

**STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

In The Matter Of:

MAINE YANKEE ATOMIC POWER COMPANY)
Lincoln County, Wiscasset, Maine)
)
APPLICATION FOR PROPERTY TAX)
EXEMPTION CERTIFICATION RE:)
INDEPENDENT SPENT FUEL STORAGE)
INSTALLATION)
A-82-75-O-X)

PRELIMINARY AFFIDAVIT OF DAVID A. SCHLISSEL

David A. Schlissel, being duly sworn, deposes and says as follows:

1. My name is David A. Schlissel. I am a Senior Consultant at Synapse Energy Economics, Inc., a national firm that provides consulting services on energy and environmental issues including nuclear power industry matters. I have undergraduate and advanced engineering degrees from the Massachusetts Institute of Technology and Stanford University, including graduate studies in nuclear engineering, and a law degree from Stanford Law School. Over my thirty-year career I have provided consultant assistance on a wide range of energy issues, in significant part on management and engineering in the nuclear power industry. **My resume is attached as Exhibit A to this affidavit.**

2. This affidavit is filed at the request of the Town of Wiscasset and is intended merely to identify those areas within which I expect to provide additional, detailed information that has not previously been presented to the Board of Environmental Protection or that contradicts information previously provided by Maine Yankee. I am available to provide live testimony and/or additional material by affidavit during the direct review of the substance of Maine Yankee's application. My testimony will

be directed to the nuclear engineering aspects of the storage of irradiated nuclear fuel and the purpose served by using a dry cask storage system.

3. I have reviewed the application material submitted by Maine Yankee in this pending application for certification of their Independent Spent Fuel Storage Installation ("ISFSI") as an air pollution control facility. In particular, I have focused my attention on the affidavit of Mr. Brian C. Haagensen that is found at pages 218 - 233 of the 2001 packet of material previously reviewed by the Board and that was attached by Maine Yankee to the current application ("2001 Board Packet").

4. As the Board correctly determined in its 2001 findings of fact, radiation is not a listed air pollutant. However, it is the danger from exposure to direct radiation from the fuel rods that is the most significant threat to be minimized in the safe storage of the irradiated nuclear fuel. In addition, control of the heat created by the irradiated fuel is critical to preventing deterioration of the containment structure and preventing the fuel rods from attaining nuclear criticality. Containing this direct radiation in both normal and off-normal conditions and preventing the fuel rods from attaining nuclear criticality due to increased heat requires the redundancy in containment structures and their extensive and substantial construction.

5. The emission of particulate and gaseous radionuclides from the fuel rods (and the subsequent potential for exposure to radiation from the radionuclides) is primarily controlled by the cladding surrounding the fuel rods. Although radionuclides may also exist on the cladding and fuel assembly structures, they do not, by themselves, justify the extensive and redundant construction of the dry cask storage system.

6. The robust and redundant barrier system provided by the air tight steel canisters ("TSCs") and concrete overpack ("VCC's") of a dry cask ISFSI is designed to withstand deterioration from heat while controlling the emission and dispersion of *radiation* from the irradiated fuel rods. The robust construction would not be necessary

merely to prevent the emission of radionuclides themselves into the air. Containment of the radionuclides could be accomplished with a much less substantial containment structure sufficient to contain gaseous and particulate matter.

7. A spent fuel pool performs the same heat control and direct radiation containment functions as does a dry cask storage system. The only functions that a dry cask storage system performs significantly better than a spent fuel pool storage system are (1) lower cost of operation; (2) improved security by the limitation of access to the irradiated fuel rods by unauthorized persons; and (3) ease of transition for transport off-site. A dry cask storage system also facilitates the ultimate decommissioning and dismantlement of a retired nuclear power plant like Maine Yankee.

8. The absence of any mention of radionuclide containment in the NRC regulations prescribing minimum standards for storage systems for irradiated nuclear fuel demonstrates that effective radionuclide containment is not conceived as the primary challenge posed by storage of irradiated nuclear fuel and wastes.

9. The NRC regulations as provided by Maine Yankee during the 2001 proceeding cannot be properly characterized as being addressed to the containment of radionuclides at all, but are directed toward the containment of radiation and dissipation of radiation heat. I have attached 10 C.F.R. § 72.236 ("Specific requirements for spent fuel storage cask approval and fabrication") as **EXHIBIT B** to this affidavit.

10. In addition to the regulations previously identified by Maine Yankee, I have also attached 10 C.F.R. § 72.122 ("Overall requirements"); 10 C.F.R. § 72.124 ("Criteria for nuclear criticality safety"); 10 C.F.R. § 72.126 ("Criteria for radiological protection") and 10 C.F.R. § 72.128 ("Criteria for spent fuel, high-level radioactive waste, reactor-related Greater than Class C waste, and other radioactive waste storage and handling.") These are attached together as **EXHIBIT C** to this affidavit. These regulations describe several aspects of the NRC's

requirements for the storage of high level nuclear waste - whether in a spent fuel pool or in a dry cask storage system.

11. As review of these regulations will demonstrate, the storage of spent nuclear fuel is subject to several requirements, of which radiological protection is only one. For example, the spent nuclear fuel must be protected against natural phenomena and accident conditions such as fires and explosions (§72.122(b) and (c)); it must be independent of other systems to avoid a sharing of safety failures (§72.122(d)); it must ensure that the cladding is protected against degradation (§72.122(h)); it must be retrievable for later transport and disposal (§72.122(l)); it must protect against the fuel reaching nuclear criticality (§72.124); it must remove heat (§72.128(a)(4)); and it also must protect against direct radiation exposure and airborne release of radioactive material (§72.126). By reviewing the full breadth of the NRC's regulatory framework regarding the storage of irradiated nuclear fuel, Mr. Haagensen's bare conclusion that containment of radionuclides is the primary function of the ISFSI is not supportable.

12. Vendors for dry cask systems have failed to identify and market air pollution control as a benefit of any of their casks. Specifically, the website for NAC International - the vendor of the dry cask storage system utilized by Maine Yankee - makes absolutely no mention of radionuclide containment or air pollution control in its descriptions of the functions and benefits of its own product. I have attached as **EXHIBIT D** to this affidavit pages from the NAC International website that describe the system employed by Maine Yankee. The benefits of the system as touted by its own designers include the ease of transportability, thermal efficiency, criticality safety achievement, and structural soundness.

13. As a matter of engineering, the primary characteristics of all irradiated nuclear fuel and high level nuclear waste storage systems are the containment of direct radiation, the containment and dissipation of radiation heat, and the protection of the irradiated fuel and waste from dispersion through natural disaster or human agency. All systems also minimize the escape of radionuclides. However, in terms of perceived danger and importance, design and construction of the storage systems, and the requirements of the licensing authorities and the priorities of the vendors, prevention of radionuclide emissions is not the primary purpose of the ISFSI facility.

DATED: December __, 2003

David A. Schlissel

COMMONWEALTH OF MASSACHUSETTS

December __, 2003

PERSONALLY APPEARED the above-named David A. Schlissel and made oath that the foregoing statements made by him are true.

Before me,

Notary Public