



## EXECUTIVE SUMMARY

### R. E. Ginna Nuclear Power Plant NRC Integrated Inspection Report 50-244/99-09

This integrated inspection included aspects of operations, engineering, maintenance, and plant support. The report covers a 6-week period of resident inspection, and it includes the results of announced inspections by regional specialists in the licensed operator requalification training and radiological environmental monitoring programs.

#### Operations

Operators responded well to a service water leak inside containment and an unexpected loss of pressurizer proportional heaters. (O2.1 and M2.1)

Overall, RG&E personnel were effectively providing training for licensed operators and evaluating their performance. The licensed operator requalification training program met regulatory requirements with no significant weaknesses identified. Program content was balanced and incorporated risk insights, and met the needs of the operators. Evaluations of simulator scenarios and job performance measures by the training department staff and operations department managers were objective and thorough. Training on plant specific and selected industry events was well prepared and presented. (O5.1)

The Nuclear Safety Audit and Review Board convened in accordance with station guidelines, and its board members provided good insights to line management and sufficiently challenged the manner in which station activities were being performed. (O7.1)

#### Maintenance

Maintenance personnel effectively repaired a leaking containment recirculation fan cooler, and a faulty pressurizer heater control cabinet. (O2.1 and M2.1)

#### Engineering

RG&E engineering personnel maintained proper controls over a permanent plant modification throughout the development, implementation, and testing stages. Maintenance activities associated with the modification were well coordinated. (E2.1)

#### Plant Support

RG&E effectively maintained and implemented the radiological environmental monitoring program. Procedures and annual reports were adequate and contract laboratory oversight was effective. RG&E effectively maintained the meteorological monitoring system operable, and properly performed channel calibrations and functional tests. (R1.1 and R1.2)

Executive Summary (cont'd)

Quality assurance personnel appropriately conducted an audit of the radiological environmental monitoring program, and the audit findings were properly acknowledged in the corrective action program. (R7.1)

## TABLE OF CONTENTS

EXECUTIVE SUMMARY .....	ii
TABLE OF CONTENTS .....	iii
Summary of Plant Status .....	1
I. Operations .....	1
O1    Conduct of Operations .....	1
O1.1    General Comments .....	1
O2    Operational Status of Facilities and Equipment .....	1
O2.1    Containment Recirculation Fan Cooler Service Water Leak .....	1
O5    Operator Training and Qualification .....	2
O5.1    Licensed Operator Requalification Training Program Evaluation .....	2
O7    Quality Assurance in Operations .....	5
O7.1    Review of Nuclear Safety Audit and Review Board Activities .....	5
II. Maintenance .....	5
M1    Conduct of Maintenance .....	5
M1.1    General Comments .....	5
M2    Maintenance and Material Condition of Facilities and Equipment .....	6
M2.1    Pressurizer Proportional Heater Failure and Repair .....	6
III. Engineering .....	7
E2    Engineering Support of Facilities and Equipment .....	7
E2.1    Permanent Plant Modifications .....	7
IV. Plant Support .....	7
R1    Radiological Protection and Chemistry (RP&C) Controls .....	7
R1.1    Implementation of the Radiological Environmental Monitoring Program .....	7
R1.2    Implementation of the Meteorological Monitoring Program .....	8
R7    Quality Assurance in Radiological Protection and Chemistry Activities .....	9
R7.1    Quality Assurance Audit Review .....	9
V. Management Meetings .....	9
X1    Exit Meeting Summary .....	9

## ATTACHMENTS

- Attachment 1 - Partial List of Persons Contacted  
- Inspection Procedures Used  
- Items Opened, Closed, and Discussed  
- List of Acronyms Used

## Report Details

### Summary of Plant Status

The plant began this inspection period at full power, and remained there throughout the end of the period.

### I. Operations

#### **O1 Conduct of Operations**

##### **O1.1 General Comments**

###### **a. Inspection Scope (71707)**

The inspectors conducted frequent observations of ongoing plant operations, including control room walkdowns, log reviews, and shift turnovers. The inspectors also conducted numerous plant tours to observe equipment operation and personnel working in the field. In general, the conduct of operations was professional and safety-conscious.

#### **O2 Operational Status of Facilities and Equipment**

##### **O2.1 Containment Recirculation Fan Cooler Service Water Leak**

###### **a. Inspection Scope (71707, 62707, 40500)**

The inspectors reviewed RG&E's response to a service water (SW) leak in the A containment recirculation fan cooler (CRFC).

###### **b. Observations and Findings**

On October 2, 1999, control room operators noted that the A containment sump pump was actuating more frequently than normal. This indicated an increased leak rate in containment. Control room operators entered the appropriate response procedure and generated an action report (99-1382). Operators determined that the leakage source was not the reactor coolant system (RCS) based on a subsequent RCS leak rate determination and no observed increase in containment radiation levels. On October 5, RG&E personnel entered the containment and discovered a pinhole leak on the A CRFC SW inlet piping. They concluded that the SW leak accounted for the additional leakage noted in containment, and generated another action report (99-1384) to document the pinhole leak.

On October 7, maintenance personnel repaired the leak. However, after the CRFC was placed back in service, another pinhole leak developed due to thermal stresses from the repair activity. On the following day, maintenance personnel successfully repaired the second leak, and operators returned the CRFC to service. As of the end of the inspection, RG&E engineering personnel were still evaluating the cause of the initial pinhole leak.

c. Conclusions

Operations and maintenance personnel effectively identified and repaired a service water leak from a containment recirculation fan cooler.

**O5 Operator Training and Qualification**

**O5.1 Licensed Operator Requalification Training Program Evaluation**

a. Inspection Scope (71001)

The inspectors evaluated the Ginna licensed operator requalification training (LORT) program during the week of October 4, 1999. The following areas were evaluated: LORT program content; written and operating test content; operating test administration; operator license activation; training feedback program effectiveness; and conformance with license conditions.

b. Observations and Findings

LORT Program Content

The inspectors reviewed the subjects covered in the 1998 and 1999 LORT cycles, including a sample of training on modifications and licensee event reports. RG&E training personnel effectively incorporated appropriate topics in their LORT program. Interviews with operators indicated that the operators were getting the training required for them to do their jobs.

Written and Operating Test Content and Administration

The inspectors reviewed the written exam and operating tests for weeks one and three of the current exam cycle. RG&E personnel followed the guidance in the examiner standards, and the scenarios were well written with excellent interrelated events.

The inspectors reviewed weekly and annual exams given during the prior two years to assess exam overlap. No excessive overlaps were noted on the written or simulator exams.

Two simulator scenarios administered to an operating shift crew were observed. The crew's performance on the simulator was good, and their communications were generally good. Crew members corrected each other's verbal mistakes when made.

The simulator evaluation group consisted of management personnel from both the training and operations departments, in addition to four training instructors. The evaluators worked well together and did a good job in identifying competencies and deficiencies displayed during the two scenarios. The evaluators' debriefs accurately addressed major strengths and weaknesses of the evaluated operators.

The inspectors observed the administration of several simulator and in-plant job performance measures (JPM). In general, the evaluators did a good job. One problem was noted during an in-plant JPM when three of four operators inadvertently stepped backwards into a taped off contaminated area around a pump. The evaluator did not correct these individuals until prompted by the inspectors. This issue was entered into the corrective action program.

### Training Feedback

By interviewing operators and reviewing training feedback records, the inspectors determined that the feedback process was effective in capturing operator concerns and providing timely resolution. A feedback mechanism, using "trouble cards," strengthened the validity of written exam questions. The inspectors witnessed the use of this system during a post exam debrief. Operators submitted "trouble cards" regarding concerns or problems with three exam questions.

The inspector reviewed the plant's operating history since the last LORT program inspection and selected two events used for training. The first event was an inadvertent pressurizer power operated relief valve (PORV) lift, and the second was an operator burn injury during boric acid mixing. The inspectors also reviewed lesson plans for three industry events.

In the PORV lift event, maintenance had been performed on the pressurizer pressure controller and the crew believed that the plant process computer system (PPCS) high pressure alarms were due to system restoration after maintenance. The crew failed to notice actual system pressure increasing until a PORV lifted. Training on this event included on-shift crew briefs by the head control operator involved, discussions during plant-event briefs, and a simulator presentation of the event incorporating a plant modification that provides an alarm prior to a PORV lifting. Operators recalled receiving this training when questioned in interviews. Additionally, the simulator evaluators placed more emphasis on monitoring PPCS alarms. An example of this was observed during the simulator scenarios conducted during this inspection.

Training on the operator burn event was presented by the operations manager. This training was observed and critiqued by another instructor. Additional training material was being prepared for non-licensed operator training regarding this event.

The industry events were selected by the operations manager and the operations training manager. Lesson plans were developed by contacting the facility involved for additional information. The industry events covered a valve misalignment and resin intrusion event at Davis Besse, a cracked control rod drive mechanism event at Prairie Island, and a reactivity mismanagement event at Susquehanna. These lesson plans were well prepared, detailed, and contained comparisons to Ginna and questions concerning the event for the students.

### Risk Insights

The inspectors reviewed Ginna's probabilistic safety assessment (PSA) and its use in developing training and exam materials. One operations training instructor had a collateral duty of ensuring that human errors with a high or moderate risk achievement worth were being evaluated in some manner. The majority were evaluated in scenario critical tasks, and the others were evaluated in JPMs. The inspectors reviewed the scenario bank and noted that all major events identified as significant contributors to core damage frequency were addressed. One system identified as risk significant in the PSA, but not included in scenario failures, was DC electrical power. The facility stated that this was due to limitations in the simulator model; the inspector verified that loss of DC power was covered in a classroom lesson plan.

### Compliance with License Conditions

A review of records and discussions with licensee personnel found that the licensee was meeting the requirements of:

- a. 10 CFR 55.53 for maintaining active operator licenses
- b. 10 CFR 55.21 for medical examinations of operators
- c. 10 CFR 55.59 for operator participation in the LORT program

The inspectors found the records for the above requirements to be complete, up-to-date, and well maintained.

### Activation of Inactive Operator Licenses

RG&E personnel complied with rules and regulations, as reflected in their internal guidelines, regarding the activation of inactive operator licenses. One senior reactor operator license and one refueling license were activated within the last year. On-shift time requirements, including reviews of applicable procedures, were met and were appropriately documented for these two license activations.

### c. Conclusions

Overall, RG&E personnel were effectively providing training for licensed operators and evaluating their performance. The licensed operator requalification training program met regulatory requirements with no significant weaknesses identified. Program content was balanced and incorporated risk insights, and met the needs of the operators. Evaluations of simulator scenarios and job performance measures by the training department staff and operations department managers were objective and thorough. Training on plant specific and selected industry events was well prepared and presented.

## **O7 Quality Assurance in Operations**

### **O7.1 Review of Nuclear Safety Audit and Review Board Activities**

#### **a. Inspection Scope (71707)**

The inspectors attended an October 14, 1999 meeting of the Nuclear Safety Audit and Review Board (NSARB) to identify the issues being reviewed and to evaluate the board's focus on nuclear safety.

#### **b. Observations and Findings**

Board members were well prepared for the discussion topics, which included recent plant performance, event reports, and quality assurance (QA) audit findings. Each member actively participated in the discussions and presented thought-provoking questions to RG&E's management team. For example, the NSARB questioned the extent of corrective actions for several plant equipment issues, including a recent problem involving the control room emergency air treatment system. The board also thoroughly scrutinized several QA audit reports, and provided insightful feedback. The inspectors verified that the NSARB's composition was in accordance with the station's QA program.

#### **c. Conclusions**

The Nuclear Safety Audit and Review Board convened in accordance with station guidelines, and its board members provided good insights to line management and sufficiently challenged the manner in which station activities were being performed.

## **II. Maintenance**

### **M1 Conduct of Maintenance**

#### **M1.1 General Comments**

##### **a. Inspection Scope (61726, 62707)**

The inspectors watched all or portions of the following maintenance and surveillance activities:

WO 19901658, control room toxic gas monitor upgrade  
 WO 19901763, B RHR pump discharge pressure instrument calibration  
 WO 19902364, flush emergency diesel generator B jacket water cooler  
 WO 19903036, service water motor operated valve thermal overload replacement  
 WO 19903793, governor linkage adjustment emergency diesel generator A  
 WO 19903954, pressurizer proportional heater amp reading discrepancy  
 PT-12.1, emergency diesel generator A  
 PT-12.2, emergency diesel generator B

b. Observations, Findings, and Conclusions

The inspectors observed that RG&E personnel effectively performed the above stated maintenance and surveillance activities in accordance with approved procedures and station requirements.

**M2 Maintenance and Material Condition of Facilities and Equipment**

**M2.1 Pressurizer Proportional Heater Failure and Repair**

a. Inspection Scope (62707, 71707, 40500)

The inspectors reviewed RG&E's response to an unexpected loss of the pressurizer proportional heaters.

b. Observations and Findings

On October 21, 1999, control room operators noted a decreasing trend in pressurizer pressure on the plant process computer system (PPCS). Operations personnel noted that the proportional heaters were in demand to be energized. An auxiliary operator was dispatched to the pressurizer heater control cabinet and discovered that two of the three phase currents for the proportional heaters were abnormal. Control room operators manually energized the backup heaters to maintain pressurizer pressure, and generated an action report (99-1446) to document and determine the cause of the problem.

Electrical maintenance personnel performed troubleshooting on the proportional heater control circuit and found that several silicon control rectifiers (SCR) had failed. This also caused their associated fuses to blow. Maintenance personnel replaced the faulted SCRs and their blown fuses, and the proportional heaters were subsequently returned to service. On October 25, another proportional heater phase current abnormality occurred during testing on the heater control cabinet. Control room operators again maintained pressurizer pressure using the backup heaters, and generated another action report (99-1462). Further troubleshooting revealed two faulted resistors in the affected phase. Maintenance personnel replaced the failed resistors along with several other components as a precautionary measure due to component aging concerns. The inspectors determined that RG&E's long term corrective actions include a plant modification to have the heater control cabinet replaced during the next refueling outage.

c. Conclusions

Operations personnel responded well to an unexpected loss of the pressurizer proportional heaters, and maintenance personnel effectively troubleshot and repaired the problem. RG&E's plan to replace the proportional heater control cabinet during the next refueling outage was a good initiative.

### **III. Engineering**

#### **E2 Engineering Support of Facilities and Equipment**

##### **E2.1 Permanent Plant Modifications**

###### **a. Inspection Scope (37551, 62707)**

The inspectors reviewed RGE's control of a permanent plant modification involving the replacement of undersized thermal overload heaters for several service water valve motor operators. The inspectors used procedure IP-DES-2, "Plant Change Process," as a reference.

###### **b. Observations and Findings**

RG&E engineering personnel developed plant change record (PCR) 99-057, "Motor Control Center D Thermal Overload Heater Replacement," in accordance with IP-DES-2. The inspectors found PCR 99-057 to be technically adequate to support the design change. RG&E personnel appropriately evaluated the modification to ensure that applicable design criteria were satisfied and that related documents were updated. The inspectors also observed field work and post-maintenance testing associated with the modification. RG&E personnel exercised appropriate maintenance controls, including equipment tagouts and technical specification action statement requirements. The inspectors determined that the specified post-maintenance testing adequately verified the modification's intended performance and equipment operability.

###### **c. Conclusions**

RG&E engineering personnel maintained proper controls over a permanent plant modification throughout the development, implementation, and testing stages. Maintenance activities associated with the modification were well coordinated.

### **IV. Plant Support**

#### **R1 Radiological Protection and Chemistry (RP&C) Controls**

##### **R1.1 Implementation of the Radiological Environmental Monitoring Program**

###### **a. Inspection Scope (84750)**

The following areas of the radiological environmental monitoring program (REMP) were reviewed and assessed:

- Offsite dose calculation manual (ODCM)
- Technical specifications (Sections 5.4.1 and 5.5)
- Selected sampling and analysis procedures
- Selected sampling techniques

- Analytical data from January to September 1999
- 1998 annual radiological environmental operating report
- Operability and calibration of air samplers
- 1998 and 1999 land use census results
- Interlaboratory comparison program results from June 1998 to September 1999

b. Observations and Findings

The REMP procedures provided appropriate guidance for performing environmental sampling and analysis required by the ODCM. Environmental sample collection techniques were appropriate. Air sampling equipment and water compositors were operable, and equipment calibrations were performed within the required frequencies with satisfactory results. RG&E implemented the land use census according to ODCM requirements.

Descriptions of produce and fish sample locations in the ODCM were not specific and not clearly described in the implementation procedures. General descriptions were used instead of precise locations like those used for other samples (e.g., air and milk). Nonetheless, RG&E personnel were collecting the required samples at specific locations.

The 1998 annual radiological environmental operating report was adequate. However, the inspectors noted that tritium analysis results were inadvertently omitted from the "Summary of Results" table in this and previous annual reports.

RG&E maintained a quality assurance program for the REMP, which included oversight of the J. A. FitzPatrick Environmental Laboratory's quality control and interlaboratory comparison programs. This ensured that the contract laboratory's analytical quality was consistent with RG&E standards.

c. Conclusion

RG&E effectively maintained and implemented the radiological environmental monitoring program. Procedures and annual reports were adequate and contract laboratory oversight was effective.

R1.2 Implementation of the Meteorological Monitoring Program

a. Inspection Scope (84750)

The following areas of the meteorological monitoring program (MMP) were reviewed and assessed:

- Status of meteorological instrumentation
- System operability
- Channel calibration and functional test procedures and results from June 1998 to September 1999

b. Observations and Findings

Channel calibrations, checks, and functional tests were performed within the required frequencies. Wind speed, direction, and temperature sensors on the meteorological towers were operable. The associated procedures provided appropriate guidance to perform channel calibrations and functional tests.

c. Conclusion

RG&E effectively maintained the meteorological monitoring system operable, and properly performed channel calibrations and functional tests.

**R7 Quality Assurance in Radiological Protection and Chemistry Activities**

**R7.1 Quality Assurance Audit Review**

a. Inspection Scope (84750-2)

The inspector reviewed the most recent radiological environmental monitoring program (REMP) quality assurance (QA) audit report and discussed its results with cognizant personnel.

b. Observations and Findings

The REMP included an annual QA audit. The most recent audit of the REMP and offsite dose calculation manual was conducted in January 1999. Audit findings and program deficiencies were entered into the corrective action program as action reports.

c. Conclusion

Quality assurance personnel appropriately conducted an audit of the radiological environmental monitoring program, and the audit findings were properly acknowledged in the corrective action program.

**V. Management Meetings**

**X1 Exit Meeting Summary**

After the inspection was concluded, the inspectors presented the results to members of licensee management on November 2, 1999. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT I

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Widay	VP, Plant Manager
T. Alexander	Operational Review Manager
P. Bamford	Reactor Engineering Manager
T. Delorey	Quality Assurance
G. Graus	I&C/Electrical Maintenance Manager
G. Hermes	Acting Primary Systems Engineering Manager
J. Hotchkiss	Mechanical Maintenance Manager
G. Jones	Radiochemist
G. Joss	Results and Test Supervisor
N. Leoni	Quality Assessment Coordinator
M. Lilley	Quality Assurance Manager
R. Marchionda	Nuclear Assessment Manager
T. Marlow	Nuclear Engineering Services Manager
F. Mis	Principal Health Physicist
J. Pacher	Electrical Systems Engineering Manager
T. Plantz	Maintenance Systems Manager
R. Ploof	Secondary Systems Engineering Manager
P. Polfleit	Emergency Preparedness Manager
R. Popp	Production Superintendent
J. Smith	Maintenance Superintendent
W. Thomson	Radiological Protection & Chemistry Manager
J. Wayland	Scheduling Manager
T. White	Operations Manager
G. Wrobel	Nuclear Safety & Licensing Manager

**INSPECTION PROCEDURES USED**

- IP 37551: Onsite Engineering
- IP 40500: Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
- IP 61726: Surveillance Observation
- IP 62707: Maintenance Observation
- IP 71707: Plant Operations
- IP 71750: Plant Support
- IP 84750: Radioactive Waste Treatment, and Effluent and Environmental Monitoring

**ITEMS OPENED, CLOSED, AND DISCUSSED**

None

## LIST OF ACRONYMS USED

CRFC	Containment Recirculation Fan Cooler
CFR	Code of Federal Regulations
DC	Direct Current
EDG	Emergency Diesel Generator
JPM	Job Performance Measure
LORT	Licensed Operator Requalification Training
MMP	Meteorological Monitoring Program
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
NSARB	Nuclear Safety Audit and Review Board
ODCM	Offsite Dose Calculation Manual
PCR	Plant Change Record
PDR	Public Document Room
PORV	Power Operated Relief Valve
PPCS	Plant Process Computer System
PSA	Probabilistic Safety Assessment
PT	Periodic Test
QA	Quality Assurance
RCS	Reactor Coolant System
REMP	Radiological Environmental Monitoring Program
RG&E	Rochester Gas and Electric Corporation
RHR	Residual Heat Removal
RP&C	Radiological Protection and Chemistry
SCR	Silicon Control Rectifier
SW	Service Water
WO	Work Order