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February 25, 1993
Fort St. Vrain
Unit No. 1
P-93017

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Docket No. 50-267

SUBJECT: **Licensee Event Report 93-001-00, Final Report**

REFERENCE: Facility Operating License No. DPR-34

Gentlemen:

Enclosed is a copy of Licensee Event Report No. 50-267/93-001-00, Final, submitted per the requirements of 10 CFR 50.73(a)(2)(v).

If you have any questions regarding this report, please contact Mr. M. H. Holmes at (303) 620-1701.

Sincerely,

Mary Fisher for

Don W. Warembourg
Decommissioning Program Director

DWW/SWC

Enclosure

cc: Regional Administrator, Region IV

Mr. Ramon E. Hall, Director
Uranium Recovery Field Office

Mr. Robert M. Quillin, Director
Radiation Control Division
Colorado Department of Health

NRC FORM 366
(6-89)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Fort St. Vrain Unit No. 1	0 5 0 0 0 2 6 7	1 OF 0 8

TITLE (4)

Overflow of Radioactive Liquid Effluent Line

EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR		SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
0 1	2 6	9 3	9 3	–	0 0 1	– 0 0	0 2	2 5	9 3	N/A	0 5 0 0 0
											0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
N		20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	0 1 0 0	20.405(a)(1)(i)	50.36(c)(1)	X 50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
M. H. Holmes, Project Assurance Manager	3 0 3 6 2 0 – 1 7 0 1

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	
				N							

SUPPLEMENTAL REPORT EXPECTED (14)

		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

From 1705 hours until 2245 hours on January 26,1993, a release was made from the Fort St. Vrain radioactive liquid waste system. It was later discovered that some of this release overflowed an underground oil separator and spilled onto the adjacent ground.

At 0120 hours on January 27, 1993, water was observed to have overflowed the oil separator in the Fort St. Vrain radioactive liquid effluent release line. Water spilled onto the surrounding ground and flowed east into the yard drain system. All of the spill was confined to the restricted area of the plant. Water that entered the yard drains was then fully diluted with water from the cooling tower blowdown/bypass line, and was released to the unrestricted area in the normal liquid effluent release path. Based on area surveys and water samples, there was negligible radioactive contamination of affected soil.

The overflow was caused by an ice plug in the drain line downstream of the oil separator, due to an unusual period of extended sub-freezing weather. The ice plug was thawed and heat tracing was added to prevent recurrence of this event.

This event is reported as a condition that could have prevented the ability to control the release of radioactive material.

BACKGROUND:

The Fort St. Vrain Nuclear Station is being decommissioned in accordance with a Decommissioning Order issued November 23, 1992. This process includes the decontamination and dismantlement, as necessary, of radioactively contaminated systems and equipment, so that the Fort St. Vrain site can eventually be released for unrestricted use.

Radioactive liquid effluent is released from the Fort St. Vrain Nuclear Station in the same manner as it was released during previous plant operations. Prior to release, radioactive liquid waste is sampled and analyzed. In accordance with the Offsite Dose Calculation Manual, a release rate is calculated to ensure compliance with 10 CFR 20 limits on maximum permissible concentrations.

Radioactive liquid effluent is released through underground piping that includes an oil separator and a remotely operated isolation valve, as shown on the attached figure. The oil separator serves mainly to remove oils from discharges from the reactor building sump. During batch releases from the radioactive liquid waste system, the oil separator is normally isolated by closing V-62247 and opening the bypass line through V-62248. Radioactive liquid effluent then enters the yard drain system where it mixes with and is diluted by water from on-site storage ponds. This dilution flow is referred to as cooling tower blowdown or bypass flow, and is provided by the circulating water makeup pumps at a flowrate that typically provides dilution of at least a factor of 110.

Diluted effluent is then released into the Goosequill Ditch, which is an open ditch located outside the FSV restricted area. It flows to a farm pond located on PSC property, and is then discharged into the South Platte River and downstream surface waters.

EVENT DESCRIPTION:

From 1705 hours until 2245 hours on January 26,1993, a release was made from the Fort St. Vrain radioactive liquid waste system. This release was followed by a flush of the release piping with firewater, for approximately 1 hour. It was later discovered that some of this release and flush water overflowed the underground oil separator and spilled onto the adjacent ground.

At approximately 0120 hours on January 27, 1993, an FSV Equipment Operator discovered that the oil separator in the radioactive liquid effluent release line had overflowed and water had spilled onto the ground, in an area within the FSV restricted arca. Water flowed out of the underground oil separator through a vented manway cover, and flowed east for a total distance of about 110 feet. Along the way this water could have entered an alternate portion of the yard drain system through a vented manhole cover. It then would have flowed approximately 400 feet through this alternate underground yard drain before being diluted by cooling tower blowdown flow, which was being discharged through the normal connecting drain line. From that point, it flowed through the normal release path out of the restricted area, into the Goosequill Ditch, and eventually offsite.

The spill water was suspected of containing radioactive liquid effluent, since a release (number 1575) had just been performed about three hours earlier, from 1705 hours to 2245 hours on January 26, 1993. Water and soil samples were taken and sent to the radiochemistry laboratory for analysis. The drainage path at the yard drain manways was dammed to prevent further release. Health Physics personnel surveyed the area of the spill and determined that contamination in the area was negligible, and that the area did not present any health physics concerns. The activity in the soil and water samples was later determined to contain tritium on the order of E-5 μCi/g and Cs-137 on the order of E-8 μCi/g, both of which are considerably below any maximum permissible concentrations of 10 CFR 20. Based on these surveys and samples, the area was considered to not present any radiological hazards.

A slight amount of oil was observed on the surface of the spill water. An operator checked the Goosequill Ditch to see if oil was being released from the site. There are two sets of oil absorbent bags located in the Goosequill Ditch, downstream of the plant effluent discharge point and upstream of the sample point specified in the current FSV Wastewater Discharge Permit issued by the Colorado Department of Health. No oil was found downstream of the first set of oil absorbent bags.

All of the spill was confined to the restricted area of the plant. All of the release was fully diluted within the drainage system, before its release to unrestricted areas.

Affected soil that had been visibly stained with oil was removed. This soil and personnel protective equipment were placed in two 55 gallon drums for later disposition and disposal. The frozen condition of the soil prevented migration of the spill liquid into the ground and assured complete clean-up of all contaminated soil.

After reviewing the full ramifications of this event, a non-emergency event telephone notification was made to the NRC at 1647 hours on January 27, 1993. This notification was not completed within 4 hours of the event, as required by 10 CFR 50.72(b)(2).

CAUSE:

Oil Separator Overflow

The cause of the oil separator overflow is believed to have been an ice plug that blocked the downstream release line and caused the release to back up into the oil separator. The release line downstream of the oil separator is a 6-inch line that reduces to a 3-inch line just before entering the yard drain system at the cooling tower blowdown/ bypass line. This 3-inch section includes a remote operated isolation valve (HV-62249), located about 8 feet underground in a concrete vault/manway, about 40 feet downstream of the oil separator.

The cause or location of the blockage was not evident, especially since this has never happened before at Fort St. Vrain. Engineering and maintenance personnel suspected that the blockage was located at the isolation valve (HV-62249), because it is located in the smallest part of the line. During an inspection of the valve, ice was observed around its position indicating limit switches, and an ice plug in the line was suspected, even though the line is 8 feet underground and was thought to be sufficiently protected.

The area had experienced sub-freezing weather for an extended period before the spill, and the location of the valve in the vault/manway could have exposed it to these low temperatures. Also, HV-62249 is normally closed after a liquid effluent release and the line slopes down from the oil separator to the valve, potentially trapping a volume of water on the upstream side of the closed valve. A portable heater was lowered into the valve vault, and by the next morning the release line was flowing freely. Based on this, PSC considers that an ice plug in the 3-inch section of the release line downstream of the oil separator is the most likely cause of the blockage described above. PSC also considers it likely that this blockage existed, to at least a partial extent, before radioactive liquid waste release number 1575 was initiated, and that some of this release was probably made through the manway into the yard drain system.

Delayed Notification

The cause of the delayed notification of the NRC was human error. The individuals involved in the event were focused on determining whether contamination (either by oil or radioactive material) actually had occurred, to determine whether the environmental impacts had to be reported to the Colorado State Department of Health. If such a report had been required, then the NRC would have been notified under the requirements of 10 CFR 50.72(b)(2)(vi). The requirements of 10 CFR 50.72(b)(2)(iii) to report conditions that could have prevented FSV's ability to control the release of radioactive material were not fully recognized until later in the day after a management review of the event.

ANALYSIS:

During this event, all radioactive liquid effluent that entered the drain piping was fully diluted prior to its release into the unrestricted areas around the plant. Also, all radioactive liquid effluent was discharged from the plant at the normal liquid effluent release point into the Goosequill Ditch, from which it was released into the environs in the normal manner.

However, the flowpath of liquid effluent within the Fort St. Vrain restricted area was not the normal flowpath. Also, as liquid effluent was flowing over the ground into the manway in the yard drain system, PSC did not have control and could not have readily isolated this flow. As such, this condition is reportable to the NRC in accordance with the requirements of 10 CFR 50.73(a)(2)(v), as a condition that could have prevented PSC's ability to control the release of radioactive material.

During the event of January 26 and 27, 1993, there was negligible radioactivity in the spilled water, as determined by area surveys and water sample analysis. Also, there was negligible radioactive contamination of the soil affected by the spill. The soil that was stained by the oil that spilled out of the oil separator was effectively cleaned up and packaged for disposal. Had a more concentrated radioactive liquid effluent discharge been in progress at the time of the blockage, it would have been fully diluted before it reached any unrestricted area, but the ground over which it flowed could have become contaminated. Also, until access was restricted, plant personnel could have wandered into the area and become similarly contaminated, although this is not a normal pathway for plant personnel.

This event is considered an isolated occurrence, as it has never occurred during previous plant operations.

CORRECTIVE ACTION:

The immediate corrective action was to dam the manholes into the yard drain system to prevent any further drainage. Also, the ice plug was thawed by use of a heater and a free release path was restored.

The 3-inch valve (HV-62249) and piping in the valve vault area have been heat-traced to prevent future freezing. This is the most likely place for ice to form, since the remainder of this release line is a 6-inch line that is buried 8 feet underground.

Operations personnel were reminded of the need to examine this area during releases. Typically, an operator examines the area during the initial valve lineup to isolate the oil separator, again as he is on his way to take a water sample from the Goosequill Ditch during the release, and finally when he returns the oil separator to its normal configuration. Any abnormal conditions would be reported to the control room and the release would be terminated.

Two drums of oil-stained soil and personnel protective equipment were packaged and prepared for disposal.

An Operations Order was issued by the Operations Manager and read by all Shift Supervisors detailing PSC's reporting philosophy. This Operations Order emphasizes contacting management to discuss potentially reportable events, considering the ramifications that **could** have resulted from events or conditions - notwithstanding good luck, and the general policy of "When in doubt, report it".

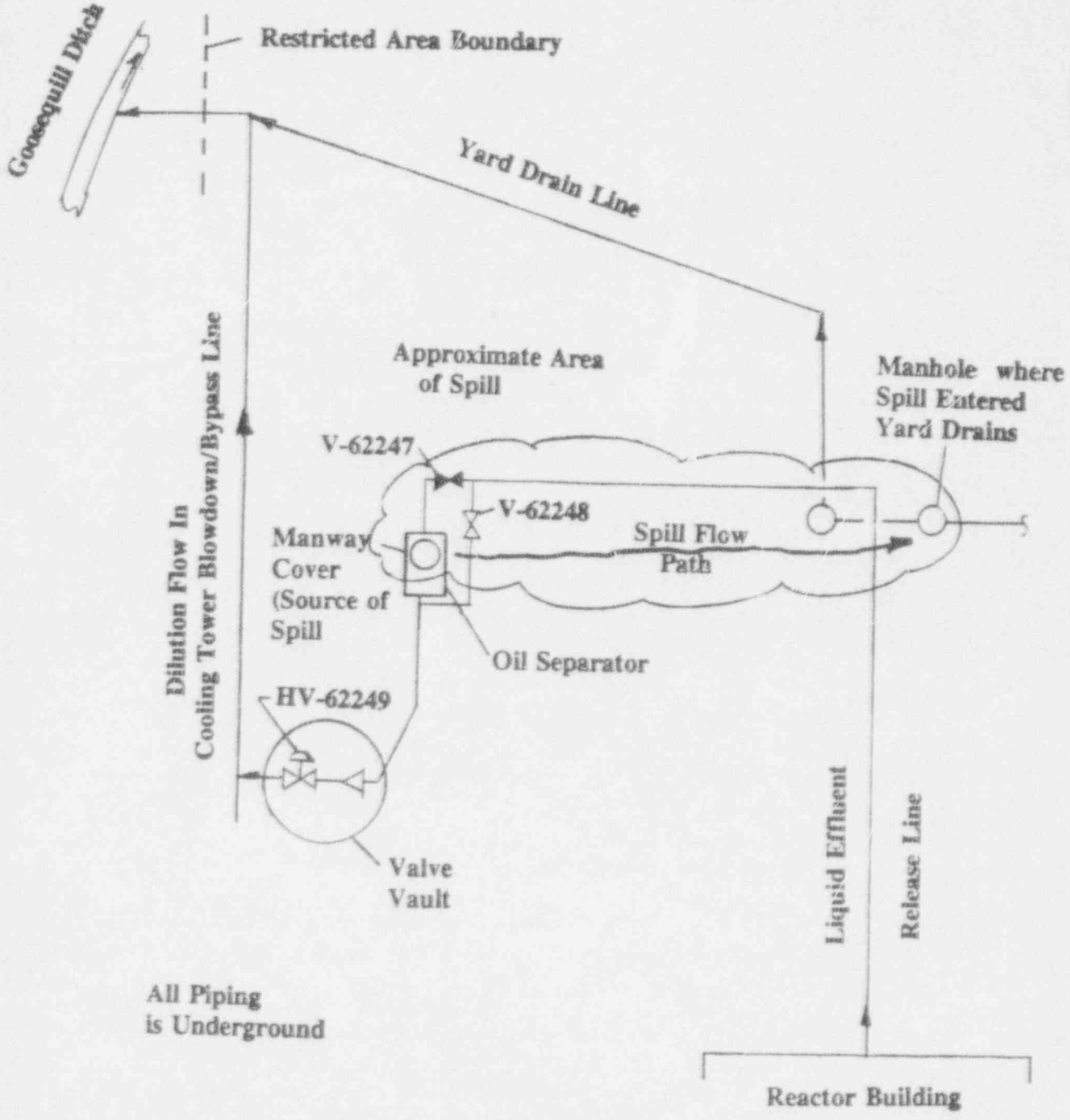

FIGURE SHOWING SPILL FROM OIL SEPARATOR TO YARD DRAINS

Sam W. Chesnutt

S. W. Chesnutt
Project Assurance

Sam W. Chesnutt for M. Holmes

M. H. Holmes
Project Assurance Manager

Mary Reidinger for

D. W. Warembourg
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