

AUDIT REPORT

UTILIZATION OF THE BIG EXPLOSIVES EXPERIMENTAL FACILITY



MARCH 2001

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MEMORANDUM FOR THE MANAGER, NEVADA OPERATIONS OFFICE

FROM: Lawrence R. Ackerly, Regional Manager (Signed)
Western Regional Audit Office
Office of Inspector General

SUBJECT: INFORMATION: Audit Report on "Utilization of the Big Explosives Experimental Facility"

BACKGROUND

The National Nuclear Security Administration is responsible for managing the high-explosive firing facilities used by the Stockpile Stewardship Program. In 1995, Lawrence Livermore National Laboratory justified the need for a firing facility at the Nevada Test Site (NTS). The Big Explosives Experimental Facility (BEEF), under the direction of the Nevada Operations Office (Nevada), was designed and operated to perform large-load, high-explosive experiments that could not be done at other Department of Energy (DOE) firing facilities. The objective of this audit was to determine if the BEEF needed to operate on a full-time basis.

RESULTS OF AUDIT

We found that there was not a need to operate the BEEF on a full-time basis. Since it opened in February 1997, the BEEF was used to perform only a limited number of detonations (shots). In fact, most of the shots performed at the BEEF could have been conducted at other DOE firing facilities. In addition, we also determined that in the future, facility utilization might decline even further because potential users of the facility were moving away from larger shots for which the BEEF was designed. If the BEEF was used on an as-needed basis, \$500,000 could be better used annually and the laboratory personnel could avoid unnecessary travel costs to the NTS.

We recommended that Nevada operate the BEEF on an as-needed basis, require users to justify sending shots to the BEEF that do not exceed local load limits, and periodically review the operations of the BEEF.

MANAGEMENT REACTION

Management concurred with the recommendations and agreed to operate the BEEF as needed and to periodically review the operations of the BEEF.

UTILIZATION OF THE BIG EXPLOSIVES EXPERIMENTAL FACILITY

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Overview

INTRODUCTION AND OBJECTIVE

The National Nuclear Security Administration (NNSA) is responsible for managing the high-explosive firing facilities used by the Stockpile Stewardship Program. Chemical compounds or mechanical mixtures that exert the pressure needed to detonate nuclear or advanced conventional weapons are considered high explosives. Non-nuclear testing of these explosives is performed in containment chambers or remote outdoor locations with an array of special instrumentation.

In 1995, Lawrence Livermore National Laboratory (Livermore) justified the need for a firing facility at the Nevada Test Site (NTS). The proposed facility would perform large-load, high-explosives experiments that exceeded the load limits of other Department of Energy (DOE) firing facilities. In response to the stated need, the Big Explosives Experimental Facility (BEEF) began operation in February 1997 and was available to all DOE users (principally, the Pantex Plant (Pantex), Los Alamos National Laboratory (Los Alamos), Sandia National Laboratories (Sandia), and Livermore). Although these sites had their own firing facilities (40 in all), the BEEF was available for larger denotations ranging up to the equivalent of 70,000 pounds of explosives.

Nevada Operations Office (Nevada) and Livermore jointly operated the BEEF. Nevada, through its contractor, provided the operation and maintenance, while Livermore scheduled the detonations (shots). Nevada's contractor had three full-time staff and a manager supporting the day-to-day operation of the facility. Livermore had a full-time facility manager; however, during the audit Livermore converted this position to part-time. The objective of this audit was to determine if the BEEF needed to operate on a full-time basis.

CONCLUSIONS AND OBSERVATIONS

The BEEF did not need to operate on a full-time basis. Since it opened in February 1997, the BEEF has been operated on a full-time basis even though it was used to perform only a limited number of shots and most of these shots could have been performed at other DOE locations. This situation is not likely to improve since the trend is away from large shots for which the BEEF was designed and some past potential users have no plans to utilize the BEEF in the future.

Even though the BEEF had limited use, Nevada officials requested and received funding from NNSA to operate the BEEF on a full-time basis. At the conclusion of the audit, however, Nevada agreed that

approximately \$500,000 annually could be better used if the facility were operated on an as-needed basis. Additionally, an unspecified amount of laboratory travel costs could be avoided.

The audit identified a material internal control weakness that management should consider when preparing its yearend assurance memorandum on internal controls.

(Signed)
Office of Inspector General

FACILITY OPERATIONS

Necessity For Operating BEEF On A Full-Time Basis

A review of the workload of the BEEF indicated that there was no need to operate the facility on a full-time basis. Since its inception, very few shots were performed at the facility, and even fewer actually had to be done there. In its first 38 months of operation, 60 shots were performed at the BEEF. Of this amount, just 3 had to be performed at this facility because the load limits exceeded the limits imposed at other firing facilities.

Even with Livermore and Los Alamos sending shots to the BEEF, the facility was often inactive for extended periods of time. For example, there were no shots for 3 straight months in Fiscal Year (FY) 1998, 7 straight months in FY 1999, and 4 of the first 6 months in FY 2000. In total, no shots were conducted at the BEEF in 19 of the 38 months it was open.

In the future, the usage of the BEEF will probably not increase. Sandia and Pantex have never used the facility and had no plans to use it in the future. Also, the Los Alamos program, which used the facility, is no longer funded. Therefore, Livermore is the only user conducting shots at the BEEF. Further, both Livermore and Los Alamos personnel stated that the trend was moving away from the larger load-type shots.

Load Limits And Goals

Maximum load limits at firing facilities were established by local environmental restrictions or firing facility safety limits. The load limit for Livermore is 100 pounds and the load limit for Los Alamos is 5,000 pounds. In contrast, the load limit for the BEEF is 70,000 pounds. Thus, the BEEF was primarily built to accommodate high-explosive shots that cannot be done elsewhere.

NNSA established a goal as part of its annual performance plan to ensure that all stockpile stewardship facilities remain operational. However, the goal did not specify that facilities had to operate full-time to be operational.

Review Of BEEF Operations

Nevada had not reviewed the BEEF since it began operating in February 1997. Instead, Nevada believed it had to operate the BEEF on a full-time basis and requested and received funding based upon this premise. Because Nevada officials believed that it had to operate the BEEF full-time, it also did not review the shot projections or detonations to determine if the facility was used full-time or how much downtime the facility experienced. Further, Nevada did not review the load limits of shots to determine if they had to be done at the BEEF or if it was more economical to do them there.

Livermore officials stated that they were sending shots to the BEEF because they wanted to give facility personnel practice and to keep equipment calibrated. Further, discussions with Livermore and Los Alamos officials indicated that it was more costly to perform the shots at the BEEF because employees incurred travel costs to perform the shots in addition to the costs of the shots. However, Los Alamos and Livermore personnel indicated that through better planning, more shots could be done at their own locations.

Funds Better Used

Nevada's budget for full-time operation of the BEEF was \$1.3 million in FY 2001. Of this amount, approximately \$1 million was related to the expense of having full-time personnel assigned to the facility. We determined that since the BEEF had been used only half of the months it was opened, at least \$500,000 annually could be better used if the facility were operated on an as-needed basis. Additional travel costs for the laboratories, principally Livermore, would be avoided by conducting shots at their own firing facilities. However, we did not quantify these additional costs. During discussions of the audit results, Nevada agreed with our figures.

RECOMMENDATIONS

To facilitate the economic operation of the BEEF, we recommend that the Manager, Nevada Operations Office:

1. Operate the BEEF on an as-needed basis;
2. Require the laboratories or other users to justify sending shots to the BEEF that do not exceed local load limits; and,
3. Periodically review the usage of the BEEF to see if further operational cutbacks can be achieved.

MANAGEMENT REACTION

Nevada concurred with Recommendations 1 and 3. Accordingly, Nevada will prepare a plan to operate the BEEF on an as-needed basis. The plan will consider, as a minimum, alternative actions regarding charging practices and partial warm-standby. In addition, Nevada will periodically review the usage of the BEEF. This review will be done annually during the budget planning process.

Nevada said that it would need to work through the Office of Defense Programs to address the second recommendation to require users to justify the use of the BEEF.

AUDITOR COMMENTS

Management's comments are responsive to the report.

Appendix

SCOPE

The audit was performed from January 2000 through January 2001 at the NNSA Headquarters; Nevada, Oakland, and Albuquerque Operations Offices; NTS; Livermore; Los Alamos; Sandia; and Pantex. We reviewed the operations of the DOE's high-explosives firing facilities. There were 41 firing facilities reviewed in total. Based on the review, we found that 36 of the 41 facilities operated on an as-needed basis, 4 operated on a supportable full-time basis, and 1 (the BEEF) operated full-time but was not fully supported. Therefore, we focused the audit on the BEEF. We reviewed the BEEF operations from February 1997 through March 2000.

METHODOLOGY

To accomplish the audit objective, we:

- Interviewed personnel at NNSA Headquarters; Nevada, Oakland, and Albuquerque Operations Offices; and contractor personnel at Nevada, Livermore, Los Alamos, Sandia, and Pantex;
- Reviewed prior audit reports related to the audit objective;
- Analyzed available shot records for the BEEF;
- Toured firing facilities at Nevada, Livermore, Los Alamos, Sandia, and Pantex;
- Reviewed relevant performance measures in accordance with the *Government Performance and Results Act of 1993*; and,
- Reviewed local operating policies and procedures.

The audit was performed according to generally accepted Government auditing standards for performance audits and included tests of internal controls and compliance with laws and regulations to the extent necessary to satisfy the audit objective. There were no relevant performance measures for high-explosive firing facilities. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. We conducted a reliability assessment of computer-processed shot data and found the data to be reliable. Management waived the exit conference on January 30, 2001.

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