

RECORD #7

TITLE: Monitoring of Radioactive Release Via Storm Drains

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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SEP 10 1981

MEMORANDUM FOR: J. H. Joyner, Chief, TI Branch, Region I
A. F. Gibson, Chief, TI Branch, Region II
L. R. Greger, Acting Chief, TI Branch, Region III
G. D. Brown, Chief, TI Branch, Region IV
H. E. Book, Chief, TI Branch, Region V

FROM: L. J. Cunningham, Chief, Reactor Radiological Safety
Section, RSB:IE

SUBJECT: NRC POSITION RE: MONITORING OF STORM DRAINS

Enclosed for your information is an EDO reply to Commissioner Bradford regarding monitoring of storm drains. This information may be of general interest to you and your staffs.

L. J. Cunningham
L. J. Cunningham, Chief
Reactor Radiological Safety
Section:RSB:IE

Enclosure: As stated

cc: L. B. Higginbotham, IE
RRSS Staff

Joy

*LAST page of
EDO response
missing see
attached copy
you should check
to see whether
above listing
received entire
response
Joy*

AUG 28 1981

MEMORANDUM FOR: Commissioner Bradford
FROM: William J. Dircks, Executive Director for Operations
SUBJECT: MONITORING OF RADIOACTIVE RELEASES VIA STORM DRAINS

Northern States Power Company recently reported that an unmonitored release of radioactive water occurred on July 30, 1981, at the Monticello plant. Based on this and similar occurrences at Millstone, Unit 1 (June 21, 1981) and at the Japanese Tsuruga plant, you asked if there were technical reasons for not continuously monitoring these paths.

As pointed out in my memorandum of July 14, 1981, concerning the Millstone release, 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, Appendix A, General Design Criterion 64; Regulatory Guide 1.21, Position C.2). Plants are designed and reviewed, and Technical Specifications are provided, to assure that during normal operation and anticipated operational occurrences, all such release paths are monitored.

At Monticello, an unreviewed and improper action by a plant engineer resulted in radioactive water being employed in the cement solidification of radioactive resin waste at a newly-installed portable solidification system located in the radwaste shipping building. This building has no floor drains or curbs to prevent water from escaping. The building had not been designed for the type of use which was made of it by addition of the solidification system; the deficiency is being corrected by the licensee. The proposal for installation of the system had been reviewed by plant management and had called for the use of "deionized water" for mixing with resin and cement so as to provide control of the pH of the mixture; the responsible engineer improperly and inadvertently used slightly radioactive water from the reactor's condensate storage tank. A rubber hose used to supply the water, secured by means of a hose clamp to the piping of the concrete mixing system, came loose, permitting an estimated 2,000 gallons of radioactive water to spill 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. It is estimated that 100 gallons of water, contaminated to 4.5×10^{-7} uCi/ml of I-131 and 1.4×10^{-6} uCi/ml of I-133, entered the Mississippi River at the storm drain outfall, with the remainder of the water entering the soil or being trapped in the storm drain ditches. The release concentrations totaled approximately 300% of maximum permissible concentration (MPC, per 10 CFR 20, Appendix B, Table II, Column 2) at the point of release; dilution and dispersion in the Mississippi River are assumed to have resulted in essentially instantaneous reduction to non-detectable concentrations with essentially zero environmental radiation dose impact.

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While there are no insurmountable technical reasons why storm drains could not be monitored for radioactive material, there are practical difficulties in the automatic sampling or extraction of material for radioactivity analysis from highly variable stream flow rates that would have to be resolved, and there are practical considerations involved in the volumetric measurement of highly variable water flows in storm drain systems, if the total release is to be quantified. Based on the assumption that each nuclear power plant is serviced by a single storm drain system (also called "yard drains") we estimate the initial cost of installation per plant to be approximately 200 to 500 thousand dollars and that annual operation and maintenance costs would be approximately 20 to 50 thousand dollars.

In light of our general knowledge of past experience with this type of unmonitored release from U.S. reactor operations, and the small potential effect on public health which has resulted from such releases, it is our opinion that a blanket requirement for such monitoring is unwarranted from a safety standpoint.

We plan to confirm our current understanding of the magnitude of this type of problem by reviewing LERs for the past five years to determine the frequency, and the scope or magnitude of such inadvertent releases. In a related area, we have an ongoing study of portable radwaste solidification systems being conducted by a contractor to identify potential problems such as that which led to the Monticello release. We will keep the Commission informed of any new information developed by these studies which changes our view as to the need for monitoring storm drains.

(Signed) William J. Dircks

William J. Dircks, Executive Director
for Operations

Contact: P. G. Stoddart
Ext. 27682

- cc: Chairman Palladino
- Commissioner Gilinsky
- Commissioner Ahearne
- Commissioner Roberts
- L. Bickwit, OGC
- D. Rathbun, OGC
- S. Chilk, SECY
- F. Remick, OPE

*SEE PREVIOUS WHITE FOR CONCURRENCES

EDO
WJDircks
08/ /81

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Commissioner Bradford

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