

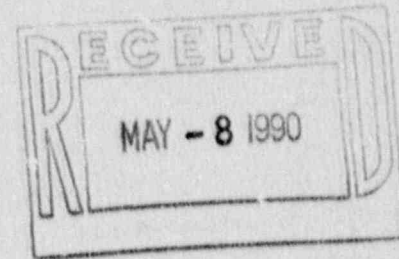


Arkansas Power & Light Company
Arkansas Nuclear One
Route 3, Box 137 G
Russellville, AR 72801
Tel 501 964 3100

May 4, 1990

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Mr. Robert D. Martin
Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011



SUBJECT: Arkansas Nuclear One - Units 1 and 2
Docket Nos. 50-313/50-368
License Nos. DPR-51 and NPF-6
Exercise Critique Board
REX-90 Evaluation
Inspection Report 50-313/90-08; 50-368/90-08

Dear Mr. Martin:

The attached summary of the Exercise Critique Board's evaluation of Arkansas Nuclear One's 1990 Radiological Emergency Preparedness Exercise (REX-90) is provided as discussed with Mr. Nemen Terc of your staff.

I have actioned the Emergency Planning Staff to review the Radiological Exercise Evaluation Report, correct the weaknesses and evaluate each improvement item contained in the report.

The Critique Board identified zero (0) deficiencies, six (6) weaknesses and sixty-one (61) improvement items. Each weakness is discussed in detail. Attachment A briefly describes each of the improvement items. Attachment B is the additional information which Mr. Terc requested concerning the eight (8) apparent weaknesses identified by the NRC Inspection Team.

If you have specific questions concerning the report, please contact Fred Van Buskirk, of my staff.

Very truly yours,

E. C. Ewing
General Manager,
Technical Support
and Assessment

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Mr. Robert D. Martin
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ECE/DWB/sgw
Attachment

cc: Mr. Nemen Terc
Emergency Preparedness Specialist
U. S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

U. S. Nuclear Regulatory Commission
Document Control Desk
Mail Station P1-137
Washington, D. C. 20555

Thomas W. Alexion
NRR Project Manager, Region IV/ANO-1
U. S. Nuclear Regulatory Commission
NRR Mail Stop 13-D-18
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852

NRC Senior Resident Inspector
Arkansas Nuclear One - ANO-1 & 2
Number 1, Nuclear Plant Road
Russellville, AR 72801

Mr. Chester Poslusny
NRR Project Manager, Region IV/ANO-2
U. S. Nuclear Regulatory Commission
NRR Mail Stop 13-D-18
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852

ARKANSAS NUCLEAR ONE

1990

RADIOLOGICAL EXERCISE EVALUATION REPORT

Prepared by the ANO Exercise Critique Board

E. C. Ewing, Chairman
B. A. Baker
R. A. Fenech
R. A. Sessoms
J. J. Fisicaro
D. A. Daniels

THE 1990 RADIOLOGICAL EXERCISE EVALUATION REPORT

I. INTRODUCTION

The Arkansas Nuclear One 1990 Radiological Exercise (REX-90) was held on March 14, 1990, in accordance with 10CFR50.47(b)14, 10CFR50.54(q) and Appendix E.IV.F. Arkansas Power and Light (AP&L), the Arkansas Department of Health, the Arkansas Office of Emergency Services, local governments, Regional Office of the Nuclear Regulatory Commission (NRC), and officials from the Federal Emergency Management Agency (FEMA) participated in the exercise. The state and local governments participated fully in this exercise after participating only partially in the 1989 Radiological Exercise.

The REX-90 Scenario Committee developed a more complex scenario for this exercise in that the scenario began during off-hours (1:00 a.m.), the scenario developed more rapidly than in past exercises (i.e., from normal operations to Alert to General Emergency), and most of the agencies whose services would be required in a real emergency participated in this exercise. Also, the Arkansas Department of Health, the Arkansas Office of Emergency Services and AP&L (partial participation) continued the exercise with an Ingestion Pathway scenario on March 15.

Personnel from the Arkansas Department of Health and the Arkansas Office of Emergency Services co-located with their utility counterparts in the Emergency Operations Facility (EOF). The Nuclear Regulatory Commission's Base Team participated at the Regional Office in Arlington, Texas and dispatched part of the NRC's advance site team to co-locate and play in the exercise at ANO. An NRC inspection team comprised of five NRC/contractor personnel evaluated the exercise.

II. EVALUATION PROCESS

At the conclusion of the exercise, the Lead Evaluators/Evaluators met with the players to discuss noted problems and to solicit comments from the players. Following this meeting, each Lead Evaluator met with their group to discuss each observation. The Lead Evaluator from each group was responsible for collecting and documenting each finding in their group into one of 3 categories as follows:

Deficiency - Evaluation findings which indicate that our state of emergency preparedness does not provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

Weakness - Evaluation findings which, in the opinion of the Lead Evaluator, are not considered deficiencies, but would be identified by the NRC as a violation of regulation, procedural violation or deviation from a commitment.

Improvement Item - Evaluation findings which are not considered weaknesses, but will be documented and evaluated in order to improve our Emergency Preparedness program.

Once the Lead Evaluator had classified each finding in their respective group, an evaluation form was completed to document their findings.

The Lead Evaluators continued the evaluation process by presenting each documented finding to the Exercise Critique Board. This Exercise Critique Board was composed of the following management personnel:

General Manager, Technical Support & Assessment (AP&L)
Manager, Licensing (AP&L) Plant Manager, Unit-2 (AP&L)
Manager, Plant Modifications (AP&L) Plant Manager, Central (AP&L) Manager, Plant Projects (Entergy Services)

The purpose of the Exercise Critique Board was to evaluate each finding presented by the Lead Evaluators and to verify that the findings were adequately classified as deficiencies, weaknesses, or improvement items (scenario or other). Findings were reclassified and prioritized as necessary. A listing of each weakness and significant improvement items was compiled for presentation to the NRC Inspection Team.

III. EXERCISE CRITIQUE BOARD EVALUATION RESULTS

Final evaluation results indicated zero deficiencies, six (6) weaknesses and sixty one (61) improvement items.

Attachment A contains a complete list of findings which includes a brief description of each weakness or improvement item along with the area in which it was identified. The six identified weaknesses are discussed in more detail below and shall be corrected as required by 10CFR50 Appendix E. Additionally, the Emergency Plan Steering Committee is directed to address each improvement item, incorporate those which are determined to be beneficial to the program, and provide the basis for those the committee decides not to implement.

Weakness #1 Conditions which should have resulted in the declaration of a General Emergency were not recognized in a timely manner and the event was under-classified. The under classification was a consequence of inaccurate information conveyed to the Emergency Coordinator regarding Containment Isolation valve CV-1221. This valve, according to the scenario, was failed in the open position resulting in a breach of containment. It was, however erroneously reported closed and the Emergency Coordinator, at that point understood that containment integrity had been maintained.

Weakness #2 Command and control of Control Room activities was weak as evidenced by poor communication practices within the shift, and a failure to communicate recommendations on event classification to the TSC.

Weakness #3 There was ineffective Health Physics support as evidenced by the following:

- Health Physics Technicians did not report to the Control Room upon activation of the IRS.
- Health Physics Technicians were not dispatched to staff the Field Monitoring Teams in a timely manner.
- An inadequately staffed control point at the EOF resulted in improper entry thru the portal monitors.
- The individual filling the Onsite Monitoring Supervisor position was not qualified by training.
- Four of the six HPs initially sent to staff the Offsite Monitoring Teams had not received Emergency Plan Training.
- Several members of the Emergency Radiation Team were unqualified.
- Subsequent interviews have provided the following information regarding problems associated with staffing of the Emergency Radiation Team:

When the on-duty Onsite Monitoring Supervisor was not successfully contacted, instead of attempting to contact a qualified alternate (there are six (6) alternates on the roster) an on-shift Health Physics foreman was temporarily assigned to this position. Although qualified as a team member, he has not received training as Onsite Monitoring Supervisor in the Emergency Response Organization. He served in this capacity for approximately 20 minutes until a qualified Onsite Monitoring Supervisor reported to the OSC.

While notifications of Emergency Radiation Team members from offsite were in progress (there are approximately 40 qualified members), the team was initially staffed with HP techs who were working onsite, some of whom as new employees had not received Emergency Response Training. Additionally, several of the HPs used were contractors and although they would most likely be used during a real emergency if available, their use is not described in the Emergency Plan because their continuous availability cannot be assured.

Weakness #4

Improvements in training of Health Physics personnel are needed as evidenced by:

- An HP and Operator failed to check their SRD's when in a radiation area.
- An HP and Operator failed to wear protective equipment when entering an area of unknown radiological conditions.
- Two separate air sample media (iodine and particulate) were placed in the same container allowing for cross contamination of the samples.
- Contrary to procedure 1905.002, the Offsite Monitoring team members did not receive a whole body count after returning to the EOF.

Weakness #5

In several instances, when the maximum "worst case" integrated dose was requested for a specific downwind distance, the highest integrated dose at a nearby GERMS dose evaluation point was given. The "worst case" centerline dose was actually about a factor of two hundred higher.

Weakness #6

There was inconsistent use of technical staff support to assist in establishment of objectives, alternatives and setting priorities:

- TSC set priority on diesel repair over stopping the release.
- No consistent looking ahead for possible alternative solutions and for potential accident pathways.

IV. CONCLUSION

The Exercise Critique Board has evaluated the exercise and has identified the areas of weakness and has contributed a substantial number of recommendations for improvement of ANO's emergency preparedness program. The Critique Board considered this to be a very challenging and rapidly developing scenario which stressed the Emergency Response Organization and maintained an intense level of response activity throughout the exercise.

The NRC evaluation results presented during the exit meeting on March 16, 1990, characterized eight (8) findings as apparent exercise weaknesses. Several of these items required further investigation of circumstances before a final determination could be made. AP&L agreed to submit this additional information to Mr. Nemen Terc, NRC Inspection Team Leader, as soon as possible following the exercise. This information is contained in Attachment B.

ATTACHMENT A

REX-90 CRITIQUE ITEMS

<u>NR</u>	<u>AREA IDENTIFIED</u>	<u>SUMMARY DESCRIPTION</u>
1 W	EOF, CR, TSC	Conditions which should have resulted in the declaration of a General Emergency were not recognized in a timely manner and the event was under-classified.
2 W	CR	Command and control of Control Room activities were weak as evidenced by poor communication practices within the shift.
3 W	DAT, CR, OSC	There were several instances of ineffective Health Physics Support (i.e., delayed control room support, onsite monitoring functions were not staffed in a timely manner, etc.).
4 W	DAT, OSC	Need improvements in training of HP Personnel. There were several instances of violations of H.P. procedures and work practices.
5 W	DAT	When maximum "worst case" downwind points were requested, the value for dose evaluation points were given instead of "worst case" centerline dose.
6 W	TSC, OSC, EOF	There was inconsistent use of technical staff support to assist in establishment of objectives, alternatives, and setting priorities.
7	EOF, CDR	The lead communicator had problems notifying communicators. As a result, a notifications communicator did not arrive at the Command Room until 0325.
8	EOF, CDR	During the medical emergency, the Emergency Operations Facility Director received information that the injured person was in a 700 R/hr field. This report was in error since the scenario called for less than 1.5 R/hr.
9	ENC	Terminology used in news releases/press conference was not understood by lay-person.
10	ENC	Visual aids were not being utilized during press conferences. Use of visual aids will help explain difficult subjects to lay people.

- 11 EOF, ENC Press releases were not issued in a timely manner.
- 12 ENC Person in rumor control was not a good communicator and wasn't sure about what to say.
- 13 REAM Emergency phone directory was not available when the Radiological/Environmental Assessment Manager reported to the Emergency Operations Facility.
- 14 DAT State Health Department requested dose rate projections beyond the 10 mile Emergency Protection Zone. Data was available but not provided. The Radiological/Environmental Assessment Manager thought the data was not available.
- 15 REAM Need better two-way data sharing between AP&L and Arkansas Department of Health. ADH needs to supply Field Monitoring Data to AP&L Field Monitoring staff and vice versa.
- 16 OFF MON Need to use see-through colored markers on maps for the EOF, as opposed to black markers, which obscure map information.
- 17 OFF MON Personnel setting up Portal Monitors at Emergency Operations Facility were confused about which console went with which portal. They are calibrated as a set.
- 18 OFF MON The Offsite Monitoring Team command area is too small and noisy for debriefing. Alternate location is needed for debriefing.
- 19 OFF MON Communications between Offsite Monitoring Supervisor and field teams were confusing due to a failure to use the phonetic alphabet. Use Alpha, Bravo, Charlie, etc. for radio communications, instead of A,B,C, etc.
- 20 OFF MON Field teams were concerned about amount of time or number of times teams were in the plume, and total uptake of radioisotopes for time spent in the plume.
- 21 OFF MON Chevy citation is inadequate for offsite sampling. A larger vehicle is needed to provide more room for Offsite Monitoring teams and equipment.

22	OFF MON	Teams had difficulty inventorying Offsite Monitoring kits. Access to the kits is restricted due to equipment stored around them.
23	OFF MON	No ink pens in one of the Offsite Monitoring Kits.
24	OFF MON	Malfunctioning calculator in one of the Offsite Monitoring Kits.
25	OFF MON	Calculator batteries were dead and particulate filters were old in one of the Offsite Monitoring kit.
26	OFF MON	Keys to the ANO fuel depot were not available at the Emergency Operations Facility. Field Monitoring teams did not know where to find the keys.
27	OFF MON	The tables on the plume maps in controller books are confusing. This resulted in erroneous dose numbers being given to drill participants by the controller.
28	OFF MON	Plume sample data provided exceeded RM-14 (frisker) capability. Instrumentation limits should be considered when developing the exercise scenario.
29	EOF	EOF Director must search for "common equivalents" for dose and dose rates (e.g., X-rays, TV, etc) for comparison purposes during press conferences.
30	REAM	New position of Health Physics Network (HPN) communicator should be established to man the HPN phone during emergencies.
31	CR	Chemists were needed to obtain PASS sample and be available for the Emergency Medical Team at the same time. Need to qualify more personnel for the Emergency Medical Team.
32	CR	Shift Operations Supervisor/Shift Admin. Assistant had difficulty finding phone numbers for support shift personnel because they were not "assigned" ERO personnel and were not in the Emergency Phone Book.
33	CR	Control Room Shift Admin. Asst. (SAA) had to man the Emergency Notification System phone until after 0445. This kept the SAA busy with the phone when she should have been supporting the Shift Operations Supervisor.

- 34 CR Switchover time for simulator phone page to Plant Page System not clearly determined. Messages were partially announced due to response time of system. User needs some sort of feedback to indicate when switchover is completed.
- 35 CR Simulator Rad Monitor response is difficult to set for exercise. Need more accurate modeling of these monitors.
- 36 CR Errors in communication or mis-information were observed in the control room (example: Report that CV-1221 was closed when it was not).
- 37 CR Problems exist with Plant Evacuation Alarm/ Fire Tone Alarm in relation to exercise coordination. The alarms must be activated from the real control room rather than the simulator and this causes confusion.
- 38 CR Radio reception was poor between simulator Control Room radio and Fire Brigade leader radio, causing confusion.
- 39 OSC Controllers that also function as Evaluators are overloaded. Increase Controller/ Evaluator staffing.
- 40 OSC Maintenance personnel on 2nd floor Admin Bldg cannot hear updated briefing from the Technical Support Center.
- 41 OSC Some teams being dispatched are not being briefed in a consistent manner. A check-off list is needed so that all teams are briefed the same.
- 42 OSC Procedure 1905.001, paragraph 10.2 has errors. Extremety dosimetry requirements have changed, and require revision.
- 43 OSC A number of personnel had dose limits raised to 25R. Some needed this dose limit, while others didn't.
- 44 OSC Lack of table space for maps, etc. in the Operations Support Center.
- 45 OSC No safety equipment in Operations Support Center lockers for personnel going into the plant. Hard hats and safety glasses should be added to the OSC locker.

- 46 OSC Some items were not available to startup the Operations Support Center (OSC). Create startup kit to include forms, phone books, etc. for the OSC.
- 47 OSC Total lack of office supplies at the OSC.
- 48 OSC Operations personnel need Fire Suppression Skills training. Ops. personnel often disagree with Fire Brigade Leaders requests.
- 49 OSC Inadequate Self Contained Breathing Apparatus (SCBA) Masks in proper sizes for Fire Brigade. Need 3 sizes available for each set.
- 50 OSC Improve training on types of fires and equipment.
- 51 OSC A Health Physics Tech functioned as the Onsite Monitoring Supervisor, but was not qualified to do so.
- 52 OSC Health Physicists and Mechanics had to shave prior to issue of SCBA's. No exception was made because of the emergency.
- 53 OSC, MED Neither of the HP's that were with the Medical Emergency victim while onsite were sent to the hospital with the victim.
- 54 OSC Control point was initially setup in the Administration Bldg instead of at the Unit 2 Controlled Access Point (CA-2), even though dose rates were such that it could have been set up at CA-2.
- 55 OSC Proceduralized work plan written for repair of electrical breaker B-61 instead of written guidance. This slowed repair. A formal proceduralized work plan was not necessary.
- 56 OSC, MED Inadequate staffing available for Medical Teams. Only 4 medical team members were available for the first few hours of the exercise.
- 57 OSC, MED ANO Health Physics policies and hospital radiation protection policies differ, causing confusion.
- 58 OSC Fitness for duty rule could be challenged during weekends and off-hours emergencies.
- 59 OSC Operations Support Center was not staffed within the 1 hour goal.

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| 60 | OSC | Call out list for the Operations Support Center is too long for one person to perform in the amount of time required. |
| 61 | OSC | Limited numbers of qualified players for key positions. Need requirement to attend requal classes. |
| 62 | OSC | Insufficient number of personnel for Electrical Maintenance Supervisor for call-out. |
| 63 | OSC | Not enough personnel available for storeroom, and Stores Supervisor should have been called. |
| 64 | OSC | The Gaitronics speaker and the Technical Support Center closed link intercom should be relocated to opposite ends of the Operations Support Center to prevent them from competing with each other. |
| 65 | OSC | Corridor 89 and 386' Elev. Turbine Deck page speakers are not working properly. |
| 66 | TSC | Technical Support Center was not staffed within one hour of the declaration of an Alert (1 hour, 13 minutes). |
| 67 | TSC, PASS | Had problems getting valve 2CVC 151 opened to provide flush water to the Post Accident Sampling System. |

LEGEND:

W-Weakness	CR-Control Room
CDR-Command Room	OSC-Operational Support Center
TSC-Technical Support Center	EOF-Emergency Operations Facility
OFF MON-Offsite Monitoring	DAT-Dose Assessment Team
REAM-Radiological/Environment Assessment Manager	MED-Medical Emergency
PASS-Post Accident Sampling System	ENC-Emergency News Center

NOTE: Items 1W through 6W are considered weaknesses, the remainder are improvement items.

ATTACHMENT B

During the exit meeting on March 16, 1990 the NRC Team identified several apparent weaknesses and presented a number of observed examples which were possible indicators of the apparent weaknesses. Several of these examples required that follow-up information be obtained in order to make a conclusive determination. This attachment contains additional information acquired in post exercise interviews with players and controllers.

APPARENT WEAKNESS: Inadequate Technical Analysis

Supporting example noted by NRC: Operators did not transfer from the normal Auxiliary Building ventilation system to the Penetration Room ventilation system.

Follow-up information: Although the source of the primary coolant leak had been correctly identified as the letdown line, there was no clear indication available to the operators that distinguished the exact location as being the upper north penetration room (within the Penetration Room Ventilation area) or the lower north pipeway (normal Auxiliary Building ventilation area). Visual identification of the leak point would have been required to make this distinction and both areas were inaccessible due to high radiation. Therefore, the decision was made to remain on normal Auxiliary Building ventilation. Both ventilation systems are filtered and monitored.

The scenario, however, assumed that the transfer to the Penetration Room ventilation would be made and the SPING data reflected this assumption. The scenario should have also provided data which would have been consistent with the decision to remain on normal Auxiliary Building ventilation.

Supporting example noted by NRC: From 0300 - 0630 there was no discussion on whether to cool down using forced circulation or natural circulation.

Follow-up information: Based on a subsequent interview with the Emergency Coordinator, when indications of failed fuel were received, he directed the Engineering Manager to check the loose parts monitor noise level for any changes whenever a Reactor Coolant Pump was started or stopped. This allowed the use of the preferred method for cool down while continually monitoring the effects of forced circulation in the primary system on the extent of damage to the fuel.

APPARENT WEAKNESS: Failure to Follow Procedure.

Supporting example noted by NRC: Operators tripped "D" Reactor Coolant Pump (RCP) rather than "B" Reactor Coolant Pump.

Follow-up information: When the "A" RCP impeller failure occurred, the operators used Abnormal Operating Procedure (AOP) 1203.31, Section 7 (sheared shaft) in conjunction with the Emergency Operation Procedure (EOP). The AOP directs the operators to secure the other pump in the same loop if there are indications that the impeller in the casing of the affected pump is rotating. This is indicated by the loose parts/vibration monitor and/or Reactor Coolant flow degradation below the expected 3 RCP configuration flow. Neither of these indications were present, thus, the operators determined that the affected pump was not rotating and secured RCPs as instructed by the normal shutdown/cooldown procedure 1102.10.

APPARENT WEAKNESS: Information Flow and Communications.

Supporting example noted by NRC: EOF Staffing Board did not show NRC personnel.

Follow-up information: NRC exercise players specifically requested the Support Manager not to display their names on the staffing board until they assumed command and control from the region. Once this was accomplished, the staffing board was updated to include NRC site team staff.

APPARENT WEAKNESS: Management control in the TSC.

Supporting example noted by NRC: The work activities displayed in the TSC in order of priority, placed the assessment of the operable Emergency Diesel Generator (EDG) above the effort to terminate the offsite release.

Follow-up information: The Emergency Coordinator had regarded both activities as having equal priority and had directed that both jobs be performed in parallel by two separate repair and damage control teams. His rationale for assigning a high priority to ensuring operability of the EDG was based on a possibility of severe weather in the area which he regarded as a potential threat to offsite power supplies.

APPARENT WEAKNESS: Inadequate record keeping.

Supporting example noted by NRC: A chronology of events was not available in the TSC.

Follow-up information: Plant status forms were completed by the TSC Status Board Communicators and provided a chronology of events from 0110 to 1057 when the exercise was terminated. The Emergency Coordinator stated that he did review the plant status forms and that the Engineering Manager used them to prepare for a shift turnover.

Copies of these forms will be provided.

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NRC OBSERVATION: Announcement of the fire was made from the real control room before the simulator Shift Operations Supervisor was ready.

Follow-up information: Based on observations by the attending Control Room Controller, it was concluded that the Simulator Shift Operations Supervisor was about to make the announcement of the fire. The controller then, as instructed, intervened and directed another controller in the actual control room to have the announcement made from that location since the simulator control room does not have the capability to sound the fire tone. Thus the sequence occurred as planned in the scenario.