Chapter 8

PROGRAM RBA: SHUTOFF RODS EXTRACTION

8.1 INTRODUCTION

The RBA module is one of the simplest of RRS. It is in charge of controlling the extraction of the 28 shutoff rods following the firing of SDS1.

For RBA, the twenty eight shutoff rods are divided into two banks. Bank 1 is made of the 14 odd numbered rods, ie rods 1,3,5,..,27. Bank 2 is composed of the 14 even numbered rods, ie rods 2,4,6,..,28.

8.2 SLOW PART AND FAST PART

RBA is executed by the slow part of RRS, every two seconds. There is no fast part in this module.

8.3 EXTRACTION INHIBIT

First, the RBA module checks that the reactor is not shutoff, neither by SDS1 or by SDS2. Thus, the cause of the shutoff must have disappeared before RBA can proceed to rod extraction.

Two other conditions must be met before rod extraction is permitted:

- The ion chamber log rate (TLOGI) as calculated by MCP must be lower than 7%/second

- The power error (ERPU) as calculated by must be lower than 0.

The shutoff rods will thus be declared inhibited as long as these two conditions are not met simultaneously.

8.4 EXTRACTION TIME

A timer is started as soon as a bank extraction is permitted. This timer is used to check that the shutoff rod bank takes less than three minutes to be fully out of core. If more than three minutes have passed since the extraction request, the bank will be declared blocked and an alarm is sent to the control room. Usually only about 140 seconds are necessary to fully remove a shutoff rod bank from the core.

8.5 EXTRACTION SEQUENCE

The shutoff rods are always removed from the core one bank at a time. Bank 1 is removed first, and bank 2 second. In this way, fast power increases do not occur.