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HW--28171

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May 1973

BY PM Eick 10-27-92
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FINAL DETERMINATION

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BY AE Barber DATE 6-10-81

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May 25, 1953

PRODUCTION TEST NUMBER 105-522-E.
EXAMINATION OF PILE PROCESS TUBES

OBJECTIVE

The objective of this production test is to provide the authority and mechanism to remove process tubes from the piles for inspection. The test is intended to provide a more positive tube inspection program than was previously provided under Production Test Number 105-9-P, "Corrosion of Slugs and Tubes", Document Number 7-3928.

BASIS AND JUSTIFICATION

Corrosion of the inner and outer surfaces of pile process tubes has caused tube wall penetration and subsequent water leakage into the graphite moderator. This leakage has caused considerable damage to the piles, and resulted in serious production losses. Because of this development, and because of the practice of operating piles close to the limiting corrosion conditions, an urgent need has arisen to remove and examine irradiated process tubes periodically on a scheduled basis, and to use the data from them as follows:

1. To expose current operating practices and process conditions that are shortening tube life.
2. To determine expected tube life so that the most economical retubing schedule can be recommended. Because of the high cost of tube replacement, recommendations for retubing of the piles must be made on the basis of accurate and sufficient data.
3. To aid in recommending operating practice and process conditions that will extend tube life and pile safety.
4. To aid in the evaluation of materials for new pile construction.

SCHEDULE

Duration of Test: Examination of process tubing will continue as long as significant results are obtained.

Frequency of Tube Removal: Two or more tubes per pile per month.

Areas: All 100 areas.

COSTS

Cost Code: XXXX-5270-253.xx, where xx refers to Process Assistance codes.

Reactivity Loss: None. Tubes that are removed for routine examination will be those available following a normal metal discharge, those tubes which are known to be defective, or those tubes in which

ruptured slugs have caused the metal to be prematurely removed.

Maintenance: When the tube is being removed for routine examination at the request of the Pile Technology Sub-Section, approximately 30 man hours per tube for pushing and cutting and about four hours for preparation of the replacement tube.

Operations: Approximately twelve man hours per tube for operation of the elevators, and about one-half hour for special pick-up of the tube.

Elevator Time: Approximately six hours per tube.

Shutdown Time: Approximately six hours per tube.

(When the tube is being removed at the request of the Reactor Section, or on another production test, only the additional time required for identification will be charged toward this test.)

DESCRIPTIVE DETAILS

Tube Identification: Tube sections will be identified by cutting them in different lengths as specified by Technical. In the event that many tubes are being removed at the same shutdown, and there is danger of confusion, a tag will be attached to each section before it is cut off.

Procedure: Tube sections that have been cut and/or tagged will be picked up and placed in galvanized buckets, or on galvanized sheets where provided, as soon as possible to reduce the possibility of mechanical or corrosion damage in the basin. A separate bucket will be used to contain all the sections from each tube. As soon as possible after discharge the sections will be slit and examined, both before and after cleaning, either in the basin or in the 108-B examination facilities.

SPECIAL INSTRUCTIONS

Special Hazards: None.

Special Adjustments: None.

Data Desired: The Operations Sub-Section will supply the available past history of the tube, such as length of time in the pile, type of tube material, coolant history, reason for removal if not routine, etc.

Special Equipment: The device used to tag the sections as well as the tags will be supplied by the Pile Technology Sub-Section.

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RESPONSIBILITY

Reactor Section

The Reactor Section will be responsible for all scheduling and for the operational safety and production continuity of the piles.

Pile Technology Sub-Section

M. Lewis, Pile Materials Unit, Pile Technology Sub-Section will be responsible for the examination of the process tubing after removal from the piles and for the preparation of interim and final reports. T. L. Deobald and R. E. Falkoski, Pile Technology Sub-Section, will be responsible for following the 105 Building operations.

R. E. Falkoski
PILE TECHNOLOGY SUB-SECTION
ENGINEERING DEPARTMENT

RE Falkoski:mc

APPENDIX

DESCRIPTION

The process tubes will be slit, examined, defilmed and re-examined in the tube examination facilities located in the storage basins of the 105 buildings. Interesting sections as well as the tubes removed from piles where tube examination facilities do not exist will be taken to the facilities located in the 108-B building. For the transfer of the irradiated process tubes a lead cave built upon the bed of a truck is available. By means of a track, which can be rolled under the dummy elevator, a special transfer basket can be lowered into the basin. When loaded with tubing the basket can be remotely loaded into the lead cave.

PROCEDURES

Reactor - Notify Technical whenever possible, two weeks before a tube is scheduled for removal.

Technical - When a tube is to be removed on a routine basis, notify the Reactor Section two weeks in advance so that the tube may be scheduled for removal.

Technical - Supply the equipment for tagging the tube together with a sufficient number of tags. If the tube is to be identified by length of the sections, inform the Reactor Section of the sequence and lengths of the sections to be cut.

Maintenance - The tube will be replaced by pushing it to specified lengths and cutting with a guillotine.

Reactor - Pick up the tube sections from the basin floor, place them in a regular metal bucket, and hold for Technical.

POST-IRRADIATION INFORMATION

Cooling Time Before Examination or Shipment: There is no minimum cooling time.

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APPROVAL

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Date of issue June 9, 1953

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