thick reinforced concrete, according to the letter. But the two areas of sub-surface cracking deemed "not associated" with that cracking are being

investigated "as a separate issue," the letter said.

[http://www.toledoblade.com/Energy/2011/11/01/More-cracks-are-found-in-Davis-Bessebuildin g.html]. Hence the early assurances by FENOC and NRC spokespeople, implying that the cracking was superficial, cosmetic, non-structural, etc. have been admitted to be false by FENOC itself in a letter to its own shareholders, as reported above. Reinforcing years of incredulity respecting FENOC's statements for public consumption, the company manipulates pronounce-ments about an issue of potentially serious safety significance in its pursuit of a 20-year license extension.

19. On November 4, 2011, David Lochbaum, Director of the Nuclear Safety Project at

the Union of Concerned Scientists, wrote a "Conditional Allegation - Shield Building Design at

Davis-Besse" to Cynthia Pederson, Regional Administrator (Acting), U.S. Nuclear Regulatory

Commission Region III, in Lisle, IL. [posted online at http://www.beyondnuclear.org/stora-

ge/20111104-db-ucs-nrc-shield-bldg1.pdf]. Lochbaum stated:

The purpose of this letter is to ask questions concerning the design evaluation and analysis of the shield building at the Davis-Besse nuclear plant. However, if the NRC's processes cannot support answering these questions before the plant restarts, please treat them as allegations.

BACKGROUND

Updated Final Safety Analysis Report (UFSAR) section 3.8.2.2 summarizes the design and associated analyses for the shield building. UFSAR section 3.8.2.2.2 states that dead loads were considered in the shield building design. UFSAR section 3.8.2.2.4 states that the dead loads included concrete (143 pounds per square foot) and steel reinforcing (489 pounds per square foot). UFSAR section 3.8.2.3.7 states that "Cement for all concrete except the Shield Building is Type II low alkali cement...The Shield Building has Type I cement above grade." UFSAR Figure 3.8-3 (left [see original document, at link provided]) illustrates a typical section of the containment vessel and shield building.

The NRC's PNO-III-11-014 (ML11293A092) dated October 20, 2011 stated:

The reactor vessel closure head is bolted on top of the reactor vessel which is located inside a 1.5 inch thick steel containment vessel surrounded by a 2.5 foot thick freestanding, reinforced concrete, shield building. The majority of the shield building vertical exterior has additional nonstructural, architectural concrete up to 1.5 foot thick separated by grooves.

This plan diagram (overhead view [see original document]) of a section of the shield building wall shows the "nonstructural, architectural concrete" referred to in the NRC's PNO. As indicated by the two fishhook shaped devices in the drawing, the attachments are anchored to the shield building wall.

The media has reported that numerous cracks in the "non-structural, architectural concrete" have been identified. The NRC PNO stated "If there are any challenges identified to the design function of the shield building they will have to be resolved before the plant restarts."

QUESTIONS

1. The "non-structural, architectural concrete" elements do not appear in UFSAR Figure 3.8-3. The plan diagram indicates these elements are connected to the shield building wall. Are the dead loads from these concrete elements properly considered in the design analyses of the shield building?

2. The UFSAR does not explicitly describe these "non-structural, architectural concrete" elements. Thus, it is not clear if these elements have Type II concrete or Type I cement as explained in UFSAR section 3.8.2.3.7. What type of cement was used in the "nonstructural, architectural concrete?"

3. If the concrete/cement in the shield building is the same as that in the "nonstructural, architectural concrete" elements and all have the same age and environmental exposure history, would numerous cracks identified in one suggest comparable conditions in the other? If not, why not?

UCS realizes that UFSAR Figure 3.8-3 is a simplified drawing and the design analysts hopefully used the more detailed civil/structural arrangement drawings, but it is prudent to check to verify it. Recall that the NRC team conducting the design inspection at the DC Cook nuclear plant in summer 1997 found that design analysts had failed to consider a wall inside containment that caused their calculations of water inventory available during the recirculation phase of an accident to be significantly nonconservative. Holes had to be cut through that wall to assure that adequate water inventory would be available.

UCS also understands that the numerous cracks, even if also within the shield building's walls, do not in themselves demonstrate that the design function has been compromised. But there's little reason that numerous cracking found in the "nonstructural, architectural concrete" would not also be found in the shield building concrete unless (a) a different type of concrete was used, or (b) no one looked at the shield building concrete.

CONDITIONAL ALLEGATIONS

UCS would prefer that the NRC answer the questions above before Davis-Besse restarts. But we realize that the NRC may lack the process and means to do so. If that is the case, please consider the following two items with the agency's allegations program:

1. The design evaluation and analysis for the shield building did not properly consider the dead load from the "non-structural, architectural concrete" attached to it.

2. The shield building wall was not sufficiently examined for indication of cracking.

Intervenors concur with the above questions and allegations posed by David Lochbaum,

and hereby incorporate them into the body of our contention.

20. On November 17, 2011, the Toledo Blade published an article entitled "Davis-Besse

to stay shut until probe ends." [http://www.toledoblade.com/Energy/2011/11/17/Davis-Besse-

tostay-shut-until-probe-ends.html] The article reports:

..."Until we have confidence that the cracks in the Shield Building don't have any safety implications, the plant won't go back online," Viktoria Mytling, spokesman at the NRC's regional office in Chicago, said...

Ms. Young [FENOC spokeswoman] said Wednesday the reactor head replacement had been completed and that the steel removed to create the access hole had been welded back into place and pressure tested. The shield building hole should be patched by week's end, she said.

Ms. Mytling said such patching would not affect the NRC investigation, and no timetable is in place for restarting the plant...

Those patches are, of course, weak spots themselves, both the welded area on the inner

steel containment, a mere 1.5 inches thick, as well as the "patched" area on the concrete shield

building/secondary reactor containment structure, a mere 2.5 feet thick. As explained below, on

January 4, 2012, David Lochbaum of UCS questioned whether the multiple holes cut in

containment, and thus the multiple "patches" applied afterwards, overlapped, and how so. The

"welds" on the inner steel container, and "repours" of concrete on the outer shield/secondary

containment building, are themselves weak spots – perhaps repeatedly so in spots that have been involved in more than one cut-through and repair. This is a safety-significant issue that will grow all the more so with age-related degradation, and the prospect for yet one more cut-through and "repair" (patch) for the 2014 steam generator replacement project. In fact, FENOC has answered Lochbaum's question about the overlap of the breaches. In its January 5, 2012 Camp Perry power point presentation cited previously, on Slide #18 (page 9 of the hardcopy handout), FENOC documents that indeed *all* of the first three breaches – 1970, 2002, and 2011 – have already overlapped, specifically in the top left-hand quadrant.

21. On November 19, 2011, the Toledo Blade reported that the hole cut for the lid

transplant would be sealed shut that day, and that FENOC predicted the reactor would be re-

started by the end of November:

A 12-hour concrete pour is scheduled for Saturday at the Davis-Besse nuclear power plant, closing a hole in the reactor's outer shield building cut last month for access to install a new reactor head, a FirstEnergy spokesman said Friday.

While declining to set a date when the utility plans to restart the plant, spokesman Jennifer Young said it remains on schedule to resume operation by the end of November, as forecast in a recent letter to FirstEnergy stockholders.

By then, Ms. Young said, FirstEnergy also expects to have closed its investigation into hairline cracks discovered in the shield building's reinforced concrete after the access hole was made.

FirstEnergy has submitted to the Nuclear Regulatory Commission its finding that the cracks are not a safety hazard, she said, and now is following up by submitting technical reports to the commission in response to its questions about the matter. "The cracks, as they are, do not impact the structural integrity of the building," Ms. Young said Friday. "There's plenty of margin in the building. It's a very, very robust building."

Viktoria Mytling, a spokesman at the NRC's regional office in Chicago, said that as matters stand, FirstEnergy is free to restart Davis-Besse when it considers the plant to be ready, since the regulatory agency has made no finding of any safety hazard there. "If the plant does restart while our review isn't done, and we subsequently identify a safety issue, they are legally required to shut the plant down to resolve the safety issue," Ms. Mytling said. "If we are conducting a review and have a specific safety concern the company needs to address, but they tell us they will restart the plant before providing us with answers we need to make sure the plant will operate safely, we can and would order
the plant to cease restart activities until they answer our questions."

The NRC could also order "compensatory actions" -- essentially, special conditions -- for a restart or continued operation if the agency were to declare a safety issue, Ms. Mytling said.

Ms. Young said FirstEnergy expects the "conversation" with the Nuclear Regulatory Commission to be concluded before the restart.

After the shield building concrete is poured, the spokesman said, it will take several days to harden. Other maintenance that has been under way since Davis-Besse shut down Oct. 1 for the reactor-head replacement also needs to be finished before the plant's restart, she said.

[http://www.toledoblade.com/local/2011/11/19/Nuclear-plant-to-close-hole-made-forrepairs. html].

22. Intervenors do not understand how FENOC and the NRC can claim that the cracks are not safety-significant. NRC does not plan to publish its independent analysis until January 16, 2012. NRC is not requiring FENOC to provide its final analysis until February 28, 2012. NRC staff has made Requests for Additional Information (RAIs) to FENOC as far back as May 2011, relating to age-related degradation management issues, which are broad enough in nature to include this concrete shield building cracking problem of yet-unexplained origin. On December 27, 2011, as will be shown, NRC's RAIs extended directly to aging management *vis-a-vis* cracking in the concrete shield building. Because FENOC's responses to date to NRC's RAIs have been inadequate, the NRC has had to repeat its "requests for additional information." NRC has also postponed its due dates for FENOC's responses, and currently has provided FENOC the slack to postpone RAI response dates further off into the future. This approach appears more attuned to an arbitrary outage schedule, with a speedy return to economically-profitable "production" rather than taking a conservative, analytical approach to determination of root causes, extent, and safety-significance of cracking in the shield building. Such an approach imperils Intervenors, the people they represent, and countless residents downwind and

downstream of the aged and aging Davis-Besse atomic reactor in the Great Lakes Basin.

23. Of additional concern is that the pour of new concrete to re-seal the shield building

foreclosed significant investigatory options for examination and further analysis of the cause,

extent, and significance of the cracks, such as direct visual examination, direct measurement,

direct sampling, etc. In effect, evidence of the cracking has been buried under inches or feet of

concrete, due to FENOC's rush to re-start, and NRC's letting them get away with it.

24. On November 20, 2011, U.S. Representative Dennis Kucinich published an op-ed

entitled "Time for truth about Davis-Besse" in the Toledo Blade, which stated:

It's time for FirstEnergy Corp. to tell Ohioans the truth about the Davis-Besse nuclear power plant.

Last month, FirstEnergy disclosed that workers who were replacing a deteriorating reactor head had found cracks in the concrete wall of the Davis-Besse shield building. FirstEnergy said they were "hairline" cracks, "barely visible" in an "architectural" or "decorative" section of the concrete. We were told that the shield building merely "provides protection from natural phenomena, including wind and tornados."

Later, though, it was revealed that these cracks ran for about 30 feet along the line of steel reinforcing rods in the wall. A photo of the wall posted on the U.S. Nuclear Regulatory Commission's Web site appears to show cracks that are not "hairline" and are clearly "visible." [this photo is still posted at NRC's website, at the following link: http://www.nrc.gov/images/reading-rm/photogallery/ 20111021-001.jpg]

This month, FirstEnergy acknowledged to investors that the wall of the shield building has many cracks. In fact, there are cracks in 15 out of 16 of what FirstEnergy calls "exterior architectural elements."

The shield building provides the primary defense for Davis-Besse's nuclear reactor against terrorist attacks. It offers secondary defense against the release of radiation in the event of a nuclear accident and a breach of the inner containment vessel.

The areas where most of the cracks have appeared have structural significance, and are not merely "architectural elements." A drawing provided by FirstEnergy - a cross-section of the wall where the cracks were discovered - shows that these areas have steel reinforcing rods within the concrete.

These rods are anchored into the wall in two places. They provide an anchor to the bands of steel rods that run around the circumference of the shield building wall, and also a perpendicular anchor through most of the thickness of the wall.

What FirstEnergy calls "architectural ... attachments" are an integral part of the shield building wall. The concrete they contain was poured at the same time as the rest of

the concrete in the wall.

We should expect that the same age-related deterioration that has occurred in this concrete would occur throughout the wall. That is exactly what FirstEnergy is discovering.

In its letter to investors, FirstEnergy revealed it has found subsurface cracks in other areas of the wall that it does not even try to claim are "architectural." We still have no idea how many other cracks there are in areas of the shield building that have not been tested.

Davis-Besse's reactor is aging. Its concrete is more than 34 years old. It is likely that more concrete will crack during the remaining six years of the plant's operating license, and even more if FirstEnergy gets the 20-year license extension it is seeking from the Nuclear Regulatory Commission.

It's time for FirstEnergy to tell the truth about Davis-Besse. It's time to release all the photos, all the test results, and all the reports. It's time to stop the spin and start full disclosure. Rather than risk the future of our region and the contamination of the Great Lakes, we must safeguard the public interest. We must insist that First Energy be honest and forthcoming about the serious defects in its reactor containment.

(Emphasis supplied). [http://www.toledoblade.com/Op-Ed-Columns/2011/11/20/Time-for-truth-

about-Davis-Besse.html].

25. Regarding accelerated breakdown phase problems, Rep. Kucinich said at a

December 14, 2011 hearing of the U.S. House Oversight and Government Reform Committee,

referring to analyses carried out in the aftermath of the 2002 Davis-Besse Hole-in-the-Head

fiasco, that:

FirstEnergy's insurance company became worried and commissioned an independent study to analyze the data from the incident. The study, which was released in April 2007, painted an even darker picture than the regulatory rebukes that came before it. The report found that corrosion of the steel plate happened at a faster rate than was reported by FirstEnergy, bringing the reactor closer to a catastrophic incident than had previously been reported.

(Emphasis added). [http://kucinich.house.gov/News/DocumentSingle.aspx?DocumentID=27

2516]. Such accelerating age-related degradation is entirely possible vis a vis the cracking of the

concrete shield building, too. If so, Davis-Besse's shield building cracking will become more

and more safety-significant with each passing year, especially during the extended operations

license. If the shield building loses its ability to perform its safety- and security-related functions, Davis-Besse should be immediately shut down, of course. But this very risk, the potential loss of shield building safety and security function over time, is exactly the kind of analysis that should be included in FENOC SAMA analyses regarding the Davis-Besse license extension. Such analyses have not been done. Similarly, the potential for Davis-Besse's cracked shield building to cause its early retirement, before its current license expiration in 2017, or before its extended 2037 license expiration proposed by FENOC, should be addressed by FENOC's reliability analyses, and its energy alternatives analyses. For, if Davis-Besse's days are numbered, due to its cracked shield building, then Intervenors' wind, solar, and compressed air energy storage contentions increase in merit. FENOC, and the Region of Interest as a whole, should be preparing now to replace Davis-Besse and the NRC should reflect such a reality through its own independent analysis in the Draft Environmental Impact Statement on the license extension proposal.

26. On November 21, 2011, U.S. Rep. Kucinich wrote a letter to Gregory B. Jaczko,

Chairman, U.S. Nuclear Regulatory Commission, which reads:

I am writing to ask that the NRC conduct a public hearing in Northern Ohio to reveal the facts surrounding the apparent delamination that has been discovered in the concrete wall of the shield building of the Davis-Besse nuclear power plant, and that this hearing be conducted before FirstEnergy is allowed to power up its reactor. A public hearing is necessary because FirstEnergy has been characterizing the situation at Davis-Besse in ways that I believe are misleading, and because representatives of the NRC seem to have adopted and repeated those characterizations in their statements.

For example, FirstEnergy has characterized the cracks they have discovered as "hairline" and "barely visible." They have characterized the locations of these cracks as being "decorative elements" or "architectural elements" of the building that are separate or distinct from the "structural elements" of the building. And, they have characterized the shield building as something that merely "provides protection from natural phenomena including wind and tornados."

In sharp contrast to these characterizations, the facts reveal that these "barely

visible" "hairline" cracks run for approximately 30 feet along the line of the steel reinforcing rods in the wall. A photo of the wall posted on the NRC website appears to show cracks that are not "hairline" and are clearly "visible."

FirstEnergy's diagram of a cross section of the wall shows that the "elements" in which the cracks have been found are "structural" and are part of that wall, not separate "decorative" elements.[1] And, First Energy has described the purpose of the shield building quite differently in its recent "License Renewal Application."

"The Shield Building is a concrete structure surrounding the Containment Vessel. It is designed to provide biological shielding during normal operation and from hypothetical accident conditions. The building provides a means for collection and filtration of fission product leakage from the Containment Vessel following a hypothetical accident through the Emergency Ventilation System, an engineered safety feature designed for that purpose. In addition, the building provides environmental protection for the Containment Vessel from adverse atmospheric conditions and external missiles."[2]

I am also concerned because the few facts that have been disclosed about the cracks seem to indicate a widespread problem that will undermine the structural integrity of the shield building. The fact that the visible cracking is 30-feet long, the fact that the cracking runs along the line of the outermost steel reinforcing bars (rebar), the fact that further testing has discovered similar cracking in 15 out of 16 of the "wings" or "shoulders" of the building, the fact that cracking has been discovered in other areas of the wall, all suggest a delamination of the concrete, at the outermost rebar, caused by concrete carbonation.

Concrete carbonation is a process of deterioration of concrete that is caused by the seepage of CO2 through the concrete wall. As the CO2 seeps through the concrete wall, it creates a chemical reaction that lowers the alkalinity of the concrete. On average, CO2 seepage occurs at a rate of approximately 1 mm per year.[3] The problem arises when the CO2 seepage reaches the steel rebar, because it is the high alkalinity of the concrete that protects the steel from corrosion. When carbonation lowers the alkalinity of the surrounding concrete, the steel can begin to corrode. As the steel corrodes, it expands and creates cracks in the concrete that run along the line of the steel rebar.[4]

Obviously, the outermost rebar is the first steel that the carbonation would reach. The rebar in the "wings" of the wall is the closest to the surface and would be affected first, followed shortly thereafter by the rebar at the midpoint between the wings where the main circumferential rebar is closest to the outside surface of the wall. And, since this process should be occurring uniformly around the circumference of the building, it should exist to about the same extent in all the "wings."

This scenario seems to fit the situation discovered at Davis-Besse perfectly. Cracks have been discovered in 15 of the 16 wings, and the process of carbonation almost certainly has reached the rebar in the 16th wing, but corrosion of the rebar there has not yet progressed enough to open cracks in the adjoining concrete.

In 2006, Oak Ridge National Laboratory performed a study for the NRC "to support the NRC's efforts to understand containment degradation ... and how changes in concrete material properties may affect the performance of [nuclear power plant]

concrete structures." The resulting Report [5] contains a number of findings that are very worri-some when applied to the Davis-Besse situation.

First, cracks that "follow the line of the steel reinforcement," like those discovered at Davis-Besse, are called "coincident cracks." [6] The Report calls those cracks "of more importance than transverse cracks relative to accelerating corrosion." [7]

Second, the Oak Ridge study "concluded that there is little evidence to support the idea that wide cracks will promote corrosion faster than narrow cracks." [8] "[I]t was concluded that the corrosion rate is...independent of crack width." [9] So, characterizing the cracks at Davis-Besse as "hairline" or "barely visible" may soothe the concerns of the public, but it does not reduce the severity of the problem.

Finally, with respect to "coincident cracks", "the passivity [ability to resist corrosion] of the reinforcing steel may be lost at several locations with the same crack being able to readily transmit oxygen and moisture to the cathodic areas of the steel. Since there is no way of inhibiting or confining the corrosion process, corrosion may then proceed unchecked and possibly accelerate." [10]

In summary, the kind of cracks found at Davis-Besse "are of more importance ... relative to accelerating corrosion." With respect to that rate of corrosion, it doesn't matter that they are small cracks. And, in the case of this kind of cracks, "there is no way of inhibiting or confining the corrosion process," which "may then proceed unchecked and possibly accelerate."

FirstEnergy has publicly stated that it expects to have Davis-Besse back on line and producing electricity in late November. That kind of accelerated schedule is unreasonable, given that this problem was only discovered a month ago, that FirstEnergy has only tested a very small fraction of the shield building wall, that none of the testing or results have been made public, and that the statements that have been made by First-Energy have been misleading at best.

FirstEnergy has a long history at Davis-Besse of placing profit ahead of safety. I want to make certain that Davis-Besse is not rushed back into operation before the NRC and the people of Northern Ohio have a full and complete opportunity, through the vehicle of a public hearing, to evaluate both the cause and the extent of the problem.

Footnotes:

[1] They could, legitimately, be characterized as "additional" to the 2.5-foot thickness of the wall, but they are clearly structural.

[2] "License Renewal Application," p. 2.4-3

[3] American Concrete Institute, http://www.concrete.org/FAQ/afmviewfaq.as p?faqid=50

[4] See generally, Containment Liner Corrosion Operating Experience Summary Technical Letter Report – Revision 1 http://adamswebsearch.nrc.gov/idmws/DocConten t.dll?library=PU_ADAMS^pbntad01&LogonI D=06340b961c634f3d934580551d394520 &id=112220033

[5] "Primer on Durability of Nuclear Power Plant Reinforced Concrete Structures - A Review of Pertinent Factors."

[6] Id., p. 103.

[7] Id., p. 110.
[8] Id., p. 105.
[9] Id., p. 106.
[10] Id., p. 103.

27. The prospects that " 'there is no way of inhibiting or confining the corrosion process,' which 'may then proceed unchecked and possibly accelerate,'" and that "the kind of cracks found at Davis-Besse 'are of more importance...relative to accelerating corrosion,'" point directly to the concern that the cracking of the concrete shield building may be an accelerating process with age and time, just as the corrosion of the reactor vessel head seems to have been in 2001-2002. Thus, the concrete shield building cracking is aging-related, and entirely worthy of an in-depth hearing on the merits before the ASLB in this license extension proceeding.

28. FirstEnergy has denied that carbonation is a problem. On November 22, 2011, the

Toledo Blade quoted FENOC as saying:

A FirstEnergy spokesman said the company has a "root cause team" looking at the problem but that carbonation appears not to be an issue.

"Our testing on a number of concrete samples showed no carbonation on any of the crack surfaces of those that we tested, and [from] our inspections of the rebar, the rebar looks very good and healthy. There was no corrosion of the rebar," said spokesman Jennifer Young.

"[Mr. Kucinich's] letter suggested we weren't telling the full story. I don't believe that to be the case. The NRC understands everything we've looked at," Ms. Young said...

FirstEnergy has submitted to the NRC its finding that the cracks are not a safety hazard and is following up by submitting technical reports to the commission in response to its questions about the matter.

[http://www.toledoblade.com/local/2011/11/22/Kucinich-seeks-NRC-hearing-about-cracks-at-

Davis-Besse-2.html]

29. The contradiction between Congressman Kucinich's analysis of the concrete shield

building cracking and FENOC's is just the sort of factual dispute that is worthy of an ASLB

hearing. Moreover, FENOC's claims to be "submitting technical reports to the commission in response to its questions about the matter" are belied by the fact that some NRC Requests for Additional Information (RAIs) have gone unanswered by FENOC for well over half a year, and due dates for responses have been postponed, despite the controversial nature and safety significance of the shield building cracking. NRC's RAIs from May, 2011 had to do with aging management issues, which include shield building cracking. NRC's RAIs from December, 2011 have directly to do with shield building cracking, a critical safety-significant aging management issue that should be addressed in the license extension proceeding, as urged by this contention.

30. On December 2, 2011, the Toledo Blade reported that NRC had granted FENOC

permission to re-start Davis-Besse:

The Nuclear Regulatory Commission has given FirstEnergy a green light to restart the Davis-Besse nuclear power plant while ordering the company to investigate further the cause and extent of cracks discovered during October in the plant's concrete shield building.

In a "confirmatory action letter" to FirstEnergy Nuclear Operating Co., Cynthia Pederson, the NRC's acting regional administrator, wrote that her agency had been provided "reasonable assurance that the shield building is capable of performing its safety functions" despite the multiple hairline cracks discovered after a hole was cut in the concrete through which reactor heads were swapped out.

But the letter requires FirstEnergy to "provide the results of the root cause evaluation and corrective actions to the NRC, including any long-term monitoring requirements, by Feb. 28, 2012" and describes the nature of further testing necessary to determine if the cracks are spreading or widening.

Further study also will be required during a refueling outage scheduled for next year, Ms. Pederson wrote.

NRC also announced that a public meeting will be held, on a date and at a place to be determined, during which FirstEnergy will "discuss their technical analysis and explain why the plant is safe to continue to operate with the cracks in the shield building."

The commission said it would issue its own inspection report and conclusions about the plant on Jan. 16.

Jennifer Young, a FirstEnergy spokesman, confirmed that the re-start go-ahead had been received, but declined to say when Davis-Besse would be back on-line.

"We are wrapping up our outage activities, and beginning the re-start," Ms. Young said Friday.

The Davis-Besse plant's reactor chamber is enclosed by a 1.5-inch thick steel containment vessel and the shield building, made of concrete 2.5 feet thick. Officials have described the shield building's primary role as protection of the plant against terrorism or natural disasters, but it also would provide secondary containment if the steel enclosure were breached. FirstEnergy is in the midst of applying for an extension of Davis-Besse's operating license, which expires in 2017. Anti-nuclear activists have argued that the cracking concrete in the shield building is yet another reason, on top of the plant's troubled safety history, for Davis-Besse's license not to be renewed or, alternatively, to be extended for a shorter time than the 20-year extension FirstEnergy has requested.

A 30-foot, barely visible crack was discovered in "architectural concrete" adorning the outside of the Shield Building after workers used hydro-demolition — high-pressure water — Oct. 10 to cut the hole for the reactor-head exchange.

Additional, similar cracks were later discovered during investigation. Michael Keegan, one of several critics who have intervened in the re-licensing proceedings, called the Confirmatory Action Letter "a big fat nothing" and repeated his doubts about the wisdom of re-starting Davis-Besse.

The NRC's re-start approval, he said, is "a promise to kick the can down the road and roll the dice one more time. The concept of 'Use As Is,' when it comes to operating a nuclear power plant, is a risky proposition."

In a Nov. 21 letter to the NRC, U.S. Rep. Dennis Kucinich (D., Cleveland) questioned the Shield Building's structural soundness in light of the crack and requested a hearing like the one the agency said it will hold — except that Mr. Kucinich wanted the hearing held before the plant's restart.

[http://www.toledoblade.com/Energy/2011/12/02/Davis-Besse-allowed-to-restartoperations.

html]

31. The January 16, 2012 issuance of NRC's own inspection report and conclusions

about the shield building cracking, and the February 28, 2012 due date for FENOC to "provide

the results of the root cause evaluation and corrective actions to the NRC, including any long-

term monitoring requirements," show that previous publicly stated assurances by FENOC and

NRC - that full understanding of the causes, extent, and significance of the cracking would be

resolved prior to restart -- were empty promises. Public confidence is completely undermined at

this point.

32. On Monday, December 5, 2011, Congressman Kucinich issued the following

statement:

Test results, analyses, and reports on which this decision has been based have not been revealed to the public. It is one thing to conceal this information from the public while the reactor is idle. It is quite another to restart the reactor without making full disclosure to the public why it thinks we should accept a nuclear power plant operating at full power with a building containing cracks of unknown origin.

33. Intervenors call upon both FENOC and NRC to make their shield building cracks related documentation accessible to the Interveners and public in order to make the license extension proceeding and its treatment of this safety-significant aging related issue fully transparent and accountable.

34. On December 7, 2011, after a December 6, 2011 meeting between his staff and representatives of the U.S. Nuclear Regulatory Commission, U.S. Representative Dennis Kucinich (D-OH) issued a strongly worded statement critical of nuclear utility FirstEnergy's public assurances about the problem of cracking, claiming that the NRC's detailed description of the cracking revealed that the cracks in the Davis-Besse shield building are more numerous and more widely distributed than FirstEnergy has publicly portrayed. Congressman Kucinich and his staff prepared a comparison of FirstEnergy statements with known fact. Congressman Kucinich's statement read, in full:

Congressman Dennis Kucinich (D-OH) today questioned whether FirstEnergy has been entirely upfront with the people of Ohio over the extent of the damage to the Davis-Besse nuclear power plant. Kucinich requested full public disclosure of all relevant photographs, test results, analyses and reports by FirstEnergy after comparing reassuring public statements made about the damage by FirstEnergy officials to disquieting information received from the NRC during a briefing yesterday for the Congressman's staff.

Descriptions by the NRC, which receives non-public reports from FirstEnergy, revealed that the damage to the Davis-Besse plant is greater than has previously been portrayed in public statements made by FirstEnergy officials. Kucinich called upon FirstEnergy to release all photographs, test results, analyses and reports to the public in order to verify the accuracy of FirstEnergy's public statements.

"In response to inquiries by my staff, the NRC provided a detailed description of the cracking at FirstEnergy's Davis-Besse plant. That description revealed that the cracks in the Davis-Besse 'shield' building are more numerous and more widely distributed than FirstEnergy has publicly portrayed," said Kucinich.

Cracks were initially discovered by accident in the concrete shield wall that protects the reactor from physical attacks and prevents radiation release into the air, water and soil. FirstEnergy publicly claimed the damage was limited as to the size and the location of the cracks.

As a result of information shared by the NRC, it was revealed that the extent of those cracks is greater than portrayed to the public by FirstEnergy. Cracks have been found in additional locations not revealed in public statements by FirstEnergy, including cracks around the top twenty feet of the building.

"The NRC's decision to approve the restart is based solely on information and reports prepared by FirstEnergy and consultants that FirstEnergy has hired and paid. We do not fully know what is in the reports made by FirstEnergy to the NRC, but we must reveal that the description of damage by the NRC does not mirror public statements made by FirstEnergy officials. FirstEnergy should release all the documents it has in order to ensure that the public has a full and accurate understanding of the situation," said Kucinich.

"Full disclosure is mandatory. FirstEnergy risks loss of public confidence if it continues to tell the people of Ohio one thing and the NRC another. Since we are talking about a nuclear power plant with a troubled history, the public has a powerful health and safety interest in full and immediate disclosure," Kucinich said.

Last Friday evening, the NRC announced it would allow FirstEnergy to restart Davis-Besse even though the cause of the cracking and the extent of the cracking is still unknown. The investigation into the cause of the widespread cracks is not expected to be completed until February.

(Emphasis added). [http://kucinich.house.gov/UploadedFiles/Factual_Analysis_of

FirstEnergy_Statements.pdf].

35. Congressman Kucinich's December 7, 2011 "Factual Analysis of FirstEnergy's

Recent Statements About Damaged Shield Building at Davis-Besse Nuclear Power Plant"

reveals as follows:

FirstEnergy Statements: FirstEnergy originally announced that, while

cutting an opening in the shield building of its aging Davis-Besse nuclear reactor, to replace a deteriorating reactor head for the second time, workers discovered cracks in the concrete shield building wall. FirstEnergy called this a "barely visible indication" of a crack, which ran for approximately 30 feet along the line of the steel reinforcing rods in the wall.[http://www.cleveland.com/business/index.ssf/2011/10/nrc_firstenerg y_concerned_abou.html]

Fact: A photo of the wall posted on the website of the Nuclear Regulatory Commission appears to show cracks that are not "hairline" and that are clearly visible.[http://www.sanduskyregister.com/carrolltwp/news/2011/nov/23/kucinich-urgespublichearing-proposed-davisbesse-restart]

FirstEnergy Statements: We were told by FirstEnergy that the cracks were not a problem because they were in "architectural elements" of the concrete wall

[http://www.cleveland.com/business/index.ssf/2011/10/firstenergy_reveals _it_has_fou.html] or "architectural design components" of the wall, [http://www.sanduskyregister.com/carroll-twp/news/2011/nov/01/morecracksfounddavis-besse-nuclear-power-station], that were, somehow, different from the "structural" elements of the wall. The NRC initially accepted this characterization and issued a statement that the cracking was in "non-structural architectural" concrete

[http://blog.cleveland.com/metro/2011/10/c

rack_at_davis-besse_nuclear_p.html] On October 31, in a letter to its "Investors," FirstEnergy wrote that there are cracks in "most" of the "exterior architectural elements" of the shield building that merely "serve as architectural features and do not have any structural significance." [http://phx.corporateir.net/External.File?item=UGFyZW50SUQ9MTEzMj EwfENoaWxkSUQ9LTF8VHlwZT0z&t=1]. On November 1, we learned that "most" meant 15 out of 16 of what FirstEnergy still claimed were merely "architectural

elements."[http://www.sanduskyregister.com/carrolltwp/news/2011/nov/0 1/more-cracks-founddavis-besse-nuclear-power-station]

Fact: The areas where most of the cracks have been discovered do have structural significance. They are not merely "architectural elements." The drawing that FirstEnergy provided, of the cross-section of the wall where the first cracks were discovered, shows that the "flutes" contain steel reinforcing rods within the concrete and that those rods are anchored to the rest of the wall in two ways—first, an anchor to one of two of the bands of steel rods that run around the full circumference of the shield building wall, and second, a perpendicular anchor through most of the thickness of the wall itself. [see diagram in primary document] Furthermore, what FirstEnergy calls "architectural flute attachments" in this drawing are not "attachments" at all. They are an integral part of the concrete shield building wall and the concrete they contain was poured at the same time as the rest of the concrete in the shield building wall. In both briefings that the NRC has provided us, their employees volunteered that this was one continuous concrete wall that was poured at the same time. There is no "architectural" element that is distinct from the structure of the wall.

FirstEnergy Statements: FirstEnergy has tried to minimize the significance of the cracks by describing the shield building as something that merely "provides protection from natural phenomena including wind and

tornados."[http://phx.corporateir.net/External.File?item=UGFyZW50SUQ 9MTEzMjEwfENoaWxk SUQ9LTF8VH lwZT0z&t=1]

Fact: However, First Energy described the purpose of the shield building quite differently in its recent "License Renewal Application." That document states that the primary purpose of the shield building is to provide protection from radiation leakage in accident situations:

"The Shield Building is a concrete structure surrounding the Containment Vessel. It is designed to provide biological shielding during normal operation and from hypothetical accident conditions. The building provides a means for collection and filtration of fission product leakage from the Containment Vessel following a hypothetical accident through the Emergency Ventilation System, an engineered safety feature designed for that purpose. In addition, the building provides environmental protection for the Containment Vessel from adverse atmospheric conditions and external missiles."

[Footnote 1 in original, "License Renewal Application," p. 2.4-3] "Environmental protection" is only an "additional" purpose of the shield building. And, FirstEnergy has totally omitted the fact that one "additional" purpose of the shield building concrete is to protect against "external missiles."

FirstEnergy Statements: In its letter to investors, FirstEnergy stated that it had discovered cracks in two other locations that were not "flute shoulders."

[http://phx.corporateir.net/External.File?item=UGFyZW50SUQ9MTEzMj EwfENoaWxkSUQ9LTF8VHlwZT0z&t=1]. FirstEnergy subsequently described those two areas as places where the steam lines entered and exited the shield building. [cite]

Fact: On December 6, 2011, the NRC informed us that "impact response mapping" had revealed similar cracks in "various areas of

the top 20 feet of the building" that were not flute shoulders. This cracking seems to be "more extensive on the south side of the building." They also described the cracking as "laminar cracking" that is "circumferential to the entire outer rebar map." While only a small percentage of the wall has actually been tested, they are assuming for purposes of evaluation that the flute shoulders have laminar cracking "all the way up and down" the concrete wall. (emphasis added)

Glossary of Terms: "Containment"—The structure enclosing a nuclear reactor and designed to contain the results of an anticipated nuclear accident and to prevent release of radiation into the environment. At Davis-Besse, the containment system includes the containment vessel and the shield building.

"Containment vessel"—At Davis-Besse, the containment vessel is a 1.5-inch-thick steel structure that encloses the reactor vessel and the heat exchanger.

"Shield building"—At Davis-Besse, the shield building is a reinforced concrete building that encloses the containment vessel, separated by 4.5 feet of interior space.

"Flutes"—there are 8 vertical flutes evenly spaced around the circumference of the shield building. They appear to be vertical grooves in the wall, where the thickness of the wall is less than the edges on either side of the flute. [See diagram in primary document, mentioned above]

"Flute shoulder"—there are 16 shoulders—two on each side of each flute. The flute shoulders become thicker as they approach the flute. [See diagram in primary document, mentioned above]

"Laminar cracking" or "Delamination"—A mode of failure of composite materials, including concrete, in which the "layers" or "lamina" of the material separate. In reinforced concrete structures, laminar cracking or delamination usually occurs as a result of corrosion of the steel reinforcing rods, which expand as they corrode and cause cracking along the line of the steel reinforcement.

"Impact response mapping"—term used by NRC representative for testing to locate laminar cracking inside a concrete wall. The wall is struck with a hammer and an instrument records and evaluates the response.

"Rebar map"—term used by NRC representative to describe the system of steel reinforcing bars inside the concrete wall.

To summarize, NRC staff's admissions to Congressman Kucinich's staff

represent significant evidence that the concrete shield building cracking is structural, not

cosmetic. NRC staff's admission to Congressman Kucinich's staff that "While only a

small percentage of the wall has actually been tested, they [NRC staff] are assuming for purposes of evaluation that the flute shoulders have laminar cracking 'all the way up and down' the concrete wall" means that the NRC staff are assuming the cracks are not 30 feet long, as originally reported in the media, but rather 225 feet long – the full height of the concrete shield building. In fact, FENOC's Davis-Besse Site Vice President, Barry Allen, confirmed this very point towards the very end of a long, grueling NRC public "Informational Presentation" meeting at Camp Perry in Port Clinton, Ohio on January 5, 2012 – namely, that FENOC (as with NRC) is assuming that the cracking extends for 225 feet from the bottom of the concrete shield building to the top.

36. On December 7, 2011, FENOC submitted to the Document Control Desk at NRC a 14 page letter entitled "SUBJECT: Davis-Besse Nuclear Power Station, Unit No. 1, Docket No. 50-346, License Number NPF-3, Reply to Request for Supplemental Information for the Review of the Davis-Besse Nuclear Power Station, Unit No. 1, License Renewal Application (TAC No. ME4640)." [posted online at http://www.beyondnuclear.org/storage/DB%2012-7-11% 20Methodology%20for%20Visual%20Inspection%20of%20Reactor%20Building1.pdf] The cover letter, signed by Barry S. Allen, Vice President – Nuclear, FENOC, explains: "During a telephone conference held on November 22, 2011, the Nuclear Regulatory Commission (NRC) requested supplemental information to complete its review of the License Renewal Application (LRA)." The cover letter's enclosure, "Document Sections Described in the FENOC Response to NRC Request for Additional Information (RAI) Followup B.2.1-2," is FENOC's response to NRC's request. [this FENOC response is posted online at

http://www.beyondnuclear.org/storage/DB%2012-7-11%20Methodology%20for%20Vis

-37-

ual%20Inspection%20of%20Reactor%20Building1.pdf]. The first document in the enclosure is entitled: Davis-Besse Nuclear Power Station, SURVEILLANCE TEST PROCEDURE, DB-PF-03009, CONTAINMENT VESSEL AND SHIELD BUILDING VISUAL INSPECTION, REVISION 07, Prepared by: Maik Swain, Procedure Owner: Supervisor - Nuclear Engineering Programs, Effective Date: JUN 17 2011.

37. Under "Purpose," at Section 1.1, is written:

The visual examination of the Containment Vessel and Shield Building is performed of the accessible interior and exterior surfaces of the containment system in order to detect any structural deterioration which may affect the containment leak-tight integrity.

38. The containment system, including the shield building, is safety-significant and vul-

nerable to age-related degradation, especially during extended operations from 2017 to 2037.

Thus, it is subject matter worthy of a hearing.

39. In a yellow highlighted section is written:

2.1.2 Personnel who perform general visual examinations of the exterior surface of the Containment Vessel and the Interior and exterior surfaces of the Shield Building shall meet the requirements for a general visual examiner in accordance with NOP-CC-5708, Written Practice for the Qualification and Certification of Nondestructive Examination Personnel. These individuals shall be knowledgeable of the types of conditions which may be expected to be identified during the examinations.

40. A problem with this examination protocol is that this visual inspection program is

limited to external surfaces. The present cracking controversy involves internal cracking, not visible to the naked eye on the surface. That is another reason that Interveners are concerned that the early December pouring of the concrete to patch the shield building hole may have covered up evidence of cracking that could only be obtained through direct visual inspection, but is now

under inches or feet of concrete.

41. Further on in the enclosure, under WRITTEN PRACTICE FOR THE QUALIFI-

CATION AND CERTIFICATION OF NONDESTRUCTIVE EXAMINATION PERSONNEL,

Effective Date: 04/30/10, Approved by Colin P. Keller, Program Manager on 4/21/2010, at

section 4.2.5, General Visual Examiner (IWE / IWL), is written:

For Davis Besse: The General Visual examiner visually assesses the general condition of Class MC or metallic liners of CC containment components. General Visual examinations shall be performed by, or under the direction of a Registered Professional Engineer or other individual knowledgeable in the requirements for design, inservice inspection, and testing of MC or CC containments. The examination type is described simply as General Visual.

While visual inspection is necessary, it is far from sufficient.

42. The same part of the enclosure, at "Page 41 of 59," in ATTACHMENT 1:

TRAINING, EXPERIENCE, AND EXAMINATION REQUIREMENTS ("Page 2 of 9") states:

10) (a) Formal training is not required for MWE/IWL General Visual examination personnel, however, individual shall receive sufficient general familiarization under the direction of a knowledgeable individual experienced in performing CTMT exams and the requirements for design, inservice inspection, and testing of the Class MC and metallic liners of Class CC pressure retaining components. No qualification or training examinations are required. Document familiarization training. (b) Alternatively, VT personnel with MC endorsement are approved to perform the general visual examinations.

(Emphasis added). Intervenors are alarmed that this necessary, but far from sufficient, visual

inspection methodology is so informal, regarding the high safety significance of the containment

system.

43. The final section of the enclosure, Davis-Besse Nuclear Power Station Unit #1, Third

Ten Year Inservice Inspection Program, Revision 5, June 9, 2009, poses concerns. The

infrequency of the inspections and the long intervals between inspections, seems unacceptable,

given the safety-significance of the containment system. This infrequency of, and long interval between, inspections risks missing the development of new problems, which could break at an accelerating speed, as mentioned previously, especially considering the advanced age and state of disrepair of Davis-Besse, particularly regarding its cracked concrete shield building. Also, given Rep. Kucinich's revelations about cracking in the top 20 feet of the concrete shield building/secondary radiological containment structure, Intervenors seek to understand FENOC's specific methodology for visually inspecting that elevated region of the structure.

44. On December 12, 2011, NRC's Office of Congressional Affairs Director, Rebecca L. Schmidt, sent the following letter to Congressman Dennis Kucinich (please see next page):



UNITED STATES NUCLEAR REGULATORY COMMISSION WASHINGTON, D.C. 20555-0001

December 12, 2011

The Honorable Dennis Kucinich United States House of Representatives Washington, D.C. 20515

Dear Representative Kucinich:

Pursuant to your request, the U.S. Nuclear Regulatory Commission (NRC) is providing documents that First Energy Nuclear Operating Company (FENOC) provided to the NRC for its consideration in evaluating the functionality of the Davis-Besse shield building. We are continuing to gather additional documents and will be providing them to you.

Please note that the majority of these documents have not been released to the public and have been marked "Not for Public Disclosure." The NRC may use some of this pre-decisional information to support potential enforcement actions associated with ongoing inspections. For these reasons, the NRC does not typically provide this type of information to Members of Congress during the pendency of ongoing inspections. Recognizing your interest in this matter, we are providing the requested material, but respectfully request that none of this sensitive material be made public.

We also emphasize that the material we are providing represents FENOC's analysis and the NRC staff does not necessarily agree with all aspects of the analysis or calculations. After evaluating the material provided to it by FENOC, including responses to NRC staff questions, the NRC staff made its own professional judgment regarding the functionality of the shield building.

Sincerely,

-Rebecco L. Jehmest

Rebecca L. Schmidt, Director Office of Congressional Affairs

Enclosures: As stated If NRC is so confident of the maintenance of safety function of the Davis-Besse cracked concrete shield building, it is unclear why NRC feels the need to withhold documents, especially technical data, from the public. However, given Interveners' standing in the license extension proceeding, they have an added claim to access to significant age-related safety documentation concerning Davis-Besse, information that should have been publicly disclosed in the first place. It is also unclear what information NRC is withholding from the public, vis a vis the information that it, as well as FENOC, publicly presented at the January 5, 2012 meeting held at Camp Perry in Port Clinton, Ohio. Interveners urge NRC to immediately publish any and all documentation made public at the January 5, 2012 Camp Perry meeting, as well as any and all additional information relating to the cracked Davis-Besse concrete shield building that has still been withheld from the public. This would be in keeping with one of President Obama's very first acts in office, his declaration that his administration would maximize transparency and accountability in government. Given NRC's mandate, to protect public health, safety, and the environment against nuclear power's many risks, such transparency and accountability is of paramount importance.

45. Also on December 12, 2011, NRC Inspector M. Holmberg requested the following information from FENOC regarding the cracked concrete shield building:

"December 12, 2011

Davis Besse Information Request – Inspector M. Holmberg - (630) 829-9748, msh@nrc.gov

To support an NRC inspection (followup review) please have the following information provided to the Site Resident Inspectors Office on Monday January 9, 2012. This information is needed to support NRC review of the root cause of cracking in the shield building (SB) identified during the recent 17-M Davis-Besse outage. This inspection will be conducted in accordance with

Section 02.04.c and Appendix B "Temporary Containment Opening Review Guidance" of NRC inspection procedure IP 71007 "Reactor Head Replacement." If any records are not available on January 9, 2012, please identify a date when this information will be available.

1) All site and vendor corrective action records related to the identification of cracks in the SB.

2) Copy of corrective action records (for past 5 years) that identify degraded conditions associated with the shield building.

3) Composition of Root Cause Team (RCT) investigating the SB cracks (including contractors) – Please identify the Team Lead, Members (with a short biography/resume) and contact numbers.

4) Identify the corrective action record associated with the RCT efforts to determine the cause of the SB cracking.

5) RCT- Charter defining scope and methods used to identify the root cause of the SB cracking.

6) Current (draft) of the list of potential causes considered and preliminary status (e.g. possible cause or ruled out). Additionally, provide the draft RCT assessment with respect to the potential cause of these cracks associated with concrete carbonation (CC). CC is caused by the seepage of carbon dioxide through the concrete wall creating a chemical reaction that lowers the alkalinity of the concrete leading to corrosion of the steel reinforcing materials (rebar). As the steel corrodes, it expands and creates cracks in the concrete that may run adjacent to the steel rebar.

7) Identify (if) and to what extent the RCT has considered the information developed by Oak Ridge National Laboratory related to concrete degradation (reference NUREG/CR NUREG/CR- 6927 - ORNL/TM-2006/529- in Primer on Durability of Nuclear Power Plant Reinforced Concrete Structures - A Review of Pertinent Factors published in February 2007). If this information was not considered explain why it was not considered applicable to this root cause investigation.

8) Identify and describe any nonconformances for the SB concrete or steel reinforcement (rebar) with applicable specifications, standards or design that have been identified to date (e.g. up thru January 1, 2012) by the RCT investigation of the SB cracking.

9) Drawings/maps that identify the extent of SB cracking identified to date and document which identifies any additional plans to further define the extent of SB cracking. 10) Drawings/maps that identify the extent of nondestructive examinations and location of core bores used to confirm the current extent of SB cracking to date.

11) Plan/instruction which identifies the concrete samples removed from the SB to be subjected to further examination or testing in support of the RCT investigation.

12) Identify list and provide a copy of the vendor procedures or applicable American Society for Testing and Materials (ASTM) standards applied for each test or examination performed on SB concrete samples in support of the RCT investigations and the intended purpose for each test/exam performed. If any testing or examination of concrete were conducted without approved procedures identify these tests or examinations and the extent to which this information is relied upon by the RCT.

13) Provide the owner's acceptance review of the vendor tests/exams discussed in question 12 above. If an owner's acceptance review is not required, explain.

14) Qualifications and certifications for contractors performing tests and examinations in support of the SB root cause investigation.

15) Schedule for completion of root cause report and any interim milestones (e.g. core bore testing complete, creep testing complete, data analysis complete, etc).

16) Schedule for completion of extent of condition review for cracking.

17) Purchase Orders for vendors performing work or testing in support of SB root cause (e.g. testing, examination of core bores).

18) Copy of the following site or corporate procedures associated with:

a) The corrective action process including screening and defining significance of corrective action records.

b) Defining quality assurance requirements applicable to vendors that perform tests or examinations in support of root cause investigations.

19) Copy of vendor procedure used for impulse response testing (IRT) and mapping of crack locations in the SB.

20) If the extent of SB cracking is reliant upon IRT, provide the bases

document which validates this method (e.g. confirmatory core bore tests with statistically valid sample size). Additionally, provide the owner's acceptance review of this document."

These questions and demands for documentation are most appropriate for a safety

regulator to demand of a nuclear licensee, as in this case of a cracked shield building. What is

most inappropriate is the fact that the NRC demand is dated December 12, 2011 – ten days after NRC authorized restart at Davis-Besse, and six days after FENOC actually restarted the reactor with a cracked shield building. January 9, 2012 – the date Inspector Holmberg asked FENOC to comply with his demands – is a five weeks after NRC already approved restart, as well as four days after the NRC public meeting at Camp Perry in Port Clinton, Ohio, at which NRC repeatedly declared Davis-Besse's restart as "safe." This is a most odd sequencing of events. Jan. 9 is after Dec. 2 restart authorization, Dec. 6 restart, and Jan. 5 public meeting.

NRC also seems to give FENOC an unlimited amount of time to provide the requested information: "If any records are not available on January 9, 2012, please identify a date when this information will be available." A hard and fast due date is necessary, given the safety significance of this issue.

Regarding "2) Copy of corrective action records (for past 5 years) that identify degraded conditions associated with the shield building," why limit it to just the past five years? At the January 5, 2011 Camp Perry NRC public meeting in Port Clinton, FENOC's slide show presentation (at Slide 18, on page 9 of the hardcopy of the presentation), FENOC documents 1970 and 2002 breaches of the concrete shield building, in addition to the very recent 2011 breaching. Why doesn't NRC also look for documentation of potential shield building degradation associated with those earlier breaches of the concrete shield building?

Regarding "3) Composition of Root Cause Team (RCT) investigating the SB cracks (including contractors) – Please identify the Team Lead, Members (with a short biography/resume) and contact numbers," and a number of similar questions/demands, it seems that NRC simply trusted FENOC to have deployed qualified personnel to examine the root cause of the cracking up to this point, to determine its extent, and to work out appropriate corrective action. Trust devoid of verification and oversight is an unacceptable regulatory practice vis a vis nuclear safety. Verification and oversight long *after restart* authorization is a very dubious approach to safety regulation enforcement. This is especially unacceptable at Davis-Besse in 2011-2012, given the December 2002 NRC Office of Inspector General Report on Davis-Besse's Hole-in-the-Head fiasco, which found that not only did FENOC place profits ahead of safety (earning a record fine from NRC, amounting to \$33.5 million altogether), but also that NRC – at the highest levels of the agency – also put FENOC's profits ahead of public safety. The December 2, 2011 NRC restart authorization, without resolving the root cause, extent, or solution to the concrete shield building cracking problem, is a repeat of FENOC putting profits ahead of safety, and NRC letting FENOC get away with it. As Intervener Michael Keegan of Don't Waste Michigan put it at the January 5, 2012 meeting at Camp Perry, "The lesson I have learned from over 30 years of research on nuclear safety issues is that NRC is incapable of learning lessons."

Intervenors request that as soon as FENOC provides the above demanded information to NRC, that it be provided not only to Interveners, but also released to the public, in the interests of transparency and accountability.

Intervenors question with alarm the safety significance of the potential for worsening concrete shield building cracking over the next five years of licensed operations. Contemplating such worsening cracking for the next *quarter century*, considering the 20 year license extension proposed, raises the level of alarm considerably. Interveners contend that Davis-Besse should be

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shut down on Earth Day (April 22), 2017 – its last licensed date for operations under the original 40 year license – at the very latest.

46. On December 13, 2011, NRC's Samuel Cuadrado de Jesus, Project Manager, Projects Branch 1, Division of License Renewal Office of Nuclear Reactor Regulation, published "SUMMARY OF TELEPHONE CONFERENCE CALL HELD ON NOVEMBER 22, 2011, BETWEEN THE U.S. NUCLEAR REGULATORY COMMISSION AND FIRSTENERGY NUCLEAR OPERATING COMPANY, CONCERNING REQUESTS FOR ADDITIONAL INFORMATION PERTAINING TO THE DAVIS-BESSE NUCLEAR POWER STATION LICENSE RENEWAL APPLICATION (TAC. NO. ME4640)."

Regarding "Followup RAI B.2.1-2 (ASME Section XI general visual examiner qualification requirements)," it contained:

Discussion: The staff stated that although the response to followup RAI 8.2.1-2 provided in RAO response letter dated August 26, 2011, was acceptable, additional information provided by the applicant via e-mail was needed under the docket to support the staff review. The staff asked whether the applicant would docket the highlighted copy of the procedures sent to the staff by e-mail on July 21, 2011. The applicant agreed to docket the highlighted procedure sections provided in the e-mail dated July 21, 2011. The applicant also stated that the highlighted procedure sections would be included in the next license renewal letter to the NRC.

There was no further discussion and the call was concluded.

Action: The applicant will include the highlighted procedure sections in the next license renewal letter to the NRC.

Intervenors point out that visual examination quality assurance is relevant to many age-

related degradation issues in the license extension application proceeding, including concerning

the concrete shield building's recently revealed cracking problem. This NRC documented December 13, 2011 is the first indication Interveners had that NRC had concerns about the qualifications of FENOC's Davis-Besse visual examiners' qualifications. This communication from NRC essentially constituted a reminder to FENOC to provide an adequate response to an RAI issued many months earlier. No explanation for FENOC's inadequate responses to date was given.

47. On December 14, 2011, Rep. Kucinich (D-OH) continued to press the case on safety, by raising questions about Davis-Besse Power Plant during an NRC oversight hearing before the U.S. House Committee on Oversight and Government Reform, upon which he serves as a subcommittee ranking member. His full statement reads:

"In February 2001, the NRC began investigating an aging mechanism that often caused cracking in reactors. As a result of these findings, in late September 2001, the NRC determined that the Davis-Besse plant was at risk and should shut down by December 31, 2001. FirstEnergy, the owner of Davis-Besse, resisted the order, claiming that it could stay open without incident until March 2002. FirstEnergy argued that a shutdown would cause an unnecessary financial burden."

"Rather than following its own safety procedures and shutting down Davis-Besse, the NRC relented and allowed the plant to operate until February 2002. After the Davis-Besse plant had been shut down, workers repairing one of five-cracked control rod nozzles discovered extensive damage to the reactor vessel head. The workers found a large, corroded crater the size of a football in the reactor vessel head next to one of the nozzles. Only three-sixteenths of an inch of steel remained intact at the bottom. Even that began to crack and bulge."

"The NRC later found that the plant might have been as close as 60 days from bursting. If it did, there could have been a major release of radioactivity. It would have jeopardized the immediate and long-term safety of millions of Americans near my district not to mention the single biggest source of fresh water in the world, the Great Lakes."

"The Government Accountability Office later called it 'the most serious safety issue confronting the nation's commercial nuclear power industry since 'Three Mile Island.' The Department of Justice said that FirstEnergy admitted that they 'knowingly made false representations to the Nuclear Regulatory Commission (NRC) in the course of attempting to persuade the NRC that its Davis–Besse Nuclear Power Station was safe to operate beyond December 31, 2001.'''

"FirstEnergy's insurance company became worried and commissioned an independent study to analyze the data from the incident. The study, which was released in April 2007, painted an even darker picture than the regulatory rebukes that came before it. The report found that corrosion of the steel plate happened at a faster rate than was reported by FirstEnergy, bringing the reactor closer to a catastrophic incident than had previously been reported."

"Despite the findings of these three bodies, just a few weeks before that study was released, FirstEnergy asked the NRC to remove the requirement for independent assessments of Davis Besse's operations. They asked for less oversight."

"The NRC's 2004 Confirmatory Order Modifying License lists some of FirstEnergy's malfeasant policies and actions that led to the 2002 incident, providing more evidence that profits were prioritized over safety. It specifically lists the key reasons the leak was allowed to persist and grow; FirstEnergy's selfpolicing mechanisms failed. Worse, FirstEnergy tried to convince the NRC that the problems were solved when in fact they were not."

"FirstEnergy continues to try to prioritize profits over safety. Since I don't have time here to cover in detail the full history of FirstEnergy's bad decisions, near misses and safety lapses, I ask unanimous consent to place into the record a document prepared by Beyond Nuclear that does just that."

[Beyond Nuclear's document, "Davis-Besse Atomic Reactor: 20 MORE Years of Radioactive Russian Roulette on the Great Lakes Shore?!" is posted online at: http://www.beyondnuclear.org/storage/Davis Besse Backgrounder.pdf]

"Several weeks ago, FirstEnergy had to shut down Davis-Besse to replace yet another reactor head because its design has flaws that create leaking problems. In so doing, they found cracks in the building designed to protect the core from external missiles like planes, but also to prevent the release of radioactive air and steam in the event of a problem with the reactor. The latter scenario is what almost happened in 2001 at Davis-Besse and is exactly what happened at Fukushima, when the containment buildings blew up from steam build up. A structurally compromised building affords less protection to the public."

"True to form, there were important differences between the story FirstEnergy told the public and the real story which I only uncovered because of my own investigation and because of my staff. Specifically, FirstEnergy tried to convince the public that the cracks were only cosmetic in nature, were few in number, and were not widely distributed. None of the above was accurate. And yet FirstEnergy was eager to restart Davis-Besse, even though they will not know the cause of the cracking until February." "We should be looking at this. The corporations that run nuclear power plants are fundamentally no different than the corporations that drove our economy off a cliff. They will cut corners to maintain or increase profits in the absence of sufficient incentives to act differently. They must be sufficiently and carefully regulated. The consequences of failing to do so are simply unthinkable. I hope we will reflect on the NRC's position here and help to achieve a culture of independence, objectivity, public interest over corporate interest and will have complete dedication to safety."

[http://kucinich.house.gov/News/DocumentSingle.aspx?DocumentID=272516]

48. On December 27, 2011, NRC staff sent a Request for Additional Information (RAI)

to FENOC on Davis-Besse. Very critical questions were asked - not for the first time - by NRC

Staff to FENOC, regarding age-related degradation, including its impacts on worsening concrete

shield building/secondary radiological containment building cracking.

Regarding RAI B.1.4-2, NRC provided the following "Background":

"In request for additional information (RAI) B.1 4-1, issued on May 19, 2011, the staff asked the applicant to describe the programmatic activities that will be used to continually identify aging issues, evaluate them, and as necessary, enhance the aging management programs (AMPs) or develop new AMPs for license renewal. In its response dated June 24, 2011, the applicant stated that it currently has a procedurally controlled operating experience review process, as required by NUREG-0737, "Clarification of TMI Action Plan Requirements," Item I.C.5, "Procedures for Feedback of Operating Experience to Plant Staff." The applicant stated that this process provides for the systematic identification and transfer of lessons learned from site and industry experience into fleet and station processes to prevent events and enhance the safety and reliability of its operations."

The "Issue" that NRC had with FENOC is that it woefully inadequately responded to this RAI.

Thus, NRC made the following "Request" to FENOC (page 3 to 4):

"Provide a response to each item below.

(a) Describe the sources of plant-specific operating experience that are monitored on an ongoing basis to identify potential aging issues.

(b) Indicate whether plant-specific and industry operating experience is only considered from a prescribed list of sources. If only prescribed sources are considered, provide a justification as to why it is unnecessary to consider other sources.

(c) Indicate whether guidance documents are considered as a source of operating experience information. If they are considered as a potential source, provide a plan for considering the content of guidance documents, such as the GALL [Generic Aging Lessons Learned] Report, as operating experience applicable to aging management.

(d) Describe how operating experience issues will be identified and categorized as related to aging.

(e) Describe the training requirements on aging issues for those plant personnel responsible for screening, evaluating, and submitting operating experience items.

(f) Describe how evaluations of operating experience issues related to aging will consider the following:

--systems, structures, or components --materials --environments --aging effect --aging mechanisms --AMPs

(g) Describe how the results of the AMP inspections, tests, analyses, etc .. will be considered as operating experience.

(h) Describe the operating experience evaluation records with respect to what is considered for aging. Indicate whether these records are maintained in auditable and retrievable form.

(i) Provide details on the operating experience evaluation schedules and justify why they provide for timely evaluations. Also, describe how the relative significance of operating experience items is determined so that the reviews can be prioritized appropriately.

(j) Justify why the corrective action program has an appropriate threshold for capturing issues concerning aging.

(k) Describe the criteria for considering when AMPs should be modified or new AMPs developed due to operating experience. Also, describe the process for

implementing changes to the AMPs or for implementing new AMPs; describe how these changes are implemented in a timely manner,

(1) Provide criteria for reporting plant-specific operating experience on age-related degradation to the industry.

If enhancements are necessary, provide an implementation schedule for incorporating them into the existing programmatic operating experience review activities."

NRC's background, "issue," and "request" regarding RAI B.1.4-2 is on age-related

degradation management plans, making it entirely relevant to such issues as the risk associated

with cracking and other deterioration of the concrete shield building, which Interveners raise in

this contention.

Regarding RAI B.1.4-3, NRC provided the following "Background" (page 4):

"In RAI B.1.4-1, the staff asked the applicant to provide, in accordance with 10 CFR 54.21(d), a USAR [Updated Safety Analysis Report] supplement a (sic) summary description of the programmatic activities for the ongoing review of operating experience, as required by 10 CFR 54.21(d). By letter dated August 17, 2011, the applicant provided this description:

> Existing FENOC processes require reviews of relevant site and industry operating experience and periodic benchmarking to ensure program enhancements are identified and implemented. Such ongoing reviews identify potential needs for aging management program revisions to ensure their effectiveness throughout the period of extended operation.

NRC's "Issue" with RAI B.1.4-3 involves the following:

As described above in RAI B.1.4-2, the applicant described generally how it intends to consider operating experience on an ongoing basis; however, it did not provide specific information on how its operating experience review activities address issues related to aging. Similarly, the above entry for USAR supplement also lacks details on how aging is considered in the ongoing operating experience reviews. Thus, NRC's "[r]equest" is:

Consistent with the response to RAI B.1.4-2, provide additional details in the USAR supplement on how the ongoing operating experience review activities address issues specific to aging.

Certainly, if FENOC plans to use "ongoing operating experience review activities to address issues specific to aging," such as the problem of cracks in the shield building, then it must be considerably more forthcoming with detail.

49. It's most troubling that NRC issued (RAI) B.1 4-1 on May 19, 2011, and yet FENOC's June 24, 2011 response was so woefully inadequate that NRC was forced to repeat itself with RAIs B.1.4-2 and B.1.4-3, essentially repeating RAI B.1.4-1 seven long months later, but urging FENOC to provide sufficiently detailed responses. It's disconcerting that it took NRC over half a year to assert itself for the second time. And it's further troubling that NRC is giving FENOC another 30 days to respond to the now seven month old RAIs. Why does NRC have to repeat its RAIs, and have to wait eight months to get answers back from FENOC? Giving that these RAIs implicate aging management issues, FENOC is obviously not ready for a license extension at Davis-Besse by 2017. It's not even able to safely manage aging issues today, in 2012. This has been true for a decade or more already, as shown by the 2002 Hole-In-The-Head fiasco.

50. Although the above RAIs touch upon the cracked shield building, RAI B.2.39-13, discussed beginning on page 5, is a direct bull's eye. In its "Background," NRC states:

In order to perform a scheduled reactor head replacement, a construction opening was made in the concrete shield building. During hydro-demolition of the concrete shield building, cracks were identified in the 'architectural shoulders' of the shield

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building. While investigating the extent of the cracking, additional cracks were identified around the shield building. These additional cracks were identified using an Impulse Response (IR) technique and core bores were used to verify the IR results.

NRC's "Issue" states:

Extensive cracking in the shield building could affect the structural integrity of the shield building and may impact its ability to perform its intended function during the period of extended operation.

NRC's "Request" then includes:

1. Summarize the shield building degradation, the root cause, and the expected corrective actions.

2. Explain how the recent plant-specific operating experience impacts the Shield Building's ability to perform its intended functions during the period of extended operation. Include a list of any additional aging effects that may require management based on this operating experience.

3. Explain how the recent plant-specific operating experience will be incorporated into the Structures Monitoring Program AMP, and whether the current program will be adequate to manage aging of the shield building during the period of extended operation, based on this operating experience. Specifically address the following:

(a) Details of tests planned to determine the long term effect of the concrete cracks on the ability of the rebars to carry design loads.(b) Plans, if any, to repair the crack or reinforce the shield building concrete.

(c) Detailed plans to monitor the extent and thickness of cracks, and corrosion of the rebars over the long term.

(d) Plans, if any, to perform detailed structural analysis, with explicit modeling of rebars, cracks, and concrete, to demonstrate that the shield building will perform its intended design function over the long term. This analysis should also consider the effect of shrinkage and environment on the concrete and rebar during the period of extended operation.

4. Identify and explain any changes to the license renewal application based on the recent plant specific operating experience.

Interveners have exactly the same questions as NRC does above, and incorporates them by reference into this contention regarding Davis-Besse's shield building cracking. If FENOC insists on pursuing a license extension, it should explain in detail the answers to these safetysignificant questions in this ASLB licensing proceeding before the 20 additional years is approved.

51. NRC's DB RAI 3.1.2.2.16-3, on page 6, also directly touches upon Intervenors' present contention. This is due to the fact that degradation of the steam generators will require their premature replacement, requiring yet another breach of the Davis-Besse concrete shield building. FENOC already plans such an organ transplant in 2014. But if FENOC screws up this aging management program badly enough, it could very well have to replace steam generators yet again in the future, during the license extension, even after the 2014 steam generator replacement. Given the fact that Davis-Besse currently has its third lid, with no guarantees that a fourth lid will not be needed, necessitating yet another concrete shield building breach, it is not far fetched to raise the concern about yet more steam generator replacements post-2014. Each breach of the concrete shield building risks introducing more weakness into the structure, and undermining its vital safety function.

NRC's "Background" states:

By letter dated November 23, 2011, the applicant responded to RAI 3.1.2.2.16-2, which addresses the extent and method of the inspections to manage cracking due to primary water stress corrosion cracking (PWSCC)

of the steam generator (SG) tube-to-tubesheet welds. In its response, the applicant indicated that a gross visual inspection coupled with eddycurrent inspections will be performed on the SG tube-to-tubesheet welds. The applicant also indicated that the inspection schedule will be concurrent with the eddy-current inspections of the SG tubes in accordance with Davis-Besse Technical Specification 5.5.8, "Steam Generator (SG) Program." The applicant further indicated that at a minimum, 100% of the tubes are inspected at sequential periods of 60 effective full power months.

NRC's "Issue" states:

In its review, the staff noted that it is not clear whether the gross visual inspection of the tube-to tubesheet welds will include the welds on the hot leg, cold leg, or both legs. The staff also needs more clarifications on the extent and method of the visual inspection addressed in the applicant's response.

NRC's "Request" then states:

1. Clarify whether the visual inspection will be conducted on the welds on the hot leg, cold leg, or both legs. In addition, describe the extent of the visual inspection (i.e., what percentage of the welds will be inspected), and clarify whether the visual inspection will be conducted on each tubeto-tubesheet weld.

2. Provide information on the objective, equipment, and method of the visual inspections.

52. Of course, given the danger of a single steam generator tube rupture causing a

cascade of tubes ruptures, which could lead to a Loss of Coolant Accident and melt down in the reactor core, a once every five years inspection of all tubes is unacceptable to Interveners, especially at the 40 year old Davis-Besse atomic reactor starting in 2017 with a license extension. Also, the basic questions NRC asks clarification on above, regarding SG tube inspections, raises concern that FENOC is not on top of such safety significant aging management issues. Interveners incorporate NRC's concerns as their own, in this shield building cracking contention.

53. On December 29 and 30, 2011, the *Toledo Blade* reported that a January 5, 2012 meeting had been announced by the NRC.

[http://www.toledoblade.com/Energy/2011/12/29/Nuclear-Regulatory-Commission-to-discussreopening-Davis-Besse.html andhttp://www.toledoblade.com/local/2011/12/30/Meeting-on-Davis-Besse-restart-set.html]. The January 5, 2012 date replaced the previously announced, December 15, 2011 date, which NRC postponed and re-scheduled due to an unexplained scheduling conflict.

54. An earthquake registering 4.0 on the Richter Scale, which occurred on December 31, 2011, epi-centered in Youngstown, Ohio, about two miles below the surface of the earth, has added to concerns about Davis-Besse's cracked concrete shield building/secondary radiological containment building. If the structural integrity of the shield building is in question – a problem that very well could be growing worse over time, even accelerating with age – then seismic activity in the area raises even more concerns. The NRC and U.S. nuclear power utilities harbor an apparent disregard of the need for seismic safety, even post-Fukushima. The NRC blessed nuclear utility Dominion's post-quake re-start at North Anna in short order in fall 2011, despite a large number of lingering safety significant concerns and questions. Beyond Nuclear, an intervening organization in this proceeding, helped lead a 10 CFR 2.206 emergency enforcement petition effort to stop the North Anna re-start, at least until certain safety conditions were satisfied, but the NRC approved the re-start, despite numerous lingering questions and concerns.

55. Per David Lochbaum, Nuclear Safety Project Director at the Union of Concerned Scientists, on the eve of the Camp Perry, Ohio meeting on Jan. 5, 2012, the following questions remain unclear, unanswered or only partially answered as of the date of filing of this Motion:

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1) Did workers notice/detect cracking in the concrete shield building wall in 2002-2003?

1a) If they did, why weren't the extent of condition assessments and root cause evaluations that were done/are being done currently conducted back then as well?

1b) If they did not, why not and doesn't that failure suggest that workers, if looking at all, are only looking for problems du jour (Crystal River 3 and Seabrook had concrete problems in recent years, so FENOC's workers are narrowly looking for concrete issues)?

2) Since there apparently were no concrete cracks observed back in 2002, is it possible that there were no cracks and all the cracks identified last year formed and propagated since 2002?

2a) If the shield building concrete aged so well from the 1970s until 2002 that no visible cracks formed during these decades and then aged so badly that many cracks became readily available during the relatively short intervening years, doesn't that onset of rapid degradation suggest that the plant cannot safely operate to the end of its existing license, let alone to an extended license?

2b) If the concrete cracks have been there all along and workers in 2002 didn't report them because they and others didn't care about concrete integrity or didn't grasp the big wall having lots of cracks, how much faith can the public possibly have in periodic and one-time inspections of safety components and structures?

- 3) NRC inspectors were criticized for having been handed the infamous "red photo" of the Davis-Besse reactor vessel head during the 2000 refueling outage, but not pursuing it. Did NRC inspectors examine the holes cut through the concrete shield building wall and metal containment liner in 2002? [the Davis-Besse "red photo," showing boric acid crystal and carbon steel rust "red lava" flowing from the reactor lid, is posted online at: http://www.beyondnuclear.org/storage/davisbesseredphoto.jpg]
 - 3a) If so, why didn't they notice all or any of the cracks?
 - 3b) If not, why not?

4) Did NRC inspectors examine the holes cut through the concrete shield building wall and metal containment liner in 2011? How closely? What tests were done? What measurements taken? What data collected?
56. Intervenors reserve the right to supplement this contention as NRC and/or FENOC reveal more information on the cracking in the future. Significantly, NRC is due to publish a report on January 16, 2012 regarding the Davis-Besse shield building cracking. FENOC is due to publish a report on February 28, 2012 regarding the Davis-Besse shield building cracking. Intervenors reserve the right to supplement this contention based on those, and future, revelations by NRC and FENOC regarding shield building cracking at Davis-Besse.

WHEREFORE, Intervenors pray the ASLB admit their Contention No. 5 for adjudication in this proceeding.

Respectfully submitted,

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Co-representatives of Intervenors

UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

| In the Matter of |) | Docket No. 50-346-LR |
|---|---|------------------------|
| First Energy Nuclear Operating Company |) | Dookee 110. 50 5 10 EK |
| (Davis-Besse Nuclear Power Station, Unit 1) | | January 10, 2012 |
| |) | |

CERTIFICATE OF SERVICE

*

We hereby certify that a copy of the foregoing "Motion for Admission of Contention No. 5 on Shield Building Cracking" was sent by us to the following persons via electronic deposit filing with the Commission's EIE system this 10th day of January, 2012:

Administrative Judge William J. Froehlich, Chair Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 E-mail: wjfl@nrc.gov

*

*

Administrative Judge Dr. William E. Kastenberg Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 E-mail: wek1@nrc.gov

Administrative Judge Nicholas G. Trikouros Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 E-mail: ngt@nrc.gov

Office of the Secretary U.S. Nuclear Regulatory Commission Rulemakings and Adjudications Staff Washington, DC 20555-0001 E-mail: hearingdocket@nrc.gov

*

*

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Brian G. Harris Megan Wright Emily L. Monteith E-mail: Brian.Harris@nrc.gov; Megan.Wright@nrc.gov Emily.Monteith@nrc.gov Office of Commission Appellate Adjudication U.S. Nuclear Regulatory Commission Mail Stop: O-16C1 Washington, DC 20555-0001 E-mail: ocaamail@nrc.gov

Michael Keegan Don't Waste Michigan 811 Harrison Street Monroe, MI 48161 E-mail: <u>mkeeganj@comcast.net</u> Stephen J. Burdick Morgan, Lewis & Bockius LLP 1111 Pennsylvania Avenue, N.W. Washington, D.C. 20004 Phone: 202-739-5059 Fax: 202-739-3001 E-mail: sburdick@morganlewis.com Alex S. Polonsky Morgan, Lewis & Bockius LLP 1111 Pennsylvania Avenue, N.W. Washington, DC 20004 Phone: (202) 739-5830 Fax: (202) 739-3001 E-mail: apolonsky@morganlewis.com

Respectfully submitted,

<u>/s/ Terry J. Lodge</u> Terry J. Lodge (Ohio Bar #0029271) 316 N. Michigan St., Ste. 520 Toledo, OH 43604-5627 Phone/fax (419) 255-7552 tjlodge50@yahoo.com

Counsel for Intervenors

<u>/s/ Kevin Kamps</u> Kevin Kamps Beyond Nuclear 6930 Carroll Avenue, Suite 400 Takoma Park, Maryland 20912 Office: (301) 270-2209 ext. 1 Fax: (301) 270-4000 kevin@beyondnuclear.org

Co-representatives of Intervenors

Genesky, Donielle

| From: | Kevin Kamps <kevin@beyondnuclear.org></kevin@beyondnuclear.org> |
|--------------|---|
| Sent: | Friday, January 23, 2015 10:05 PM |
| То: | Puco Docketing |
| Subject: | OPPOSITION COMMENT UNDER CASE # 14-1297-EL-SSO: (#6) 2nd Cracking-Related Safety & Environmental Contention in Opposition to Risky Davis-Besse 20-Year Licence Extension. |
| Attachments: | Coalition filing contention amdt 2 27 2012.pdf |

OPPOSITION COMMENT UNDER CASE # 14-1297-EL-SSO: (#6) 2nd Cracking-Related Safety & Environmental Contention in Opposition to Risky Davis-Besse 20-Year Licence Extension.

Dear Public Utilities Commission of Ohio,

I have sent five previous emailed submissions re: Davis-Besse, vis a vis this proceeding.

I am now submitting for the record of this proceeding, our second Davis-Besse Shield Building concrete containment cracking related contention, titled INTERVENORS' MOTION TO AMEND 'MOTION FOR ADMISSION OF CONTENTION NO. 5.' This document is dated Feb. 27, 2012.

This filing was based on U.S. Representative Dennis Kucinich's (D-OH) revelation that the shield building's outer rebar layer was no longer structurally functional, due to the severe cracking.

This document is posted online at

http://www.beyondnuclear.org/storage/Coalition%20filing%20contention%20amdt%202%2027%202012.pdf

This document is also attached to this email.

Our environmental coalition intervening against Davis-Besse's 20-year license extension includes: Beyond Nuclear; Citizen Environment Alliance of Southwestern Ontario; Don't Waste Michigan; and Green Party of Ohio.

Bowling Green, Ohio resident Phyllis Oster, a member of Beyond Nuclear, provides Beyond Nuclear standing in the Davis-Besse License Renewal Application proceeding.

Our legal counsel is Terry Lodge of Toledo, Ohio.

Given the catastrophic risks associated with Davis-Besse's severely cracked, and worsening, concrete containment Shield Building, we urge that PUCO not approve FENOC's request for a massive ratepayer bailout.

Thank you.

Sincerely,

Kevin Kamps, Beyond Nuclear

Kevin Kamps Radioactive Waste Watchdog Beyond Nuclear 6930 Carroll Avenue, Suite 400 Takoma Park, Maryland 20912 Office: (301) 270-2209 ext. 1 Cell: (240) 462-3216 Fax: (301) 270-4000 kevin@beyondnuclear.org www.beyondnuclear.org

Beyond Nuclear aims to educate and activate the public about the connections between nuclear power and nuclear weapons and the need to abandon both to safeguard our future. Beyond Nuclear advocates for an energy future that is sustainable, benign and democratic.

UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

| In the Matter of |) | |
|---|---|----------------------|
| | | Docket No. 50-346-LR |
| First Energy Nuclear Operating Company |) | |
| (Davis-Besse Nuclear Power Station, Unit 1) | | February 27, 2012 |
| |) | |
| | | |

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<u>INTERVENORS' MOTION TO AMEND 'MOTION FOR</u> <u>ADMISSION OF CONTENTION NO. 5'</u>

*

*

Now come Beyond Nuclear, Citizens Environment Alliance of Southwestern Ontario

(CEA), Don't Waste Michigan, and the Green Party of Ohio (collectively, Intervenors), by and

through counsel, and move to amend their "Motion for Admission of Contention No. 5."

Intervenors have discovered new information which they believe to be relevant to the contention.

A. Background

On January 10, 2012, Intervenors moved for admission of a new Contention No. 5, which

states:

Contention 5: Cracked Shield Building/Secondary Reactor Radiological Containment Structure

Interveners contend that FirstEnergy's recently-discovered, extensive cracking of unknown origin in the Davis-Besse shield building/secondary reactor radiological containment structure is an aging-related feature of the plant, the condition of which precludes safe operation of the atomic reactor beyond 2017 for any period of time, let alone the proposed 20-year license period.

B. New Information

To the allegations of fact submitted by Intervenors with their January 10, 2012 filing, they

propose to add the following:

1. On or about February 8, 2012, Congressman Dennis Kucinich posted a press release at

his official website entitled "Why Won't FirstEnergy Tell the Truth About Davis-Besse?" which

discussed the shield building cracking controversy. That press release contained the following

passage:

On November 20, 2011, I publicly called upon FirstEnergy "to tell the truth about Davis-Besse... to release all the photos, all the test results, and all the reports." I also wrote a letter to Gregory Jaczko, the Chairman of the NRC, requesting that the NRC conduct a public hearing on the issue so that the people in the communities surrounding Davis-Besse could get accurate information about what the situation truly was.

FirstEnergy ignored my request, but Chairman Jaczko did not. He scheduled a public hearing for January 5, 2012. In the interim, I pressed the NRC to provide me with the photos, test results and "core bore" reports that FirstEnergy was concealing from the public.

The NRC allowed my staff to review those documents. The reports showed conclusively that the cracking was not in "architectural" or "decorative" elements of the wall, as FirstEnergy publicly claimed, but *ran throughout the line of the main outer rebar*.

In fact, the cracking is so extensive that the NRC required FirstEnergy to assume, in its calculations of the strength of the wall, that the vertical outer rebar mat did not even exist.

When FirstEnergy made its presentation at the January 5 public hearing, its Site Vice-President, Mr. Barry Allen, admitted for the first time that the cracking was located along the line of the main outer rebar. But, Mr. Allen, did not mention FirstEnergy's previous misrepresentations or explain the significance of the new description. When I asked him about this discrepancy, his response was that FirstEnergy's investigation of the cracking had been ongoing, and that FirstEnergy had revealed all new information as it was discovered.

That would be a very appropriate response, if it were true. But, it is not true.

FirstEnergy knew in early October that the cracking was in the area of the main outer rebar. That is shown in the very first photo released by the NRC. Most of the tests that showed that cracking in the line of the main outer rebar were performed before FirstEnergy issued a statement to its shareholders on October 31, 2011 that repeated their misrepresentations. And, even as late as December 29, 2011, the NRC was still repeating this misleading description from FirstEnergy—"Cracking has been identified primarily in the architectural regions...." ("Q-and-As for Davis-Besse Shield Building Issues," 12/29/11).

(Emphasis added).

2. A January 31, 2012 inspection report, ML12032A119,¹ shows that FENOC discovered on October 31, 2011 that there were other areas of cracking, but also:

On October 31, 2011, the licensee identified additional indications of concrete cracking during IR testing towards the top of the SB wall, approximately between the 780 ft and 800 ft elevations. This area of indications was yet another one different from the laminar cracking initially identified adjacent to the RRVCH opening. The licensee entered this extent-of-condition issue for the SB cracking into their CAP as CR 2011-04648, informed the NRC via the Resident Inspectors' Office on site, and continued to investigate further to determine if any additional adverse conditions existed.

P. 48 of report (p. 52 of .pdf).

C. Legal Standards for Amendment

Section 2.309(f)(2) of 10 C.F.R. allows a new contention to be filed after the initial docketing with leave of the presiding officer upon a showing that (i) The information upon which the amended or new contention is based was not previously available; (ii) The information upon which the amended or new contention is based is materially different than information previously available; and (iii) The amended or new contention has been submitted in a timely fashion based on the availability of the subsequent information.

The information contained in the two numbered paragraphs above was not previously available from any source prior to February 8, 2012 (paragraph 1) and January 31, 2012 (paragraph 2). It is materially different from information previously available about the cracking phenomena in the shield building of Davis-Besse Nuclear Power Station, as the facts describe new locations and types of structural damage caused by the cracking compared to the information hitherto known. Finally, the informational disclosures are well within the 60-day window in

¹http://adamswebsearch2.nrc.gov/webSearch2/doccontent.jsp?doc={99E65968-3B8D-471D-B9B 9-65CDA18AE0CC}

which new allegations must be raised following discovery.

It bears observation that both FirstEnergy and the NRC Staff know much more about the cracking problems than they are willing to disclose to the public. Were it not for the repeated, aggressive efforts of Congressman Kucinich, who continues to demand documents and briefings frmo the NRC, only a few disparate facts would have been grudgingly admitted piecemeal to the media, but without any indication of their interrelatedness or significance. Neither the NRC nor FENOC have independently released the information alleged in paragraph 1 above.

The January 31, 2012 NRC inspection report referenced in paragraph 2 above appears to be the report that was promised at the January 5, 2012 NRC public meeting to be released on January 16, 2012.

Intervenors believe the new information which they have provided falls within the scope of their initial, January 10, 2012 contention. That contention addresses the recently-discovered shield building cracking and draws upon multiple sources in an attempt to identify the various locations and components of the cylindrical shield structure wherein cracks have been found, and also to define the resulting or potential damage caused by cracking. But even if the ASLB or parties do not agree that these new allegations are within the scope of the original Contention 5, an amended contention may include additional issues outside the scope of the contention as originally admitted. *Louisiana Energy Servs., L.P.* (National Enrichment Facility), CLI-05-20, 62 NRC 523, 533 (2005).

D. Conclusion

Intervenors need not prove their contention at the admissibility stage. *Private Fuel* Storage, L.L.C. (Independent Spent Fuel Storage Installation), CLI-04-22, 60 NRC 125, 139 (2004). The factual support required is "a minimal showing that material facts are in dispute." All that is needed at this juncture is "alleged facts" and the factual support "need not be in affidavit or formal evidentiary form and need not be of the quality necessary to withstand a summary disposition motion." *First Energy Nuclear Operating Company* (Davis-Besse Nuclear Power Station, Unit 1), ASLBP No. 11-907-01-LR-BD01, LBP-11-13 at 17 (April 26, 2011) (slip op.).

Intervenors have timely articulated new information which was not previously available. That information shows that material facts of the application for the license extension are in dispute. The Intervenor have met the threshold requirements to be accorded leave to amend their proposed Contention 5, and amendment to add facts as stated above should be granted.

WHEREFORE, Intervenors pray the Licensing Board allow amendment of their Contention 5.

/s/ Terry J. Lodge Terry J. Lodge (Ohio Bar #0029271) 316 N. Michigan St., Ste. 520 Toledo, OH 43604-5627 Phone/fax (419) 255-7552 tjlodge50@yahoo.com Counsel for Intervenors

<u>/s/ Kevin Kamps</u> Kevin Kamps Radioactive Waste Watchdog Beyond Nuclear 6930 Carroll Avenue, Suite 400 Takoma Park, MD 20912 Tel. 301.270.2209 ext. 1 Email: kevin@beyondnuclear.org Website: www.beyondnuclear.org *pro se* on behalf of Intervenors

-5-

UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

| In the Matter o | f |) | |
|---|---------------------|--|----------------------|
| | | | Docket No. 50-346-LR |
| First Energy N | uclear Operating Co |) () () () () () () () () () () () () () | |
| (Davis-Besse Nuclear Power Station, Unit 1) | | on, Unit 1) | February 27. 2012 |
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CERTIFICATE OF SERVICE OF INTERVENORS' MOTION TO AMEND CONTENTION 5

We hereby certify that a copy of the "INTERVENORS' MOTION TO AMEND 'MOTION FOR ADMISSION OF CONTENTION NO. 5" was sent by us to the following persons via electronic deposit filing with the Commission's EIE system on the 27th day of February, 2012:

Administrative Judge William J. Froehlich, Chair Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 E-mail: wjf1@nrc.gov

Administrative Judge Dr. William E. Kastenberg Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 E-mail: wek1@nrc.gov

Administrative Judge Nicholas G. Trikouros Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 E-mail: ngt@nrc.gov

Office of the Secretary U.S. Nuclear Regulatory Commission Rulemakings and Adjudications Staff Washington, DC 20555-0001 E-mail: hearingdocket@nrc.gov

Office of the General Counsel U.S. Nuclear Regulatory Commission Mail Stop O-15D21 Washington, DC 20555-0001 Catherine Kanatas catherine.kanatas@nrc.gov Brian G. Harris E-mail: Brian.Harris@nrc.gov Lloyd B. Subin lloyd.subin@nrc.gov

Office of Commission Appellate Adjudication U.S. Nuclear Regulatory Commission Mail Stop: O-16C1 Washington, DC 20555-0001 E-mail: ocaamail@nrc.gov

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Respectfully submitted,

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Counsel for Intervenors

<u>/s/ Kevin Kamps</u> Kevin Kamps Radioactive Waste Watchdog Beyond Nuclear 6930 Carroll Avenue, Suite 400 Takoma Park, MD 20912 Tel. 301.270.2209 ext. 1 Email: kevin@beyondnuclear.org Website: www.beyondnuclear.org pro se on behalf of Intervenors



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| Washington Office 2445 Rayburn HOB. Washington, DC 20515 Phone (202) 225-5871 Fax (202) 225-5745 | Google | facebook | digg |



UNITED STATES NUCLEAR REGULATORY COMMISSION

REGION III 2443 WARRENVILLE ROAD, SUITE 210 LISLE, IL 60532-4352

January 31, 2012

Mr. Barry Allen FirstEnergy Nuclear Operating Company Davis-Besse Nuclear Power Station 5501 North State Route 2 Oak Harbor, OH 43449-9760

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION INTEGRATED INSPECTION REPORT 05000346/2011005

Dear Mr. Allen:

On December 31, 2011, the U. S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Davis-Besse Nuclear Power Station. The enclosed report documents the results of this inspection, which were discussed on January 10, 2012, with the Director of Site Operations, Mr. Brian Boles, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, two NRC-identified and four self-revealed findings of very low safety significance were identified. Four of these findings were determined to also involve violations of NRC requirements. In addition, one Severity Level IV violation was also identified by the NRC. However, because of the very low safety significance and because these issues were entered into your corrective action program, the NRC is treating the issues as Non-Cited Violations (NCVs), in accordance with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the subject or severity of any finding or NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspectors' Office at the Davis-Besse Nuclear Power Station. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III, and the NRC Resident Inspector at the Davis-Besse Nuclear Power Station.

B. Allen

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Jamnes L. Cameron, Chief Branch 6 Division of Reactor Projects

Docket No. 50-346 License No. NPF-3

Enclosure: Inspection Report 05000346/2011005 w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

| Docket No: License No: | 50-346 NPF-3 |
|---------------------------|--|
| Report No: | 05000346/2011005 |
| Licensee: | FirstEnergy Nuclear Operating Company (FENOC) |
| Facility: | Davis-Besse Nuclear Power Station |
| Location: | Oak Harbor, OH |
| Dates: | October 1, 2011, through December 31, 2011 |
| Inspectors: | D. Kimble, Senior Resident Inspector A. Wilson, Resident Inspector T. Briley, Reactor Engineer P. Cardona-Morales, Reactor Engineer T. Go, Radiation Protection Inspector M. Holmberg, Senior Reactor Inspector L. Jones, Jr., Reactor Inspector G. O'Dwyer, Reactor Inspector M. Mitchell, Radiation Protection Inspector J. Neurauter, Senior Reactor Inspector P. Smagacz, Reactor Engineer J. Steffes, Reactor Engineer |
| Approved by: | Jamnes L. Cameron, Chief Branch 6 Division of Reactor Projects |

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SUMMARY OF FINDINGS

Inspection Report 05000346/2011005; 10/1/2011-12/31/2011; Davis-Besse Nuclear Power Station; Inservice Inspection Activities; Maintenance Risk Assessments and Emergent Work Control; Operability Evaluations; Post-Maintenance Testing; Outage Activities; Follow-Up of Events and Notices of Enforcement Discretion; and Other Activities.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Six Green findings and one Severity Level (SL) IV violation were identified by the inspectors. Four of the findings, as well as the SL IV violation, were dispositioned as non-cited violations (NCVs) of NRC regulations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a SL after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealed Findings

Cornerstone: Initiating Events

• <u>Green</u>. A self-revealed finding of very low safety significance was identified for the licensee's failure to establish, implement, and maintain technically adequate procedures to permit the proper switching of feedwater sources for the station's auxiliary boiler, such that when the switching of feedwater sources from demineralized water to the station's normal condensate system took place per approved procedures, there were detrimental results. Specifically, the approved procedures for this activity relied upon a check valve to keep the demineralized water header from being exposed to greater pressure than its design. When that check valve failed to function as designed, failure of demineralized water system components and the inadvertent deluge and failure of safety-related electrical equipment resulted.

The finding was determined to be of more than minor significance because it was associated with the Initiating Events Cornerstone attribute of procedure quality and had adversely affected the associated cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, electrical power to an entire string of safety-related 480 Vac motor control center (MCCs) (i.e., E11A, E11B, E11C, E11D, and E11E) was forced to be interrupted when a deficient procedure for the operation of the station's auxiliary heating boiler caused a significant amount of water to be deluged onto MCC E11C, resulting in an electrical short and fire within the MCC. The inspectors evaluated the finding using IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings." Because the finding involved reactor shutdown operations and conditions, the inspectors transitioned to IMC 0609, Appendix G. Attachment 1, "Shutdown Operations Significance Determination Process - Phase 1 Operational Checklists for Both PWRs and BWRs." Since the finding was associated with an issue that occurred during the time the licensee was in a cold shutdown (Mode 5) condition, the inspectors consulted Checklist 3, "PWR Cold Shutdown and Refueling Operation: Reactor Coolant System (RCS) Open and Refueling Cavity Level Less Than 23 Feet or

RCS Closed and No Inventory in the Pressurizer; Time to Boiling Less Than 2 Hours." The inspectors determined that the finding did not adversely impact any shutdown defense-in-depth or mitigation attributes, nor did it meet any of the checklist specific requirements for a Phase 2 or Phase 3 SDP analysis. Consequently, the finding was determined to be of very low safety significance. This finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program (CAP) component, because the licensee did not take appropriate corrective actions to address the safety issue in a timely manner, commensurate with the safety significance and complexity. Specifically, the licensee had multiple previous opportunities to have appropriately diagnosed and corrected the issue, but failed to do so. (P.1(d)) (Section 4OA3.2)

<u>Green</u>. A finding of very low safety significance and an associated NCV of 10 CFR 50, Appendix B, Criterion VII, "Control of Purchased Material, Equipment, and Services," were identified by the inspectors for the licensee's failure to perform an adequate review of fabrication records to ensure material procured from a contractor (replaced reactor vessel closure head) met the construction code (CC). Specifically, the accessible surfaces of the 60 closure head flange stud holes were not subjected to dye penetrant or magnetic particle examinations as required by the CC. As a corrective action, the licensee completed magnetic particle examination of the accessible surfaces of the 60 flange stud holes prior to placing the vessel head into service.

The finding was determined to be more than minor because it was associated with the Initiating Events Cornerstone attribute of Equipment Performance and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions. Absent NRC identification, the licensee would not have completed surface examination of the 60 flange stud holes to ensure unacceptable material flaws (e.g., cracks) were not placed in service. Because material flaws such as cracks serve as stress risers that reduce the ability of the replacement reactor vessel closure head to withstand failure by crack propagation during design basis events (e.g., pressurized thermal shock), they would place the reactor coolant system at an increased risk for through-wall leakage and/or failure. The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process." Attachment 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," Table 4a for the Initiating Events Cornerstone. Because this finding was identified prior to placing the replacement reactor vessel closure head in service and no fabrication flaws were identified, the inspectors answered "no" to the SDP Phase 1 screening question "Assuming worst case degradation, would the finding result in exceeding the Technical Specification (TS) limit for any reactor coolant system leakage or could the finding have likely affected other mitigation systems resulting in a total loss of their safety function assuming the worst case degradation?" Therefore, the finding screened as having very low safety significance. This finding had a cross-cutting aspect in the area of Human Performance, Decision Making because the licensee staff failed to demonstrate that nuclear safety was an overriding priority in decisions affecting the replacement reactor vessel closure head. Specifically, the failure to perform an adequate review of the replacement reactor vessel closure head fabrication records was caused by the licensee's decision to not review the manufacturer's interpretations and application of the CC rules. (H.1(b)) (Section 4OA5.3).

Cornerstone: Mitigating Systems

Green. A self-revealed finding of very low safety significance (Green) was identified when low pressure injection equipment was damaged by operators attempting to access an overhead valve. Specifically, by climbing and standing on sensitive plant equipment, the licensee failed to comply with the standards and expectations for accessing plant equipment contained in procedure NOP-OP-1002, "Conduct of Operations". An immediate corrective action was taken to repair the damaged temperature element and restore low pressure injection pump no. 1 to operable status. A long-term solution to providing access to the overhead valve is under evaluation in the corrective action program.

The inspectors determined that the finding was more than minor because it was associated with the Mitigating Systems Cornerstone attribute of Human Performance and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the damage caused when falling from plant equipment rendered low pressure injection train 1 inoperable. The inspectors evaluated the finding using IMC 0609, Attachment 4, Phase 1 - Initial Screening and Characterization of Findings, using the Phase 1 SDP worksheet for the Mitigating Systems Cornerstone. The finding screened as very low safety significance because the inspectors answered "no" to the screening questions in Table 4a. Specifically, the finding was not a design or qualification deficiency, did not represent a loss of system safety function, did not represent actual loss of safety function of a single train for greater than its TS allowed outage time, and the finding did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding had a cross-cutting aspect in the area of Human Performance. Work Control Component, because the licensee did not plan and coordinate work activities consistent with nuclear safety. Specifically, the licensee did not appropriately plan for job site conditions impacting human performance since an appropriate available method for accessing CC258 was not evaluated. (H.3(a)) (Section 1R13.1)

<u>Green</u>. A finding of very low safety significance and an associated NCV of TS 5.4.1(a) were identified by the inspectors for the licensee's failure to establish, implement, and maintain technically adequate procedures to cover the restoration (i.e., filling and venting) of the component cooling water (CCW) system following maintenance activities. Specifically, a complex series of fill and venting evolutions to restore the system had been required following extensive maintenance activities; these evolutions did not ensure that all the air was vented from the system, such that later ultrasonic testing performed by the licensee identified a significant air void, approximately 19 cubic feet, in a CCW pump 3 horizontal suction piping segment. The issue was entered into the licensee's CAP as CRs 2011-05542 and 2011-05831.

The finding was determined to be of more than minor safety significance because the issue was associated with the Mitigating Systems Cornerstone attribute of procedure quality, and had adversely affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, CCW, a mitigating system, had its reliability adversely impacted by the lack of appropriate fill and venting procedural guidance. The inspectors evaluated the finding using IMC 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings." Because the finding involved

reactor shutdown operations and conditions, the inspectors transitioned to IMC 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process - Phase 1 Operational Checklists for Both PWRs and BWRs." Since the finding was associated with an issue that occurred during the time the licensee was conducting RCS fill and venting activities and plant conditions were in transition, the inspectors consulted both Checklist 2, "PWR Cold Shutdown Operation: RCS Closed and Steam Generators Available for Decay Heat Removal (Loops Filled and Inventory in the Pressurizer); Time to Boiling Less Than 2 Hours," and Checklist 3, "PWR Cold Shutdown and Refueling Operation: RCS Open and Refueling Cavity Level Less Than 23 Feet or RCS Closed and No Inventory in the Pressurizer; Time to Boiling Less Than 2 Hours." The inspectors determined that the finding did not adversely impact any shutdown defense-in-depth or mitigation attributes on either checklist, nor did it meet any of the checklist specific requirements for a Phase 2 or Phase 3 SDP analysis. Consequently, the finding was determined to be of very low safety significance. This finding had a cross-cutting aspect in the area of Human Performance. Resources component, because the licensee did not ensure that personnel, equipment, procedures, and other resources were available and adequate to assure nuclear safety. Specifically, the licensee's procedures and guidance for the restoration of the CCW system following outage maintenance activities did not ensure that the system was fully filled and properly vented prior to operation. (H.2(c)) (Section 1R15.1)

 <u>Severity Level IV</u>. The inspectors identified a SL IV NCV of 10 CFR 54(i) when a non-licensed member of the licensee's engineering staff was observed operating switches that directly caused the insertion of various control rods that were being subjected to timing tests. Specifically, the inspectors observed that key switches used to interrupt power to the control rod drives and cause control rod insertion were manipulated by a member of the licensee's engineering staff, and not a licensed individual. The issue was entered into the licensee's CAP as CR 2011-06318.

The issue was determined to be associated with the Mitigating Systems Cornerstone attribute of procedure quality. However, the inspectors subsequently determined that the issue had not adversely affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Because of several factors, the inspectors determined that the issue was of minor safety significance and, as such, did not constitute a finding. These factors included:

- All control rod group withdrawal activities were accomplished from the control room by an on-watch licensed reactor operator;
- All activities in the electrical penetration room were performed in accordance with an approved written test procedure, and under the direct supervision of a licensed Senior Reactor Operator;
- The operation of the local key switches in the electrical penetration room, albeit by a non-licensed individual, could only cause control rod insertion. There was no withdrawal capability; and
- The individual operating the local key switches in the electrical penetration room was always in continuous communication with the on-watch licensed reactor operator in the control room.

The inspectors determined that the issue was subject to the NRC's traditional enforcement process as an issue that had the potential to impact the agency's ability to

perform its regulatory function. Specifically, the NRC's Reactor Oversight Process fundamentally assumes that only duly licensed individuals are allowed to manipulate reactor controls and alter core reactivity or make changes to reactor power, and that all licensed individuals perform their licensed duties in accordance with any restrictions associated with their individual licenses. The inspectors conferred with NRC Region III management and members of the enforcement staff and determined that, because of the factors noted above, the issue constituted a SL IV violation that resulted in no, or relatively inappreciable, safety consequences. Because this issue was dispositioned through the traditional enforcement process and had no Reactor Oversight Process aspects, there was no cross-cutting aspect associated with the violation. (Section 1R19.1)

Green. A finding of very low safety significance and an associated NCV of TS 5.4.1(a) were identified by the inspectors for the licensee's failure to establish, implement, and maintain technically adequate procedures and drawings to cover the restoration (i.e., motor controller re-energization) of components in the CCW system following maintenance activities. Specifically, as circuit breaker BE1161 was closed to restore power to motor-operated valve (MOV) CC2645, the train 1 auxiliary building return header isolation valve, the MOV unexpectedly stroked open resulting in a rapid loss of CCW system inventory and a low level alarm for the CCW surge tank. Subsequent investigation revealed that notes describing the operating logic for CC2645 on approved operational drawings were less than adequate. The issue was entered into the licensee's CAP as CR 2011-04078.

The finding was determined to be of more than minor safety significance because the issue was associated with the Mitigating Systems Cornerstone attribute of procedure quality, and had adversely affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, CCW, a mitigating system, had its reliability adversely impacted by the inadequate procedural guidance for motor controller restoration. The inspectors evaluated the finding using IMC 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings." Because the finding involved reactor shutdown operations and conditions, the inspectors transitioned to IMC 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process - Phase 1 Operational Checklists for Both PWRs and BWRs." Since the finding was associated with an issue that occurred during the time the reactor was in a defueled condition, the inspectors conservatively consulted all four PWR checklists (i.e., Checklists 1 - 4). The inspectors determined that the finding did not adversely impact any shutdown defense-in-depth or mitigation attributes on any checklist, nor did it meet any of the checklist specific requirements for a Phase 2 or Phase 3 SDP analysis. Consequently, the finding was determined to be of very low safety significance. This finding had a cross-cutting aspect in the area of Human Performance, Resources component, because the licensee did not ensure that personnel, equipment, procedures, and other resources were available and adequate to assure nuclear safety. Specifically, the licensee's procedures, drawings and guidance for the restoration of the CCW system following outage maintenance activities did not ensure that the system was properly aligned prior to restoration of electrical power to MOV CC2645. (H.2(c)) (Section 1R20.1)

Cornerstone: Barrier Integrity

 <u>Green</u>. A finding of very low safety significance and an associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings" were identified by the inspectors for the licensee's failure to control weld rod oven temperature in accordance with procedure WFMC-1 during a rebar splice weld completed for restoration of the shield building access opening. As a corrective action, the licensee removed the welder's certification to weld rebar and documented this issue in CR 2011-05536. To ensure that the horizontal rebar splice weld 2H-03R was not affected by delayed hydrogen cracking, the licensee's vendor examined the weld splice 48 hours after fabrication and did not identify cracks.

The finding was determined to be more than minor because the finding was associated with the Barrier Integrity Cornerstone attribute of Configuration Control and adversely affected the cornerstone objective to provide reasonable assurance that the physical design barriers (e.g., containment) protect the public from radionuclide releases caused by accidents or events. The shield building is part of the containment system. Absent NRC identification, rebar welds would have been fabricated with electrodes exposed to ambient temperatures for excessive periods of time creating a condition that results in hvdrogen-induced weld cracking. Rebar splice material with cracks returned to service would increase risk for shield building failure during design basis events such as wind-driven missile impact or earthquake-induced loads. The inspectors completed a significance determination, in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," Table 4a for the Containment Barrier. Because the issue was corrected promptly, prior to introduction of weld material with hydrogen-induced cracks, the inspectors answered "no" to each of the four Phase 1 screening questions. Therefore, the finding screened as having very low safety significance. This finding had a cross-cutting aspect in the area of Human Performance, Work Practices because the licensee did not provide adequate supervisory and management oversight of work activities including contractors such that nuclear safety was supported. Specifically, the failure to control the weld rod oven temperature in accordance with procedure WFMC-1 was caused by inadequate licensee oversight of the contracted welder. (H.4(c)) (Section 1R08.1).

B. Licensee-Identified Violations

No violations were identified.

REPORT DETAILS

Summary of Plant Status

At midnight on September 30/October 1, 2011, the main generator output breakers were opened and the unit was taken offline for mid-cycle outage 17M to facilitate replacement of the reactor vessel closure head. On December 5, 2011, the reactor was restarted and criticality achieved. The unit was synchronized to the main electrical grid and the main generator output breakers were closed on December 6, 2011. The unit reached full power operation 2 days later, on December 8, 2011, and remained operating at or near full power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

- 1R01 Adverse Weather Protection (71111.01)
 - .1 <u>Winter Seasonal Readiness Preparations</u>
 - a. Inspection Scope

The inspectors conducted a review of the licensee's preparations for winter conditions to verify that the plant's design features and implementation of procedures were sufficient to protect mitigating systems from the effects of adverse weather. Documentation for selected risk-significant systems was reviewed to ensure that these systems would remain functional when challenged by inclement weather. During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Safety Analysis Report (USAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. Cold weather protection, such as heat tracing and area heaters, was verified to be in operation where applicable. The inspectors also reviewed Corrective Action Program (CAP) items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their CAP in accordance with station corrective action procedures. Specific documents reviewed during this inspection are listed in the Attachment. The inspectors' reviews focused specifically on the following plant systems due to their risk significance or susceptibility to cold weather issues:

- Ultimate heat sink; and
- Borated water storage tank and associated piping.

This inspection constituted one winter seasonal readiness preparations sample as defined in Inspection Procedure (IP) 71111.01-05.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

- .1 Quarterly Partial System Alignment Verifications
 - a. Inspection Scope

The inspectors performed partial system alignment verifications of the following risk-significant systems:

- Service water train 1 in Mode 5 when lined up to support shutdown operations during the week ending November 19, 2011; and
- Emergency diesel generator (EDG) no. 2 when EDG no. 1 was unavailable for planned testing during the week ending December 24, 2011.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, USAR, Technical Specification (TS) requirements, outstanding work orders (WOs), condition reports (CRs), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

These activities constituted two partial system alignment verification samples as defined in IP 71111.04-05.

b. <u>Findings</u>

No findings were identified.

- .2 Semi-Annual Complete System Alignment Verification
- a. Inspection Scope

During the week ending December 10, 2011, the inspectors performed a complete system alignment inspection of the decay heat/low pressure injection system to verify the functional capability of the system. This system was selected because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment line ups, electrical power availability, system pressure and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding WOs was

performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the CAP database to ensure that system equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the Attachment to this report.

These activities constituted one complete system alignment verification sample as defined in IP 71111.04-05.

b. Findings

No findings were identified.

- 1R05 Fire Protection (71111.05)
 - .1 Routine Resident Inspector Quarterly Tours
 - a. Inspection Scope

The inspectors conducted fire protection inspection tours which were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- Containment Elevation 565' (Room 217, Fire Area D);
- Containment Elevation 603' (Rooms 407 and 410, Fire Area D);
- Containment Elevation 636' (Room 580, Fire Area D); and
- Containment Elevation 643' (Rooms 700 and 701, Fire Area D).

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and implemented adequate compensatory measures for out-of-service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events (IPEEE) with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the Attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's CAP. Documents reviewed are listed in the Attachment to this report.

These activities constituted four quarterly fire protection inspection samples as defined in IP 71111.05-05. In addition, these samples contributed towards completion of IP 71007, "Reactor Vessel Head Replacement."

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

.1 Annual Heat Sink Performance Review

a. Inspection Scope

The inspectors reviewed the licensee's testing of the spent fuel pool heat exchangers to verify that potential deficiencies did not mask the licensee's ability to detect degraded performance, to identify any common cause issues that had the potential to increase risk, and to ensure that the licensee was adequately addressing problems that could result in initiating events that would cause an increase in risk. The inspectors reviewed the licensee's observations as compared against acceptance criteria, the correlation of scheduled testing and the frequency of testing, and the impact of instrument inaccuracies on test results. Inspectors also verified that test acceptance criteria considered differences between test conditions, design conditions, and testing conditions. Documents reviewed for this inspection are listed in the Attachment to this document.

This annual heat sink performance review constituted a single inspection sample as defined in IP 71111.07-05.

b. Findings

No findings were identified.

.2 Triennial Review of Heat Sink Performance

a. Inspection Scope

The inspectors reviewed operability determinations, completed surveillances, vendor manual information, associated calculations, performance test results and cooler inspection results associated with the Component Cooling Water (CCW) heat exchanger number E22-3. This heat exchanger was chosen based on its risk significance in the licensee's probabilistic safety analysis, its important safety-related mitigating system support functions, its operating history, and its relatively low margin.

The inspectors verified that testing, inspection, maintenance, and monitoring of biotic fouling and macrofouling programs were adequate to ensure proper heat transfer. This was accomplished by verifying the test method used was consistent with accepted industry practices, or equivalent, the test conditions were consistent with the selected methodology, the test acceptance criteria were consistent with the design basis values, and results of heat exchanger performance testing. The inspectors also verified that the test results appropriately considered differences between testing conditions and design conditions, the frequency of testing based on trending of test results was sufficient to detect degradation prior to loss of heat removal capabilities below design basis values and test results considered test instrument inaccuracies and differences.

The inspectors reviewed the methods and results of heat exchanger performance inspections. The inspectors verified the methods used to inspect and clean heat exchangers were consistent with as-found conditions identified and expected degradation trends and industry standards, the licensee's inspection and cleaning activities had established acceptance criteria consistent with industry standards, and the

as-found results were recorded, evaluated, and appropriately dispositioned such that the as-left condition was acceptable.

In addition, the inspectors verified the condition and operation of the CCW heat exchanger number E22-3 were consistent with design assumptions in heat transfer calculations and as described in the final safety analysis report. This included verification that the number of plugged tubes was within pre-established limits based on capacity and heat transfer assumptions. The inspectors verified the licensee evaluated the potential for water hammer and established adequate controls and operational limits to prevent heat exchanger degradation due to excessive flow-induced vibration during operation. In addition, eddy current test reports and visual inspection records were reviewed to determine the structural integrity of the heat exchanger.

The inspectors verified the performance of ultimate heat sinks (UHS) and safety-related service water systems and their subcomponents such as piping, intake screens, pumps, valves, etc. by tests or other equivalent methods to ensure availability and accessibility to the inplant cooling water systems.

The inspectors reviewed the results of the licensee's inspection of the UHS weirs or excavations. The inspectors verified that identified settlement or movement indicating loss of structural integrity and/or capacity was appropriately evaluated and dispositioned by the licensee. In addition, the inspectors verified the licensee ensured sufficient reservoir capacity by trending and removing debris or sediment buildup in the UHS.

The inspectors reviewed the licensee's operation of service water system and UHS. This included the review of licensee's procedures for a loss of the service water system or UHS and the verification that instrumentation, which is relied upon for decision making, was available and functional. In addition, the inspectors verified that macrofouling was adequately monitored, trended, and controlled by the licensee to prevent clogging. The inspectors verified that licensee's biocide treatments for biotic control were adequately conducted and the results monitored, trended, and evaluated. The inspectors also reviewed strong pump-weak pump interaction and design changes to the service water system and the UHS. The inspectors also verified that the licensee maintained adequate pH, calcium hardness, etc.

In addition, the inspectors reviewed condition reports related to the heat exchangers/coolers and heat sink performance issues to verify that the licensee had an appropriate threshold for identifying issues and to evaluate the effectiveness of the corrective actions. The documents that were reviewed are included in the Attachment to this report.

These inspection activities constituted two heat sink inspection samples as defined in IP 71111.07 05.

b. Findings

No findings of significance were identified. Section 4OA2 documents a review of the licensee's assessment of the as-found condition of the intake canal.

1R08 Inservice Inspection Activities (71111.08P)

From October 11, 2011, through November 23, 2011, the inspectors conducted a review of the implementation of the licensee's Inservice Inspection (ISI) Program for monitoring degradation of the reactor coolant system (RCS), steam generator (SG) tubes, emergency feedwater (FW) systems, risk-significant piping and components and containment systems.

The inspections described in Sections 1R08.1, 1R08.2, R08.3, IR08.4, and 1R08.5 below were completed in accordance with IP 71111.08. A full inspection sample was not available during this outage, so the reviews under Section 1R08.4 are considered incomplete. Additional reviews to complete this procedure will be documented in a future inspection report. In addition, these samples contributed towards completion of IP 71007, "Reactor Vessel Head Replacement."

.1 Piping Systems Inservice Inspection

a. Inspection Scope

The inspectors observed the following non-destructive examinations mandated by the American Society for Mechanical Engineers (ASME) Code Section XI to evaluate compliance with the ASME Code Section XI and Section V requirements and if any indications and defects were detected, to determine if these were dispositioned in accordance with the ASME Code or an NRC approved alternative requirement.

- Ultrasonic examination (UT) of the pressurizer nozzle-to-lower head weld (RC-PZR-WP-15);
- Dye penetrant (PT) examination of pipe-to-valve weld (MU-31-CCA-18-1-FW23);
- UT of reactor vessel shell-to-lower head weld no. 4.; and
- UT of reactor vessel nozzle-to-shell weld no. 11.

The inspectors reviewed the following examination records (volumetric or surface) with recordable indications accepted for continued service to determine if acceptance was in accordance with the ASME Code Section XI or an NRC approved alternative:

• PT examination report no. 17-PT-011, valve HP92- to-pipe weld.

The inspectors observed the following welds completed for risk significant systems during the outage to determine if the licensee applied the preservice non-destructive examinations and acceptance criteria required by the construction code (CC). Additionally, the inspectors reviewed the welding procedure specification and supporting weld procedure qualification records to determine if the weld procedures were qualified in accordance with the requirements of CC, the ASME Code Section IX and the American Welding Society (AWS) D.1.4 Code:

- Containment access door closure weld FW-1;
- Beam (stiffener)-to-containment plate weld FW-1; and
- Splice welds of shield building (SB) rebar joints 2H-03R and 2V-45B.

b. Findings

Inadequate Control of Weld Filler Metal Electrodes

Introduction

A finding of very low safety significance and an associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," were identified by the inspectors for the licensee's failure to control weld rod oven temperature in accordance with procedure WFMC-1 during a rebar splice weld completed for restoration of the SB access opening.

Description

The inspectors identified that the portable weld rod oven temperature had not been maintained above the minimum required temperature of 250 degrees Fahrenheit (deg F). The inspectors were concerned that if this practice had continued, it would increase the possibility for rebar splice weld failure due to hydrogen-induced cracking.

The coatings of shielded metal arc welding (SMAW) electrodes used for steel (especially low-hydrogen electrodes) readily absorb moisture (i.e., hydroscopic). Water present in the electrode coating, breaks down into hydrogen and oxygen within the welding arc. The hydrogen becomes entrained in the weld metal and as the metal cools, it undergoes a phase transformation from an austenitic to a martensitic structure. From 400 deg F to room temperature, some of the retained austenite changes slowly into martensite (delayed transformation). During this delayed transformation, the monatomic hydrogen has limited solubility and recombines into hydrogen gas causing metal microcracks and fissures. These defects may appear in the weld, at the weld interface, or in the parent metal, depending on how the hydrogen moves or where it becomes trapped and results in delayed hydrogen induced cracks and weld porosity. Because detection of hydrogen-induced cracks is difficult and may not be found until after a weld is placed into service, the controls used to prevent introduction of hydrogen are critical for fabrication of acceptable welds. To prevent introduction of hydrogen, the controls for storage of low-hydrogen electrodes are designed to preclude moisture absorption by the use of hermetically-sealed containers (e.g. shipping package from manufacturer) or by the use of ovens maintained at elevated temperatures to keep the electrode coating dry.

For the low-hydrogen electrodes used to fabricate rebar splices in the restoration of the SB, the licensee's contractor provided for the control of the low-hydrogen electrodes in procedure WFMC-1 "Bechtel Welding Specification Welding Filler Material Control." This procedure required the use of portable rod warmers maintained at a minimum temperature of 250 deg F for storage of low-hydrogen electrodes to ensure that the hydroscopic coating of the welding electrode stayed dry and did not absorb moisture from the atmosphere.

During fabrication of a horizontal rebar splice weld 2H-03R, the inspectors observed that the low-hydrogen electrode filler material was protruding several inches above the top of the welder's portable rod storage oven (e.g. top of oven was open). The inspectors requested the welder verify that the portable oven was at or above the minimum required temperature of 250 deg F. The welder applied a temperature crayon designed to melt at 200 deg F to the oven at the inside surface of the top lid, to the oven inner wall, and at several points on the removable filler metal storage rack. The temperature

crayon did not melt at any of these locations. The welder then removed a single weld electrode and applied the temperature crayon at locations along the weld electrode and was able to get the crayon to melt on the bottom 1/2 length of the electrode (portion nearest the bottom of the oven). These measurements demonstrated that the oven temperature had not been maintained above 250 deg F as required by the procedure WFMC-1.

As a corrective action, the licensee removed the welder's certification to weld rebar and documented this issue in CR 2011-05536. The welder who fabricated weld 2H-03R was assigned three additional welds, and absent NRC intervention, these welds would likely have been fabricated with electrodes exposed to ambient temperature conditions for more than 1 hour. A 1-hour time limit outside the warming oven was the maximum allowed by procedure WFMC-1 and AWS D1.4 "Structural Welding Code - Reinforcing Steel" for the E-9018-B3H4R electrode material used on weld 2H-03R to ensure moisture was not absorbed from the atmosphere. To ensure that the horizontal rebar splice weld 2H-03R was not affected by delayed hydrogen cracking, the licensee's vendor examined the weld splice 48 hours after fabrication and did not identify cracks.

<u>Analysis</u>

The inspectors determined that the licensee's failure to control weld rod oven temperature in accordance with procedure WFMC-1 is contrary to 10 CFR 50 Appendix B, Criterion V, and a performance deficiency.

The finding was determined to be more than minor because the finding was associated with the Barrier Integrity Cornerstone attribute of Configuration Control and adversely affected the cornerstone objective to provide reasonable assurance that the physical design barriers (e.g. containment) protect the public from radionuclide releases caused by accidents or events. The SB is part of the containment system. Absent NRC identification, rebar welds would have been fabricated with electrodes exposed to ambient temperatures for excessive periods of time creating a condition that results in hydrogen-induced weld cracking. Rebar splice material with cracks returned to service would increase risk for SB failure during design basis events such as wind-driven missile impact or earthquake-induced loads. The inspectors completed a significance determination, in accordance with Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," Table 4a for the Containment Barrier. Because the issue was corrected promptly, prior to introduction of weld material with hydrogen induced cracks, the inspectors answered "no" to each of the four Phase 1 screening questions. Therefore, the finding screened as having very low safety significance (Green).

This finding had a cross-cutting aspect in the area of Human Performance, Work Practices because the licensee did not provide adequate supervisory and management oversight of work activities including contractors such that nuclear safety was supported. Specifically, the failure to control the weld rod oven temperature in accordance with procedure WFMC-1 was caused by inadequate licensee oversight of the contracted welder (IMC 0310 - Item H.4(c)). The inspector determined that this was the cause of the finding based upon discussions with licensee and vendor staff.

Enforcement

Appendix B of 10 CFR 50, Criterion V, "Instructions, Procedures, and Drawings," required in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.

Procedure WFMC-1, Bechtel Welding Specification Welding Filler Material Control, Revision 0, required; in Paragraph 6.1.2.2 that: "The oven shall be held at a minimum of 250 deg F and a maximum of 350 deg F," and in Paragraph 7.5 that: "The portable rod warmers shall maintain a minimum temperature of 250 deg F" and in Table 1 for use of "All Low-Hydrogen Electrodes" to "Issue in portable warmers maintained at 250 deg F minimum."

Contrary to the above, on November 16, 2011, for an activity affecting quality (weld rod oven temperature) the licensee failed to accomplish the activity in accordance with the applicable procedure WFMC-1. Specifically, the licensee failed to maintain a portable rod warmer oven containing low-hydrogen electrode weld material above the minimum required temperature of 250 deg F. Because of the very low safety significance of this finding and because the issue was entered into the licensee's CAP (CR 2011-05536), it is being treated as a non-cited violation (NCV), consistent with Section 2.3.2 of the NRC Enforcement Policy. (NCV 05000346/2011005-01)

.2 Reactor Pressure Vessel Upper Head Penetration Inspection Activities

a. Inspection Scope

The vessel head penetration nozzles and J-groove welds of the inservice head had been affected by primary water stress corrosion cracking (PWSCC) and repaired during the previous outage (reference NRC Inspection Report (IR) 05000346/2010008 – Adams Accession No. ML102930380). For the No. 17 mid-cycle outage, the in-service head was removed to an on-site storage location pending off-site disposal and thus did not require further non-destructive examination. The licensee procured a replacement reactor vessel closure head (RRVCH) with penetration nozzles and J-groove welds fabricated with materials (e.g., Alloy 690) more resistant to PWSCC.

For the RRVCH a bare metal visual pre-service examination and a non-visual preservice examination was required pursuant to 10 CFR 50.55a(g)(6)(ii)(D) and Code Case N-729-1. The inspectors had previously completed the review of the non-visual preservice examination records for the replacement head as documented in NRC IR 05000346/2011004 (Adams Accession No. ML112991544).

For the pre-service visual examinations of the RRVCH the inspectors observed and reviewed records of the visual examination conducted on the vessel head at penetrations 1, 3, 54, and 61 to determine if the activities were conducted in accordance with the requirements of ASME Code Case N-729-1 and 10 CFR 50.55a(g)(6)(ii)(D). In particular, the inspectors confirmed that:

- The required visual examination scope/coverage was achieved and limitations (if applicable) were recorded in accordance with the licensee procedures;
- The licensee criteria for visual examination quality and instructions for resolving interference and masking issues were adequate; and

 That the visual examination procedure required recording indications of potential through-wall leakage and that licensee documented relevant conditions in the corrective action system and implemented appropriate corrective actions.

Prior to the mid-cycle outage, the inspectors observed a welded repair/replacement activity associated with installation of a vent assembly on the upper head penetration of the RRVCH at nozzle No. 21 as documented in NRC IR 05000346/2011004 (Adams Accession No. ML112991544).

b. Findings

No findings were identified.

.3 Boric Acid Corrosion Control

a. Inspection Scope

The inspectors performed an independent walkdown of portions of the reactor coolant system and attached safety-related systems which had received a boric acid walkdown by the licensee staff to determine whether the licensee's Boric Acid Corrosion Control (BACC) visual examinations emphasized locations where boric acid leaks can cause degradation of safety significant components and to determine if degraded conditions were entered into the CAP.

The inspectors reviewed the following evaluations of reactor coolant system or other safety-related systems with components affected by boric acid to determine if the licensee applied appropriate corrosion rates and properly assessed the effects of corrosion-induced wastage on the component's structural or pressure boundary integrity:

- CR 2010-74892, reactor coolant pump 1-2-2 boric acid;
- CR 2010-79012, high pressure injection (HPI) pump 2P58-2 boric acid; and
- CR 2011-94103, spent fuel pool pump 1-2 seal leak.

The inspectors reviewed the following corrective actions related to evidence of boric acid leakage to determine if the corrective actions completed were consistent with the requirements of the ASME Code Section XI and 10 CFR 50, Appendix B, Criterion XVI:

- CR 2010-78548, leak at DH 22A packing;
- CR 2010-73653, leak at DH-11 packing; and
- CR 2010-76667, leak at SF-35 packing.
- b. Findings

No findings were identified.

- .4 Steam Generator Tube Inspection Activities
- a. Inspection Scope

Steam Generator tube eddy current (ET) examinations were not required during the No. 17 mid-cycle outage pursuant to TS 3.4.17 "Steam Generator Tube Integrity," and TS 5.5.8 "Steam Generator Program." Therefore, the licensee did not conduct SG tube

examinations and only a portion of the NRC IP could be completed for this review area. Specifically, from October 11, 2011, through November 23, 2011, the inspectors performed an on-site review of documentation related to the SG ISI program to determine if:

• Primary-to-secondary leakage (e.g., SG tube leakage) was below 3 gallons per day or the detection threshold during the previous operating cycle.

Completion of Section 02.04 of IP 71111.08 is scheduled to be completed during the Spring 2012 refueling outage when the licensee will perform ET of the SG tubes.

b. <u>Findings</u>

No findings were identified.

- .5 Identification and Resolution of Problems
- a. Inspection Scope

The inspectors performed a review of ISI/SG related problems entered into the licensee's CAP and conducted interviews with licensee staff to determine if:

- The licensee had established an appropriate threshold for identifying ISI/SG related problems;
- The licensee had performed a root cause (if applicable) and taken appropriate corrective actions; and
- The licensee had evaluated operating experience and industry generic issues related to ISI and pressure boundary integrity.

The inspectors performed these reviews to evaluate compliance with 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requirements. The corrective action documents reviewed by the inspectors are listed in the Attachment to this report.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

- .1 Routine Quarterly Evaluations
 - a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk-significant systems:

- Auxiliary building and SB structures; and
- Containment systems.

The inspectors reviewed events such as where ineffective equipment maintenance had resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- Implementing appropriate work practices;
- Identifying and addressing common cause failures;
- Scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- Characterizing system reliability issues for performance;
- Charging unavailability for performance;
- Trending key parameters for condition monitoring;
- Ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- Verifying appropriate performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2), or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

The inspectors' maintenance effectiveness reviews constituted two quarterly inspection samples as defined in IP 71111.12-05. In addition, these samples contributed towards completion of IP 71007, "Reactor Vessel Head Replacement."

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

- .1 Maintenance Risk Assessments and Emergent Work Control
- a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- Work activities during the week ending October 8, 2011, which included a period
 of yellow shutdown risk during the time that the RCS was drained to reduced
 inventory conditions. Other activities included the lift and movement of the
 reactor vessel head from the reactor vessel to the containment storage stand;
- Emergent work associated with cracking identified in the containment SB during the 17M mid-cycle reactor head replacement outage, as documented in CR 2011-03346 and other entries into the licensee's CAP; and
- Emergent repairs associated with damage to decay heat pump 1-1 during the week ending December 24, 2011, as documented in CR 2011-07195.

These activities were selected based on their potential risk significance relative to the Reactor Safety Cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's
probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

Specific documents reviewed during this inspection are listed in the Attachment to this report. These maintenance risk assessments and emergent work control activities constituted three inspection samples as defined in IP 71111.13-05. In addition, these samples contributed towards completion of IP 71007, "Reactor Vessel Head Replacement."

b. Findings

Decay Heat Pump 1-1 Damaged and Rendered Inoperable By Personnel Climbing on Equipment

Introduction

A self-revealed finding of very low safety significance (Green) was identified when low pressure injection equipment was damaged by operators attempting to access an overhead valve. Specifically, by climbing and standing on sensitive plant equipment, the licensee failed to comply with the standards and expectations for accessing plant equipment contained in procedure NOP-OP-1002, "Conduct of Operations".

Description

On the morning of December 22, 2011, the plant was performing DB-PF-03071, "CCW Check Valve Testing." Performance of this test requires an operator to manipulate CC258, CCW Essential Line 1 to Makeup Pump 1 Isolation Valve. The location of this valve makes it difficult for an operator to gain access. The valve is approximately 12 feet off the floor, amidst overhead interferences, and is located directly above the motor for decay heat removal pump no. 1. A convenient way to access the valve was not readily available when CC258 was required to be closed and opened during the performance of the CCW check valve test. The operator attempting to perform the task determined the most practical method to access the valve was to climb up plant equipment and position himself standing on the top of the decay heat pump motor. The first time the valve was accessed, the operator chose the more open, north, side of the motor. This proved difficult, though the operator was able to make the climb and perform the valve manipulation without event. The operator lowered himself from the motor on the east side, which contained more sensitive equipment, but had more hand and foot holds that made it easier to climb down. For the second time accessing CC258, the operator attempted to climb up the side he had just descended (east), despite the proximity to more sensitive equipment. Upon climbing the motor the second time, the operator's hand slipped causing a fall of approximately 3 feet. The operator landed on his feet, however, during the fall the operator came into contact with the oil temperature probe for the decay heat motor outboard bearing. The temperature element was dislodged and oil began spilling from motor out the open connection.

The loss of oil from the outboard motor bearing rendered low pressure injection pump no. 1 inoperable, causing entry into the action statement for limiting condition for Operation (LCO) 3.5.2.A, which has a 7-day completion time for restoring the system to an operable status. The temperature element was repaired; and the system was

restored in the afternoon of December 22, 2011, after being out-of-service for approximately 13 hours.

The inspectors reviewed the standards and expectations contained in Section 4.17 of NOP-OP-1002, "Conduct of Operations", covering access to plant equipment. The expectation states that: "Climbing on equipment is the exception and not the rule." The Conduct of Operations standards also include the following:

- Plant equipment should not be climbed upon to gain access from one location to another. Ladders and/or scaffold are used whenever possible; and
- If no other means are available, plant equipment may be climbed upon provided it does not pose a risk to the safety of personnel or equipment.

Contrary to the standards above, the operator climbed upon plant equipment (decay heat pump motor no. 1) despite the risks involved to personnel safety and equipment safety. An alternate method for accessing CC258 was not addressed in the pre-job brief for the CCW check valve test. A ladder could have been used to provide safer access to the top of the motor or a scaffold addition could have provided better access to the valve itself.

The licensee included this issue in their CAP as CR 2011-07195. An immediate corrective action was taken to repair the damaged temperature element and restore low pressure injection pump no. 1 to operable status. A long-term solution to providing access to the overhead valve is under evaluation in the licensee's CAP.

<u>Analysis</u>

The inspectors reviewed this finding using the guidance contained in Appendix B, "Issue Screening," of IMC 0612, "Power Reactor Inspection Reports." The inspectors determined that the licensee's failure to comply with the standards and expectations for accessing plant equipment contained in the "Conduct of Operations" procedure was a performance deficiency that was reasonably within the licensee's ability to foresee and correct and should have been prevented. The inspectors determined that the finding was more than minor because it was associated with the Mitigating Systems Cornerstone attribute of Human Performance and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the damage caused when falling from plant equipment rendered low pressure injection train 1 inoperable.

The inspectors evaluated the finding using IMC 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," using the Phase 1 SDP worksheet for the mitigating systems cornerstone. The finding screened as very low safety significance (Green) because the inspectors answered "no" to the screening questions in Table 4a. Specifically, the finding was not a design or qualification deficiency, did not represent a loss of system safety function, did not represent actual loss of safety function of a single train for greater than its TS allowed outage time, and the finding did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

This finding had a cross-cutting aspect in the area of Human Performance, Work Control component, because the licensee did not plan and coordinate work activities, consistent with nuclear safety. Specifically, the licensee did not appropriately plan for job site

conditions impacting human performance since an appropriate available method for accessing CC258 was not evaluated. (H.3(a))

Enforcement

The inspectors concluded that the licensee did not comply with the standards and expectations for accessing plant equipment contained in procedure NOP-OP-1002, "Conduct of Operations." This finding, however, did not involve a corresponding violation of NRC requirements. Specifically, the inspectors determined that the "Conduct of Operations" procedure is an administrative procedure, and not covered under the quality assurance (QA) requirements set forth in 10 CFR 50, Appendix B. Additionally, the inspectors also determined that the "Conduct of Operations" procedure is not covered under TS 5.4.1(a), which requires the licensee to establish, implement, and maintain applicable written procedures for the safety-related systems and activities recommended in Regulatory Guide (RG) 1.33, Revision 2, Appendix A. (FIN 05000346/2011005-02)

1R15 Operability Determinations and Functional Assessments (71111.15)

- .1 Operability Evaluations
- a. Inspection Scope

The inspectors reviewed the following issues:

- The functionality of the containment SB and operability of the plant's containment system following identification of cracking in the SB concrete, as documented in CR 2011-03346 and other related entries in licensee's CAP;
- The operability of the plant's safety-related station batteries and direct current (DC) electrical distribution systems following identification of loading issues, as documented in CR 2011-01902;
- The functionality and operability of the CCW system following the unexpected drop in CCW surge tank level, as documented in CR 2011-05542; and
- The functionality and operability of the service water (SW) system following issues associated with the balancing of SW train no. 2 safety-related flows after maintenance, as documented in CR 2011-05526.

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and USAR to the licensee's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment to this report.

The inspectors' reviews of these operability and functionality evaluations constituted four inspection samples as defined in IP 71111.15-05. In addition, these samples contributed towards completion of IP 71007, "Reactor Vessel Head Replacement."

b. Findings

Air Voids in Component Cooling Water System Caused By Inadequate Fill and Vent Procedure

Introduction

A self-revealed finding of very low safety significance (Green) and an associated NCV of TS 5.4.1(a) were identified for the licensee's failure to establish, implement, and maintain technically adequate procedures to cover the restoration (i.e., filling and venting) of the CCW system following maintenance activities.

Description

In the early morning hours of November 17, 2011, the plant was in Mode 5, cold shutdown. A heightened shutdown safety awareness condition (i.e., "yellow" risk) was in effect due to the plant having a reduced capacity for decay heat removal until activities to fill and vent the RCS were completed. These RCS filling and venting procedures were in progress.

At approximately 0120 hours, the on-watch control room crew received an unexpected annunciator alarm, 11-3-A, which indicated a low level in the CCW surge tank. The crew entered DB-OP-02011, "Heat Sink Alarm Panel 11 Annunciators," and cut in demineralized water to the CCW system to retard the drop in surge tank level in accordance with the procedure. CCW surge tank level was stabilized, and restored to the normal operating band in short order. The operating crew calculated that approximately 125 gallons of inventory from the CCW surge tank had been lost.

A follow-on investigation by the operating crew revealed no signs of leakage from the system, but that a chemical addition had been made to the CCW system approximately 50 minutes before the receipt of annunciator alarm 11-3-A. From this, the licensee surmised that an air bubble might have been introduced into the CCW system during the chemical addition. The chemical addition piping was a long run of approximately 300 feet that had not been used since maintenance had been conducted on the system and, if voided, could have introduced an air bubble of sufficient size to account for the drop in CCW surge tank level.

On November 18, 2011, the inspectors discussed the issue with the licensee's Superintendent of Nuclear Operations, and voiced a concern regarding how the licensee's procedures for restoration from maintenance activities on the CCW system could have permitted parts of the system to have air entrapped. The possibility that more sections of the CCW system could be voided was also discussed, whereupon the Superintendent of Nuclear Operations stated that the licensee would conduct additional inspections and investigation into the issue.

On November 22, 2011, UT performed by the licensee identified a significant air void, approximately 19 cubic feet, in a CCW pump 3 horizontal suction piping segment. CCW pump 3 is a 'swing' pump that can be lined up to take the place of either the

normal train 1 CCW pump or the normal train 2 CCW pump. Component Cooling Water pump 3 was immediately declared unavailable upon identification of the air void, but because the pump was not lined up to support either train of the CCW system there was no TS implications. Extensive ultrasonic testing was performed on the rest of the CCW system, with no abnormal conditions being noted.

A follow-on investigation by licensee engineering and operations personnel revealed that the air entrapment in the CCW system was most likely due to the extensive maintenance activities on the system during the 17M mid-cycle outage. A complex series of fill and venting evolutions to restore the system had been required, and these evolutions may not have vented all of the air from the system. The licensee had entered this issue into their CAP as CRs 2011-05542 and 2011-05831. Planned corrective actions included additional procedural guidance for CCW fill and venting activities.

Analysis

The inspectors determined that failure of the licensee to establish, implement, and maintain technically adequate procedures to cover the restoration (i.e., filling and venting) of the CCW system following maintenance activities was contrary to the requirements in the licensee's Quality Assurance Program Manual and TS, and as such constituted a performance deficiency that was reasonably within the licensee's ability to foresee and correct and should have been prevented.

The inspectors reviewed this issue using the guidance contained in Appendix B, "Issue Screening," of IMC 0612, "Power Reactor Inspection Reports," and determined that it was of more than minor safety significance and constituted a finding. The issue was determined to be associated with the Mitigating Systems Cornerstone attribute of procedure quality, and had adversely affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, CCW, a mitigating system, had its reliability adversely impacted by the lack of appropriate fill and venting procedural guidance. In addition, the unexpected 11-3-A annunciator alarm and ensuing alarm response and investigation caused the on-watch operations crew to temporarily suspend the in-progress RCS fill and venting procedures, which extended the heightened shutdown safety awareness condition (i.e., "yellow" risk) by approximately 30 minutes.

The inspectors evaluated the finding using IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings." Because the finding involved reactor shutdown operations and conditions, the inspectors transitioned to IMC 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process - Phase 1 Operational Checklists for Both PWRs and BWRs." Since the finding was associated with an issue that occurred during the time the licensee was conducting RCS fill and venting activities and plant conditions were in transition, the inspectors consulted both Checklist 2, "PWR Cold Shutdown Operation: RCS Closed and Steam Generators Available for Decay Heat Removal (Loops Filled and Inventory in the Pressurizer); Time to Boiling Less Than 2 Hours," and Checklist 3, "PWR Cold Shutdown and Refueling Operation: RCS Open and Refueling Cavity Level Less Than 23 Feet or RCS Closed and No Inventory in the Pressurizer; Time to Boiling Less Than 2 Hours." The inspectors determined that the finding did not adversely impact any shutdown defense-in-depth or mitigation attributes on either checklist, nor did it meet any

of the checklist specific requirements for a Phase 2 or Phase 3 SDP analysis. Consequently, the finding was determined to be of very low safety significance (Green).

This finding had a cross-cutting aspect in the area of Human Performance, Resources component, because the licensee did not ensure that personnel, equipment, procedures, and other resources were available and adequate to assure nuclear safety. Specifically, the licensee's procedures and guidance for the restoration of the CCW system following outage maintenance activities did not ensure that the system was fully filled and properly vented prior to operation. (H.2(c))

Enforcement

Technical Specification 5.4.1(a) requires the licensee to establish, implement, and maintain applicable written procedures for the safety-related systems and activities recommended in RG 1.33, Revision 2, Appendix A. Section 3(e) of RG 1.33, Revision 2, Appendix A, requires procedures for the proper operation of the CCW system, including filling, venting, and draining operations. Contrary to this requirement, the licensee failed to properly prepare and implement technically adequate written procedures for the filling and venting of the CCW system following mid-cycle outage 17M maintenance, such that significant air voids were left in the system following its restoration and return to service.

Because this finding was of very low safety significance and had been entered into the licensee's CAP as CRs 2011-05542 and 2011-05831, the associated violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. (NCV 05000346/2011005-03)

1R18 Plant Modifications (71111.18)

- .1 Temporary and Permanent Plant Modifications
- a. Inspection Scope

The inspectors reviewed the following temporary and permanent plant modifications:

- Engineering change package (ECP) 11-0412, which covered replacement of large portions of service water (SW) piping and removal of emergency core cooling system (ECCS) room cooler check valves [permanent modification];
- ECP 02-0540, which covered replacement of the unit load demand module of the station's integrated control system (ICS) [permanent modification]; and
- ECPs 10-0458 and 10-0459, which covered the opening and restoration of the access openings in the concrete containment SB and steel containment vessel (CV) to facilitate replacement of the integrated reactor head assembly [temporary modification].

The inspectors reviewed the configuration changes and associated 10 CFR 50.59 safety evaluation screenings against the design basis, the USAR, and the TS to verify that the modification did not affect the operability or availability of the affected systems. The inspectors observed ongoing and completed work activities to ensure that the modifications were installed as directed and consistent with the design control documents; the modifications operated as expected; post-modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modifications did not impact the operability of any interfacing

systems. In addition, the inspectors verified that relevant procedure, design, and licensing documents were properly updated. Lastly, the inspectors discussed the plant modification with operations, engineering, and training personnel to ensure that the individuals were aware of how the operation with the plant modification in place could impact overall plant performance. Documents reviewed in the course of this inspection are listed in the Attachment to this report.

These inspection activities constituted a single temporary modification sample and two permanent plant modification samples as defined in IP 71111.18-05. In addition, these samples contributed towards completion of IP 71007, "Reactor Vessel Head Replacement."

b. Findings

No findings were identified.

- 1R19 Post-Maintenance Testing (71111.19)
 - .1 Post-Maintenance Testing
 - a. Inspection Scope

The inspectors reviewed the following post-maintenance testing (PMTs) to verify that procedures and testing activities were adequate to ensure system operability and functional capability:

- Motor testing and pump baseline testing of containment spray train 1 during the week ending October 29, 2011, following motor replacement and preventive maintenance activities;
- Motor testing and baseline testing of no. 1 makeup pump during the week ending October 29, 2011, following motor replacement and preventive maintenance (PM) activities;
- Motor testing and baseline testing of no. 1 decay heat pump during the week ending November 5, 2011, following motor replacement and preventive maintenance activities;
- Motor testing and 18-month response time testing of containment air cooling unit no. 3 during the week ending November 12, 2011, following motor replacement and preventive maintenance activities;
- Post-modification test and 8 hour load test of station battery charger 1N and 1P during the weeks ending October 29 and November 5, 2011, following replacement of the battery chargers;
- Emergency ventilation system train 1 refueling interval SFAS drawdown test during the week ending November 26, 2011, following restoration of the SB and CV openings;
- Testing and tuning of main feedwater regulating valve (FRV) SP6B during the week ending November 5, 2011, following various outage-related maintenance activities;
- Integrated leakage testing of the primary containment during the week ending November 19, 2011, following restoration of the maintenance access opening that facilitated replacement of the reactor vessel integrated closure head assembly;

- Performance testing of auxiliary FW train no. 1 during the week ending December 10, 2011, following various outage-related maintenance activities; and
- Control rod drop timing testing during the week ending December 10, 2011, following replacement of the reactor vessel integrated closure head assembly.

These activities were selected based upon the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following (as applicable): that the effect of testing on the plant had been adequately addressed; that testing was adequate for the maintenance performed; that acceptance criteria were clear and demonstrated operational readiness; that test instrumentation was appropriate; that the tests were performed as written in accordance with properly reviewed and approved procedures; that equipment was returned to its operational status following testing (i.e., temporary modifications or jumpers required for test performance were properly removed after test completion, etc.); and that test documentation was properly evaluated. The inspectors evaluated the activities against TS, the USAR, 10 CFR 50 requirements, licensee procedures, and various NRC generic communications to verify that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with PMTs to determine whether the licensee was identifying problems and entering them in the CAP and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment to this report.

The inspectors' reviews of these activities constituted ten PMT samples as defined in IP 71111.19-05. In addition, these samples contributed towards completion of IP 71007, "Reactor Vessel Head Replacement."

b. Findings

Reactivity Manipulations Performed By Non-Licensed Individual

Introduction

The inspectors identified a SL IV NCV of 10 CFR 54(i). Specifically, on December 4, 2011, during the conduct of control rod insertion timing testing, the inspectors observed a non-licensed member of the licensee's engineering staff operating switches that directly and purposefully caused the insertion of various control rods that were being tested.

Description

On December 4, 2011, the inspectors were observing control rod insertion timing testing as part of a normal baseline inspection sample, and also to fulfill post-installation testing requirements associated with IP 71007, "Reactor Vessel Head Replacement." The sequence of testing involved the withdrawal of each control rod group (one group at a time) from the control room, and then timing the insertion of the control rods upon removal of power from their control rod drive (CRD) mechanisms. This latter action was accomplished locally in the field from electrical penetration room no. 1 where the control rod power supply cabinets were situated.

The inspectors observed the first of several control rod groups to be tested from the control room. Control rod group withdrawal was accomplished by an on-watch licensed

reactor operator who was in constant communication with testing personnel in the electrical penetration room, and no issues were noted by the inspectors. During a brief pause between control rod groups, the inspectors moved to electrical penetration room no. 1 to observe the remaining testing from that location.

During the next control rod group to be tested, the inspectors observed that the actual key switches used to interrupt power to the CRDs and cause control rod insertion were manipulated by a member of the licensee's engineering staff, and not a licensed individual. A licensed Senior Reactor Operator (SRO) was present in the electrical penetration room and providing oversight and test direction. The inspectors immediately questioned the SRO concerning the appropriateness of having a non-licensed individual causing control rod insertion and directly manipulating core reactivity, at which point the testing was suspended and the Shift Manager and Superintendent of Nuclear Operations were contacted and informed of the issue. The licensee immediately dispatched a licensed reactor operator to the electrical penetration room and testing resumed with a licensed reactor operator conducting all further operation of the local key switches.

The licensee entered the issue into their CAP as CR 2011-06318, and initially classified it as a severity level (SL) 5 reactivity management issue (i.e., low level and inconsequential).

Analysis

The inspectors determined that failure of the licensee to assign a licensed operator to manipulate the key switches in the electrical penetration room and directly change core reactivity constituted a performance deficiency that was reasonably within the licensee's ability to foresee and correct and should have been prevented.

The inspectors reviewed this issue using the guidance contained in Appendix B, "Issue Screening," of IMC 0612, "Power Reactor Inspection Reports." The issue was determined to be associated with the Mitigating Systems Cornerstone attribute of procedure quality. However, the inspectors subsequently determined that the issue had not adversely affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Because of several factors, the inspectors determined that the issue was of minor safety significance and, as such, did not constitute a finding. These factors included:

- All control rod group withdrawal activities were accomplished from the control room by an on-watch licensed reactor operator;
- All activities in the electrical penetration room were performed in accordance with an approved written test procedure, and under the direct supervision of a licensed SRO;
- The operation of the local key switches in the electrical penetration room, albeit by a non-licensed individual, could only cause control rod insertion; there was no withdrawal capability; and
- The individual operating the local key switches in the electrical penetration room was always in continuous communication with the on-watch licensed reactor operator in the control room.

Continuing in Appendix B, "Issue Screening," of IMC 0612, "Power Reactor Inspection Reports," the inspectors determined that the issue was subject to the NRC's traditional enforcement process as an issue that had the potential to impact the agency's ability to perform its regulatory function. Specifically, the NRC's Reactor Oversight Process fundamentally assumes that only duly licensed individuals are allowed to manipulate reactor controls and alter core reactivity or make changes to reactor power, and that all licensed individuals perform their licensed duties in accordance with any restrictions associated with their individual licenses.

The inspectors reviewed the violation examples in Section 6.4 of the NRC's Enforcement Policy, "Licensed Reactor Operators." However, no similar examples of non-licensed individuals performing licensed duties could be found. Subsequently, the inspectors conferred with NRC Region III management and members of the enforcement staff and determined that, because of the factors noted above, the issue constituted a SL IV violation that resulted in no, or relatively inappreciable, safety consequences. Because this issue was dispositioned through the traditional enforcement process and had no Reactor Oversight Process aspects, there was no cross-cutting aspect associated with the violation.

Enforcement

Controls is defined in 10 CFR 50.2, "Definitions," as: "When used with respect to nuclear reactors means apparatus and mechanisms, the manipulation of which directly affects the reactivity or power level of the reactor." Further, 10 CFR 50.54(i) states that: "Except as provided in part 55.13 of this chapter, the licensee may not permit the manipulation of the controls of any facility by anyone who is not a licensed operator or senior operator as provided in part 55 of this chapter."

Contrary to this requirement, on December 4, 2011, the licensee permitted a nonlicensed member of the engineering staff to manipulate controls (e.g., key switches) in electrical penetration room no. 1 that directly altered core reactivity through the insertion of a group of control rods. Because the licensee entered this issue into the CAP as CR 2011-06318, this SL IV violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. (NCV 05000346/2011005-04)

1R20 Outage Activities (71111.20)

.1 Reactor Vessel Head Replacement Outage Activities

a. Inspection Scope

The inspectors reviewed the licensee's shutdown safety plan and contingency plans for the 17M mid-cycle outage conducted from October 1, 2011, to December 6, 2011, to confirm that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. During the outage, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below:

 Licensee configuration management, including maintenance of defense-in-depth commensurate with the shutdown safety plan for key safety functions and compliance with the applicable TS when taking equipment out of service;

- Implementation of clearance activities and confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing;
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error;
- Controls over the status and configuration of electrical systems to ensure that TS and the licensee's shutdown safety plan requirements were met, and controls over switchyard activities;
- Monitoring of decay heat removal processes, systems, and components;
- Controls to ensure that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system;
- Reactor water inventory controls including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss;
- Controls over activities that could affect reactivity;
- Maintenance of secondary containment as required by TS;
- Licensee fatigue management, as required by 10 CFR 26, Subpart I;
- Refueling activities, including fuel handling and sipping to detect fuel assembly leakage;
- Startup and ascension to full power operation, tracking of startup prerequisites, walkdown of the containment building to verify that debris had not been left which could block ECCS suction strainers; and
- Licensee identification and resolution of problems related to outage activities.

In addition, the inspectors reviewed the licensee's heavy lift plans and activities in conjunction with the NRC's Operating Experience Smart Sample (OpESS) FY2007-03, Revision 2, "Crane and Heavy Lift Inspection, Supplemental Guidance for IP 71111.20." Documents reviewed during the inspection are listed in the Attachment to this report.

This inspection constituted one non-refueling outage activity sample as defined in IP 71111.20-05. Additionally, these inspection items contributed towards completion of IP 71007, "Reactor Vessel Head Replacement."

b. Findings

Inadequate Information on Valve Interlocks Resulted in Inadvertent Operation and Loss of Component Cooling Water Surge Tank Inventory

Introduction

A self-revealed finding of very low safety significance (Green) and an associated NCV of TS 5.4.1(a) were identified for the licensee's failure to establish, implement, and maintain technically adequate procedures to cover the restoration (i.e., motor controller re-energization) of components in the CCW system following maintenance activities.

Description

On Thursday, October 20, 2011, the plant was in a defueled condition. At approximately 1511 hours, the on-watch control room crew received an unexpected annunciator alarm, 11-3-A, which indicated a low level in the CCW surge tank. The crew entered DB-OP-02011, "Heat Sink Alarm Panel 11 Annunciators," and cut in demineralized water

to the CCW system to retard the drop in surge tank level in accordance with the procedure.

At the same time that the above event was occurring, an equipment operator was in the process of restoring electrical loads on 480 Vac Motor Control Center (MCC) E11D. The operator had just closed circuit breaker BE1161 for motor-operated valve (MOV) CC2645, the train 1 auxiliary building return header isolation valve. This valve had been in the shut position to isolate a portion of the CCW system that had been drained for maintenance, and plant operators after reviewing the valve's operating drawings and interlock logic had expected the valve to remain in the shut position following closure of its circuit breaker. As circuit breaker BE1161 was closed, however, CC2645 unexpectedly stroked open. Operations personnel in the control room heard the distinct sounds of collapsing air voids in the CCW piping outside the control room as CC2645 stroked open and annunciator 11-3-A came into alarm.

The on-watch operations crew quickly determined that the unexpected opening of MOV CC2645 was the cause of the low level condition in the CCW system. Because of the low level condition, once CC2645 completed its open stroke it automatically received a command to shut and moved back to the closed position. On an ensuing cycle when the valve was closed or nearly closed, plant operators reopened circuit breaker BE1161 and halted the transient. Component Cooling Water surge tank level was then restored to the normal operating band and stabilized there.

Prior to the event, loads on MCC E11D were being restored at the discretion of the unit supervisor. Drawings being utilized by the plant operators for this activity indicated that CC2645 should only automatically open under a set of very specific conditions. All but one of these conditions were met, and the operators believed that CC2645 would remain in the shut position when circuit breaker BE1161 was closed because an interlock associated with CCW pump no. 1 was not met. Specifically, the operators thought that based on the information on their reference drawings that CC2645 would only open with the circuit breaker for CCW pump no. 1 racked into the "test" position. Since the circuit breaker for CCW pump no. 1 was racked to the "out" position, plant operators had concluded that closing circuit breaker BE1161 would not result in any change in CC2645 valve position. A follow-up investigation by licensee engineering personnel, however, identified that both CCW pump no. 1 being racked into the "test" position and being racked to the "out" position satisfied the CC2645 interlocks and will provide the MOV with a signal to open.

The licensee had entered this issue into their CAP as CR 2011-04078. Corrective action taken or planned by the licensee included a revision to the referenced drawings to include all interlock requirements associated with MOV CC2645, as well as other similar valves.

<u>Analysis</u>

The inspectors determined that failure of the licensee to establish, implement, and maintain technically adequate procedures to cover the restoration (i.e., motor controller re-energization) of the CCW system following maintenance activities was contrary to the requirements in the licensee's Quality Assurance Program Manual and TS, and as such constituted a performance deficiency that was reasonably within the licensee's ability to foresee and correct and should have been prevented.

The inspectors reviewed this issue using the guidance contained in Appendix B, "Issue Screening," of IMC 0612, "Power Reactor Inspection Reports," and determined that it was of more than minor safety significance and constituted a finding. The issue was determined to be associated with the Mitigating Systems Cornerstone attribute of procedure quality, and had adversely affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, CCW, a mitigating system, had its reliability adversely impacted by the inadequate procedural guidance for motor controller restoration.

The inspectors evaluated the finding using IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings." Because the finding involved reactor shutdown operations and conditions, the inspectors transitioned to IMC 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process - Phase 1 Operational Checklists for Both PWRs and BWRs." Since the finding was associated with an issue that occurred during the time the reactor was in a defueled condition, the inspectors conservatively consulted all four PWR checklists (i.e., Checklists 1 – 4). The inspectors determined that the finding did not adversely impact any shutdown defense-in-depth or mitigation attributes on any checklist, nor did it meet any of the checklist specific requirements for a Phase 2 or Phase 3 SDP analysis. Consequently, the finding was determined to be of very low safety significance (Green).

This finding had a cross-cutting aspect in the area of Human Performance, Resources component, because the licensee did not ensure that personnel, equipment, procedures, and other resources were available and adequate to assure nuclear safety. Specifically, the licensee's procedures, drawings and guidance for the restoration of the CCW system following outage maintenance activities did not ensure that the system was properly aligned prior to restoration of electrical power to MOV CC2645. (H.2(c))

Enforcement

Technical Specification 5.4.1(a) requires the licensee to establish, implement, and maintain applicable written procedures for the safety-related systems and activities recommended in RG 1.33, Revision 2, Appendix A. Section 3(e) of RG 1.33, Revision 2, Appendix A, requires procedures for the proper operation of the CCW system, including restoration operations following maintenance and other outage activities. Contrary to this requirement, the licensee failed to properly prepare and implement technically adequate written procedures and drawings for the restoration of CCW system components, specifically electrical power to MOV CC2645, following mid-cycle outage 17M maintenance.

Because this finding was of very low safety significance and had been entered into the licensee's CAP as CR 2011-04078, the associated violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. (NCV 05000346/2011005-05)

1R22 <u>Surveillance Testing</u> (71111.22)

.1 Surveillance Testing

a. Inspection Scope

The inspectors reviewed the test results for the following activities to determine whether risk-significant systems and equipment were capable of performing their intended safety function and to verify testing was conducted in accordance with applicable procedural and TS requirements:

- DB-SC-03121, "Safety Features Actuation System Train 2 Integrated Response Time Test," during the weeks ending October 15, 2011 and November 12, 2011 (routine);
- DB-PF-10310, "Containment Integrated Leakage Rate Test," during the week ending November 19, 2011 (routine);
- DB-SC-03074, "Emergency Diesel Generator 1, ABDC1, and AC103 Appendix R Test," during the week ending October 29, 2011 (routine);
- DB-PF-03010, "Reactor Coolant System Leakage Test," during the week ending December 10, 2011 (RCS leakage);
- DB-PF-03008, "Containment Local Leakage Rate Tests," {Local Leak Rate Test P71C – Core Flood Tank 1-1 Fill and Nitrogen Supply Line and Local Leak Rate Test P49 – Refueling Canal Fill Line}, during the week ending October 8, 2011 (containment isolation valve); and
- DB-SP-03157, "Auxiliary Feedwater Pump 1 Response Time Test," during the week ending December 10, 2011 (inservice testing).

The inspectors observed in-plant activities and reviewed procedures and associated records to determine the following:

- Did preconditioning occur;
- Were the effects of the testing adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- Were acceptance criteria clearly stated, demonstrated operational readiness, and consistent with the system design basis;
- Plant equipment calibration was correct, accurate, and properly documented;
- As-left setpoints were within required ranges; and the calibration frequency was in accordance with TSs, the USAR, procedures, and applicable commitments;
- Measuring and test equipment calibration was current;
- Test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied;
- Test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used;
- Test data and results were accurate, complete, within limits, and valid;
- Test equipment was removed after testing;
- Where applicable for inservice testing (IST) activities, testing was performed in accordance with the applicable version of Section XI, ASME code, and reference values were consistent with the system design basis;

- Where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- Where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- Where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- Prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- Equipment was returned to a position or status required to support the performance of its safety functions; and
- All problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

These inspection activities constituted three routine surveillance testing samples, one RCS leakage testing sample, one containment isolation valve testing sample, and one IST sample as defined in IP 71111.22, Sections -02 and -05. In addition, these samples contributed towards completion of IP 71007, "Reactor Vessel Head Replacement."

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety and Public Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

The activities in sections 1 through 9 that follow constituted one complete inspection sample as defined in IP 71124.01-05. In addition, these samples contributed towards completion of IP 71007, "Reactor Vessel Head Replacement."

- .1 Inspection Planning (02.01)
- a. Inspection Scope

The inspectors reviewed all licensee performance indicators (PIs) for the occupational exposure cornerstone for follow-up since the last inspection. The inspectors reviewed the results of radiation protection program audits (e.g., licensee's QA audits or other independent audits). The inspectors also reviewed reports of operational occurrences related to occupational radiation safety since the last inspection. The inspectors reviewed and assessed results of the licensee's audit and operational report reviews to gain insights into overall licensee performance before and during the outage.

b. Findings

No findings were identified.

.2 Radiological Hazard Assessment (02.02)

a. Inspection Scope

The inspectors assessed any changes to plant operations since the last inspection that may result in a significant new radiological hazard for onsite workers or members of the public. The inspectors evaluated whether the licensee assessed the potential impact of these changes and has implemented periodic monitoring, as appropriate, to detect and quantify the radiological hazard.

The inspectors reviewed the last three to five radiological surveys from selected plant areas and evaluated whether the thoroughness and frequency of the surveys where appropriate for the given radiological hazard.

The inspectors conducted walkdowns of the facility, including radioactive waste processing, storage, containment, fuel handling, and auxiliary building areas to evaluate material conditions, and performed independent radiation measurements to assess conditions of radioactive materials at these areas.

The inspectors selected the following radiologically risk-significant work activities that involved exposure to radiation:

- Reactor head swap work activities in containment;
- ISI of the reactor vessel, core support assembly;
- Plenum and reactor flange maintenance;
- Reactor head disassembly/reassembly work activities; and
- Replacement of SW piping in the auxiliary building.

For these work activities, the inspectors assessed whether the pre-work surveys performed were appropriate to identify and quantify the radiological hazard and to establish adequate protective measures. The inspectors evaluated the radiological survey programs to determine if hazards were properly identified, including the following:

- Identification of hot particles;
- The presence of alpha emitters;
- The potential for airborne radioactive materials, including the potential presence of transuranics and/or other hard-to-detect radioactive materials;
- The hazards associated with work activities that could suddenly and severely increase radiological conditions and that the licensee has established a means to inform workers of changes that could significantly impact their occupational dose; and
- Severe radiation field dose gradients that can result in non-uniform exposures of the body.

The inspectors observed work in potential airborne areas during the 17M mid-cycle outage and evaluated whether the air samples were representative of the breathing air zone. The inspectors evaluated whether continuous air monitors (CAMs) were located in areas with low background to minimize false alarms and were representative of actual work areas. The inspectors evaluated the licensee's program for monitoring levels of loose surface contamination in areas of the plant with the potential for the contamination to become airborne.

b. Findings

No findings were identified.

.3 Instructions to Workers (02.03)

a. Inspection Scope

The inspectors selected various containers holding non-exempt licensed radioactive materials that may cause unplanned or inadvertent exposure of workers, and assessed whether the containers were labeled and controlled in accordance with 10 CFR 20.1904, "Labeling Containers," or met the requirements of 10 CFR 20.1905(g), "Exemptions To Labeling Requirements."

The inspectors reviewed the following radiation work permits (RWPs) used to access high-radiation areas and evaluated the specified work control instructions or control barriers.

- Reactor head swap work activities in containment;
- ISI of the reactor vessel, core support assembly;
- Plenum and reactor flange maintenance;
- Reactor head disassembly/reassembly work activities; and
- Refueling activities.

For these RWPs, the inspectors assessed whether allowable stay times or permissible dose (including from the intake of radioactive material) for radiologically significant work under each RWP were clearly identified. The inspectors evaluated whether electronic personal dosimeter alarm set-points were in conformance with survey indications and plant policy.

The inspectors reviewed selected occurrences where a worker's electronic personal dosimeter noticeably malfunctioned or alarmed. The inspectors evaluated whether workers responded appropriately to the off-normal condition. The inspectors assessed whether the issue was included in the CAP and dose evaluations were conducted as appropriate.

For work activities in transient radiological conditions, the inspectors assessed the licensee's means to inform workers of changes that could significantly impact their occupational dose.

b. Findings

No findings were identified.

- .4 Contamination and Radioactive Material Control (02.04)
- a. Inspection Scope

The inspectors observed locations where the licensee monitors potentially contaminated material leaving the radiological control area and inspected the methods used for control, survey, and release from these areas. The inspectors observed the performance of personnel surveying and releasing material for unrestricted use and

evaluated whether the work was performed in accordance with plant procedures and whether the procedures were sufficient to control the spread of contamination and prevent unintended release of radioactive materials from the site. The inspectors assessed whether the radiation monitoring instrumentation had appropriate sensitivity for the types of radiation present.

The inspectors reviewed the licensee's criteria for the survey and release of potentially contaminated material. The inspectors evaluated whether there was a procedural guidance on how to respond to an alarm that indicates the presence of licensed radioactive material.

The inspectors reviewed the licensee's procedures and records to assess that the radiation detection instrumentation was used at its typical sensitivity level based on appropriate counting parameters. The inspectors assessed whether or not the licensee has established a de facto "release limit" by altering the instrument's typical sensitivity through such methods as raising the energy discriminator level or locating the instrument in a high-radiation background area.

The inspectors selected several sealed sources from the licensee's inventory records and assessed whether the sources were accounted for and verified to be intact.

The inspectors evaluated whether any transactions, since the last inspection, involving nationally tracked sources were reported in accordance with 10 CFR 20.2207.

b. <u>Findings</u>

No findings were identified.

- .5 Radiological Hazards Control and Work Coverage (02.05)
- a. Inspection Scope

The inspectors evaluated ambient radiological conditions (e.g., radiation levels or potential radiation levels) during tours of the facility. The inspectors assessed whether the conditions were consistent with applicable posted surveys, RWPs, and worker briefings.

The inspectors evaluated the adequacy of radiological controls, such as required surveys, radiation protection job coverage (including audio and visual surveillance for remote job coverage), and contamination controls. The inspectors evaluated the licensee's use of electronic personal dosimeters in high noise areas as high radiation area monitoring devices.

The inspectors assessed whether radiation monitoring devices were placed on the individual's body consistent with licensee procedures. The inspectors assessed whether the dosimeter was placed in the location of highest expected dose or that the licensee properly employed an NRC-approved method of determining effective dose equivalent.

The inspectors reviewed the application of dosimetry to effectively monitor exposure to personnel in high-radiation work areas with significant dose rate gradients.

The inspectors reviewed the following RWPs for work within airborne radioactivity areas with the potential for individual worker internal exposures.

- Reactor head swap work activities in containment;
- ISI of the reactor vessel and core support assembly;
- Plenum and reactor flange maintenance;
- Reactor head disassembly/reassembly work activities; and
- Replacement of SW piping in the auxiliary building.

For these RWPs, the inspectors evaluated airborne radioactive controls and monitoring, including potential for significant airborne levels (e.g., grinding, grit blasting, system breaches, entry into tanks, cubicles, and reactor cavities). The inspectors assessed barrier (e.g., tent or glove box) integrity and temporary high efficiency particulate air ventilation system operation.

The inspectors examined the licensee's physical and programmatic controls for highly activated or contaminated materials (nonfuel) stored within spent fuel and other storage pools. The inspectors assessed whether appropriate controls (i.e., administrative and physical controls) were in place to preclude inadvertent removal of these materials from the pool.

The inspectors examined the posting and physical controls for selected high radiation areas and very high radiation areas to verify conformance with the occupational PI.

b. <u>Findings</u>

No findings were identified.

- .6 Risk-Significant High Radiation Area and Very High Radiation Area Controls (02.06)
- a. Inspection Scope

The inspectors discussed with the radiation protection manager the controls and procedures for high-risk high radiation areas and very high radiation areas. The inspectors discussed methods employed by the licensee to provide stricter control of very high radiation area access as specified in 10 CFR 20.1602, "Control of Access to Very High Radiation Areas," and Regulatory Guide 8.38, "Control of Access to High and Very High Radiation Areas of Nuclear Plants." The inspectors assessed whether any changes to licensee procedures substantially reduce the effectiveness and level of worker protection.

The inspectors discussed the controls in place for special areas that have the potential to become very high radiation areas during certain plant operations with first-line health physics supervisors (or equivalent positions having backshift health physics oversight authority). The inspectors assessed whether these plant operations require communication before hand with the health physics group, so as to allow corresponding timely actions to properly post, control, and monitor the radiation hazards including re-access authorization.

The inspectors evaluated licensee controls for very high radiation areas and areas with the potential to become very high radiation areas to ensure that an individual was not able to gain unauthorized access to the very high radiation area.

b. Findings

No findings were identified.

- .7 Radiation Worker Performance (02.07)
- a. Inspection Scope

The inspectors observed radiation worker performance with respect to stated radiation protection work requirements. The inspectors assessed whether workers were aware of the radiological conditions in their workplace and the RWP controls/limits in place, and whether their performance reflected the level of radiological hazards present.

The inspectors reviewed radiological problem reports since the last inspection that found the cause of the event to be human performance errors. The inspectors evaluated whether there was an observable pattern traceable to a similar cause. The inspectors assessed whether this perspective matched the corrective action approach taken by the licensee to resolve the reported problems. The inspectors discussed with the radiation protection manager any problems with the corrective actions planned or taken.

b. Findings

No findings were identified.

- .8 Radiation Protection Technician Proficiency (02.08)
- a. Inspection Scope

The inspectors observed the performance of the radiation protection technicians with respect to all radiation protection work requirements. The inspectors evaluated whether technicians were aware of the radiological conditions in their workplace and the RWP controls/limits, and whether their performance was consistent with their training and qualifications with respect to the radiological hazards and work activities.

The inspectors reviewed radiological problem reports since the last inspection that found the cause of the event to be radiation protection technician error. The inspectors evaluated whether there was an observable pattern traceable to a similar cause. The inspectors assessed whether this perspective matched the corrective action approach taken by the licensee to resolve the reported problems.

b. Findings

No findings were identified.

- .9 Problem Identification and Resolution (02.09)
- a. Inspection Scope

The inspectors evaluated whether problems associated with radiation monitoring and exposure control were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee's CAP. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involve radiation monitoring and exposure controls.