

Monitoring of Radioactive Release Via Storm Drains

HPPOS-007

PDR-9111210092

Title: Monitoring of Radioactive Release Via Storm Drains

See the memorandum from W. J. Dircks to Commissioner Bradford dated August 28, 1981. This memo states that a blanket requirement for monitoring storm drains (yard drains) from every power reactor is unwarranted from a safety standpoint. The information was also provided to J. H. Joyner (and others) by L. J. Cunningham in the form of a memorandum dated September 10, 1981.

Based on an unmonitored release of radioactive water on July 30, 1981, at the Northern States Power Company's Monticello Plant and similar occurrences at Millstone, Unit 1 (June 21, 1981) and at the Japanese Tsuruga plant, it was asked if there were technical reasons for not continuously monitoring storm drains for radioactivity.

In the Monticello Plant incident, an unreviewed and improper action by a plant engineer resulted in radioactive water being used in the cement solidification of radioactive wastes at a newly-installed portable solidification system located in the radwaste shipping building. The building was not designed for this purpose and did not have floor drains or curbs to prevent spilled water from escaping. The incident occurred when the responsible engineer improperly and inadvertently used slightly radioactive water from the reactor's condensate storage tank by connecting a rubber hose secured by a hose clamp to the piping of the concrete mixing system. The hose came loose and an estimated 2,000 gallons of radioactive water spilled onto the concrete floor of the radwaste storage building. The water ran down the sloping floor, under two closed overhead garage-type doors, and into the storm drain system.

An estimated 100 gallons of water, contaminated with 4.5×10^{-7} micro-Ci/ml I-131 and 1.4×10^{-6} micro-Ci/ml I-133, entered the Mississippi River at the storm drain outfall. At the point of release, the isotope concentrations were approximately 300% of the "maximum permissible concentration" described in 10 CFR 20 (20.1-20.601), Appendix B, Table II, Column 2, but dilution and dispersion

by the Mississippi River was assumed to have resulted in essentially instantaneous reduction to non-detectable concentrations with essentially zero environmental radiation-dose impact. The remainder of the water entered the soil or was trapped in the storm drain ditches.

NRR replied that no insurmountable technical reasons existed with regard to the monitoring of storm drains for radioactivity. However, practical difficulties in the automatic sampling or extraction of material for radioactivity analysis, as well as practical problems of volumetric measurements from the highly variable stream flow rates would need to be resolved if the total release were to be determined. In addition, if it is assumed that each nuclear power plant is serviced by a single storm drain system (also called yard drains), the initial cost of the installation of monitoring equipment per plant would be approximately 200 to 500 thousand dollars and that the annual operation and maintenance costs would be 20 to 50 thousand dollars.

Because of the difficulties in monitoring radioactive discharge into storm sewer drains, the associated costs for installation and operation, the general knowledge of past experiences with this particular type of unmonitored release from reactor operations, and the small potential effect on public health, it was the opinion of the EDO that requirements for monitoring storm sewer drains were unwarranted.

Regulatory references: 10 CFR 20.201, 10 CFR 20.1501,
Technical Specifications

Subject codes: 7.3, 7.4, 9.2

Applicability: Reactors