

September 1989

# DOD WARRANTIES

## Effective Administration Systems Are Needed to Implement Warranties





United States  
General Accounting Office  
Washington, D.C. 20548

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National Security and  
International Affairs Division

B-218845

September 27, 1989

The Honorable Richard B. Cheney  
The Secretary of Defense

Dear Mr. Secretary:

This report assesses the Department of Defense's administration of its warranty program. It concludes that the military services have not yet established fully effective warranty administration systems and recommends that your office extend its oversight of this area.

The head of a federal agency is required by 31 U.S.C. 720 to submit a written statement on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Operations not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the Secretaries of the Army, Navy, and Air Force.

This report was prepared under the direction of Paul F. Math, Director, Research, Development, Acquisition, and Procurement Issues. Other major contributors are listed in appendix II.

Sincerely yours,

A handwritten signature in cursive script that reads 'Frank C. Conahan'.

Frank C. Conahan  
Assistant Comptroller General

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## Principal Findings

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### OSD Does Not Actively Oversee Warranty Administration

OSD is not actively overseeing the services' progress in establishing effective warranty administration systems. The focal point for warranty administration has been delegated to each service, and OSD functions only in a reactive mode to deal with issues raised by audit groups and other interested organizations.

### Fully Effective Administration Systems Have Not Been Established

The services are in various phases of establishing systems to administer their warranties. The Navy issued a policy on the use of warranties in 1987, but has not defined roles and responsibilities or established overall procedures and controls for administering warranties. The Air Force recently issued comprehensive guidance and is in the process of establishing its system. The Army has issued policies and procedures, but the Army procurement command visited by GAO is experiencing problems in executing them.

### Adequate Cost- Effectiveness Analyses Are Not Being Prepared

Procurement activities included in GAO's review either have not been performing cost-effectiveness analyses or have prepared analyses that do not adequately support conclusions that proposed warranties are cost-effective. As a result, procurement activities were not considering waiver requests in their decisions on proposed warranties because their analyses did not provide a convincing basis to support requests for waivers in cases where warranties may not be justified because they would not be cost-effective.

### Post-Warranty Evaluations Are Not Being Prepared

To achieve full benefits from weapon system warranties, DOD needs assurance that the warranties are accomplishing their purpose. A system that provides information to evaluate actual warranty benefits is a key element in effective warranty administration and could provide such assurance. The procurement activities GAO visited have not yet evaluated warranty benefits after warranties have expired. The general lack of evaluations has been due to problems experienced in establishing effective warranty administration systems that will provide the information needed to perform post-warranty evaluations. These problems included delays in establishing warranty information collection procedures and difficulties in obtaining accurate information concerning warranty claims.



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to waive any or all of the guarantee requirements on a major defense acquisition and the reasons for doing so.

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## Objective, Scope, and Methodology

In July 1987, we reported<sup>1</sup> on DOD's implementation of the warranty legislation. We concluded that DOD procurement activities generally complied with the warranty laws by obtaining warranties for weapon systems with terms that were consistent with requirements in the laws. However, our report contained recommendations to address problems that we identified. We recommended that DOD ensure that procurement activities (1) perform cost-effectiveness analyses of proposed warranties, (2) specify warranted performance requirements, (3) define the contractor's redesign responsibilities, and (4) appropriately mark warranted systems as warranted items.

The objective of our present review of DOD's progress was to examine the services' systems for administering and evaluating warranties on fielded equipment. Our work was performed primarily at three major DOD procurement activities: the Naval Sea Systems Command (NAVSEA), the Aeronautical Systems Division (ASD) of the Air Force Systems Command, and the Army Tank-Automotive Command (TACOM). These procurement activities were selected because they manage large numbers of high visibility, high dollar weapon systems and components. Table 1.1 shows the major weapon systems and subsystems covered by our review.

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<sup>1</sup>DOD Warranties: Improvements Needed in Implementation of Warranty Legislation (GAO/NSIAD-87-122, July 21, 1987).

and plans, legislative histories, DOD policy guidance and regulations, and the services' and procurement activities' guidelines for implementing the warranty legislation. Interviews were held with DOD management, procurement and legal officials, as well as selected contractor officials. Officials at the Anniston Army Depot were also interviewed. We limited our review to the major procurement activities and did not visit user levels because, in most instances, warranty administration systems that define users' roles and responsibilities were not yet in place.

Our review was performed from August 1987 to December 1988 in accordance with generally accepted government auditing standards.

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**Chapter 2**  
**Warranty Administration: Effective Systems**  
**Have Not Been Fully Established**

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issues raised by audit agencies and other interested organizations. According to an OSD representative, when DOD is asked for assessments of warranty benefits, its response is that benefits cannot be documented until more time has elapsed.

Although OSD has not taken an active oversight role, OSD's Defense Systems Management College<sup>1</sup> published a warranty handbook in June 1986 as a reference guide and training device for program managers. The stated purpose of the handbook is to aid program managers of all the military services in meeting the requirements of the warranty law. The handbook contains guidelines for warranty administration and criteria for assessing warranty benefits. According to an OSD official, a working group of representatives from OSD, the services, and the Defense Logistics Agency participated in formulating the warranty handbook by setting up the requirements for it and meeting with the contractor that developed it. Representatives from OSD and the services performed a detailed review of the final draft of the handbook before publication.

We believe that the warranty handbook provides good, definitive guidance and criteria on how to administer warranties and evaluate their benefits. For example, in addressing warranty administration, the handbook contains guidance for preparing a warranty implementation plan. It states that the plan's purpose is to provide a comprehensive document that describes warranty features, defines who is responsible for meeting contractual provisions, identifies responsible participants, and establishes the procedures and interfaces required for successful management of a warranty. The handbook also includes a checklist of topics to be addressed in a warranty implementation plan. Examples of checklist topics include procedures for issuance and receipt of warranted assets, descriptions of contractor in-plant procedures, and special Defense Contract Administration Services' responsibilities for handling warranties.

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<sup>1</sup>The Defense Systems Management College was established in July 1971 to train managers of defense acquisition programs.

ensure that warranty benefits were obtained. Generally, NAVSEA was depending on contractors to keep records of warranty claims and was not routinely receiving such information.

In commenting on our draft report, DOD stated that it did not agree with us concerning the status of warranty contract administration guidance in the Navy, noting that we recognized that the Navy had issued several general instructions and regulations on warranty administration. DOD stated that the Navy was committed to furnish additional guidance which will ensure that both the fleet and shore stations know how to administer warranted items effectively. DOD did not provide any new status information indicating that the Navy has made progress towards fulfilling its commitment to furnish guidance to the fleet and shore stations and did not indicate that the Navy had a target date for doing so. We believe the apparent indefinite nature of the Navy's commitment shows why OSD needs to exercise oversight and establish specific service milestones as key elements of a warranty administration program.

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### Air Force Recently Issued Guidance on Warranty Administration

The Air Force's system for administering warranties is decentralized with each of its system/program offices responsible for performing its own warranty administration. However, at the time of our review, a number of system/program offices at ASD had not established warranty administration systems.

Since 1986, Air Force regulations have required contracting activities to develop written warranty implementation plans for all weapon system acquisitions. Further guidance on warranty implementation plans was provided by the Air Force Systems Command in April 1987. More recently, in June 1988, the Air Force issued Regulation 800-47, "Weapon System Warranties." It defines administration procedures and responsibilities and requires program offices to prepare and coordinate warranty plans with the supporting and using commands. These warranty plans must then be approved by the program manager. Air Force officials estimate that an automated system to track and manage its warranties will be in place by November 1991.

Our review of eight ASD contracts showed that warranty implementation plans were prepared in three cases, but not prepared in five other cases. ASD officials gave varying reasons why no plans were prepared in the five cases.

seriously considered as viable options by the procurement activities in their decisions on proposed warranties.

The DOD FAR Supplement states that in assessing the cost-effectiveness of a proposed warranty, an analysis must be performed which considers both the quantitative and qualitative costs and benefits of the warranty. The regulation specifies that costs include (1) warranty acquisition, administration, enforcement, and user costs, (2) weapon system life-cycle costs with and without a warranty, and (3) any costs resulting from limitations imposed by the warranty provisions. The cost-effectiveness analysis is to consider expected logistical/operational benefits, as well as additional contractor motivation provided by the warranty. The DOD FAR Supplement also defines the criteria and procedures for requesting a waiver of a weapon system warranty.

Neither the DOD FAR Supplement nor the services' implementing regulations require that warranty prices be separately identified. Without the warranty price information, the acquisition cost of the warranty may not be readily available for use in a cost-effectiveness analysis.

According to the Defense Systems Management College's Warranty Handbook, the administration and enforcement costs of warranties should include the labor and material costs for government personnel to administer the warranty. The handbook states further that the costs should include those for liaison between the program, support, user, and contractor activities, including development and implementation of procedures. These procedures include (1) reporting and processing warranty claims, (2) handling, storing, and transporting warranted items, and (3) determining warranty compensation.

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### **Cost-Effectiveness Analyses Not Being Prepared by NAVSEA**

NAVSEA is not preparing cost-effectiveness analyses because it has not negotiated additional costs for warranties. Navy regulations require cost-effectiveness analyses of weapon system warranties to be performed and documented in business clearances.<sup>2</sup> However, the Navy official in charge of business clearance reviews took the position that cost-effectiveness analyses are not necessary because the Navy is not paying for warranties.

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<sup>2</sup>A business clearance memorandum contains the required approval of the business and pricing aspects of proposed contractual actions and serves as the historical record of the acquisition.

## Some Cost-Effectiveness Analyses Prepared by ASD Were Inadequate and Waivers Were Not Being Requested

ASD program offices were preparing cost-effectiveness analyses of their weapon system warranties. Air Force regulations require that cost-effectiveness analyses of warranties be prepared at the time the contractor's proposal is received.

We evaluated the adequacy of cost-effectiveness analyses for warranties in five 1986 and 1987 contracts at ASD. We found two analyses contained errors or inadequately supported the results. A third analysis appeared to adequately show that the warranty was cost-effective. The warranties for the remaining two contracts had not been finalized because of difficulties in agreeing to warranty terms after initial cost-effectiveness analyses showed that proposed warranty terms and prices were not cost-effective.<sup>3</sup> Examples of contracts we reviewed included the following:

- ALR-56C Radar Warning Receiver: The analysis of this warranty, obtained at a cost of \$2 million, showed it was cost-effective. However, our review showed that errors in the analysis substantially inflated the warranty benefits, raising questions about the conclusions reached from the analysis. Errors included (1) use of a 12-month warranty period when parts of the warranty covered only 6 months, (2) understating the warranty cost for certain production lots, and (3) an erroneous assumption that all repairs would be covered under the warranty.
- F-15E Aircraft The cost-effectiveness analysis of this \$4.8 million warranty concluded that the warranty was cost-effective. The F-15 System Program Office justified the warranty price on the basis that because it fell between 2 percent and 3 percent of the contract price, the warranty price was reasonable. However, the cost-effectiveness analysis did not show why a warranty price in this range would be cost-effective. Officials from the program office said a more elaborate cost-effectiveness analysis was not prepared because the contractor's data base did not provide sufficient data to estimate the warranty costs.
- AC-130U Gunship Conversion to Full Mission: The cost-effectiveness analysis showed the warranty, obtained at a cost of \$6.4 million, to be cost-effective. We concluded the assumptions, information, and logic used in the analysis were reasonable.

<sup>3</sup>The Air Force Audit Agency found that the B-1B engine program office purchased engine warranties although a cost-effectiveness analysis prepared to support warranty negotiations had concluded that proposed warranty costs were significantly greater than expected benefits. This condition occurred, according to the Audit Agency's report, because B-1B engine program office personnel believed that both the Congress and DOD's policy mandated that warranties be included in all production contracts. (F-101-GE-102 Warranty Management, Air Force Audit Agency Project 7036325, 15 February 1989, p. 3.)

permits procurement activities to provide a narrative analysis comparing non-measurable, intangible benefits to the administrative costs of the warranty. An expected failure warranty exempts contractors up to a specified number of failures that occur after delivery. TACOM also uses narrative analyses for systemic warranties that cover a pattern of multiple or recurring failures should they occur. The supplemental regulation generally defines intangible benefits in terms of the contractor's potential liability that may be incurred during the warranty period. The regulation justifies use of narrative analyses on the basis that logistical and operational benefits do not occur with expected failure warranties.

The Materiel Command's regulation states that the Army's warranty model shall be used to assess cost-effectiveness of other types of warranties, such as failure-free warranties. Failure-free warranties generally make each failure after delivery subject to contract remedy. Logistical and operational benefits are quantified in the Army's warranty model. We reviewed nine TACOM contracts awarded in calendar year 1987. We found that cost-effectiveness analyses for five contracts did not quantify the Army's administrative costs or the expected benefits from the warranty. We also found that TACOM did not act to seek a waiver when one analysis showed a warranty would not be cost-effective. Another contract had a cost-effectiveness justification that appeared to justify the warranty but was not complete. The two remaining contracts had warranties that did not come under the warranty law.

- Five analyses justified the cost-effectiveness of expected failure and systemic warranties on the basis that potential and intangible benefits could be realized for little or no cost. These analyses appeared to comply with the Army Materiel Command's supplemental regulation, which permits cost-effectiveness justification based on intangible benefits. The analyses did not make a direct comparison of costs and benefits or attempt to compare life-cycle costs with and without a warranty as required by DOD regulations. Also, none of them attempted to quantify the Army's costs of administering the warranties. A typical narrative analysis states that:

"Based on the variety of remedies available to the government, the absence of contract costs for the warranty and the minimal Army administration and execution costs, it is determined that the benefits of obtaining a warranty for the X-1100-3B Transmission outweigh the costs to the Army."

- On one contract, a mathematical analysis was prepared that showed the warranty would not be cost-effective, but the warranty was nonetheless

amounts that have not been corrected for changes in purchasing power based on expected inflation.

We found that the models and guidance available for performing cost-effectiveness analyses were not used extensively in the contracts we reviewed. The Army model and the Product Performance Agreement Center's model were not used extensively by TACOM and ASD, respectively. TACOM was not using the Army model because it was not required for threshold and systemic warranties. Two contracting officials at ASD said the Product Performance Agreement Center's model was not being used because no data base existed from which they could obtain reliability data called for in the model.

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## Procurement Activities Are Not Performing Post- Warranty Evaluations

A key element in effective warranty administration is a system that provides information needed to assess actual warranty benefits received. To achieve full benefits from weapon system warranties, the services need assurance that the government's rights under warranties are exercised and that warranties are accomplishing their purpose. A warranty administration system that tracks and accumulates data on the progress of administering the warranty and identifies warranty claims and costs while the warranty is in effect can provide such assurance.

The Defense Systems Management College's Warranty Handbook contains guidance on how to assess the benefits received from a warranty. The warranty handbook sets forth several areas of consideration in assessing warranty benefits, including (1) the warranty's influence on essential weapon system performance parameters, (2) the economic effect on the government and the contractor, and (3) contractors' motivations and actions under the warranty.

Army and Air Force regulations require an assessment of warranties while they are still active and a post-warranty analysis to measure the results actually achieved when a warranty is closed out. A Navy instruction requires annual collection and analysis of actual warranty use and claim information. The Navy and the Air Force have recently provided guidance on collecting information and evaluating warranty benefits, but the Navy has not yet issued detailed directives needed to implement collecting warranty use and claim data.

Because two of the services have recently issued guidance and difficulties have occurred in obtaining accurate information on warranty

to incur any cost to correct failures because the threshold will not be met. To be meaningful, the assessment should determine the reason why failures reported were so low compared to the threshold in the warranty.

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### ASD Evaluations of Warranty Benefits

Before issuing its June 1988 regulation, the Air Force did not provide guidance on how to evaluate the benefits after warranties expire. However, the June 1988 regulation requires an annual activity report on each warranted system to be used by program managers to evaluate the overall effectiveness of the warranty. The reports are to include, as a minimum, information on warranty claim activity and the desirability of existing warranty provisions based on claim activity, type of failure, and dollar value of claims.

We reviewed one 1984 and two 1985 contracts at ASD to determine the status of claim information. We found that the program offices were receiving monthly warranty claim reports required from the contractors. The following example shows the type of information available to the offices concerning warranty claims and costs. Warranty claim information received to date for this example is inconclusive, because of the long duration period of the warranty. Nevertheless, this type of information provides some basis to evaluate warranty benefits.<sup>6</sup>

- The F101-GE-102 warranty, which covers engines for B-1B aircraft, is a long duration warranty that extends for 3 years for material and workmanship and 7 years for excessive fuel consumption and thrust deterioration. It also includes a removal rate guarantee for engines and selected components and accessories that extends to 1995. An April 1988 report showed a total of about \$1.8 million in warranty claims and other warranty administrative costs accumulated against the warranty at that time. The cost of the warranty was over \$5 million.

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### TACOM Evaluations of Warranty Benefits

Army regulations require that warranties be assessed while they are still active, as well as after the warranty period is over. This assessment includes a summary of claim actions and why certain claims were denied or disputed by the contractor. The regulations also require that a final assessment be made to evaluate the economic benefits of the warranty

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<sup>6</sup>The Air Force Audit Agency found, however, that the B-1B engine program office had not established adequate tracking and verification of warranty claims. (F-101-GE-102 Warranty Management, Air Force Audit Agency Project 7036325, 15 February 1989, pp. 2-3.)

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According to a TACOM warranty administration official, the low dollar value of claims is attributable to the user's failure to file paperwork and provide accurate claim information. Because of the worldwide dispersment of TACOM vehicles and the number of Army organizations and people involved in warranty administration, this official expressed doubts that the Army's system could adequately capture claims to make the warranties pay off. Claims have been lost because claim forms were filed too late. At Anniston Army Depot, we found that some claims on the M-1 engine (AGT-1500) were denied because they were not submitted to the contractor within the required 90-day time frame. Our review of Bradley transmission (HMPT-500) claims at TACOM showed that the contractor denied 46 of 100 claims because they contained insufficient data to determine the nature of the failure or whether the transmission was under warranty. Because of problems encountered in obtaining information on warranty claims, TACOM has begun using warranties that remove the users from the claim processing system. TACOM is using systemic warranties that require an analysis of system failures and do not depend on users to identify failures subject to warranty claims.

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## Conclusions

To achieve the full benefits of weapon system warranties, DOD needs assurance that warranties are accomplishing their intended purpose, that is, that the government and the contractor exercise their rights and fulfill their obligations if defective items or services are delivered. Effective warranty administration systems can provide such assurance when they include:

- well defined roles for the military services, system program offices, weapon system users, and field personnel;
- objective analyses of the cost-effectiveness of all proposed warranties;
- use of the waiver option where warranty benefits are not commensurate with the cost;
- efficient procedures for processing claims and good controls over claims processed and collected; and
- comprehensive analyses of the benefits of completed warranties versus the warranty price and administrative cost.

Although the warranty laws have been in effect for over 4 years, the services still have not established fully effective warranty administration systems that include all these essential elements. OSD has delegated warranty administration to the services without overseeing their progress in establishing effective warranty administration systems. Specific milestones have not been established for the services to design and

making changes to correct deficiencies in present systems. Periodic progress reports on achievements and problems being experienced should be required from the services.

We also recommend that the Secretary of Defense, as part of the oversight role, ensure that the services consider the use of waivers as viable options when it can be shown that a warranty is not cost-effective.

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## Agency Comments and Our Evaluation

DOD disagreed with our recommendation that the Secretary of Defense should establish milestones for the services to meet in implementing effective warranty administration systems or making changes to correct deficiencies in present systems. It did, however, state that it would request the services to provide status reports of their individual efforts no later than November 30, 1989.

DOD said establishing milestones would not be productive because each service's equipment is unique and their logistics and supply systems vary greatly. DOD also pointed out that improvement actions have been taken, noting that representatives from the services' procurement and administrative contracting functions, and the Defense Logistics Agency, the services' logistic and operational commands, and the Defense Contract Audit Agency were members of the DOD Joint Contract Administration Coordinating Council Working Group on Warranties. The council published its report in September 1987, which contained recommendations for actions by OSD and the services to implement warranties.

While we agree that each service has unique circumstances, it is not clear that these circumstances preclude OSD from identifying milestones suitable for each service and holding the services accountable for their progress in implementing the generally accepted elements of a warranty administration program. Depending on the status of each service's warranty administration program, milestone completion dates can be set for

- establishing definitive criteria for the use of waiver options;
- developing systems for collecting and analyzing data to conduct cost-effectiveness analyses of planned warranties, as well as benefits of completed warranties;
- defining roles for program offices, weapon systems users, and field personnel; and
- developing claims processing procedures.

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that a warranty is not cost-effective. DOD said it would reemphasize its current policy on the use of waivers during the next interdepartmental staff meeting and would issue a memorandum on the subject.

**Appendix I  
Comments From the Assistant Secretary of  
Defense (Production and Logistics)**

The Services are actively planning the administration of each warranty clause on a program by program basis. The Department of Defense will request the Services to provide a status report of their individual efforts.

The concerns expressed in the Council of Defense and Space Industry Association letter are unsubstantiated and we are unable to trace the programs on which the concerns arose. If the GAO desires to substantiate the specific findings of the Association's letter, the DoD would like the opportunity to review GAO's findings before publication.

Specific DoD comments on the findings and recommendations contained in the draft report are provided in the enclosure.

Sincerely,



Jack Katzen  
Assistant Secretary of Defense  
(Production and Logistics)

Enclosure

See comment 1.

**DoD Response:** Partially Concur. In reference to the letter from the Council of Defense and Space Industry Association, the concerns of that group are unsubstantiated and they have failed to disclose the identity of the specific programs. If the GAO desires to substantiate the specific finding of the Association's letter, the DoD would like the opportunity to review their findings before publication.

**FINDING C: More Active Oversight by the Office of the Secretary of Defense is Needed.** The GAO explained that the Office of the Secretary of Defense (OSD) regulatory guidance to the Services on warranties is contained in the DoD Federal Acquisition Regulation Supplement. The GAO noted the regulation prescribes that the Services obtain warranties meeting the requirements of the law, unless waived, and also that they establish procedures to track and accumulate data relative to warranty costs. The GAO further noted, however, that the regulation does not elaborate beyond the requirement to track data on how warranties should be administered after systems are fielded or how to assess benefits received from warranties. The GAO found that the OSD did not actively oversee the progress made by the Services in establishing warranty administration systems. The GAO observed that the OSD did not provide milestones for the Services to meet in establishing systems, nor were the Services required to report on the status or progress of the systems. The GAO further observed that the focal point for warranty administration had been delegated to each Military Service, with the OSD functioning only in a reactive mode to deal with issues raised by audit agencies and other interested organizations. The GAO found, however, that although the OSD has not taken an active oversight role, in June 1986, the Defense Systems Management College published a warranty handbook to be used to train program managers. The GAO concluded that the warranty handbook provides good, definitive guidance and criteria on warranty administration and evaluation of warranty benefits. The GAO also concluded, however, that more active OSD oversight is needed. (p. 3, pp. 13-14, pp. 33-34/GAO Draft Report)

Now on pp. 3, 12-13, 27-28.

**DoD Response:** Nonconcur. Each of the Services acquires equipment whose intended use, operational environment, maintenance requirements and support and supply systems vary greatly, both within and among the Services. Current statutory and regulatory guidance recognize these differences by permitting the tailoring of warranties to fit specific acquisition situations. Similarly, each Service must be permitted sufficient time to assess its warranty experience in terms of its organizational structure and logistics support methodologies in order to develop manageable and efficient administrative procedures. The imposition of OSD milestones is not considered productive under these circumstances.

**FINDING D: Effective Administration Systems Have Not Been Fully Established.** The GAO found that the Services are in various stages of establishing warranty administration systems. (A listing of the weapons systems included in the GAO review is provided as Attachment 2). The GAO observed that the Services have encountered problems in establishing warranty administration systems, as follows.

- The GAO found that, although the Army has issued policies and procedures for warranty administration that define responsibilities for warranty administration and establish procedures for identifying, processing, and filing warranty claims, the command it visited had problems in getting users to follow the procedures.
- The GAO reported that, although the Navy issued a policy on the use of warranties in 1987, it has not defined roles and responsibilities or established overall procedures and controls for administering warranties. According to the GAO, detailed directives have been delayed because (among other things) the

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for the submission of warranty claims. The Army has attempted to incorporate warranty procedures that will have minimal impact on equipment users. The use of the Standard Army Maintenance System to collect information on maintenance actions and the increased use of warranty coverage in the form of systemic warranties will continue to reduce the administrative burden on users.

Navy. The Department does not agree with the GAO concerning the status of the warranty contract administration guidance in the Navy. The report recognized the issuance of several general instructions and regulations on administering weapon system warranties. There is a commitment to furnish additional guidance, which will ensure that people in the fleet and at the various shore stations know how to administer warranted items effectively.

Air Force. Policy was issued on October 17, 1986 to cover this area and, although a fully automated system which incorporates warranty administration capabilities is in development, the Air Force does have the capability to administer warranties. Individual systems have been developed for programs, such as the F-16, the Peacekeeper, and various engine programs. In addition, program offices are planning warranties to maximize the use of existing systems, in accordance with current policy. Air Force Regulation 70-11 seeks to improve warranty administration through a required planning process resulting in a written, coordinated implementation plan. The Air Force product divisions are concluding reviews of warranty plans already in existence to ensure warranty administration requirements are adequately addressed.

**FINDING E: Procurement Activities' Cost-Effectiveness Analyses Are Inadequate.**

The GAO observed that, when the warranty laws were enacted, the Congress recognized that warranties may not always be appropriate--thus, the law allows the Services to seek waivers of the warranty requirements if it can be determined that a warranty would not be cost-effective. The GAO observed that, accordingly, DoD and Service regulations require that cost-effectiveness analyses be performed on all proposed warranties before contract award. The GAO found, however, that at the three procurement activities it reviewed (the Army Tank Automotive Command, the Naval Sea Systems Command, and the Aeronautical Systems Division of the Air Force Systems Command), cost effectiveness analyses were either not being prepared or those that were prepared did not adequately support the conclusions that proposed warranties were cost-effective. The GAO also found that waiver requests were not being seriously considered as viable options by the procurement activities in their decisions on proposed warranties. The GAO explained the DoD Federal Acquisition Regulation Supplement states that, in assessing the cost-effectiveness of a proposed warranty, an analysis must be performed considering both the quantitative and qualitative costs and benefits of the warranty. The GAO noted the regulation specifies that costs include (1) warranty acquisition, administration, enforcement, and user costs, (2) weapon system life-cycle costs with and without a warranty, and (3) any costs resulting from limitations imposed by the warranty provisions. The GAO further noted that, in addition, the cost-effectiveness analysis is to consider expected logistical/operational benefits, as well as additional contractor motivation provided by the warranty, and defines the criteria and procedures for requesting a waiver of a weapon system warranty. The GAO observed, however, that neither the DoD Federal Acquisition Regulation Supplement nor the Services' implementing regulations require that warranty prices be separately identified. The GAO concluded that without the warranty price information, the acquisition cost of the warranty may not be readily available for use in a cost-effectiveness analysis.

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- NAVY: The GAO found that the Naval Sea Systems Command is not preparing cost-effectiveness analyses because it has not negotiated additional costs for warranties. The GAO observed that, although Navy regulations require cost-effectiveness analyses of weapon system warranties to be performed and documented in business clearances, the Navy official in charge of business clearance reviews took the position that cost-effectiveness analyses are not necessary because the Navy is not paying for warranties. The GAO noted that, since September 1986, the Navy has had a policy that makes use of warranties mandatory and directs procurement activities to obtain warranties without negotiating additional costs for them. The GAO reported it is Navy policy that contractors should be expected to meet warranty obligations without the need to negotiate additional costs because warranties contain the same basic expectations that the Navy has when it enters into development and production contracts. The GAO concluded, however, that notwithstanding the fact Navy policy states costs should not be negotiated separately for warranties, its review showed that costs are associated with obtaining and administering warranties.

- AIR FORCE: The GAO found that the Aeronautical Systems Division of the Air Force Systems Command was preparing cost-effectiveness analyses of its weapon system warranties. The GAO noted that, according to Air Force regulations, cost-effectiveness analyses of warranties are required to be prepared at the time the contractor proposal is received. The GAO further found, however, that the Aeronautical Systems Division continued negotiating warranty terms and prices and did not request a waiver, even after an initial cost-effectiveness analysis showed that the proposed warranty would not be cost-effective.

The GAO found the Services' analytical models and guidance for performing cost-effectiveness analyses of warranties generally methodologically sound except for one area, which is the method used to calculate present values of estimated costs and savings. The GAO further found, however, that the models and guidance available for performing cost-effectiveness analyses were not used extensively in the contracts it reviewed. The GAO concluded that valid cost-effectiveness analyses of proposed warranties are necessary in order to provide reasonable assurances that warranties are cost-effective and to support requests for waivers when it appears warranty costs outweigh benefits. (pp. 4-5, pp. 18-27, pp. 34-35/GAO Draft Report).

**DoD Response:** Partially Concur. The Department recognizes the difficult task of performing cost-benefit analyses, as reflected in Finding E. The Department also shares the GAO assessment that the methodology of the analytical models used in performing analyses is sound. The Department does, however, take exception to the comment concerning the method used to calculate present value. The DoD method is prescribed by an Office of Management and Budget Circular and, therefore, the GAO comment should be directed to the Office of Management and Budget not to the Department of Defense. Status of the Services cost benefit analysis is reflected below.

Army. The Army has determined that, in some warranty applications, where the warranty benefits are limited and obtained at little or no cost, a narrative analysis is sufficient. In these cases they consider the use of warranty models to be inappropriate and the field activity may, on a selected basis, use a narrative statement.

Navy. The Navy recognizes that further clarification needs to be made in its instructions regarding the documentation of the cost benefit analysis

Now on pp. 3, 16-23, 28.

See comment 2.

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Contract Administration Coordinating Council will be used, as required, for general guidelines. However, the Services will and should address their own procedures because each Service has unique operational and logistical needs that must be an inherent part of their planning for the administration of contract warranty arrangements. The specific actions by the Services have been identified in Finding D. The Army and the Air Force have implemented warranty administration policy and the Navy is in the process of finalizing its policy. The Department of Defense will request the Services to provide a status report of their individual efforts no later than November 30, 1989.

**RECOMMENDATION 2:** The GAO recommended that the Secretary of Defense, as part of the oversight role, ensure that the Services consider the use of waivers as viable options when it can be shown that a warranty is not cost-effective. (p. 35/GAO Draft Report)

**DoD Response:** Concur. The Department of Defense will reemphasize the current policy on the application of warranty waivers during the next Interdepartmental Staff meeting and issue a memorandum (within the next sixty days) on the subject.

Now on p. 29.

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## Our Comments

The following are our comments on DOD's June 15, 1989, letter.

1. Reference to the letter from the Council of Defense and Space Industry Associations was deleted from our final report.
2. We recognize that DOD is following OMB guidance on the method to be used in the services' cost-effectiveness analysis models to calculate present value and have previously advised OMB of our concerns with its guidance. Our intent in this report was not to criticize DOD but only to make it clear that we disagree with OMB's prescribed method for calculating present value.

**Air Force.** The Air Force is continuing to improve the quality of cost-benefit analyses as more warranty experience is gained and as more warranty data becomes available. The DoD does not agree with the GAO conclusion that a program office should not continue to negotiate the terms and conditions of a warranty after the initial analysis reflects the proposed warranty would not be cost effective and that a waiver should be requested instead of negotiating an affordable warranty. The Defense Federal Acquisition Regulations, in Section 246.770-3, permits the negotiation of warranty terms and conditions if necessary to derive a cost-effective warranty. This is one way of recognizing technical risk, contractor financial risk, or other program uncertainties when a warranty clause is tailored to the government's needs on a specific program.

**FINDING G: Procurement Activities Are Not Performing Post-Warranty Evaluations.**

The GAO observed that a key element in effective warranty administration is a system that provides information needed to assess actual warranty benefits received. According to the GAO, to achieve full benefits from weapon system warranties, the Services need assurance that the Government's rights under warranties are exercised and that warranties are accomplishing their purpose. The GAO pointed out a warranty administration system that tracks and accumulates data on the progress of administering the warranty can provide such assurance. The GAO reported, however, that the procurement activities it visited do not yet evaluate warranty benefits after warranties have expired. The GAO noted that a key element in effective warranty administration is a system that provides information needed to assess actual warranty benefits received. The GAO concluded that the general lack of evaluations is the result of problems experienced in establishing effective warranty administration systems that will provide the information needed to perform post-warranty evaluations. The GAO further concluded that, since two of the Services have recently issued guidance and since there have been difficulties in obtaining accurate information on warranty claims, it is unlikely that the Services and the Office of the Secretary of Defense will be able to evaluate warranty benefits in the near future. (p. 5, pp. 27-35/GAO Draft Report)

Now on pp. 3, 23-28.

**DoD Response:** Partially Concur. The Department of Defense is aware of the need for this data and believes the Services are working toward the accomplishment of better warranty administration procedures, as reflected in the response to Finding D. As indicated the Services are beginning to receive some data that will satisfy this requirement. However, not enough time has elapsed since inception of most warranties to accumulate enough data to perform any meaningful analyses. The Department is satisfied that the current efforts in motion will in time provide a proper overview of contract warranty

\* \* \* \* \*

**RECOMMENDATIONS**

**RECOMMENDATION 1:** The GAO recommended that the Secretary of Defense expand his oversight role in warranty administration by identifying milestones for the Services to meet in establishing effective warranty administration systems or making changes to correct deficiencies in present systems. (The GAO noted, for example, that periodic progress reports on achievements and problems being experienced should be required from the Services.) (p. 35/GAO Draft Report)

Now on pp. 28-29.

**DoD Response:** Partially Concur. The Department of Defense disagrees with the need to establish milestones (as indicated in the response to Finding C). The Joint

Appendix I  
Comments From the Assistant Secretary of  
Defense (Production and Logistics)

In addition, the GAO found that, according to the Defense Systems Management College Warranty Handbook, the administration and enforcement costs of warranties should include the labor and material costs for Government personnel to administer the warranty. The GAO also pointed out that the handbook states further that the costs should include those for liaison between the program, support, user, and contractor activities, including development and implementation of procedures, such as (1) reporting and processing warranty claims, (2) handling, storing, and transporting warranted items, and (3) determining warranty compensation.

**DoD Response:** Partially Concur. The Department of Defense recognizes the difficulty in performing cost-benefit analyses. The DoD policy requires the inclusion of both qualitative and quantitative considerations and, although this has been difficult in the initial compliance, the Department looks forward to improvement as additional experience and data are made available. The DoD plans to keep the present flexibility our policy permits by allowing each warranty clause to be tailored and priced to the individual application.

As addressed in the GAO report, one purpose of a warranty is to assure that the Government receives what it paid for. Therefore, with regard to items which were warranted prior to the effective date of the warranty legislation, the Government may have no obligation to pay for the warranty unless the current warranty imposes requirements that exceed the requirements of the former warranty. In that case, the Government's obligation to pay for the warranty should extend only to the incremental requirement and total warranty costs may not be identifiable.

The costs of correcting failures to conform to contractual requirements and associated administrative costs are allowable costs of performance under Government contracts. In many cases, the recurring costs of correction cannot be segregated from other recurring costs of performance under those contracts. Similarly, administrative costs may not be segregable from other similar effort. Therefore, if a contract is priced on the basis of historical costs, which include the costs of repair or other corrections of non-conforming items, an accurate and separate identification of warranty prices is not possible and the contract price inherently includes an amount for corrective action. Under those circumstances, the establishment of a separate warranty price would, in effect, constitute payment for effort already included in the contract or item price. A cost benefit analysis would not be meaningful under those circumstances.

**FINDING F. Status of Procurement Activities' Implementation Of Cost-Effectiveness Analysis Requirement.** The GAO observed the following with respect to the three sites it visited:

- **ARMY:** The GAO found that, generally, the Army Tank Automotive Command (TACOM) was preparing cost-effectiveness analyses in line with Army regulations that require them. The GAO further found, however, for some warranty types that provide limited benefits at little or no cost, the Army Materiel Command supplemental regulation permits procurement activities to use narrative statements in cost-effectiveness analyses rather than quantified benefits and costs and the Tank and Automotive Command is using warranties for which the regulation allows narrative analyses. The GAO concluded that the narrative statements appear to be judgmental in nature. The GAO further concluded that cost-effectiveness analyses, which are not quantitative, may increase the risk of obtaining warranties that are not cost-effective because the basis is lacking to request a waiver in cases where warranties may not be justified.

Appendix I  
Comments From the Assistant Secretary of  
Defense (Production and Logistics)

Office of the Chief of Naval Operations is concerned that the costs to establish the system may outweigh the benefits. The GAO further attributed the delay to a lack of priority given to warranty administration within the Navy, as well as uncertainty on how to establish an effective system. The GAO concluded that the Navy has been the slowest of the Services to establish a warranty administration system.

- The GAO found that the Air Force has recently issued comprehensive policies and guidance that address warranty administration procedures and controls and is in the process of implementation. The GAO reported that the Air Force is in the process of establishing an automated system to track and manage its warranties, which it estimates will be in place by November 1991. The GAO indicated that, according to the Air Force, the delay in implementation is attributed to the time needed to design a system that will be effective.

The GAO concluded that effective administration systems have not been fully established by the Services and, unless effective warranty administration systems are established for each procurement activity or weapon system program office that uses warranties, there will continue to be little assurance the Government receives the benefit of warranties or that warranties achieve the intended results. (p. 4, pp. 14-18, pp. 33-34/GAO Draft Report)

Now on pp. 3, 14-16, 27-28.

**DoD Response:** Partially Concur. The Department of Defense is very much aware of the difficult task of providing detailed guidance on an effective warranty administration system. The Services are continuing to refine guidance in this area. It is anticipated that there will be variances among contract administration activities until demonstrated experience and appreciable data has been collected.

The Department of Defense has actively pursued the contract administration function for warranties through the Joint Contract Administration Coordinating Council. A final report was published in September 1987 that incorporates the general consensus of the Services, the Defense Logistics Agency and the various contract administration activities regarding the basis for addressing the Procuring Contracting Officer, the Administrative Contracting Officer, and the Contract Administration Office responsibilities along with the needs and responsibilities of the logistic and operations activities and the planning that is necessary to administer contracts with warranty clauses. The individual Services have or are in the process of issuing instructions for administering warranty requirements in contracts.

The DoD agrees that the availability of meaningful data is an important factor in developing individual guidance within the Services. The availability of data is directly related to the time it takes for equipment to be manufactured, delivered, and a reasonable amount of operational experience to occur. As an example, this sequence of time can take in excess of five years for aircraft and upwards of eight years for a ship. Even with some of the early warranty applications the Department will not begin to see sufficient operational experience until the early 1990's

As noted in the report, the Services have implemented policies and procedures in this area. The Department of Defense will request the Services to provide a status report of their individual efforts no later than November 30, 1989. The status of the present Service warranty administration follows:

**Army.** The U. S. Army Tank-Automotive Command (the Command in question) has properly implemented Army guidance for administration of warranties. User requirements are identified in Department of the Army Pamphlet 738-750 (The Army Maintenance Management System) and Department of the Army Pamphlet 738-751 (The Army Maintenance Management System - Aviation)

GAO DRAFT REPORT - DATED MARCH 16, 1989  
(GAO CODE 396515) OSD CASE 7937

DOD WARRANTIES: EFFECTIVE ADMINISTRATION SYSTEMS ARE NEEDED TO  
IMPLEMENT WARRANTIES

DEPARTMENT OF DEFENSE COMMENTS

\* \* \* \* \*

FINDINGS

**FINDING A: Background: DoD WARRANTIES.** The GAO explained that the 1985 Department of Defense Authorization Act requires that the DoD obtain warranties in its weapon system production contracts for systems that exceed \$100,000 in unit cost, or when total procurement cost exceeds \$10 million. The GAO further explained that contracts for the mature, full-scale production of weapons systems may not be entered into unless each prime contractor guarantees that the weapon system and subsystems meet performance, reliability, and mission capability requirements, as agreed to in the contract. The GAO observed that, if any of the warranties are breached, the contractor must promptly correct the failure without additional cost to the Government or pay costs reasonably incurred by the Government to correct the condition. The GAO noted that the DoD has the authority to negotiate the specific details of the guarantee and the Secretary of Defense may waive the warranty requirements, if necessary, in the interest of national defense or if the warranty would not be cost effective. The GAO also noted, however, that the Congress must be given written notice of the intention to waive any or all of the guarantee requirements on a major defense acquisition, as well as the reasons for doing so. (pp. 1-2, pp.7-8/GAO Draft Report)

**DOD Response:** Concur.

**FINDING B: Prior Audits and Current Concerns About Warranties.** The GAO noted that, in a prior report, it recommended the following:

- that cost-effectiveness analyses of proposed warranties be performed,
- that warranted performance requirements be specified,
- contractor redesign responsibilities be defined; and
- warranted systems be appropriately marked as warranted items

The GAO also reported that, in a July 1988 letter to the Under Secretary of Defense for Acquisition, the Council of Defense and Space Industry Associations expressed concern that the Government warranty practices had unfairly allocated risks to the contractors. The GAO noted the council claimed that warranties were often vague, over-inclusive, and form the foundation for disputes. The GAO further noted the letter stated that (1) DoD has become inflexible in negotiating and pricing warranty clauses, (2) some warranties required performance of tests and development that should have otherwise occurred in preceding program phases, and (3) DoD warranties may not be cost-effective because the requirement for cost-effectiveness analyses had been avoided. The GAO indicated that the Department had not yet responded to the letter, but does have a response underway. (pp. 8-9/GAO Draft Report).

Enclosure

Now on pp. 2, 8-9.

Deleted. See comment 1.

# Comments From the Assistant Secretary of Defense (Production and Logistics)

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



PRODUCTION AND  
LOGISTICS

ASSISTANT SECRETARY OF DEFENSE  
WASHINGTON, D.C. 20301-8000

JUN 15 1989

Mr. Frank C. Conahan  
Assistant Comptroller General  
National Security and International  
Affairs Division  
U.S. General Accounting Office  
Washington, DC 20548

Dear Mr. Conahan:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) Draft Report, "DOD WARRANTIES: Effective Administration Systems Are Needed to Implement Warranties," Dated March 16, 1989 (GAO Code 396515), OSD Case 7937.

The Department generally concurs with the draft report. The report recognizes the Department is following the intent of the 1985 law and the Department has placed warranty contract administration policy and procedures into effect at the various Service procurement activities. The GAO has indicated there are some areas that need further refinement and the appropriate steps will be taken to follow up on these areas.

Contract administration for warranties involves the collective efforts of the Procuring Contracting Officer, Administrative Contracting Officer, the Army, Navy, Air Force, and Defense Logistic Agency, Service Contract Administration Office activities, all Services' logistic and operational commands, and the Defense Contract Audit Agency. The Department's Joint Contract Administration Coordinating Council Working Group on Warranty Administration included representatives from all the aforementioned activities and published a report dated September 1987, which contributed to subsequent Services' policy on warranty administration. The introduction of a Memorandum of Understanding to clarify the capabilities of the Defense Logistics Agency in their support of the Service Procuring Contracting Officers was an important step in establishing the initial planning essential in administering contract warranty clauses. The Department is encouraged by the initiation of joint planning by all the activities involved in program warranty administration. The GAO has reported evidence of these actions.

While the report of the Working Group on Warranty Administration does contain recommendations to OSD and the services, the recommendations do not define a mechanism to hold the services accountable for establishing effective warranty administration systems. We believe that an OSD request for status reports would be a good initial step in determining if effective systems are being established. However, we still believe that unless OSD pursues more active oversight by developing milestones and requiring progress reports, service plans may not be achieved. Past history has shown that without OSD oversight, the services' progress in implementing effective administration systems has been extremely slow. OSD should use the status reports and other specific service information to set goals for progress and identify service milestones.

DOD recognizes the difficulty in performing cost-effectiveness analyses for weapon system warranties, but expects that analyses will be improved as additional experience and data become available. It commented that actual warranty cost and price information cannot be isolated in some circumstances and, therefore, these analyses are meaningless. While we recognize that isolating warranty costs can be difficult, we nonetheless believe that if DOD is to be able to make sound decisions on waivers, every attempt should be made to identify the consideration given to the contractor for the warranty and the administrative costs of the warranty. If identifying costs imposed by the warranty is impossible, this should be recognized and noted in the analysis so that decisionmakers responsible for evaluating the cost-effectiveness of the warranty are aware of it. Both the magnitude of these difficulties and the effect that the inability to obtain this data has on making decisions on the cost-effectiveness of proposed warranties should be documented so it can be fully considered in any future decisions on warranty legislation.

DOD agreed that the services need information to assess actual warranty benefits received and expressed the view that current efforts will, in time, provide a proper overview of contract warranties, but that enough time has not elapsed to accumulate sufficient data. Our concern is that the services have not yet established systems to accumulate enough data to assess warranty benefits and perform post-warranty evaluations. We believe the services still need to establish a baseline of factual information concerning their experiences with warranties.

DOD concurred that the Secretary of Defense should ensure that the services consider the use of waivers as viable options when it can be shown

implement warranty administration systems that (1) include controls needed to ensure that warranty benefits are realized and (2) provide information needed to assess warranty benefits. Unless effective warranty administration systems are established for each procurement activity or weapon system program office that uses warranties, OSD and the services, as well as the procurement activities, will continue to have little assurance that the government is receiving the benefits of warranties and that warranties are achieving intended results.

Valid cost-effectiveness analyses of proposed warranties are necessary to provide reasonable assurances that warranties are cost-effective and to support requests for waivers when it appears warranty costs outweigh benefits. Without more use of methodologically sound, quantitative cost-effectiveness analyses, the risk is increased of obtaining warranties that are not cost-effective. The risk is greater because the basis is lacking to support requests for waivers in cases where warranties may not be justified. We believe the services should devote more attention to performing appropriate cost-effectiveness analyses to be able to determine whether waivers should be requested.

Warranty values included in profit, the costs to administer warranties, and other costs associated with warranties should be identified or estimated and used in performing cost-effectiveness analyses. None of the regulations covering warranties requires that warranty prices be specifically identified. As a result, warranty acquisition costs are often unavailable for use in cost-effectiveness analyses.

As evidenced by problems experienced by the services in trying to establish warranty administration systems, we recognize the complexities and inherent difficulties in establishing effective systems. However, we believe the services must establish a baseline of factual information concerning their experiences with warranties. Warranty administration systems will offer the services a baseline by providing the information they need to analyze problems being experienced in executing warranties. In addition, the systems can also provide quantitative results useful for cost-effectiveness analyses of proposed warranties and evaluations of actual warranty benefits.

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## Recommendations

We recommend that the Secretary of Defense expand his oversight role in warranty administration by establishing milestones for the services to meet in implementing effective warranty administration systems or

**Chapter 2**  
**Warranty Administration: Effective Systems**  
**Have Not Been Fully Established**

as compared to the cost of corrective action by the Army if there were no warranty. Although TACOM has evaluated whether warranty benefits were being realized, no post-warranty evaluations were available concerning overall cost-effectiveness of completed warranties. The final assessment requires a comparison of the amount reimbursed on claims to the amount that the Army paid for the warranty, as well as the government's cost of administering the warranty. While TACOM was collecting cost versus claims information and analyzing warranties on an interim basis, no final assessments had been completed. According to a TACOM warranty administration official, final assessments had not been made because some claims information was still being processed.

Available cost and claim information on TACOM warranties showed that in almost all cases where TACOM paid for warranties during the early years of the warranty law, warranty costs exceeded warranty claims. However, final assessments will be needed to determine whether the warranties were or were not cost-effective.<sup>7</sup> Warranty claim information collected on the 1984 and 1985 awarded contracts reviewed is shown in table 2.1. The data shows, in two instances, that established warranty claim thresholds were never met since the number of claims recorded is far below the threshold number. This has occurred in the cases of the Bradley Fighting Vehicle (1985 contract) and the M1A1/IPM1 tanks.

**Table 2.1: TACOM Warranty Claims**

System/component	Warranty cost	Dollar value of claims reimbursed <sup>a</sup>	Expiration dates	Threshold number <sup>b</sup>	Number of claims
AGT-1500 engine	\$9,942,101	\$10,453	2/87	n/a	127
M88A1 Recovery Vehicle	641,600	0	11/87	n/a	0
Bradley Fighting Vehicle (1985)	67,812	357	4/87	2,756	689
M1A1/IPM1 tanks	2,925,500	0	5/88	5,745	31
HMPT-500 transmission	5,867,361	10,214 <sup>c</sup>	9/88	55	96
Bradley Fighting Vehicle (1984)	4,176,851	17,963	4/87	n/a	215
<b>Total</b>	<b>\$23,621,225</b>	<b>\$38,987</b>			

<sup>a</sup>The value of reimbursed claims for the Bradley Fighting Vehicle contracts includes the value of fixes made at the contractor's plant. Others do not include the value of contractor fixes because TACOM does not routinely collect and record this type of information.

<sup>b</sup>The number of failures for which the contractor is not responsible.

<sup>c</sup>The value of claims submitted was \$647,595; however, only \$10,214 had been reimbursed as of July 1988.

<sup>7</sup>While a comparison of warranty costs with claims provide useful insight into the cost-effectiveness of a warranty, it does not address the question of whether or not the warranty had a positive impact on the contractor's quality control efforts.

claims, it appears unlikely that the services and OSD will be able to evaluate warranty benefits adequately in the near future. Several contracting/program offices at the procurement activities visited have not established systems to collect information needed to assess warranty benefits. Officials at the Army procurement activity visited told us they do collect and analyze warranty cost and claim information, but encountered difficulties in obtaining accurate claim information because users of warranted equipment failed to file the necessary paperwork.

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## NAVSEA Evaluations of Warranty Benefits

The Secretary of the Navy's September 1987 instruction requires the Chief of Naval Operations to develop a system to collect actual warranty use and claim data and analyze it annually. The first analysis will be performed following implementation of the instruction. However, the Navy does not have a system to collect warranty use and claim data that could serve as the basis for an analysis. Action has only recently been taken on the instruction. It is unlikely that the Chief of Naval Operations or Navy procurement activities will be able to provide adequate evaluations of warranties soon, because the Navy's system for collecting data is still not in place.

Since no system was in place to evaluate the number and types of warranty claims being made, we requested such information for selected systems from NAVSEA contracting and program offices. None of the offices had readily available information on warranty claims for the eight 1984 contracts that we reviewed. Generally, NAVSEA was leaving record keeping for warranty claims to the contractors and did not routinely receive such information.

Several contracting and program offices did, however, provide some information regarding claims in response to our request. For example, NAVSEA bought 80 PHALANX Close-in Weapon Systems. The warranty on all of these systems expired in May 1988. At the end of April 1988, 251 failures had been reported. However, since the warranty stated that the contractor was only responsible for failures in excess of 5,238, no warranty claims are expected. The threshold of 5,238 failures was based on historic failures over a 12-month period. The price of the warranty was \$546,261. (The contract was awarded before the Navy's policy not to negotiate additional costs for warranties.)

Although this type of claim information would be useful in evaluating warranty benefits, it is not enough to make a complete assessment. The claim data on the PHALANX indicates that the contractor is not likely

included in the contract. TACOM contracting officials said they did not seek a waiver because the analysis was done after the contract containing the warranty provision was awarded.

- On another contract, the cost-effectiveness analysis appeared to justify the warranty but did not address all costs or quantify administrative costs. The warranty was partially justified because the price was less than 1 percent of the contract price. The analysis also compared the cost of repairs on a similar vehicle to the contract warranty costs and showed that the contractor's repair costs would exceed the warranty costs. However, the analysis did not compare life-cycle costs with and without a warranty and did not quantify the Army's administrative costs.
- Two contracts had no substantive cost-effectiveness analyses because the systems had commercial warranties, rather than weapon system warranties under the warranty law. The law excludes commercial items sold in substantial quantities to the general public.

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### Cost-Effectiveness Models Are Generally Methodologically Sound but Not Extensively Used

We reviewed the analytical models and guidance for performing cost-effectiveness analyses of warranties. Models and guidance reviewed included the Army's warranty model, the Air Force Product Performance Agreement Center's model, guidance in the Defense Management Systems College's Warranty Handbook, and several models designed by individual ASD system offices. Our assessment of the models and guidance indicated that they are generally methodologically sound except for one area, which is the method used to calculate present values of estimated future costs and savings. The services are following guidance in the Office of Management and Budget (OMB) Circular No. 94 (revised). The circular prescribes using a 10-percent discount rate<sup>4</sup> and applying it to constant dollars, a term used for future dollar amounts that have been corrected for expected inflation. Our policy on the method that should be used to perform present value analyses differs from the method prescribed by the circular and is set forth in the Comptroller General's May 19, 1983, letter to the Director of OMB.<sup>5</sup> We use a discount rate based on the average rate (yield) on Treasury obligations that mature during the period when anticipated future costs will occur. The rate is applied to current dollars, a term used for future dollar

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<sup>4</sup>An interest rate called a "discount rate" is used to discount future dollar amounts, such as estimated costs, when calculating present value amounts in order to compare proposed alternatives.

<sup>5</sup>This letter is reprinted in Improved Analysis Needed to Evaluate DOD's Proposed Long-Term Leases of Capital Equipment, Appendix VII (GAO/PLRD-83-84), June 28, 1983.

On two of the weapon systems reviewed, drawn out negotiations on warranties had continued without petitions for waivers. For example, two cost-effectiveness analyses of proposed warranties for F-16 Air Defense Fighter Retrofit Kits concluded that the warranties would not be cost-effective. One analysis was done for the warranty originally proposed and the second was done for a revised warranty proposal. In another case, two cost-effectiveness analyses on proposed warranties for fiscal years 1986 and 1987 procurements of the F-16 AN/APG-68 Fire Control Radar concluded that the warranties would not be cost-effective at proposed prices. After 2 years of negotiation, a warranty price had not been negotiated and deliveries had started on the 1986 contract.

In commenting on our draft report, DOD stated that we had concluded that a program office should not continue to negotiate the terms and conditions of a warranty after the initial analysis showed the proposed warranty would not be cost-effective and instead should request a waiver. We did not mean to infer that warranty negotiations should not continue after an initial finding that a proposed warranty was not cost-effective. As DOD states, the DOD FAR Supplement provides the basis for appropriately tailoring warranty terms and conditions. However, it also prescribes that if a specific warranty is considered not to be cost-effective by the contracting officer, a waiver request should be initiated. We believe the examples we have included in the report illustrate a reluctance to petition for waivers. We have made changes in the report text to clarify our position.

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### TACOM Cost-Effectiveness Analyses Used Narrative Statements Rather Than Quantified Benefits and Costs

Generally, TACOM was preparing cost-effectiveness analyses in line with Army regulations that require them. However, for some warranty types providing benefits at little or no cost, the Army Materiel Command's supplemental regulation permits procurement activities to use narrative statements in cost-effectiveness analyses rather than quantified benefits and costs. TACOM is using warranties for which the regulation allows narrative analyses. The narrative statements appear to be judgmental in nature. We believe that cost-effectiveness analyses that are not quantitative may increase the risk of obtaining warranties that are not cost-effective because the basis is lacking to request a waiver in cases where warranties may not be justified. For other warranty types, the supplemental regulation does require mathematical analyses using the Army's warranty model.

For one warranty type, expected failure warranties (also called threshold warranties), the Army Materiel Command's supplemental regulation

Since September 1986, the Navy has had a policy that makes use of warranties mandatory and directs procurement activities to obtain warranties without negotiating additional costs for them. The policy states that contractors should be expected to meet warranty obligations without the need to negotiate additional costs because warranties contain the same basic expectations that the Navy has when it enters into development and production contracts. The policy further states that while it is not appropriate to negotiate additional cost for a warranty under these conditions, it may be reasonable to consider, through additional profit, the added risk to a contractor for costs which may be incurred in satisfying the conditions of a warranty. According to the policy, the degree of risk to a contractor is related to the complexity of the design and manufacturing requirements and the difficulty in meeting essential performance requirements. The risk associated with a warranty must be quantified and documented in the business clearance when additional profit is included for contractor's risk.

While Navy policy states that costs should not be negotiated separately for warranties, our review showed that costs are associated with obtaining warranties. Our review of contract files for nine NAVSEA contracts awarded in 1987 and 1988 showed costs associated with seven of the warranties.

- Two competitive contracts included line item warranty costs ranging from 3.2 percent to 3.4 percent of contract prices.
- Four contracts included information in business clearance memoranda that estimated from 0.16 percent to 0.5 percent of the contract cost was included in profit to account for the contractor's risk under the warranty.
- Documents in one file for a competitive contract stated that warranty costs were included in applicable line item prices, although these costs were not identified.

Other warranty costs, which were not recognized by NAVSEA, included costs incurred by the Navy in administering warranties.

In commenting on a draft of this report, DOD said that the Navy recognizes that further clarification needs to be made in its instructions regarding the documentation of cost-effectiveness analyses.

ASD contracting personnel said that in two cases plans were not prepared because the contracts were awarded before the 1986 regulation requiring such plans. In the other three cases, where contracts were awarded after the regulation became effective, ASD contracting officials told us two plans were not prepared because the contracting officials were unaware of the requirement. In the remaining case, the system manager did not prepare a plan because it was assumed that a plan already existed.

In the three cases where warranty implementation plans were prepared, two were very specific and comprehensive concerning warranty administration responsibilities and procedures. We considered the other warranty administration plan inadequate because it did not (1) describe roles and relationships of warranty managers and users, (2) describe how the claim process should work, or (3) provide controls to ensure that warranties were used and claims were made.

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**Army Procurement  
Activity Has Problems  
Implementing Warranty  
Administration Procedures**

The Army has defined its warranty administration responsibilities and procedures, but the Army procurement activity we visited, the U.S. Army TACOM, has had problems implementing them.

The Army issued Regulation 700-139, "Army Warranty Program Concepts and Policies," in March 1986. The regulation defines who is responsible for warranty administration at various organizational levels and establishes a procedure for identifying, processing, and filing warranty claims. However, according to a TACOM warranty administration official, problems have been experienced in getting users to follow these procedures and properly prepare the paperwork necessary to file warranty claims. TACOM's problems are discussed on page 27.

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**Procurement  
Activities' Cost-  
Effectiveness  
Analyses Are  
Inadequate**

When the warranty laws were enacted, the Congress recognized that warranties may not always be appropriate. Thus, the law allows the services to seek waivers of the warranty requirements if it can be determined that a warranty would not be cost-effective. Accordingly, DOD regulations require that cost-effectiveness analyses be performed on all proposed warranties that compare the expected warranty benefits against the warranty's acquisition and administrative costs. At the three procurement activities covered by our review, we found cost-effectiveness analyses were either not being prepared or those that were prepared did not adequately support conclusions that proposed warranties were cost-effective. We also found that waiver requests were not

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## Effective Administration Systems Have Not Been Fully Established

Although DOD has delegated responsibility for warranty administration to the services, effective warranty administration systems have not been fully established. The services are in various stages of establishing warranty administration systems, but have encountered some difficulties. The Navy has not established its overall procedures and controls for administering warranties. The Air Force recently issued comprehensive policies and guidance that address warranty administration procedures and controls and is in the process of implementation. The Army issued policies and procedures and has a system in place; however, problems have been experienced in implementing the system.

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## Navy Has Not Established Warranty Administration Procedures and Controls

The Navy has been the slowest of the services to establish a warranty administration system. The Navy has issued several general instructions and regulations on administering weapon system warranties, but it has not provided detailed implementing directives.

The Navy provided initial guidance in 1985. However, in 1988 the Navy still had not provided its commands with guidance for the necessary systems, procedures, and controls for administering warranties in the field. In 1985, the Navy issued a notice requiring contracting officers to ensure that warranty records were kept and that points of contact were established at Navy contractor activities. In 1987, this notice was formalized as a supplemental regulation that required procurement contracting officers to delegate warranty administration and record keeping to contract administration services components in the field. This regulation provided only limited guidance on the type of data that should be collected. It did not include specifics on what procedures and controls should be established to record and process warranty claims.

Recognizing the need for some central direction, the Secretary of the Navy assigned responsibility for developing a system to administer warranties to the Chief of Naval Operations in 1987. The Navy's slow progress is attributable to a lack of priority given to warranty administration within the Navy and uncertainty on how to establish an effective system. Specifically, detailed directives have been delayed because, among other things, the Office of the Chief of Naval Operations is concerned that costs to establish the system may outweigh the benefits.

Our review of eight 1984 NAVSEA contracts showed that contract administration services components were not performing warranty administration functions. They were not tracking warranty claims, keeping records on warranted items, or performing management functions to

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# Warranty Administration: Effective Systems Have Not Been Fully Established

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Our review of the warranty legislation, the DOD Federal Acquisition Regulation (FAR) Supplement, the service regulations, and the Defense Management Systems College's Warranty Handbook showed that the essential elements of effective warranty administration and evaluation systems should include:

- well defined roles for DOD, the military services, weapon system users, system program offices, and field personnel;
- objective analyses of the cost-effectiveness of all proposed warranties;
- use of the waiver option where benefits are not commensurate with the cost;
- efficient procedures for processing claims and good controls over claims processed and collected; and
- comprehensive analyses of the benefits of completed warranties versus the warranty price and administrative cost.

The Office of the Secretary of Defense (OSD) has not taken an active oversight role to ensure that the services establish effective warranty administration systems. OSD has delegated responsibility for warranty administration to the military services. The services, however, have not fully established effective systems for administering and evaluating their warranties. Unless effective warranty administration systems are established, there will be little assurance that the government is receiving full benefits from warranties. Although the services are in the process of establishing warranty administration systems, progress has been slow and a variety of problems are being experienced.

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## More Active OSD Oversight Is Needed

OSD's regulatory guidance to the services on warranties is contained in the DOD FAR Supplement. This regulation prescribes that the services obtain warranties that meet the requirements of the law unless waived and also that they establish procedures to track and accumulate data relative to warranty costs. The regulation does not elaborate beyond the requirement to track data on how warranties should be administered after systems are fielded or how to assess benefits received from warranties.

OSD is not actively overseeing the services' progress in establishing warranty administration systems. OSD has not provided milestones for the services to meet in establishing systems or required the services to report on their status and progress. OSD officials told us that the focal point for warranty administration had been delegated to each military service and that OSD functions only in a reactive mode to deal with

**Table 1.1: Weapon Systems/Subsystems Reviewed**

<b>Procurement activity</b>	<b>Weapon system/subsystem</b>
NAVSEA	AEGIS Weapon System
	Gun and Guided Missile Director and Director Control
	AN/UYQ-21 Navy Tactical Display System
	AN/SPS-49 Radar System
	PHALANX Close-In Weapon System
	AN/SQS-53B Hull-Mounted Sonar
	Target Acquisition System MK 23
Air Force ASD	AN/BQQ-5 Submarine Sonar System
	F-15 C/D aircraft
	F-15E aircraft
	F-16 Air Defense Fighter
	F-16 AN/APG-68 Fire Control Radar
	AC-130U gunship
	AGM-65D Infrared Maverick Missile
	ALR-56C Radar Warning Receiver
	F101-GE-102 engines
	Army TACOM
Bradley Fighting Vehicle	
M113A1 Personnel Carrier	
Heavy Expanded Mobility Ammunition Trailer	
Heavy Expanded Mobility Tactical Truck	
X-1100-3B transmission	
AGT-1500 engine	
HMPT-500 transmission	
VTA-903T engine	
M88A1 Medium Recovery Vehicle	

At the procurement activities, we reviewed 48 weapon system contracts—25 at NAVSEA, 15 at TACOM, and 8 at ASD. Of the 48 contracts, 22 were awarded from 1983 through 1985, and the warranties had expired or were substantially expired at the time of our review. The remaining 26 contracts were awarded in calendar years 1986 through 1988. More recent awards were reviewed to determine the current status of warranty administration and evaluation systems, cost-effectiveness analyses, and warranty coverage. Older contracts were reviewed to determine early experience with administering and evaluating warranties.

We reviewed contract files at the three procurement activities, including basic contract information, warranty clauses, cost-effectiveness studies, and correspondence. We also reviewed warranty administration systems

# Introduction

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The services spend hundreds of millions of dollars annually on weapon system warranties. In 1983 and 1984, the Congress passed laws requiring that weapon systems have warranties because of its concern that systems often failed to meet their military missions, were operationally unreliable, had defective and shoddy workmanship, and could endanger the lives of U.S. troops. It was anticipated that warranties would make contractors more accountable and encourage them to build better quality and reliability into their systems.

A warranty is the seller's promise or affirmation regarding the nature, usefulness, or condition of supplies or performance of services to be furnished. The principal purposes of a warranty are to (1) describe the rights and obligations of the contractor and the government in those instances when defective items and services are delivered and (2) foster quality performance. Generally, warranties remain in effect for a stated period of time after the contract items are accepted or until a specified event occurs.

Section 1234 of the 1985 Department of Defense (DOD) Authorization Act (10 U.S.C. 2403) requires that DOD obtain warranties in its weapon system production contracts for systems that exceed \$100,000 in unit cost, or when total procurement cost exceeds \$10 million. The act further states that an agency may not enter into contracts for the mature, full-scale production of weapon systems unless each prime contractor guarantees that the weapon system meets performance, reliability, and mission capability requirements of the contract.

Specifically, the contractor is to guarantee that the item will (1) conform to design and manufacturing requirements, (2) be free from all defects in material and workmanship when delivered, and (3) conform to essential performance requirements specifically delineated in the production contract. If any of the warranties are breached, the contractor is required to take prompt action to correct the failure at no additional cost to the government or to pay reasonable costs incurred by the United States in taking corrective action. The law gives DOD authority to negotiate the specific details of a guarantee, including reasonable exclusions, limitations, and time duration.

The Secretary of Defense may waive any or all of the warranty requirements after determining that a waiver is necessary in the interest of national defense or that the warranty would not be cost-effective. The Secretary of Defense, however, must give the Senate and House Armed Services and Appropriations Committees written notice of the intention

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## Abbreviations

ASD	Aeronautical Systems Division
DOD	Department of Defense
FAR	Federal Acquisition Regulation
GAO	General Accounting Office
NAVSEA	Naval Sea Systems Command
OSD	Office of the Secretary of Defense
TACOM	Tank-Automotive Command

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## Recommendations

GAO recommends that the Secretary of Defense expand his oversight role in warranty administration by establishing milestones for the services to meet in implementing warranty systems and ensuring that the services consider the use of waivers as viable options when it can be shown that a warranty is not cost-effective.

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## Agency Comments

DOD did not agree that the Secretary of Defense should establish milestones for the services to meet in implementing warranty administration systems, but stated that it would request status reports from the services on their efforts to implement administration systems (see app. 1). While status reports will be helpful, GAO continues to believe that because the services' progress in establishing effective warranty administration systems has been slow, OSD needs to identify milestones for the completion of the generally accepted elements of a warranty administration program tailored to the status of each service's program.

DOD agreed with GAO's recommendation to emphasize the use of waivers when it can be shown that a warranty is not cost-effective.

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# Executive Summary

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## Purpose

The Congress passed warranty laws in 1983 and 1984 because of its concern that weapon systems often failed to meet their military missions, were operationally unreliable, had defective and shoddy workmanship, and could endanger the lives of U.S. troops. These laws require defense contractors to guarantee that weapon systems will meet performance requirements specifically delineated in the contract. It is the Department of Defense's (DOD) policy only to obtain warranties that are cost-effective. Because the services spend hundreds of millions of dollars on warranties each year, GAO reviewed DOD's warranty program to determine whether the services (1) had effective warranty administration systems and (2) were performing cost-effectiveness analyses as required by DOD and service regulations.

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## Background

The Secretary of Defense has delegated administration of the warranty program to the military services. The services are responsible for issuing implementing rules, regulations, and procedures pertaining to warranties. Procurement activities within the services are each responsible for warranty design and administration activities.

The current law requires warranties on weapon systems that have a unit cost of more than \$100,000 or an expected total procurement cost of more than \$10 million. However, the Secretary of Defense may waive this requirement if it can be shown that the warranty is not likely to be cost-effective. Both DOD and service regulations require cost-effectiveness analyses of proposed warranties. In addition to cost-effectiveness analyses, Army and Air Force regulations require an assessment of warranties while they are still active and a post-warranty analysis to measure the results actually achieved. A Navy instruction requires annual collection and analysis of actual warranty use and claim information.

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## Results in Brief

The Office of the Secretary of Defense (OSD) is not actively overseeing warranty administration by the services. And, the services have not yet established fully effective warranty administration systems. As a result DOD has little assurance that warranty benefits are being fully realized.

Waivers of warranty law requirements generally are not being sought by the procurement activities included in GAO's review. Problems are being experienced in performing cost-effectiveness analyses, thus, the activities are not in a position to know whether they should seek waivers.



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