

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION**

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

_____)
In the Matter of

Docket No. 52-016

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

**DECLARATION OF DIANE D'ARRIGO
IN SUPPORT OF INTERVENORS' OPPOSITION TO MOTION FOR
SUMMARY DISPOSITION OF CONTENTION 7**

Under penalty of perjury, Diane D'Arrigo, do hereby state as follows:

Statement of Qualifications

1. My name is Diane D'Arrigo. I am employed by Nuclear Information and Resource Service as Radioactive Waste Project Director. My business address is 6930 Carroll Ave., Takoma Park, Maryland 20912. I have over 25 years of experience in the technical, policy and economic issues relating to LLRW storage and disposal. I have spoken publicly and published articles on these topics. I have testified as an expert on nuclear waste issues before the NRC. A copy of my *curriculum vitae* is attached.

Purpose of Declaration

2. The purpose of my declaration is to provide factual support for Joint Intervenors' opposition to Unistar's motion for summary disposition of Contention 7 regarding Unistar's inadequate provisions for long term storage of so-called "low-level" radioactive waste (LLRW) at the proposed Calvert Cliffs 3 Nuclear Power Plant.

Materials Reviewed

3. I have reviewed Contention 7 (as amended), Unistar's Motion for Summary Disposition of Contention 7, the relevant portions of Unistar's Final Safety Analysis Report (FSAR), and the relevant portions of the Design Control Document (DCD) for the EPR, the revised ER and additional related documents. I am familiar with NRC

regulations and guidance documents governing the storage and disposal of LLRW. Finally, I am familiar with the technical, legal and policy issues surrounding the operation or proposed operation of LLRW disposal, processing and storage facilities in the United States.

4. Overview

Essentially Unistar has made some very general additions to its ER, referencing industry-developed guidance and agreeing that there is no permanent disposal available for its Class B and C LLRW. Unistar is suggesting some potential options it might consider: more onsite storage capacity and or scenarios to send the waste off for disposal or processing with subsequent storage and disposal. This is an inadequate response to the Contention 7, however, which requires more specific explanation of how Unistar will deal with the long lasting, intensely radioactive Class B and C waste that Calvert Cliffs 3 would generate. The guidance documents and potential options do not reveal what will really happen with the waste during and after the years that Calvert Cliffs would operate. The onsite storage could be needed for more than a year or ten years. There is no commitment to where and how on site it would be stored. It has been 30 years since the passage of Low Level Radioactive Waste Policy Act that was intended to provide new disposal for LLRW. Although Unistar does not specify which 3rd parties to which it might attempt to send its waste, I point out some of the limitations in the existing system that render it unreliable for long term storage of the Class B and C waste from Calvert Cliffs 3. We provide greater detail on these points in the attached declaration of Dr. Makhijani and Ms. D'Arrigo that was submitted for the intervention at the proposed Vogtle 3 and 4 nuclear power reactors.

Operational Status of LLRW Disposal Sites in the United States

5. Currently, there are two operating commercial facilities that dispose of Classes A, B, and C radioactive waste: US Ecology at Hanford, near Richland, Washington; and EnergySolutions in Barnwell, South Carolina. These sites only accept waste from generators located in the Northwest, Rocky Mountain and Atlantic Compacts. EnergySolutions in Clive, Utah, is licensed to dispose of Class A waste and cannot take Class B or C. Waste Control Specialists (WCS), located in Andrews, Texas, has a conditional license to dispose of Class A, B and C waste but has numerous issues to resolve before disposal can begin. It is limited to receipt of waste generated within the Texas-Vermont Compact.

Limitations on the Disposal Capacity of WCS

6. WCS holds a license (License R04100) which permits it to dispose of LLRW generated inside the Texas-Vermont LLRW Disposal Compact. The facility is not authorized to accept LLRW from outside the two states that comprise the Compact. The Texas-Vermont Compact Commission is currently considering whether to adopt rules that could allow the importation of additional LLRW from outside the Compact. Proposed Rule for 31 TAC §§ 675.21-675.23, published at 35 Tex. Reg. 1028 on February 12, 2010.

7. WCS is not currently disposing of commercial LLRW, because License R04100 has several conditions which remain unfulfilled. According to the regulator, the Texas Commission on Environmental Quality (TCEQ), “[c]onstruction may not begin until several preconstruction license conditions are completed and approved by the executive director. Once approved construction is complete, additional conditions of the license must be met prior to commencement of disposal.”¹

8. Several pending lawsuits create uncertainty about if, when and under what terms the WCS facility may open for disposal under License R04100. *See Sierra Club v. Texas Commission on Environmental Quality*, No. D-1-GN-09-000660 (250th Dist. Ct., Travis County, Texas. March 2, 2009); *Sierra Club v. Texas Commission on Environmental Quality*, No. D-1-GN-09-000894 (98th Dist. Ct., Travis County, Texas. March 19, 2009); *Sierra Club v. Texas Commission on Environmental Quality*, No. D-1-GN-09-003492 (200th Dist. Ct., Travis County, Texas. October 9, 2009); *Sierra Club v. Texas Commission on Environmental Quality*, No. D-1-GN-09-004020 (261st Dist. Ct., Travis County, Texas. November 24, 2009). An Andrews County election for the issuance of a bond to build the WCS facility is also under legal challenge. *Pryor vs Dolgener, County Judge of Andrews County*, No. 08-09-00284 CV, on appeal to the Texas 8th Court of Appeals from the 109th Judicial District of Andrews County Texas, Cause No. 17,988.

Limitations on Storage Capacity of WCS

9. WCS also holds a license for the processing and storage of LLRW (License R04971). The License was due to expire 2004, but it is still in effect because of WCS’ timely application for renewal. WCS’ renewal application currently is under review by the TCEQ.

10. If the WCS License R04971 for storage is renewed with the present terms, there are limitations to the quantity of LLRW that can be stored by WCS and the duration for which it can be stored.

11. For instance, paragraph 23.B of the License requires that within 365 days of arrival at WCS, all LLRW must be placed in interim storage or transferred to an authorized recipient.

12. Paragraphs 7A and 7C of the License also limit LLRW storage at WCS to 2,255,000 Curies and other provisions in the license could limit the amount to less than that. Given that WCS is the main or only offsite facility available for storage of Class B and C waste, that radioactivity limit could be exceeded in just a few years (as few as 4) by Class B and C waste that is being generated by facilities without access to disposal. The capacity could be exceeded well before Calvert Cliffs 3 begins operation, especially

¹ From TCEQ website: Waste Control Specialists LLC License Application for Low-Level Radioactive Waste Disposal, Current Status of this Application
http://www.tceq.state.tx.us/permitting/radmat/licensing/wcs_license_app.html#wcs_status

if nuclear reactors in the U.S. continue to generate Class B and C LLRW and ship offsite. This will be exacerbated when decommissioning of older reactors takes place

Please see the attached declaration of Dr Makhijani and Ms D'Arrigo for the proposed Vogtle 3 and 4 nuclear power reactors for detailed estimates of the potential amounts of radioactivity that could compete for storage. We looked at waste received at operating disposal facilities from generators in states that do not have access to the operating disposal sites to get an estimate of the amount of radioactive waste that would need to be stored either at the sites of generation or at a centralized storage facility.

Limitations on the Storage Capacity of Studsvik

13. Studsvik is a nuclear materials processor holding Material License R-86011-E17 for the processing of LLRW in Erwin, Tennessee. This Studsvik Radioactive Material License contains limits on the quantity of LLRW that can be stored and the duration of storage. Although Studsvik could take title to the radioactive material it processes, it retains the right to physically send it back to the generator.

14. Paragraph 17 of the License limits the duration of the storage period to 365 days. Paragraph 24 requires that Studsvik “establish in every contractual obligation relating to radioactive materials the ability to return the radioactive materials, processed or unprocessed, to the prior licensed or exempt processor.” In addition, for generators in states that are not in the Southeast Compact and Maryland is not, written approval is required by the generator, the Governor of the State and the compact commission permitting the radioactive material to be returned. (Paragraph 23)

Delays and Limitations on LLRW Disposal Capacity

15. Currently, there is no LLRW disposal facility that can accept Class B and C radioactive waste from Calvert Cliffs 3. WCS disposal is not an option because it is not operating and it may not accept LLRW from outside the Texas-Vermont Compact.

16. Even if WCS begins disposing of LLRW and even if it receives permission to accept LLRW from outside the Texas-Vermont Compact, it cannot be relied on for disposal of LLRW beyond the immediate future due to its limited capacity.

17. The licensed capacity of the WCS facility is 2.31 million cubic feet and 3.89 million curies of LLRW. The Compact States (Texas and Vermont) have estimated their combined need for LLRW disposal under the Compact at 6 million cubic feet: 5 million for Texas and one million for Vermont. Adopted Rules, 34 Tex. Reg. 6341 (September 11, 2009); Vermont Health and Safety Code Chapter 403, Sec. 3.04 (11).²

² The Vermont Code states: “The shipments of low-level radioactive waste from all non-host party states shall not exceed 20 percent of the volume estimated to be disposed of by the host state during the 50-years period.” The Proposed Volume Rule states: “Vermont indicated that its needs would probably meet or exceed 1,000,000 cubic feet of capacity based on observed experiences during decommissioning of the Maine Yankee generating facility. There are similar decommissioning requirements in Vermont that indicate the

18. The total needed storage capacity of 6,000,000 cubic feet, as estimated by the Compact States, exceeds currently licensed capacity under the Compact. Therefore, the WCS facility does not have the capacity to dispose of LLRW generated at Calvert Cliffs 3 Nuclear Power Plant.

19. In addition, there are further concerns with the volume of additional waste that could be diverted to WCS if it is opened to non-compact states. Waste from non-compact states could potentially fill WCS in a year: 8.76 million cubic feet of commercial low-level waste containing 2.23 million curies were disposed of in the United States between January 1, 2006 and December 31, 2008.³ Therefore, an average of 2.9 million cubic feet and 0.74 million curies were disposed of annually during this period. Most of this waste comes from states without an in-compact disposal facility.

20. Because of the longevity of the radioactivity of LLRW and the history of problems at closed LLRW disposal sites, new facilities have been and will continue to be extremely difficult, time-consuming, and expensive. Since the 1980 passage of the Low Level Radioactive Waste Policy Act passed, there have been dozens of siting efforts that have yielded no new full service facilities. According to a 1999 GAO Report: “[s]tates acting alone or within Compacts of two or more, have collectively spent \$600 million over the last 18 years attempting to find and develop about 10 sites for disposing of commercially generated low-level radioactive wastes.” Yet, states’ efforts to license new facilities “have come to a standstill.” GAO/RCED-99-238 *Low-Level Radioactive Wastes: States Are Not Developing Disposal Facilities*, page 26.

21. Regarding onsite storage, long-term, quasi-permanent onsite storage typically requires that the LLW drums/canisters be placed inside some structure to assure compliance with regulations requiring all potentially radioactive effluents from a site to be controlled and monitored. The proposed storage location is not identified on the site, nor are specific procedures and calculations to assure protection from environmental threats like earthquakes, floods, hurricanes, tornadoes and others. Planning for management this portion of the source term is needed to demonstrate prevention of leakage and breaching and ability to both monitor and control of the radioactive material the containers.

Conclusion

UniStar states that solid wastes will be shipped for disposal and is not providing detailed plans for long term storage at the site. Since there are no disposal sites available for Class B and C radioactive wastes from generators in Maryland and the Appalachian Compact, and creating new sites has been unsuccessful, this is an unrealistic scenario. UniStar cannot count on being able to enter an agreement with the Texas Compact to dispose at the Waste Control Specialists Site in Texas. There are unresolved technical, economic

volume could be similar to that generated in the Maine decommissioning process.” 34 Tex. Reg. 4279.

and legal matters impeding the ability of WCS to begin construction of the disposal facility and implementation of disposal. There are quantity limits impeding the amount of waste that can be stored and disposed at the facility. UniStar cannot rely on processors to take the waste away. Storage capacity is limited and processors could return the waste.

UniStar's proposed potential actions to reduce the creation of wet Class B and C waste would not reduce the radioactivity generated but would disperse it differently. The radioactivity would still need disposal or long term storage.

I declare that the foregoing facts are true and correct to the best of my knowledge and that the statements of opinion are based on my best professional judgment.

A handwritten signature in blue ink that reads "Diane D'Arrigo". The signature is written in a cursive style with a large, looping initial "D".

Diane D'Arrigo

March 4, 2010

Date

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1988- Present RADIOACTIVE WASTE PROJECT DIRECTOR, Nuclear Information and Resource Service, Washington, D.C.

1986-1988 REGULATORY OVERSIGHT COORDINATOR, Nuclear Information and Resource Service, Washington, D.C.

Track, analyze and report on federal agencies' and Congressional policies, rulemaking and proposals regarding radioactive waste, radiation and nuclear energy issues. Coordinate national and support local initiatives and responses regarding radioactive waste. Publicize federal and international programs that increase public risk and exposure to radioactive waste and radioactivity.

Provide information and assistance to concerned community groups and individuals, local and state officials involved in siting of disposal facilities for nuclear waste including so-called "low-level" radioactive waste.

Track national, international and state efforts to deregulate/prevent deregulation of radioactive waste to destinations not controlled for radioactivity. Track reactor specific rule changes, amendments, rulemaking.

1985-1986 ANALYTICAL CHEMIST, Ecology and Environment, Cheektowaga, NY

1984-1985 CHEMICAL RESEARCH ASSISTANT, Great Lakes Laboratory, Buffalo, NY
Chemical research on toxic and carcinogenic compounds.

1982-1984 RESEARCH ASSOCIATE, Sierra Club Radioactive Waste Campaign, Buffalo, NY
Prepared and presented scientific testimony before federal, state, county and local legislatures and agencies. Commented on proposed rules. Researched, wrote and edited educational materials including fact sheets, brochures, slide shows, and research papers for the public on complicated technical issues. Conducted community outreach programs. Organized regional and local workshops.

1981-1982 CHEMIST, FMC, Inc. Research and Development, Middleport, NY
Research, analysis and synthesis of chemicals to be tested for biological activity. Regularly used IR, NMR, UV, TLC, HPLC and GC for identification and quantification.

1980 COMMUNITY ORGANIZER, Citizens Alliance, Massapequa Park, NY
Trained community residents in building and maintaining an active chapter of the statewide Citizens Alliance, focussing on energy, toxics and housing issues.

1979-1980 FIELD SUPERVISOR, CANVASSER, New York Public Interest Research Group, Buffalo, NY

EDUCATION AND SPECIAL STUDY

- 1978 B.S. Chemistry, Course Concentration in Environmental Studies. William Smith College,
Geneva, NY
- 1981 Environmental Law Course, University of NY at Buffalo.