

RECORDED HW-33698

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November 5, 1954

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PROCESS TEST MR-105-25
REACTOR PURGE AT LOW CONCENTRATIONS

INTRODUCTION

A consequence of coolant flowing through a reactor is the layer of film which is deposited on the slug and tube surfaces. This film is undesirable because it impedes heat transfer and fluid flow and therefore affects reactor production. Hence, periodic injections of diatomaceous earth particles into the process water stream are employed to remove the film deposits. Although many improvements have been applied to solids purging, it still is an operation which requires considerable preparation and involves some risk of a production loss from screen plugging or a low-trip Panellit scram from over-purging.

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PROCEDURE

The first purge^① authorized by^② this test will accomplish three objectives:
(1) to determine the effect of solids concentration on film removal, (2) to establish a base from which to measure future film build-up accurately, and (3) to evaluate the radiological hazard of disposing the waste from low concentration purges^③ directly to the river.

The following test procedure will demonstrate the effect of solids concentration on film removal:

1. Before the purge, record the flow through each of the four risers, and record the Panellit pressures of 40 representative process tubes selected by Process personnel.
2. Purge both sides, near and far, of the reactor with 2-5 ppm solids.
3. When no further change is observed in Panellit pressures, again record the Step 1 data and increase the purge concentration to 5-10 ppm.
4. Repeat Step 3 and increase the concentration of solids to 10-25 ppm.
5. A "film-free" base will have been established when no further Panellit pressure decrease results from the 25 ppm purge.

Throughout Steps 1 through 4, water samples will be collected at the inlet of the 107 Retention Basin. Radiological Engineering has temporarily relaxed the restrictions on the disposal of purge material^④ for this test, so that in the event the 107 Retention Basin is insufficient to hold the contents of this^⑤ purge, the excess can be discharged into the river. Subsequent purges must be confined to the 107 Retention Basin unless specific authorization is secured from Radiological Engineering to permit excess purge material to be^⑥ discharged into the river. J. F. Honstead of Radiological Engineering will interpret the water analyses, and determine if the data obtained from this test is sufficient to warrant any^⑦ changes in Radiological specifications for purging.

At future dates when^⑧ there is a five-pound film build-up above base on the near side of the D Reactor, a purge will be conducted (on the near side only) with 2-5 ppm solids for a period sufficient to return the Panellit readings of the 20 near side control tubes to the base. The far side will be observed as a control for the test.

All purging will be conducted during reactor operation at substantially full power level, unless jointly agreed otherwise by responsible Power, Operations, and Reactor Operation Engineering Unit personnel.

The concentration of solids in each riser will be monitored at five-minute intervals throughout the purge period with a spectrophotometer and microphotometer.

During the shutdown following a purge, a radiation survey of the rear face will be made to detect any significant change in activity levels.

* Letter, "100-D Operating Purge Test," J.M. Smith to J.H. Warren, 10-25-54.

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RESPONSIBILITY

The Operations Unit, 100-D Area, will be responsible for the operational safety and production continuity of the reactor. The Power Unit, 100-D Area, will be responsible for water treatment and purging operations. The Radiation Monitoring Unit, 100-D Area, will share, with Operations, the responsibility for collecting samples of 107 basin influent, and will be responsible for conducting radiation surveys of the rear face piping. The Process Sub-Section, represented by N. V. Starkebaum and W. E. Cawley, will be responsible for technical assistance during this test, evaluation of data, and preparation of reports.



N. V. Starkebaum
Reactor Operation Engineering
Process Sub-Section
REACTOR SECTION

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APPROVED BY:

O. C. Schroeder O. C. Schroeder, Superintendent
Process Sub-Section
REACTOR SECTION

R. C. Mehann R. C. Mehann, Production Superintendent
Operations Sub-Section
REACTOR SECTION

J. C. McLaughlin J. C. McLaughlin, Superintendent
Power Sub-Section
REACTOR SECTION

P. C. Jerman P. C. Jerman, Head
Radiation Monitoring Sub-Section
REACTOR SECTION

J. M. Atwater for L. P. Supp, Head
Pile Materials Unit
Pile Development Unit
TECHNICAL SECTION

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