

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555

June 19, 1991

NRC INFORMATION NOTICE NO. 91-40: CONTAMINATION OF NONRADIOACTIVE SYSTEM  
AND RESULTING POSSIBILITY FOR UNMONITORED,  
UNCONTROLLED RELEASE TO THE ENVIRONMENT

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

This information notice is intended to alert addressees to the continuing possibility for unmonitored, uncontrolled releases of radioactive material. The staff had previously addressed these concerns in NRC IE Bulletin 80-10, "Contamination of Nonradioactive System and Resulting Potential for Unmonitored, Uncontrolled Release of Radioactivity to the Environment," dated May 6, 1980. However, two recent incidents involving the operation of radioactive waste concentrators resulted in the radioactive contamination of the auxiliary boiler system and subsequently, unmonitored, uncontrolled release offsite. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

Oyster Creek (NRC Inspection Report No. 50-219/90-06)

During early 1990, at the Oyster Creek Nuclear Generating Station, an auxiliary boiler was being operated with radioactively contaminated boiler water because of a leak in the "A" radioactive waste concentrator. On March 10, 1990, the deaerating feed tank associated with the auxiliary boiler overflowed onto the boiler house floor. The water that spilled in the boiler house was treated as radioactive, and actions were initiated by the licensee to monitor and clean up the spill. Because of standing water in the floor drains (which were clogged) and the negative results of the initial surveys of the catch basin, the licensee originally concluded that no radioactive material had been transported outside the radiologically controlled area. However, subsequent monitoring at a different location indicated that a small amount of radioactive water had been released into the site storm drain. The storm drain system ultimately discharges into Barnegat Bay.

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Updated on  
7/8/91  
PDR I&E

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Notice 91-040 910619

FitzPatrick (NRC Augmented Inspection Team Inspection Report No. 50-333/91-80)

On March 18, 1991, at the James A. FitzPatrick Nuclear Power Plant, an unmonitored release of radioactively contaminated steam occurred through an atmospheric vent of the auxiliary boiler for approximately 3 hours. The radioactive materials were inadvertently drawn from the waste concentrator into the auxiliary boiler system, released to the atmosphere, and resulted in contamination of site buildings and grounds within the protected area. Subsequently, some of the contamination was washed by rainfall into site storm sewers and through the drain system into Lake Ontario.

Before the event on March 18, 1991, the auxiliary boiler had been operating without detectable activity in the boiler water. The licensee was venting the auxiliary boiler to the atmosphere (at approximately 9000 pounds per hour) to increase its load, since operation at low loads made burner operation difficult. The boiler became contaminated from the "B" radioactive waste concentrator because operators failed to follow administrative and radioactive waste concentrator operating procedures, and a side stream steam supply line (steam agitation line) to the concentrator had been installed contrary to the system design. While reducing the liquid waste level in the waste concentrator, operators inadvertently left the steam agitation valve FCV-02 open (see attached drawing). On the indication of low concentrator level, the steam supply valve FCV-106 automatically closed, as designed. Because FCV-02 was open and the steam agitation line was installed downstream of FCV-106 rather than upstream as specified in the design drawings, a flow path was established from the concentrated radioactive liquid side to the steam side of the waste concentrator. The motive force was the vacuum created as the steam condensed on the steam side. When steam was readmitted to the waste concentrator, the contamination was flushed to the condensate supply for the auxiliary boiler. The licensee took samples of the boiler water 1 hour after the release was terminated and found residual contamination at 3.4 E-2 microcuries per milliliter.

The licensee recognized the potential for the unmonitored release through the storm sewer and took samples which indicated radioactive material concentrations above the limits for release from the site. The licensee effectively isolated the storm sewer system with inflatable plugs, securing the release from the site. The licensee used plastic sheets on horizontal, flat surfaces to prevent the spread of contamination by runoff or wind action or by penetration into the soil as a result of the rains. Contaminated building vertical surfaces were painted with a strippable coating to temporarily fix the radioactive material on the surfaces. The strippable coating was later removed and handled as solid radwaste.

Discussion:

In NRC IE Bulletin 80-10, the staff stated that the auxiliary boiler could become contaminated from the radioactive waste evaporator concentrate tank. The bulletin recommended that licensees take appropriate action to identify non-radioactive systems that could become radioactive through system interfaces and establish sampling and monitoring programs to prevent an unmonitored,

uncontrolled release. The events at Oyster Creek and FitzPatrick indicate that not all licensees took effective actions in response to the bulletin.

The event at FitzPatrick emphasizes the potential for unmonitored, uncontrolled releases from various sources, including the storm drain system. The circumstances associated with this release were fortuitous in that only a small fraction of the radioactive material released to the atmosphere was released offsite. The small offsite release was attributed to the high rate of deposition with condensed steam caused by the cold ambient temperature which occurred during the release and also to the effective corrective actions taken by the licensee once the release was identified. If these conditions did not exist, offsite releases (and thus radiological consequences) would likely have been substantially higher.

This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact one of the technical contacts listed below or the appropriate NRR project manager.

*Charles E. Rossi*  
Charles E. Rossi, Director  
Division of Operational Events Assessment  
Office of Nuclear Reactor Regulation

Technical Contacts: Richard Plasse, RI  
(315) 342-4907

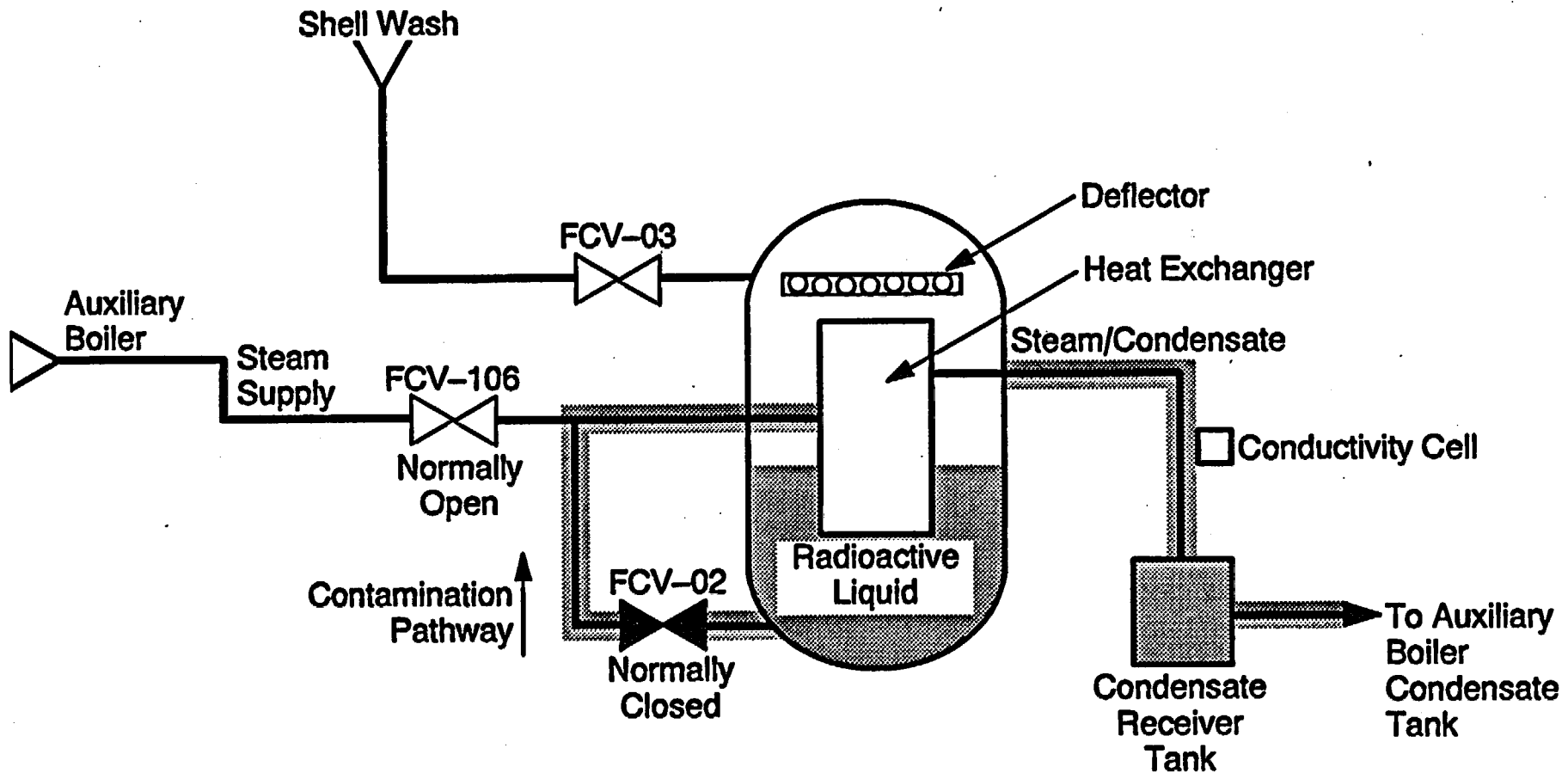
Robert Temps, RI  
(315) 342-4041

Kenneth T. Eccleston, NRR  
(301) 492-1081

Attachments:

1. Waste Concentrator (WC) B Flow Schematic
2. List of Recently Issued NRC Information Notices

# WASTE CONCENTRATOR (WC) B FLOW SCHEMATIC



**Note:**  
 Contamination pathway (  )

LIST OF RECENTLY ISSUED  
 NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
91-39	Compliance with 10 CFR Part 21, "Reporting of Defects and Noncompliance"	06/17/91	All Nuclear Regulatory Commission (NRC) material licensees.
91-38	Thermal Stratification in Feedwater System Piping	06/13/91	All holders of OLs or CPs for nuclear power reactors.
91-37	Compressed Gas Cylinder Missile Hazards	06/10/91	All holders of OLs or CPs for nuclear power reactors.
91-36	Nuclear Plant Staff Working Hours	06/10/91	All holders of OLs or CPs for nuclear power reactors.
91-35	Labeling Requirements for Transporting Multi-Hazard Radioactive Materials	06/07/91	All U.S. Nuclear Regulatory Commission (NRC) licensees.
91-34	Potential Problems in Identifying Causes of Emergency Diesel Generator Malfunctions	06/03/91	All holders of OLs or CPs for nuclear power reactors.
91-33	Reactor Safety Information for States During Exercises and Emergencies	05/31/91	All holders of OLs or CPs for nuclear power reactors.
91-32	Possible Flaws in Certain Piping Systems Fabricated by Associated Piping and Engineering	05/15/91	All holders of OLs or CPs for nuclear power reactors.
91-31	Nonconforming Magnaflux Magnetic Particle (14AM) Prepared Bath	05/09/91	All holders of OLs or CPs for nuclear power reactors.
91-30	Inadequate Calibration of Thermoluminescent Dosimeters Utilized to Monitor Extremity Dose at Uranium Processing and Fabrication Facilities	04/23/91	All fuel cycle licensees and other licensees routinely handling unshielded uranium materials.

OL = Operating License  
 CP = Construction Permit

uncontrolled release. The events at Oyster Creek and FitzPatrick indicate that not all licensees took effective actions in response to the bulletin.

The event at FitzPatrick emphasizes the potential for unmonitored, uncontrolled releases from various sources, including the storm drain system. The circumstances associated with this release were fortuitous in that only a small fraction of the radioactive material released to the atmosphere was released offsite. The small offsite release was attributed to the high rate of deposition with condensed steam caused by the cold ambient temperature which occurred during the release and also to the effective corrective actions taken by the licensee once the release was identified. If these conditions did not exist, offsite releases (and thus radiological consequences) would likely have been substantially higher.

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Document Name: IN 91-40

\*SEE PREVIOUS CONCURRENCES

D/DOEA:NRR  
CERossi  
06/14/91

C/OGCB:DOEA:NRR

\*CHBerlinger  
06////91

\*OGCB:DOEA:NRR  
PCWen  
06/05/91

\*RPB:ADM \*D/DREP:NRR

TechEd FCongel  
06/07/91 06/07/91

\*RI \*RI  
RAPlasse RRTemps  
06/05/91 06/05/91

\*C/PRPB:DREP:NRR

LJCunningham  
06/07/91

\*SC/RI  
RJBores  
06/05/91

\*SC/PRPB:DREP:NRR

THEssig  
06/06/91

\*PRPB:DREP:NRR  
KTEccleston  
06/06/91

uncontrolled release. The events at Oyster Creek and FitzPatrick indicate that not all potential release paths from potentially contaminated systems were identified.

The event at FitzPatrick emphasizes the potential for unmonitored, uncontrolled releases from various sources, including the storm drain system. The circumstances associated with this release were fortuitous in that only a small fraction of the radioactive material released to the atmosphere was released offsite. This can be attributed to the high rate of deposition with condensed steam which occurred during the release and to the effective corrective actions taken by the licensee once the release was identified. If these conditions did not exist, offsite releases (and thus radiological consequences) would likely have been substantially higher.

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*all with comment  
for*

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SC/RI PCW

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SC/PRPB:DREP:NRR

THEssig

06/6/91

PRPB:DREP:NRR

KTEccleston  
06/6/91

PER TEL CON 6/5/91  
WITH RJB



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*6/7/91*  
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PER TEL CON 6/5/91  
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