

# AUDIT REPORT

## THE NEED FOR THE ATLAS PULSED POWER EXPERIMENTAL FACILITY



FEBRUARY 2001

U.S. DEPARTMENT OF ENERGY  
OFFICE OF INSPECTOR GENERAL  
OFFICE OF AUDIT SERVICES

February 12, 2001

MEMORANDUM FOR THE SECRETARY

FROM: Gregory H. Friedman (Signed)  
Inspector General

SUBJECT: INFORMATION: Audit Report on "The Need for the Atlas  
Pulsed Power Experimental Facility"

BACKGROUND

In 1993, the Department of Energy proposed developing the Atlas Pulsed Power Experimental Facility (Atlas) as part of its effort to assure the reliability of the U.S. nuclear stockpile after the moratorium on below-ground nuclear weapons testing.

The \$49 million facility was intended to produce more than 30 million amperes of electric current for weapon-physics experiments to allow validation of certain elements of nuclear weapons computer codes. Once authorized, Atlas was assembled within budget and on time. The assembled facility is currently undergoing acceptance testing and in December, 2000, Atlas discharged 28.7 million amperes of current, duplicating the world record for current produced by a capacitor bank with only 75 percent of the facility's design voltage used. According to the Director of Physics at the Los Alamos National Laboratory, given the success of its operation to date, the Atlas facility was expected to become a valuable tool for stockpile stewardship experimentation.

The objective of the audit was to evaluate issues that have been raised relating to the need for Atlas.

RESULTS OF AUDIT

After an extensive review process, the Office of Defense Programs (Defense Programs) validated the need for Atlas. In June 1998, construction of the \$49 million facility was authorized. However, two years later, the Department, in internal communications to Los Alamos, stated that it did not have funds to operate the facility. Nonetheless, it decided to complete construction of Atlas and, due to the lack of operating funds, place the completed facility in cold standby. More recently, as directed by Congress in applicable appropriations law, Defense Programs, now a component of the National Nuclear Security Administration, made plans to move the facility to the Nevada Test Site at a cost of \$12 million. We were informed that the Department plans to seek a FY 2002 appropriation for Atlas operating funds, however, at the time this report was issued there had been no resolution of the operating fund situation.

The Department initially contended that without Atlas it may be difficult to validate certain elements of nuclear weapons computer codes used to certify the safety, security and reliability of the weapons stockpile. The current status of operating funds for Atlas, however, suggests that the facility's importance to the stockpile stewardship program may not be as great as originally asserted. In the absence of an assured funding stream to operate Atlas, any decision to move the facility to Nevada raises concern. Consistent with our recommendations, the Department should work with the Congress to address this uncertainty in stockpile stewardship priorities.

During the course of our review, it became apparent that the Department may have faced resource constraints forcing it to make difficult choices in deciding which programs to fund. Yet, despite discussions with responsible officials at all levels and a comprehensive document search, we could not obtain a clear understanding of why operating funds for Atlas were not currently available. Thus, we concluded that the prioritization process in Defense Programs needs to be strengthened.

#### MANAGEMENT REACTION

Although management agreed with two of the three audit recommendations, there was significant disagreement with key aspects of the report. For example, management stated that the report presumed to pass judgement on the technical need of the project without the benefit of unbiased expertise on the subject of weapons research and design. Management also took exception to our conclusions regarding the prioritization process in Defense Programs and the potential impact of not operating Atlas. Management's comments are synopsisized on page 5 of the report and our response is found on page 6 of the report.

Attachment

cc: Under Secretary for Nuclear Security/Administrator for Nuclear Security

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# THE NEED FOR THE ATLAS PULSED POWER EXPERIMENTAL FACILITY

## TABLE OF CONTENTS

### Overview

Introduction and Objective..... 1

Conclusions and Observations..... 1

### The Need For Atlas

Details of Finding ..... 3

Recommendations and Comments ..... 5

### Appendices

Scope and Methodology..... 7

Past Audits Relating to Design and Construction  
of Projects ..... 8

Photograph of Atlas..... 9

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## Overview

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### INTRODUCTION AND OBJECTIVE

The United States policy governing nuclear weapons has undergone a profound change since the end of the Cold War. In the past, confidence in the stockpile was ensured through research and development at the national laboratories and testing at the Nevada Test Site (NTS). In 1992, the United States announced a halt in the production of new weapons designs and a moratorium on underground nuclear testing. In 1993, the President of the United States continued the moratorium on testing and initiated the Stockpile Stewardship Program. Thus, the Department of Energy (Department) and its Office of Defense Programs (Defense Programs) were challenged to explore other means of maintaining confidence in the safety and reliability of nuclear weapons. Since November 1993, Defense Programs has been required to certify annually that its stockpile is safe and reliable without nuclear testing. The Atlas Pulsed Power Experimental Facility (Atlas) was proposed in 1993 as part of the Stockpile Stewardship Program's response to the restrictions on nuclear weapons testing.

Atlas is a pulsed power facility designed to validate certain elements of nuclear weapons computer codes; thus, Atlas helps to ensure that the simulations run on super computers are accurate. Assembly of Atlas was completed in August 2000. The facility is currently undergoing acceptance tests leading to formal construction project completion, at a total project cost of about \$49 million. The physical assembly was completed on time and within budget. On December 15, 2000, the machine successfully discharged 28.7 million amperes of current into a test load, duplicating the world record for current produced by a capacitor bank with only 75 percent of the facility's design voltage used. According to the Los Alamos National Laboratory (Los Alamos) Physics Director, the Atlas facility is expected to quickly become a valuable tool for stockpile stewardship experimentation.

The objective of the audit was to determine if there is a need for Atlas.

### CONCLUSIONS AND OBSERVATIONS

Defense Programs determined that Atlas was needed to support its Stockpile Stewardship Program and in June 1998, authorized construction of the \$49 million Atlas facility. Two years later, however, Defense Programs stated it did not have funds to operate the facility. Defense Programs then decided to complete construction of Atlas and place the completed facility in cold standby.

Defense Programs is now testing and performing initial experiments on Atlas at Los Alamos. Although Defense Programs had estimated the cost to operate Atlas when construction was authorized in 1998, it had not assigned the facility a priority high enough to fund its operations.

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Without operating funds, the Department will not be able to reap the benefits of the technology that this facility provides -- validation of certain elements of nuclear weapons computer codes used to certify the safety, security, and reliability of the weapons stockpile. In response to more recent events, Defense Programs plans to spend an additional \$12 million to move and reassemble Atlas at the NTS.

This audit identified issues that management should consider when preparing its yearend assurance memorandum on internal controls.

(Signed)  
Office of Inspector General

## **The Need for Atlas**

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### **Need for Atlas**

On August 5, 1993, Defense Programs determined that Atlas was needed to support its Stockpile Stewardship Program and approved a mission need statement to support the \$49 million facility. Over the next few years, Department-sponsored studies asserted the need for the facility. In the September 1994 mission-need approval memorandum, for example, two senior Defense Programs officials reported that Atlas was an important part of the Stockpile Stewardship Program. The need for Atlas was also referred to in the Record of Decision (ROD) *Programmatic Environmental Impact Statement for the Stockpile Stewardship Program* signed by the Secretary of Energy on December 19, 1996. The ROD stated that Atlas offered improved experimental capabilities and that the Department had decided to construct and operate it at Los Alamos. Further, Defense Programs verified the need for Atlas through annual line item project validations.

In June 1998, construction of Atlas was authorized. Seven months later, an independent assessment found that Atlas was a cost-effective way to obtain new and useful information to certify the safety and reliability of nuclear weapons. Later, in November 1999, the *Stockpile Stewardship Plan* identified Atlas as a needed experimental facility for testing. In spite of these positive assertions, Defense Programs stated it could not afford to operate Atlas and, therefore, suggested its termination in February 2000. Officials at Los Alamos responded that Atlas was about 90 percent complete and was needed because the same tests could not be performed elsewhere. Defense Programs subsequently decided to complete construction, perform operational testing, and place Atlas in cold standby at Los Alamos.

In July 2000, Congress authorized some of the funding needed to move Atlas to the NTS. The Deputy Administrator for Defense Programs then requested in a memorandum that "the Albuquerque Operations Office, with assistance from the Nevada Operations Office, prepare a plan, schedule and cost estimate to effect the transfer." Further the memorandum stated that "the move should be to a storage location in Nevada," and "Defense Programs does not currently have funds or plans to reassemble and operate Atlas in Nevada." In January 2001, Defense Programs provided documentation that showed that it initiated action to request funds to operate Atlas after it is moved. However, the Department has not, to date, approved the request.

### **Project Requirements**

Managers are required to adhere to the Department's life-cycle asset management procedures for a line item project. Specifically, Department Order 430.1A, *Life Cycle Asset Management*, and Department Guide GPG-FM-002, *Critical Decision Criteria*, require that critical decision determinations be made on all projects. One of

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these is the decision to begin construction. At this point, management is to determine the projects' life cycle costs, which includes maintenance, training, and operating costs. Once operating costs are determined, the Department is to use this information to prepare its budget request to Congress.

## **Project Management**

Defense Programs has not effectively managed the Atlas project because program officials did not assign the facility a priority high enough to fund its operations. On June 1, 1998, construction was authorized and operating costs for the life of the project were estimated. However, as construction neared completion, Defense Programs determined that it could not provide the funding needed to operate the facility. In fact, Atlas was 90 percent complete before Defense Programs realized the seriousness of the problem. Thus, funding was not included in the Department's budgetary request.

A contributing factor was that the Stockpile Stewardship Program was underfunded by about \$750 million a year from 1996-1999. As construction neared completion, program officials recognized that they did not have the funds to operate Atlas. However, construction was not halted. One Defense Programs official said that, in the past, adequate funds were available to ensure that projects could be operated. Others believed that the funding deficit would eventually be corrected. They hoped that if the construction were completed, Defense Programs would eventually have the funding needed to operate the facility.

If Defense Programs had effectively prioritized its projects, officials would have been alerted to the possible shortfall in funds to operate Atlas. As it was, Defense Programs did not recognize its predicament until it revised its budget structure in 1999. Even though the revised budget structure better categorized Defense Programs' costs in broad categories, it did not prioritize funding for individual projects.

## **Program Constraints**

Defense Programs constructed the \$49 million facility on-time and within budget. However, it subsequently realized that it did not have the operating funds needed for Atlas even though it was designed to fulfill a vital role in the Department's Stockpile Stewardship Program. If this cannot be resolved, the Department's confidence in its stockpile may be adversely affected.

The Department began testing Atlas at Los Alamos, and subsequent to the issuance of a draft of this report, Defense Programs acquired funding to dismantle, move, and reassemble Atlas at the NTS. However, the Department had not secured the funding needed to operate Atlas after it is reassembled. If funding constraints continue,

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the Department may not be able to reap the benefits of the technology that this facility provides – validation of certain elements of nuclear weapons computer codes used to certify the safety, security, and reliability of the weapons stockpile. Further, without operating funds, the Department may not have made prudent use of monies spent to construct the facility and subsequently move it to the NTS.

## **RECOMMENDATIONS**

We recommend that the Deputy Administrator for Defense Programs, National Nuclear Security Administration:

1. Establish a formal prioritization process to help ensure that funds are available to operate Stockpile Stewardship projects based on detailed cost information;
2. Ensure that prior to construction, projects have operating funding requirements identified and that requests for operating funds are made in a timely manner; and,
3. Notify Congress if there is any change in plan to operate Atlas once it is moved to the NTS.

## **MANAGEMENT REACTION**

Management did not agree with the report and stated that the report presumed to pass judgement on the technical need of the project without the benefit of unbiased expertise on the subject of weapons research and design. It non-concurred with recommendation 1, but did concur with recommendations 2 and 3.

Exception was taken to the report's criticism of the prioritizing process in Defense Programs. Management stated that it had a good process, but after the project was approved and life-cycle costs were determined, funding was not available to operate Atlas. The storage option was considered in 1999 when it became evident that funding expectations were lower than previously anticipated. Management also pointed out that if the project were moved, it would not be operable until 2003.

Exception was also taken to the statement that not operating Atlas might impact the confidence level of the stockpile. Management stated this would not, of itself, justify the operation of the facility. However, the plan now is to test the facility in Los Alamos and then move it to the NTS. Applicable appropriations law mandated the move. Thus, the report was premature with respect to comments that the facility would not be used. Funds have been requested for the move.

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**AUDITOR COMMENTS**

With respect to the technical statements in the report, the report never presumed to judge the technical merit of Atlas. In fact, all references regarding the need for Atlas were based on statements made by Department officials or studies made on behalf of the Department.

We recognize that the Department is in a difficult position. It justified the facility, acquired the construction funds, and built Atlas in a very timely manner. The Department now faces budgetary problems for which there are no easy solutions. While we acknowledge those problems, the report clearly showed a weakness with Defense Programs' prioritization process. That is, if Atlas was important enough to build, then it should have received a high enough priority ranking to allow it to be operated. However, there was no formal prioritized listing of projects to be benchmarked against available funding.

Subsequent to the issuance of the draft report, Defense Programs provided documentation to support its plan to request funds for the future operation of Atlas. Although this documentation showed desire within Defense Programs to operate the facility, the budget plan had not been finalized and approved by the Department. Unless the Department assigns a high enough priority to assure it can operate any facility once it is constructed, it should not proceed with construction. Likewise, unless the Department can be assured that it will have funds needed to operate a facility once it is moved, it should not be moved.

## Appendix 1

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### SCOPE

The audit was performed between May and September 2000 at Defense Programs, Albuquerque Operations Office (Albuquerque), and Los Alamos. The audit covered project activities for the period from August 1993 through September 2000.

### METHODOLOGY

To accomplish the audit objective, we:

- Reviewed applicable Public Laws, Department Orders, other Departmental guidance, studies, and related correspondence;
- Reviewed project justification documents and plans;
- Interviewed Defense Programs, Albuquerque, and Los Alamos personnel;
- Interviewed participants involved in the independent assessments of Atlas and Sandia National Laboratories pulsed power personnel; and,
- Reviewed Department and Los Alamos reports on Atlas and the Stockpile Stewardship Program.

The audit was conducted in accordance with 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 objective of the audit. Accordingly, we assessed the significant internal controls and performance measures established under *The Government Performance and Results Act of 1993* related to the management of Atlas. However, neither Los Alamos nor Albuquerque had performance measures related specifically to Atlas. 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 did not rely on computer processed data to conduct this audit. We held an exit conference on the report with Defense Programs officials on January 17, 2001.

## Appendix 2

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### PAST AUDITS RELATING TO DESIGN AND CONSTRUCTION OF PROJECTS

- *Followup Review of Major System Acquisitions and Major Projects*, OIG Report DOE/IG-0292, November 1990. Departmental elements responsible for operating and managing major acquisitions still were not in full compliance with the documentation and reporting requirements of the Department's project management system.
- *Special Report on the Audit of the Management of Department of Energy Construction Projects*, OIG Report DOE/IG-0398, November 1996. Past OIG reports showed that construction plans were not always updated when mission needs changed and projects were not needed or all alternatives were not fully evaluated prior to proceeding with construction of new facilities.

PHOTOGRAPH OF ATLAS



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