U. S. NUCLEAR REGULATORY COMMISSION
REGION I

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LICENSEE: Rochester Gas and Electric Company

FACILITY: R. E. Ginna Nuclear Power Station
Ontario, New York

DATES: April 11-22, 1994

INSPECTOR: Paul Bissett, Senior Operations Engineer
BWR & PWR Sections
Division of Reactor Safety

5/20/94
Date

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BWR & PWR Sections
Division of Reactor Safety

5/24/94
Date

EXECUTIVE SUMMARY

BACKGROUND

From April 11-22, 1994, the NRC observed daily operations during the startup of the R. E. Ginna Nuclear Power Station following the completion of a scheduled refueling outage. During this time period, observation and subsequent evaluations were performed in the areas of operations, maintenance, surveillance and quality assurance. Particular attention was paid to the manner in which operations coordinated their efforts with other departments in the ascension from cold shutdown to full power operations.

OPERATIONS

The inspector concluded that operational activities were well controlled and coordinated with appropriate departments in all instances during those startup evolutions observed. Also, the inspector noted that all prerequisites were completed prior to progressing to the next applicable power level plateau. In several instances, equipment problems forced delays in the planned startup schedule; however, appropriate reviews and consultations were held by operations and other appropriate departmental personnel to determine exactly what the problem was; the effect on the scheduled startup; and, what exactly had to be done to correct the problem. These systematic evaluations of unforeseen problems were addressed, and subsequently executed such that eventually, the operators were able to continue with the startup. The inspector found that command and control of control room activities to be effectively managed during several days of routine observations. Licensed operators focused in on their assigned responsibilities and senior licensed operators were aware of the status of the plant, including ongoing testing activities, and equipment operability. It was noted that thorough turnovers and briefings were conducted during shift changes and/or testing evolutions.

The training of licensed operators was excellent, as judged by the inspector, based upon lesson plan reviews and discussions with personnel. Specific emphasis was placed on reactor startup controls and was implemented both in the classroom and on the simulator. Also, this training was applied to all operating shifts, which had not been the case during past refueling outages.

MAINTENANCE

Several maintenance and testing activities were observed during the inspection and were judged by the inspector to have been completed in a conservative, conscientious and well

controlled manner. Corrective maintenance problems affecting the scheduled startup were thoroughly evaluated and approached with caution. Also, the root causes of several problems were applied to similar pieces of equipment in order to evaluate their present and future operability status.

ENGINEERING

Engineering's presence during the evaluation of equipment problems and their subsequent support in determining corrective actions was excellent. Specific examples of their participation included the repair of the B safety injection pump and the evaluation of the A main feedwater regulating valve oscillation problem.

RADIATION CONTROL

Excellent radiation protection practices were observed during the repair of the B safety injection pump. Appropriate controls were maintained throughout the repair process and also during the subsequent testing of the pump.

DETAILS

1.0 INSPECTION SCOPE AND OBJECTIVES

An announced control room and plant observation inspection was conducted of the Rochester Gas and Electric (RG&E) Company Ginna station during the period of April 11-22, 1994. The primary purpose of the inspection was to observe and evaluate the conduct of operational activities implemented by RG&E personnel as they progressed from a shutdown condition following a scheduled refueling outage to full power operations. The scope of the inspection included direct observation of plant operations, surveillance testing, maintenance activities; reviews of applicable documentation related to activities observed; and interviews with personnel. Among the operational activities that were evaluated were the licensed operator training program, various management meetings, shift turnovers and briefings, quality control involvement and maintenance and surveillance activities in general. Maintenance and surveillance activities included equipment operability, valve line-ups, tagging and work control center activities.

2.0 OPERATIONAL ACTIVITY OBSERVATIONS

Ginna station has six rotating crews who perform NRC-licensed activities. Each crew is made up of at least four NRC-licensed individuals, a shift technical advisor, and three to four equipment operators. Over a two-week period, the inspector observed the conduct of startup and daily routine activities performed by five of these six crews. Of these five crews observed, the inspector noted that they all essentially performed that same, i.e., each crew executed daily routine activities in the same manner.

Effective morning and afternoon turnovers were witnessed by the inspector on numerous occasions. The inspector found the turnover and briefings to be effectively focused on what was important to safety. All licensed operators preparing to take the watch, performed walkdowns of the main control boards and associated nuclear control panels and instrumentation located throughout the control room. They also performed reviews of logs, system line-ups, and equipment operability and subsequently discussed with off-going personnel the status of the plant prior to assuming the watch. Shortly after the oncoming shift had relieved the offgoing shift, the shift supervisor would conduct a briefing with all members of the crew to again go over the status of the plant, testing that would by accomplished during their shift, evolutions that were accomplished on prior shifts, problems that had previously existed or still existed, etc. Incoming phone calls frequently occurred during this crew turnover briefing by the shift supervisor and were answered by either the control room foreman or one of the reactor operators. In all instances, the shift supervisor stopped his turnover briefing until the phone call was completed and he again had the undivided attention of all crew members. Subsequent to the shift supervisor's briefing, each crew member was also given the opportunity to discuss important items of interest regarding plant status or upcoming shift evolutions to other members of the crew.

The inspector also noted that the control room foreman routinely completed a 24 hour status sheet prior to shift turnover. This turnover sheet, updated every shift and distributed to all

oncoming crew personnel, provided pertinent information as to the plant status, surveillance and maintenance activities accomplished the past 24 hours, equipment out-of-service, etc. The inspector found this turnover sheet to be an effective tool in keeping the operators abreast of maintenance and testing activities that had occurred within the last 3 shifts of watchstanding.

Excellent response was taken by crew during an instance where instrument air was almost lost during a header realignment to accommodate a repair activity. It had been determined that a section of the instrument air piping was leaking and needed to be replaced. One of the equipment operators, via two-way radio contact, was told to make the valve manipulations as instructed by the control room, in order to isolate that section of piping that needed to be replaced. In their attempt to make the realignment, instrument air pressure started to rapidly drop. The control room foreman was immediately notified by the reactor operator, who in turn notified the shift supervisor. The control room foreman instructed the equipment operator to immediately return the instrument air piping back to its original alignment. Once this realignment was initiated, instrument air pressure immediately began to increase and eventually was restored to its normal operating pressure. The inspector noted that communications was excellent during the entire evolution, as evidenced by repeatbacks and notification of supervisory personnel. Had communications been lacking, instrument air may have eventually dropped low enough such that the operators would have had to trip the reactor. The operators noted that they got to within 10 psig of the setpoint that would have required this reactor trip. The inspector noted that the control room operators were very much aware of this procedural requirement.

Once all things returned to normal, the control room foreman, shift supervisor and equipment operator began to investigate why they started to lose instrument air pressure. Flow paths were traced out on control room piping and instrument drawings and discussions were held with appropriate personnel. Determining that the system lineup was appropriate for what they were attempting to do, it was concluded that the air dryer was causing a too high of a differential pressure to allow normal unimpeded air flow. This determination was based upon the fact that the air dryer desiccant had just been recently replaced.

Attempts to initially commence a reactor startup were delayed as a result of reactor coolant leakage through a flange conoseal for one of three columns that support the thermocouple assemblies. This leakage problem prevented achieving satisfactory test results from the hydrostatic test on the primary system. Also, problems with the B safety injection pump were identified, which failed a performance test, and, as a result, had to be declared inoperable. The plant was again placed into a mode of cold shutdown to repair the conoseal flange leak and replace the mechanical seal on the B SI pump, which had subsequently failed following the failure of the performance test. These problems were thoroughly evaluated by both maintenance and operations personnel to ensure that repairs were made correctly and not hastily done in order to recommence the startup.

Another problem that arose once the plant was on-line with the grid, dealt with a problem of the A feedwater regulating valve (FRV) during automatic operation. The trim (valve internals) of both FRVs had been replaced during the outage, and the operators had since noticed that A FRV had been oscillating quite excessively as a result of this modification. Consequently, the valve had been placed into manual to steady out the operation. A meeting was held with operations, maintenance, and engineering personnel to decide upon a course of action to remedy the low frequency oscillation problem. The inspector noted the excellent interaction between all departments present and felt that all possible problems causing the oscillation problem had been addressed. A course of action was chosen such that they first wanted to narrow the problem down to whether or not both valves were affected, or was it just the "A" FRV. A matrix was developed, which systematically called for the change of operation, i.e., manual to automatic, or automatic to manual, for the feedwater regulating valves and bypass valves. Following completion of this operation, the "B" FRV would be in manual and the "A" FRV would be in auto, which is just the opposite of where they started. As valve operation was changed, five-minute traces would be taken of valve position to determine if and how often the oscillations were occurring. A briefing was held with the operations crew detailing what course of action was decided upon and the purpose behind it. Contingency actions were addressed should problems with steam generator levels be encountered. The inspector witnessed the entire evolution, reviewed the valve fluctuation traces, and observed the overall control of licensed operator performance. The entire evolution was extremely well handled by all personnel involved. Analysis of the test results indicated that the oscillation problem was limited to the A FRV. The inspector was unavailable for review of subsequent corrective action(s) to correct the problem.

3.0 COMMUNICATIONS

As noted above, clear, concise communications were evident in the restoration of instrument air, thus averting a possible required manual reactor trip. This was one of many instances observed by the inspector that demonstrated an emphasis on communications. On several occasions, while observing fill and vent operations of the reactor coolant system in preparation for the startup, the inspector again observed effective communications between control room personnel and equipment operators in containment. Instructions for valve manipulations were carried out in a clear, distinct manner and repeatbacks were consistent with management expectations as prescribed in the operations communication standard. Only in one instance did the inspector determine that communications was less than desired. In this instance, a reactor coolant pump was started for a five minute run, however, no announcement of this was made over the PA system prior to the pump start. The inspector discussed this with the shift supervisor who in turn indicated that he knew that there were only two individuals in containment and they were both involved with the fill and vent operation and thus were aware of periodic reactor coolant pump starts. For this reason, he felt that it was not necessary to make an announcement each and every time a reactor coolant pump was started or stopped. The inspector stated that it still would be prudent to make the

announcement, especially from a safety standpoint, as long as there were individuals inside containment. The inspector viewed this instance as an isolated instance of less than excellent communications involving the starting of plant equipment.

4.0 MAINTENANCE ACTIVITIES -

Of particular interest was the repair to the B safety injection pump, since its inoperable status delayed the scheduled startup of the reactor plant. The inspector followed the RG&E's identification of the problem, its effect on the scheduled startup, planned and implemented corrective maintenance, rad protection concerns and corrective maintenance procedure adequacy. The inspector noted that coordination between various departments was effective, as demonstrated during interface meetings, and the eventual successful completion of repair activities.

The inspector noted that excellent root cause analysis results of "B" safety injection (SI) pump failure was also applied to A and C SI pumps for identification of any similar problems. A review of the completed SI pump work package was reviewed for completeness, including supervisory reviews, quality control hold points, signoffs, etc. Included in the work package was an analysis of cause of the problem and any applicability to the other SI pumps. RG&E determined, based upon an analysis of past performance test results, that the other two SI pumps were operationally sound and capable of performing their intended safety function.

The inspector also noted an ongoing procedure upgrade program was in progress to improve the quality of maintenance procedures. Repairs to the B SI pump were done in accordance with the approved maintenance procedure that had not yet been reviewed and upgraded. However, in parallel, an unapproved upgraded maintenance procedure scheduled to replace the one that was used was field tested by maintenance personnel during the removal and reassembly of the rotating assembly. This was done in order to identify any problems or deficiencies prior to submitting it for review and approval. This also would substantiate the correctness of the technical manual from which the procedure was developed. The inspector judged this to be an excellent opportunity to field test a yet unapproved maintenance procedure. Additionally, the inspector noted significant improvement between the old and new procedures.

The inspector judged that creation of a work control center during the outage greatly helped in the control of maintenance and testing activities. The work control center provided not only real time system status, but it also diverted much of the time and paperwork from the control room personnel to personnel who manned the work control center. Control room supervision ultimately reviewed and approved system tagouts, equipment testing and results thereof and final system restoration; however, they were not burdened with the generation of paperwork and tagging research normally associated with taking a piece of equipment out of service. This allowed the shift supervisor to devote more of his attention to operational and testing activities that were occurring both in the control room and in the plant instead of

being tied up with necessary paperwork activities. The inspector noted that control room traffic was significantly less than what might be expected just prior to a reactor startup. Also, the shift supervisor was seen quite frequently within the control room controlled area, rather than his office, which is located outside the controlled area.

Discussions were held by the inspector with work control center personnel as to their responsibilities and activities that they performed. Much of the planning for the tagging system is automated, such that, whenever a piece of equipment is to be taken out of service, the work control center can provide automatically what valves need to be tagged out and it also can tell what systems are affected. However, manual reviews are still often performed, for instance, whenever double-valve protection cannot be attained within one particular system and manual research of piping and instrument drawings (P&IDs) of associated systems are performed to determine what other valves may be utilized to provide double valve protection. Also, the work control center updated the status of systems periodically, thus enabling the control room personnel to determine if repairs or surveillance testing were complete or awaiting system operability testing.

Discussions were also held with a shift supervisor who developed and maintained the Safety Tagging and Equipment Tracking System (STETS), as described above. The shift supervisor stated that STETS together with the work control center definitely helped to minimize control room traffic and therefore helped him to maintain a more broader overview of plant operations, including systems' operability.

5.0 LICENSED OPERATOR TRAINING

Licensed operator training was well received by shift personnel and was relevant to startup operations. Discussions were held with many on-shift licensed operators to determine the quality of reactor startup training that they had received, if any, during the just completed refueling outage period. All operators indicated that they felt that the training that they received during this refueling outage, was the most worthwhile startup training they had received in quite some time. All six crews participated in this training, not just those two or three crews that management anticipated would be actually involved in the startup, as was the case during previous startups that followed refueling outages.

Discussions with training personnel indicated that the training that was given to the operators was the outcome of reviews of training session evaluations and discussions amongst operators and training personnel indicating a desire for relevant startup training. Training lesson plans were reviewed by the inspector and determined to be of particular significance in regard to startup operations. Each crew received approximately 1.5 hours of classroom training and 4.5 hours of simulator training. Also, system modifications that occurred during the past refueling outage were discussed. Modification training, in part, dealt with feedwater regulating valve trim replacement, valve status light reconfiguration, source range detector replacement, steam line radiation monitors R31 and R32 installations, etc. Finally,

applicable operational procedure changes and industry related event reports were covered. Industry event reports covered such areas as reactivity control, reactor water level control, reactor temperature control and operator awareness.

6.0 QUALITY ASSURANCE AND QUALITY CONTROL

The inspector briefly held discussions with quality control (QC) personnel to ascertain their involvement during the refueling outage and anticipated plans during the restart. The inspector noted that effective participation in plant activities had been completed or were scheduled during the restart of the reactor plant. Based upon a review of the scheduled audit activities, the inspector concluded that it was quite comprehensive and covered a wide range of activities. This coverage dealt primarily with the effectiveness of plant maintenance, modifications, testing, operations and refueling. Scheduled operation surveillances included such things as routine operations, system lineups, independent verification and communications. QC personnel were observed in the control room quite frequently performing scheduled surveillances or inspections. Several surveillance reports were reviewed, although in the draft stage, and appeared to be complete and comprehensive.

7.0 RG&E MANAGEMENT MEETINGS

The inspector frequently attended morning outage planning meetings, plant operations review committee meetings and to a lesser extent, problem solving meetings. The inspector found most of these meetings to be brief and to the point, but not so brief as to neglect the significance of the issue or issues at hand. Many important points were often brought to the attention of the person in-charge of the meeting. These items of interest were factored into many decision making resolutions. One example of this was the notification by a vendor concerning diesel generator engine cold starting. The engineering memorandum stated that above 50°F, no starting aids were required. It was decided not to immediately apply the information to the RG&E's diesel generators until additional research and followup was completed. There was some hesitation on the part of personnel present to accept the memo without some additional research, because it had been brought to their attention that the vendor had recently been taken over by another company. Personnel felt that it was prudent on their part to first verify the information before initiating any changes to current maintenance practices. The inspector also felt that this was very prudent action on their part.

8.0 SUMMARY OF NRC COMMENTS MADE AT THE EXIT MEETING

On April 22, 1994, an exit meeting was held with Mr. Marchionda and other members of the RG&E staff to discuss the above results of the inspection. The inspector noted that there were no violations identified during the course of the inspection and that operational activities observed were effective and well controlled. RG&E personnel present at the exit meeting acknowledged the inspector's findings and conclusions. A list of personnel in attendance at the exit meeting is provided below.

Rochester Gas and Electric Company:

* T. White	Operations Manager
* R. Marchionda	Superintendent, Ginna Production
* T. Plantz	Maintenance Systems Manager
* T. Schuler	Technical Manager
* J. Wayland	Lead Systems Engineer
* M. Ruby	Shift Supervisor/EOP Coordinator
* S. Adams	Superintendent Support Services
* C. Edgar	Manager Electrical/I&C Maintenance
* R. McMahon	QC Engineer-Operations
* J. St.Martin	Director Operating Experience
* R. Jaquin	Lead Engineer, Nuclear Safety & Licensing
* J. Fischer	Director, Maintenance Rule
* R. Bryan	Systems Engineer
* A. Harhay	Manager, RP & Chemistry

Nuclear Regulatory Commission:

* P. Bissett	Senior Operations Engineer/Examiner
* T. Moslak	Senior Resident Inspector

* Denotes those personnel present at the exit meeting on April 22, 1994.

Other plant, technical, and management personnel were contacted during the course of the inspection.