

Regulatory

File 67

# Commonwealth Edison Company

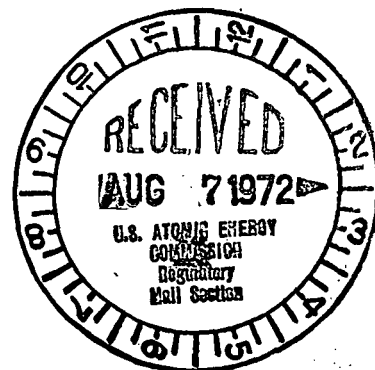
ONE FIRST NATIONAL PLAZA ★ CHICAGO, ILLINOIS

Address Reply to:

POST OFFICE BOX 767 ★ CHICAGO, ILLINOIS 60690

August 3, 1972

Mr. Donald J. Skovholt  
Assistant Director for Operating  
Reactors  
Directorate of Licensing  
U.S. Atomic Energy Commission  
Washington, D.C. 20545



Subject: Operating History of the Rod Worth  
Minimizers (RWM) for Dresden Units 2 and  
3 and Quad-Cities Units 1 and 2 - AEC  
Dkts 50-237, 50-249 and 50-254 and 50-265

Dear Mr. Skovholt:

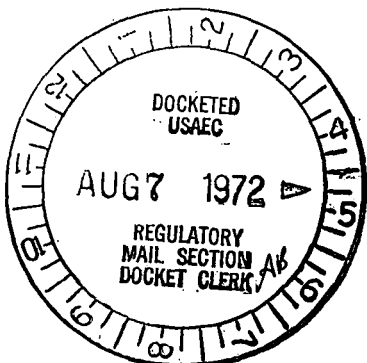
Attached is Commonwealth Edison's report on the operating history of the RWM for Dresden Units 2 and 3 and Quad-Cities Units 1 and 2. This is in response to your letter of June 16, 1972 requesting the operating history as well as plans for improvement of the operability.

Discussions are in progress with your staff on revisions to the Quad-Cities technical specification requirements for RWM operability during startup and low power operation. Agreement on these requirements is to be reached prior to the issuance of the full power license for the Quad-Cities Station. It is anticipated that once the Quad-Cities technical specifications have been modified, that similar arrangements will be made for the Dresden Station technical specifications.

In addition to one signed original, 39 copies of this report are also submitted.

Very truly yours,

L. D. Butterfield, Jr.  
Nuclear Licensing Administrator



4314  
RW

Dresden Station Units 2&3  
Quad Cities Station Units 1&2

Rod Worth Minimizer Experience

History of Operability

Taken from shift logs, check sheets, etc.

Dresden Station

	<u>RWM Logged</u> <u>Unit 2</u>	<u>Operable</u> <u>Unit 3</u>	<u>RWM Logged</u> <u>Unit 2</u>	<u>Inoperable</u> <u>Unit 3</u>	<u>No Log</u> <u>Unit 2</u>	<u>Entry</u> <u>Unit 3</u>
1970	0%	N.A.	40%	N.A.	60%***	N.A.
1971	0%	23%	32%	23%	68%***	54%***
1972	17%	15%	0%	54%	83%***	31%*

\* Probably operable  
\*\*\* Probably inoperable

Quad Cities Station

Unit 1

57 - Start-Ups  
42 - RWM operable through entire startup

Unit 2

26 - Start-Ups  
19 - RWM operable through entire startup.

Major Causes of RWM Inoperability

1. Malfunctions due to abnormal rod position information input. The rod position input circuitry will prevent RWM operation if one rod position is unknown. To maintain RWM operable in the event a rod position input is unknown a substitute rod position must be inserted into the program from the RWM console in the computer room. This substitution is limited to position 48 (fully withdrawn) and must be reinserted at the console every time a scan

- of rod position is made. The computer console must be attended constantly during startup if it is to remain operable with one unknown rod position.
2. Control rod drifting creates a condition requiring bypass of the RWM to allow continued rod movement and recovery of the RWM. Upon receiving a drift signal the RWM blocks rod movement and rescans all rod positions in an attempt to determine the current position of all rods. If the selected rod is not moved to a valid position the operator cannot recover without bypassing the RWM. Since a rod drift will initiate a rod position scan it also results in the situation described in Item 1 if substitute rod positions were inserted in the program.
  3. One abnormal rod identification input will prevent RWM operation. A rod identification error will shutdown RWM and recovery cannot be accomplished until the error signal is corrected and computer restarted.
  4. RWM computer programming or hardware malfunctions result in system shutdown and bypass.

#### Current Status of RWM Operability

It is our general position that based on the original design criteria for the RWM system its operability record can be improved; however it was not intended that the RWM be a 99% plus operable system. Significant modification of the system would be required if such high levels of operability were required. Considering the functional purpose of the RWM, this high level of operability was not intended in the design. The RWM is an operating aid to check

that the rod withdrawal sequence is in accordance with the predetermined schedule. This function can be fulfilled either by the RWM or by a second operator. The rod worth minimizer is no better than the withdrawal schedule program into the computer; therefore the RWM is no better than the man programming it and is not better than a second operator checking the rod withdrawal sequence.

#### Plans for Improving RWM Operability

1. The following changes have been made or are planned to eliminate abnormal rod position information inputs to the RWM. These modifications involve the following:
  - a. Capability for programmer to enter rod position other than 48 at the computer console. In the event of an unknown rod position, the program allows inserting the correct rod position as read from the reactor control panel and continuing startup using the RWM.
  - b. The RWM program has been changed to maintain a rod position manually inserted at the computer console, as described in (a) above. With this change the manually inserted rod position will remain in the program until a position input scan signal replaces it with a valid rod position.
  - c. Further modification to allow manually inserting rod positions from the main control room is being evaluated presently. With this modification rod positions could be manually inserted by the reactor operator allowing continued use of the RWM for startup without delays presently involved to

- manually insert rod positions in the computer room. The evaluation is scheduled to be completed by September 1, 1972. The schedule to complete installation is not yet defined.
2. The most common reason for bypassing the RWM during startup has been erroneous rod drift inputs to the RWM resulting in unscheduled rod blocks. This deficiency has been corrected by installing a time delay in the rod drift input circuitry thus eliminating spurious inputs due to relay chatter.
  3. New rod select relays were installed at Dresden to eliminate abnormal rod identification inputs to the RWM. This change did not correct the deficiency and further evaluation is in progress to determine the source of the abnormal rod identification signals. It is presently scheduled to complete this evaluation by September 1, 1972. Currently rod identification is the primary cause of RWM inoperability during startup. As presently programmed the RWM computer is shut down by any abnormal rod identification input. Included in the evaluation will be consideration of reprogramming the computer to allow continued operation and rod identification scanning until the correct rod identification is received as an input.
  4. The feasibility of providing backup RWM computer capability is being studied.