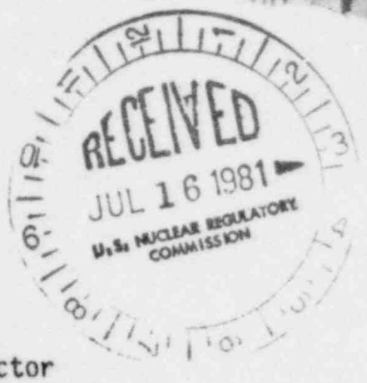
Central file

JUL 14 1981



MEMORANDUM FOR: Commissioner Bradford

FROM: William J. Dircks, Executive Director for Operations

SUBJECT: MILLSTONE UNIT 1 RADIOACTIVE RELEASE VIA STORM DRAIN

On June 21, 1981, the licensee reported an unmonitored release of radioactivity from Millstone Unit 1 through the storm sewers into Niantic Bay. Based on this, and the Tsuruga event, you wanted to know if the Millstone Storm Drain System is "representative and allowable".

The requirements of NRR are that during normal reactor operation, including anticipated operational occurrences, all major and potentially significant paths for release of radioactive material should be monitored (10 CFR 50, App. A, GDC 64; R. G. 1.21, C.2). Plants are designed, reviewed and Technical Specifications are provided to assure that, during normal operation and anticipated operational occurrences, all such related paths are monitored.

The Millstone 1 release involved a system which had not previously been identified generically as a potential source for release of radioactive materials and, therefore, had not been specifically included as such in plant designs, NRR reviews, or in the Technical Specifications. The specific system is the turbine lubricating oil drain oil/water separator. Drain water had never, in approximately 10 years of operation at Millstone 1, been observed to drain from the system. The radioactive water was actually condensed primary reactor steam, which is used in older boiling water reactors as sealing steam for the turbine gland seals and for valve stem seals in large steam valves. The system overflow drain was connected to a turbine building drain system which was connected to the plant storm drain. Apparently, a sealing steam leak occurred in a turbine bypass valve; condensate from this leak accumulated in the lubricating oil recovery system and flowed to the oil/water separator, resulting in the unmonitored discharge, as described above.

Our preliminary review indicates the potential for similar leakage at other plants is limited to older boiling water reactor designs. Newer boiling water reactors utilize "clean" steam for sealing systems, with the non-radioactive steam being provided by auxiliary boilers. Pressurized water reactors utilize clean secondary-side steam for sealing systems.

The Office of Inspection and Enforcement is assessing the generic implications of the Millstone 1 event to determine if either a circular or bulletin should be issued to plants having a potential for similar releases.

OFFICE							
SURNAME	8107240457 810714 PDR ADOCK 05000245 P PDR						
DATE							

A brief description of the circumstances surrounding the Millstone 1 event and additional relevant information are provided in the enclosure.

(Signed) William J. Dircks
William J. Dircks, Executive Director
for Operations

Contact: J. J. Shea
Ext. 27231

cc:
Chairman Palladino
Commissioner Gilinsky
Commissioner Ahearne
L. Bickwit, OGC
D. Rathbun, OGC
S. Chilk, SECY

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JShea	KWichman	TMurley
HSmith	WKreger	RVollmer
OELD	FCongel	BSnyder
RMattson	PFine	PPAS

*SEE ATTACHED YELLOWS FOR PREVIOUS CONCURRENCES

note: Shea read letter to Callahan / Thornburg

EDO
WJDircks
7/14/81

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DATE	7/10/81	7/07/81*	7/10/81	7/10/81	7/ /81 *	7/ /81	7/13/81

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The requirements of NRR are that during normal operation all potentially radioactive effluent paths are to be monitored. The investigation of IE is continuing into whether this concern is generic.

A brief description of the circumstances surrounding the Millstone 1 event and additional relevant information are provided in the enclosure.

William J. Dircks, Executive Director for Operations

Contact: J. J. Shea
Ext. 27231

cc:
Chairman Palladino
Commissioner Gilinsky
Commissioner Ahearne
L. Bickwit, OGC
D. Rathbun, OGC
S. Chilk, SECY

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ENCLOSURE

DISCUSSION OF MILLSTONE UNIT 1
RADIOACTIVE RELEASE THROUGH THE STORM DRAIN

The Millstone 1 plant returned to low power production on June 17, 1981, following an eight and one half month outage (refueling, extensive modifications and turbine repair). With the plant operating at full thermal power, the licensee reported an unplanned release of radioactive water through the storm drain system to Niantic Bay during the period June 19-22, 1981. The source of the leakage was observed to be from one of the turbine bypass valves. Because of the insulation on the valve that prevents direct visual observation and high radiation levels in the area while at power that restrict personnel access to the valve, it cannot be determined whether or not the leakage is due to valve stem seal degradation or other cause.

The radioactive water was released to the storm sewers through a lubricating oil/water separator-water drain. The turbine lubricating oil system includes an oil conditioner to remove water and particulate contaminants. In addition to oil from the main turbine oil sump, the oil conditioner accepts drains from the oil sump vapor extractor and from several drip pans located beneath hydraulically-actuated valves, such as the turbine bypass valve. Under normal plant operation the water level in the oil separator is nearly constant. Operators have reported that it is sometimes necessary to add water to maintain water level in the desired range. The water level is visually checked twice per shift. Abnormal conditions at this separator were first noticed when the roving plant operator noticed an unusually high water level and took corrective action to lower the level to normal by drawing off some of the water to radioactive storage. Subsequently, an operator noticed that the level was overflowing. He traced the water to the storm sewer and obtained water samples at the oil separator water drain and storm sewer.

Isotopic analysis and radioactivity measurements of the water from the oil separator support the observed leakage of condensed reactor steam as the source of radioactive water. The total radioactivity of the water at the separator drain was reported to be 3×10^{-2} microcuries per milliliter but only 4.7×10^{-6} microcuries per milliliter in the storm sewer where the unmonitored release of radioactivity to the environment had been detected. Since there was little dilution (no rain) prior to and during the period of concern, the magnitude of the significant reduction (i.e. 3×10^{-2} to 4×10^{-6}) cannot be explained at this time.

The licensee has sealed the storm drain system, flushed and cleaned it. The flushing water was sent to the plant's radioactive waste handling systems. Two flushes lowered activity levels in the storm sewer below measurable values.

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Water from the separator was measured at 4 gallons per hour and has been diverted to the plant radioactive waste system as plant operation continues uninterrupted at the rated thermal power level. On the basis of measured water flow rate from the oil/water separator, the time since plant startup, and the span of time between water level observations at the oil/water separator, it is estimated that up to 50 gallons of radioactive water could have been discharged into Niantic Bay and diluted prior to entering Long Island Sound. This is the first reported incident at Millstone 1 involving an unmonitored release of water drained from the oil/water separator during more than 10 years of commercial operation. The total amount of radioactivity released from the plant and diluted in Niantic Bay before entering the waters of Long Island Sound was negligibly small and the effect on the health and safety of the public is insignificant.

The Office of Inspection and Enforcement is continuing its investigation to assess generic implications, if any. However, it should be noted that 1) all pressurized water reactors (PWRs) utilize a primary/secondary coolant system, and 2) newer boiling water reactors (BWRs) use fossil-fired units to generate auxiliary steam. For these plants, the steam for gland seals is "clean", i.e. nonradioactive - not reactor steam. The specific reactor steam condensate sneak radioactive water to storm sewer path discovered at Millstone 1 may involve only plants that use reactor steam for gland seals.

In contrast to the Tsuruga incident:

- o The release did not go undetected for days at Millstone 1.
- o The operator checked for unplanned release of radioactivity immediately when unmonitored drainage of radioactive waste was discovered.
- o The incident was reported to Millstone 1 management and NRC upon discovery.
- o Not more than 50 gallons of unmonitored radioactive waste escaped to the environment compared to 500 gpm at Tsuruga.
- o The Tsuruga incident resulted from seepage through floor cracks into site drainage systems not known to the operators after radwaste collection tanks had overflowed.
- o The Tsuruga incident resulted in measurable radiation exposure to cleanup workers. No measurable Millstone 1 worker exposure ocurred.

FROM:	ACTION CONTROL	DATES	CONTROL NO.
Commissioner Bradford	COMPL DEADLINE	7/13/81	10622
	ACKNOWLEDGMENT		DATE OF DOCUMENT
	INTERIM REPLY		6/25/81
TO: Dircks	FINAL REPLY	Dircks 7/14/81	PREPARE FOR SIGNATURE OF: ☐ CHAIRMAN ☒ EXECUTIVE DIRECTOR OTHER:
	FILE LOCATION		

DESCRIPTION ☐ LETTER ☒ MEMO ☐ REPORT ☐ OTHER	SPECIAL INSTRUCTIONS OR REMARKS
Question re Millstone Unit 1 storm drain system	PRIORITY

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		Shea	3. Mattson	P. Fine

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JCAE NOTIFICATION RECOMMENDED: ☐ YES ☐ NO

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EXECUTIVE DIRECTOR FOR OPERATIONS

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