U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-331/92021(DRSS)

Docket No. 50-331 License No. DPR-49

Licensee: Iowa Electric Light and Power Company
IE Towers, P.O. Box 351
Cedar Rapids, IA 52406

Facility Name: Duane Arnold Energy Center

Inspection At: Duane Arnold Energy Center site, Palo, IA
Corporate Office, Cedar Rapids, IA

Inspection Conducted: December 14-17, 1992

Inspectors: T. Ploski — T. Ploski — 12/22/92 — Date

J. W. McCormick-Barger for — C. Cox — 12/23/92 — Date

N. Simons — H. Simons — 12/22/92 — Date

J. W. McCormick-Barger for — A. Markley — 12/23/92 — Date

Accompanying Personnel: M. Parker
C. Miller
D. McNeil

Approved By: J. W. McCormick-Barger for — J. W. McCormick-Barger, Chief — 12/23/92 — Date
Emergency Preparedness and
Non-Power Reactor Section

Inspection Summary

Inspection on December 14-17, 1992 (Report No. 50-331/92021(DRSS))
Areas Inspected: Routine, announced inspection of the Duane Arnold Energy Center's emergency preparedness exercise involving review of the exercise scenario (IP 82302), observations by seven NRC representatives of key

functions and locations during the exercise (IP 82301), and follow-up on licensee actions on previously identified items (IP 82301 and IP 82701).
Results: No violations or deviations were identified.

The licensee's overall performance was excellent, particularly with respect to: the onsite medical response; prompt emergency declarations and offsite agency notifications; onsite and offsite protective action decisionmaking; and operation of the Operational Support Center. Thorough corrective actions were demonstrated on both concerns identified during the 1991 exercise.

Several improvement areas were recommended. The operating shift supervisor should have declared a second Unusual Event rather than making timely courtesy notifications to offsite agencies when plant conditions satisfied a second set of Unusual Event classification criteria (Section 6.a). The emergency operations facility's engineering support group should have treated assessment requests from the facility's senior manager as action items having response deadlines (Section 6.e).

Challenging aspects of the scenario included: assembling and accounting for all onsite personnel; an onsite medical response; a difficult to identify release path from containment; and use of a response cell of controllers to simulate remotely located NRC reactor safety and protective measures staffs.

DETAILS

1. NRC Observers and Areas Observed

C. Cox, Control Room Simulator (CRS), Technical Support Center (TSC)
D. McNeil, CRS, TSC
C. Miller, TSC
H. Simons, Onsite Medical Response, Operational Support Center (OSC), Inplant Teams
A. Markley, Emergency Operations Facility (EOF)
M. Parker, EOF
T. Ploski, EOF

2. Persons Contacted

D. McGaughy, Vice President, Production
J. Franz, Vice President, Nuclear
P. Serra, Manager, Emergency Planning
L. Henderson, Supervisor, Emergency Planning

The above and 15 other licensee staff attended the exit interview on December 16, 1992. The inspectors also contacted other licensee personnel during the inspection.

3. Licensee Action on Previously Identified Items (IP 82301)

(Closed) Inspection Followup Item No. 331/91010-01: During the 1991 exercise, there was inefficient and untimely decision making regarding the dispatch of inplant repair teams.

As indicated in Inspection Report No. 50-331/92008 (DRSS), the licensee revised the responsibilities assigned to positions in the Technical Support Center (TSC) and Operational Support Center (OSC) which would be involved in the authorization, formation and briefing of inplant teams. During the 1992 exercise, inplant teams were authorized, formed and briefed in a timely manner. This item is closed.

(Closed) Inspection Followup Item No. 331/91010-02: During the 1991 exercise, Emergency Operations Facility (EOF) staff failed to properly complete several offsite agency notification forms.

The licensee revised the format of the form used for state and county notifications. During the 1992 exercise, EOF staff correctly completed the offsite agency notification forms. This item is closed.

(Closed) Inspection Followup Item No. 331/92008-01: Three emergency plan implementing procedures (EPIPs) contained incorrect information regarding the NRC Incident Response Plan and the notification requirements of 10 CFR 50.72 (a)(3) and (c)(3).

These EPIPs were revised to include current information on the NRC Incident Response Plan and accurate information regarding NRC notification requirements. This item is closed.

4. General (IP 82302)

An announced, daytime exercise of the licensee's emergency plan was conducted at the Duane Arnold Energy Center on December 15, 1992. This was also a full scale exercise for the State of Iowa and for Linn County and Benton County. The exercise tested the capabilities of licensee, state and local organizations to respond to an accident scenario resulting in a simulated release of radioactive effluent.

The performances of state and local response organizations were evaluated by representatives of the Federal Emergency Management Agency (FEMA), who will document their evaluation in a separate report. NRC and FEMA representatives summarized their preliminary exercise findings at a Public Critique hosted by FEMA in Cedar Rapids, Iowa, on December 17, 1992.

Attachment 1 describes the scope and objectives of the exercise. Attachment 2 summarizes the exercise scenario.

5. General Observations (IP 82301)

The licensee's response was coordinated, orderly and timely. If events had been real, actions taken by the licensee would have been sufficient to mitigate the accident and allow state and local officials to take appropriate actions to protect public health and safety.

6. Specific Observations (IP 82301)

a. Control Room Simulator (CRS)

The A - Operating Shift Supervisor (A-OSS) quickly and correctly declared an Unusual Event for the onsite response to a simulated, contaminated injured worker and an Alert for a reactor coolant system leak greater than 50 gallons per minute but within makeup capability. State, county and simulated NRC officials were initially notified of both emergency declarations in a very timely and detailed manner. In contrast, the crew was slow to seek information about the status of the onsite medical emergency from onscene responders.

In between the aforementioned emergency declarations, an orderly reactor shutdown was begun when the coolant leak was less than 50 gallons per minute but above the limiting value in the plant's Technical Specifications. This condition warranted an Unusual Event declaration per the plant's Emergency Action Levels (EALs). However, since an Unusual Event had already been declared for the unrelated response to an onsite injury, the A-OSS made "courtesy" notifications to state, county and simulated NRC officials rather

than declare a second Unusual Event. These courtesy notifications were completed in a timely and detailed manner. The A-OSS should have declared a second Unusual Event for the increased coolant leak and associated commencement of reactor shutdown.

Overall communications among the crew were good. As the scenario progressed, inplant repair activities were tracked. Operators made good use of control panel indicators to quickly identify the approximate location in the reactor building associated with the containment breach. However, the fact that the breach was a failed containment penetration could not be identified from CRS readouts.

No violations or deviations were identified.

b. Onsite Medical Emergency Response

Security and Health Physics (HP) technicians quickly responded to the simulated, contaminated injured person. The lead security officer exhibited strong command and control at the accident scene and did an excellent job assessing the victim's injuries and monitoring vital signs.

The HP technicians did an excellent job of promptly surveying the accident scene for contamination to expedite the medical response by the security officers. The victim was located in a very small space which allowed only one person to attend the victim at a time. Despite these cramped conditions, the HP technician was thorough in monitoring the victim for contamination.

The security officers and HP technicians worked well together to provide a timely transfer of the victim to the ambulance crew. A noteworthy example of this teamwork occurred when a security officer forgot to don gloves before helping another officer splint the victim's contaminated broken leg. The other officer quickly noted that his coworker was not wearing gloves and instructed him to have his hands monitored for contamination. The HP technician surveyed the officer's bare hands and found that one hand was contaminated. The technician taped a surgical glove on the contaminated hand, allowing the officer to continue attending to the victim, and properly decided to decontaminate the officer's hand after the victim had been transferred to the ambulance.

The lead security officer made a detailed record of the victim's injuries and contamination levels. He provided this written information to the ambulance crew along with a thorough verbal briefing before the victim was transported offsite.

No violations or deviations were identified.

c. Technical Support Center (TSC)

The TSC was activated following the Alert declaration. Incoming staff prepared to perform their duties in an efficient manner. An orderly transfer of command and control of onsite response activities to the Emergency Coordinator (EC) occurred within one half of an hour of the Alert declaration.

All onsite personnel were assembled and accounted for within 30 minutes following the Alert declaration, per procedures. The simulated evacuation of nonessential personnel was ordered after the Site Area Emergency declaration in accordance with procedures. Since the scenario postulated the unavailability of the primary offsite reassembly point for these evacuees, the correct decision was made to simulate their going to a backup reassembly point.

Technical staff did an excellent job of adjusting priorities as the scenario progressed. Internal briefings were good supplements to detailed information accurately maintained on status boards. Status boards were well utilized to display the current status of inplant teams and numerical values found in potentially relevant EALs, so the EC could make a timely reclassification decision.

Radiation protection staff closely monitored inplant radiation level data and kept OSC supervision informed of adverse changes. When significant increases in a number of area radiation monitors' readings were noted, TSC staff even paged several deployed inplant teams to better ensure that these teams were promptly notified of the adverse radiological changes that could affect their missions.

TSC staff maintained effective communications with CRS and EOF counterparts. For example, when some plant parameter data appeared questionable on Emergency Data System (EDS) displays following a brief stop and restart of the simulator, actions were soon initiated to verify the more critical plant parameters' latest values using a CRS communicator, who periodically obtained the data from panel indicators. The updated data were then verbally relayed by TSC staff to OSC and EOF counterparts, as appropriate.

A simulated liquid post accident sample was requested in order to obtain an initial estimate of core damage. A reactor engineer made a good evaluation of the sample analyses results provided in the scenario, which indicated somewhat different estimates of the extent of core damage.

Very good engineering solutions were pursued to identify the breach of containment integrity. Once the possibility of a leak from the reactor water cleanup system was eliminated, plant drawings were used to identify that nearby piping of one train of the core spray system was another possible leak path. TSC staff eventually recognized that a failed containment penetration was

another possibility and that visual inspection of the portion of the reactor building having the highest radiation levels would be necessary to confirm the identity of the containment breach. As inplant radiation levels generally trended down, a team was requested to perform this inspection.

Copies of emergency operating procedure flowcharts were readily available in the TSC. However, these flowcharts were not used as a reference to better monitor and anticipate the actions of the CRS crew until relatively late in the scenario.

No violations or deviations were identified.

d. Operational Support Center (OSC) and Inplant Teams

The OSC was staffed in a timely and orderly manner following the Alert declaration. The OSC Supervisor exhibited strong command and control in the OSC. Excellent support was provided by the HP, instrumentation and controls, electrical maintenance and mechanical maintenance supervisors. Status boards were kept current with detailed information regarding plant conditions and the status of repair teams. Briefings by TSC staff on the public address system provided additional information to OSC personnel.

Inplant teams were dispatched from the OSC in a timely manner. When the TSC staff requested a team, appropriate personnel were promptly chosen and were given detailed briefings on their missions and associated radiological conditions prior to dispatch.

One noteworthy instance of good team coordination occurred with respect to the high priority task of opening a core spray valve. Two teams were simultaneously formed to accomplish this task. One team was comprised of electrical maintenance personnel, while the other consisted of mechanical maintenance technicians. HP technicians accompanied both teams.

A good decision was made to dispatch the electrical maintenance team first to attempt to open the valve electrically, since their effort would take relatively little time. The mechanical maintenance supervisor and HP supervisor then began briefing the mechanical maintenance team, which would manually open the valve, should the efforts to open the valve electrically fail.

The only negative aspect to the efforts to open the valve was that an overly restrictive turn back dose rate of 50 milliroentgen per hour (mR/hr) was given to the mechanical maintenance team. When the electrical maintenance team reported that they could not open the valve, the mechanical maintenance team was immediately dispatched. The team's HP technician closely monitored dose rates along the route to the job site. When the valve could not be operated manually, the team left to obtain additional tools. On the way to these tools, they encountered dose rates exceeding

their turn back dose rate. The HP technician called the OSC to get the turn back dose rate raised. The HP Supervisor only raised the turn back dose rate to 100 mR/hr, which proved to be insufficient when the team later encountered a higher radiation field. Meanwhile, the OSC Supervisor made the good decision to dispatch another team to continue work on this valve.

No violations or deviations were identified.

e. Emergency Operations Facility (EOF)

The decision to activate the EOF following the Alert declaration was conservative. Facility activation was orderly and timely. The EOF's Emergency Response and Recovery Director (ERRD) relieved the EC of lead responsibility for the licensee's emergency response within an hour of the Alert declaration. The ERRD assumed overall command only after he was well briefed on the situation and after his key aids had indicated their staffs' readiness to begin performing their duties.

The ERRD, the Corporate Management Representative and a member of the engineering support group closely monitored changing plant parameter data and potentially relevant emergency action levels. As torus radiation level values approached the value stated in the relevant EAL, the ERRD correctly declared a Site Area Emergency. The Radiological and EOF Manager assured that State, county and simulated NRC officials were initially notified of this declaration and the associated Protective Action Recommendation (PAR), that animals within two miles of the plant be placed on stored feed and water, in a very timely manner.

Shortly after the Site Area Emergency declaration, the simulator briefly stopped. After its restart, EOF staff initiated good efforts to verify data on the various EDS displays with the aid of CRS and TSC staffs. About 30 minutes elapsed before sufficient, verified data were available to key EOF staff.

While the reliability of various EDS data were being determined with and without the intervention of exercise controllers, the ERRD correctly directed engineering and protective measures staffs to focus on identifying any indications of a loss of containment integrity and evaluating the possible offsite consequences of its loss. State officials were informed that a loss of containment integrity would necessitate an emergency reclassification and a revised PAR.

Upon recognizing the first indication of a containment breach, the ERRD quickly verified the indication with his TSC counterpart and correctly declared a General Emergency. A procedurally correct PAR was rapidly developed. State, county and NRC officials were initially notified of this declaration, its bases, the initiation of an abnormal release to the environment and the PAR well within

the required 15 minutes. A revised PAR was later transmitted in a timely manner, as containment radiation and release rate levels sharply increased.

The Radiological and EOF Manager's performance was excellent with respect to developing PARs, keeping the ERRD well informed of the protective actions chosen by offsite officials and updating the ERRD of the progress of the simulated offsite evacuations. The manager also directed his staff to perform frequent offsite dose projections based on current plant conditions. An eight hour default release duration was utilized in these calculations, since engineering and operations staffs remained relatively unsure of the exact cause of the loss of containment integrity and could not, therefore, provide a better estimate of release duration than this fairly large default value.

The ERRD and several key EOF staff gave frequent briefings to EOF staff on current plant status, inplant repair priories and their assessments of the onsite and offsite situations. Back screen projectors were an excellent method of displaying EDS outputs and the geographic areas affected by offsite PARs.

Engineering staff assured that critical plant parameters were trended. Typically only one of the parameters being trended was displayed on a projection screen at a time. The parameter was selected either by the ERRD or by a member of the engineering support group. The display of only one trended parameter at a time along with the EDS displays did not adversely affect key staff's ability to maintain a very good overall perspective of abnormal plant conditions for this scenario.

The ERRD approved all offsite agency notification message forms prior to their transmittal. These message forms contained accurate information. The ERRD also reviewed and approved draft press releases. A communicator kept a public affairs counterpart well informed on scenario events and major decisions.

One member of the EOF's engineering support group provided excellent support to the ERRD by closely monitoring potentially relevant EALs and emergency operating procedures' flowcharts. In contrast, when the ERRD requested the group to focus on assessing high priority concerns and to provide feedback, the group was generally not very results oriented. The ERRD's requests were not treated as action items having deadlines. Feedback was usually not provided until the ERRD asked for it. Although the group listed high priority items on its status board, the group's followup on these items typically was another brainstorming session rather than completed assessments or recommendations. The engineering support group should treat requests from the ERRD as action items having deadlines.

In response to a scenario control message late in the exercise, TSC and EOF staffs focused their efforts on initial recovery planning. Action item lists were developed by TSC and EOF staffs and were consolidated during a teleconference involving key staffs. Excellent use was made of procedural guidance in arriving at the correct conclusion that, if scenario events were real, it was very premature to enter a recovery phase.

The overall quality of the action item list was very good. The needs to interface with onscene NRC incident responders and incident investigators were recognized; however, the program needed to assess the environmental impacts of the release was not well understood. Key staff indicated that environmental sampling would be done using only licensee, State and contractor resources. The major role of the Department of Energy in performing this assessment in cooperation with the State, licensee and a number of Federal agencies was not recognized.

No violations or deviations were identified.

f. Offsite Monitoring Teams (OMTs)

Two OMTs were formed, well briefed and dispatched from the OSC following the Alert declaration, per procedures. Control of the teams was smoothly transferred from TSC to EOF staff when the ERRD assumed command of the licensee's response efforts.

The teams were appropriately positioned at different distances downwind from the plant prior to the release in order to detect a release. Before and after the simulated release began, the OMTs were in frequent contact with the EOF's Field Team Director, who maintained good records of their reports and directed their activities. The director kept both teams well advised of changing plant conditions and simulated meteorological conditions.

Based on communications between the teams and the Field Team Director, the teams successfully located and tracked the simulated plume. The teams kept the director adequately informed of their survey results and simulated exposures.

Proper concern was demonstrated for minimizing the teams' stay times in the plume. When the OMT closest to the plant reported reaching 50 percent of its exposure limit, a good decision was made to switch its future assignments with the second OMT rather than to seek an exposure extension. However, neither the Field Team Director nor the Radiological Assessment Coordinator were certain of the teams' exposure limit until they contacted TSC staff who had earlier established that limit.

Personnel directing the activities of the State's OMTs were located in a room adjacent to their licensee counterparts. The State's and licensee's OMTs typically remained within similar

downwind distances from the plant. Reports from the licensee's and State's teams were posted on status boards to facilitate information sharing.

At one point, the State's OMT were advised to simulate taking potassium iodide (KI) to reduce the effects of their exposure to radioiodines in the release. When one of the licensee's OMTs asked whether taking KI was advisable, TSC and EOF staffs considered the request for over 10 minutes before advising the team that taking KI was not yet necessary. This decision was in accordance with procedural guidance; however, the licensee should reevaluate this apparent inconsistency with the State's criteria for taking KI. Variable meteorological conditions may make an OMT's exposure to radioiodines less predictable than an inplant team's exposure.

No violations or deviations were identified.

7. Exercise Objectives and Scenario Review (IP 82302)

The exercise's scope and objectives and complete scenario manuals were submitted for NRC review within the proper timeframes. No significant concerns were identified during the review.

Challenging aspects of the scenario included: assembly and accounting for all onsite personnel; an onsite medical emergency response; activation of a backup facility as a reassembly point for non-essential site evacuees; a difficult to identify release path from containment; deployment of two offsite survey teams; operation of the emergency news center and the rumor control function; and use of a response cell of controllers to simulate NRC officials for the receipt of reactor safety and protective measures information from TSC and EOF communicators.

No violations or deviations were identified.

8. Exercise Control (IP 82301)

There were sufficient numbers of personnel to control the exercise. Overall control of the exercise was very good. The only noteworthy instance of improper controller action occurred after a brief stoppage of the simulator. After the simulator was restarted, exercise participants began verifying plant parameters' current values available on EDS displays in the TSC and EOF. It soon became apparent that some values were reasonable, while others remained suspect. Participants arranged to obtain the more relevant parameters' values using communicators. Meanwhile, several exercise controllers inappropriately advised TSC and EOF participants on the reliability of various data on the EDS displays.

No violations or deviations were identified.

9. Exercise Critiques (IP 82301)

The licensee's controllers held initial critiques in each facility with participants following the exercise. The licensee provided a summary of its strengths and weaknesses, which were in very good agreement with the inspectors' findings, prior to the exit interview.

10. Exit Interview

The inspectors held an exit interview on December 16, 1992, with those licensee representatives identified in Section 2 to present and discuss the preliminary inspection findings. The licensee indicated that none of the matters discussed were proprietary in nature.

Attachments:
1. Exercise Scope and Objectives
2. Exercise Scenario Summary

SCOPE AND OBJECTIVES BASIS

Scope

The 1992 Duane Arnold Energy Center (DAEC) Emergency Preparedness Exercise, scheduled for December 15, 1992, will test and provide the opportunity to evaluate Iowa Electric Light and Power Company, the State of Iowa, and Benton, Linn, and Marshall Counties' emergency plans and procedures. The Exercise will test each emergency response organization's ability to assess and respond to emergency conditions and coordinate efforts with other agencies for protection of the health and safety of the general public.

Whenever practical, this Exercise will incorporate provisions for "Free Play" on the part of the participants.

The scenario, as driven by the DAEC Control Room Simulator, will depict a simulated sequence of events, resulting in a radiological release of sufficient magnitude to warrant mobilization of State and local agencies to respond to the emergency.

Objectives

The DAEC 1992 Emergency Preparedness Exercise Program objectives are based on the Nuclear Regulatory Commission (NRC) requirements as delineated in 10 CFR 50.47, and 10 CFR 50, Appendix E, and Inspection Procedure 82302. Additional guidance provided in NUREG-0654 FEMA-REP-1 Revision 1, NUREG-0696, and NUREG-0737 Supplement 1 was utilized in developing these objectives.

This Exercise will include participation from Benton, Linn, and Marshall Counties, as well as the State of Iowa. The offsite objectives are based upon the Federal Emergency Management Agency (FEMA) Exercise Manual and Exercise Evaluation Methodology, FEMA-REP-14 and FEMA-REP-15 respectively.

Please note that the warning system sirens for the DAEC Emergency Planning Zone will not be sounded, and the area EBS Station (WMT AM/FM) will not be broadcasting during the Exercise.

The purpose of the Exercise is to evaluate the integrated capability of a major portion of the basic elements existing within the onsite and offsite emergency plans and emergency response organizations. The specific objectives of the Exercise to be demonstrated are listed within the following attachments.

1992 DAEC EXERCISE ONSITE OBJECTIVES

CORE ELEMENTS (1)	FREQUENCY (1)	REGULATORY REFERENCE (2)	COMMENTS
(a) Accident detection and assessment	Annual	I.1, I.2	Will be demonstrated.
(b) Emergency classification	Annual	D.1, D.2	Will be demonstrated.
(c) Notification of onsite and offsite emergency responders	Annual	E.1, E.2, E.3, J.1	Will be demonstrated. Activation of EBS Sirens and Indoor Warning Systems by offsite authorities will be simulated. In-plant alarms and pages will be sounded.
(d) Communications	Annual	F.1, F.2, E.2, E.4, H.6, B.1, B.2, B.3, B.4	Initial "drill" notification to NRC may be made on ENS Network. All other calls and communications with NRC to be simulated. Activiation of ERDS may also be demonstrated.
(e) Radiological exposure control	Annual	K.1, K.2, K.3, K.5, K.6, J.3, J	Will be demonstrated.
(f) Protective action recommendations	Annual	J.7	Will be demonstrated.
(g) Staff augmentation	Annual	A.1, A.3, A.4, B.7, B.8, B.9	Staff augmentation will be accomplished through ERO supplements to normal shift staffing. Timely activation of facilities will be demonstrated.
(h) Shift staffing	Annual	B.1, B.2, B.3, B.5 Table 2	Depth and scope of ERO documented in Emergency Telephone Book.

(1) As delineated in NRC Inspection Manual-Procedure 82302
(2) Items refer to NUREG-0654, Part II, except for elements (d) and (h), for which the reference is NUREG-0737, Supplement 1

1992 DAEC EXERCISE ONSITE OBJECTIVES

CORE ELEMENTS (1)	FREQUENCY (1)	REGULATORY REFERENCE (3)	COMMENTS
(a) Off-hours staffing (6 pm-4 am) as referenced in NUREG-0654, Revision 1, Supplement 1	5 years	N.1.b	Will not be demonstrated as part of the exercise in 1992. Propose demonstration of this objective is through separate drill techniques.
(b) Activation of emergency news center (Joint Information Center)	5 years	G.3, G.4	Will be demonstrated.
(c) Use of fire control teams	5 years	N.2.b, O.4.b	Will not be demonstrated as part of the 1992 exercise.
(d) Use of first aid and/or rescue teams	5 years	K.1, K.2, K.3, K.4, K.5, L.2, O.4.f	Demonstration via in-plant medical emergency: injury with potential contamination.
(e) Use of medical support personnel	5 years	N.2.c, L.1, L.4, O.4.h	Benton-Linn Ambulance will demonstrate contamination control and communications capabilities with Mercy Medical Center.
(f) Use of licensee's headquarters support personnel	5 years	O.4.i	As dictated by the scenario, Corporate Support Services and engineering support will be utilized within the EOF.
(g) Use of security personnel to provide prompt access for emergency equipment and support	5 years	O.4.d	Will not be demonstrated in 1992. Last demonstrated in 1990.

(1) As delineated in NRC Inspection Manual-Procedure 82302
(3) Items refer to NUREG-0654, Part II, except for element (j), for which the reference is NUREG-0737, Supplement 1

1992 DAEC EXERCISE ONSITE OBJECTIVES

CORE ELEMENTS (1)	FREQUENCY (1)	REGULATORY REFERENCE (3)	COMMENTS
(h) Use of backup communications	5 years	F.1	Use of interfacility back-up will not be demonstrated in 1992.
(i) Rumor control	5 years	G.4.c	Rumor control will be demonstrated in parallel with activation of the Emergency News Center
(j) Use of emergency power (where not a part of plant safety systems e.g. Technical Support Center (TSC))	5 years	8.2.1	Will not be demonstrated during the 1992 exercise. Completion of this objective may be ascertained by routine inspection of applicable test procedures.
(k) Evacuation of Emergency Response Facilities (ERFs) and relocation to backup ERFs, where applicable	5 years	J.10.g	Will be demonstrated in 1992.
(l) Ingestion pathway exercise	5 years	J.9, J.11	Will not be demonstrated in 1992. Last demonstrated in 1990 with State of Iowa
(m) Field monitoring, including soil, vegetation, and water sampling	5 years	I.7, I.8, I.11, N.2.d	Collection and analysis of sample media will be demonstrated.

(1) As delineated in NRC Inspection Manual-Procedure 82302
(3) Items refer to NUREG-0654, Part II, except for element (j), for which the reference is NUREG-0737, Supplement 1

1992 DAEC EXERCISE ONSITE OBJECTIVES

CORE ELEMENTS (1)	FREQUENCY (1)	REGULATORY REFERENCE	COMMENTS
(n) Capability for determining the magnitude and impact of the particular components of a release	5 years	I.3, I.4, I.6, I.8, I.9, I.10	Will demonstrate determination of total release and presence of radio-iodine
(o) Capability for post-accident coolant sampling and analysis	5 years	I.2	Will not be demonstrated in 1992.
(p) Use of Potassium Iodide (KI)	5 years	J.6.c	Will not be demonstrated in 1992.
(q) Assembly and accountability	5 years	J.5	Will be demonstrated
(r) Recovery and Re-entry	5 years	M.1	Will not be demonstrated in 1992.

(1) As delineated in NRC Inspection Manual-Procedure 82302

6.1 Narrative Summary

The scenario for this Exercise is based upon a series of postulated events that leads to a release of radiation off-site of sufficient magnitude to declare a GENERAL EMERGENCY. The fuel failure occurs due to a combination of Emergency Core Cooling system failures and a Loss of Coolant Accident, beyond the design basis. This coupled with a small failure in the primary containment boundary, leads to the release off-site.

Initial conditions specify that the plant is at about 96% power, middle of cycle, with the current run at about 109 days. RCIC is out-of-service due to pump seal failure. The pump seals are being replaced. The turbine is uncoupled from the pump, the old seals have been removed, with the pump casing off of the pump. The new seals are due to arrive late this Wednesday, with installation to be completed by this coming Saturday. The 14 day LCO has been in effect for 6 days. The HPCI system has been verified operable. The "D" RHR pump is out of-service due to a short in the motor windings. The motor is being repaired and due back to the plant this Friday. The 30 day LCO has been in effect for 20 days. All required systems for the LCO have been verified operable. The "A" CRD pump is OOS due to a failed motor bearing. The pump motor is scheduled to be pulled this Thursday for bearing replacement. The "B" pump tripped last Wednesday on a faulty suction pressure switch. The "A" pump ran until Monday morning, when its motor bearing failed. Ops shifted back to the repaired "B" pump. Drywell Floor Drain leakage is running around 1.0 gpm and the Equipment Sump leakage around 0.7 gpm (holding steady for the last two months). A high level radwaste shipment is scheduled to be moved from the refuel floor today. Plans are to ship the container out on Wednesday. This shipment is the last of a series and has a very high Curie content. Several key events in the last few months, include: a 12 hour Hot Shutdown LCO, when both Diesel Generators were inop, due to a faulty auto start logic problem; a Limitorque concern from a recent NRC maintenance inspection, that required several small LCOs to be entered/exited to adjust some torque settings; and a partial loss of EHC, when the "A" pump tripped, during turbine testing. Those problems have been corrected and the systems restored.

The drill starts with a worker deconning in the Hot Tool Crib area, getting injured. He/she is highly contaminated, with injuries to the upper left shoulder and the lower left leg. Off-site transportation is required, so an Unusual Event, (A-26), "Transportation of contaminated injured individual to the hospital." is declared. A small leak develops on the "B" Feedwater check valve, inside the Drywell, (V-14-3). Ops will calculate the leak rate and may decide to start a plant shutdown.

Ops will monitor the leak rate closer and it will gradually increases to around 5 gpm. If not already started, a plant shutdown will commence. Reactor power is reduced to about 64% with Recirc and control rod insertion begins. After several rod insertions, the Reactor Manual Control system will fail and the operators will be unable to select any control rods. Meanwhile, a fire develops at the Palo School, the Iowa Electric "Off-Site Relocation and Assembly Area" (ORAA), and will require the use of an alternate facility, when the ORAA is activated.

The leak rate in the drywell increases to around 60 gpm. A larger increase in drywell air temperature and pressure start occurring. Ops may elected to lineup and vent the containment, to help control any drywell pressure increase. The EAL is upgraded to an ALERT, (B-1), "Reactor Coolant System leak rate greater than 50 gpm, but within makeup capacity: RPV level being maintained." Ops also may elect to insert a manual scram from this power level. If they elect to scram, the ALERT may shift to B-11, "Failure of RPS to initiate and complete a reactor shutdown." The rod select problem is repaired and the insertion of control rods can resume. (if a manual scram was not inserted) Leak rate in the drywell increases, with drywell pressure approaching the 2 psig setpoint. Ops inserts a manual scram, but all control rods do not go in. 24 rods don't scram, of which about 14 are full out. The ATWS EOP will be entered. Some initial cladding failure starts to show up.

Drywell pressure finally exceeds 2 psig and the operable emergency systems auto start. The "A" Core Spray pump will start and trip, HPCI will start and Ops will secure it. The remaining control rods are inserted, by manually driving them in, or by venting the over piston area. The ATWS EOP is exited and Ops start a cooldown of the reactor vessel.

The leak again increases in size. HPCI is re-started, but is injecting into the broken feedwater line. The feedwater and condensate pumps run out of makeup water and trip. The remaining RHR pumps and the "B" Core Spray pump are verified running and OPS Emergency Depressurizes, to allow low pressure injection. The "B" Core Spray pump's outboard discharge valve, MO-2137, does not open. LPCI (RHR) injects, but Reactor Vessel level does not fully recover. Alternate means of makeup are looked at, and the EAL is upgraded to a SITE AREA EMERGENCY (C-1), "LOCA greater than makeup capacity.", or a (C-25), "Torus radiation levels > 100 R/hr". Torus water temperature increases rapidly, along with drywell temperature and pressure. The magnitude of the cladding failure increases, as indicated primarily by the drywell radiation monitors.

Penetration X16a fails in the plant. (2nd floor Rx Bldg, "A" Core Spray Drywell penetration) Radiation levels in the Reactor Building start increasing and a release off-site starts. The "C" RHR pump trips on a faulty motor overload relay and RPV level drops rapidly. The EAL is upgraded to a GENERAL EMERGENCY (D-1), "LOCA, with failure of ECCS to perform, leading to core degradation or melt in minutes or hours. Loss of containment integrity may be imminent.", or a (D-5), "Loss of 2 of 3 following fission product barriers with potential loss of the third.", or (D-10), "High Radiological Indications: Offgas monitor reading of > 1300 μCi/cc, or Drywell radiation levels > 3200 R/hr.". Drywell radiation levels peak and slowly start to drop to a lower level. (peak is around 400,000 R/hr) The "C" RHR and "B" Core Spray pumps are recovered and Reactor vessel level is slowly restored. Drywell radiation levels start decreasing at a faster rate and the release off-site diminishes. With plant conditions stable, Recovery/Re-entry discussions commence. Following the Recovery discussions, the Exercise is terminated.