**Cover Sheet for a Hanford
Historical Document
Released for Public Availability**

Released 1994

**Prepared for the U.S. Department of Energy
under Contract DE-AC06-76RLO 1830**

**Pacific Northwest Laboratory
Operated for the U.S. Department of Energy
by Battelle Memorial Institute**

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

DISCLAIMER

This is a **historical document** that is being released for public availability. This was made from the best available copy. Neither the United States Government nor any agency thereof, nor Battelle Memorial Institute, 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.** The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

HW-78596

SERIES AND COPY NO.

GENERAL ELECTRIC

REFLAPS

HANFORD ATOMIC PRODUCTS OPERATION - RICHLAND, WASHINGTON

August 9, 1963

X

THIS DOCUMENT CONTAINS RESTRICTED DATA AS
DEFINED IN THE ENERGY ACT OF 1954,
ITS TRANSFER BY ANY MEANS OF ITS
CONTENTS BY ANY MANNER IS PROHIBITED.

TITLE

TRITIUM PRODUCTION
HORIZONTAL CONTROL RODS

AUTHOR

H. W. Heacock
Design Engineering

RECEIVED THE AREA
AUG 19 1963
RETURN TO
TECHNICAL INFORMATION FILES

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.

THIS DOCUMENT MUST NOT BE LOST, UNTRACKED OR WERE AN UNAUTHORIZED PERSON MAY HAVE ACCESS TO IT. WHEN NOT IN USE, IT IS TO BE STORED IN AN APPROVED LOCKED RECEPTACLE WITHIN AN APPROVED GUARDED AREA. WHILE IN YOUR POSSESSION, UNTIL I HAVE OBTAINED A SIGNED RECEIPT FROM CLASSIFIED FILE. IT IS YOUR RESPONSIBILITY TO KEEP IT AND ITS CONTENTS WITHIN THE LIMITS OF THIS SUBJECT MATTER. UNAUTHORIZED PERSONS ITS TRANSFERRING TO, AND STORAGE AT YOUR PLACE OF RESIDENCE IS PROHIBITED. IT IS NOT TO BE DUPLICATED. ADDITIONAL COPIES ARE REQUIRED, OBTAINED FROM THE RELAT. ISSUING OFFICE. ALL PERSONS READING THIS DOCUMENT ARE REQUESTED TO SIGN IN THE SPACE PROVIDED BELOW.

FILE NO. _____ ROUTE _____

ROUTE TO:

PAYROLL NO.

LOCATION

FILE	ROUTE	DATE
100-443888-100	100-443888-100	100-443888-100

SIGNATURE AND DATE

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

54-3000-340 (3-57)

AEC-GE RICHLAND, WASH

(CLASSIFICATION)

COLLUSION

DECLASSIFIED

-1-

HW-78596

Distribution: 1. GC Fullmer
2. DH Frieling
3. HW Heacock
4. RT Jessen
5. LW Lang
6. CA Priode
7. GE Wade
8. 300 Files
9. Record Center

Classification Cancelled and Changed To

DECLASSIFIED

By Authority of B.M. Hen

PR-24, 3-31-94

By DK Hanson, 9-15-94

Verified By Jerri Maley
4-18-94

C. A. Priode
Production Operation
1704-H Building, 100-H Area

August 9, 1963

TRITIUM PRODUCTION
HORIZONTAL CONTROL RODS

- Reference: 1. HW-75370, same subject, C. A. Priode from H. W. Heacock dated October 24, 1962.
2. HW-74706 RD, Incentive for By-Product Rods, L. W. Lang, dated August 24, 1962.

The possibility of producing small amounts of by-product tritium in selected horizontal control rods at several of the reactors has been recognized for some time. As indicated in reference 1, by-product production would be accomplished by irradiation of a lithium-aluminum alloy in replacement horizontal control rods. Following through on our previous information requests was prevented due to lack of manpower, changes in rod tip design, and changes in engineering assignments. The subject study work, however, has been reinitiated and should be carried to completion. A preliminary review of the economic incentives for the proposed program has been reported in reference 2.

Some questions exist which must be answered before any preliminary economic evaluation can be accomplished. It is requested that the following questions be forwarded to Savannah River personnel for their review:

This document contains restricted data defined in the Atomic Energy Act of 1954. Transmission of the disclosure of its contents in any form to an unauthorized person is prohibited

DECLASSIFIED

1. What is the cost per pound of a 3.1 percent lithium-aluminum alloy with the lithium enriched with Li^6 to 44.3 percent? Assume that the quantity of each order will be one ton and that the alloy will be shipped in rod form with a diameter of approximately 0.75 inch. The purity of the aluminum and the lithium will be 99.95 and 99.80 percent by weight, respectively.
2. What is considered the extraction cost per gram of tritium? This figure is to include all costs incurred for processing irradiated aluminum-clad elements from the element shipping cask to finally obtain the tritium product. Assume that 130 pounds of lithium-aluminum alloy which has been irradiated to 12 GVR will be shipped to Savannah River each month.
3. What is the maximum element size which can be processed without substantially changing the configuration of the extraction system.

It would be appreciated if we could obtain answers to these questions before August 28, 1963. If additional information is required which would aid in obtaining the requested information, we will be glad to supply it upon request.

E. Heacock / FOR

Manager, Design Engineering

HW Heacock:DHF:cl

DECLASSIFIED

DATE

FILMED

5 / 31 / 94

END