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 FACIL:50-244 Robert Emmet Ginna Nuclear Plant, Unit 1, Rochester G 05000244
 AUTH.NAME AUTHOR AFFILIATION
 WIDAY,J.A. Rochester Gas & Electric Corp.
 RECIP.NAME RECIPIENT AFFILIATION
 LINVILLE,J.C. Region 1 (Post 820201)

SUBJECT: RO:on 930629,malfunction in rod control sys caused minor misalignment between control rods in Group 1 & 2 of Bank D. Cause under investigation.Control rods will be maintained in manual control & Bank D rods will be exercised daily.

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U.S. Nuclear Regulatory Commission
Region I

July 2, 1993

Attn: James C. Linville
Chief, Projects Branch No. 3
Division of Reactor Projects
475 Allendale Road
King of Prussia, PA 19406

Subject: Rod Control System Malfunction
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Linville:

As requested, Rochester Gas and Electric is transmitting a description of the activities related to the rod control system malfunction which occurred on 6/29/93. A description of the event and the troubleshooting efforts, an analysis of the impact on safety, and the interim actions to be implemented are included below.

Event Description:

On 6/29/93, a malfunction in the rod control system caused a minor misalignment between the control rods in group 1 and group 2 of bank D. Bank D group 1 was indicating 212 steps on its step counter and 216 steps on the Microprocessor Rod Position Indication system (MRPI). Bank D group 2 was indicating 209 steps on its step counter and 204 on MRPI. This caused a Rod Control Urgent Failure alarm which stopped all automatic and manual rod motion. (Bank D contains 4 rods, 2 in each group. The rods in each group are located symmetrically across the core. Group 1 contains rods C7 and K7, group 2 contains rods G3 and G11.)

The troubleshooting efforts are described in Attachment 1.

Efforts to determine the root cause are continuing.

Impact on Safety:

Technical Specifications applicability:

Tech Spec 3.10.4.1 requires the rods to be "operable and positioned within ± 12 steps of their group step counter demand position". The safety function of the control rods is to shutdown the reactor upon initiation of a reactor trip signal. Control rod movement via the rod control system is a control function and is not required for the rods to be considered operable. Standard Tech Specs defines operability for a control rod as being tripable. Therefore, as long as the rods are tripable they are operable. Both flux map traces and MRPI indicated that the rods were moving when a demand signal was present. This proves that the

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rods were not "immovable as a result of excessive friction or mechanically untripable" and therefore were operable. Since the alignment specification was also met, Tech Spec 3.10.4.1 was fully satisfied.

Tech Spec 3.10.1.1 specifies the shutdown margin that must be maintained. Tech Spec 3.10.1.3 specifies that the control rods must be maintained above the Rod Insertion Limits (RIL). The RIL for 100% power is 184 steps on Bank D. The maximum rod insertion was Bank D at 205 steps. Therefore, Tech Spec 3.10.1.3 was satisfied. Since Tavg was on program, and the rods were maintained above the RIL, the shutdown margin requirement was also met.

Based on this evaluation, the control rods were operable at all times and all Tech Specs were satisfied.

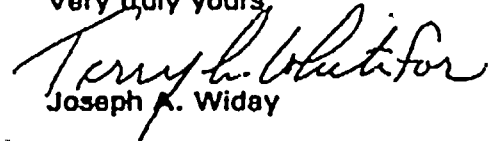
Postulated Malfunction Consequences:

The Bank D rods are maintained near the fully withdrawn position in order to maintain axial offset within its target band as required by Tech Specs. Even if uncontrolled rod withdrawal were to occur (ie. urgent failure alarm did not stop rod motion), there would be a very small positive reactivity addition since Bank D rods are in a low worth region. In addition, since the malfunction resulted in movement of a group of rods rather than a single rod, core symmetry would be maintained and the peaking factors would be less severe. This is consistent with the licensing basis for Ginna as described in UFSAR section 15.4.2, Uncontrolled RCCA Withdrawal at Power.

Interim Actions:

Until there is reasonable assurance that the cause of the rod control problem has been corrected, the following actions will be taken. The control rods will be maintained in manual control. The Bank D rods will be exercised daily to ensure the rod control system is functioning properly. The temperature, in the area of the rod control cabinets, at which ventilation will be increased has been reduced from 92 °F to 85 °F in an attempt to mitigate potential temperature related effects. This direction has been provided to Operations through the daily operations plan.

Very truly yours,


Joseph A. Widay

JPW/001
attachment

xc: Mr. Allen R. Johnson (Mail Stop 14D1)
Project Directorate I-3
Washington, D.C. 20555

U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

Ginna Senior Resident Inspector

Attachment 1

Subject: Bank D Group 1 Rod Control Problem

On June 29, 1993 at 2100 hours with the plant operating at 97.5% power and normal steady state condition a Rod Control urgent failure Rod Stop (C30) alarm was received when Control Bank "D" stepped in response to an Automatic In demand signal.

Rod Control System indication prior to and after receipt of the Rod Control Urgent Failure Alarm was as follows:

Prior: Bank D Group 1 counter at 211 steps
Group 2 counter at 210 steps

After:

- Bank D Group 1 counter at 212 steps
- Group 2 counter at 209 steps
- Urgent Alarm in Logic Cabinet
- DS1 light lit on 1BD Slave Cyclor printed circuit card location A-414 in Logic Cabinet. Light indicates a slave cyclor fault.
- Bank Overlap counter at 601 steps
- MRPI indication for Bank D Group 1 Rods (K7 and C7) was 216 steps. MPRI Indication for Bank D Group 2 Rods (G3 and G11) was 204 steps.

Ambient temperature in the vicinity of the Rod Control Cabinets was approximately 87 degrees F. at the time the problem occurred.

Troubleshooting Efforts and Results:

- Setup a Visicorder to monitor Bank D Group 1 "Lift", "Moveable", and "Stationary" Coil voltages.
- Requested Operations reset Rod Control Urgent Failure Alarm.
- Requested Operations to step Bank D "IN" one step while monitoring coil voltages with visicorder. Both Groups moved one step in and Visicorder traces of coil voltages showed proper signal sequencing.
- Requested Operations to step Bank D "IN" a few steps and "OUT" a few steps. This was repeated three times with both groups responding properly.
- Visicorder traces of coil voltages showed proper signal sequencing for both "IN" and "OUT" motion.
- Temperature in the vicinity of the Rod Control Cabinets at time of testing was 73 degrees F. Reduction in temperature caused by increased ventilation.
- Rod Control Indication at the completion of the above Rod testing was:
 - o Bank D Group 1 Counter at 212 steps
Group 2 Counter at 209 steps
 - o Bank D P/A converter at 212 steps

Per procedure guidance Operations realigned Bank D Group 1 rods with Bank D Group 2 rods at 209 steps, verified P/A converter Bank D indication was at 209 steps, and had I&C position Bank overlap counter at 599 steps.

- Operations satisfactorily performed procedure PT-1 (Rod Control System) which verified operability of all control rods.

On June 30, 1993, analysis of the problem continued. Contact was made with Westinghouse to inform them of our problem and to also obtain their assistance. After several conversations and a lot of research the final consensus was that the supervisory Logic II printed circuit was the most probable cause of the problem. The supervisory Logic II card provides (1) A Buffer Memory Control Circuit which accepts input commands, (2) Feeds the Master Cyclor which generates the "Go" pulses for rod movement, (3) Feeds the Bank Overlap Circuit for data logging and (4) Outputs to the Slave Cyclor which generates current orders for Rod Movement.

Operations performed procedure PT-1 (Rod Control System) procedure to verify operability of all control rods. During the performance of procedure PT-1, I&C personnel obtained recordings of the voltages for Group Counter Coils while stepping the Group Counters for "IN" and "OUT" movements to ensure that high voltage spikes were not being fed back into the Logic Cabinet (as was experienced at Salem). All voltages were normal which proved the diodes across the Group Counter coils were performing their intended function.

RG&E and Westinghouse were satisfied that Ginna does not have the same problem as Salem; because (1) Salem's problem affected only one Rod Cluster where Ginna's affected the whole group, (2) Salem didn't receive an urgent failure alarm, (3) Salem's problem persisted while Ginna's Problem occurred only once, and (4) Salem's problem was the Slave Cyclor Decoder Card where Ginna's problem is upstream in that logic.

On July 1, 1993, the supervisory Logic II printed Circuit Card was replaced and Operations successfully completed procedure PT-1 (Rod Control System) for proving operability of all control rods.

