

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos. 50-454; 50-455
License Nos: NPF-37; NPF-66

Report No: 50-454/99015(DRS); 50-455/99015(DRS)

Licensee: Commonwealth Edison Company (ComEd)

Facility: Byron Generating Station, Units 1 and 2

Location: 4450 N. German Church Road
Byron, IL 61010

Dates: August 24-26, 1999

Inspectors: J. Foster, Sr. Emergency Preparedness Analyst
R. Jickling, Emergency Preparedness Analyst
D. Funk, Emergency Preparedness Analyst
B. Kemker, Resident Inspector

Approved by: Gary L. Shear, Chief, Plant Support Branch
Division of Reactor Safety

9909130162 990908
PDR ADOCK 05000454
G PDR

EXECUTIVE SUMMARY

Byron Generating Station Units 1 and 2
NRC Inspection Report 50-454/99015(DRS); 50-455/99015(DRS)

This inspection consisted of evaluating the licensee performance during an exercise of the Emergency Plan. It was conducted by three regional inspectors and a Resident Inspector. No violations of NRC requirements were identified.

Plant Support

- Overall licensee performance during the 1999 Emergency Plan exercise was very good and performance in the Emergency Operations Facility was excellent. (Section P4.1.c).
- Performance in the Simulator Control Room was effective. (Section P4.1.c)
- The Technical Support Center staff's overall performance was excellent. (Section P4.1.c)
- Overall performance of Operational Support Center management and staff was good. (Section P4.1.c)
- Self-critiques following termination of the exercise were thorough and in close agreement with the majority of the inspectors' observations. Licensee critique findings were consistent with the NRC evaluation team's findings. (Section P4.1.c)

Report Details

IV. Plant Support

P3 Emergency Preparedness Procedures and Documentation

P3.1 Review of Exercise Objectives and Scenario (82302)

The inspectors reviewed the 1999 exercise's objectives and scenario and determined that the exercise would acceptably test major elements of the licensee's emergency plan. The scenario provided a very challenging framework to support demonstration of the licensee's capabilities to implement its emergency plan. The scenario included a radiological release and several equipment failures.

P4 Staff Knowledge and Performance in Emergency Preparedness

P4.1 1999 Evaluated Biennial Emergency Preparedness Exercise

a. Inspection Scope (82301)

Appendix E to 10 Code of Federal Regulations (CFR) Part 50 requires that power reactor licensees conduct biennial exercises that involve participation by offsite authorities. On August 25, 1999, the licensee conducted a biennial exercise involving partial participation by the State of Illinois, and full participation by Ogle County responders. This exercise was conducted to test major portions of the licensee's onsite and offsite emergency response capabilities. Onsite and offsite emergency response organizations and emergency response facilities were activated.

The inspectors evaluated performance in the following emergency response facilities:

- Simulator Control Room (SCR)
- Technical Support Center (TSC)
- Operational Support Center (OSC)
- Emergency Operations Facility (EOF)

The inspectors assessed the licensee's recognition of abnormal plant conditions, classification of emergency conditions, notification of offsite agencies, development of protective action recommendations, command-and-control, the transfer of emergency responsibilities between facilities, communications, and the overall implementation of the emergency plan. In addition, the inspectors attended the post-exercise critiques in each of the above facilities to evaluate the licensee's initial self-assessment of exercise performance.

b. Emergency Response Facility Observations and Findings

b.1 Control Room Simulator

Exercise performance of shift personnel in the control room simulator was effective. Operators effectively controlled and stabilized plant parameters, utilizing the appropriate alarm and emergency response procedures. The shift manager and Unit 1 Senior Reactor Operator (SRO) demonstrated strong command and control throughout the exercise event. The Shift Technical Advisor and Unit 2 SRO were effectively utilized to assist the Unit 1 SRO.

Communications were generally a strength. Routine briefings provided necessary information to operations personnel and were appropriate in scope and duration. The inspectors noted that on at least two occasions, proper use of three-way "repeat back" communications prevented operators from potentially acting on incorrect information. The inspectors also noted, however, that three-way communications were not consistently utilized during later portions of the exercise. Radio communications were often difficult to understand because of poor quality transmissions. Communications between communicators in the control room simulator and the Technical Support Center (TSC) were dependable.

The shift manager correctly classified events at the Unusual Event and Alert levels in a timely manner. Event notification message forms and verbal notifications to the State and NRC were completed in sufficient detail and well within required time limits. Transfer of command and control of emergency responsibilities from the control room simulator to the TSC was completed smoothly.

The Unit 2 SRO made a very early assessment of a containment release based upon a slight containment building pressure decrease. When the actual release occurred, the control room staff readily identified it.

Operators diligently monitored the control panels following the loss of annunciators. A reactor operator promptly identified that the 1A centrifugal charging pump tripped by noting the trip indicating lamp. However, operators could have made better use of the alarm printout to monitor alarm conditions during the time that the annunciators were out of service. Operators were slow to recognize that the 1CC0685 valve failed closed isolating component cooling water flow to the thermal barrier heat exchangers. The condition was not recognized until 15 minutes after the valve failed and upon return of the annunciators to service, which prompted operators to walkdown the control panels to evaluate alarming annunciators.

b.2 Technical Support Center

Overall performance in the TSC was excellent. Personnel were focused on their emergency response, and teamwork and communications were very good. The TSC staff promptly staffed and activated in an orderly manner following the Alert declaration. Transfers of command and control of event response to and from the TSC's Station Director (SD) were done in a timely and well coordinated manner and effectively utilized

the turnover briefing form. The SD made good use of TSC staff and ensured the staff was informed of the current status of communications and forthcoming notifications. An Assistant SD provided excellent support to the SD.

Briefings of the TSC staff were effectively and efficiently performed by utilizing a cordless microphone circulated among the directors. Those periodic briefings kept all TSC personnel well informed of changing plant conditions, major decisions and revised plant priorities. The initial briefing conducted by the SD was especially effective in providing the proper focus for the TSC staff and assigning specific responsibilities to key individuals.

Status boards were effectively used to accurately display information on major events, key decisions, current priorities and the status of in-plant team activities. Status board information served as a good backup information source to the verbal briefings.

The Operations and Technical directors were pro-active in tracking plant conditions and comparing emergency action levels for possible event paths leading to potential emergency classification upgrades. Tasks and priorities were effectively identified for OSC repair teams by the Maintenance, Operations, Technical, and Radiation Protection Directors and quickly communicated to the OSC.

Individuals assigned to participate as the "mock NRC" site team could have been better integrated into TSC activities. These individuals arrived and immediately began to interact with TSC personnel before being briefed and introduced. After TSC staff recognized that the mock NRC team was present they were appropriately briefed by the Assistant SD and introduced during the next facility briefing.

Simulated dose rates in the TSC were monitored. The SD and Radiation Protection Director kept TSC staff adequately informed of the TSC's simulated radiation levels. A radiation protection technician was observed conducting habitability monitoring every 30 minutes after elevated radiation levels were identified.

Two offsite radiation survey teams were activated following the Alert declaration. Their initial deployment strategy was reasonable. The TSC kept command and control of these teams until an expanded EOF activation was accomplished at the Site Area Emergency classification. The TSC then appropriately completed transfer of command and control of these radiation survey teams to the EOF, monitored the communications between these teams and the EOF and continued to compare survey data in case a discrepancy in data was observed.

b.3 Operational Support Center and Emergency Response Teams

The overall performance by OSC personnel was good. Personnel were professional and focused on their emergency response. The OSC activation was rapid and efficient. The facility was fully staffed and operational within 30 minutes after the Alert declaration. The TSC's staff was promptly notified when OSC personnel were ready to accept assignments. The inspector noted, however, that plant announcements for the emergency and facility activations were not heard in the OSC.

The OSC Director provided good command and control of the facility and personnel. Facility briefings were periodic and concise. However, some personnel in the facility were not attentive to the briefings as discussions and phone conversations continued as the OSC Director and OSC Supervisor provided updates to the staff. Also, it was noted that when the OSC Supervisor and RP Director spoke during some of the initial facility briefings, some information could not be heard in all locations of the OSC.

Status boards were continuously maintained and included indication of the TSC's priority assigned to the plant response teams. Team personnel's information was effectively transferred from the OSC Staffing board to the Team Tracking Status Board which provided a good means of tracking personnel availability. The teams' deployment times and results were promptly communicated to TSC staff. One ad hoc flip chart was used to track emergency events. The Station Priority Log was available and used in the OSC. The Station Priority Log's wall projected information was not focused tightly and was difficult to read from certain locations in the facility; the screen saver activated periodically, resulting in a black screen.

Personnel selected for response teams were adequately briefed prior to dispatch. During the emergency hatch repair team briefing, team members were checked to verify whether they were qualified to use respirators. The Security Guard appropriately identified that he was not qualified to wear a respirator. Respiratory protection equipment requirements were later removed for the emergency hatch leak repair team when dose estimates were performed. The requirement for full protective clothing was retained.

OSC habitability monitoring, which included dose rates, contamination, and airborne surveys, was periodically performed. A step off pad was conservatively set up at the OSC entrance in the event of an unmonitored radiological release. Later in the exercise, participants appropriately determined whether issuance of potassium iodide to environmental teams and an OSC response team was warranted.

The inspector accompanied two OSC response teams. A plant survey team was requested to survey the Turbine Building after the General Emergency was declared. The radiation protection technician (RPT) accompanying the team was professional, demonstrated effective radiation practices, and demonstrated appropriate exercise drillsmanship.

The unit one emergency hatch inspection/repair teams requested dispatch from the OSC was delayed more than one hour and 27 minutes while the licensee evaluated the emergency conditions and the team prepared to respond. A radiological release to the environment was thought to be from a leaking emergency hatch on unit one containment. An "urgent" priority team was requested at approximately 11:37 a.m. to inspect and later, at 12:30 p.m., to repair the suspected leaking emergency hatch. At 1:04 p.m., the exercise objectives had been met, the exercise was terminated, and the emergency hatch repair team was not yet fully prepared for dispatch. The licensee's evaluation of the process to request, prepare, brief, and dispatch "urgent" OSC response teams will be tracked as an Inspection Followup Item (IFI 50-454/99015-01; 455/99015-01).

b.4 Emergency Operations Facility

Overall performance of the Emergency Operations Facility (EOF) staff was excellent. The facility was efficiently activated and assigned personnel performed their duties effectively throughout the exercise.

Procedures and associated checklists were observed to be extensively used. Status boards were generally well maintained, with few exceptions. Periodic and as-needed briefings kept the EOF staff aware of current status and concerns. Turnover of command and control from the TSC was smoothly accomplished. Availability of a former Byron SRO appeared to significantly enhance familiarity with station equipment.

Event classifications were accurate and timely. A list of events or parameter changes which would lead to a higher level classification were posted on a status board. Parameters which would lead to classification changes were trended. Notification forms were quickly generated when classifications changed, and communicated to offsite authorities within required timeframes.

Protective action recommendations were developed per the applicable procedure and promptly communicated to state of Illinois authorities. Periodic communication between the Manager of Emergency Operations and Illinois Department of Nuclear Safety officials effectively kept offsite authorities aware of plant status and event mitigation activities. The EOF staff was aware of protective actions implemented by the State of Illinois. Minor errors made in several Illinois Nuclear Accident Reporting System (NARS) forms were quickly detected and corrected by verbal communication or re-issuance of the NARS form.

The Protective Measures staff performed well, utilizing available information to make decisions on dose extensions and issuance of potassium iodide. Communication problems with one environs team developed immediately after the decision to issue potassium iodide. Environs team communicators coped well with this problem, requesting the other environs team to communicate with the team which was out of communication, or search for and directly communicate with the other team.

Priorities for response activities were well tracked by the "Station Priorities Log", and events were tracked by the "Significant Events" electronic system.

b.5 Scenario and Exercise Control

The exercise scenario was very challenging and exercised the majority of the licensee's emergency response capabilities.

The inspectors identified no significant controller performance concerns related to the plant response teams that were evaluated. Controllers ensured that team members asked appropriate questions before providing them with information sought, such as current radiological conditions. Simulation for obtaining parts from stores was noted by the inspectors.

The control room ventilation system was not initially aligned for operation in the make-up mode (which would have been normal with the diesel driven auxiliary feedwater pump in operation) by the drill controllers prior to starting the exercise. Operators promptly recognized this in the simulator, and properly aligned the control room ventilation system.

b.6 Licensee Critiques

The inspectors attended the licensee's self-critiques in the SCR, TSC, OSC, and EOF which occurred immediately after the exercise. Exercise controllers solicited verbal and written inputs from the participants in addition to providing the participants with the controllers' initial assessments of personnel performance. The inspectors concluded that these initial self-critiques were thorough and in close agreement with the majority of the inspectors' observations.

c. Summary of Conclusions

Evaluation of the license's exercise performance was as follows:

- Overall licensee performance during the 1999 exercise was very good.
- Performance of shift personnel in the Simulator Control Room was effective.
- The Technical Support Center staff's performance was excellent.
- Overall performance of OSC management and staff was good.
- Performance in the Emergency Operations Facility was excellent.
- The participants and controllers initial critique following termination of the exercise was self critical and detailed. The critiques included inputs from controllers and exercise participants. Licensee critique findings were consistent with the NRC evaluation team's findings.

P8 Miscellaneous EP Issues

- P8.1 (Closed) Inspection Followup Item No. 50-263/97016-01: Exercise Weakness: During the 1997 exercise, personnel in the simulator control room did not classify the initial events properly (an Alert was classified as an Unusual Event). During the current exercise, the shift manager correctly classified events at the Unusual Event and Alert levels in a timely manner. Event notification message forms and verbal notifications to the State and the NRC were completed properly. This item is closed.
- P8.2 (Closed) Inspection Followup Item No. 50-263/97016-02: Exercise Weakness: During the 1997 exercise, the Acting Station Director failed to utilize the Acting Station Director procedure and checklist. During the current exercise, the procedure and checklist were appropriately utilized. This item is closed.

V. Management Meetings

X.1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on August 26, 1999. The inspection team leader stated that overall exercise performance was very good, a single Inspection Followup Item had been identified, and the licensee critiques were effective. The licensee acknowledged the preliminary findings presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

B. Adams, Regulatory Assurance Manager
T. Burns, Emergency Planner
R. Colglazier, NRC Coordinator
D. Drawbaugh, Emergency Preparedness Coordinator
M. Jurmain, Maintenance Manager
B. Kouba, Engineering Manager
J. Kramer, Work Control Manager
R. Kartheiser, Communicatoins
S. Kuczynski, Nuclear Oversight Manager
W. Levis, Site Vice President
R. Lopriore, Station Manager
W. McNeill, Radiation Protection Manager
S. Merrell, Assistant Emergency Preparedness Coordinator
M. Snow, Operations Manager
D. Stobaugh, Coordinator
P. Sunderland, Lead Scenario Developer
M. Vonk, Corporate Emergency Preparedness Manager

NRC

E. Cobey, Senior Resident Inspector
B. Kemker, Resident Inspector

Illinois Department of Nuclear Safety

C. Thompson, Resident Engineer

INSPECTION PROCEDURES USED

IP 82301	Evaluation of Exercises for Power Reactors
IP 82302	Review of Exercise Objectives and Scenarios for Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-454/455/99015-01	IFI	Difficulty in dispatching "urgent" inplant team.
---------------------	-----	--

Closed

50-454/455/97016-02	IFI	Exercise Weakness: Failure to classify properly during the 1997 evaluated exercise.
---------------------	-----	---

50-454/455/97016-01

IFI

Exercise Weakness: Failure to utilize the Acting Station Director procedure and checklist.

Discussed

None.

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
EAL	Emergency Action Level
ED	Emergency Director
EM	Emergency Manager
EOF	Emergency Operations Facility
EOP	Emergency Operating Procedure
EP	Emergency Preparedness
FEMA	Federal Emergency Management Agency
IFI	Inspection Follow up Item
KI	Potassium Iodide
NARS	Illinois Nuclear Accident Reporting System
NPF	Nuclear Power Facility
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
NUE	Notification of Unusual Event
OSC	Operational Support Center
PA	Public Address
PAR	Protective Action Recommendation
PDR	NRC Public Document Room
PRR	Public Reading Room
RPT	Radiation Protection Technician
SCR	Simulator Control Room
SD	Station Director
SRI	Senior Resident Inspector
TSC	Technical Support Center