

KAPL-155

GENERAL ELECTRIC  
RESEARCH LABORATORY

DECLASSIFIED

document consists of 3 pages

Address reply to:  
Knolls Atomic Power Laboratory  
Schenectady, N. Y.

CLASSIFICATION DOWNGRADED TO ~~CONFIDENTIAL~~  
RESTRICTED DATA BY AUTHORITY OF ~~CONFIDENTIAL~~  
IN ACCORDANCE WITH AEC ANNUAL CHAPTER 346  
~~CONFIDENTIAL~~ September 25, 1950  
(Dictated September 22)

Mr. W. H. Milton, Jr.  
Room 218, Building Al-V  
KAPL

~~CONFIDENTIAL~~  
11/16/50

COMMENTS ON TRITIUM DISCUSSIONS AT HANFORD

September 18 and 19, 1950

The use of "P-10" as a code for tritium work has been compromised by the loss of a Hanford document. Hanford will suggest a new code immediately. In the body of secret documents, the word "tritium" should be used, but the code should be used in the title of secret documents (for cataloging) and, of course, in any unclassified documents.

A great deal of the KAPL tritium effort in recent weeks has been concentrated on the development of a satisfactory method for the recovery of by-product gas issuing as a waste from the present tritium extraction process at Hanford. It was believed that this by-product gas contained approximately 2 per cent of tritium and that its recovery was desirable, both for the intrinsic value of the tritium and on account of the health hazard arising from liberating it to the atmosphere. Later data indicate that this by-product gas contains certainly less than 0.5 per cent of tritium, and possibly only 0.1 per cent. In view of this, there is no economic need to recover tritium from the by-product gas, and there is little or no health physics hazard in liberating this much tritium to the atmosphere.

This meeting was called at Hanford to decide whether a new extraction building should be constructed in the 100-B Area at Hanford to provide space for stripping lines, as well as for product extraction lines, or whether the foreseeable demands for the product could be accommodated in the existing 108-B Building, which would give only a very little space for stripping equipment. It was decided that the de-emphasis on stripping would probably make it possible to get along with the present building.

DECLASSIFIED BY CG-NMP-2

SEPT. 2000 AND APPROVED FOR PUBLIC RELEASE

NAME/DATE Donald J. Brown 11-21-02

NAME/DATE R. M. Iton 12-9-02

ORG. PNNL NSAT

RESTRICTED DATA

DECLASSIFIED

~~CONFIDENTIAL~~  
CAUTION

This document contains information affecting the national defense of the United States within the meaning of the espionage laws, the transmission or the revelation of its contents in any manner to an unauthorized person is prohibited by law.

T. M. M... 71-8-03  
JOB...

KAPL Aug 95

**GENERAL ELECTRIC**

**DECLASSIFIED**

W. H. Milton, Jr.

-2-

September 25, 1950

This does not mean that the KAPL effort on a stripping process should be abandoned because there are indications that the method developed may be superior to the present method for the extraction of product and that the new method may later be substituted for the present one as a routine production method. There is, however, a definite change in emphasis and KAPL effort should be concentrated on processing the product rather than the by-product.

KAPL tritium work for the balance of this calendar year should, therefore, be on the following projects. Efficient prosecution of these projects will require maintenance of our effort at least at present level.

a. Complete development of the proposed stripping method and study of its alternate use in production. This should be done in conjunction with some design assistance from the General Engineering and Consulting Laboratory.

b. Investigate the palladium windows used in the present Hanford extraction process with the aim of improving their efficiency, reliability, and life.

c. Continue the development of improved methods for the analysis of the tritium product. In particular, KAPL should at once procure (at Hanford's expense) a mass spectrometer for use in tritium analyses. Both Los Alamos and Hanford are using a Consolidated mass spectrometer as a reference standard for the tritium product. It is not necessary that KAPL should buy a Consolidated instrument if the performance and delivery of a G.E. instrument might make it more suitable for our use. Particular attention should be paid to the possible resolution of the  $\text{He}^+$ ,  $\text{HT}$  doublet by the G.E. instrument. This would be of considerable interest, as with the Consolidated instrument these two lines have to be separated by a chemical absorption technique which may introduce complications.

d. Make a study of the production material balance for tritium; that is, is all the tritium produced recovered from the slugs.

e. Work should be continued on the present metallurgical problems.

~~CONFIDENTIAL~~

**DECLASSIFIED**

~~SECRET~~

**GENERAL ELECTRIC**

W. H. Milton, Jr.

-3-

**DECLASSIFIED**

September 25, 1950

f. A study of the diffusion of tritium through various materials of construction, especially stainless steel. Aluminum is thought to be less permeable to tritium than stainless steel, and studies should be made to determine whether aluminum can be substituted for stainless steel in various parts of the equipment.

g. A study of the equilibrium between hydrogen and tritium and between tritium and water.

h. The helium cryostat which Hanford has ordered from the A. D. Little Company will be sent to KAPL for possible use here in this program.

i. KAPL should prepare a final topical report on the use of finely divided uranium metal as a chemical pump for tritium.

j. As a negative item in the program, Hanford has no interest in possible KAPL work on isotopic separation of hydrogen and tritium.

*K. H. Kingdon*

K. H. Kingdon

KHK:dms

**Distribution:**

- 1A - W. H. Milton, Jr.
- 2A - L. L. Ferguson
- 3A - J. P. Howe
- 4A - C. Manna
- 5A - J. Marsden
- 6A - L. Tonks
- 7A - K. H. Kingdon (file)

**DECLASSIFIED**

REPRODUCED AT GOVT EXPENSE