

DECLASSIFIED

DOCUMENT NO.

EW-41400

(CLASSIFICATION)

DATE Feb. 13, 1956

COPY NO. AND SERIES

COPY 1 OF 1, SERIES

GENERAL ELECTRIC

HANFORD ATOMIC PRODUCTS OPERATION - RICHMOND, WASHINGTON

RECEIVED FEB 17 1956

~~RESTRICTED
THIS DOCUMENT CONTAINS INFORMATION OF A
DEFINITE AND SPECIFIC NATURE WHICH
ITS DISCLOSURE TO AN UNAUTHORIZED
PERSON IN ANY MANNER TO AN UNAUTHORIZED
PERSON IS PROHIBITED.~~

TITLE 100-D AREA
CLASSIFIED FILES
RELATION BETWEEN HAND AND FLOW SEATING OF SLUG
CHARGES AS THEY AFFECT SLUG RUPTURE RATES

OTHER OFFICIAL CLASSIFIED INFORMATION
THIS MATERIAL CONTAINS INFORMATION AFFECTING
THE NATIONAL DEFENSE OF THE UNITED STATES
WITHIN THE MEANING OF THE ESPIONAGE LAWS,
TITLE 18, U. S. C., SECS. 793 AND 794, THE TRANSMISSION OR REVELATION OF WHICH IN ANY MANNER TO AN UNAUTHORIZED PERSON IS PROHIBITED BY LAW.

AUTHOR
S. O. Arneson
F. W. VanWormer

THIS DOCUMENT MUST NOT BE LEFT UNATTENDED OR WHERE AN UNAUTHORIZED PERSON MAY HAVE ACCESS TO IT. WHEN NOT IN USE, IT MUST BE STORED IN AN APPROVED LOCKED REPOSITORY WITHIN AN APPROVED GUARDED AREA. WHILE IT IS IN YOUR POSSESSION AND UNTIL YOU HAVE OBTAINED A SIGNED RECEIPT FROM CLASSIFIED FILES, IT IS YOUR RESPONSIBILITY TO KEEP IT AND ITS CONTENTS WITHIN THE LIMITS OF THIS PROJECT AND FROM ANY UNAUTHORIZED PERSON. ITS TRANSMITTAL TO, AND STORAGE AT YOUR PLACE OF RESIDENCE IS PROHIBITED. IT IS NOT TO BE DUPLICATED. IF ADDITIONAL COPIES ARE REQUIRED, OBTAIN THEM FROM THE RELATED ISSUING FILE. ALL PERSONS READING THIS DOCUMENT ARE REQUESTED TO SIGN IN THE SPACE PROVIDED BELOW.

ROUTE TO:	PAYROLL NO.	LOCATION	SIGNATURE	DATE
William J. ...				

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

THIS DOCUMENT IS PUBLICLY AVAILABLE

FILES CIRCULATING COPY
RETURN TO:
TECHNICAL INFORMATION FILES

U-3195-D (11-54) REPRODUCED FROM

RECORD CENTER FILE

(CLASSIFICATION)
DECLASSIFIED

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

DECLASSIFIED

HW-41400

1. JK Anderson
2. SO Arneson
3. JA Ayres
4. JT Baker
5. RS Bell
6. CW Botsford - GO Amy
7. FW Bown - WG Albert
8. RV Bowersock
9. LP Bupp
10. JJ Cadwell
11. RL Cail
12. NW Cayey
13. RG Clough
14. JP Cooke
15. VR Cooper
16. EJ Filip
17. HL Floyd
18. JM Fouts
19. RM Fryar - CF Jacky
20. JH Garety

21. C Groot - JL Ryan
22. ET Hubbard
23. CG Lewis
24. DS Lewis
25. AR Maguire - IL Huffman
26. LH McEwen - KJ Bell
27. JF Music
28. SL Nelson
29. WC Riley
30. OC Schroeder
31. JW Sowards
32. JW Talbott
33. FW VanWormer
34. HT Wells
35. NG Whittenbrock - DR de Halas
36. FW Woodfield
37. Extra Copy
38. Extra Copy
39. Extra Copy
40. Yellow Copy
41. 300 Files

By Authority of DOC 1973
 By PM ECKE 6-6-94
 Verified By J. J. Wells 6-6-94

DECLASSIFIED

Classification Cancelled and Changed To

~~RESTRICTED DATA~~

~~This document contains restricted data as defined in the Atomic Energy Act of 1954. Its transmittal or disclosure to any person without the express written consent of an authorized person is prohibited.~~

MASTER

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

**SPECIAL RE-REVIEW
 FINAL DETERMINATION
 DECLASSIFICATION CONFIRMED**

This document consists of
4 pages, No. 4 of
11 copies, Series A.
 COPY 1 OF 1.

BY JW Jordan DATE 7-10-81
 BY JP Derrin DATE 7-10-81

February 13, 1956

DEVELOPMENT TEST 105-623A
RELATION BETWEEN HAND AND FLOW SEATING OF SLUG
CHARGES AS THEY AFFECT SLUG RUPTURE RATES

OBJECTIVE

The objective of this test is to determine the effect upon slug rupture rate due to slug cocking as affected by hand seating or flow seating of slug columns.

BACKGROUND AND JUSTIFICATION

A large portion of the slug failures which occurred during 1955 were of the "hot-spot" type. Observation of these failures has shown them to be the result of intergranular corrosion attack of the aluminum jacket. Intergranular corrosion is presently considered to occur in water temperature above 150° C; (1) a flow disturbance which causes non-uniform coolant temperatures is suspected as the cause of failure.

(1)HW-40252, "Low Exposure Failures and Intergranular Corrosion, C. Groot and J. L. Ryan, 11-29-55.

DECLASSIFIED

The presence of a cocked slug, or a bowed slug column, might provide this flow disturbance.

189-D laboratory tests have shown that flow seating the slug charge allows slugs to cock in the tube. It has also been found that these cocked slugs may be lifted to close proximity of the tube wall by the axial load on the slug column due to process water flow. It is believed that in cases such as this, slug and coolant temperatures may become critical.

Present charging procedures allow for flow seating of the slug column. The distance the column is flow seated varies from very little to 3 or 4 inches depending on the particular charge. It is believed that this practice can lead to the situation observed in the laboratory tests.

During the past two months, there has been an increase of failures of the "hot-spot" type at the DR pile. Therefore, this test proposes to evaluate the effectiveness of hand seating slug columns at the DR pile as outlined below.

PROCEDURE

During alternate outages at the DR pile each charge-discharge operation will include hand seating of the charge using a push pole from the front face. This will be done before the upstream dummy pattern is removed and after personnel on the rear face have replaced the nozzle cap. After nozzle caps have been replaced on the particular header being discharged personnel on the rear elevator will prepare the next header to be charged while personnel on the front elevator will hand seat those tubes just charged. Front elevator time requirements for this additional operation will be approximately one hour for every 200 tubes charged.⁽²⁾ During all other outages, charging will be continued as it is done now.

Operations will keep a record available for inspection by Pile Engineering personnel of those charges that have been hand seated. Ruptures can then be related to hand or flow seating procedures.

SCHEDULING

Start of Test: Immediately upon acceptance of this test.

Duration of Test: Two years or until sufficient data have been collected.

REACTIVITY LOSS

None

MAINTENANCE

None

ELEVATOR TIME

Approximately one hour will be required for each 200 tubes charged.

(2) Private Communication - J. T. Baker

RESPONSIBILITY

Reactor Section: The Reactor Section will be responsible for all scheduling and data collection as well as the operational safety and production continuity of the pile.

Pile Engineering Sub-Section: Pile Engineering personnel will correlate the data and issue all reports.

A. E. Arneson

Mechanical Equipment
Development Unit
Pile Technology Section
ENGINEERING DEPARTMENT

F. W. Van Wormer

Process Technology Unit
Pile Technology Section
ENGINEERING DEPARTMENT

O Arneson:FW VanWormer:pjh