June 5, 2001

Mr. James O. Horrigan
The Seacoast Anti-Pollution League
P.O. Box 1136
Portsmouth, NH 03802

Dear Mr. Horrigan:

I am responding to your letter dated May 9, 2001, to Chairman Richard A. Meserve of the U.S. Nuclear Regulatory Commission (NRC) in which you expressed concerns regarding: (1) the failure of the Seabrook plant to either reduce power or shut down in anticipation of a winter storm that occurred on March 5, 2001; (2) the failure of the steam-driven emergency feedwater pump at the onset of the plant shutdown; (3) the use of the atmospheric dump valves to remove decay heat following shutdown; and (4) the alert and notification system. The NRC Region I office sent a Special Inspection Team to Seabrook on March 12, 2001, to evaluate this event. The team's report was published on May 7, 2001. A copy of the report is enclosed. The report is also available from the Publicly Available Records (PARS) component of NRC's document system (ADAMS), at accession number ML011270420. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

The NRC thoroughly evaluates and analyzes nuclear power plants in the United States prior to granting an operating license. One element of the staff's review is to assess the capability of a power plant to withstand natural phenomena such as seismic events, hurricanes, and other potentially serious external events associated with the physical location of the plant. Seabrook is designed to operate safely under conditions more severe than those encountered during the March event. The licensee for Seabrook monitored the severe weather forecast for March 5, 2001, and concluded that there was no need to shut down the reactor. However, as a precautionary measure the licensee prepared for storm conditions, deferring work activities that could have removed important equipment from service, sending non-essential staff home, and stationing essential staff, including emergency responders, near the site so that they would be able to staff the emergency response organization if needed. As a result of the unexpected degrading conditions of the transmission lines during the storm, the plant operators initiated a power reduction. The automatic shutdown occurred about 9 minutes after the initiation of the power reduction, when another transmission line experienced flashover (arcing) and the connecting circuit breakers opened. That line was carrying the electrical output from the main generator. Due to the sudden loss of load on the main generator, an automatic reactor shutdown occurred, as designed. During this event, there was always at least one transmission line providing power to the plant switching station.

In your letter you expressed concern over the failure of the steam driven emergency feedwater (EFW) pump. Seabrook has two pumps for EFW, each of which is capable of supplying sufficient water to the steam generators for decay heat removal. One pump is motor-driven, powered by the B vital bus, with emergency power available from the B emergency diesel generator (EDG). The second EFW pump is driven by a steam turbine with control power from the station vital batteries. The plant is designed to maintain plant safety assuming a single failure of any safety-related component. Although the turbine driven EFW pump failed to

actuate as designed, the motor-driven EFW pump actuated, powered from the B EDG, and supplied sufficient water to the steam generators to remove the decay heat from the reactor during the March 5, 2001, event. The plant's ability to achieve safe plant shutdown validated the design, thus the loss of the turbine driven EFW pump had little safety significance for this event. However, the NRC has issued a non-cited violation to the licensee related to the failure to properly maintain this safety-related pump, which is discussed in Section 4.2 of the enclosed inspection report.

The turbine driven EFW pump tripped shortly after it automatically started on March 5. The licensee determined that the pump tripped due to overspeed. The cause of the overspeed was attributed to the rubbing of components in the pump seal and impeller. Inlet steam pressure increased in response to the impeller slowing down. Subsequently, the "rub" broke free, resulting in a momentary overspeed condition. Before the restart of Seabrook after this event, the licensee fully repaired and satisfactorily tested the turbine driven EFW pump to demonstrate that the cause of the pump failure had been corrected and the pump had been restored to its design condition.

One other noteworthy fact regarding the design capability of the EFW system is that Seabrook has a non-vital, startup feedwater pump that can also provide sufficient makeup water to the steam generators to remove decay heat from the reactor. This pump is normally powered by a non-vital electrical bus. However, the operators have the capability of powering this motor-driven pump from the A vital bus, with power from the A EDG, if necessary. In the unlikely event that both the motor-driven and the turbine driven EFW pumps fail, this pump provides an alternate capability to remove decay heat. This pump was available for use during the March 5 event.

In your letter you expressed an additional concern over the use of atmospheric steam dumps as a heat sink. The sudden loss of load on the main generator resulted in an automatic shutdown of the main generator and the reactor. Initially, power to all non-vital plant equipment was lost during this event sequence, including power to the circulating water system. The circulating water system removes heat from the main condenser. After a reactor shutdown, decay heat is normally transferred to the main condenser by use of the condenser steam dumps. When unable to remove heat using the main condenser and the condenser steam dumps, the plant operators use the atmospheric steam dumps for decay heat removal. Due to the loss of the circulating water system, the main condenser could no longer be used. The use of atmospheric steam dumps is a diverse and redundant feature in the event that the preferred means of removing decay heat using the main condenser is not available. This is a normal design feature of pressurized water reactors.

Your letter discussed problems with the alert and notification system, in that some local officials were not promptly informed of the declaration of an Unusual Event at Seabrook. The Unusual Event was declared, at the discretion of the licensee, due to the weather conditions and the partial loss of offsite power. The NRC Special Inspection Team determined that the event classification was appropriate and in accordance with plant procedures. The licensee made the proper notifications to the State of New Hampshire (NH), via the NH State Police, and to the Commonwealth of Massachusetts (MA) via the Massachusetts Emergency Management Agency. However, as discussed in the enclosed Special Inspection Team report, the NH State Police failed to notify the NH agencies and the Rockingham County Dispatch Center (RCDC), which notifies the 17 surrounding NH communities in accordance with the NH State Emergency Plan. The licensee became aware that the surrounding communities had not been notified by

the RCDC when they were contacted by some of the local communities. The licensee then contacted the RCDC and the RCDC notified the 17 communities. The NH Office of Emergency Management has reviewed this issue and is taking corrective actions to ensure that notifications occur in a timely manner. NRC will contact FEMA and request that FEMA follow up to ensure resolution of this issue. Even though the licensee is not required to notify county officials, the licensee has revised the onsite emergency plan to verify that all required off-site notifications to State emergency management officials, State public health officials, and local communities have been initiated and/or completed by the emergency response facilities in NH and MA. The team's review also revealed that based on availability of power, all offsite sirens remained operable during the event. The sirens are not powered from the site and have backup batteries that last 7 days or two activations, whichever happens first. The sirens were not activated during this event and the emergency plan did not require them to be activated.

It is worthy to note that this was the first reactor shutdown caused by a weather-related event at Seabrook in its 10 years of operation. However, in 1997 Seabrook had experienced a similar, albeit less severe snowstorm that caused a partial loss of the transmission lines. This is discussed in Section 4.1 of the enclosed inspection report. The NRC monitors the licensee's efforts to put enhancements in place as part of our normal reactor oversight process, but further restrictions on plant operation are not warranted for this type of event due to the infrequent occurrence, low safety significance, and the fact that the plant is designed to operate in such conditions. The NRC continues to maintain two full-time inspectors at the Seabrook Station to monitor the operation of the plant. Please refer to the enclosed Special Inspection Team report for detailed information.

I trust that this letter addresses your concerns. Should you have further questions, please contact Mr. Victor Nerses, Senior Project Manager for Seabrook, at 301-415-1484.

Sincerely,

/RA J. Johnson for/

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Enclosure: NRC Special Inspection Team
Report No. 05000443/2001-005

the RCDC when they were contacted by some of the local communities. The licensee then contacted the RCDC and the RCDC notified the 17 communities. The NH Office of Emergency Management has reviewed this issue and is taking corrective actions to ensure that notifications occur in a timely manner. NRC will contact FEMA and request that FEMA follow up to ensure resolution of this issue. Even though the licensee is not required to notify county officials, the licensee has revised the onsite emergency plan to verify that all required off-site notifications to State emergency management officials, State public health officials, and local communities have been initiated and/or completed by the emergency response facilities in NH and MA. The team's review also revealed that based on availability of power, all offsite sirens remained operable during the event. The sirens are not powered from the site and have backup batteries that last 7 days or two activations, whichever happens first. The sirens were not activated during this event and the emergency plan did not require them to be activated.

It is worthy to note that this was the first reactor shutdown caused by a weather-related event at Seabrook in its 10 years of operation. However, in 1997 Seabrook had experienced a similar, albeit less severe snowstorm that caused a partial loss of the transmission lines. This is discussed in Section 4.1 of the enclosed inspection report. The NRC monitors the licensee's efforts to put enhancements in place as part of our normal reactor oversight process, but further restrictions on plant operation are not warranted for this type of event due to the infrequent occurrence, low safety significance, and the fact that the plant is designed to operate in such conditions. The NRC continues to maintain two full-time inspectors at the Seabrook Station to monitor the operation of the plant. Please refer to the enclosed Special Inspection Team report for detailed information.

I trust that this letter addresses your concerns. Should you have further questions, please contact Mr. Victor Nerses, Senior Project Manager for Seabrook, at 301-415-1484.

Sincerely,

/RA J. Johnson for/

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Enclosure: NRC Special Inspection Team
Report No. 05000443/2001-005

DISTRIBUTION: See next page
PACKAGE NO. ML011490166
ACCESSION NO. ML011490138
*See previous concurrence

OFFICE	PDI-2/PM	PDI-2/LA	TECH ED*	PDI-2/SC*	LPDI/D*	DRP/RI*
NAME	JBoska	SLittle for TClark	PKleene	JClifford	JClifford for EAdensam	CCowgill per telcon
DATE	6-5-01	6-5-01	5/17/01	6-5-01	5/29/01	6/4/01

OFFICE	IOLB/BC*	DLPM/D*	NRR/ADPT*	NRR/D		
NAME	KGibson for GTracy	JZwolinski	JZwolinski for BSheron	JJohnson for SCollins		
DATE	6/4/01	5/30/01	5/31/01	6-5-01		

Official Record Copy

Letter to J. Horrigan re concerns about Unusual Event at Seabrook

DISTRIBUTION:

PUBLIC (w/incoming)	F. Congel	W. Travers
EDO#G20010198	T.J. Carter (EDO#G20010198)	
W. Kane	S. Collins/J. Johnson	M. King
C. Paperiello	P. Norry	J. Craig
B. Sheron	J. Boska	SECY (SECY LTR-01-0246)
L. Cox	E. Adensam	V. Nerses
S. Burns/K. Cyr	OGC	J. Clifford
T. Clark	C. Cowgill, RI	H. Miller, RI
PDI-2 R/F (w/incoming)	OPA	R. Summers, RI
S. Reiter	OCA	G. Tracy