NOTICE

**CERTAIN DATA
CONTAINED IN THIS
DOCUMENT MAY BE
DIFFICULT TO READ
IN MICROFICHE
PRODUCTS.**

HW-7-2042

RECORD CENTER FILE

File

1. ~~SECRET~~
2. ~~SECRET~~
3. ~~SECRET~~
4. ~~SECRET~~
5. ~~SECRET~~
- RECORD CENTER FILE

INV.

9-47

Date 7-28-45

Subject Final Report on Production Test No.

105-17-P' Pile Tube Lubrication

To File

From the Editor

Copy No.

CONTINUED

300

NOV 23 1992 COPY 1 OF 1

DO NOT CIRCULATE!
REFERENCE COPY ONLY.

BEFORE READING THIS DOCUMENT, SIGN AND DATE BELOW:

Chase	7/30
Richmond	7/31
Richmond	89.51

MA

INVENTORIES

JUL 3 1951

DOCUMENT

MASTER

INVENTORIES

~~101-3-195~~

DECLASSIFIED

3p

DECLASSIFIED

Copies: #1 - W. O. Simon - B. H. Mackey - 7-204
#2 - M. H. Smith - 700 File
#3 - J. H. Tilley, Wilmington 7-204
#4 - L. Squires
#5 - G. W. Cross - 800 File
#6 - Ned Northington
#7 - W. Humington
#8 - G. F. Kidder
#9 - F. H. Dinson - E. W. French -
G. A. Fries
#10 - Pink Copy
#11 - Yellow Copy

INV.

9-47

July 18, 1945

THIS DOCUMENT CONSISTS OF 4 PAGES

~~COPY 2 OF 4 COPIES, SERIES~~

FINAL REPORT ON PRODUCTION TEST NO. 106-17-P

PILE TUBE LUBRICATION

Classification Cancelled (Change to
DECLASSIFIED)

By Authority of 10-3-72

BF O'Meally

By IM Eick 10-27-92
JN Wells - 10-27-92

Prepared By

D. H. Edwards

DECLASSIFIED

DECLASSIFIED

FINAL REPORT ON PRODUCTION TEST NO. 108-17-P

PILE TUBE LUBRICATION

Introduction

Original plans did not include provisions for lubricating of the Pile tubes and slugs during the charge-discharge operation. Early work at both SHI and CMX, however, showed that there was a risk of galling tube ribs and slug surfaces unless lubrication was provided. This report describes work done in developing equipment and methods for handling and adding the lubricant.

Summary

Equipment for adding oil continuously while charging Pile tubes has been developed and is in use. The method assures adequate lubrication and requires little operating attention, thus reducing abrasion and shortening the time required for the charge-discharge operation.

Investigation

Initial work on this problem in the 100 Areas was carried out in the 100-B flow laboratory. Pushing forces required to displace a column of slugs were measured under different conditions of lubrication. The first experiments were aimed at giving the tube an initial "shot" of lubricant with the expectation that the film of oil adhering to the slugs would be permanent enough to last through the pushing period. However, this effect was not realized since the lubricant was carried away by the cooling water before pushing could be completed.

Lubrication was greatly improved by giving the tube an initial shot of lubricant plus dipping the ends of the slugs in a bucket of oil just before charging. This method was adopted and used for a number of months at both B and D Areas. The shot of lubricant was provided from 2-gallon blowlasses on the floor of the work areas. These were supplied with 20 lbs/sq.in. air pressure and were connected to the tubes to be lubricated by long rubber hoses. The lubricant used was a 50-50 mixture of water and Standard Oil Company's A-60 Soluble oil supplied under the trade name of "Calol."

This method of lubrication, while an improvement, was found to have several disadvantages. The amount of lubrication supplied was not always adequate because of the variable amount which was washed out of the charging nozzle by the cooling water. Moreover, the method required considerable manipulation by the charging crew, thus interfering with that operation. The use of buckets of oil on the elevator also was messy and made the operation somewhat hazardous. For these reasons, a better method was sought.

This better method, which was developed from flow laboratory experiments by the Technical Department, and later designed and installed by Project Engineering, is illustrated in the attached drawings.

The system is of the continuous injection type, lubricant being supplied to the tube for about two minutes prior to and during the whole time that the tube is being pushed. It is fed to the tube through a rubber hose leading to the

DECLASSIFIED

DECLASSIFIED

7-26

charging head which is attached to the tube during charging. Oil is prevented from coming out of the front face by a tight-fitting gasket in the throat of the charging head. This part of the system is described more completely in Report No. 7-2013 on Charge-Discharge Method and Equipment.

The free end of the hose attached to the charging head has a quick coupling which in use fastens to one of a row of fittings on a manifold attached to the rail of the elevator. Lubricant is forced into the manifold by a pump and motor from a 70-gallon capacity tank on the elevator. This latter equipment is supported by the elevator frame. A pressure regulating valve limits the oil pressure to a pre-set value. This value is about six pounds per sq. in. and is selected to supply 1800 cc of oil-water mixture per minute to the charging head.

A lubricant makeup tank of 470 gallons capacity on the floor of the work area contains a supply of the oil-water mixture. A quantity of this mixture sufficient to fill the elevator tank is admitted to it by gravity through a flexible hose and filling spout each time the elevator is brought to ground level for a load of slugs. The elevator tank contains enough solution to lubricate 12 tubes, which is as much metal as the elevator can carry at one time. The large makeup tank contains enough solution for an entire discharge.

Present Status

Lubrication systems, as described above, have been installed in all of the 100 Areas. They have been used at least twice at B and D, and will be used on the first discharge at 100-F.

Reference Drawings

H-1-335	Oiling Systems - Arrangement
H-1-342	Charging Machine Head - Details
H-1-346	Oiling System - Electrical

Reference Reports

Document 3-2441 - May 15, 1945 - Laboratory Evaluation of Proposed Lubricants.

G. P. KIDDER - 100 TECHNICAL

F. H. Edwards, c.e.s.
R. L. Edwards

DHR/ewc

DECLASSIFIED

DECLASSIFIED

LUBRICATION SYSTEM

DECLASSIFIED

END

DATE

FILMED

3/10/94