

MAINE STATE LEGISLATURE

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MAINE
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**REPORT OF THE
STATE NUCLEAR SAFETY ADVISOR**

submitted to the

116th MAINE LEGISLATURE

April 16, 1993

State Nuclear Safety Advisor
Executive Department
Maine State Planning Office

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(25 MRSA, sec 10)	

INTRODUCTION

This is presented in compliance with the reporting requirements (25 MRSA, sec. 52) directing the State Nuclear Safety Advisor to submit an annual report on issues pertaining to the safe operation of nuclear facilities, and the safe transportation and storage of nuclear waste.

The State Nuclear Safety Advisor position was established in legislation that created a State Nuclear Safety Inspection and Monitoring Program for Commercial Nuclear Power Facilities in the State of Maine. Signed by Governor John R. McKernan, Jr. on June 29, 1987, the statute addressed the concerns of the potential impact nuclear facilities can have to public health and safety, and the environment. The overall responsibility of the Nuclear Safety Advisor is to provide the Governor and Legislature with information, analyses, and recommendations on issues pertaining to the safe operation of nuclear facilities and the safe transportation and storage of nuclear waste. More specifically, the Nuclear Safety Advisor provides State oversight of policy issues affecting nuclear power generation, including spent fuel storage, low-level waste, reactor decommissioning, radiation monitoring, and public health and safety. The Nuclear Safety Advisor serves as the State liaison to nuclear facilities operating in Maine, and coordinates State agencies on nuclear power related issues. (The statute establishing the Nuclear Safety Advisor position is provided as Attachment I.)

This report summarizes the major activities and issues undertaken by the Nuclear Safety Advisor for the year of 1992 to the first quarter of 1993. The majority of the Nuclear Safety Advisor activities center upon the operations at the Maine Yankee Atomic Power Station located in Wiscasset. Occasionally, the Nuclear Safety Advisor provides information, analysis, or state agency coordination on other nuclear safety issues within the State of Maine. The Nuclear Safety Advisor activities discussed in this report are:

- An analysis of the expected low-level radioactive waste from the decommissioning of the Maine Yankee Atomic Power Station.
- Refinement and update of the annual generation of low-level radioactive waste in Maine.
- Final report of the Radiation Monitoring Issues Committee, chaired by the State Nuclear Safety Advisor.
- State oversight of Maine Yankee's proposed plan to re-rack their nuclear spent fuel pool.
- Assistance to the Maine Department of Environmental Protection on radiological issues pertaining to the environmental restoration of the Loring Air Force Base.
- Other Activities
 - Monitoring of U.S. Nuclear Regulatory Commission rule making and research on nuclear power plant aging concerns and license renewal.
 - Technical assistance to the Maine Low-Level Radioactive Waste Authority on radiological issues.
- Work tasks for 1993-1994

Maine Yankee Decommissioning Radioactive Wastes

During 1992, the State Nuclear Safety Advisor completed a study of the expected low-level radioactive waste (LLRW) from the decommissioning of the Maine Yankee Station by report entitled "A Study of Radioactive Wastes". This report, released in May 1992, provides needed information on the types and quantities of LLRW that can be expected from the decommissioning of the Maine Yankee plant in 2008. The report also provides an estimate of the total LLRW generation in Maine for a thirty year period, and the radiological decay of the isotopes over a period of 500 years. The information in this report will provide the radioactive source term data for future performance modeling of a proposed facility design by the Maine Low-Level Radioactive Waste Authority (Authority), and is presently being used by the Texas Radioactive Waste Authority to perform initial modeling of the proposed Texas disposal facility.

The Nuclear Safety Advisor conducted the extensive study at the request of the Authority and to assure Maine has an adequate understanding of the significant volume and character of the LLRW that would be produced from the prompt dismantlement and removal of the Maine Yankee Station upon the expiration of its operating license in 2008. As decommissioning experience and information become more available, the Nuclear Safety Advisor will periodically revise the estimates from the study, and provide assessments and recommendations to assure all decommissioning safety issues are adequately and promptly addressed.

A copy of this report can be obtained from the Maine Low Level Radioactive Waste Authority, or from the Maine State Planning Office.

Radiation Monitoring Issues Committee

The Nuclear Safety Advisor completed and released a report to the Joint Standing Committee on Human Resources from the Radiation Monitoring Issues Committee (Committee) on April 14, 1993. The Committee, chaired by the Nuclear Safety Advisor, was charged with evaluating the existing State surveillance and monitoring of radioactive emissions from the Maine Yankee Atomic Power Station, per Maine P.L. 1991, Chapter 496, (22 M.R.S.A., Sec. 5).

The Committee was composed of five members, and consisted of one representative of the general public from the community surrounding the Maine Yankee Station, one representative from the scientific or medical community having knowledge of the effects of radiation on public health, the State Nuclear Safety Inspector, one representative from the Maine Yankee Station, and the State Nuclear Safety Advisor. The State Nuclear Safety Advisor served as chair of the Committee, and selected all the Committee members with the exception of the State Nuclear Safety Inspector. (The State Nuclear Safety Inspector and Advisor were specifically designated as members of the Committee by statute.)

The question posed to the Committee for this study was whether the current monitoring activities are adequate such that the State of Maine can speak confidently to the issue of public health and the environment with regards to the impact from environmental radiation releases from the Maine Yankee Station. To assess the state monitoring activities, the Committee researched the following areas:

- Overview of State and Federal regulations on the radioactive effluent releases from Maine Yankee.
- Review of radioactive effluent generation, release points, and in-plant detection instrumentation at Maine Yankee.
- Review of State, U.S. Nuclear Regulatory Commission, and Maine Yankee environmental radiation surveillance programs.
- Review and assessment of the primary stack monitor operation at Maine Yankee versus the SAIC system used by the State of Illinois to monitor radioactive gaseous effluent from nuclear power plants.
- Review of meteorological information acquired by Maine Yankee, and methodology of off-site dose calculations from gaseous releases.
- In-depth investigation of the capabilities and effectiveness of the 17 State of Maine operated remote environmental radiation monitors (ERM-2 system) encircling the outer perimeter of the Maine Yankee Station.

Overall, the Committee found that the State has access to important information from the Maine Yankee in-plant instrumentation and from existing environmental radiation surveillance programs to assess the public health from Maine Yankee's routine operational radioactive releases. However, the Committee did find areas for improvement and made several recommendations. The five recommendations are noted below:

- 1) The State, through the State Nuclear Safety Inspector, should increase its efforts to monitor the calibration, maintenance, and procedures of the Maine Yankee primary vent stack (PVS) monitors to assure that the data acquired is accurate.
- 2) With regards to the Maine Yankee primary vent stack monitor system, if the frequency of down time increases in the future, or the State finds that the daily "grab sample" is not a reliable representation of the daily PVS effluent, the Committee recommends that Maine Yankee acquire a back-up low range PVS monitor for the measurement of radioactive noble gases. The determination of a need for a PVS back-up system should be accomplished through the State Nuclear Safety Advisor and State Nuclear Safety Inspector.
- 3) The Committee recommends that the State's environmental radiation exposures and sample analyses be compiled in an annual report similar to that prepared by Yankee Atomic Laboratory for the Maine Yankee Station. This would aid in the interpretation of the results, and possibly identify areas where further measurements or samples should be acquired. The State Nuclear Safety Advisor and the Division of Health Engineering should jointly compile and produce an annual State of Maine Environmental Radiation Surveillance Report for the Maine Yankee Station.
- 4) The Committee recommends that the ERM-2 system be maintained in its present configuration of 17 pole mounted monitors, with no modifications. Maintenance of the

system can include the replacement of a component of higher quality or performance than the original only if the cost is comparable to the original replacement.

The system's usefulness for monitoring non-emergency releases could be marginally improved by better identifying the uncertainties in the system's response. Although the State Nuclear Safety Inspector has already taken the initiative on this matter, the Committee recommends that the State Nuclear Safety Advisor design a plan in consultation with the State Nuclear Safety Inspector to improve the quality of the data that can be acquired from the existing system. The plan is to include procedures and methods to quantify the uncertainties in the data, and to improve the calibration of the ERM-2 monitors. Maine Yankee has agreed by letter dated April 5, 1993 to provide funds not to exceed a total of \$25,000 to fulfill this item. This item will be completed by December 31, 1993.

- 5) The State Nuclear Safety Advisor should continue to identify and review developments in the monitoring of radioactive effluents from nuclear power plants, and provide the State Legislature and Governor with analyses and recommendations as progress occurs.

The report entitled "State of Maine Monitoring of Radioactive Effluent from the Maine Yankee Atomic Power Station", dated March, 1993 is available from the Maine State Planning Office.

Maine Yankee's Intentions to Rerack Spent Fuel Pool

Maine Yankee, as well as all other U.S. nuclear power plants, currently store spent fuel on-site. Spent fuel is considered high-level radioactive waste and is the responsibility of the U.S. Department of Energy (DOE) for disposal. Currently the DOE is characterizing the Yucca Mountain Site in Nevada as a repository for the nations high-level waste, but anticipates operation no earlier than 2010. This delay in DOE acceptance of the fuel has caused Maine Yankee and many other nuclear power plants in the nation to consider ways to expand its on-site storage capacity of spent fuel.

For the past several years, Maine Yankee has been investigating its options for expanding on-site spent fuel storage. Since the beginning of Maine Yankee's operation in 1972, the spent nuclear fuel removed from the reactor (about 72 assemblies every three years) has been stored on-site in a specially designed pool filled with borated water to cool the spent fuel and provide shielding from the radiation emitted. By 1996, the pool is expected to be full, having only sufficient capacity to accommodate the removal of all fuel from the reactor, if necessary. Without additional storage capacity, Maine Yankee cannot continue to operate beyond 1996.

On October 5, 1992, Maine Yankee announced to the State that although they are continuing to review all viable options to expand their spent fuel storage capacity, a decision was made to proceed with a reracking license amendment application to the Nuclear Regulatory Commission (NRC). The reracking of nuclear fuel will involve placing the existing spent fuel in specially designed storage racks that will reduce the distance between spent fuel assemblies, and thus enable more spent fuel to be stored in the existing pool on-site. Some of Maine

Yankee's reasoning for choosing this option is that it does not require any new technology, and has considerable industrial experience and record. Also, Maine Yankee has successfully reracked its spent fuel before in 1975 and 1984, and has experience in this field of spent fuel storage and expansion.

Maine Yankee first presented their reracking plan to the NRC on October 15, 1992, followed by a request for a license amendment to the NRC on January 25, 1993. The license amendment request is to allow Maine Yankee to increase the number of spent fuel assemblies from 1476 to 2019 to be stored in the Maine Yankee Spent Fuel Pool. This will accommodate sufficient capacity through the duration of Maine Yankee's operating license (2008).

The NRC is expected to perform a comprehensive safety review of Maine Yankee's application. Because this type of reracking has been approved by the NRC for other nuclear power plants under similar circumstances, it is likely that Maine Yankee will adequately address all of the NRC's safety concerns, and the application will be approved. The State will review several portions of the application where it has capabilities, such as radiological safety. However, the State does not have expertise in all the disciplines required for a comprehensive review, nor does it have the man power and will have to rely on the NRC's credibility in those areas.

The Nuclear Safety Advisor is currently coordinating the review of Maine Yankee's Spent Fuel Reracking proposal with the pertinent State agencies.

Other Activities

Nuclear Power Plant Aging and License Renewal

As nuclear power plants in the U.S. age, an understanding of the age-related degradation on the safety of operating nuclear power plants is needed. The Nuclear Regulatory Commission has been active for some time in examining aging issues, and is increasing its efforts in order to address the concerns of nuclear power plant license renewal. (The NRC has developed rules to extend a nuclear power plant's license by a maximum of 20 years.) The Nuclear Safety Advisor participated in a NRC workshop on Nuclear Power Plant License Renewal to provide comments on concerns of license extension, and also attended an NRC Conference on Nuclear Power Plant Aging Research Information. This is a continuing effort by the Nuclear Safety Advisor to stay abreast of any aging concerns or issues that can have an impact upon the safe operation of the Maine Yankee Station.

Technical Assistance to the Maine Low-Level Radioactive Waste Authority

The United States Low-Level Radioactive Waste Policy Amendments Act of 1985 transferred the responsibility for disposal of low level radioactive waste (LLRW) from the Federal Government to the States. In complying with the Federal Law, the State of Maine established the Low Level Radioactive Waste Authority (Authority) to site, construct, and operate a LLRW disposal facility. In consideration that the majority of the LLRW generated in Maine is from the Maine Yankee Station, the Nuclear Safety Advisor has provided technical assistance on radiological issues to the Authority, as requested.

Loring Air Force Base Environmental Restoration

The Maine Department of Environmental Protection (DEP) is currently engaged in overseeing the clean-up of the Loring Air Force Base (Base) in Limestone. The Base is a U.S. Environmental Protection Superfund site with areas contaminated with chemical wastes and pesticides, and a small fraction contaminated with buried low-level radioactive wastes. The Nuclear Safety Advisor is assisting the DEP Project Manager in the review of the radiological aspects of the Base restoration. Assistance to the DEP has included review of radiological Health and Safety Plans, Operational Work Plans, and coordination of the DEP with the University of Maine Environmental Radiation Laboratory to conduct a radiological characterization of potentially contaminated areas at the Base. The Nuclear Safety Advisor will continue to review and participate in this effort. (Though this is not a mandate of the Nuclear Safety Advisor, work is provided "in kind" within the Maine State Planning Office.)

1993-1994 Work Tasks

The 1993-1994 work tasks for the Nuclear Safety Advisor include the following:

- Produce the annual "State of Maine Nuclear Safety Report-1993". This report is a comprehensive assessment of the Maine Yankee Station with respect to its operational record, performance, and nuclear safety. It is expected this report will be completed and distributed to the Governor and the Legislature by mid June 1993.
- Develop a plan to improve the quality of data acquired from the State operated Environmental Radiation Monitors located about the perimeter of the Maine Yankee Station. Development and implementation of the plan will be completed by December 1993. This task is a result of a recommendation by the Radiation Monitoring Issues Committee.
- Produce an annual State of Maine Environmental Radiation Surveillance Report for the Maine Station. This task is a recommendation by the Radiation Monitoring Issues Committee. The completion date for this task is expected in March 1994.
- Coordinate review of Maine Yankee's proposal to rerack the spent fuel pool.
- Continue researching nuclear power plant aging concerns and assess how they apply to the Maine Yankee Station.
- Continue to evaluate activities and events at the Maine Yankee Station, and discuss the same with the State Inspector.
- Address rule making and policy development by the Nuclear Regulatory Commission as it pertains to the operation of a nuclear power plant in Maine.

Attachment I

25 § 50

INTERNAL SECURITY & PUBLIC SAFETY

Title 25

Library References

Health and Environment ⇌25.5.
C.J.S. Health and Environment § 61 et seq.

WESTLAW Electronic Research

See WESTLAW Electronic Research Guide following the Preface.

§ 51. Agreements

The Governor, the Department of Human Services and other state agencies designated in Title 22, section 676, in consultation with the State Nuclear Safety Advisor, in fulfillment of his duties pursuant to section 52, shall have authority to enter into agreements, understandings or arrangements with any other department or agency of this State, any federal agency, state, political subdivision or person to provide for mutual aid plans, emergency plans, evacuation plans and their implementation, memoranda of understanding and any other agreements deemed necessary to protect public and property in this State from hazards or dangers from radiation, radioactive materials, nuclear materials or the occurrence of a radiological incident as a result of the presence of, release of or emissions from radioactive materials, radioactivity or nuclear materials in this State. The hazards or dangers referred to in this section shall be only those arising from the peaceful use, transportation or storage of nuclear or atomic materials.

1971, c. 423, § 2, eff. June 9, 1971; 1971, c. 592, § 37; 1987, c. 519, § 9, eff. June 29, 1987.

Historical Note

Laws 1971, c. 592, substituted "Bureau of State Police" for "Department of the State Police".

Laws 1987, c. 519, in the first sentence, substituted "Department of Human Services and other state agencies designated in Title 22, section 676, in consultation with the State Nuclear Safety

Advisor, in fulfillment of his duties pursuant to section 52," for "Department of Health and Welfare and the Bureau of State Police, or any person, department or agency designated by the Governor" and inserted ", memoranda of understanding", and in the second sentence, inserted ", transportation or storage".

Cross References

Nuclear safety, state program, see title 22, § 661 et seq.

Library References

Health and Environment ⇌25.5.
C.J.S. Health and Environment § 61 et seq.

§ 52. State Nuclear Safety Advisor

1. **State Nuclear Safety Advisor position established.** There is established within the State Planning Office a State Nuclear Safety Advisor position, which shall be an unclassified, confidential position. The State Nuclear Safety Advisor shall be an individual knowledgeable in the field of nuclear power production.

2. **Duties.** The State Nuclear Safety Advisor shall have the following duties:

A. To advise the Governor and the Legislature on issues pertaining to the safe operation of nuclear facilities and the safe transportation and storage of nuclear waste;

Attachment I (continued)

RADIATION

25 § 52

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B. To consult with other agencies of State Government or Federal Government whose activities pertain to the issues in paragraph A;

C. To review and evaluate and to advise the Governor and the Legislature on activities conducted by other states to inspect and monitor the safe operation of nuclear facilities and the safe transportation and storage of nuclear waste; and

D. To prepare a report of his activities under this section to be submitted January 15th of each year to the Governor and the Legislature.

For purposes of this section, "commercial nuclear power facility" or "facility" means a utilization facility situated in this State which holds an operating permit or license issued by the United States Nuclear Regulatory Commission.

3. Fees. In addition to the fee provided in Title 22, section 664, each nuclear power plant licensee whose operations are monitored under this chapter shall pay a fee to the permanent fund established in section 680, subsection 7. The amount of the fee for each licensee shall be calculated by multiplying the total allocation to the State Planning Office for the fiscal year from the fund established in section 680, subsection 7, for the full cost of the State Nuclear Safety Advisor, including the cost to the State for personnel and fringe benefits, by the licensee's proportion of the total electric generating capacity of all licensees subject to this chapter.

1987, c. 519, § 10, eff. June 29, 1987.