**Cover Sheet for a Hanford
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**Pacific Northwest Laboratory
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by Battelle Memorial Institute**

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November 8, 1951

This document consists of
2 pages, [REDACTED]

To: R. H. Beaton
Chairman, Design Committee

From: C. A. Rohrmann

Subject: RDA NO. DC-7 - CAPACITY BASIS FOR INCREASING PRODUCTION FROM
REDOX - 202-S

Reference: This document formalizes the information on a proposed capacity basis presented in the Secret Rough Draft Memorandum of October 11, 1951. This capacity basis received the concurrence (undocumented) of the Development Committee in its last meeting, prior to the establishment of the Design Committee and the Working Committee.

SUMMARY:

It is proposed that the capacity basis for the subject study be for as much as 200 tons of uranium and up to 105 kilograms of plutonium per month, assuming that facilities proposed for these capacity levels will not interfere with the operating flexibility of the plant, if it is required to produce at the original rate of an average of 75 tons of uranium per month with the attendant plutonium.

DISCUSSION:

The outstanding economy of the Redox process when compared with the BiPO_4 process dictates that as much production as possible and as soon as possible should be shifted from the BiPO_4 process to Redox (202-S).

The real capacity of the Redox Plant (202-S) is unknown. The ultimate future production requirements from Hanford are also unknown. The real capacity of the plant will not be definitely known until after it operates in the next few months. It was originally designed for about 20 Kg/month. Changes instituted during construction and new decisions relating to critical mass have, it is confidently believed, increased this capacity to between two and three times the original figure. Recent testing of plant equipment has shown

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it to be capable of capacities in this range with the equivalent uranium. So it is too early to establish a firm figure for the capacity of the whole Redox operation. However, it is possible to set a goal and determine by engineering study the equipment requirements to meet the goal.

The first problem then is the establishment of a goal capacity. Ideally, the immediate goal should be the maximum capacity or at least that capacity necessary to place the BiPO₄ process on a standby basis, with sufficient excess capacity to allow for scheduled shutdowns and reasonable peak demands, taking into consideration scheduled plant expansion and plant down time required to make the equipment changes. This capacity, it is estimated, will be that required to recover the production equivalent to 3500 MW of pile capacity. At a 600 MWD/T exposure level and an overall reactor efficiency of 78 per cent this will amount to the following metal processing capacities for a separation plant:

Plutonium - Kg/month sustained or average rate = 71.2
or about 3 Kg/day instantaneous rate basis.

Uranium - Tons/month sustained or average rate = 136.4
or about 5.7 Tons/day instantaneous rate basis

Recent estimates and "water run" evaluations of the capacity of Redox equipment and piping (HDC-2270 and HW-22541) indicate that some of the facilities are capable of capacities in excess of these requirements and that those facilities of less capacity are capable of removal and replacement by the usual remote means for which the plant was designed. Those final plutonium handling facilities which are inadequate can be replaced, duplicated or extended in the available space.

The above references indicate that some facilities have capacities of about 200 tons per month. It is recognized, however, that reasonable compromises would have to be made in the operating procedures to allow attainment of such capacities in the dissolving and head-end treatment facilities.

In view of these possible capacities and anticipated future demands it is proposed to determine by test, study and observation of production equipment and operations the maximum capacity of the Redox (202-S) plant, utilizing equipment change where necessary. As an immediate goal 200 tons per month, sustained rate basis, is proposed. Since the decisions relating to whether reactor exposures should continue at the 600 MWD/T level or revert to the 420 MWD/T level are not clearly established at this time, it is accordingly proposed that the goal for plutonium processing capacity be in the range of 75 to 105 Kg per month.

THE WORKING COMMITTEE

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