July 19, 2001

Mr. Oliver D. Kingsley, President
Exelon Nuclear
Exelon Generation Company, LLC
Quad Cities Nuclear Power Station
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: QUAD CITIES NUCLEAR POWER STATION
NRC SUPPLEMENTAL INSPECTION REPORT 50-254/01-11(DRS);
50-265/01-11(DRS)

Dear Mr. Kingsley:

On June 14, 2001, the NRC completed a supplemental inspection at your Quad Cities Station, Units 1 and 2 reactor facilities. The enclosed report documents the inspection results which were discussed on June 14, 2001, with Mr. T. J. Tulon and other members of your staff.

The supplemental inspection was conducted to address a White risk significant performance finding that was identified during an Operational Safeguards Response Evaluation (OSRE) conducted in May 2000, regarding the implementation of your protective strategy. This inspection was performed to verify that root cause(s) and contributing cause(s) of the risk significant performance issues were understood, to verify the extent of the condition was identified, and to verify that corrective actions were sufficient to address the root cause(s) and contributing cause(s) and to prevent recurrence.

Based on our inspection results, we concluded that members of your staff performed a comprehensive analysis of the performance issues and risk significance associated with our White inspection finding. We also determined that your corrective actions appeared sufficient to address the root cause and contributing factors, and to prevent recurrence and that your extent of condition was comprehensive in scope and that it included extending your corrective measure to other sites as noted in this inspection report We consider the White inspection finding closed.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,

/RA/

John A. Grobe, Director
Division of Reactor Safety

Docket Nos. 50-254; 50-265
License Nos. DPR-29; DPR-30

Enclosure: Inspection Report 50-254/01-11(DRS);
50-265/01-11(DRS)

cc w/encl: W. Bohlke, Senior Vice President, Nuclear Services
C. Crane, Senior Vice President - Mid-West Regional
J. Cotton, Senior Vice President - Operations Support
J. Benjamin, Vice President - Licensing and Regulatory Affairs
R. Krich, Director - Licensing
H. Stanley, Operations Vice President
J. Skolds, Chief Operating Officer
R. Helfrich, Senior Counsel, Nuclear
DCD - Licensing
T. J. Tulon, Site Vice President
G. Barnes, Quad Cities Station Manager
W. Beck, Regulatory Affairs Manager
W. Leach, Manager - Nuclear
Vice President - Law and Regulatory Affairs
Mid American Energy Company
M. Aguilar, Assistant Attorney General
Illinois Department of Nuclear Safety
State Liaison Officer, State of Illinois
State Liaison Officer, State of Iowa
Chairman, Illinois Commerce Commission

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-254, 50-265
License Nos:	DPR-29, DPR-30
Report No:	50-254/01-11(DRS), 50-265/01-11(DRS)
Licensee:	Exelon Generation Co., LLC
Facility:	Quad Cities Nuclear Power Station, Units 1 and 2
Location:	22710 206th Avenue North Cordova, IL 61242
Dates:	June 12 through 14, 2001
Inspector:	T. Madeda, Physical Security Inspector
Approved by:	James R. Creed, Safeguards Program Manager Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000254-01-11(DRS), IR 05000265-01-11(DRS), on 06/12-14/2001, Exelon Generation Co., LLC, Quad Cities Nuclear Power Station.

The supplemental inspection was conducted by one regional safeguards inspector. No findings of significance were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609 "Significance Determination Process" (SDP). The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at http://www.nrc.gov/NRR/OVERSIGHT/index.html. Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violations.

Cornerstones: Physical Protection

This supplemental inspection was performed to assess the licensee's root cause evaluation related to exercise failures during two of four force-on-force contingency exercises. This performance issue was characterized as a White finding having a low to moderate risk significance in NRC Inspection Report No. 50-254; 265/00-201. This supplemental inspection determined that the licensee had performed a comprehensive evaluation which identified the root cause and contributing factors associated with the exercise failures noted above. The licensee's evaluation identified that the root cause of the exercise finding was a failure to effectively accomplish exercise control activities. Contributing factors were human performance errors by some security force response personnel and controllers, a lack of effective controller training, vulnerabilities in some defensive positions, and command and control activities. Licensee corrective actions were implemented to address the root cause and each contributing factor. Those actions appeared effective in correcting the identified deficiencies. Therefore, the White performance finding associated with the exercise failures was closed.

Report Details

01 Inspection Scope

This supplemental inspection was performed to access and verify the licensee's evaluation, extent of conditions, and corrective actions for two exercise failures, resulting from protective strategy deficiencies, controller errors, and performance errors by response personnel, in which critical plant equipment was simulated to be disabled or destroyed by an adversary team. This issue, which is related to the physical protection cornerstone, was previously characterized as a White inspection finding in NRC Inspection Report Nos. 50-254; 265/00-201.

02 Evaluation of Inspection Requirements

02.01 Problem Identification

a. Determine that the evaluation identified who and under what condition(s) the issue was identified.

The exercise failures were identified during a NRC scheduled Operational Safeguards Response Evaluation (OSRE) that was conducted May 1 through 4, 2000. The failures occurred during two of four force-on-force contingency response exercises.

b. Determine how long the issue existed, and prior opportunities for identification.

The licensee's evaluation determined that deficiencies in their force-on-force exercise program related to poor controller evaluation activities, and defensive strategy deficiencies regarding some weak defensive positions and less than effective command and control issues. The licensee's evaluation also identified that those deficiencies had existed since the security organization began preparing for the OSRE in February 1997, prior to the OSRE inspection in May 2000.

The licensee's evaluation further determined that the weaknesses identified in their security contingency assessment program significantly reduced their ability and opportunities to identify those flaws and deficiencies prior to the OSRE inspection.

c. Determine that the evaluation documented the plant-specific risk consequences and compliance concerns associated with the issue.

The licensee's evaluation documented an assessment of the plant-specific risk consequences. The evaluation compared the risk consequences presented by the OSRE exercises, and events that would likely occur in an actual intrusion. The licensee's evaluation concluded that the significance of the exercise failures regarding poor security force performance, ineffective controller activities, and deficiencies in the protective strategy to include target set designation was minimal because no actual intrusion had occurred, and that the exercises did not constitute an actual threat to the safety of the plant. The licensee also concluded that as a result of several liberal controller assumptions regarding decisions, the adversaries were more successful

during the exercise than they would have been in an actual intrusion. In addition, a licensee conducted operational analysis determined that had an actual intrusion occurred with the same results as the exercise simulations, core cooling would have been adequate to meet regulatory requirements (10 CFR 50.46 and Appendix K). This would have been accomplished using plant equipment not previously identified as parts of the target sets. The licensee's operational assumption was reviewed by the NRC staff. The staff was unable to validate conclusively the licensee's assertion that core damage would not have resulted. The inspector verified that licensee additional analysis of target sets conducted subsequent to the OSRE appeared to adequately address security and operational considerations to prevent actions that could result in core damage.

The licensee's evaluation included an assessment of compliance. The licensee determined that their deficient exercise performance did not constitute a violation of the approved station security plan. The NRC staff refrained from taking enforcement action based on force-on-force exercise findings.

02.02 Root Cause and Extent of Conditions Evaluation

a. Determine that the problem was evaluated using a systematic method(s) to identify root cause(s) and contributing cause(s).

The inspector verified that the licensee used four root cause analysis methods to evaluate the problems related to the force-on-force exercise failures identified during the OSRE inspection. The four methods included: (1) event and causal factor analysis to identify the events and develop a time line that led up to the events; (2) interviews to identify what action(s) were taken by involved personnel; (3) change analysis to evaluate the affect cause by a change in the protective strategy; and (4) cause and effect analysis to determine the consequence(s) on the effectiveness of the licensee's contingency response program.

The inspector also verified that the licensee's analysis followed their procedure guidance (Root Cause Investigation and Report Hand Book, (CAP-3, Revision 4)) for performing root cause(s) analysis, identifying contributing factor(s), develop corrective action(s), and documented the results in writing in the prescribed format.

b. Determine that the root cause evaluation was conducted to a level of detail commensurate with the significance of the problem.

The inspector verified that the licensee's root cause analysis was thorough and identified both a primary root cause and contributing factors. Licensee review determined that the root cause involved a failure by it's security organization to recognize the need for appropriate exercise control (controller training, adequate critiques, scenario expectations, etc) and to effectively implement some elements of the licensee's protective strategy regarding command and control activities, defensive positions, and target set design. A common contributing factor in each exercise failure was inadequate controller action regarding exercise management. Several other contributing factors were also identified: (1) corporate security, licensee's Nuclear

Oversight, and the security contractor failed to identify controller issues due to security's adequate performance during prior exercises, (2) prior exercises were not challenging enough and they did not continue to the point of equipment damage, (3) several human performance errors occurred because response personnel failed to perform as instructed, and (4) several defensive positions were vulnerable to specific attack methods. The inspector concluded that the licensee's root cause analysis was conducted at a level commensurate with the significance of the problem.

c. Determine that the root cause evaluation included a consideration of prior occurrences of the problems and knowledge of prior experience.

The licensee's evaluation included a review to determine if similar problems had been reported regarding contingency response exercises. A licensee search of its security report database and the licensee condition report database identified no previous events that involved contingency response exercise problems. The licensee evaluation also included interviews of cognizant individuals. None had any knowledge of previous events. The inspector verified that the licensee's review of prior occurrences was broad in scope.

d. Determine that the root cause evaluation included consideration of potential common cause(s) and extent of conditions of the problems.

The licensee's evaluation reviewed other potential common cause aspects of the security program for applicability to this root cause. The root cause team confirmed that there has been no common cause effect on other aspects of the security program interrelationships due to the poor demonstration of the station's protective strategy plan.

The licensee's root cause team expanded the extent of condition evaluation to discuss potential effects at the other four ComEd nuclear stations. The team determined that each of the stations had developed and implemented an independent exercise program specifically tailored to the station's own protective strategy. The team concluded that the controller deficiencies identified at Quad Cities also existed at the other ComEd nuclear stations. Therefore, the four other station's (Braidwood, Byron, Dresden, and LaSalle) have been included in the corrective actions regarding controller deficiencies identified at Quad Cities.

02.03 Corrective Actions

a. Determine that appropriate corrective action(s) are specified for each root/contribution cause or that there was an evaluation that no actions were necessary.

The inspector determined that licensee's corrective actions for the exercise deficiencies appeared to be focused to address the root cause and each contributing factor. The corrective actions included: (1) implementation of controller training that defined performance expectation and exercise control activities; (2) modification and expansion of exercise scenario development and implementation; (3) implementation of an exercise checklist to identify specific controller training, and critique methods;

(4) counseling each exercise controller and responder who demonstrates unsatisfactory performance; and (5) use of licensee corporate emergency preparedness personnel to validate controller activities. In addition, the following corrective actions were taken to enhance the protective strategy: (1) defensive position vulnerabilities and weaknesses were identified and strengthened; (2) implementation of procedure enhancement to address command and control activities; (3) conduct additional tactical training to strengthen the effectiveness in implementing the protective strategy (table top exercises, stress fire course and exercises); and (4) implement response team staffing as committed to in the licensee's security plan. In addition, the licensee conducted exercises similar to those conducted during the OSRE inspection to validate the effectiveness of their corrective actions.

b. Determine that corrective actions have been prioritized with consideration of the risk significance and regulatory compliance.

The inspector concluded that the licensee's corrective actions appeared to be appropriately prioritized to address the risk significance of the issues, in that the actions taken were timely and appeared to be effective. Inspector review of licensee force-on force exercises (8) of the type that failed during the previously identified OSRE showed successful exercise results.

The licensee's root cause analysis and corrective action plan also addressed a review of NRC regulatory requirements. No regulatory compliance issues were identified.

c. Determine that a schedule had been established for implementing and completing the corrective actions.

The inspector verified that the licensee's corrective action program identified assigned individuals and completion dates to ensure that the actions taken to improve the performance in the contingency program were conducted in a timely and effective manner. The inspector verified that all corrective action implementation dates were met and completed as documented in the licensee's root cause analysis.

d. Determine that quantitative or qualitative measures of success have been developed for determining the effectiveness of corrective action to prevent recurrence.

The inspector verified that the licensee's root cause evaluation analysis also included a commitment to validate the effectiveness of the implemented corrective action. This validation program, is scheduled to be completed by July 2001, and will include self-assessments and independent audits of the noted corrective actions, review of exercise results, and interviews of cognizant personnel to determine the adequacy and effectiveness of the licensee protective strategy.

OA6 Management Meetings

Exit Meeting Summary

The inspector presented the supplemental inspection results to Mr. T. J. Tulon and other members of licensee management at the conclusion of the onsite inspection on June 14, 2001. The licensee representatives acknowledged the findings presented and did not identify any information discussed as proprietary or Safeguards Information.

KEY POINTS OF CONTACT

Licensee
D. Barker, Radiation Protection Manager
G. Barnes, Station Manager
W. Beck, Regulatory Assurance Manager
T. Fuhs, Regulatory Assurance
K. Hungerford, Project Manager, Wackenhut
M. Karney, Corporate Midwest Security Manager
S. Kirven, Director, Nuclear Operations, Wachenhut
K. Leech, Site Security Manager
B. Rittmer, Security Analyst
J. Sirovy, Nuclear Oversight Assessor
T. Tulon, Site Vice President

Illinois Department of Nuclear Safety
R. Ganser, Resident Inspector

LIST OF DOCUMENTS REVIEWED

AR 33829-02	Root Cause Analysis	October 5, 2000
CR 2000-2994	Condition Report	May 3, 2000
CAP3	Root Cause Investigation and Report Handbook	September 14, 2000 Revision 4
	Nuclear Generation Group-Security Training Program	June 1999
	Force-On-Force Exercise Evaluations (Eight Exercises)	September 2000 to May 2001