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Report to Congressional Committees

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# DEFENSE INVENTORY

# Improved Industrial Base Assessments for Army War Reserve Spares Could Save Money


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# Contents

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**United States General Accounting Office**
**Washington, DC 20548**

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Congressional Committees

This report follows up on our May 2001 recommendation that the Secretary of the Army develop improved estimates of private industry's spare parts production capability for meeting currently projected wartime scenarios.[1] We made this recommendation after we found that the Army relied on internally generated data rather than on current data from industry to develop its industrial base capability assessments.[2] The Army concurred with our recommendation and cited actions it intends to take. Improvements to industrial base capability assessments could lead to increased readiness and to reduced costs for unneeded wartime spare parts inventories

In this report, we address whether (1) the Army has begun to collect and use current industrial base data and (2) opportunities exist to improve the reliability of the Army's industrial base capability assessments.

To accomplish this review, we interviewed Army officials who are responsible for estimating the requirements and developing budgets for war reserve spare parts and for assessing what portion of those requirements private industry is capable of providing. We also talked with officials from the Defense Logistics Agency about its industrial base assessment program.

## Results in Brief

The Army's approach for assessing wartime spare parts industrial base capability still does not use current data from industry. Instead, the Army uses historical parts procurement data because its prior efforts to collect current data from industry were not successful due to poor response rates. The Army's assessments depend on historical data and resulting lead-time factors to project industry's contribution to satisfying wartime spare parts

[1] This work was undertaken in response to a mandate in section 364 of the National Defense Authorization Act for Fiscal Year 2000, which resulted in the report *Defense Inventory: Army War Reserve Spare Parts Requirements Are Uncertain*, GAO-01-425 (Washington, D.C.: May 10, 2001).

[2] The industrial base includes both privately owned and government-owned assets. In this report, we use the term *industrial base* to refer only to private industry and commercial sources.

requirements. Without current data on industry's capability, assessments could be unreliable, resulting in reduced readiness due to critical spare parts shortfalls in wartime or inflated and costly war reserve spare parts inventories in peacetime. Moreover, the Army's budget requests to Congress for war reserve spare parts risk being inaccurate. [3]

Opportunities exist to improve the Army's industrial base capability assessments. After issuing our May 2001 report, we identified a program in the Defense Logistics Agency that has several attributes reflecting sound management practices that are required for reliable industrial base capability assessments. Our analysis of the approach used by the Army compared to the Defense Logistics Agency's spare parts industrial base assessment program revealed that the Army's approach can be improved in three areas—data collection, data analysis, and management strategies. Table 1 highlights the key attributes where there are opportunities to improve the Army's assessments, based on the program used by the Defense Logistics Agency (DLA).

**Table 1: Industrial Base Assessment Attribute Comparison between Defense Logistics Agency and Army**

| Attribute | DLA | Army |
|---|---|---|
| **Data collection** | | |
| Collects current data from industry | Yes | No |
| Uses Internet based survey | Yes | No |
| **Data analysis** | | |
| Models current production capability | Yes | No |
| Identifies problems for future management actions | Yes | No |
| **Management strategies** | | |
| Creates acquisition strategies | Yes | No |
| Targets industrial base investments | Yes | No |

Source: GAO's analysis.

Although DLA's program is in its early stages of implementation, DLA has been able to successfully collect current data directly from private industry on thousands of parts. Further, DLA is analyzing that data to identify actual or potential parts availability problems. From this analysis,

[3] War reserves are stocks of materiel amassed during peacetime to meet increased military requirements following the outbreak of war. The reserves are intended to provide the Army with interim support to sustain its operations until the Army can be resupplied with materiel from the industrial base.

it has created management strategies for changing its acquisition procedures and making targeted investments in material and technology resources to reduce production lead times. For example, DLA identified an unusually long lead time of 360 days for an electronic part that, with a targeted investment, it was able to reduce to 30 days, saving approximately $600,000.

We are making recommendations to the Secretary of Defense for the Army to create management strategies for improving wartime spare parts availability that can save money, improve readiness, and provide more realistic budget requests to Congress. The Department of Defense (DOD) partially concurred with our recommendations because it did not agree with details about how the attributes we cited could enhance the Army's current process for assessing industrial base capabilities. Its concerns principally centered on the need for the Army to have flexibility in implementing the program and the additional resources required to maintain more accurate data. As discussed in the agency comments section of this report, we continue to believe our recommendations provide an opportunity to enhance the Army's program while allowing this flexibility.

## Background

DOD's current policy calls for each military service to determine its requirements and acquire sufficient war reserve materiel for the execution of current wartime scenarios and to be able to sustain these operations until being re-supplied.[4] Thus, in developing their plans, the services must consider the availability of spare parts in their peacetime operating stocks, their war reserve spare parts inventories, and from the industrial base, and then estimate what additional materiel they need to buy. The Army's industrial base and stationing strategies and DOD's regulations reflect the importance of the industrial base in supporting wartime operations and require the services to rely on the industrial base to the maximum extent possible.[5] In addition, the Army is required to maintain a viable capability to monitor and assess the health of the industrial base and identify potential risks.[6]

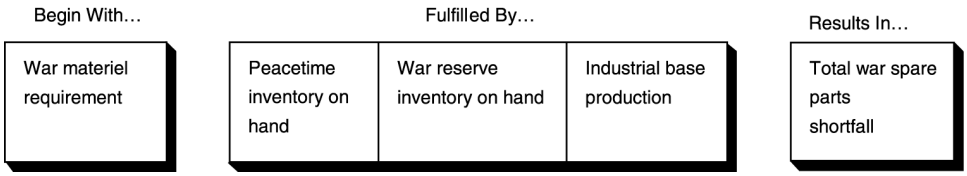
[4] DOD Directive 3110.6, *War Reserve Materiel Policy*, November 9, 2000.

[5] DOD 4140.1-R, *DOD Materiel Management Regulation*, May 1998.

[6] This requirement comes from the Army's 2001 Industrial Base Strategy and its Stationing Strategy.

The U.S. Army Materiel Command is responsible for determining the Army's requirements for war reserve spare parts, as well as the Army's estimate of what private industry can be expected to provide during wartime, in order to derive the war reserve spare parts shortfall.[7] It receives technical expertise from the Army Materiel Systems Analysis Agency in determining its war reserve requirements and an estimate of what can be expected from private industry. The Command's major subordinate commands are responsible for purchasing specific types of materiel, such as aviation, tank, automotive, and communications parts, and they have a limited number of industrial base specialists who can be assigned to provide data for assessments. Figure 1 illustrates the steps that the Army follows to determine its war reserve shortfall.

**Figure 1: Army's Steps for Determining War Reserve Spare Parts Shortfalls**




Source: GAO's analysis.

To plan how much war reserve materiel it needs to buy, the Army develops estimates of when spare parts will be available from the industrial base during wartime so that it can determine how much war reserve materiel it needs to buy and put into its war reserve inventory. In preparing its estimates, the Army first calculates the total amount of war materiel that it needs to support current wartime scenarios. Specifically, it calculates its requirements by using a computer model that considers several factors, such as spare parts usage and breakage rates. Next, it determines the amount of peacetime and war reserve inventories that are available to meet that requirement. The Army then applies the amount it estimates the industrial base can be expected to provide during wartime. The remaining amount is considered the total spare parts shortfall. The total shortfall can then be divided into the amount for which Congress has authorized funding, any amounts budgeted for future years, and an additional amount the Army has not yet requested from Congress.

[7] The Army uses the term *industrial base offset* to mean its estimate of what private industry can be expected to provide during wartime.

As table 2 shows, in preparation for its fiscal year 2003 budget submission to Congress (part of the fiscal year 2003-2007 out-of-cycle Program Objective Memorandum), the Army calculated that it required $3.30 billion for its wartime spare parts. Of this amount, it estimated that $1.93 billion worth of spare parts would be available from peacetime and war reserve inventories. Another $0.13 billion expected to be available from private industry was applied. The resulting total spare parts shortfall was $1.24 billion. Of this amount, the Army has been funded $0.11 billion for fiscal years 2000-2002 and expects to request $0.47 billion in fiscal years 2003-2007. Overall the Army reports a total spare parts shortfall of approximately $0.66 billion.[8]

**Table 2: The Army's Fiscal Year 2003-2007 War Reserve Spare Parts Plan**

| Dollars in billions | | |
|---|---|---|
| | **Subtotal** | **Total** |
| Calculated costs of required wartime spare parts | | **3.30** |
| Peacetime inventory on hand | 0.63 | |
| War reserve inventory on hand | +1.30 | |
| Inventory to be available | 1.93 | **-1.93** |
| Remaining unfilled requirement | | **1.37** |
| Estimated amount from private industry | | **-0.13** |
| Estimated amount still needed to fulfill requirement (spare part shortfall) | | **1.24** |
| Funding for fiscal years 2000-02 | | **-0.11** |
| Expected funding for fiscal years 2003-07 | | **-0.47** |
| Shortfall remaining | | **0.66** |

Source: Fiscal Years 2003-07 Program Objective Memorandum for the Army.

## Army Industrial Base Assessments Do Not Use Current Industry Data

The Army's approach for assessing wartime spare parts industrial base capability still does not use current data from industry. Rather, the Army's assessments of industry's capability to produce spare parts in wartime depend on historical data and lead-time factors that the Army develops itself. Without current data on industry's capability, assessments could be unreliable, resulting in reduced readiness due to critical spare parts shortfalls in wartime or inflated and costly war reserve spare parts inventories in peacetime. Moreover, the Army's budget requests to Congress for war reserve spare parts risk being inaccurate.

[8] We did not attempt to verify the validity of the requirements estimates.

In the past, the Army collected data directly from private industry through paper questionnaires to industry representatives that were up to 22 pages long.[9] It stopped this practice primarily because of the poor response rates. According to Army Materiel Command officials, industry representatives said they saw no apparent direct benefit from filling in the lengthy questionnaires and, moreover, felt they should be compensated for their time and effort. We were told that command officials themselves do not believe that collecting current data from industry is cost-effective.

Now, rather than collecting current data from private industry, the Army uses data that it acquired several years ago from private industry to create lead-time factors for estimating its wartime industrial base capability. These factors are based on out-of-date industry data. Furthermore they were developed from a limited range of spare part items but were applied to all parts needed for war. For example, in developing its fiscal year 2003 budget submission to Congress, the Army used a formula with wartime lead-time factors that were derived from estimated accelerated peacetime administrative lead times and production lead times.[10] These accelerated lead-time factors of 85 and 61 percent, respectively, were based on data obtained prior to 1998 for specific items, such as howitzers, that were managed by the Army Tank and Automotive Command's Rock Island facility. According to an Army document,[11] this method of calculating lead times fails to account for variations that exist from item to item and can lead to unrealistic industrial base capability estimates. For example, a 1998 Army study found that 44 of 86 parts assumed to be supported by industry could not be and that 176 of 218 parts that were assumed not to be supported by the industrial base were.

Partly in response to the recommendation in our prior report, the Army has several initiatives underway to improve its industrial base capability assessments, but these initiatives continue to focus on historical, rather than current industry data. In one initiative, the Army is developing a new approach to calculate its wartime spare parts requirements, in part, from

[9] DOD Form 2737, *Industrial Capabilities Questionnaire.*

[10] Administrative lead time is defined as the interval between initiation of procurement action and letting of contract or placing of order. Production lead time is defined as the time interval between the placement of a contract and receipt into the supply system of materiel purchased.

[11] This document, an engineering change request (XLGWRA13713), dated December 15, 1999, proposes changes to this estimating method.

data collected from private industry during 1998. In another, the Army Materiel Command has designed a tool—called the Industrial Base Hub[12]—that brings together in one Web-based automated system a broad range of existing industrial base data. The data consist of war reserve requirements, producer capabilities, contract awards and actions, contractor businesses, and commercial businesses and finances. The Industrial Base Hub relies on historical data rather than on current data from industry. In a third initiative, the Army Materiel Systems Analysis Agency has proposed periodically collecting data on production lead times for the 100 costliest spare parts, which account for 70 percent of the total dollar value of the entire wartime spare parts requirement. The Army Materiel Systems Analysis Agency believes that collecting current data periodically from the private manufacturers of the top 100 costliest spare parts could be a reasonable way to get a cost-effective, reliable industrial base offset estimate.

## Opportunities Exist to Improve the Reliability of the Army's Industrial Base Capability Assessments

The Army could improve the reliability of its industrial base assessments by considering several key attributes present in DLA's industrial base assessment program. These include the collection of up-to-date industry data, the timely analysis of data to develop current and reliable industrial base assessments, and the use of analytical data to create management strategies aimed at reducing spare parts costs and the risk of shortfalls.

### DLA's Assessment Program

To improve its management of spare parts for the services, and thus reduce costs and inventory, DLA re-engineered its industrial base capability assessment program. DLA's assessment program, called the Worldwide Web Industrial Capabilities Assessment Program, was started in the fall of 1999. It consists of a data collection tool and an analytical tool, which is used to create management strategies. (See appendix I for a more detailed description.) The data collection tool provides the capability to gather new and updated information directly from private companies via the Internet. Company representatives voluntarily respond to a series of on-line survey questions that, depending on how answered, are self-tailored to that company to simplify and speed up the survey process.

[12] The Industrial Base Hub is composed of three components: Industrial Base Automated Rating System, Industrial Base Activity System, and Industrial Base Information System.

Private companies provide information on what spare part items they can provide (or are willing to provide); what quantities they can produce; how long it will take to produce them under different scenarios (e.g., normal or crisis conditions); and what potential bottlenecks (e.g., availability of certain materials, or equipment constraints) exist that could limit the production of certain spare parts. DLA validates this information as part of its assessment process before acting on the information.

The program's analytical tool provides analysts with immediate access to the automated data collected from industry. This provides the capability to develop timely and reliable assessments of industry's ability to provide various spare parts in peacetime as well as wartime. In addition, it provides the capability to use the analytical data to identify actual or potential parts availability problems (e.g., items with unusually long lead times or items that are involved in bottlenecks) and, based on this information, to create a management strategy for resolving these problems, for example, by changing its acquisitions procedures or targeting investments in material and technology resources to reduce production lead times.

## Benefits of DLA's Assessment Program

Although DLA's industrial base assessment program is relatively new, it provides a number of examples that illustrate the effectiveness of collecting current data directly from the industrial base. Table 3 shows the impact on production lead time when it is based on up-to-date industry data. For example, clamp couplings for tanks, aircraft, and aircraft engines have a production lead time of 35 days during a crisis (surge) situation rather than a lead time of 156 days (lead time of record) previously estimated by DLA for normal, or peacetime, situations.

**Table 3: Production Lead Times for Selected War Reserve Spare Parts**

| Weapon system | Spare part item | Industry surge lead time[a] | Lead time of record[b] |
|---|---|---|---|
| Helicopters, aircraft engines | Resilient mount | 70 | 163 |
| Communications satellite terminal | Centrifugal fan | 56 | 109 |
| Communications | Tube axial fan | 45 | 125 |
| Tanks, aircraft, and aircraft engines | Clamp coupling | 35 | 156 |
| Aircraft | Clamp coupling | 35 | 65 |
| Aircraft and support equipment | Clamp coupling | 35 | 49 |

[a] The surge production lead-time estimate, based on industry's response to DLA's survey, refers to the best possible production lead time (in days) for an item in a crisis situation which is date of contract award to date of receipt of first significant delivery.

[b] The production lead time of record estimate is a computed new average production lead time (in days) that factors in the latest actual production lead time, the number of days from contract award to date of contract delivery and subsequently the receipt date of first significant delivery, and the old production lead time of record in the system. It is designed for normal, or peacetime, situations.

Source: DLA Worldwide Web Industrial Capabilities Assessment Program.

This more reliable information could result in greater economy in purchasing decisions. For example, private industry says it can provide a resilient mount within 70 days during a crisis rather than in the 163 days that DLA previously estimated. The war reserve requirement for this item occurs during the first 3 months of a war. The reduction in production lead time from 163 to 70 days means that the third month could be covered with a savings of $4,810 by not buying the items.[13] Likewise, the war reserve requirement for the centrifugal fan spreads over the first 6 months of a war with the bulk occurring during the last 3 months. The lead-time reduction from 109 days to 56 days means that months 2-6 could be covered with a savings of $62,560 by not buying the items.

Additional benefits from the assessment program stem from evaluating currently collected and analyzed information to identify potential problems with production and create various management strategies to resolve them. For example, by identifying an unusually long lead time for a cesium lamp and examining the reasons for this, DLA was able to ultimately reduce the lamp's lead time of 360 days to only 30 days. The lamp is used on several types of Navy, Marine Corps, and Air Force aircraft in electronic counter measure systems to defeat infrared missiles. The lamp cartridge, which is a critical element used in these systems, is made of exotic materials and operates at extreme temperatures and power levels.

An industrial capabilities assessment concluded that the lead time of record for this item was 360 days. Negotiations with the vendor, however, reduced this to 300 days. The lead time of 300 days is due to the use of highly technical processes and several long-lead-time materials in its production. Because of the unique nature of the cesium lamp, additional measures were needed to reduce the lead time further. As part of a targeted investment, DLA awarded a contract to preposition and rotate long-lead materials and partially finished components, resulting in a further 270-day reduction in lead time to 30 days. As a result, DLA is

[13] DLA calculated the savings based on the number of units that would not need to be purchased for war reserves multiplied by the cost per unit.

spending $530,000 for this investment, compared with the $1.1 million it would cost to purchase and store an equivalent amount of finished product to meet war reserve requirements, saving approximately $600,000.

## Army Industrial Base Capability Assessments Can Be Improved

The Army's approach for assessing wartime spare parts industrial base capability can be improved. A comparative analysis of DLA's program to the Army's approach shows opportunities to improve, specifically in the areas of data collection, data analysis, and management strategies. Table 4 compares the DLA and Army industrial base assessment approaches for the three key attributes.

**Table 4: Industrial Base Assessment Attribute Comparison between DLA and Army**

| Attributes | DLA | Army |
|---|---|---|
| **Data collection** | | |
| Collects current data from industry | Yes | No |
| Maintains a deliberate, ongoing program to collect current data | Yes | No |
| Conducts follow-up to encourage participation | Yes | No |
| Uses Internet based survey rather than paper | Yes | No |
| Saves input time through a self tailoring survey instrument | Yes | No |
| Uses a unique classification strategy to group industry items | Yes | No |
| **Data analysis** | | |
| Incorporates current data into Internet based analytical tool | Yes | No |
| Allows immediate access to current industry data | Yes | No |
| Uses current and historical data to model industry capability | Yes | No |
| Identifies item shortfalls for further analysis | Yes | No |
| **Management strategies** | | |
| Meets requirement to assess industrial base capability | Yes | No |
| Creates acquisition strategies | Yes | No |
| Targets industrial base investments | Yes | No |
| Reduces lead times and saves money | Yes | Unknown |
| Links results of analysis to its strategy | Yes | No |

Source: GAO's analysis.

By focusing on the above attributes, DLA's industrial base capability assessment program has become an improved, simplified, time-saving process for companies to provide current production capability data. For example, the process uses a streamlined Internet based data collection tool that industry representatives say is an improvement over the old paper process. Also DLA uses follow-up letters and phone calls to encourage use of the online data collection tool. Companies can then participate with DLA in creating management strategies to reduce lead times, which can reduce required war reserve inventories.

## Conclusions

Industrial base capability assessments designed to have current data such as DLA's create opportunities for sound decision making regarding the planning for and purchase of Army war reserve spare parts. The Army's approach to industrial base capability assessments lacks key attributes that include the collection of current industry data, the analysis of that data and the creation of management strategies for improving wartime spare parts availability. Out-of-date data could result in reduced readiness and inflated or understated war reserve spare parts funding requests within budget submissions to Congress. Without a process that provides such analysis, the Army cannot identify long lead times and create management strategies to reduce lead times and thus the amount of inventory needed.

## Recommendations for Executive Action

In order to improve the Army's readiness for wartime operations, achieve greater economy in purchasing decisions, and provide Congress with accurate budget submissions for war reserve spare parts, we recommend that the Secretary of Defense direct the Secretary of the Army to have the Commander of Army Material Command take the following actions to expand or change its current process consistent with the attributes in this report:

- establish an overarching industrial base capability assessment process that considers the attributes in this report;
- develop a method to efficiently collect current industrial base capability data directly from industry itself;
- create analytical tools that identify potential production capability problems such as those due to surge in wartime spare parts demand; and
- create management strategies for resolving spare parts availability problems, for example, by changing acquisition procedures or by targeting investments in material and technology resources to reduce production lead times.

## Agency Comments and Our Evaluation

DOD partially concurred with the overall findings and recommendations. However, it nonconcurred with specific points in several of our recommendations relating to the need to improve the capability of the Army's approach to assessing industrial base capabilities. Our evaluation of the Department's specific comments on each recommendation follows.

DOD agreed with the overall point of our first recommendation that it establish an overarching industrial base assessment process relying on the most accurate information available. However, it did not concur that the Army should change its current process to be consistent with attributes of

the DLA program. It stated that the Army's current system already applies many of these attributes and must have the flexibility to do so in its own manner consistent with its specific requirements and resources. As we reported, our analysis shows the Army's program does not have all the key attributes such as collecting current industrial base capability data from industry. Furthermore, we considered the Army's need for flexibility in managing and executing its program when developing our recommendation by stating that the Army should be consistent with—not necessarily mirror the attributes of DLA's program. Therefore, we continue to believe our recommendation is appropriate.

DOD agreed with the underlying premise of our second recommendation that the most accurate data lead to the most accurate estimates. However, it stated that we provided no evidence that more current data would result in a more accurate forecast of industry's capability to provide parts for war. As pointed out in our report, DLA provided examples of how it could save money by using current data it collected from industry, such as over $62,000 on the centrifugal fan. Furthermore, we noted that a study done by the Army in 1998 showed that data collected at that time about actual industrial base capability significantly disagreed with the Army's estimated industrial base capability. The department also did not agree to a comprehensive data collection effort because keeping more current data does not warrant additional resources and stated that it will direct the Army examine the feasibility of attempting to proactively collect production data for a limited number of items. We recognized the potential for such an initiative in our report and stated that the Army Materiel Systems Analysis Agency believes that periodically collecting current data on the top 100 costliest spare parts could be a reasonable approach. Although this is a good first step, a comprehensive effort to collect current industrial base capability data directly from industry is basic to the recommendation's underlying premise and is a best practice. Therefore we continue to believe that our recommendation has merit.

DOD concurred with the point of our third recommendation that there is a need to identify potential production capability problems such as those resulting from a wartime surge in demand for spare parts. However, it did not agree that the Army does not have such a process. While the Army's approach may have many analytical features, it does not provide specific analyses of production capability. Such analyses contribute to identifying possible production capability problems and could enhance the Army's management decisions. Therefore, we continue to recommend that the Army create such analytical tools. Furthermore, in response to DOD's comment about the need to validate survey data on production capability

before taking action, we added information to our report stating that DLA does validate its industry surveys as part of its process.

With regard to our fourth recommendation, DOD concurred with the concept that management strategies are needed to resolve spare parts availability problems. But, it disagreed with the implication that the Army has no such strategies. While the Army does have some processes at the individual command level that identify and address spare parts availability problems, we did not find an overarching process to create management strategies designed to reduce lead times and inventories. Therefore, we continue to believe that our recommendation is appropriate.

## Scope and Methodology

To determine whether the Army is using current industrial base data for assessing wartime spare parts industrial base capability, we interviewed Army officials responsible for war reserve spare parts planning, requirements development, and estimation of industrial base capability in the Office of the Army Deputy Chief of Staff for Logistics in Washington, District of Columbia; the Army Materiel Command in Alexandria, Virginia; the Army Aviation and Missile Command at Redstone Arsenal, Alabama; and the Army Materiel Systems Analysis Agency at Aberdeen Proving Grounds, Maryland.

To determine whether opportunities exist to improve the reliability of the Army's industrial base capabilities assessments, we compared the Army's approach to key attributes of the DLA's program by interviewing DLA officials in the Supplier Assessment and Capability Division at Fort Belvoir, Virginia, and the Defense Supply Centers in Richmond, Virginia, and Columbus, Ohio, that are responsible for an industrial base data collection and analysis activity using information from private industry to improve spare parts management. We also reviewed the processes used by the Army and DLA to assess industrial base capability.

We performed our review between October 2001 and May 2002 in accordance with generally accepted government auditing standards.

We are sending copies of this report to the Secretary of Defense and the Secretary of the Army. We will also make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at http://www.gao.gov.

Please contact me on (202) 512-8412 if you or your staff has any questions concerning this report.

David R. Warren, Director
Defense Management Issues

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# Appendix I: Defense Logistics Agency Industrial Base Planning

The Defense Logistics Agency's (DLA) industrial base assessment program operates within the Supplier Assessment and Capability Division in the Acquisition Management and Logistics Policy Directorate. Among the division's objectives are: (1) to provide information tools to assess the capabilities of suppliers and (2) to identify potential readiness shortfalls and mitigate them through various business practices such as investing in long-lead materials and by taking advantage of manufacturing commonalities.

To achieve these objectives, the division has developed a variety of tools to assess the supplier base in each of its major product categories—weapon systems and hardware, construction, medical supplies, subsistence items, and clothing and textiles. Using these tools, DLA is able to evaluate suppliers' capabilities to provide items in both peacetime and wartime, to take actions to mitigate quantifiable risks, and to examine broad industrial base issues and trends, using statistically valid information. The tools allow assessments to be made by individual item or grouped by items, product family, sector or subsector, weapon system or platform, or supplier.

One of these tools, the Worldwide Web Industrial Capabilities Assessment Program, was designed for assessing supplier resources available to the Defense Department. The program is an automated, interactive, Web-based program that allows the gathering of information from industrial suppliers and the use of this data to assess the industrial sector's capabilities for supplying various items. It also enables information to be analyzed in a wide variety of formats in order to identify strategies directed toward reducing costs and providing wartime readiness.

Developed in 1997, the Worldwide Web Industrial Capabilities Assessment Program replaced the old data collection process, which relied on mass mailings of lengthy (up to 22 pages), cumbersome questionnaires that suppliers had to fill out by hand. The response rate from industry was typically too low to allow any statistically relevant analysis. In addition, the narrative answers to key questions were incompatible with computer analysis, and thus the information that industry provided could not be acted upon.

The development of the program changed both the way information is collected from industrial suppliers and the way that information is used to conduct industrial base assessments and analyses.

## Data Collection Tool

The data collection tool was built specifically for industrial base assessments. It resides on a Web site that can be easily accessed by industry representatives. It uses an interactive survey format to collect information directly from a company about its ability to supply certain items. A company's representative checks in and fills out, or updates, a survey questionnaire for each item or group of items that is supplied. Depending on how a user answers a question, the questionnaire automatically adjusts itself to remain as short as possible but still collect the essential information that is needed for analysis. The survey information is saved in a permanent database, which eliminates the need for a company to reenter information when it is updated.

The program identifies each item by the supplier's own part number grouped by an industry standard classification code. This simplifies input of information for multiple items that might use the same production line or equipment. It requests a wide range of information about the industry's ability to supply an item, including high and low estimates of production time, capacity, potential constraints and bottlenecks, and inventory on-hand. See table 5 for a list of the data fields.

**Table 5: Program Data Fields and Descriptions**

| Data field | Description of data |
|---|---|
| Previous year (production data) | The actual quantity of the item (in units) produced during the previous calendar year. |
| Current year (production data) | The actual/estimated quantity of the part produced at the responding manufacturing site during the current calendar year. |
| Next year (production data) | The projected quantity of the item (in units) to be produced during the next calendar year. |
| Low estimate (production for U.S. government end use) | Estimate the minimum amount of the portion of current production (in percent) of the item that will be sold directly to the U.S. government or included in some other product that is sold to the U.S. government. If you have precise knowledge of the final use of the surge item, the minimum and maximum estimates will be identical. |
| High estimate (production for U.S. government end use) | Estimate the maximum amount of the portion of current production (in percent) of the item that will be sold directly to the U.S. government or included in some other product that is sold to the U.S. government. If you have precise knowledge of the final use of the surge item, the minimum and maximum estimates will be identical. |
| Constraints (surge data) | Specify the major constraints to larger production quantities. |
| First article test | Needed for items requiring Department of Defense (DOD) certification. Clicking yes means your facility has been approved by DOD to manufacture items with rigid specifications. |
| Technical data package | Clicking yes indicates you possess the technical drawings/specifications for the item. |
| Current lead time | The current minimum time between order and delivery of a listed part. |
| Priority lead time | The estimated time between order and delivery of a listed part (supplied from new production, not finished inventory), if the part were given priority treatment over all other production. |
| Finished inventory | Average inventory of finished parts under normal operating conditions. |

| Data field | Description of data |
|---|---|
| Production resource category | The survey focuses on five production resource categories: production equipment, test equipment, tooling, skilled labor, and materials. For each listed part, provide bottleneck and throughput data for those categories that were identified in the "Constraints" section as limiting increased production of the part. |
| Bottleneck | The specific production equipment, tooling, test equipment, labor, or material that would limit output of a part in response to a sudden substantial increase in demand. |
| Maximum throughput during one hour of operation | The maximum units of a part that can be processed through a specific bottleneck during one hour of operation. |
| Materials special definition | For material bottlenecks, provide the maximum number of this part that can be produced from the average "on hand quantity" of the specified bottleneck material. This answer should be consistent with the average inventory reported for materials in the capacity section of this tool. If Average On-Hand Inventory was reported equal to 0, provide number of material bottleneck required to produce one unit of the surveyed item. |
| Quantity of item | The estimated quantity of the item that can be processed through the identified bottleneck during one hour of utilization. |
| Critical resources | The piece of equipment that would be the first bottleneck limiting increased output of the item. (Ignore bottlenecks that are not the direct result of equipment constraints and ignore competing demands for the equipment used to produce items other than the item.) |
| Quantity from inventory | The amount of units of the item that could be produced using only materials currently in inventory. Assume that all applicable materials currently in inventory could be dedicated to production of the item. In other words, ignore any conflicting material needs for the production of other items. If the current inventory levels are abnormally high or low, base your calculations on an average inventory level. Include any finished quantities of the item currently/normally held in inventory in the total. |
| Number of equipment/staff | Provide the unit count for each type of equipment, tooling, or skilled labor category. For skilled labor, express the unit count in terms of full-time equivalents. "Full-time equivalent" is the number of hours entered in the "Current capacity" column. For example, if "Current capacity" is a 40-hour workweek, two half-time employees who work 20-hour workweeks should be counted as one full-time equivalent. |
| Current capacity | The hours per week that constitute 100 percent utilization of the listed production resource under normal operating conditions. For skilled labor, this number should be normal weekly hours for a full-time employee. |
| Capacity utilization | The current utilization rate (in hours per week) of the listed production resource. |
| Utilization for government end use | The average hours per week the listed production resource is utilized to produce items for government end use. Your response should include both items sold directly to the U.S. government and items included in other products sold to the U.S. government. If you do not track final use of some or all items produced with this production resource, provide your "best guess." |
| Surge capacity | The maximum hours of operation per week (sustainable over several months) that the listed production resource could be utilized under emergency conditions. |
| Normal lead time (current lead time) | If a customer placed an order with you today for a quantity of the item, how many days from today would you promise delivery (from new production, not from off-the-shelf)? |
| Lead time to bring new capacity on-line | What is the "order-to-first production" lead time for the listed production resource. If you were to order/hire the production resource today, how soon (in days) would you expect this production resource to be operational? |
| Shortest lead time to bring new capacity on-line | What is the shortest "order–to-first production" lead time for the listed production resource, if your order for this production resource were given top priority. (In other words, assume that your order would be placed at the top of your supplier's delivery queue.) If you were to order/hire the production resource today, how soon (in days) would you expect this production resource to be operational? |
| New item production | In response to an emergency need, the length of time it would take to produce that item after receiving the technical data (in days). Assumptions: (1) the item is similar in |

| Data field | Description of data |
|---|---|
| | complexity to the item addressed in your previous responses and (2) the item can be produced using the same production equipment, test equipment, and skilled labor currently used for production of that item. |
| Surge lead time | Given crisis planning what is your best possible production lead time (PLT) for this item? |
| Facility name | This is the legal name for the location about which information is being provided. Include all qualifiers such as division and subsidiary. |
| Street address | The street address includes the post office box number, if used, as well as a physical street address. |
| City | The city (mailing) address for the facility. |
| State | The state address for the facility. Use the standard, two-character abbreviations for states. Use the province name if Canadian. |
| Zip code | Nine-digit zip codes are preferred for U.S. addresses, and 10-digit codes are preferred for Canadian addresses. |
| Country | USA or Canada. |
| DUNS number | This is a nine-character number assigned by Dun & Bradstreet Financial Services that identifies corporate entities. |
| CAGE code | CAGE is the abbreviation for Commercial and Government Entity. This five-character alphanumeric identifier is assigned by the government to companies doing business with the government. (The CAGE Code was formerly known as FSCM.) |
| DODAAC number | This is the DOD Activity Address Code for the DCMC representative (DCMAO or DPRO). The DODAAC listing is contained in DOD 4000.25-6-M, DOD Activity Address Directory. |
| Name | Enter your name. |
| Job title | Enter your job title. |
| Telephone number | Enter your telephone number, including area code.<br>Enter the extension number in the extension field. |
| Fax number | Enter your fax number, including area code. |
| Email address | Enter your email address. |
| Company name | If known, include qualifiers such as divisions and subsidiary. |
| Street address | The street address includes the post office box number, if used, as well as a physical street address. |
| City | The city (mailing) address for the key supplier. |
| State | The state (mailing) address for the key supplier. Use the standard two-character abbreviations for states. Use the appropriate mailing designation instead of state if the supplier is foreign. |
| Zip code | Nine-digit zip codes are preferred for U.S. addresses, and ten-digit zip codes are preferred for Canadian addresses; use the appropriate mailing designation instead of the zip code if the supplier is foreign. |
| Country | The country where the key supplier resides. |
| Material name | Identify the material/item supplied by this supplier. |
| Part number/grade of material | Enter a unique identifier for the material/item. |
| Inventory | Your facility's average inventory of the material or pass through item. |
| Unit of measure | The standard measure of material or item quantity, such as "each," "100-ct box," "pounds," "100-lb ingot," "55-gal barrel," etc. |
| Material lead time (normal) | The current order-to-delivery lead time (days) for this material/item. |
| Monthly supply (normal) | The average monthly supply of the material or part acquired from this vendor under normal conditions or the average quantity ordered if ordered only on intermittent demand or periodically. |
| Material lead time (surge) | The order-to-delivery lead time (days) for this material/item, if your supplier were required to place your order at the top of the order queue. |

| Data field | Description of data |
|---|---|
| Maximum monthly supply (surge) | Your estimate of the maximum monthly supply of the material or item that could be acquired from this vendor under emergency conditions. Assume your order for the material or item would be given priority treatment by your vendor. |
| Delete | Deletes the connection between the material bottleneck or PTI and company listed on the row. |
| Contact name | Enter the name of your contact person with the company. |
| E-mail address | Enter the contact's email address. |
| Phone number | Enter the contact's phone number. |

Source: Worldwide Web Industrial Capabilities Assessment Program survey instrument.

## Analytical Tool

While the data collection tool interfaces with industry via the Web to gather data, the analytical tool, also Web-based, is a centralized tool that is available to all approved personnel regardless of location. The analytical tool allows analysts to assess what is needed in the way of industrial items and what the industrial base is capable of providing. It does this by combining the current information supplied by industry with existing DLA legacy data (e.g., item purchase histories, and previous item shortfalls). Analysts can use this integrated database to examine information at various levels (e.g., individual item, family groups, sector and subsector, weapon system and platform, or supplier) and to graphically depict this information in a range of formats and export the data to external files for further complex analysis. They can create statistically valid samples of discrete data to analyze. With this information, they are able to identify acquisition strategies that take advantage of similar manufacturing processes and affect changes in peacetime buying practices as a low-cost way of providing wartime readiness.

# Appendix II: Comments from the Department of Defense

DEPUTY UNDER SECRETARY OF DEFENSE FOR
LOGISTICS AND MATERIEL READINESS
3500 DEFENSE PENTAGON
WASHINGTON, DC 20301-3500

JUL 8 2002

Mr. David R. Warren
Director, Defense Management Issues
U.S. General Accounting Office
441 G Street, N.W.
Washington, D.C. 20548

Dear Mr. Warren:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report entitled, "DEFENSE INVENTORY: Improved Industrial Base Assessments for Army War Reserve Spares Could Save Money," dated May 31, 2002 (GAO Code 350069/GAO-02-650).

The DoD comments on the draft report are enclosed.

Please contact John Becker, (703) 614-8578, of my staff if additional information is required.

Sincerely,

Allen W. Beckett
Principal Assistant

Enclosure:
As stated

**GAO DRAFT REPORT DATED MAY 31, 2002**
**GAO CODE 350069/GAO-02-650**

**"DEFENSE INVENTORY: IMPROVED INDUSTRIAL BASE ASSESSMENTS FOR ARMY WAR RESERVE SPARE COULD SAVE MONEY"**

**DEPARTMENT OF DEFENSE COMMENTS TO THE RECOMMENDATION**

**RECOMMENDATION:** The GAO recommended that the Secretary of Defense direct the Secretary of the Army to have the Commander of the Army Materiel Command take the following actions to expand or change its current process consistent with the attributes in this report:

1. Establish an overarching industrial base capability assessment process that considers the attributes of this report;
2. Develop a method to efficiently collect current industrial base capability data directly from industry itself;
3. Create analytical tools that identify potential production capability problems such as those due to surge in wartime spare parts demand; and
4. Create management strategies for resolving spare parts availability problems, for example, by changing acquisition procedures or by targeting investments in material and technology resources to reduce production lead times.

**DOD RESPONSE:** Overall, we concur with GAO finding that the Army's approach for assessing wartime spare parts base capabilities does not rely on current data from industry to the maximum extent possible. And, while it is intuitively appealing to think that more current data would result in more accurate forecasts, there is no evidence in the report that this would be the case. Further, monetary savings may be achieved by deferring expenditures, as described in the draft, based on shorter lead times reported by suppliers. However, for critical war reserve spares, such actions should not be taken until supplier-related lead times are verified; the Defense Logistics Agency (DLA) system cited as an example may include this step, but it was not apparent from the report.

**DOD RESPONSE 1: Partially concur.** The Office of the Secretary of Defense (OSD) agrees with the need to have an overarching industrial base assessment process, analytical tools to identify potential production capability problems, and management strategies for resolving spare parts availability problems. We further agree that such a process should rely on the most accurate information available. We nonconcur with the GAO recommendation that the Army Materiel Command (AMC) change its current process to be consistent with the attributes of the DLA program, as described in the GAO report. We agree with Army claim that their processes already apply many of the attributes addressed in this GAO report and that, while there are differences between the two approaches, Army and DLA must have the flexibility to manage and execute their War Reserve and Industrial Base Programs in a manner consistent with their specific requirements and resources. Army and DLA should continue to share information so each can obtain leverage from the efforts of the other. Army has in fact developed an automated

web-based tool, the IB Hub, to facilitate industrial base analysis. Because this initiative was too early in its infancy, when GAO was working on the earlier report, *Defense Inventories: Army War Reserve Spare Parts Requirements Are Uncertain* (GAO-01-425, Washington, D.C., May 10, 2001), the Army chose not to discuss this tool with GAO at the time. Subsequently, when GAO was working on the current report, the Army did brief GAO on its web-based efforts. The IB Hub utilizes many of the same data elements that GAO lists in their report.

**DOD RESPONSE 2: Partially concur.** We concur with the underlying premise that the most accurate data leads to the most accurate estimates. The GAO report references the Army's experience with a volunteer system for collecting data, which resulted in data of poor quality. While the data collected from suppliers via the internet may be more current, there is no reason to believe the resultant data will be any more accurate and thus, we are surprised to see GAO recommending such a system. The Army developed the IB Hub system specifically to overcome the problem associated with collecting data directly from industry by integrating available and relevant data from multiple sources. In developing the Hub, Army included a mechanism for collecting industrial base production data in a web-based form directly from industry. However, Army did not follow up by starting a comprehensive collection effort because of concerns over voluntary industry participation, validity of data, the perishable nature of the data, and the potential resources to maintain decision quality data. Army populates the IB Hub with production data on a case-by-case basis as data become available. Given that the War Reserve processes use estimates to look seven-years into the future, a planning estimate for industrial base production does not warrant the additional resources that would be required to keep more data more current. OSD will direct the Army to examine the feasibility of attempting to pro-actively collect production data for a limited number of items that represent the greatest risk to the Army.

**DOD RESPONSE 3: Partially concur**. We concur with the need to identify potential production capability problems such as those due to surge in wartime spare parts demand. However, we noncur with the GAO assertion that the Army does not have such a process. Even though the war reserve requirements are based on looking out seven-years into the future to the end of the Program Objectives Memorandum (POM), the IB Hub does have visibility into current logistics and procurement data, including war reserve requirements, as well as current financial data for producers. While this look does not provide specific production capability, it does help establish a level of risk from which the Army can make decisions whether more detailed data is needed.

**DOD RESPONSE 4: Partially concur.** We agree with the need to have management strategies for resolving spare parts availability problems. We nonconcur with the GAO report assertion that the Army does not have such strategies. The Army has processes separate from the requirements determination discussed in the report to manage and execute the War Reserve Program.

# Appendix III: Staff Acknowledgments

## Acknowledgments

Key contributors to this report were Richard Payne, Paul Gvoth, Leslie Gregor, Douglas Mills, and Nancy Benco.

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