00/11/7/95 JS ②

DOE/IG-0380 **U.S. Department of Energy** October 1995
Office of Inspector General

Report on

Audit of the Department of Energy's Transportation Accident Resistant Container Program

MASTER

IGIGIGIGIGIGIG

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

The Office of Inspector General wants to make the distribution of its reports as customer friendly and cost effective as possible. Therefore, this report will be available electronically through the Internet five to seven days after publication at the following alternative addresses:

Department of Energy Headquarters Gopher
gopher.hr.doe.gov

Department of Energy Headquarters Anonymous FTP
vm1.hqadmin.doe.gov

Department of Energy Human Resources and Administration Home Page
http://www.hr.doe.gov/refshelf.html

Your comments would be appreciated and can be provided on the Customer Response Form attached to the report.

This report can be obtained from the
U.S. Department of Energy
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, Tennessee 37831

DOE F 1325.8
(08-93)

United States Government **Department of Energy**

memorandum

DATE: October 11, 1995

REPLY TO
ATTN OF: IG-1

SUBJECT: INFORMATION: Report on "Audit of the Department of Energy's Transportation Accident Resistant Container Program"

TO: The Secretary

BACKGROUND:

The U.S. Department of Energy (Department) has ultimate responsibility for the safety of all nuclear explosives and weapons operations conducted by the Department and its contractors. The Department also has joint responsibility for the safety of nuclear weapons in the custody of the Armed Services. Since the 1970s, the Department has designed, developed, and produced accident resistant containers to promote safety when transporting certain types of nuclear weapons by air.

DISCUSSION:

After successfully developing and modifying accident resistant containers for the Army, the Department unilaterally designed, modified, and produced similar containers for the Air Force. Because the Department spent millions of dollars on this project, we conducted an audit to determine if the Department had adequate controls in place to preclude the development and production of products which did not have customer agreement or meet customer requirements.

One goal of the Department's Strategic Plan is to ensure that customer expectations are met by having them participate in the planning process. Although nuclear safety responsibility was shared with the Department of Defense, the Department designed and produced 87 accident resistant containers for about $29 million when the Air Force did not want them and expressed no desire to use these containers. This occurred because the Department unilaterally decided to produce containers without ensuring that the containers met customer expectations.

There may be circumstances where the Department will do some preliminary design and testing before agreeing with the Department of Defense on requirements. However, the Departments of Energy and Defense should reach agreement on the requirement for products before final design and production, otherwise funds could be spent unnecessarily.

We, therefore, recommended that the Assistant Secretary for Defense Programs act to resolve issues regarding these containers and to preclude future spending for production of products without customer agreement to use the product. The Assistant Secretary and the Albuquerque Operations Office generally concurred with the recommendations. However, they stated that this particular case was exceptional in that the Department was responding to a "sincerely felt" requirement and wanted to assure that containers would be available at the earliest possible time.

John C. Layton
Inspector General

Attachment

cc: Deputy Secretary
Under Secretary
Assistant Secretary for Defense Programs
Deputy Assistant Secretary for Military Application and Stockpile Support
Manager, Albuquerque Operations Office

U. S. DEPARTMENT OF ENERGY
OFFICE OF INSPECTOR GENERAL

AUDIT OF THE DEPARTMENT OF ENERGY'S TRANSPORTATION ACCIDENT RESISTANT CONTAINER PROGRAM

Report Number: DOE/IG-0380
Date of Issue: October 11, 1995

Western Regional Audit Office
Albuquerque, New Mexico 87185

AUDIT OF THE DEPARTMENT OF ENERGY'S TRANSPORTATION ACCIDENT RESISTANT CONTAINER PROGRAM

TABLE OF CONTENTS

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

AUDIT OF THE DEPARTMENT OF ENERGY'S TRANSPORTATION ACCIDENT RESISTANT CONTAINER PROGRAM

Audit Report Number: DOE/IG-0380

SUMMARY

The U.S. Department of Energy (Department) has ultimate responsibility for the safety of all nuclear explosives and weapons operations conducted by the Department and its contractors. The Department also has joint responsibility for the safety of nuclear weapons in the custody of the Armed Services. Since the 1970s, the Department has designed, developed, and produced accident resistant containers to promote safety when transporting certain types of nuclear weapons by air.

After successfully developing and modifying accident resistant containers for use on Army helicopters, the Department subsequently designed, modified, and produced similar containers for the United States Air Force. Because the Department spent millions of dollars on this project, we conducted the audit to determine if the Department had adequate controls in place to preclude the development and production of projects which did not have customer agreement or meet customer requirements.

One goal of the Department's Strategic Plan is to ensure that customer expectations are met by having them participate in the planning process. Although nuclear safety responsibility was shared with the Department of Defense, the Department designed and produced 87 accident resistant containers for about $29 million when the customer did not want them and expressed no desire to use these containers. This occurred because the Department unilaterally decided to produce containers without ensuring that the containers met customer expectations.

There may be circumstances where the Department will do some preliminary design and testing before agreeing with the Department of Defense on requirements. However, the Departments of Energy and Defense should reach agreement on the requirement for products before final design and production, otherwise funds will be spent unnecessarily.

We, therefore, recommended that the Assistant Secretary for Defense Programs act to resolve issues regarding these containers and to preclude future spending for production of products

without customer agreement to use the product. The Deputy Assistant Secretary for Military Application and Stockpile Support and the Albuquerque Operations Office generally concurred with the recommendations. However, they stated that this particular case was exceptional in that the Department was responding to a "sincerely felt" requirement and wanted to assure that containers would be available at the earliest possible time.

Office of Inspector General

Office of Inspector General

PART I

APPROACH AND OVERVIEW

INTRODUCTION

The Department of Energy (Department) has ultimate responsibility for the safety of all nuclear explosives and weapons operations conducted by the Department and its contractors. The Department also has joint responsibility for the safety of nuclear weapons in the custody of the Armed Services. Since the 1970s, the Department has designed, developed, and produced accident resistant containers to promote safety when transporting certain types of nuclear weapons by air. Although none of the containers developed in the 1970s were ever fielded, the United States Army used modified and redesigned containers in the 1980s to airlift nuclear weapons under their control.

After successfully developing and modifying accident resistant containers for use on Army helicopters in 1987, the Department subsequently designed, modified, and produced containers for the United States Air Force. Because the Department spent millions of dollars on this project, we conducted the audit to determine if the Department had adequate controls in place to preclude the development and production of projects which did not have customer agreement or meet customer requirements.

SCOPE AND METHODOLOGY

The audit was performed at the Department's Albuquerque Operations Office (Albuquerque), the Sandia National Laboratories (Sandia), the Kansas City Plant and Department Headquarters. Additional work was done at Office of the Secretary of Defense, the Air Force's Headquarters, and the Air Force's San Antonio Air Logistics Command, and the Nuclear Weapons Integration Division.

To accomplish the audit objective, we reviewed:

- Department Orders related to packaging and transporting nuclear weapons, as well as weapon safety;

- Department and Department of Defense (DOD) technical manuals related to the transportation of nuclear weapons;

- Memorandums of Agreement between the Air Force and the Energy Research and Development Administration related to nuclear warhead production; and,

- Minutes of meetings and correspondence of the Department, DOD, and Air Force concerning the container program.

We interviewed Department and Sandia officials to determine their procedures for meeting customer requirements. We also interviewed cognizant Air Force personnel about containers.

The audit was conducted 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. We assessed the significant internal controls with respect to ensuring that the Department produced containers that the DOD intended to use. We did not rely on any computer processed data in developing this audit report. 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.

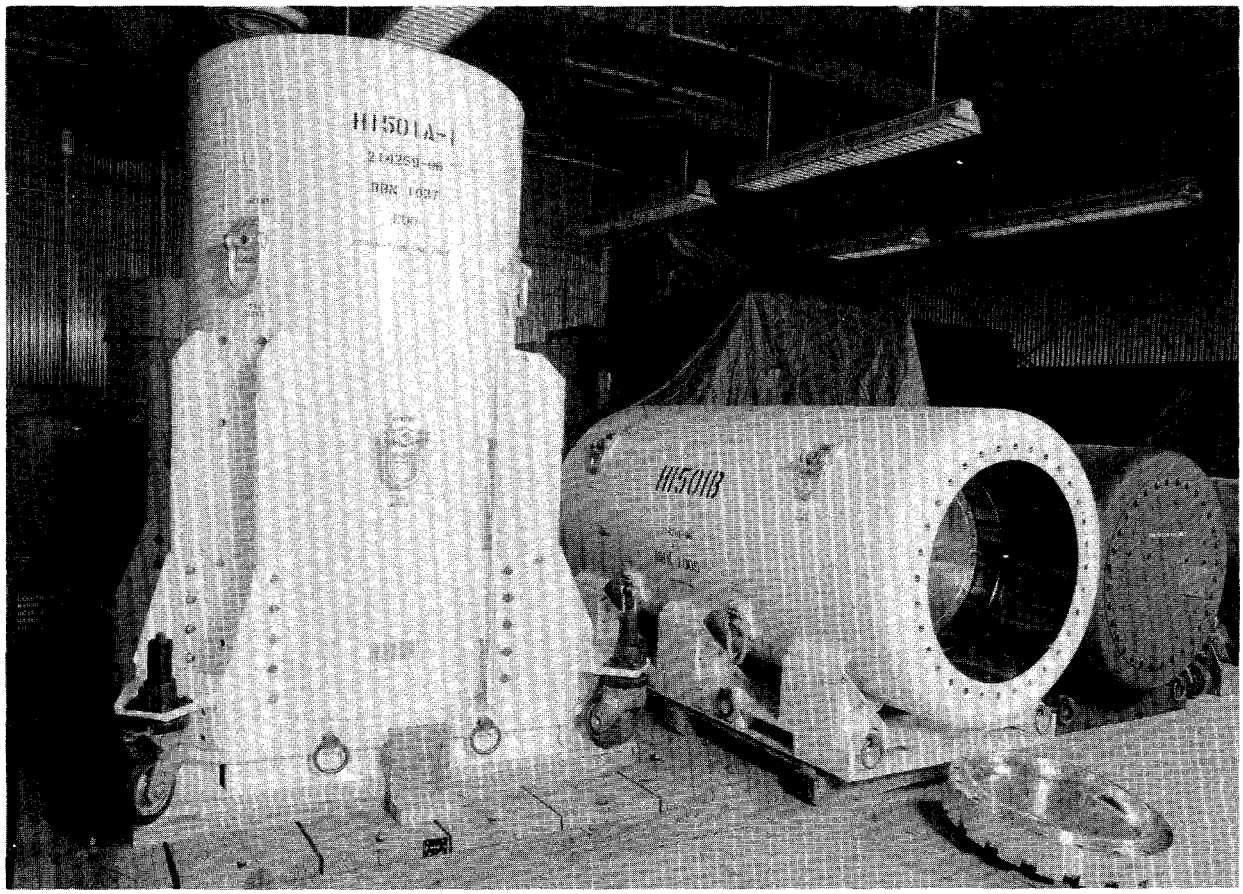
Audit fieldwork was conducted from May 1994 through February 1995. Audit findings were discussed with the Deputy Assistant Secretary for Military Application and Stockpile Support (MASS) on February 3, 1995, and with Albuquerque on February 27, 1995. The Deputy Assistant Secretary waived the exit conference.

BACKGROUND

To minimize risks and enhance safety, most modern nuclear weapons are designed with insensitive high explosives. Older nuclear weapons, however, contain less-safe conventional high explosives in their design. A 1991 Defense Nuclear Agency report pointed out that if these older weapons were involved in an aircraft crash, the conventional high explosives could detonate and scatter nuclear materials, thus contaminating the environment and producing a serious health hazard. Consequently, the report emphasized that the United States must minimize the effects associated with any accident involving nuclear weapons.

By Presidential Directive, the Secretary of Energy has joint responsibility with the DOD for the safety of nuclear weapons in DOD custody. DOD and Department policies require that nuclear weapons be transported with the highest level of safety practicable to minimize risks to the population and environment.

In 1987, the Department provided accident resistant containers to the Army in response to the Army's concern for safely moving artillery-fired nuclear projectiles on helicopters. The accident resistant containers were constructed with an outer shell and a custom designed insert. The insert was designed to secure a particular type of nuclear weapon, such as a bomb or a warhead. After successfully developing containers and inserts for the Army, the Department unilaterally decided to develop containers for Air Force weapons containing conventional high explosives. New inserts were produced to carry the bombs and the warheads in containers the Army had previously used and a new container was designed and produced to carry other bombs. Sandia designed, and the Department's Kansas City Plant produced, inserts to carry various other warheads. More recently, a new container and inserts were designed and produced to carry certain warheads in a vertical position. These containers which are pictured in the following photograph, may weigh more than a ton.



OBSERVATIONS AND CONCLUSIONS

The Department did not ensure that adequate controls were implemented to prevent spending resources on production of a product that lacked customer support and requirements to use the product. Early in the container program, the Air Force informed the Department that it had no requirement to use accident resistant containers and for various reasons would not use them. The Department, nonetheless, continued the program and spent about $3.3 million for design and testing and about $25.4 million to produce 87 containers which are currently being stored and may never be used. We, therefore, recommended that the Assistant Secretary for Defense Programs act to resolve issues regarding these containers and to preclude future spending for production of products without a customer requirement for the product.

The finding contained in Part II of this report should be considered by management when preparing the yearend assurance memorandum on internal controls.

PART II

FINDING AND RECOMMENDATIONS

Transportation Accident Resistant Container Program

FINDING

One goal of the Department's Strategic Plan is to ensure that customer expectations are met by having them participate in the planning process. Although nuclear safety responsibility was shared with the DOD, the Department designed and produced 87 accident resistant containers when the customer did not want them and expressed no desire to use these containers. This occurred because the Department unilaterally decided to produce containers without ensuring that the containers met customer expectations. Consequently, the Department unnecessarily spent about $29 million to produce 87 accident resistant containers that were never wanted or used. Also, $35,000 was spent since August 1992 to store these containers and related equipment at an Army depot.

RECOMMENDATIONS

We recommend that the Assistant Secretary for Defense Programs:

1. Obtain a final decision from the DOD on their acceptance and agreement to use containers developed for the Air Force. Until a decision is reached, the Department should not take any action to build or modify containers for the Air Force.

2. Take appropriate action to dispose of the accident resistant containers and related equipment if it is found that there is or will not be any future use for them.

3. Ensure the implementation of policies and procedures to prevent spending resources on the production of any product before the Department and the customer (intended user) agree to the requirement for the product.

MANAGEMENT COMMENTS

In responding to our Official Draft Report, the Department's Deputy Assistant Secretary for MASS and Albuquerque generally concurred with recommendations. Greater detail on management's comments is provided in Part III.

DETAILS OF FINDING

At the end of the Cold War, the Department began placing more emphasis on a customer-oriented philosophy. Thus, one goal of the Department's Strategic Plan was to ensure that management practices met or exceeded customer expectations. A strategy for meeting this goal was to seek and incorporate customer input prior to making decisions.

The Plan also recognized the Department's responsibility to safeguard the taxpayers' interests. The Department should spend taxpayer dollars prudently. One aspect of prudent spending involves producing only products that a customer requires, requests and will use.

CONTAINER PRODUCTION

To meet a perceived need of the Air Force, the Department funded two separate but related efforts to develop and produce 87 accident resistant containers. The first and more costly effort ($23.5 million) was authorized by the Department's Office of Defense Programs in February 1992 and resulted in the production of inserts for previously built containers and 55 new containers for the B57 and B61 bombs. The Air Force never took delivery of the containers and the Department placed them in storage at an Army depot.

The second effort, authorized by Defense Programs in August 1993, called for the design and production of 32 containers to be used with the Air Force's W62 and W78 warheads. This second effort, which cost about $5.2 million, consisted of modifying existing containers previously designed for and used by the Army in 1987. The Air Force also did not take delivery of these containers and they were placed in storage, this time at the Department's Kansas City Plant.

All of the containers produced for the Air Force were designed by Sandia and produced by the Kansas City Plant. The costs of designing and producing the containers are as follows.

CONTAINER COSTS
(Thousands)

	1st Effort	2nd Effort	Total
Sandia Design/Testing	$ 2,740	$ 625	$ 3,365
Kansas City Production	20,800	4,600	25,400
Total	$23,540	$5,225	$28,765

Air Force's Decision

Cognizant Air Force personnel provided the auditors their reasons for not needing accident resistant containers to transport weapons. First, the Air Force believed it did not need them to meet the Department's safety standards. They pointed out that the DOD did not have the plutonium scatter safety standard that these containers were designed to meet. According to the Air Force, without this safety standard there was no requirement to use special containers. In addition, Air Force officials believed that the Department's plutonium scatter safety standard applied only to workers' health and safety at its nuclear weapon production facilities and not to DOD's operational use of nuclear weapons.

Second, an Air Force Directive stated that nuclear weapons were to be moved by the most secure means over the safest routes practicable. Since weapons containing conventional high explosives were generally no longer foreign based, movement of weapons could now take place within the continental United States using ground transportation. This decision has obviated the need for containers. However, the policy added that if Safe Secure Trailers could not be used to move weapons, commanders could air transport the weapons without using accident resistant containers.

Third, the Air Force cited cost versus benefits and other reasons for not using the containers. Air Force officials said that there would be additional handling involved in loading the bomb or warhead into and out of the container, additional exposure of personnel, additional training and certification requirements, and certain logistics problems due to the size and weight of the containers. They also said that the containers can not protect against certain types of accidents.

LACK OF CUSTOMER SUPPORT

Without ensuring that customer expectations were met, the Department unilaterally decided to design, develop, and produce

containers for the Air Force. In a February 7, 1992, memo, the Department's Deputy Assistant Secretary for Military Applications directed Albuquerque to provide containers for certain Air Force nuclear weapons.

Cognizant Department personnel cited three reasons for making this unilateral decision:

- Department policy requires that nuclear weapons be transported with the highest level of safety practicable to minimize risks to the population and the environment. Since accident resistant containers enhanced nuclear transportation safety, their development and production ensured compliance with this policy. In addition, officials noted that the development of containers also ensured compliance with Department Order 5610.10, which was amended in October 1990 to add plutonium dispersal standards.

- Memorandums of Agreement between the Air Force and the Department's predecessor agency, the Energy Research and Development Administration, made the Department responsible for weapon containers.

- Department officials pointed to its successful experience of developing and modifying containers for the Army and assumed it would have a similar experience with the Air Force. Officials believed that an added benefit of the container was its compatibility with most systems containing conventional high explosives.

While it was beyond the scope of this audit to determine whether accident resistant containers significantly reduce the risk of plutonium dispersal in the event of an aircraft crash, documents and interviews showed that the DOD shared the belief with the Department that risk was reduced. For example, a joint DOD-Department report in December 1991 found that the use of accident resistant containers significantly reduced safety risks for all plutonium release mechanisms and all transport modes except the Safe Secure Trailers. Similarly, representatives of the Air Force's San Antonio Air Logistics Command stated that past studies had shown the use of accident resistant containers to be beneficial. Nevertheless, as described previously, the Air Force did not intend to use them.

The Air Force was aware of the Department's container project and the Department knew as early as June 1992 that the Air Force was uninterested in using them. However, the Department was not in a position to require the Air Force to use

the containers. Accordingly, it would have been prudent for the Department not to build more than prototype quantities of containers unless the Air Force agreed to use them.

Correspondence files showed that the Department made the Air Force aware that the containers were being designed and produced. To the Department's credit, these files show that it made several attempts to get Air Force agreement, but was unsuccessful. The files, as well as interviews with personnel at the DOD and the Air Force, also showed that the Air Force was not interested in the containers. Further, the Air Force never responded to the Department's requests for the technical information, such as tie-down bracket locations.

At the field level, the Project Officers Group provides the normal interface between the Department and the DOD. Project Officers are responsible for coordinating joint efforts in the nuclear weapons program. The Albuquerque Manager and certain Department laboratory directors, or their designated representatives, are the Project Officers for the Department. In the case of the container program for the Air Force, the Project Officers Group did not resolve issues requiring resolution between the Department and DOD because there was no Air Force requirement to use the containers. The rationale for continuing production of the containers was that Department officials felt they must be prepared to meet the Air Force's needs in the event the Air Force adopted a policy to use the containers.

Suspending the Program

Although the Department knew that the Air Force would not use the containers, production was never suspended. Albuquerque recommended that activities related to the production of containers for the Air Force be suspended on November 15, 1993, if the Air Force did not establish a firm requirement for the containers by this date. However, this did not occur. About three months later, Defense Programs directed Albuquerque to suspend the program but Albuquerque never complied with this directive. Instead, in a March 22, 1994, memorandum to the Kansas City Plant, Albuquerque authorized the plant to complete production of all 32 containers and to build 4 inserts for test purposes. Albuquerque authorized the completion of these containers because the majority of the program costs had either been committed or spent--all materials had either been procured, delivered, or fabricated. Production was completed in September 1994.

PROGRAM COSTS

Since the Air Force did not have a requirement and would not accept delivery, the Department unnecessarily spent about $29 million to design, develop, and produce a product that may never be used. The Department spent about $25.4 million to produce the containers and the remainder was spent for design and testing. In addition to these costs, the Department has also paid the Army about $35,000, since August 1992, for storage and continues to pay about $11,000 annually for this service.

Having shared responsibility for safety of nuclear weapons, it was reasonable for the Department to do some preliminary design and testing before reaching agreement with the DOD on its requirements. However, the Department and DOD should reach agreement on the requirement for products before final design and full production, otherwise funds will be spent unnecessarily.

PART III

MANAGEMENT AND AUDITOR COMMENTS

The Department's Deputy Assistant Secretary for MASS and Albuquerque responded to our draft reports on June 29 and August 31, 1995. They generally concurred with the recommendations. However, they stated that this particular case was exceptional in that the Department was responding to a sincerely felt requirement that the DOD would use these containers and they wanted to assure that containers would be available at the earliest possible time.

A summary of management and auditor comments follows.

Recommendation No.1: We recommend that the Assistant Secretary for Defense Programs obtain a final decision from the DOD on their acceptance and agreement to use containers developed for the Air Force. Until a decision is reached, the Department should not take any action to build or modify containers for the Air Force.

Management Comments: The Deputy Assistant Secretary for MASS concurred with the recommendation by stating that the issue would be resolved through discussions with the Nuclear Weapons Council, the Assistant to the Secretary for Defense (Atomic Energy), and the United States Air Force. He also stated that Albuquerque had terminated development and production of these containers. Albuquerque agreed that no additional containers should be designed or manufactured absent a firm decision from the DOD to use the containers. Albuquerque also agreed that improvements can be made in the interfaces with the DOD which would mitigate situations such as these from happening in the future.

Auditor Comments: We believe management's comments are responsive to our recommendation.

Recommendation No.2: We recommend that the Assistant Secretary for Defense Programs take appropriate action to dispose of the accident resistant containers and related equipment if it is found that there is or will not be any future use for them.

Management Comments: The Deputy Assistant Secretary for MASS concurred with the recommendation by stating that the Department is pursuing potential uses for these containers and will not decide on disposal until these possibilities are evaluated. Albuquerque did not concur, but identified two potential uses for the containers and stated that the containers