

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 2, 1993

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: D. Thompson
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SUBJECT: Report on Rocky Flats Emergency Response Exercise "Ready 93"

1. **Purpose:** This report documents DNFSB staff (and outside expert) observations made during the conduct of Emergency Preparedness Exercise *Ready 93*, which was conducted during the morning of October 27, 1993 by the DOE Rocky Flats Office (RFO) and the EG&G Company (EG&G).
2. **Summary:** Overall, DNFSB staff evaluators consider the exercise to have been successful. However, there are a number of areas in which improvement is needed. These include:
 - The on-scene response team was slow in making its assessment of radiological hazards at the simulated accident scene. Radiological Protection Technicians (RPT) were slow to respond to the scene of the simulated accident. The Incident Commander (senior on-scene representative) was slow to request radiological data at the scene of the simulated accident, leading to delays in making needed information available to the Crisis Manager.
 - Some questions exist with regard to habitability of the newly renovated Emergency Operations Center (EOC). Specifically, the heating, ventilation, and air conditioning system for the building in which the EOC is located is not isolable, thus subjecting the EOC to the possibility of high level contamination under certain meteorological and accident source term conditions. This situation is significant because there are no advance arrangements for an alternate location for the EOC. RFO is aware of the problem, but has apparently encountered budgetary restrictions in attempting to resolve it.
 - There is a need for continued emphasis on routine accident response practices, such as: proper use of personnel dosimetry and protective equipment; improved communications between dose assessors and decision makers; provision of clear, concise and timely information to responders

and employees regarding the status of the accident and the response to it; effective use of available audio-visual equipment in the EOC; and the use of good contamination control practices by the field survey teams.

3. **Background:** Exercise *Ready 93*, an emergency preparedness exercise designed primarily to test the actions of members of RFO and EG&G response teams, was conducted during the morning of October 27, 1993 at the Rocky Flats Plant, near Boulder, Colorado. DOE Headquarters Emergency Operations Center (EOC) did not participate; a control cell, consisting of individual Headquarters personnel simulated Headquarters involvement; the State of Colorado participated to a limited degree. Exercise *Ready 93* was based on a simulated truck accident on the site, resulting in the dumping of approximately 3-5 kilograms of Plutonium-bearing incinerator ash. Simulated source term and meteorological conditions led to projected doses exceeding prescribed Protective Action Levels (PAL), requiring the activation of the emergency response of EG&G and RFO to protect both on-site workers and off-site public.

DNFSB staff evaluators utilized the Federal Emergency Management Agency (FEMA) evaluation methodology set forth in FEMA-REP-15, "Radiological Emergency Preparedness Exercise Evaluation Methodology", dated September 1991.

4. **Discussion/Observations:**

Specific objectives in nine subject areas, listed below, were identified by RFO and EG&G as goals for Exercise *Ready 93*. Stated objectives were evaluated by DNFSB staff evaluators, except as noted in the detailed discussions in Attachment A. Most of the objectives were satisfactorily achieved, although some minor deficiencies were noted. The nature and extent of those deficiencies are set forth in Attachment A.

- Notification and Mobilization
- Emergency Assessment, Classification, Command and Control, and Mitigation
- Emergency Response
- Emergency Response Facilities and Equipment
- Radiological Dose Assessments and Control
- Public Information
- Occupational Health Department Response
- Reentry and Recovery
- Exercise Scenario, Conduct and Control

5. **Future Staff Actions:**

The staff intends to review both the DOE-RFO and the EG&G evaluation reports, when they are issued, and will monitor the conduct of future emergency preparedness exercises.

ATTACHMENT A

1. Notification and Mobilization

Objective: Demonstrate the capability to alert and fully mobilize personnel for both emergency facilities and field operations in accordance with the RFP Emergency Preparedness Plan.

Discussion/Observations:

At the Rocky Flats Plant, a Plant Shift Superintendent is assigned to the Emergency Operations Center 24 hours a day. It is the Plant Shift Superintendent's responsibility to initiate actions in response to any unusual condition occurring during his tour of duty, including responding to any on-site incident to serve as Incident Commander at the scene. Communications channels covering the Fire and Security forces are monitored full-time, and telephone, radio and extensive data processing devices are readily available.

Exercise *Ready 93* was initiated on October 27, 1993 by a 7:35 am call from a passerby to the site 911 number. The caller reported a traffic accident involving an overturned truck, with several overturned "white barrels" and powdery material spread on the ground. The Plant Shift Superintendent declared the incident as a Site Area Emergency thereby activating the Emergency Operations Center and initiating automated notification calls to members of the Crisis Management Team and the Crisis Management Support Team. The Plant Shift Superintendent departed for the accident scene at 7:39.

The first members of the Crisis Management Support Team arrived at the Emergency Operations Center by 7:53; by 7:57, the Emergency Response Organization was declared operational by the Crisis Manager, the EG&G Deputy Manager¹. He concurred in the earlier Site Area Emergency declaration made by the Incident Commander, and directed that a site-wide announcement of the emergency be made with instructions to all employees to remain under cover until further notice.

Responding units from the RFP Fire Department approached the accident scene from downwind, thus exposing themselves and their equipment to possible contamination. They quickly recognized their error and left the area to take a more circuitous route to permit an approach from upwind,

¹In the current Rocky Flats Emergency Response Plan, the senior manager in the Emergency Operations Center is the EG&G Deputy Manager. The DOE-RFO Manager is a member of the Emergency Response Organization, but does not serve as the senior member of the team unless and until he determines that the EG&G Deputy Manager is not responding appropriately, in which case the DOE-RFO Manager may elect to relieve the EG&G Deputy Manager.

At the time Exercise *Ready 93* was conducted, the DOE-RFO Manager had been on the job for less than two weeks, and did not participate in the exercise. His role on the Crisis Management Team was played by the DOE-RFO Deputy Manager, while the Manager observed. Comments brought to the attention of the DNFSB evaluators after the exercise was completed indicate that this newly assigned Manager may elect to change the command structure of the Crisis Management Team.

thus providing the means for wider contamination. Having made the initial mistake, the proper reaction would have been to remain in place, recognizing that additional movement of the vehicles would only make matters worse.

Mobilization of on-scene resources was generally good, with the exception of a slow response from Radiological Protection Technicians (RPT's). The accident scene was within 100 yards of the entrance to Building 371, from which a RPT team was available, but the first RPT did not report to the accident scene until more than 40 minutes after initiation of the exercise. An additional five RPT's responded about 15 minutes later². Post-exercise comments by controllers indicated that there may have been some problem between Building 371 RPT's and Security Force members who required the RPT's to remain sheltered for some period of time. The first portable air sampler arrived at the accident scene about 55 minutes into the exercise.

Designated Field Survey Team (FST) members were notified to report to the dispatch point, in accordance with the RFP Emergency Preparedness Plan, approximately 20 minutes after initiation of the exercise. The last FST member arrived approximately 18 minutes later. The first FST left the staging point approximately 30 minutes after the teams were notified to respond - slightly more than 50 minutes after start of the exercise. These times are marginally acceptable.

FST responders observed that the staging point was in the simulated plume, but took no action to relocate. Staging of FST equipment was done on the ground outside the trailer used as the pre-designated FST staging point, despite awareness of the location in the plume, resulting in simulated contamination of all the staged equipment. Some of the responders did not use respiratory protection. At least one FST was slow in wearing pocket dosimeters; the same team noted high readings on their pocket dosimeters when they were finally used, but made no move to rezero them.

Workers in the buffer zone outside the plant perimeter at the time the exercise was conducted were not notified to take cover, according to a debriefing report of one of the RFP evaluators.

DNFSB staff evaluators consider this objective to have been achieved, but note that weaknesses exist in the timely and effective mobilization of resources - both at the accident scene and for off-site field surveys - and in radiation safety and contamination control practices of responders.

²During the post-exercise critique, one of the senior controllers stated that Radiological Protection Technicians are not trained for a response outside their assigned buildings. This statement appears to contradict corrective actions instituted following the Operational Readiness Review for resumption of operations in Building 559. If his assertion is true, it may indicate that the Bldg 559 ORR corrective actions were not made applicable site-wide, as might have been expected.

2. Emergency Assessment, Classification, Command and Control, and Mitigation

- Objectives:**
- a. Demonstrate the capability to properly assess and classify an emergency event, and perform command and control and mitigation activities during emergency operations.
 - b. Demonstrate the capability to make timely and appropriate protective action recommendations (PARs) to the State of Colorado.

Discussion/Observations:

The prompt declaration of the Site Area Emergency by the Plant Shift Superintendent, and the endorsement of that declaration by the Crisis Manager upon his arrival at the Emergency Operations Center were proper and in accordance with the Emergency Preparedness Plan.

By 8:07 am, the Crisis Manager had determined that the combination of release of material that was likely to be radioactive (based on the color of the drums involved and the spill on the ground) and the prevailing meteorological conditions warranted upgrading the seriousness of the incident to General Emergency, requiring notification of off-site officials and dispatch of Field Survey Teams. He did make that declaration, initiated off-site notifications and ordered an announcement over the site public address system to that effect.

From the start of the exercise, the Crisis Manager was decisive, confident, and forthcoming with information for the entire Emergency Response Organization, using the EOC public address system frequently to inform the team of the status of the emergency and providing them with the basis for his decisions. He also arranged for frequent site-wide announcements concerning the exercise, thus keeping the entire on-site work force aware of what was happening.

Delays in gathering of radiological data from the accident scene, and some initial communications problems involving the Field Survey Teams led to frustration on the part of the Crisis Manager based on his inability to obtain timely and accurate information on which to base Protective Action Recommendations to the state and local officials responsible for instituting protection of the off-site public. Despite these frustrations, the Crisis Manager acted conservatively and in accordance with the RFP Emergency Preparedness Plan, recommending to off-site officials that they direct Take Cover actions for potentially affected members of the public.

When radiological data became available from both the accident scene and the off-site Field Survey Teams, the performance of the Hazards Assessment Center team became more responsive, and hand drawn sketches of the plume were presented to the Crisis Manager. At no time during the exercise, however, were timely and accurate isopleths or even general plume path information plotted on the overlay maps available in the Crisis Management Team room.

No early action was taken to dispatch portable air sampling equipment to the simulated accident scene, nor was air sampling requested by the Incident Commander. It was nearly an hour after initiation of the exercise before air sampling at the accident scene was begun.

FST members initiated air sampling in the vicinity of the pre-designated staging point in timely fashion, and concluded they were in the plume. Programmable portable air sampling equipment available and assigned to the FST's was not effectively utilized to establish arrays to locate the plume off-site. There appeared to be a lack of coordination in the planning for the conduct of off-site field surveys, with FST's passing one another on the road in apparently random patterns.

DNFSB staff evaluators consider that the objective of demonstrating the capability to perform command and control and mitigation activities was achieved. The objectives of demonstrating the capability to properly assess and classify events and to make timely and appropriate protective action recommendations were, at best, only barely achieved. Considerable improvement is called for: (1) in the timely deployment of portable air sampling equipment to the accident scene; (2) in control of the Field Survey Teams; (3) at off-site locations; and (4) in the hazards assessment function within the Emergency Operations Center.

3. Emergency Response

Objectives:

- a. Demonstrate the capability to respond to an emergency utilizing appropriate equipment and procedures for determining field radiation.
- b. Demonstrate the capability and availability of resources required by the protective force to control traffic flow and access control.
- c. Demonstrate timely evacuation and accountability for building and emergency response personnel, as required.
- d. Demonstrate the capability to maintain EMO staffing on a continuous, 24-hour basis through an actual shift change.

Discussion/Observations:

As noted in the discussion under Objective 1. above, the timeliness of the response of designated members of the FST's was marginally acceptable. Equipment pre-designated for use by FST's was appropriate, available and generally ready for use. The initial mistake of staging the equipment outdoors, and in the plume, was never corrected nor ameliorated in any fashion, despite recognition by presumably knowledgeable individuals that that error resulted in contaminating the entire suite of equipment so staged. FST members appeared to be technically competent to perform their duties, but the discipline of their own exposure and contamination control measures was lax, at best.

Appropriate on-site protective action (Take Cover) was implemented in timely fashion for workers not directly involved in the emergency response. DNFSB evaluators did not observe accountability practices for non-involved employees.

At the accident scene, one of the simulations involved minor injuries to the two people in the truck. One of the victims was unconscious at the time the Fire Department arrived on the scene and the responding fireman encountered difficulty in determining the condition of that victim, due to the impediments of his own personnel protection (full-face respirator and heavy gloves).

During the initial on-scene response, the Incident Commander removed his own respiratory protection in order to communicate better, despite the fact that air samples to confirm the safety of that action had not been performed. The Incident Commander remained without respiratory protection for about eight minutes until a Fire Department officer prompted him to protect himself. At that time, the Incident Commander donned a half-face respirator - unsuitable protection for protection against plutonium, which was a likely constituent of the spillage.

DNFSB staff evaluators did not observe directly the involvement of the RFP Security Forces in the response to the emergency, although it was observed that security personnel had established traffic control points to limit access to the accident site. Based on that limited observation, no assessment of whether or not that objective was achieved is offered.

DNFSB evaluators were informed prior to the start of the exercise that in the initial planning for Exercise 93, DOE-RFO planners envisioned a somewhat broader and lengthier exercise. It appears that the objective of demonstrating the capability for extended operation in the Emergency Operations Center may have been desirable under that more ambitious scenario. However, no opportunity to demonstrate that capability was provided in the final exercise.

DNFSB staff evaluators conclude that, in general, Objective 3.a. was satisfactorily demonstrated, despite the disclosure of some pronounced weaknesses in survey practices. Objectives 3.b. and c. were not observed in sufficient detail to determine the adequacy of their demonstration. Objective 3.d. was not demonstrated in this exercise.

4. Emergency Response Facilities and Equipment

Objectives:

- a. Demonstrate the adequacy of facilities, equipment, displays, and other materials to support emergency response.

- b. Demonstrate the capability to communicate with appropriate emergency personnel at facilities and in the field.

Discussion/Observations:

The physical plant for the Emergency Operations Center at RFP has been extensively modified recently; *Ready 93* was the first exercise conducted since the upgrading was completed. As part of the upgrade, the number of people assigned to the Crisis Management Team was substantially reduced, and a new organizational element - the Crisis Management Support Team - was established.

The support team room is located just outside the Crisis Management Team space, with a large picture window separating the two. The seven-person Crisis Management Team is seated around one side of a large conference table facing the window, thus overlooking the support team room. Each member of the Crisis Management Team is supplied with reference material and appropriate communications equipment. The support team members (approximately 20 in number) are seated at individual carrels, each supplied with reference material and appropriate communications equipment.

Status information projection screens and television monitors are placed strategically to permit all members of both the Crisis Management Team and the support team to see them without obstruction. These display elements were used very effectively throughout the exercise, with the exception of inadequate use of the plume plotting capability discussed under Objective 2 above and the failure to post closure actions against tasks logged onto the task assignment board. Rectifying the latter deficiency is desirable to ensure that, once assigned to response organizations for resolution, tasks are actually completed in reasonable time frames; corrective action should be simply a matter of establishing and following a standard operating procedure.

In contrast to the situation at several other emergency response facilities, there is little pedestrian traffic between the two team rooms described above. This reduced traffic flow is made possible by two full-time staff members assigned responsibility for the flow of information to and from the Crisis Management Team: (1) a liaison person working from a podium at the back of the Crisis Management Team room, who acts as a highly qualified communicator of information needs of the Crisis Management Team; and (2) an experienced, senior EG&G manager assigned to supervise all activities of the support team and to provide clear and concise information to the Crisis Management Team. The resulting reduction in traffic and noise to distract the decision-makers was very effective; participants were uniform in their post-exercise endorsement of the changes.

The Hazards Assessment Center is a separate space within the Emergency Operations Center where competent Radiological Protection personnel assemble to calculate projected doses and to track any plume from releases. A very sophisticated computer model operates 24 hours a day in this space, monitoring actual meteorological data frequently and averaging those data every few minutes, then applying the result to a calculated maximum credible on-site release of radioactive material, and plotting the resulting plume path and isopleths on a real-time basis. For purposes of exercises, however, the operation of this model with real meteorological data is temporarily suspended in order to insert simulated data for control of any given exercise. That was the case for Exercise *Ready 93*, as well.

During the early portion of the exercise, radio communications between the FST Coordinator and the teams were poor, apparently due to some malfunction of the Coordinator's radio. The problem was corrected reasonably expeditiously, however. Communications protocol and discipline was somewhat lax initially, but improved later.

A recurring problem prevalent during many emergency preparedness exercises throughout the department - that of communications between field and headquarters response elements - was observed to only a limited extent during Exercise *Ready 93*. It appears likely that this was true because the DOE Headquarters Emergency Operations Center was not activated for this exercise. Instead, Headquarters activities were only simulated through a control cell, consisting of individual Headquarters staff members playing roles sketched out in the exercise scenario. These role players remained at their normal work stations and directed questions and responses to the RFP participants as though they were the full Headquarters emergency response organization.

Within the RFP Crisis Management Team, one senior staff member was assigned sole responsibility for communicating with state and local representatives and with DOE Headquarters. That individual, and a DOE colleague assigned to the Colorado State EOC for liaison purposes, were kept extremely busy during the exercise. Both these individuals were apparently adept at providing timely information needed by these outside groups, avoiding diversion of the Crisis Manager and other senior responders from their primary responsibility for dealing directly with the real-time problems at hand. It was clear, however, from eavesdropping in the Crisis Management Team Room on one side of several conversations, that it was largely by dint of this individual's powers of persuasion and his unwillingness to accede to what he perceived as unreasonable demands, that callers were dissuaded from interjecting their concerns on the Crisis Manager personally.

The intakes for the heating, ventilation and air conditioning system serving the Emergency Operating Center cannot be isolated. This is a potential problem, since under certain source term and meteorological conditions, the center could become sufficiently contaminated that evacuation would be mandatory. Since no advance provision for an alternate location for the center has been made, it is conceivable that, under these conditions, only ad hoc management of an emergency might be possible. DOE-RFO managers are aware of this problem, which has not been resolved, apparently because of budgetary considerations.

DNFSB staff evaluators consider that Objective 4.a. was satisfactorily demonstrated, but point out the continuing habitability issue and the lack of suitable arrangements for an alternate location for the Emergency Operations Center. With regard to Objective 4.b., the evaluators consider that the deficiencies observed during the early phase of dispatching field survey teams were transitory in nature and do not reflect major flaws in the preparedness status at RFP. Thus, we conclude that Objective 4.b. was also satisfactorily demonstrated.

5. Radiological Dose Assessment and Control.

Objectives:

- a. Demonstrate the capability to continuously monitor and control radiation exposure to emergency workers.
- b. Demonstrate the capability to develop dose projections and protective action recommendations regarding worker and public safety.
- c. Demonstrate the adequacy of procedures, facilities, equipment, and personnel in assessing radiation monitoring results and decontamination needs.

Discussion/Observations:

As noted in the discussion under Objective 1. above, RPT's were slow in responding to the scene of the accident, and nearly an hour passed before the first air samples were taken in the vicinity of the spill. Also as noted earlier, discipline regarding use of respiratory protection was weak. This weakness was also observed among the FST's.

At the scene, nasal smears were taken at about 1½ hours into the exercise. These smears were then placed in the middle of the road surface near the accident scene, where they remained for the next hour and a half. They were moved only when it became necessary to move a nearby truck.

The operation of the Hazard Assessment Center (HAC) staff was impeded by early communications difficulties, not only between the HAC and the Field Survey Teams, but also between the HAC and the Crisis Management Team; e.g. a recommendation from the HAC to the Crisis Manager to enlarge the coverage of the off-site Take Cover zone was explicitly rejected by the Crisis Manager as technically unsupported.

Appropriate procedures and equipment appeared to be in place, and suitable numbers of personnel were available to provide for assessment of radiation monitoring results and decontamination needs. DNFSB evaluators did not evaluate the qualifications of these personnel, but did not note any indications of inadequate training or capability.

Overall, DNFSB evaluators consider that Objective 5.a. was achieved, but note that weaknesses were present both in the on-scene response and in the self-protection practices of the FST's. Objective 5.b. was marginally achieved, with significant improvement needed in the operation of the HAC; its communication with and control of field personnel, both at an accident scene and with off-site FST's; and in its responsiveness to and communication with the Crisis Management Team. Objective 5.c. was achieved, but better discipline is called for in implementation of procedures and practices.

6. Public Information

- Objectives:**
- a. Demonstrate the capability to promptly alert and notify the public within the EPZ and disseminate instructional messages to the public on the basis of decisions by appropriate State and local officials.
 - b. Demonstrate the capability to coordinate the development and dissemination of clear, accurate, and timely information to the news media and the public.

Discussion/Observations:

As noted in the discussion of Objective 1 above, the slow response of Radiological Protection personnel led to delays in the availability of technically accurate and complete information regarding potentially affected off-site areas. Nevertheless, the actions prescribed in the RFP Emergency Preparedness Plan and the decisions of the Incident Commander and Crisis Manager were appropriate and conservative, leading to suitable Protective Action Recommendations.

Because the scenario for Exercise *Ready 93* included only limited roles for state and local agencies, the objective of demonstrating the capability to inform the public promptly and effectively of appropriate protective actions could be only partially demonstrated.

The Crisis Management Team generated and simulated transmission of appropriate and timely notification messages to the news media. The State of Colorado did have personnel responding to exercise messages sent to the State Emergency Operations Center, but there was no state participation beyond that point, nor were real or role-playing representatives of the news media actually involved in the exercise. The Joint Public Information Center was not activated for Exercise *Ready 93*, apparently because of reluctance of public information specialists in state and local jurisdictions to participate.

Experience has shown that the dynamic interactions between exercise participants and real or role-playing media and public representatives is necessary in order to adequately demonstrate not only transmission of messages, but also understanding of the same messages by the receiving parties. Thus, one cannot conclude that the objective of demonstrating the dissemination of clear, accurate and timely information to the media and the public was achieved in full. However, to the extent the initiation of appropriate notifications and briefings is involved, the objective was achieved.

DNFSB staff evaluators consider that these objectives were reasonably achieved with regard to the preparation of appropriate notifications, messages and releases. However, greater emphasis on realistic and active role playing of outside news media and hostile public representstives is needed.

7. Occupational Health Department

Objective: Demonstrate the adequacy of the equipment, vehicles, procedures, supplies, and personnel of medical facilities responsible for transport and treatment of contaminated and/or injured or exposed individuals.

Discussion/Observations:

Simulated on-scene emergency medical treatment practices for the two victims was generally adequate, partly because the nature of the simulated injuries was not life threatening. As noted in the discussion under Objective 3 above, personnel protective equipment worn by a responding fireman impeded his ability to determine the condition of an unconscious victim. This was not a serious problem in this exercise, but is the type of difficulty requiring frequent and realistic practice to overcome, and could be a very significant problem in more serious accident scenarios.

The response of the RFP Occupational Health Department was not observed by the evaluators. No participation by any local hospital was included in the Exercise *Ready 93* scenario. Evaluators were informed in DOE-RFO briefings associated with conduct of the exercise that although arrangements have been formalized with a local hospital to provide assistance in the event of a real emergency, those arrangements have never been tested in drills or exercises.

DNFSB staff evaluators consider that these objectives were adequately demonstrated to the extent they were observed. However, the difficulties encountered at the accident scene deserve attention by emergency medical technicians in their ongoing training program, and arrangements are needed for the participation of the supporting local hospital in an future exercises.

8. Reentry and Recovery

Objective: Demonstrate the capability to develop decisions on relocation, reentry, and return.

Discussion/Observations:

When the situation at the accident scene had been stabilized; i.e. victims had been transported to the Occupational Health Department and spilled material had been covered, thus terminating the release; the Crisis Manager initiated planning for recovery and reentry activities. He appointed a knowledgeable supervisor, by name, to head the planning operation, arranged for that supervisor to present preliminary plans to the Crisis Management Team, saw to it that appropriate comments on preliminary plans were incorporated, lifted the on-site Take Cover order, and left final implementation of the plan in the hands of the appointed individual.

The Crisis Manager noted, for the benefit of the Emergency Management Organization, that although the on-site problem was under control, the off-site emergency remained active, since, at the time, the path and magnitude of the plume had not been clearly identified.

DNFSB staff evaluators consider that to the extent the Crisis Manager arranged for recovery from the on-site problem, this objective was satisfactorily achieved. Subsequent decisions by the appointed supervisor were not observed.

9. Exercise Scenario, Conduct, and Control

Objective: Demonstrate the ability to develop a scenario, conduct, control, and evaluate an exercise that allows the participants to demonstrate the stated objectives.

Discussion/Observations:

The RFP staff responsible for Emergency Preparedness drills and exercises developed a satisfactory scenario, rehearsed their evaluators and controllers well, controlled information concerning the scenario and controller messages to be used during the exercise, provided for necessary logistical support to conduct the exercise, briefed controllers, evaluators and observers in appropriate detail, performed assigned tasks during the exercise with a minimum of confusion, and conducted "hot wash" debriefs in the immediate post exercise time frame as well as more detailed debriefs of participants in the days following Exercise *Ready 93*.

Last minute withdrawals of some of the expected off-site participants forced modifications in the exercise plan, not all of which were fully reflected in exercise documentation; e.g. retention of inappropriate objectives associated with relationships with off-site public and news media.

Controllers and evaluators were observant and responsive during the exercise and generally candid and forthcoming in their immediate post-exercise critiques. Participants were also frank and forthcoming in their post-exercise self-assessments and in providing comments and suggestions for improvement in future exercises. There were a few instances during the controller/evaluator debriefs in which individual controllers/evaluators appeared to be too accommodating, reflecting possible bias through overly favorable assessments and defensive statements regarding participant deficiencies. On the whole, however, this was not a big problem.

Formal, written evaluation reports on the exercise by DOE-RFO and EG&G had not been completed at the time the present report was written.

DNFSB staff evaluators consider that this objective was satisfactorily achieved.