UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE SECRETARY

In the Matter of Docket No. 52-016

Calvert Cliffs-3 Nuclear Power Plant
Combined Construction and License Application

PETITION TO INTERVENE IN DOCKET NO. 52-016, CALVERT CLIFFS-3 NUCLEAR POWER PLANT COMBINED CONSTRUCTION AND LICENSE APPLICATION

Pursuant to the notice of hearing published by the U.S. Nuclear Regulatory Commission at 73 Fed. Reg. 55,876 (September 26, 2008), the Nuclear Information and Resource Service (NIRS), Beyond Nuclear, Public Citizen Energy Program and Maryland Public Interest Research Group (Joint Intervenors) hereby petition to intervene in the Combined Construction and License Application (COLA) by Calvert Cliffs 3 Nuclear Project LLC and UniStar Nuclear Operating Services LLC for the proposed Calvert Cliffs-3 nuclear reactor. This is Docket Number 52-016. We petition to intervene on behalf of ourselves and our members and staffs in the area that could be affected by this nuclear reactor.

Description of petitioners

NIRS is an information and networking center for people and organizations concerned about the safety, health and environmental risks posed by nuclear power generation. Because of its

location in Takoma Park, Maryland, NIRS has a special interest in Maryland energy policy and economics, ratepayer protection, nuclear power, radioactive waste, renewable energy, energy efficiency and the risks posed by and the risks posed by nuclear power plants operating in or proposed for Maryland. NIRS has approximately 15,000 members, with more than 200 in Maryland, as well as two staff members who live in Maryland, one within 50 miles of the proposed reactor site, as evidenced by the attached declaration of NIRS staff member Michael Mariotte (exhibit 1). In addition, NIRS is representing the interests of NIRS member Roma Mauro, who lives within 25 miles of the proposed reactor and whose declaration is attached (exhibit 2).

NIRS also has standing in its own right to bring this petition, because its offices are located within about 50 miles of the site of the proposed nuclear power plant. *Warth v. Seldin*, 422 U.S. 490, 511 (1975) ("There is no question that an association may have standing in its own right to seek judicial relief from injury to itself and to vindicate whatever rights and immunities the association itself may enjoy.") An accident at the proposed nuclear power plant could result in radiological releases and environmental contamination that would adversely affect the health of NIRS' employees, the value of its property, and NIRS' ability to conduct its business. NIRS seeks to avoid or minimize those risks by ensuring that its safety and environmental concerns are fully addressed in the NRC's licensing proceeding for the proposed Calvert Cliffs-3 plant.

Beyond Nuclear is a Maryland-based public education and advocacy group that aims to educate and activate the public on issues pertaining to the hazards of nuclear power, its connection to nuclear weapons and the need to abandon both. Beyond Nuclear advocates for an energy future for the State of Maryland and the United States that is sustainable, benign and democratic. Beyond Nuclear has about 200 members in Maryland. Beyond Nuclear has staff

members and organizational members who live in proximity to the proposed reactor site, as evidenced by the attached declarations of staff member Kevin Kamps (exhibit 3) and members Cynthia B. Peil (exhibit 4) and William Louis Peil (exhibit 5).

Beyond Nuclear also has standing in its own right to bring this petition, because its offices are located within about 50 miles of the site of the proposed nuclear power plant. *Warth v. Seldin*, 422 U.S. 490, 511 (1975) ("There is no question that an association may have standing in its own right to seek judicial relief from injury to itself and to vindicate whatever rights and immunities the association itself may enjoy.") An accident at the proposed nuclear power plant could result in radiological releases and environmental contamination that would adversely affect the health of Beyond Nuclear's employees, the value of its property, and Beyond Nuclear's ability to conduct its business. Beyond Nuclear seeks to avoid or minimize those risks by ensuring that its safety and environmental concerns are fully addressed in the NRC's licensing proceeding for the proposed Calvert Cliffs-3 plant.

Public Citizen is non-profit, non-partisan consumer rights organization based in Washington, DC with over 100,000 members nationwide, including thousands of members in Maryland, including Bruce Boxwell who has authorized Public Citizen to represent him in this proceeding (exhibit 6). Its Energy Program does extensive work at the federal and state levels to promote energy policies that best protect consumers.

Public Citizen also has standing in its own right to bring this petition, because its offices are located within about 50 miles of the site of the proposed nuclear power plant. *Warth v. Seldin*, 422 U.S. 490, 511 (1975) ("There is no question that an association may have standing in its own right to seek judicial relief from injury to itself and to vindicate whatever rights and immunities the association itself may enjoy.") An accident at the proposed nuclear power plant

could result in radiological releases and environmental contamination that would adversely affect the health of Public Citizen's employees, the value of its property, and Public Citizen's ability to conduct its business. Public Citizen seeks to avoid or minimize those risks by ensuring that its safety and environmental concerns are fully addressed in the NRC's licensing proceeding for the proposed Calvert Cliffs-3 plant.

Southern Maryland Citizen's Alliance for Renewable Solutions is a local citizen's awareness group established to oppose the expansion of the Calvert Cliffs Nuclear Power Plant, educate citizens about the risks and disadvantages of Nuclear Power while raising awareness about the benefits of renewable energy alternatives. So MD CARES has approximately 15 members, all of whom live in the southern Maryland tri-county area in proximity to the proposed reactor site, as evidenced by the attached declaration of Steven W. Warner (exhibit 7).

An accident at the proposed nuclear power plant could result in radiological releases and environmental contamination that would adversely affect the health of So MD CARES members and the value of their property. So MD CARES seeks to avoid or minimize those risks by ensuring that its safety and environmental concerns are fully addressed in the NRC's licensing proceeding for the proposed Calvert Cliffs-3 plant.

Some materials for the Calvert Cliffs-3 COLA have not been posted on NIRS' website. Joint petitioners request an extension of time to modify contentions and/or file new contentions based on information not yet posted.

In preparing the contentions below, we have relied upon the applicants' application materials posted on the NRC's website. We note that applicants apparently submitted by DVD some revisions of application materials on August 1, 2008. Then on August 20, 2008, applicants

apparently submitted "corrected" DVDs of these materials. None of the actual information on either the original or corrected DVDs has been posted on the NRC's website. We do not have copies of either the original or corrected DVDs. Since none of the material on any of these DVDs has been posted by the NRC, even though earlier electronic submissions from applicants were posted, it is unclear to us whether the material on these DVDs is considered by NRC to be part of the license application.

This is also true of DVDs that applicants submitted on June 12, 2008 as answers to NRC Requests for Additional Information, with replacement DVDs for these submitted, apparently because of problems with the formatting of the DVDs, on October 10, 2008. None of this material is posted on NRC's website either.

If the material from these various DVDs is considered part of the license application for the purposes of this proceeding, we request that the material be posted on the NRC's website and that Joint Petitioners be given an extension of time to modify contentions and/or draft new contentions for a 60-day period following the posting of these materials.

We also request that all future submissions by applicants that are considered part of the license application be posted on the NRC website in a timely fashion.

Contention #1: Contrary to the Atomic Energy Act and NRC regulations, Calvert Cliffs-3 would be owned, dominated and controlled by foreign interests.

The Atomic Energy Act plainly prohibits foreign ownership, control or domination of a nuclear power plant. The NRC's *Final Standard Review Plan on Foreign Ownership, Control, or Domination* (August 31, 1999) additionally prohibits issuance of a power reactor license to an

applicant if the Commission knows or has reason to believe that the applicant is an alien or is owned, controlled, or dominated by an alien or by a foreign corporation or foreign government.

Calvert Cliffs-3 would be owned, controlled and dominated by a foreign corporation and foreign government. This application, therefore, must be denied.

Discussion

Section 103(d) of the Atomic Energy Act 42 U.S.C. § 2133(d) plainly states:

> No license under this section may be given to any person for activities which are not under or within the jurisdiction of the United States, except for the export of production or utilization facilities under terms of an agreement for cooperation arranged pursuant to section 123, or except under the provisions of section 109. *No license may be issued to an alien or any corporation or other entity if the Commission knows or has reason to believe it is owned, controlled, or dominated by an alien, a foreign corporation, or a foreign government.* In any event, no license may be issued to any person within the United States if, in the opinion of the Commission, the issuance of a license to such person would be inimical to the common defense and security or to the health and safety of the public.

Id. (emphasis added). Applicants Calvert Cliffs 3 Nuclear Project LLC and UniStar Nuclear LLC do not satisfy this statutory requirement.

Calvert Cliffs 3 Nuclear Project LLC is a wholly-owned subsidiary of Applicant UniStar Nuclear LLC. In turn, UniStar Nuclear LLC is owned 50% by the U.S. company Constellation Energy and 50% by the French company Electricite de France.[1] As of December 31, 2007, Electricite de France was 84.85% owned by the Government of France (http://www.edf.com/html/RA2007/uk/pdf/ra2007Corp_05_va.pdf). (Exhibit 9)

In addition, EdF is the second largest shareholder in Constellation Energy, owning 9.51% of the company.[2] Thus, EdF's ownership stake in Calvert Cliffs-3 is based not only on its 50%

[1] Constellation Energy Form 10-K, page 6, Fiscal year ending December 31, 2007; filed with U.S. Securities & Exchange Commission, February 27, 2008 (Exhibit 8)

[2] Constellation Energy Group, Form SC 13D, General Statement of Beneficial Ownership, filed with U.S. Securities & Exchange Commission, September 8, 2008. (Exhibit 11)

share of UniStar, but also on its 9.51% share in Constellation, making it more than a 50% owner of Calvert Cliffs-3. This additional stake in Constellation adds to EdF's ability to dominate and control this project, and essentially pushes its ownership of Calvert Cliffs-3 above the 50% plateau. Even without this additional stake, EdF is the dominant and controlling partner, meaning that it runs afoul of NRC regulations on all counts for a foreign corporation.

As stated above, EdF is 84.85% owned by the French government. In this case, the reactor chosen is to be designed and manufactured by another French firm, Areva, which is also more than 80% owned by the French government. Combined, this would give the French government an enormous stake in this reactor, if built, and an enormous influence over its construction and operation.

Constellation Energy has a market value of $4.7 billion, according to the pending purchase of Constellation Energy by MidAmerican Energy Holdings. Its 2007 revenue was $21.2 billion (Constellation Energy annual report: http://www.constellation.com/vcmfiles/Constellation/investors/2007AR/index.html). Electricite de France's 2007 revenue was €59.6 billion or approximately $77 billion at current exchange rates (@ 1 Euro=1.3 dollars), EdF annual report: (http://www.edf.com/html/RA2007/uk/accueil.html). (Exhibit 10)

UniStar Nuclear has been capitalized with $350 million from EdF, with another $275 million expected to be furnished by EdF, and with $49 million in assets from Constellation Energy.[3]

[3] Constellation Energy Form 10-K, page 6, Fiscal year ending December 31, 2007; filed with U.S. Securities & Exchange Commission, February 27, 2008 (Exhibit 8)

EdF is the much larger company—more than three times larger according to revenue--and has far more invested in this project than its junior partner Constellation Energy. Clearly EdF is the dominant and controlling partner in this relationship.

This scenario where a reactor is owned, controlled and dominated by both a foreign corporation and a foreign government is exactly the kind of scenario that the Atomic Energy Act and implementing NRC regulations on foreign ownership are designed to prevent.

Contention #2: The Decommissioning Funding Assurance described in the Application is inadequate to assure sufficient funds will be available to fully decontaminate and decommission Calvert Cliffs-3. Applicants must use the prepayment method of assuring decommissioning funding.

Discussion:

Applicant states in Rev. 2 of its application, General Information, Section 1.3 through 1.3.4, that its anticipated decommissioning costs using waste vendors is $378 million in 2006 dollars and that its funding mechanism to assure that amount of money will be available will be a parent company guarantee from Constellation Energy Group.

Leaving aside for the moment the adequacy of the $378 million estimate, which we believe is low by at least half for a 1600 MWe reactor with its self-described double containment and four-train safety system (which clearly will produce more decommissioning-related “low-level” radioactive waste than the reference 3400 MWthermal reactor in 10 CFR 50.75), joint petitioners argue that in the case of Calvert Cliffs-3, the prepayment method of decommissioning funding assurance must be applied.

10 CFR 50.75 provides for most commercial nuclear reactors three ways of assuring that adequate funds will be available to decontaminate and decommission a reactor when its operating life is finished. These are a) prepayment; b) external sinking fund; and c) surety or other form of guarantee. Applicants have chosen c) as their method and cite 10 CFR 30, Appendix A, which provides for two different options of passing a financial test to make use of the guarantee method of decommissioning funding assurance.

Option A in Appendix A includes this paragraph (10 CFR 30 Appendix A, A.1.ii) as one of the criteria that *must* be met to use the parent company guarantee:

"Net working capital and tangible net worth each at least six times the current decommissioning cost estimates for the total of all facilities or parts thereof (or prescribed amount if a certificate is used), or, for a power reactor licensee, at least six times the amount of decommissioning funds being assured by a parent company guarantee for the total of all reactor units or parts thereof (Tangible net worth shall be calculated to exclude the net book value of the nuclear unit(s))…."

Option B uses exactly the same language (10 CFR 30 Appendix A, B.1.ii) except it excludes the words "Net working capital."

Constellation Energy, which would provide this guarantee, already owns all or part of Calvert Cliffs-1 and -2; Ginna, and Nine Mile Point-1 and -2, and will be responsible for decommissioning costs of those reactors. Together, these units accounted for 61% of Constellation Energy's generation output in 2007.[4] In addition, Constellation Energy subsidiary UniStar Nuclear also has filed for an application to build Nine Mile Point-3, another 1600 MW EPR reactor, which also will require decommissioning funding. UniStar Nuclear is also involved in the potential construction of new EPR reactors at Callaway, Missouri and Bell Bend, Pennsylvania. The combination of all of these reactors, even though some have existing sinking funds, would lead to very high decommissioning liabilities overall—even excluding Callaway

[4] Constellation Energy Generation Assets: http://www.constellation.com/vcmfiles/Constellation/Files/Press-Kit_Corp_Gen-Assets_2008-09-17.pdf, viewed November 19, 2008. (Exhibit 12)

and Bell Bend--on the order of $2.5 billion if each costs approximately the same to decommission as Applicants have projected for Calvert Cliffs-3.

At the time the Calvert Cliffs-3 COLA was originally filed with the NRC, a guarantee from Constellation Energy might have had value—at the time of initial filing, its stock was trading above $100 per share and its overall value was some $20 billion. However, since the COLA was filed with the NRC, the financial status of Constellation Energy has changed dramatically. Due to a combination of the current economic crisis and poor decision-making on the part of Constellation management, in September 2008 Constellation faced imminent bankruptcy and an agreement was reached to sell a majority of the company to MidAmerican Energy Holdings for a total valuation of $4.7 billion. This is less than twice the anticipated decommissioning costs of Constellation Energy's nuclear plants, far less than the six times the valuation as required by 10 CFR 30, Appendix A.

For this reason alone, Constellation Energy fails the parent guarantee test and must use a different means of assuring decommissioning financing.

The current instability of Constellation Energy provides another reason why Constellation Energy fails the parent guarantee test at the present time. Several proceedings are underway, or soon will be underway, to examine the proposed purchase/merger of MidAmerican Energy and Constellation Energy. These include, but may not be limited to, the Maryland Public Service Commission, the Federal Energy Regulatory Commission, and the Nuclear Regulatory Commission. There is no guarantee this purchase/merger will be approved by these regulatory bodies. Even if approved, it is possible conditions will be attached to the purchase/merger that will cause MidAmerican Energy to end its bid according to the terms of its agreement with

Constellation Energy. Should this occur, it is likely that Constellation Energy will fall even further in value, and perhaps declare bankruptcy.

Because Calvert Cliff-3 is envisioned to be an unregulated merchant plant, and thus cannot be assured of any electricity sales, an external sinking fund is not appropriate as funding assurance for decommissioning assurance either. Even regulated reactors, which are assured of electricity sales and a return on their investment, are experiencing huge reductions in their external sinking funds, causing concern about the ability of many utilities to meet their decommissioning responsibilities. For example, the Associated Press on November 18, 2008, reported that Vermont Yankee's decommissioning fund has lost $76 million in the past 13 months due to the current economic crisis, and that the fund was already $400 million short even before these losses.[5]

We note that a reactor less than half the size of Calvert Cliffs-3 has a $400 million+ shortfall, and yet Applicants claim total decommissioning costs of only $387 million for Calvert Cliffs-3. In any event, an external sinking fund is a suspect means of assuring decommissioning funds for any reactor in this economic climate, and even more so for an unregulated reactor with no guarantee of electricity sales.

Thus, in order to assure adequate decommissioning funds, Applicants must make a prepayment of the full amount of anticipated decommissioning costs in 2006 dollars.

Contention #3: The Calvert Cliffs-3 application's Environmental Report is unacceptably deficient because it omits from the analysis of CCNPP 3's environmental impact the new reactor's potential adverse contribution to the cumulative and potentially synergistic

[5] "Nuclear decommissioning fund suffers big loss," by Dave Gram, Associated Press Writer, November 18, 2008 (Exhibit 13)

environmental impact of 11 operational reactor units and two proposed additional nuclear power projects on the watershed of an already severely degraded and declining Chesapeake Bay whose recovery plan is currently in serious doubt and the focus of a federal lawsuit for failure to comply with mitigation actions.

Discussion:

The applicant's Environmental Report (ER) describes:

The CCNPP site is located on a high bluff on the Calvert peninsula within the Chesapeake Bay watershed with the bay influencing the siting of the CCNPP Unit 3. The Chesapeake Bay, with a watershed area in excess of 64,000 mi2 (165,759, km2), is the largest estuary in the U.S." [COLA 2.3.1.1 Surface Water Resources, ML081021073]

The applicant further states that:

"The main stem of the bay is entirely within Maryland and Virginia. Nearly 50 rivers, with thousands of tributary streams and creeks, drain an area in excess of 64,000 mi2 (165,759, km2) forming the Chesapeake Bay Basin (CBP, 2006b). The basin contains more than 150,000 stream mi (241,402 stream km) in the District of Columbia and parts of six states: New York, Pennsylvania, Maryland, Virginia, West Virginia, and Delaware as shown in Figure 2.3.1-1. Nine rivers, including the Susquehanna, Patuxent, Potomac, Rappahannock, York (including its Mattaponi and Pamunkey tributaries), James, Appomattox, and Choptank, contribute over 90% of the Chesapeake Bay's mean annual freshwater inflow. The Susquehanna River, the largest river that enters the bay, drains nearly 43% of the basin. It normally contributes about 50% of the freshwater reaching the Chesapeake Bay. Eighty percent to 90% of the freshwater entering the Chesapeake Bay comes from the northern and western portions of the basin. The remaining 10% to 20% is contributed by the eastern shore (CBP, 2004). Although the Chesapeake Bay lies totally within the Atlantic Coastal Plain, the watershed includes parts of the Piedmont Province and the Appalachian Province that provide a mixture of waters to the Chesapeake Bay with variable geochemical and sediment origins (USGS 2003b) (CBP, 2006b).
[COLA, 2.3.1.1.2.1 Physical Setting, p. 2.3-5, ML081021073]

The applicant's ER looks at CCNPP 3 in context of siting and consumptive water use on the Chesapeake Bay and other operational nuclear power plant units, expressly naming only the operational CCNPP Units 1 and 2, that would compete for and impact on water resources and

quality as typified in CCNPP 3 COLA at Section 2.3.2.1.1 Surface Water and Section 2.3.2.1.2 Consumptive Surface Water Use.

"The water-use permit for CCNPP Units 1 and 2 allows an annual average withdrawal of 3.5E+09 gpd (1.3E+10 lpd) with a maximum daily withdrawal of 3.6E+09 gpd 1.4E+10 lpd). Most of the water withdrawn for the CCNPP Units 1 and 2 is returned back to the bay after being circulated through the plant condensers. The monthly variation of cooling water discharge rate at the CCNPP Units 1 and 2 during calendar years 2002 through 2006 is shown in Table 2.3.2-2, which represents typical intra-annual water use pattern by CCNPP Units 1 and 2."
[ER Chapter 2 Part 10, p.2.3-33, ML081021081]

The applicant's ER proceeds further to look at the siting of the CCNPP 3 in context of siting and the discharge impacts and water use on the Chesapeake Bay and other nuclear power plant units, explicitly naming only CCNPP Units 1 and 2, that impact on the water quality again describing the extent of the Chesapeake Bay watershed as typified in the application at Section 2.3.3.1.2:

"2.3.3.1.2 {Chesapeake Bay
The Chesapeake Bay is the largest estuary in the U.S., with over 64,000 square miles of watershed that spans six states (Delaware, Maryland, New York, Pennsylvania, Virginia and West Virginia) and the District of Columbia. The Susquehanna River provides about 50% of fresh water entering the Bay while other important tributaries include the Patapsco, Patuxent, Potomac, James, and Choptank."
[ER, Chapter 2 Part 13, p. 2.3-52, ML081021085]

"• 1.22 × 1012 gals (4.61 × 1012 L) of dilution water were discharged
The liquid effluent currently discharged from CCNPP Units 1 and 2 has relatively minimal impacts to the Chesapeake Bay (NRC, 1999a). Potential impacts include the distribution of water at higher or lower temperatures than the ambient waters and the discharge of toxic and/or radioactive materials to the receiving water body."
[ER, Chapter 2 Part 13, p.2.3-53]

The Applicant's ER looks no farther than the two Calvert Cliffs nuclear power station units directly adjacent to the new site. This narrow perspective is a fatal defect in the ER, demonstrating an overall failure to analyze—or even acknowledge "discharge of toxic and/or radioactive materials to the receiving water body" from the *nine* additional nuclear power units operating in the Applicant's description of the Chesapeake Bay watershed. In addition to Calvert

Cliffs units 1 and 2, Joint Petitioners identify the additional following nuclear power plant units operating on the Chesapeake Bay watershed:

1) Susquehanna nuclear power plant units 1 and 2 which discharge into the Susquehanna River;
2) Peach Bottom nuclear power plants units 2 and 3 which discharge into the Susquehanna River;
3) Three Mile Island nuclear power plant unit 1 which discharges into the Susquehanna River;
4) North Anna nuclear power plant units 1 and 2 which discharge into the North Anna River and eventually the James River;
5) Surry nuclear power plant units 1 and 2 which discharge into the James River

All of these units routinely discharge chemical and radioactive contaminants into these tributary waters that then mix and accumulate in the Chesapeake Bay ecosystem.

Joint Petitioners further contend that the applicant's ER at this point further demonstrates an overall failure to acknowledge and otherwise entirely omit from its analyses the "discharge of toxic and/or radioactive materials to the receiving water body" that would flow into the Chesapeake Bay from the proposed additional nuclear power construction projects at:

1) North Anna nuclear power plant unit 3 on the North Anna River and eventually the James River;
2) Bell Bend nuclear power plant unit 1on the Susquehanna River

All of these additional units if operational would discharge chemical and radioactive contaminates into the tributary waters that flow into the Chesapeake Bay.

Joint Petitioners argue that the applicant's ER must in fact acknowledge and include an environmental analysis of "the discharge of toxic and/or radioactive materials" from a collective total of 14 operational and proposed nuclear power plant point sources, including CCNPP 3, and an analysis of their cumulative impact on the receiving water of an already severely degraded and declining Chesapeake Bay.

Joint Petitioners contend that this is a necessary analysis because the Chesapeake Bay is dying. Even the Applicant's ER acknowledges in its environmental report and analysis the significantly degraded and declining condition of the Chesapeake Bay citing that:

1) "about one third of the water quality goals are being met"
2) "critical habitats and food webs are at risk"
3) "fish and shellfish populations are below historic levels"
4) "about 9% of the Chesapeake Bay's phytoplankton communities were considered healthy"

[ER Chapter 2 Part 13, 2.4.2.1.2.3, p. 2.4-15 and 2.4-16, Overall Condition of Chesapeake Bay Ecosystem]

The Applicant further cites that "Reduced amounts of nutrients, sediment and chemical contaminants flowing into the Chesapeake Bay will help these bottom dwelling communities improve" and help improve overall Chesapeake Bay water quality.

[ER Chapter 2 Part 13, 2.4.2.1.2.3 Overall Condition of Chesapeake Bay Ecosystem, p. 2.4-16]

However, the applicant does not provide an analysis of the adverse contribution of additional chemical and radioactive discharges from the proposed new reactor in context of the cumulative contribution of chemical and radioactive discharges from all of the additional reactors in the watershed area as identified by the Applicant. There is no analysis that would

address how this additional contribution would not constitute a tipping point for further Chesapeake Bay marine environmental degradation and continued decline.

In support of their contention, Petitioners submit that on October 29, 2008, the Chesapeake Bay Foundation (CBF) filed a "Notice of Intent to Sue for Failure to Comply with the Chesapeake 2000 Agreement"[6] with the United States Environmental Protection Agency and the Attorney General of the United States, U.S. Department of Justice. (Exhibit 14)

The CBF Notice of Intent to Sue asserts that

"over many years, the productivity and water quality of the Chesapeake Bay and its watershed were diminished by pollution, excessive sedimentation, shoreline erosion, the impacts of population growth and development in the Chesapeake Bay watershed, and other factors;" [CBF, Notice of Intent to Sue for Failure to Comply with the Chesapeake 2000 Agreement, October 29, 2008, p. 14]

The Notice identifies that scientific research into the causes of the bay's degradation indicates that industrial waste discharges are a major factor. As the application has identified the tributaries on the Chesapeake Bay, the Petitioners contend that the onus is on the Applicant to provide in its Environmental Report a more complete picture of the demands on the Chesapeake Bay watershed before further harnessing the bay as a workhorse further taxing its endangered and declining environmental resources with the addition of the largest yet nuclear energy project.

While the CBF law suit does not expressly name any operational or proposed nuclear power stations, it is not in dispute that the addition of a 1600 megawatt electric EPR, almost equal to the combined capacity of Calvert Cliffs nuclear power plant units 1 and 2 electrical rating, will add to and not relieve the existing and devastating environmental burden to the

[6] http://www.cbf.org/c2k_lawsuit/C2K_Notice_of_Intent_10.29.08.pdf]

Chesapeake Bay. The question is can a Chesapeake Bay in decline further tolerate and even recover with that added environmental burden?

Petitioners contend that the Applicant's offered Environmental Report is not adequate to address that question.

The presence of 11 operational nuclear reactor units on the Chesapeake Bay watershed and the proposed addition of three additional units, including CCNPP 3, and possibly more to-be-announced reactor units dramatically demonstrate the need for the Applicant to provide a collective and cumulative environmental assessment factoring in all of these industrial contributors and their cumulative impact on the declining health of this treasured resource. After identifying the extent of the Chesapeake Bay watershed, it does not suffice for the Applicant put on a set of analytical blinders that limits its environmental assessment to the two reactor units on a contiguous site in Lusby, Maryland.

Contention #4:

The UniStar application's Environmental Report (ER) is unacceptably deficient because it omits from the analysis of CCNPP 3's reactor (USEPR) design and safety of the CCNPP facility, additional relevant impacts arising from the expansion of the Dominion Cove Point Liquified Natural Gas (DCPLNG) facility located 3.2 miles south of the proposed reactor. These expansions include the modification of the existing LNG pier to accommodate larger LNG ships utilizing the waterways, shipping lanes and the expanded LNG pier, thereby increasing the probability of a larger and more catastrophic LNG spill over water (Chesapeake Bay) from a ship borne LNG full tank breach due to a major accident or sabotage of an LNG tanker docking or unloading at the offshore terminal of DCPLNG.

While the ER addresses the DCPLNG pipeline and storage facilities alongside LNG transport and risk on the waterways (Chesapeake Bay), each safety risk is addressed individually in isolation and the ER omits the effect of the aforementioned LNG spill on water triggering a cumulative domino effect on the DCPLNG pipeline and storage tanks. These risks could involve overpressure, thermal stress and thermal explosions from the LNG spill on water and subsequent fires from radiant heat of an ignited flammable LNG vapor cloud. These risks are safety and operational risks to CCNPP and the proposed reactor. Under atmospheric conditions favorable to the LNG spill's rapidly expanding LNG vapor cloud hanging over or in the vicinity of CCNPP, this flammable vapor cloud could be ignited from any source and will continue to burn with intense radiant heat until consumed. The surface emissive power of this fire could far exceed the heat that would melt steel buildings especially when Calvert Cliffs act as a fire fence.

Furthermore, the ER omits analysis of the impact of temperature rise of the cooling water to CCNPP and the proposed Unit 3 due to the prolonged heating of the Chesapeake Bay cooling water from the radiant heat of this ignited LNG vapor cloud. The cooling water intake for the proposed Unit 3 is further south on the Chesapeake Bay closer to the shipping lane and to the LNG pier which is currently being expanded by DCPLNG to accommodate the larger ships which transport cargoes of up to 267,000 cubic meters of LNG than the smaller ships (148,000 cubic meters maximum LNG capacity) currently utilizing the existing LNG pier. The ER also omits analysis and impact of this modification to the pier which will add 150 feet to each end of the offshore platform thereby increasing the "footprint" of the pier, support pilings and platform. (http://www.dom.com/about/gas-transmission/covepoint/pier_reinforcement/index.jsp)

Furthermore, Figure 2.2-1 of the FSAR omits from the site map, the offshore LNG pier, underground LNG loading tunnel and the submerged DCPLNG pipeline. While other marinas in the 5 mile radius of the CCNPP are cited in the maps, the omission of the LNG pier structure (plus proposed modifications and underground tunnel) and the submerged gas pipeline in the mapping of significant risk spots fails to illustrate visually how the pier's close proximity, breadth of the pier and the submerged pipeline contribute to the total visual overview of the risk factors in the inclusion zone of CCNPP and the proposed reactor.

The ER also omits risk analysis of the impact of LNG unloading operations which involve the pier, underground tunnel, and the LNG ship carrying capacity which affect volume and duration of risk exposure. This procedure is where accidents or sabotage are most vulnerable to DCPLNG which in turn adversely affect CCNPP and the proposed reactor.

In the applicant's CCNPP Unit 3 FSAR Vol. 1 Section 2.2 Nearby Facilities, the excerpts and tables referred to in the Argument section of this intervention, more specifically address the omissions and/or deficiencies cited in specificity regarding this contention.

Argument:

The applicant's CCNPP Unit 3 FSAR Vol 1 2.2 Nearby Facilities states:

2.2 NEARBY INDUSTRIAL, TRANSPORTATION AND MILITARY FACILITIES
This section of the U.S. EPR Design Certification Document (DCD) is incorporated by reference with the following departure(s) and/or supplement(s).
The U.S EPR DCD includes the following COL Item in Section 2.2:
A COL applicant that references the U.S. EPR design certification will provide site specific information related to the identification of potential hazards stemming from nearby industrial, transportation, and military facilities within the site vicinity, including an evaluation of potential accidents (such as explosions, toxic chemicals, and fires).
This COL Item is addressed with in the following sections.
This section also establishes whether the effects of potential accidents in the vicinity of the {CCNPP Unit 3) site from present and projected industrial, transportation, and military installations and operations should be used as design basis events for plant design parameters related to the selected accidents.
Significant facilities and activities within 5 mi (8 km) and major airports within 10 mi (16 km) of

the {CCNPP) site were identified. These facilities and activities, and significant facilities at greater distances, were evaluated in accordance with Regulatory Guide 1.206 (NRC, 2007b), Regulatory Guide 1.91 (NRC, 1978a), Regulatory Guide 4.7 (NRC, 1998), and relevant sections of both 10 CFR Part 100 (CFR, 2007d) and 10 CFR Part 50 (CFR, 2007b).

2.2.2.2.2 (Dominion Cove Point Liquefied Natural Gas Facility

The Dominion Cove Point Liquefied Natural Gas (DCPLNG) facility is located approximately 3.2 mi (5 kin) south of the facility. The DCPLNG site receives liquefied natural gas (LNG) from LNG tanker ships at its offshore dock. The facility stores the LNG onshore in tanks, then transforms
it back to gas and delivers it to a pipeline for distribution.

The DCPLNG facility includes an offshore pier; and five double-walled, insulated LNG storage tanks that are maintained at -260°F (-1620C) and 2 psig (14 kPa-gauge). One tank has a capacity of 850,000 barrels (35.7 million gallons, or 135,000 M3**),** and the remaining four tanks have a capacity of 230,000 barrels (9.8 million gallons, or 37,000 M3**).** The pipeline, known as the Cove Point pipeline, extends approximately 88 mi (142 km) from the LNG terminal to connections with several interstate pipelines (Dominion, 2007) (MDNR, 2006). The pipeline and offshore pier are described in more detail in Sections 2.2.2.3 and 2.2.2.4.2.

The Federal Energy Regulatory Commission (FERC) has approved an application for expansion of the DCPLNG facility. The scope of this expansion is described in more detail in Section 2.2.2.4.2.)

2.2.2.4 Description of Waterways

{CCNPP Unit 3 will be located about 1,000 ft (305 m) from the western shore of Chesapeake Bay. The Chesapeake Bay is a large estuary and home to many marinas and facilities along its shores. Located along the navigable waterways are two facilities which may contribute to the transportation of potentially hazardous cargo along the Chesapeake Bay, and in the vicinity of the CCNPP site: (1) the Port of Baltimore, and (2) the Dominion Cove Point Liquefied Natural Gas facility.

The Port of Baltimore is located about 60 mi (97 kin) north of the CCNPP site on the Patapsco River, a tributary that flows into the Chesapeake Bay. The Dominion Cove Point Liquefied Natural Gas facility located 3.2 mi (5.1 kin) south of the CCNPP site, and has a terminal with an off shore pier. More detailed information about the transportation of potentially hazardous material as a result of these facilities is presented in the following sections.

At its greatest depth in the vicinity of the CCNPP site, the Chesapeake Bay shipping channel is approximately 101 ft (31 m) deep (NOAA, 2005). The navigable waterways of the Chesapeake Bay are represented by the U.S. Army Corps of Engineers as those waters with a depth greater than the 47 ft (14.3 m) contour (USACE, 2006). Applying this definition, the CCNPP Unit 3 intake structure will be within 11,678 ft (2.2 mi, or 3,560 m) from a navigable waterway. The U.S. Coast Guard has committed to establish approach and docking procedures for the Dominion Cove Liquefied Natural Gas (LNG) facility to keep LNG vessels outside a 3.4 mi (5.5 km) radius from the CCNPP site (NRC, 2004b).

The intake structures for CCNPP Unit 3 will be situated in an area that is set back from the shoreline at the south end of the CCNPP Unit 1 and 2 intake structure. The intake channel will approximately 100 ft (30.5 m) long, 100 ft (30.5 m) wide structure with a dredged earthen bottom at approximate elevation -20 ft 6 in MSL (-6.25 m msl) with vertical walls extending to approximate elevation 10 ft MSL (3 m msl).

2.2.2.4.2 {Dominion Cove Point Liquefied Natural Gas Terminal

As described in Section 2.2.2.2.2, the DCPLNG facility is located along the shores of the Chesapeake Bay, approximately 3.2 mi (5.1 km) south of the CCNPP site and has a terminal with an off shore pier. It is estimated that up to 90 Liquefied Natural Gas (LNG) tankers per year currently transit the Chesapeake Bay to the terminal.

The Federal Energy Regulatory Commission (FERC).has approved an application for expansion of the DCPLNG facility. The FERC has authorized an expansion of the DCPLNG terminal facilities that would add two new storage tanks, bringing the total number at the site to seven. Each of the new tanks will be capable of storing or 1.0 million barrels (42.3 million gallons, or 160,000 M3) of LNG, increasing the storage capacity at the terminal to approximately 14.6 billionft3 (413 million M3) of natural gas (MDNR, 2006).

As part of the DCPLNG expansion, the FERC has authorized construction and operation of two air separation units, a liquid nitrogen storage tank, an electric generation unit, and associated support facilities for injection of additional nitrogen into the gas distributed from the DCPLNG site (FERC, 2006a) (FERC, 2006b) (Dominion, 2007).

With the planned expansion of the DCPLNG facility, nearly 200 LNG tankers with a typical capacity of 91,557 to 183,113 yd 3 (70,000 to 140,000 M3**)** will transit the Bay to this facility's north and south piers. Transfer of the LNG product to the onshore facility will occur through a 6,400 ft (1,951 m) submerged pipeline tunnel carrying two, 32 in (81 cm) liquid lines and two, 14 in (36 cm) vapor return lines. (MDNR, 2006) The offshore pier, from which the LNG is off loaded, is located in the Chesapeake Bay where the depth is approximately 43 ft (13 m). The offshore pier is accessible from the facility only through an underwater tunnel (NOAA, 2005).)

2.2.3 EVALUATION OF **POTENTIAL ACCIDENTS**

The **US** EPR DCD includes the following COL Item in Section 2.3:

A COL applicant that references the U.S. EPR design certification will provide information concerning site-specific evaluations to determine the consequences that potential accidents at nearby industrial, transportation, and military facilities could have on the site. The U.S. EPR design is acceptable for any site when reasonable qualitative arguments can demonstrate that the realistic probability of severe consequences from any external accident is less than 1 E-6 occurrences per year. A COL applicant that references the U.S. EPR design certification will provide information concerning any specific changes made to the U.S. EPR design to qualify the design of the site against any potential external accident with an unacceptable probability of severe consequences.

The COL Item is addressed in the following sections.

On the basis of the information provided in Section 2.2.1 and Section 2.2.2, the potential accidents to be considered as design-basis events and the potential effects of those accidents on the nuclear plant, in terms of design parameters (e.g., overpressure, missile energies) or physical phenomena (e.g., impact, flammable or toxic clouds) were identified in accordance with 10 CFR 20 (CFR, 2007a), 10 CFR 52.79(a)(1)(vi) (CFR, 2007g), 10 CFR 50.34 (CFR, 2007c), 10 CFR 100.20 (CFR, 2007e) 10 CFR 100.21 (CFR, 20070, Regulatory Guide 1.70 (NRC, 1978b), Regulatory Guide 1.78 (NRC, 2001), Regulatory Guide 1.91 (NRC, 1978a), Regulatory Guide 1.206 (NRC, 2007b), and Regulatory Guide 4.7 (NRC, 1998).

2.2.3.1 Determination of Design-Basis Events

Design-basis events internal and external to the nuclear plant are defined as those accidents

that have a probability of occurrence on the order of magnitude of 1 E-7 per year, or greater, withthe potential consequences serious enough to affect the safety of the plant to the extent that theguidelines in 10 CFR Part 100 (CFR, 2007d) could be exceeded. The following accident categories were considered in selecting design-basis events: explosions, flammable vapor clouds (delayed ignition), toxic chemicals, fires, collisions with intake structure, and liquid spills. The postulated accidents that would result in a chemical release were analyzed at the following locations:

* (Nearby transportation routes ((MD) 2/4, the Chesapeake Bay navigable waterway, and Dominion Cove Point LNG Pipeline)
• Nearby chemical and fuel storage facilities (Dominion Cove Point Liquefied Natural Gas (DCPLNG)
* Onsite chemical storage (CCNPP Units 1 and 2)

With regard to the DCPLNG facility and Dominion Cove Point LNG pipeline, the Maryland Power Plant Research Program (PPRP) commissioned an independent risk study (i.e., hazard study), "Cove Point LNG Terminal Expansion Risk Study," to assess the risks associated with the expansion of the DCPLNG facility and associated pipeline to nearby residential communities and the CCNPP site.

The probability of occurrence of a fatality at CCNPP from hazardous events associated with the existing DCPLNG facility is estimated to be 2.3E-9 per year. The probability of occurrence of physical damage to CCNPP is estimated to be lower still. Further, the probability of occurrence for a fatality involving the proposed expansion of the DCPLNG facility is estimated to be 6.6E-9 per year at CCNPP, with the risk of physical damage to the CCNPP estimated to be even smaller (MDNR, 2006).

The quantified risks to CCNPP presented in the PPRP study are below the threshold of acceptable risks defined by the U.S. Nuclear Regulatory Commission (i.e., less than 1 E-7 per year. Where more specific analyses are available for individual accident categories than are provided in the PPRP study (e.g., jet fire, flash fire), those results will be presented in the following Sections.}

This contention itemizes the various omissions and deficiencies in the applicant's ER as it pertains to various Sections and Subsections as described in the foregoing paragraphs, more specifically as it relates to DCPLNG, 2.2.3 Evaluation of Potential Accidents, and 2.2.3.1 Determination of Design-Basis events. The applicant's ER is deficient in its risk analysis of a catastrophic LNG spill on water which has many adverse impacts to the safety and operations of CCNPP and the proposed reactor. These deficiencies also impact the calculation of risk to CCNPP operations, safety, public health and the environment. The applicant's conclusions in the risk analyses as it pertains to DCPLNG are therefore impacted by these omissions and deficiencies.

The specific siting of CCNPP and the proposed CC3 reactor provides a more risk significant safety issue because DCPLNG, the largest LNG storage and gasification unit in the US is only 3.2 miles south of CCNPP, with pipelines traversing the Chesapeake Bay and in close proximity to the CCNPP.

A full breach ship borne LNG spill over water (Chesapeake Bay) is much more catastrophic than a spill over land since this type spill cannot be contained and water and air act as natural vaporizers to the cryogenic LNG, causing over pressures and explosions from Rapid Phase Transition of the LNG to gas. The intensity and occurrences of these overpressures and thermal explosions could damage sensitive equipment and installations in its range. Cryogenic LNG and the ensuing vapor cloud which rapidly expands over the spill site will freeze burn on contact (expected 100% mortality on aquatic organisms) and will induce thermal stress which may rupture or create structural fatigue to installations it encounters in this state. Waves and wind further expand the cryogenic LNG vapor cloud and the worst case scenario is an LNG spill over water during calm atmospheric conditions and little or no waves because air and Chesapeake Bay water act as instantaneous vaporizers, creating a fast spreading flammable vapor cloud which would remain longer over the area of spill which includes DCPLNG, CCNPP and surrounding populated communities. Thick LNG vapor cloud will also be an asphyxiant over the area until the proper mixture of air and vaporized LNG is reached and it becomes an ignitable vapor cloud. Any ignition source (natural, accidental or deliberate) such as static charge or a cigarette lighter would ignite the flammable vapor cloud which will burn continuously until the LNG is consumed. Radiant heat (emissive power of fire) from this type of spill could be over 350 kW/m^2 (and greater when Calvert Cliffs acts as a fire fence). This radiant

heat value from Sandia National Laboratories studies is illustrated in the table below (Exhibit 15).

Table 1: Key Assumptions and Results of the LNG Spill Consequence Studies

	Key assumptions						Key results		
			Environmental conditions modeled:						
	Hole size (m^2)	Number of tanks that rupture (cascading failure	Wind speed and its effect on waves (m/s)	Wind speed and its effect on fire (m/s)	Spill volume (m^3)	Fire surface emissive power (kW/m^2)	Pool diameter (meters)	Distance to the 5kw/m^2 heat level (meters)	Duration (minutes)
Quest Consultants Inc. (Quest)[a]	19.6	1	1.5	1.5	12,500	[b]	156	497	14.3
	19.6	1	5.0	5.0	12,500	[b]	146	531	16.6
	19.6	1	9.0	9.0	12,500	[b]	110	493	28.6
Sandia National Laboratories (Sandia)	2	3	[c]	[c]	37,500	220	209	784	20
	5	3	[c]	[c]	37,500	220	572	2,118	8.1
	5	1	[c]	[c]	12,500	350	330	1,652	8.1
	5[d]	1	[c]	[c]	12,500	220	330-405	1,305-1,579	5.4-8.1
	12	1	[c]	[c]	12,500	220	512	1,920	3.4
Pitblado, et al. (Pitblado)[e]	1.77	1	[c]	3.0	17,250	[b]	171	750	32
ABS Consulting (ABSC)[f]	0.79	1	[c]	8.9	12,500	265	200[g]	650	51
	19.6	1	[c]	8.9	12,500	265	620[g]	1,500	4.2
Fay (Fay)[h]	20	1	[c]	[c]	14,300	[b]	[b]	1,900	3.3
Lehr and Simecek-Beatty (Lehr)[i]	[b]	[b]	[c]	[c]	500	200	[b]	500	2-3

Source: GAO analysis of spill consequence studies.

Although the LNG Spill Consequence Studies depicted in the foregoing Table was copied from Table 1 of the GAO-07-316 February 2007 report: "MARITIME SECURITY, Public Safety Consequences of a Terrorist Attack on a Tanker Carrying Liquid Natural Gas Need Clarification" (Exhibit 16), it is presented here only as a convenient vehicle to illustrate the summary of 6 scientific studies with varying assumptions, but all taken together still fall short of factors affecting CCNPP should a worst case catastrophic LNG spill occur over water (Chesapeake Bay) at or near the vicinity of the DCPLNG pier. This Table also provides corroborative evidence that the June 2006 Power Plant Research Program (PPRP-CPT-01) expansion risk study on Dominion Cove Point LNG which the applicant referred to in its ER as “PPRP”, is deficient as a source for justifying the analysis of risks to CCNPP operations and the evaluation of the safety aspects required for the proposed USEPR design and containment.

Furthermore, the PPRP risk study covered mostly land-based scenarios and projected only a heat flux range of up to 37.5 kW/m^2, a fraction of the possible 350 kW/m^2 surface emissive power of fire (greater when Calvert Cliffs acts as a fire fence).

The applicants ER, FSAR Page 2.2-15 states:

The specific hazards associated with LNG tankers in the vicinity of the CCNPP site are presented in Table 2.2-9. The greatest consequence range presented, 13,943 ft (4,250 m), or 2.64 mi (4.25 km), was for the scenario where a total loss of LNG tanker inventory occurred. This maximum range is less than the distance from the postulated accident site to the CCNPP site. It is also less than the 3.4 mi (5.5 km) exclusion zone the U.S. Coast Guard committed to establish for LNG tankers in the vicinity of the CCNPP site (NRC, 2004b).
Table **2.2-9** Flammable Vapor Cloud Events (Delayed Ignition) and Vapor Cloud Explosion Analysis:

- Total loss of ship's tank enroute (off CCNPP):
  1,558 ft-Pool Fire/13,943 ft-Flash Fire and 475 m -Pool Fire/ 4,250 m -Flash Fire
- DCPLNG Gas Pipelines:
  2,362 ft-Jet Fire/ 722 ft-Flash Fire/ and 720 m - Pool Fire/ 220 m - Flash Fire
- Escalation Event- Total loss of all storage tanks:
  362 m - Pool Fire/ 1,295 m - Flash Fire)

Table 2.2-9 Flammable Vapor Cloud Events (Delayed Ignition) and Vapor Cloud Explosion Analysis
Note 2: Overall risk of fatality from DCPLNG facility and associated pipeline to CCNPP Site was evaluated to be 2.3E-9 per year (present operations) and 6.6E-9 per year (planned expansion). (The risk of physical damage to CCNPP Unit 3 is lower) The impact from blast overpressures was taken into account in developing this risk.

The above conclusion omits the possibility that the fast expanding vapor cloud could migrate before ignition to the CCNPP area and omits a total loss of LNG inventory from a large LNG tanker which could be 267,000 cubic meters or 148,000 cubic meters from a smaller ship. Furthermore, the conclusion that the greatest consequence is 2.64 miles is inconsistent with the PPRP Table 5.3 which illustrates that for CCNPP specifically, the hazard scenario for a flash fire with LFL or 37.5 kW/m^2 is 6,000 meters (3.72 miles) and ½ LFL or 9.5 kW/m^2 is 11,250 meters or approximately 7 miles. The ½ LFL distance in the PPRP study is still a hazard to human life, structures and operations of CCNPP and the proposed reactor. The commonly used “permissible safe zone” is a heat flux of 5 kW/m^2 which can cause second degree burns after about 30 seconds

of exposure to bare skin. A heat flux of about 12.5 kW/m^2 over an exposure time of 10 minutes will ignite wood, and a heat flux of about 37.5 kW/m^2 can damage steel structures. The applicant's study also omits in its analysis, the added radiant heat that could ensue when Calvert Cliffs acts as a fire fence. This would be the case under the worst conditions of an LNG spill over water at the DCPLNG pier. The overpressures and explosions from this type event were omitted in the risk development. Another omission is the risk analysis of larger LNG ships which will be docking at the modified LNG pier which is closer to CCNPP Unit 3.

The most probable risk area is the LNG pier which will be undergoing modifications and since CCNPP Unit 3 is closer to this pier, the conclusion drawn by the applicant is inconsistent with the geographic siting of the proposed reactor. When the aforementioned factors when omitted, they also affect the evaluation of the risk factor used by the applicant which in turn affect the design of the proposed reactor.

It should also be noted that the PPRP the applicant is referring to specifically states that "The study does not evaluate construction phase risks, any future modifications to the DCPLNG facility or the surrounding areas, or risks to the environment". Since the PPRP listed the Sandia National Laboratories "Guidance on Risk Analysis and Safety Implications of a Large LNG Spill Over Water" (SAND2004-6528, Dec 2004), it is provided herewith as an attachment.

The applicant's ER also omits the 2005 Sandia National Laboratories study (SAND2005-7339), that confirmed the range of LFL (Lower Flammability Limit) could be as far as 11, 175 meters or 7 miles (page 24, Final Calculations, Table 5, Final Dispersion Results).
Attached is the Sandia National Laboratories Study (SAND2005-7339), Review of the Independent Risk Assessment of the Proposed Cabrillo Liquefied Natural Gas Deepwater Port Project (Exhibit 17). Although this study was for FRSU type facility, it is referred to in this

contention because the study is also an offshore proposed facility which is a similar representation of an LNG spill over water. Regardless of whether the LNG spill is from a ship tank breach or FRSU, the spill scenario is similar; the LNG spill is on water and containment is not possible. This study also confirms that Sandia National Laboratories validates another research group's (ACE) findings on the distance to LFL is 11,175 meters or approximately 7 miles with a heat flux of 5 kW/m^2 which can cause second degree burns after about 30 seconds of exposure to bare skin.

Table 2.2-10 Toxic Vapor Cloud Analysis omits analysis of possible Toxic Air Pollution from rapid LNG vaporization and mass high combustion of gasified LNG on a catastrophic LNG spill over water.

2.2.3.1.1 Explosions
Accidents involving detonations of high explosives, munitions, chemicals, or liquid and gaseous fuels were considered for facilities and activities in the vicinity of the plant or onsite, where such materials are processed, stored, used, or transported in quantity. The effects of explosions are a concern in analyzing structural response to blast pressures. The effects of blast pressure from explosions from nearby railways, highways, navigable waterways, or facilities to critical plant structures were evaluated to determine if the explosion would have an adverse effect on plant operation or would prevent a safe shutdown.

The allowable and actual distances of hazardous chemicals transported or stored were evaluated according to NRC Regulatory Guide 1.91, Revision 1, Evaluations of Explosions Postulated to Occur on Transportation Routes Near Nuclear Power Plants (NRC, 1978a), and Guidelines for Evaluating the Effects of Vapor Cloud Explosions Using a TNT Equivalency Method (FMIC, 2005). Regulatory Guide 1.91 cites **1** psi (6.9 kPa) as a conservative value of peak positive incident overpressure, below which no significant damage would be expected.

The conclusions and assumptions described in **2.2.3.1.1** Explosions, use the TNT equivalency method and omit the explosions caused by the consequences of a catastrophic LNG spill over water which may not behave similarly or use the same assumptions, thereby omitting analysis of an appropriate method for evaluating damage.

2.2.3.1.2 Flammable Vapor Clouds (Delayed Ignition)
Flammable gases in the liquid or gaseous state can form an unconfined vapor cloud that could

drift toward the plant before ignition occurs. When a flammable chemical is released into the atmosphere and forms a vapor cloud it disperses as it travels downwind. The parts of the cloud where the concentration is within the flammable range, between the lower and upper flammability limits, may burn if the cloud encounters an ignition source. The speed at which the flame front moves through the cloud determines whether it is a deflagration or a detonation. If the cloud burns fast enough to create a detonation an explosive force is generated.
The potential onsite chemicals are shown in Table 2.2-5. Hazardous materials potentially transported on ((MD) 2/4) are shown on Table 2.2-6, and hazardous materials transported on navigable waterways are shown on Table 2.2-7. These chemicals were evaluated to ascertain which hazardous materials had the potential to form a flammable vapor cloud or vapor cloud explosion. For those chemicals with an identified flammability range, the Areal Locations of Hazardous Atmospheres (ALOHA) air dispersion model was used to determine the distances where the vapor cloud may exist between the upper flammability limit (UFL) and the lower flammability limit (LFL), presenting the possibility of ignition and potential thermal radiation effects (ALOHA, 2007).
The identified chemicals were also evaluated to determine the possible effects of a flammable vapor cloud explosion. ALOHA was used to model the worst case accidental vapor cloud explosion, including the safe distances and overpressure effects at the nearest safety-related {CCNPP Unit **3)** structure. To model the worst case in ALOHA, ignition by detonation was chosen for the ignition source. The safe distance was measured as the distance from the spill site to the location where the pressure wave is at **1** psi (6.9 kPa) overpressure.
Conservative assumptions were used in both ALOHA analyses with regard to meteorological inputs and identified scenarios. The following meteorological assumptions were used as inputs to the computer model, ALOHA: Pasquill stability class F (stable), with a wind speed of 1 m/sec; ambient temperature of 25 0C; relative humidity 50%; cloud cover 50%; and an atmospheric pressure of 1 atmosphere. Pasquill Stability class F represents the worst 5% of meteorological conditions observed at a majority of nuclear plant sites. For each of the identified chemicals, it was conservatively assumed that the entire contents of the vessel leaked forming a 1 cm thick puddle. This provides a significant surface area to maximize evaporation and the formation of a vapor cloud.

The aforementioned analysis and discussion of **2.2.3.1.2** Flammable Vapor Clouds (Delayed Ignition) omits full breach of ship borne LNG over water (Chesapeake Bay) especially at or near the LNG offshore pier where the greatest safety risk occurs. The assumption that the “entire contents of the vessel leaked forming a 1 cm thick puddle providing a significant surface area to maximize evaporation and the formation of a vapor cloud” definitely omits risk analysis of a catastrophic LNG spill over water.

2.2.3.1.3 Toxic Chemicals
Accidents involving the release of toxic chemicals from onsite storage facilities and nearby mobile and stationary sources were considered. Toxic chemicals known to be present on site or in the vicinity of the {CCNPP) site, or to be frequently transported in the vicinity were evaluated. NRC Regulatory Guide 1.78, Revision 1, Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release (NRC, 2001), requires

evaluation of control room habitability after a postulated external release of hazardous chemicals from mobile or stationary sources, offsite or onsite.
The potential onsite chemicals (Table 2.2-5), hazardous materials potentially transported on {(MD) 2/4) are identified in Table 2.2-6. Hazardous materials transported on navigable waterways are identified in Table 2.2-7. These chemicals were evaluated to ascertain which hazardous materials should be analyzed with respect to their potential to form a toxic vapor cloud after an accidental release.

Toxic Chemical Related Impacts Affecting the U.S. EPR Design
The U.S. EPR design is acceptable for any site when reasonable qualitative arguments can demonstrate that the realistic probability of severe consequences from any external accident is less than **1** E-6 occurrences per year. The analyses presented in this section demonstrate that toxic chemical concentrations that could present an immediate hazard to plant personnel will not result from postulated chemical releases, (with the exception of gasoline and ammonia. For gasoline and ammonia, it was demonstrated that the event probability is less than **1** E-6. As a result, each of the postulated toxic chemical release scenarios has been demonstrated to either not result in severe consequences, or to have an event frequency that is less than 1 E-6 per year.)

2.2.3.1.4 Fires
Accidents leading to high heat fluxes or smoke, and non-flammable gas or chemical bearing clouds from the release of materials, as the consequence of fires in the vicinity of the plant were considered. Fires in adjacent industrial plants and storage facilities, oil and gas pipelines, brush and forest fires, and fires from transportation accidents were evaluated as events that could lead to high heat fluxes or to the formation of such clouds.
(The nearest industrial site is the DCPLNG facility located, which is located approximately 3.2 mi (5.1 km) from CCNPP Unit 3. The Maryland Power Plant Research Program (MDNR, 2006) commissioned an independent risk study (i.e., hazard study) to assess the risks associated with the expansion of the DCPLNG facility and associated pipeline to the CCNPP site as described in Section 2.2.3.)
The quantified risks to the {CCNPP} site presented in this study are within the threshold of acceptable risks defined by the U.S. Nuclear Regulatory Commission (1 E-7). The evaluation of these risks included such events as (ruptures in the gas pipeline and escalation events, involving total loss of the storage tanks, which lead to a jet or pool fire. Therefore, it is not expected that there would be any hazardous effects from fires or heat fluxes associated with the operations of the DCPLNG facility and pipeline.)

Table **2.2-7** Hazardous Material, Navigable Waterway Transportation, Disposition in the applicants FSAR, lists LNG that the "vapor may explode using the PPRP Study".

Table **2.2-8** Explosion Event Analysis {Note 1: Overall risk of fatality from DCPLNG facility and associated pipeline to CCNPP Site was evaluated to be 2.3E-9 per year (present operations) and 6.6E-9 per year (planned expansion). (The risk of physical damage to CCNPP Unit 3 is lower) The impact from blast overpressures was taken into account in developing this risk.

The aforementioned conclusions for 2.2.3.1.3 Toxic Chemicals, Table 2.2.7 and Table 2.2-8

utilized the PPRP study of DCPLNG which is deficient on the current situation of "full breach of

the ship borne LNG spill on water". PPRP study also omitted the LNG Spill Consequence

Studies depicted in the aforementioned GAO-07- 316 Feb 2007 report. This GAO report summarized 6 scientific studies with varying assumptions, but all taken together still fall short of factors affecting CCNPP should a worst case catastrophic LNG spill occur on water (Chesapeake Bay) within the thermal inclusion zone of CCNPP and the proposed reactor.

The applicant's ER and the PPRP Study both omit analyses that size and spread of the flammable vapor cloud affects LNG pool fire size and duration, with heat flux greater than $\underline{350kW/m^2}$ given "worst case conditions" for an LNG spill over water that could be different from the assumptions made for a "worst case conditions" that would occur on a nuclear power plant since only CCNPP has the unique siting of DCPLNG with an offshore unloading pier within its hazard inclusion zone.

Furthermore, the ER and PPRP omit risk analysis of secondary fires that would probably occur with instantaneous combustion from radiant heat of the LNG pool fire which will burn office paper, carpet, office furniture and computers and risk damaging sensitive equipment, negatively impacting safety and operations of CCNPP and the proposed reactor.

With all the aforementioned omissions and deficiencies identified in the ER and PPRP, the following conclusion by the applicant omits assumptions and analyses that would affect the risk analyses and probability values:

FSAR Page 2.2-13
Nearby Facilities
(The Dominion Cove Point Liquefied Natural Gas (DCPLNG) facility operates within the vicinity of the CCNPP site. Section 2.2.3 addresses the overall risk from the DCPLNG facility. Blast overpressure impacts were taken into account in developing the risk analysis. Damaging overpressures from an explosion resulting from a complete tank failure at the DCPLNG facility would not adversely affect the operations of CCNPP Unit 3 (MDNR, 2006).)

Applicant's reference to overpressures from an explosion resulting from a complete tank failure at DCPLNG appears to refer to land-based storage tank and omits the more catastrophic LNG spill over water and its consequences resulting from different types of overpressures and explosions that will have greater probability to affect CCNPP and especially proposed Unit 3 since the geographical siting places Unit 3 closer to DCPLNG.

Conclusion:

As demonstrated in the Argument, the applicant's ER is deficient in its risk analysis of the impact of DCPLNG operations and hazards as it relates to CCNPP and Unit 3's operations, safety, geographical siting, and design of the proposed reactor. The omissions and deficiencies cited and most specifically, the real world impact of the catastrophic LNG spill on water at or near the LNG pier requires further study. The modifications on the LNG pier to accommodate larger LNG ships with a cargo carrying capacity of up to 267,000 cubic meters of LNG were omitted. The applicant's ER and PPRP also omits the probability of secondary fires resulting from radiant heat of a catastrophic LNG spill over water and the additional domino effect of the hazards cumulative impact to pipelines and other DCPLNG site installations previously referred to in the Contention and in the foregoing Argument. The domino effect will further increase the risk factors and these factors were omitted from the applicant's analyses, thereby affecting the assumptions in risk analysis and the conclusions drawn by the applicant.

The PPRP risk study the applicant refers to in its risk analysis is already deficient as a source for justifying the analysis of risks to CCNPP operations and the evaluation of the safety aspects required for the proposed USEPR design and containment, geographical siting, and risk assessment of the current and future situation from which the Unit 3 installation and engineering is based. Furthermore, the PPRP specifically states "The study does not evaluate construction

phase risks, any future modifications to the DCPLNG facility or the surrounding areas, or risks to the environment".

Therefore, the risk analysis and risk assessment the applicant is utilizing for its conclusions contains omissions and deficiencies that adversely affect its substantiation of the risk factors for installing the proposed CCNPP Unit 3.

Contention #5:

The UniStar application's Environmental Report (ER) is unacceptably deficient because it omits the combined and cumulative mechanical stress to Chesapeake Bay biota caused by the cooling water intake pumps for the proposed Unit 3, CCNPP units1 and 2 water intake pumps and the water ballast intake pumps of the LNG tanker ships that are operational during LNG unloading operations at the Dominion Cove Point LNG (DCPLNG) pier. The applicant's ER recognizes that 200 LNG ships per year will be docking and unloading at the DCPLNG pier. Since Unit 3's water intake pumps are much closer to the LNG pier by its geographical location, this combined impact on the same area pose adverse effects on aquatic life.

The cumulative mechanical stress on Chesapeake Bay biota from these 3 major pump sources on the watershed and other synergistic effects on the already severely degraded and declining Chesapeake Bay, whose recovery plan is currently in doubt and the focus of a federal law suit, was omitted from the applicant's ER and environmental risk analysis.

Argument:

The applicant's CCNPP Unit 3 FSAR Vol 1 2.2 Nearby Facilities states:

2.2.2.2.2 (Dominion Cove Point Liquefied Natural Gas Facility
The Dominion Cove Point Liquefied Natural Gas (DCPLNG) facility is located approximately 3.2 mi (5 kin) south of the facility. The DCPLNG site receives liquefied natural gas (LNG) from LNG tanker ships at its offshore dock. The facility stores the LNG onshore in tanks, then transforms it back to gas and delivers it to a pipeline for distribution.

The DCPLNG facility includes an offshore pier; and five double-walled, insulated LNG storage tanks that are maintained at -260°F (-1620C) and 2 psig (14 kPa-gauge). One tank has a capacity of 850,000 barrels (35.7 million gallons, or 135,000 M3**),** and the remaining four tanks have a capacity of 230,000 barrels (9.8 million gallons, or 37,000 M3**).** The pipeline, known as the Cove Point pipeline, extends approximately 88 mi (142 km) from the LNG terminal to connections with several interstate pipelines (Dominion, 2007) (MDNR, 2006). The pipeline and offshore pier are described in more detail in Sections 2.2.2.3 and 2.2.2.4.2.
The Federal Energy Regulatory Commission (FERC) has approved an application for expansion of the DCPLNG facility. The scope of this expansion is described in more detail in Section 2.2.2.4.2.)

2.2.2.4 Description of Waterways
{CCNPP Unit 3 will be located about 1,000 ft (305 m) from the western shore of Chesapeake Bay. The Chesapeake Bay is a large estuary and home to many marinas and facilities along its shores. Located along the navigable waterways are two facilities which may contribute to the transportation of potentially hazardous cargo along the Chesapeake Bay, and in the vicinity of the CCNPP site: (1) the Port of Baltimore, and (2) the Dominion Cove Point Liquefied Natural Gas facility.
The Port of Baltimore is located about 60 mi (97 kin) north of the CCNPP site on the Patapsco River, a tributary that flows into the Chesapeake Bay. The Dominion Cove Point Liquefied Natural Gas facility located 3.2 mi (5.1 kin) south of the CCNPP site, and has a terminal with an off shore pier. More detailed information about the transportation of potentially hazardous material as a result of these facilities is presented in the following sections.
At its greatest depth in the vicinity of the CCNPP site, the Chesapeake Bay shipping channel is approximately 101 ft (31 m) deep (NOAA, 2005). The navigable waterways of the Chesapeake Bay are represented by the U.S. Army Corps of Engineers as those waters with a depth greater than the 47 ft (14.3 m) contour (USACE, 2006). Applying this definition, the CCNPP Unit 3 intake structure will be within 11,678 ft (2.2 mi, or 3,560 m) from a navigable waterway. The U.S. Coast Guard has committed to establish approach and docking procedures for the Dominion Cove Liquefied Natural Gas (LNG) facility to keep LNG vessels outside a 3.4 mi (5.5 km) radius from the CCNPP site (NRC, 2004b).
The intake structures for CCNPP Unit 3 will be situated in an area that is set back from the shoreline at the south end of the CCNPP Unit 1 and 2 intake structure. The intake channel will approximately 100 ft (30.5 m) long, 100 ft (30.5 m) wide structure with a dredged earthen bottom at approximate elevation -20 ft 6 in MSL (-6.25 m msl) with vertical walls extending to approximate elevation 10 ft MSL (3 m msl).

The CCNPP Unit 3 intake structure, as stated in the foregoing paragraphs, is further south than the C1 and CC2 intake structures, and closer to the DCPLNG pier. The ER omits the CC3 water intake pumps and its mechanical stress impact to the Chesapeake Bay biota which affects the aquatic food chain.

Bay water consumption from Calvert Cliffs and DCPLNG operations

- Units 1 and 2 draw 2.4 million gallons per minute (gpm) cooling water
- Unit 3 will draw 43,480 gallons per minute cooling water

- LNG tankers typically draw 50,000 gpm into water ballasts in about 12-24 hrs, or longer when larger LNG ships with up to 267,000 cubic meters of LNG are unloading.

CCNPP continually draws Chesapeake Bay water and although these may be in similar flow to tidal waters, the analysis omits mechanical stress produced by each pump. CC1 and CC2 currently use multiple recirculating pumps. Cumulative effect of all the CCNPP pumps and the LNG ship water ballast pumps were omitted for mechanical stress assessment as it affects the declining Chesapeake Bay.

In support of their contention, Petitioners submit that on October 29, 2008, the Chesapeake Bay Foundation (CBF) filed a "Notice of Intent to Sue for Failure to Comply with the Chesapeake 2000 Agreement" with the United States Environmental Protection Agency and the Attorney General of the United States, U.S. Department of Justice.

The CBF suit identifies that *"over many years, the productivity and water quality of the Chesapeake Bay and its watershed were diminished by pollution, excessive sedimentation, shoreline erosion, the impacts of population growth and development in the Chesapeake Bay watershed, and other factors;"*
[CBF, Notice of Intent to Sue for Failure to Comply with the Chesapeake 2000 Agreement, October 29, 2008, p. 14] (Exhibit 14).

Conclusion:
The Petitioners argue that the development of CCNPP 3 has not been adequately analyzed and the applicant's Environmental Report's omits an assessment of the CCNPP 3 contribution to the cumulative impacts of mechanical stress to the Chesapeake Bay watershed.

Such omission potentially fails to address the proverbial "straw that broke the camel's back" with severe environmental and economic consequences for the already severely impacted Chesapeake Bay.

CONTENTION #6: The application is deficient in its discussion of high-level radioactive waste that would be generated by Calvert Cliffs-3

6-A: Failure to Evaluate Whether and in What Time Frame Spent Fuel Generated by Calvert Cliffs Unit 3 Can Be Safely Disposed Of

The Environmental Report for the Calvert Cliffs Unit 3 COLA is deficient because it fails to discuss the environmental implications of the lack of options for permanent disposal of the irradiated (*i.e,* "spent") fuel that will be generated by the proposed new reactor if built and operated. Nor has the NRC made an assessment on which the applicant can rely regarding the degree of assurance now available that radioactive waste generated by the proposed reactor "can be safely disposed of [and] when such disposal or off-site storage will be available." Final Waste Confidence Decision, 49 Fed. Reg. 34,658 (August 31, 1984), citing *State of Minnesota v. NRC,* 602 F.2d 412 (D.C. Cir. 1979). Accordingly, the ER fails to provide a sufficient discussion of the environmental impacts of the proposed new nuclear reactor.

Discussion

The ER for the proposed new reactor does not contain any discussion of the environmental implications of the lack of options for permanent disposal of the irradiated fuel to be generated by Calvert Cliffs Unit 3. Therefore, it is fatally deficient. *State of Minnesota v. NRC,* 602 F.2d at 416-17.

In the Calvert Cliffs Unit 3 COLA, at Part 3 of the Environmental Report at Chapter 5.7.6 about Uranium Fuel Cycle Impacts, the applicant states:

"Federal Law requires that high level and transuranic wastes are to be buried at a repository and no release to the environment is expected to be associated with such disposal because it has been assumed that all of the gaseous and volatile radionuclides contained in the spent fuel are no longer present at the time of disposal of the waste. In NUREG-0116 (NRC, 1976), which provides background and context for the high level and transuranic Table S–3 values, the NRC

indicated that these high level and transuranic wastes will be buried and will not be released to the environment.

The NRC has already concluded that for applicants seeking an Early Site Permit (ESP), these impacts are acceptable, and would not be sufficiently large to require a NEPA conclusion that the construction and operation of a new nuclear unit at the sites should be denied."

First, the U.S. Department of Energy recognizes that significant radioactivity releases from a Yucca Mountain repository would in fact occur over time. See, for example, U.S. DOE Office of Civilian Radioactive Waste Management, "NWTRB Repository Panel meeting: Postclosure Defense in Depth in the Design Selection Process," presentation for the Nuclear Waste Technical Review Board Panel for the Repository, January 25, 1999. Also, the U.S. Environmental Protection Agency's final Yucca Mountain radiation release regulations, requiring that such radiation release regulations extend out to a million years post waste burial, shows that such releases will continue for many hundreds of thousands of years into the future. EPA's proposed dose limit from Day 1 to Year 10,000 post burial is 15 millirems/year from all pathways of exposure. EPA's proposed dose limit from Year 10,000 to Year 1,000,000 post burial is 100 millirems/year from all pathways of exposure. Thus, the post Year 10,000 standard would allow for six to seven fold higher radioactivity doses to persons downstream than the pre Year 10,000 standard, a prima facie violation of the long established international moral and ethical norm referred to as "intergenerational equity." In summary, Yucca Mountain would experience significant radioactivity releases into the distant future, despite any applicant or NRC statements to the contrary. See United States. Environmental Protection Agency. "40 CFR Part 197: Public Health and Environmental Radiation Protection Standards for Yucca Mountain , Nevada : Proposed Rule." *Federal Register,* v.73, no. 200, October 15, 2008, pages 61256-61287.

Thus, the Calvert Cliffs 3 COLA's assertion that "no release to the environment is

expected to be associated with such disposal" is obviously false. While Applicants may have intended to rely on the NRC's Waste Confidence decision, issued in 1984, and most recently amended in 1999, that decision is inapplicable because it applies only to plants which are currently operating, not new plants. The second finding of the Waste Confidence Decision, as amended in 1999, is that the Commission has reasonable assurance that at least one mined geologic repository will be available within the first quarter of the twenty-first century, and that sufficient repository capacity will be available within 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of any reactor to dispose of the commercial high-level radioactive waste and spent fuel originating in such reactor and generated up until that time. Waste Confidence Decision Review: Status, 64 Fed. Reg. 68,005, 68,006 (December 6, 1999).

This finding revised the finding in the original decision that a mined geologic repository would be available by the years 2007 to 2009. Clearly, the Commission's finding applies to any existing reactor, including reactors whose licenses are revised or renewed. The Commission gives no indication that it has confidence that repository space can be found for spent fuel and other high-level radioactive waste from new reactors licensed after December 1999. Moreover, the revised second finding in the 1999 Waste Confidence review statement conspicuously fails to assert confidence in the likelihood that more than one repository will be licensed. In fact, the Commission has backtracked on its original 1984 "Nuclear Waste Confidence Decision," in which the Commission expressed confidence that "one or more" repositories would open between 2007 and 2009. Waste Confidence Decision, 49 Fed. Reg. at 34,673. The 1999 Status Report states merely that "at least one" repository will open by 2025. 64 Fed. Reg. at 68,006.

Although previous ASLBs have rejected similar intervention contentions against proposed new reactors, we urge that this contention be accepted for hearing based on the fact that the U.S. Nuclear Regulatory Commission has yet again re-opened the Nuclear Waste Confidence Decision to revision. This re-examination, currently still open for public comment, shows clearly that there is no regulatory certainty regarding the high-level radioactive waste dilemma. See Waste Confidence Decision Update. 10 CFR Part 51 [Docket ID-2008-0482]; 73 FR 59551, 10-9-08, online at http://edocket.access.gpo.gov/2008/pdf/E8-23381.pdf. See also the related Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation. 10 CFR Part 51, RIN: 3150–AI47, [NRC–2008–0404] 73 FR 59547, 10-9-08, online at http://edocket.access.gpo.gov/2008/pdf/E8-23384.pdf.

The Applicant and the NRC itself should not be allowed to rely on the NRC Commission's current re-appraisal of the Nuclear Waste Confidence Decision as constituting a safe, secure, and sound permanent solution for the high-level radioactive waste dilemma, for after all, the review is not completed. In fact, the proceeding is still open for public comment. Once the public comment period has been completed, and the NRC has issued its proposed final version of this latest review of the Nuclear Waste Confidence Decision, we request the right to re-address this issue in this proceeding, in light of that yet to be released final decision, in the context of the specific circumstances of this new reactor proposal at Calvert Cliffs.

Furthermore, it is also clear that the inventory of irradiated nuclear fuel and other high-level radioactive waste being generated by the *current* generation of nuclear reactors is far greater than what can be accommodated in the single repository in which the Commission seemingly places its confidence, Yucca Mountain, Nevada. The proposed Yucca Mountain

repository can only accept 63,000 metric tons of commercial high-level radioactive waste and irradiated nuclear fuel, at least until a second national repository became operational.

Under the Nuclear Waste Policy Act ("NWPA"), 63,000 metric tons is the legal limit for commercial waste storage that can be "disposed of" at Yucca Mountain, Nevada, at least until a second repository is operational elsewhere in the U.S. As the NWPA states at Section 114(d):

> The [NRC] decision approving the first such application [for a license to open and operate a repository] shall prohibit the emplacement in the first repository of a quantity of spent fuel containing in excess of 70,000 metric tons of heavy metal or a quantity of solidified high-level radioactive waste resulting from the reprocessing of such a quantity of spent fuel until such time as a second repository is in operation…" 42 U.S.C. § 10134(d).

By long-established DOE policy, the first 70,000 metric tons of irradiated nuclear fuel and solidified high-level radioactive waste "disposed of" at Yucca Mountain, Nevada would include 90% commercial nuclear reactor waste, and 10% DOE waste from the nuclear weapons production complex and nuclear energy research activities, as well as Department of Defense Nuclear Navy-related wastes. 90% of 70,000 metric tons means that only 63,000 metric tons of commercial irradiated nuclear fuel could be "disposed of" at Yucca Mountain, Nevada, at least until a second national repository is operational in the United States. ***See*** Yucca Mountain EIS at A-1.

Even assuming only 40 years of operations with no operating license renewals and no new nuclear reactors, the U.S. Department of Energy (DOE) has known since at least the mid-1990s—since before the most recent (1999) NRC review of its "Nuclear Waste Confidence Decision"—that by the year 2030 or so well over 80,000 metric tons of irradiated nuclear fuel generated at commercial nuclear reactors will exist in the U.S. U.S. Nuclear Waste Technical Review Board ("NWTRB") "Disposal and Storage of Spent Nuclear Fuel: Finding the Right

Balance," Figure 2 at page 11 (March 1996). This is significantly in excess of the "disposal" capacity at Yucca Mountain.

As recently as March, 2008, at the U.S. Nuclear Regulatory Commission's Regulatory Information Conference, the director of the U.S. Department of Energy's Office of Civilian Radioactive Waste Management, Ward Sproat III, announced that 63,000 metric tons of commercial irradiated nuclear fuel—enough to fill Yucca to its legal limit—will exist in the U.S. by the spring of 2010. He added more recently that the U.S. Department of Energy recognizes the need for a *second* repository, as called for by the Nuclear Waste Policy Act as Amended, *unless* the capacity limit at Yucca Mountain is done away with. Of course, changing the amount of high-level radioactive waste and irradiated nuclear fuel to be buried at Yucca Mountain would increase the environmental and public health risks and impacts downstream and downwind. Not only would a change in federal law be required, but new analyses to determine the extent of these increased impacts would be required. These analyses have not yet even been undertaken, much less completed. Given the many unknowns associated with requirements for changes in the law, new technical analyses, and additional regulatory proceedings associated with the proposal to expand Yucca's waste disposal capacity, any "confidence" in a waste solution for a new generation of reactors is entirely inappropriate.

NRC's now-routine approval of 20-year license extensions to old commercial nuclear reactors will only increase the quantity of high-level radioactive waste that exceeds the capacity limits at the proposed Yucca Mountain, Nevada repository. In its "Final Environmental Impact Statement for a Repository for Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada," (Feb. 2002) (hereinafter "Yucca Mountain EIS"), DOE predicted the generation of over 105,000 metric tons of commercial irradiated nuclear fuel by the

year 2046. *Id.*, Table A-8, page A-16. While NRC's standard license extension term is 20 years, the DOE prediction assumed that the term of license extensions would be only 10 years. DOE also assumed no new commercial nuclear reactors in the U.S. Thus, the high-level waste and irradiated fuel generated by the *current* generation of reactors will far exceed the capacity of the single repository that the NRC has identified as feasible and likely in the next several decades.

Experience also shows that the NRC has been overly optimistic about the opening of the first repository. It took from 1982 (the year the Nuclear Waste Policy Act was passed) until 2002 – 20 full years -- just for the DOE to recommend Yucca Mountain as "suitable" for repository development. This finding, however, has been consistently challenged by the State of Nevada, environmental groups, and numerous scientists. Even before DOE's suitability determination, the U.S. General Accounting Office (GAO) reported that a repository at Yucca Mountain, Nevada probably could not open to receive waste shipments till 2015 at the earliest, given nearly 300 unfinished scientific and technical studies. GAO-02-191, "Nuclear Waste: Technical, Schedule, and Cost Uncertainties of the Yucca Mountain Repository Project" (December, 2001).

DOE later admitted that 2017 was the "best achievable" date for opening Yucca. Currently, however, DOE has admitted that it has no projected opening date for the Yucca repository. *See, e.g.*, U.S. NWTRB, "Technical Report on Localized Corrosion" (November 25, 2003, and Allison M. Macfarlane and Rodney C. Ewing, "Uncertainty Underground: Yucca Mountain and the Nation's High-Level Nuclear Waste," the MIT Press, Cambridge, MA, 2006).

In addition, several legal challenges have been filed against the Yucca Mountain repository and the proposed standards for operation, including a successful State of Nevada/environmental coalition challenge to the U.S. Environmental Protection Agency's radiation release regulations for the Yucca repository. On July 9, 2004, the U.S. Circuit Court of

Appeals for the District of Columbia ordered EPA to revise its regulations, which EPA has only very recently done. See United States. Environmental Protection Agency. "40 CFR Part 197: Public Health and Environmental Radiation Protection Standards for Yucca Mountain , Nevada : Proposed Rule." *Federal Register*, v.73, no. 200, October 15, 2008, pages 61256-61287. However, even this EPA Final Radiation Release Rule has been legally challenged by the State of Nevada. See Petition for Review in the United States Court of Appeals for the District of Columbia Circuit, State of Nevada, Petitioner, versus United States Environmental Protection Agency; Stephen L. Johnson, Administrator; and United States of America, Respondents, October 10, 2008.

Accordingly, the irradiated nuclear fuel and other high-level radioactive wastes generated at the proposed new reactors, such as Calvert Cliffs Unit 3, could not be "disposed of" at Yucca Mountain unless and until a second national repository is operating. But the Commission has not expressed confidence that a second repository will open. Any irradiated nuclear fuel or other high-level radioactive waste generated after the spring of 2010 (after 63,000 metric tons of commercial irradiated nuclear fuel has been generated) would have nowhere to go, would lack "disposal" space at a repository, unless and until a second repository is opened and operating in the U.S. somewhere other than Yucca Mountain, Nevada – a process that could very well take many decades, based on the experience of trying to open the first repository at Yucca Mountain, Nevada.

Moreover, Congress has not given the NRC any basis for assuming that a second repository will be opened. Section 161(b) of the NWPA provides that: "[t]he Secretary [of Energy] shall report to the President and to Congress on or after January 1, 2007, but not later than January 1, 2010, on the need for a second repository." 42 U.S.C. §10172a(b). Section 161(a)

also states that: “The Secretary [of Energy] may not conduct site-specific activities with respect to a second repository unless Congress has specifically authorized and appropriated funds for such activities.” 42 U.S.C. §10172a(a). The Department of Energy has not made an official finding that a second repository is needed, nor has Congress specifically authorized or appropriated funds for site-specific activities.

However, very recent statements by the Energy Department’s Edward Sproat to Congress, as reported by the Associated Press’s Joe Hebert, indicated that the 70,000-metric ton limit Congress put on the capacity of the proposed Yucca waste dump will fall far short of what will be needed and has to be expanded, or else another dump built elsewhere in the country. Sproat said within two years the amount of waste produced by the country’s 104 nuclear power plants plus defense waste will exceed 70,000 metric tons. Sproat suggested that Congress scrap the limit, or else empower the Department of Energy to search for another site for a secondary facility. See “Should Yucca Mountain Hold More Than 77,000 Tons of Nuclear Waste, or None?” by Eliza Strickland in Discover’s Environment Department, November 10, 2008, online at http://blogs.discovermagazine.com/80beats/2008/11/10/should-yucca-mountain-hold-more-than-77000-tons-of-nuclear-waste-or-none/

Whether or not Sproat’s testimony before Congress constitutes the Nuclear Waste Policy Act’s mandated report on the need for a second repository sometime between 2007 and 2010 in not clear. Any confidence that Congress will expand Yucca’s capacity, or mandates a second repository elsewhere in the country, is premature until Congress actually acts. NRC should put no stock, and the applicant should take no credit, for such hypothetical eventualities.

The Nuclear Regulatory Commission’s failure to express confidence that a second repository will be opened any time soon also implicates the third and fourth findings of the

Waste Confidence Decision, *i.e,* that irradiated fuel and other high-level radioactive waste can be safely stored at reactor sites for up to 30 years. 64 Fed. Reg. at 68,006. If the Commission has no confidence that a repository will open at some reasonable time in the future, it must be assumed that irradiated fuel may sit at the proposed new Calvert Cliffs 3 reactor site for an indefinite period of time. The environmental impacts of such indefinite storage must be evaluated before a Combined Operating License can be granted.

6-B. Even if the Waste Confidence Decision Applies to This Proceeding, It Should be Reconsidered.

Even if the Waste Confidence Decision applies to this proceeding, it should be reconsidered, in light of significant and pertinent unexpected events that raise substantial doubt about its continuing validity, *i.e.,* the increased threat of terrorist attacks against U.S. facilities.

Discussion

In its 1999 "Nuclear Waste Confidence Decision" revision, NRC stated "the Commission would consider undertaking a comprehensive reevaluation of the Waste Confidence findings…if significant and pertinent unexpected events occur raising substantial doubt about the continuing validity of the Waste Confidence findings." 64 Fed. Reg. at 68,007.

Clearly, the catastrophic terrorist attacks upon the United States on September 11th, 2001 constituted significant and pertinent unexpected events that raise substantial doubts about the continuing validity of the third and fourth findings of the revised Waste Confidence Decision. These findings are:

3. The Commission finds reasonable assurance that high-level radioactive waste and spent fuel will be managed in a safe manner until sufficient repository capacity is available to assure the safe disposal of all high-level waste and spent fuel. (This finding is identical to the finding in the original Waste Confidence Decision in 1984).

4. The Commission finds reasonable assurance that, if necessary, spent fuel can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor at its spent fuel storage basin, or at either onsite or offsite independent spent fuel storage installations. (This finding is basically identical to that in the original Waste Confidence Decision with the addition of the consideration of license renewal and spent fuel storage 30 years beyond the licensed life for operation of a reactor). 64 Fed. Reg. at 68,006.

The terrorist threat to irradiated nuclear fuel and high-level radioactive waste – whether it is being stored on-site at commercial reactors in storage pools or dry casks; stored in away-from-reactor Independent Spent Fuel Storage Installations; or transported by truck, train, or barge between nuclear plants and off-site interim storage facilities – demands an evaluation of whether (a) it is appropriate to store irradiated nuclear fuel and other highly radioactive waste for 30 years or more pending availability of a permanent repository, and (b) whether nuclear power should be phased out as quickly as possible as a matter of environmental protection, national security, public safety, and common defense.

The homeland security risks posed by indefinite temporary storage of irradiated nuclear fuel have been recognized by former Energy Secretary Spencer Abraham:

"Yucca Mountain is an important component of homeland security. More than 161 million people live within 75 miles of one or more nuclear waste sites, all of which were intended to be temporary. We believe that today these sites are safe, but *prudence demands we consolidate this waste from widely dispersed, aboveground sites into a deep underground location that can be better protected.*
Statement of Spencer Abraham, Secretary of Energy, Before the Energy and Natural Resources Committee, U.S. Senate (May 16, 2002), (the full statement can be viewed and printed from: http://yuccamountain.org/abraham051602.htm)

It is undisputed that neither fuel storage pools nor dry storage facilities are designed to withstand the type of determined and sophisticated attack that was carried out on September 11, 2001. In fact, the U.S. National Academy of Sciences documented such security vulnerabilities in its

report entitled “Safety and Security of Commercial Spent Nuclear Fuel,” released on April 6, 2005.

To protect against and mitigate the impacts of terrorist attacks, the NRC has developed a system to maintain a constant state of alert, undertaken a comprehensive review of the adequacy of its safety and security regulations, and upgraded its security requirements for all operating nuclear facilities in the United States. Clearly, under NEPA it is also appropriate to consider whether the Commission continues to have a basis for expressing confidence that stored irradiated nuclear fuel and other high-level radioactive waste is safe from terrorist attacks.

Petitioners are aware that the Commission has ruled that environmental impacts of terrorist attacks are not cognizable under NEPA. *See, e.g., Pacific Gas & Electric Co.* (Diablo Canyon Independent Spent Fuel Storage Installation), CLI-03-01, 57 NRC 1 (2003); *Private Fuel Storage, L.L.C.* (Independent Fuel Storage Installation), CLI-02-25, 56 NRC 340 (2002). Petitioners request that the Commission reconsider this policy, in light of (a) the obvious attractiveness and vulnerability of irradiated nuclear fuel to terrorist attack; (b) the Secretary of Energy’s recognition of the relationship between homeland security and assured capacity for timely irradiated nuclear fuel disposal; (c) the Commission’s explicit statement in the Waste Confidence status review that it would undertake a comprehensive reevaluation of the Waste Confidence findings if “significant and pertinent unexpected events” occur raising substantial doubt about the continuing validity of the Waste Confidence findings; and (d) the decision of the 9th Circuit U.S. Court of Appeals. June 2, 2006 ruling by the U.S. Court of Appeals for the Ninth Circuit in San Luis Obispo Mothers for Peace (SLOMFP) v. NRC, 449 F.3d 1016. Clearly, a Commission reconsideration is warranted.

Given that NRC *is* currently reviewing its Nuclear Waste Confidence Decision, and is soliciting public comment before issuing a final decision at some future unspecified date, it is inappropriate for NRC and applicants to rely upon the Nuclear Waste Confidence Decision as a justification for refusing to address the irradiated nuclear fuel dilemma that would be created by the Calvert Cliffs 3 nuclear reactor. Such uncertainties about the irradiated nuclear fuel that would be generated at Calvert Cliffs 3, and the risks it would pose to the Chesapeake Bay environment and the public health of neighboring communities, will persist at least until NRC issues its revised Nuclear Waste Confidence Decision. Petitioners request the right to respond to any such final decision as an essential part of this COLA licensing proceeding.

Contention #7. UniStar Nuclear Operating Service's (UniStar) application to build and operate Calvert Cliffs Nuclear Power Plant Unit 3 violates the National Environmental Policy Act by failing to address the environmental impacts of the waste that it will generate in the absence of licensed disposal facilities or capability to isolate the radioactive waste from the environment. UniStar's environmental report does not address the environmental, environmental justice, health, safety, security or economic consequences that will result from lack of permanent disposal for the radioactive wastes generated.[7]

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[7] Joint Petitioners recognize that this contention raises a challenge to the generic assumptions and conclusions in Table S-3. However, we respectfully submit that the information submitted in this contention constitutes new and significant information, not considered in any previous environmental impact statement ("EIS"), that must be considered in the EIS for the Calvert Cliffs Unit 3 plant because it would have a significant effect on the outcome of UniStar's and the NRC's analyses of the environmental impacts of licensing the proposed plant. *Marsh v. Oregon Natural Resources Council,* 490 U.S. 360 (1989).

As required by NRC regulations, Joint Petitioners intend to submit a rulemaking petition to seek revision of Table S-3. In the meantime, we seek admission of this contention in order to protect our right to ensure that any generic resolution of our concerns is made in a timely way and "plugged in" to the licensing decision in this particular case. *Baltimore Gas and Electric Co. v. Natural Resources Defense Council, Inc.*, 462 U.S. 87, 101 (1983). *See also Commonwealth of Massachusetts v. NRC*, 522 F.3d 115 (1st Cir. 2008). In *Commonwealth of Massachusetts*, the First Circuit found that although the NRC may make generic determinations regarding the significance of environmental impacts and prohibit challenges to those generic determinations in individual proceedings, it nevertheless must "consider any new and significant information regarding environmental impacts before renewing a nuclear power plant's operating license." 511 F.3d at 127. Moreover, while the NRC may "channel" into a generic rulemaking the challenging party's concerns about the effects of new and significant information on an individual licensing decision, the NRC may not refuse to provide "at least one path by which the [challenging party] may establish a connection" between the rulemaking and the licensing proceeding, thereby ensuring that the result of the rulemaking proceeding will be applied in the individual licensing case. *Id*. at 128. In order to ensure that a "connection" is maintained between any rulemaking petition that the Joint Petitioners may bring and the Joint

The issue of long-term radioactive waste management and disposal of Class B, C and Greater than C "low-level" radioactive waste is not adequately addressed in the Calvert Cliffs-3 COLA.

1. The Environmental Report in Section 3.5 simply describes the generation of waste during operations with the expectation of shipment offsite:

> "Solid radioactive wastes are collected and packaged for temporary storage, shipment and offsite disposal."

Section 3.5.4. Solid Radioactive Waste System describes collection, processing and storage but does not address long term storage onsite. Reference is made elsewhere to NRC guidance for extended storage but not potentially permanent or very long term storage.

> "Once the activity has reduced to a low enough level, the drums are transported to an offsite repository for final disposal."

Applicant states that the systems are:

> "designed to minimize releases from reactor operation so values are as low as reasonably achievable (ALARA). These systems are designed and maintained to meet the requirements of 10 CFR 20 and 10 CFR 50 App. I."

These are the routine release levels and the applicant provides no detail regarding the ongoing onsite management and potential impact from permanent or very long term- storage of all the B, C and >C radioactive waste from operations on the site of generation.

Chapter 11 of the FSAR is entitled "Radioactive Waste Management" and states:

> This chapter of the U.S. EPR Final Safety Analysis Report (FSAR) is incorporated by reference with supplements as identified in the following sections.

The U.S. EPR FSAR section 11.4.3 is specifically referenced:

> 11.4.3 RADIOACTIVE EFFLUENT RELEASES

Petitioners' right to seek application of new and significant information to this proceeding, the Joint Petitioners request that this contention be admitted and held in abeyance pending the outcome of the generic proceeding.

> The U.S. EPR FSAR includes the following COL Item in Section 11.4.3:
> A COL applicant that references the U.S. EPR will fully describe, at the functional level, elements of the Process Control Program (PCP). This program description will identify the administrative and operational controls for waste processing process parameters and surveillance requirements which demonstrate that the final waste products meet the requirements of applicable federal, state, and disposal site waste form requirements for burial at a 10 CFR Part 61 licensed low level waste (LLW) disposal site and will be in accordance with the guidance provided in RG 1.21, NUREG-0800, BTP 11-3, ANSI/ANS-55.1-1992 and Generic Letters 80-09, 81-38, and 81-39.

This COL item is addressed as follows:

The {CCNPP Unit 3} PCP describes, at the functional level, elements of the Process Control Program (PCP). The {CCNPP Unit 3} PCP is incorporated by reference and is included in Part 11 of the COL application.

No explanation is offered for how the applicant will meet this plan in the absence of a licensed disposal site.

Applicants apparently assume that they will be able to send its Class B, C, and Greater-Than-Class-C radioactive waste offsite. After June 30, 2008, however, no facility in the United States is licensed and able to accept for disposal, Class B, C or Greater-Than-C radioactive waste from the Calvert Cliffs Unit 3 nuclear power reactors. The applicant fails to offer a viable plan for disposal of Class B, C and Greater-than-C so-called “low-level” radioactive waste generated in the course of operations, closure and post-closure of Calvert Cliffs Unit 3.

The simple fact is that Applicants fails to address how so-called “low-level” radioactive waste from the operation and closure/dismantlement and decommissioning of Calvert Cliffs Unit 3 will be isolated from the environment and permanently disposed of.

There is no disposal site licensed for the Classes B and C or for Greater-than-C radioactive waste that would be generated by operation of Calvert Cliffs Unit 3. The only operating disposal sites that take Classes B and C waste (and possibly >C on a case-by-case

basis) are in Richland WA and Barnwell SC and (after July 1, 2008) neither will accept radioactive waste from outside of the Northwest, Rocky Mountain and Atlantic Compacts.

Processors could change the form of the waste, but the radioactivity will remain, requiring isolation and disposal. Although there are experiments at diluting or down-blending higher concentration wastes to lower concentrations, this is not an accepted routine and has not been analyzed nationally to consider the environmental, health and economic effects of making such a practice routine.

Thus it is reasonable to expect that all Class B, C and Greater-than-C radioactive waste from the proposed Calvert Cliffs Unit 3 nuclear reactor will remain onsite indefinitely. Table S-3 assumes that these wastes will be disposed of at "land burial facilities," however.

The environmental impacts of leaving these wastes onsite must be addressed in order for the US Nuclear Regulatory Commission to comply with NEPA. It is imperative that the safety and security issues of extended onsite storage, de-facto disposal, be addressed prior to generation of the waste because the so-called "low-level" radioactive waste for which there is no disposal available is the hottest, most concentrated [8] waste in the category. The Environmental Report should also evaluate the impacts of licensing the site itself under 10 CFR Part 61 (licensed permanent radioactive waste disposal) or Maryland's compatible agreement state regulations for Class B and C waste. The Environmental Report should also address the fact that Greater-than-C wastes require disposal requirements that are even more protective than Classes B and C in 10 CFR 61 and must be disposed of in a deep geologic repository unless a specific exemption is granted. For on-site disposal of Greater-than-Class C waste to be carried out, it will have to be

[8] GAO report indicates some of this waste can give a lethal dose in 20 minutes if exposed unshielded. GAO-RCED-98-40R Questions on Ward Valley pages 49-52, 1998.

shown that shallow land burial there would be equivalent to the more stringent requirements and protective intent of 10 CFR 61.55.

Onsite long-term storage and disposal could significantly increase the environmental, safety and security risks of the Calvert Cliffs Unit 3 site. Therefore serious consideration must be given to licensing the site itself under 10 CFR Part 61 (licensed permanent radioactive waste disposal) or Maryland's compatible agreement state regulations for Class B and C waste. Greater-than-C wastes require disposal requirements that are even more protective than Classes B and C in 10 CFR 61 and must be disposed of in a deep geologic repository unless a specific exemption is granted. For on-site disposal of Greater-than-Class C waste to be carried out, it will have to be shown that shallow land burial there would be equivalent to the more stringent requirements and protective intent of 10 CFR 61.

Since Applicants might argue that offsite storage and treatment are potential options, it should be noted that radioactive waste sent for offsite storage and processing could be returned to Calvert Cliffs Unit 3, under certain circumstances. This is not addressed in the COL.

The decommissioning planning appears to assume that the process-generated "low-level" radioactive will not be present onsite at time of closure. In Section 1.3.1, the decommissioning cost estimate does not reference the cost of Class B, C and Greater-than-C radioactive waste that may be stored on site at that point. Section 1.3.3 Decommissioning Costs and Funding – Status Reporting provides no recognition of the increased costs that may be associated with disposal of a cumulative total LLRW from operations in addition to the LLRW generated by dismantling the facility. Section 1.3.4 Recordkeeping Plans Related to Decommissioning Funding does not mention record keeping for LLRW in the event that it is retained on-site up to the time of decommissioning.

In 5.9 Decommissioning, there is no consideration of the potential for cumulative total of operations waste (so-called "LLRW") being at the site. [9]

"Decommissioning of a nuclear facility that has reached the end of its useful life has a positive environmental impact. The major environmental impact, regardless of the specific decommissioning option selected, is the commitment of small amounts of land for waste burial in exchange for the potential re-use of the land where the facility is located."

The lack of permanent disposal for so-called "low-level" Class B, C and Greater-Than-C radioactive waste that would be routinely generated from Calvert Cliffs 3, and the failure of the COL application to fully address potentially permanent on-site storage for those long lasting wastes violated environmental and safety and security requirements. There is no justification provided for producing long-lasting, intensely radioactive wastes for which no disposal exists. There is no realistic plan for isolation of the wastes or permanent disposal of the wastes. Considering the long history of failed so-called "low-level" radioactive waste disposal sites in the country, assumptions that new ones will be available are not justified.

Respectfully submitted,

This 19th day of November 2008.
_____/s/_____
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9 http://adamswebsearch2.nrc.gov/idmws/doccontent.dll?library=PU_ADAMS^PBNTAD01&ID=072270226 page 161

CERTIFICATE OF SERVICE

It is my understanding that all on the Calvert Cliffs-3 service list are receiving this motion through the submission I am making on November 19, 2008 via the EIE system.

PETITION TO INTERVENE IN DOCKET NO. 52-016, CALVERT CLIFFS-3 NUCLEAR POWER PLANT COMBINED CONSTRUCTION AND LICENSE APPLICATION

This 19th day of November 2008.

_____/s/_____
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