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As a result of reductions in Defense procurement, product managers face the risk that the Department of Defense will lose a particular supplier or a particular capability. Companies may report that they are considering leaving a line of business, or may no longer provide a product or service to the Department of Defense. They may request that the Department of Defense maintain a particular level of production or size of contract, regardless of our present requirements. Since any of these actions involve use of limited Defense resources, the Department must make considered, critical judgments before acting. This Handbook was developed to help evaluate these situations. It provides a framework and guidelines to evaluate the need for DoD action to preserve defense industrial capabilities.

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A DoD Handbook

Assessing Defense Industrial Capabilities

April 1996

The Under Secretary of Defense
for Acquisition and Technology

THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-3010

ACQUISITION AND
TECHNOLOGY

April 25, 1996

FOREWORD

As a result of reductions in Defense procurement, product managers face the risk that the Department of Defense will lose a particular supplier or a particular capability. Companies may report that they are considering leaving a line of business, or may no longer provide a product or service to the Department of Defense. They may request that the Department of Defense maintain a particular level of production or size of contract, regardless of our present requirements.

Since any of these actions involve use of limited Defense resources, the Department must make considered, critical judgments before acting. This Handbook was developed to help evaluate these situations. It provides the framework and guidelines to evaluate the need for DoD action to preserve defense industrial capabilities.

We hope that this Handbook will improve the Department's decisions, by providing DoD managers with guidance, while recognizing the need for flexibility and judgment. However, it is not intended to replace normal vendor management practices or to supersede federal procurement regulations.

This Handbook is issued under the authority of DoD Directive 5000.60, "Defense Industrial Capabilities Assessments," April 25, 1996. This Handbook applies to the Office of the Secretary of Defense, the Military Departments, the Chairman of the Joint Chiefs of Staff, the Defense Agencies, and the DoD Field Activities, hereafter referred to collectively as "the DoD Components." The guidance provided is effective immediately and is mandatory for use by all DoD Components. DoD Component Heads may only issue supplementary instructions when necessary to provide for unique requirements within their organizations not addressed by the Handbook. Supplementary instructions must be approved by the Assistant Secretary of Defense for Economic Security.

Please send your comments and suggestions to: Office of the Deputy Under Secretary of Defense for Industrial Affairs and Installations, Industrial Capabilities and Assessments, The Pentagon, Room 2B322, Washington, DC 20301-3300 (E-mail: ICA@acq.osd.mil)

We are also available to assist in making particular judgments. Please contact the Director, Industrial Capabilities & Assessments, 703-697-1366 (DSN) if you need help.

Paul G. Kaminski

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PART I

FRAMEWORK

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1. INTRODUCTION

Purpose

This Handbook provides the framework and guidelines for evaluating, on a case-by-case basis, the need for Government action to preserve industrial capabilities vital to national security. A defense industrial capability is a skill, facility, process, or technology needed to design, develop, produce, repair, or maintain products used by the Department of Defense. You should use this Handbook when there is an indication that an important and unique industrial capability could be lost.

This Handbook is not intended to replace normal vendor management procedures and authorities. There are many routine vendor problems that arise in program and item management: components become obsolete when manufacturers change models, companies stop making certain products, and other sources for the products must be qualified. Those problems currently handled through routine vendor management authorities are not candidates for this process.

What is the purpose of this Handbook?

The Department of Defense buys products and services—not capabilities—but every product or service represents a set of industrial capabilities. This handbook outlines the Department's analysis process to answer:

⇒ What industrial capabilities are essential to making the products and services the Department's needs?

⇒ Are these capabilities truly unique? Truly endangered?

⇒ What is the best course of action for the Department of Defense?

Philosophy

The Department of Defense relies on market forces to the maximum extent possible to guide the development and sustainment of industrial capabilities. We will only consider taking action in those exceptional cases where an industrial capability, necessary to meeting defense requirements, is genuinely at risk of being lost. Any recommendation for special action must be based on a thorough analysis, using the guidance provided in this Handbook.

Responsibilities

Who should use this Handbook? When?

⇒ DoD managers or teams formed within and across the DoD Components
⇒ When there is an indication that a needed defense product or service could be lost due to loss of industrial capability

Analysis

Any DoD manager may initiate a Defense Industrial Capabilities Analysis (see Part II) when there is an indication that a needed industrial capability could be lost. Ultimately, the DoD Components are responsible for analyzing industrial capabilities that may be at risk. When industrial capabilities affect more than one defense program or user, the DoD Components should coordinate their analyses and subsequent decisions within and across the Components.

Decision authorities

- For all Acquisition Category (ACAT) programs, all actions or investments of *less than $10 million* annually to preserve a capability are approved by the Component Acquisition Executive (CAE) or Defense Acquisition Executive (DAE), as defined in DoD 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MATS) Acquisition Programs," March 15, 1996, authorized by DoD Directive 5000.1, March 15, 1996.
- For all other products or programs, all actions or investments of *less than $10 million* annually to preserve a capability are approved by the Head of the Contracting Activity (HCA).
- For all programs or products—ACAT and non-ACAT—any proposed action or investment to preserve a capability with an anticipated cost of *$10 million or more* annually requires the approval of the Under Secretary of Defense for Acquisition and Technology (USD (A&T)) and coordination with the Deputy Under Secretary of Defense for Industrial Affairs and Installations (DUSD (IA&I)).

Policies and procedures

DUSD (IA&I) is responsible for the policies and analysis procedures that govern the Department of Defense's role in maintaining industrial capabilities required to carry out the defense mission.

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NEED HELP? If you need help in applying the procedures described in this handbook, please contact the DUSD (IA&I) Director, Industrial Capabilities and Assessments, the Pentagon, Room 2B322, (703) 697-1366 or 697-6833; DSN 227-1366 or 227-6833; e-mail ICA@acq.osd.mil.

2. THE PLANNING FRAMEWORK

We are operating in a defense environment that is very different from that of the past, and defense policy has changed accordingly. The following is the framework in which decisions on the preservation of defense industrial capabilities are made.

DoD is a smaller customer with changing needs

Sharp reductions in the defense budget, particularly in the procurement account, reflect our new security environment. Between 1985 and 1995, the Department's budget dropped in real terms by 35% overall and by 67% in procurement. The largest part of these cuts is being achieved by reducing the procurement of new weapon systems. We are buying and developing fewer types of military systems and purchasing smaller quantities of the systems we do buy. This has a direct effect on industry.

Industry is downsizing

Consolidation and restructuring are the defense industry's inevitable and natural responses to lower revenues. This consolidation is essential to reducing the industrial capacity that exists in excess of defense needs, and to lowering the overhead costs of the products we do buy. Such consolidation needs to proceed primarily without Government intervention.

DoD is adopting new strategies

Our challenge is to maintain superior technology and industrial capabilities at an affordable price. To meet this challenge, we are pursuing two strategies.

Rely on commercial suppliers

The first strategy is to rely on a technology and an industrial base sustained by commercial demand, but capable of meeting defense needs. By using commercial products and services, we benefit from the cost efficiencies and technological innovations available from a much larger commercial market. We also capitalize on industry's investments in research and development and more rapid pace of product improvements.

Buy from the global marketplace

The second strategy is for the Department to take advantage of the cost and technology benefits offered by access to the best global suppliers. We are pursuing cooperative international development and production programs because they offer cost sharing of defense development projects, access to new technologies, and access to an international industrial base. With the proper selection of suppliers, we can gain from a significantly expanded use of foreign sources without becoming vulnerable to those same sources.

Reduce defense-unique industrial capabilities

While we are seeking to eliminate business practices that drive unnecessary defense-unique industrial capabilities, capabilities that are needed solely, or predominately, for defense products will remain. These capabilities may have no commercial counterpart. For example, the Department of Defense will need capabilities to produce defense products that can meet extraordinary performance demands or operate in extreme environments. We must distinguish capabilities that are truly defense unique from those which only appear unique because of past DoD acquisition practices.

DoD will fund actions to preserve capabilities only when necessary

In this period of downsizing and consolidation, our objective is to ensure that industrial capabilities needed to meet national security requirements will remain available. While an industrial capability resides in a company, it is *not* a company, per se.

Analysis

We do not need, nor can we afford, to invest to preserve every industrial capability or a capacity level greater than that needed to meet defense needs. The Department of Defense will not take actions based solely on the assumption that existing capabilities must be preserved. The Department of Defense will base its decisions on a case-by-case analysis considering defense needs and all possible alternatives.

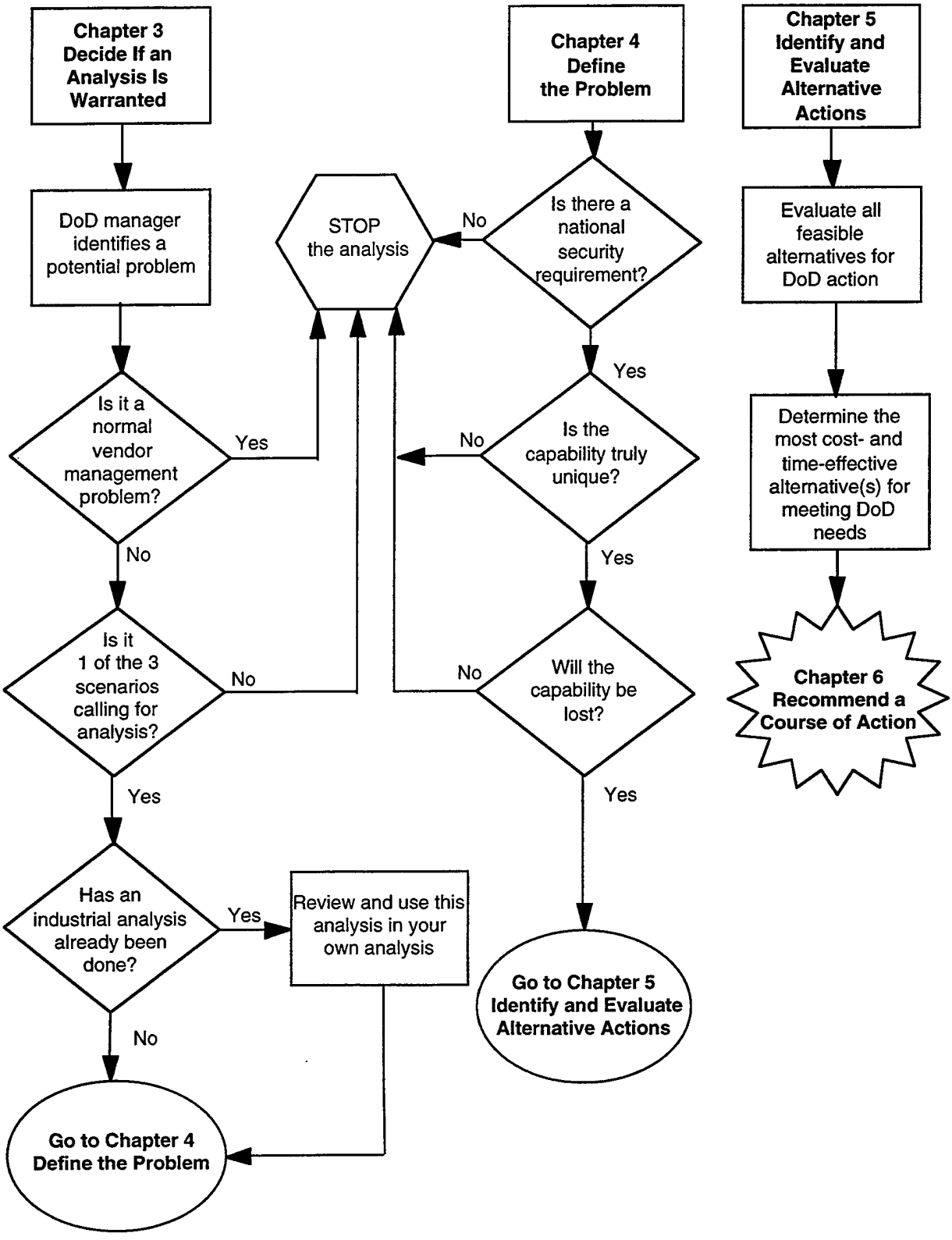
Funding trade-offs

When the Department of Defense decides to take a special action to preserve an industrial capability, we must include the costs in our budgets, acquisition plans, and resource allocations. DoD dollars spent to preserve capabilities leave fewer dollars available for other resource priorities, such as readiness, modernization, and soldier quality of life.

PART II

DEFENSE INDUSTRIAL CAPABILITIES ANALYSIS

Figure 1. Defense Industrial Capabilities Analysis



This is a step-by-step guide to performing an industrial capability analysis. The analysis process has four parts. These parts are not necessarily consecutive and you will have to collect data to address the analysis issues of each part.

	Analysis Process	Chapter
⇒	Decide if an analysis is warranted	3
⇒	Define the problem	4
⇒	Identify and evaluate alternative actions	5
⇒	Recommend a course of action	6

Each part provides flowcharts to help you understand where you are in the analysis process and what you want to learn from each step. Figure 1 is a flowchart of the entire Defense Industrial Capabilities Analysis process.

3. DECIDE IF AN ANALYSIS IS WARRANTED

You should initiate a Defense Industrial Capabilities Analysis only when you become aware of a potential problem. Concerns may be raised because the Department of Defense has stopped buying a product or service, or is reducing the quantities it is buying. An analysis is warranted only if there is an indication that the Department may lose the ability to obtain needed defense products and services. You should distinguish between normal vendor management problems, handled routinely by program and product managers within their normal authorities, and the exceptional instance when an industrial capability might be lost. Figure 2 is a flowchart of the process.

***Your objective is** to determine whether there is sufficient cause to conduct an analysis of the industrial capabilities that support the product or service of concern. Stop your analysis at any point if you decide that no analysis or action is necessary.*

There are many vendor problems that arise in normal program and item management. Usually these can be resolved within your routine procedures and authorities. In these cases, you do not need to perform the analyses described in this Handbook.

Routine vendor management problems do not require an analysis

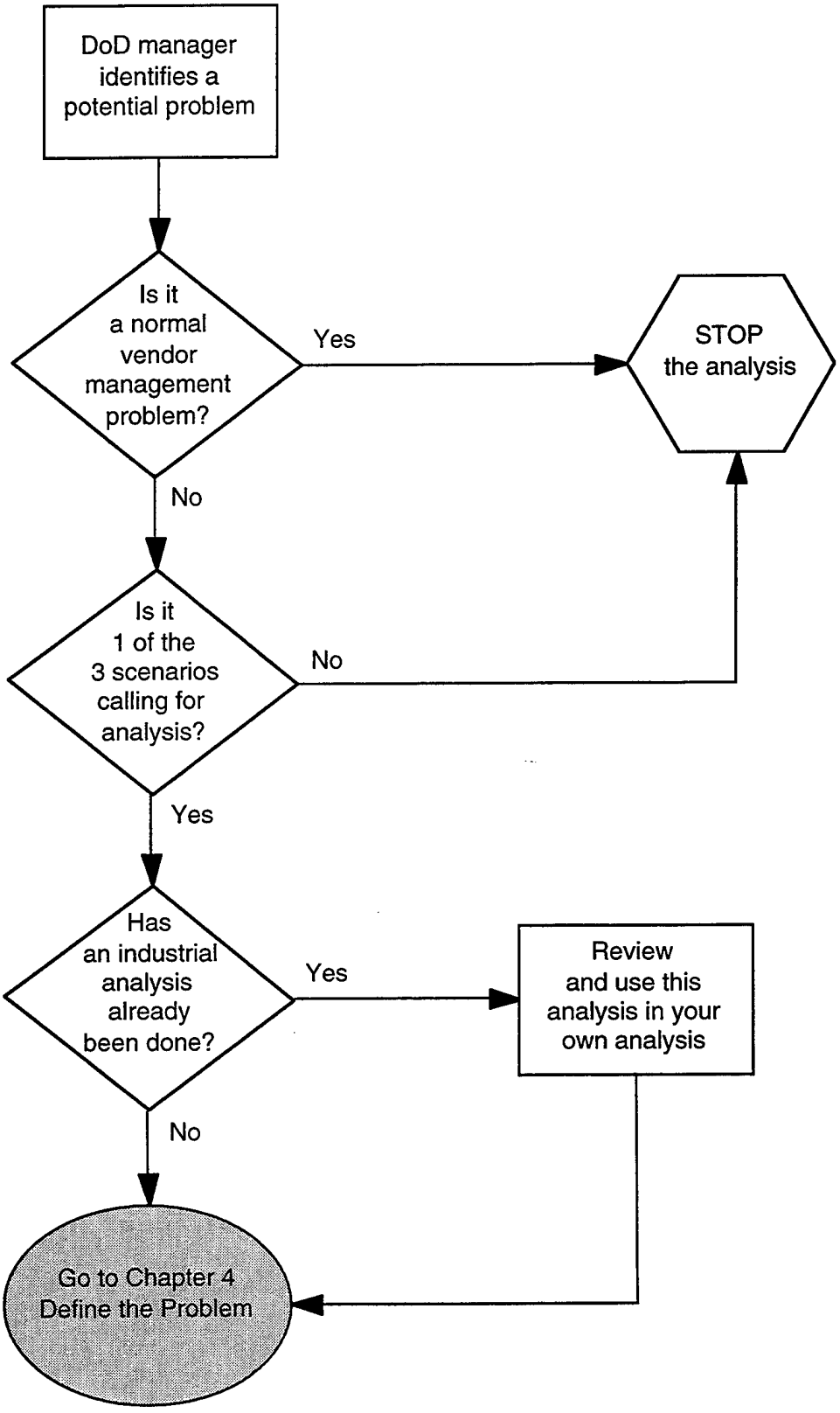
You have a normal vendor management problem if another supplier exists that can, and is willing to, provide the same product or service, given reasonable time and price.

Does another supplier exist?

You also have a normal vendor management problem if a direct substitute product or service is available.

Is a substitute available?

Figure 2. Decide If an Analysis Is Warranted



Scenarios that require an analysis

At least three scenarios call for an industrial capabilities analysis. The first is when DoD managers are faced with a problem in getting a needed product or service that they cannot resolve within their routine authorities and that may require special action or investment to resolve.

The Army is faced with a problem in obtaining a special wire needed for the production of a missile. The sole source manufacturer of the wire has advised that the missile production rate is too low to sustain the capability and he will "close shop."

The second scenario is when individual firms, industry associations, or other responsible sources warn DoD managers that an industrial capability is endangered.

Semiconductor manufacturers are reporting that they are not interested in making products to meet certain military-defined integrated circuit requirements, such as radiation hardening, unless they get a guaranteed volume of business.

A third scenario is when product development or manufacturing is terminating either permanently or temporarily. Managers facing program termination should assess the potential loss of industrial capability if a future DoD need for the product or capability is identified.

A DoD Component is faced with a decision of whether to terminate production of one of its missiles. The missiles are in adequate supply now but will be needed again within three to five years. The Component is considering awarding a low rate production contract to keep the production line intact.

Determine if an analysis has already been done

Before undertaking a new analysis, determine if your Component or the Department of Defense has completed other industrial analyses relating to the product, service, or capability that seems to be at risk. You may find that your problem has been addressed and there is no need for additional analysis. As a minimum, an already completed analysis may provide useful input for your new analysis.

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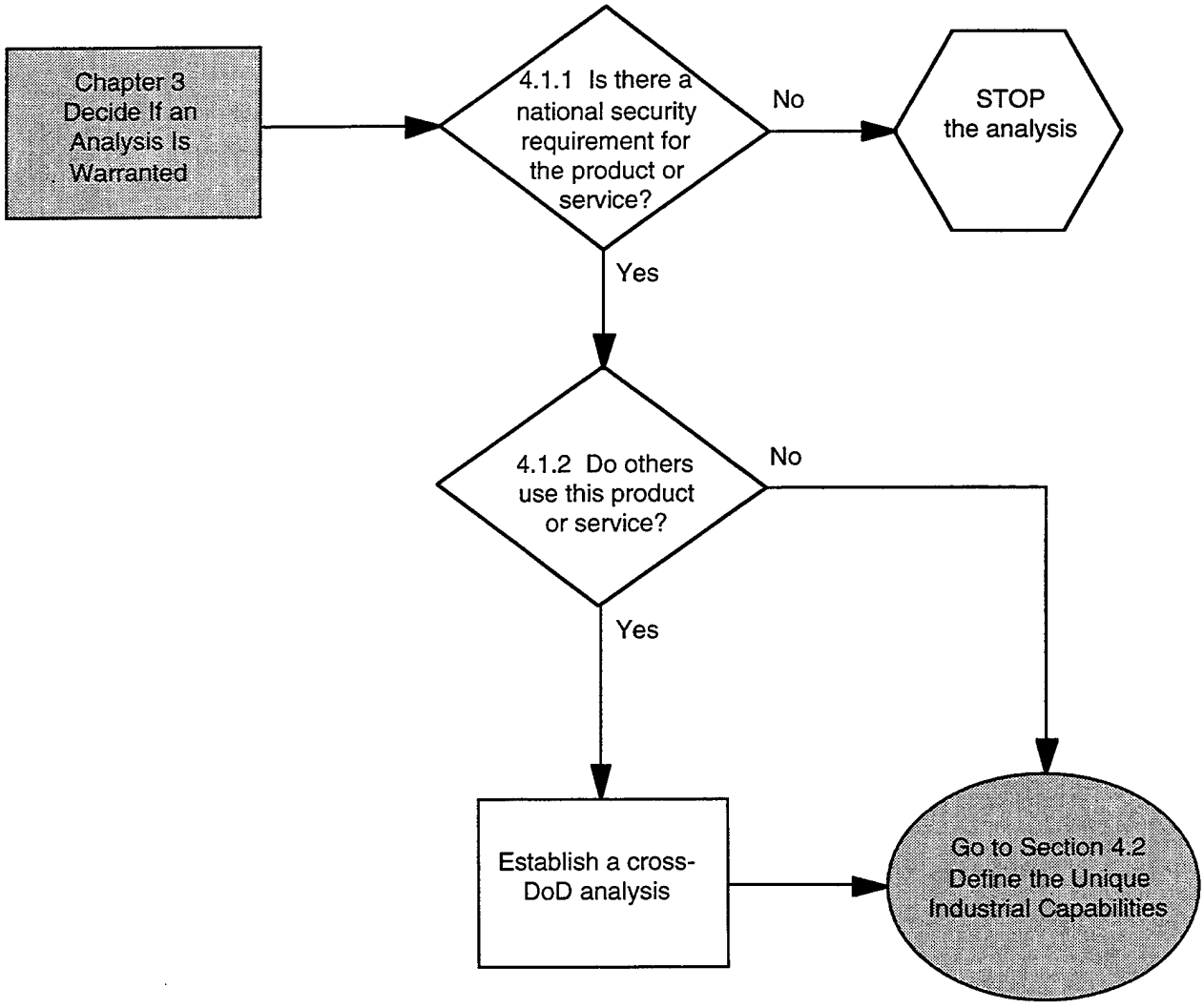
NEED HELP? If you need help determining if your Component or the Department of Defense has completed other industrial analyses relating to the product, service, or capability that seems at risk, please contact the DUSD (IA&I) Director, Industrial Capabilities and Assessments, the Pentagon, Room 2B322, (703) 697-1366 or 697-6833; DSN 227-1366 or 227-6833; e-mail ICA@acq.osd.mil.

Figure 3. Verify the National Security Relationship



4. DEFINE THE PROBLEM

Usually you will start an analysis because a product or service you buy or need is becoming unavailable, or seems at risk of becoming unavailable. If you have already identified a specific supplier or industrial capability—for example, a skill or facility—that seems at risk, you will need to tie this supplier or capability to the defense product or service it supports.

You are now ready to begin defining the problem. There are three steps to defining the problem:

1. Verify the national security requirement	Section 4.1
2. Define the unique industrial capability	Section 4.2
3. Validate the risk of losing the capability	Section 4.3

4.1 Verify the National Security Relationship

Questions to ask

Figure 3 is a flowchart of the steps involved in verifying the national security relationship. There are two basic questions to be asked at this point:

- Is there a national security requirement for the product of service?
- Who else uses this product or service?

4.1.1 Is there a national security requirement for the product or service?

Your objective is to determine whether the product or service that seems to be at risk is vital to meeting current and planned national security requirements. If not, your analysis ends at this point.

The Department of Defense will only consider preserving a capability that is needed to support national security. Start your analysis by identifying the defense product or service that seems potentially at risk, then determine if the product or service is needed to meet defense requirements. If a current defense requirement is ending, is there a known or likely future need for the product or service? Define the timeline or schedule for which the product is required, even if it can only be estimated at this time.

Broadly speaking, defense requirements—current or future—fall into three categories:

Planned force structure and mission scenarios

- Is the product or service necessary to meet planned military missions? In other words, is it needed to supply and equip the existing or planned force structure of the armed forces? Refer to the President's Budget, Future Years' Defense Program (FYDP), and the Defense Planning Guidance (DPG) for information on the Department of Defense's planned force structure.

The Air Force requires satellites and associated launch vehicles to meet identified threat and mission needs and schedules. These requirements are reflected in their FYDP input.

Nerve gas antidote auto injectors have little peacetime requirement; however, the Department of Defense must have the capability to surge production to meet wartime or contingency demand. Surge requirements are included in Component Operations Plans based upon the DPG.

Additionally, individual DoD Component plans identify long-range needs that may be outside the FYDP.

Minuteman III solid rocket motors must be rebuilt in a planned cycle of 20 years. While in a given time period the rework may not appear in the Component's budget or FYDP, there is a need for the capability to rebuild the motors when the time limitation is reached.

Readiness and sustainment

- Is the product or service needed to meet readiness or sustainment requirements? Will its absence affect the Department's ability to support defense systems, assemblies, or other components over the life cycle? When defense products go out of manufacture, the Department requires post-production support for the useful life of the product. Readiness and sustainment requirements are determined based upon product repair histories and planned overhaul schedules. Refer to DoD Component inventory and weapon system program managers for this type of data.

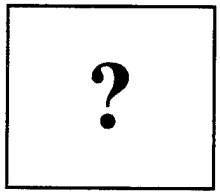
The B-52 and B-1 bombers are out of production. However, both are still in operation and require spares, repair parts, test equipment support, data, and sustaining engineering.

Next-generation defense capabilities

- Is the product or service needed to support the design, development, or manufacture of next-generation defense equipment? Would its loss limit our ability to develop or field new systems? Is it needed to modernize systems or make mission-driven upgrades?

The Department of Defense is interested in developing increasingly advanced "smart" munitions, missiles, and other weapons. Capabilities such as specialized engineering and software skills and sophisticated modeling and simulation are essential to the future development of affordable but superior "smart" weapons.

NEED HELP? If you don't know what products or services are funded or required by the President's Budget, FYDP, or how to otherwise determine national security requirements for your product or service, contact your activity or Component headquarters.



4.1.2 Do others use this product or service?

Industrial capabilities needed to support one product, service, or program are very often needed by others. The Department of Defense cannot afford to make duplicate investments to preserve identical or very similar industrial capabilities. To understand the full national security requirement, you need to identify the users and their demand for the product or service. When the product, service, or capability of concern supports more than one defense program or user, you should establish a cross-DoD analysis process.

***Your objective is** to identify all users for the products and services of concern. If appropriate, you should establish a DoD team to participate in or coordinate the analysis.*

- Define total demand, including DoD and world-wide demand. If you initiated this analysis with a specific capability as a focus, you again need to tie it to the product or service it supports. Is the defense capability in question needed to support other products, services, or programs?

  Define total demand

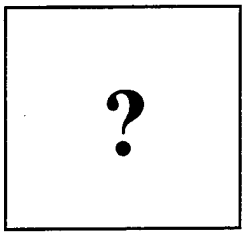
  ⇒ *DoD demand.* This includes other defense users of the product or services, both within and across Components. What is the total DoD demand for the products or services, in terms of total quantities required, quantities on order, dollars, and development or production timelines?

  ⇒ *World-wide demand.* What is the Department of Defense's relative share of the global product or service market? Who are the non-DoD users? If the Department of Defense is not the only or predominant user, then the capability is most likely not at risk. If the Department's product is a variation of a more widely-used product, the capabilities needed to provide both products are usually very similar.

- Establish a cross-DoD analysis by either coordinating a team of representatives from all affected DoD managers or by designating a lead Service or Agency. (For assistance in designating a lead Agency, see the *Help* box on page 16). If you can identify other Government users, such as the National Aeronautics and Space Administration or the Department of Energy, coordinate your analysis with them.

  Establish a cross-DoD analysis

The Navy and the Air Force have a need for high accuracy intercontinental ballistic missile (ICBM) guidance systems. Any analysis of the capabilities to manufacture ICBM guidance systems should be coordinated between the two Services. Further, the industrial capabilities needed to produce guidance systems for ICBMs may be similar to those needed for other defense missile guidance systems. These "similar" capabilities should be explored in the joint Service analysis.



NEED HELP? If you are unable to identify the other defense products or other users, elevate the need for analysis to a higher level of management. You may also call the DUSD (IA&I) Director of Industrial Capabilities and Assessments, (703) 697-1366 or 697-6833; DSN 227-1366 or 227-6833; e-mail ICA@acq.osd.mil.

4.2 Define the Unique Industrial Capabilities

Questions to ask

Figure 4 illustrates the steps that should be taken to define the unique industrial capabilities. The two questions you need to ask at this point are:

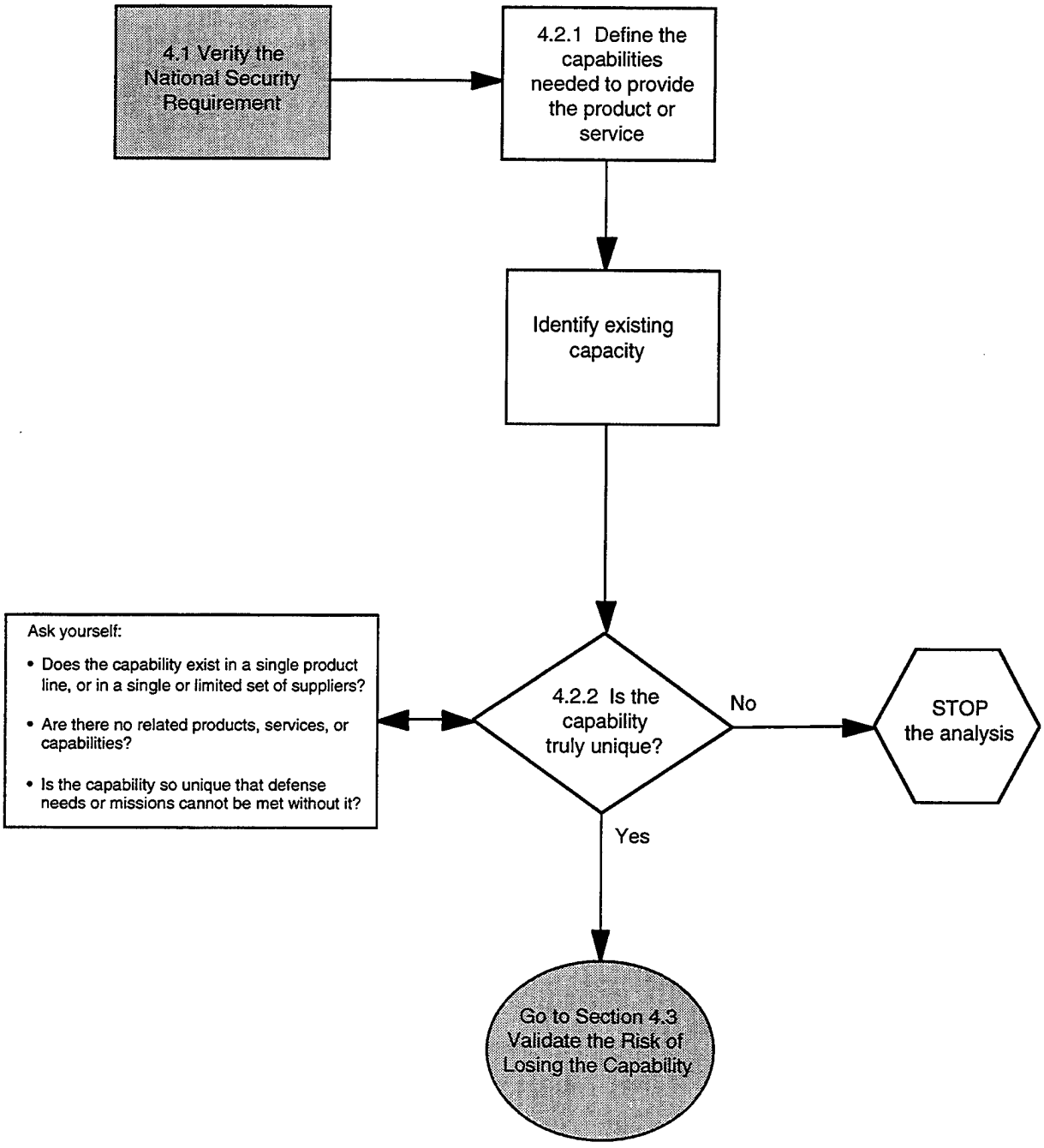
- What capabilities are needed to provide the product or service?
- Do any of these capabilities require further analysis?

4.2.1 Define the capabilities needed to provide the product or service

Define the many capabilities that are needed to provide the product or service of concern. In some instances, defining all the capabilities may be a relatively easy and limited task. For example, if a company advises the Department of Defense that it will no longer provide a particular minor assembly, you may be able to rapidly identify the small set of capabilities that are needed to develop or produce the product.

However, in many cases the product in question will be a very complex end item, subsystem, or set of assemblies. In these cases you will need to do much more extensive work to define all of the capabilities involved. A work breakdown structure, commonly used in acquisition programs, is a good starting point.

Figure 4. Define the Unique Industrial Capabilities



The Department of Defense has been using a particular type of engine that is similar to a commercial engine design. However, the DoD engine incorporates subassemblies (e.g., hot section) uniquely adapted for defense applications. The DoD production contract is ending. In assessing the capabilities that may be lost, the DoD manager delineates the types of capabilities used to develop, produce, and support the engine.

Type of Capability

Moreover, you need to define capabilities in terms of *type of capability* (skills, knowledge, facilities and equipment, processes, or technologies).

The production of solid rocket motor fuel depends on certain human skills that are difficult to document and to precisely replicate. Proper execution of the fuel mixing process is critical because of the highly explosive nature of the materials. These skills are an important capability for producing the fuel.

Kind of Activity

Other considerations are the *kind of activity* the capability supports (design, develop, produce, repair, or maintain defense products at the system, subsystem, or component level) and the *amount of capacity* that exists in private or public activities for the product, service, or industrial capability you are assessing.

Amount of Capacity

Capacity is the volume or level of output—or the potential for a level of output—that exists for a given product or service. Loss of industrial capacity that is excess to defense needs is not the same as loss of a capability, and in fact may be desirable in reducing contractor costs.

4.2.2 Is the capability truly unique?

***Your objective** is to determine those industrial capabilities that are truly unique and irreplaceable for providing a product or service required for national security*

Narrow your analysis focus to truly unique capabilities. Many capabilities that exist today in support of defense products or services seem unique. However, their existence in a unique form does not necessarily mean that they are the only capabilities that could meet defense needs. Many capabilities required to support defense products and services are available, or similar to those available, in the commercial marketplace.

The DoD manager of the engine that is adapted from commercial engine designs finds that many of the DoD engine's components, materials, and processes are identical or very similar to those of the commercial engine. These are eliminated from the analysis. The analysis will focus only on those capabilities needed to support the defense-unique adaptations (e.g., hot section).

Questions to determine if the capability is truly unique

In this part of the analysis, you should:

- Identify current suppliers of the product or capability of concern. Does the product or capability exist today only in a single product line, or in a single or very limited set of suppliers? **Note:** Suppliers can include private or public sources.
- Identify suppliers of related defense and non-defense products or services. Do these suppliers use industrial capabilities similar to the capability of concern? Is it at all feasible for the design or production of your product of concern to be carried out using these similar capabilities? Analyze projected demand for the related products to assess future availability of these similar capabilities. You may not be able to fully address this factor until you have completed some comparative analysis of substitutions (see Section 5.3).
- Is the capability so unique that defense needs or missions cannot be met without it? Will its loss cause the development or production of certain existing defense items or defense product areas to be time or cost prohibitive?

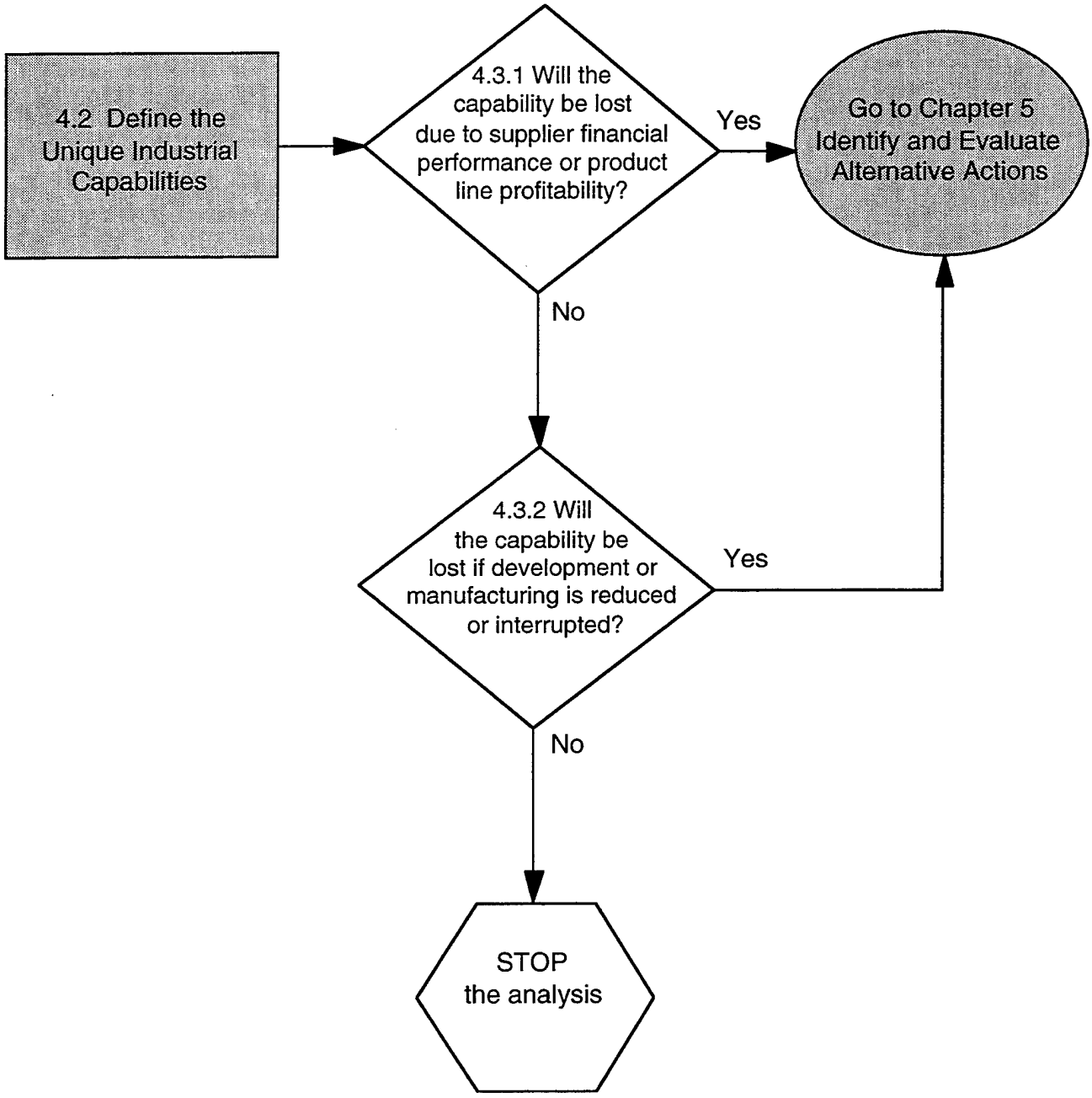
4.3 Validate the Risk of Losing the Capability

***Your objective** is to determine whether a capability, uniquely required to provide defense products and services, is truly in danger of being lost. If it is not truly unique, or if it is not in danger of being lost, further analysis is unnecessary.*

Once you have determined that an industrial capability is needed to provide a defense product or service, and is truly unique, you must determine if the capability is really at risk of being lost. Figure 5 illustrates the steps involved in validating the risk of losing the capability. There are two basic questions to address:

- Will the capability be lost due to supplier financial performance or product line profitability?
- Will the capability be lost if development or manufacturing is reduced or interrupted?

Figure 5. Validate the Risk of Losing the Capability



4.3.1 Will the capability be lost due to supplier financial performance or product line profitability?

A needed capability could be lost because the current supplier is leaving the market. If a supplier is warning that he may exit because the product line or the business unit is not profitable or sufficiently profitable, you will need to perform an analysis of either the product line's profitability or the supplier's financial viability.

The financial analysis should answer the following questions:

Follow a four-step financial analysis

- Is the specific product line profitable?
- Is the business unit's financial performance so poor that the activity may not be continued?
- Is profitability expected to improve due to likely future sales (including proposed government contracts), internal restructuring, ongoing corporate mergers and acquisitions, or other changes in circumstance?

To answer these questions and gain a *bottom-line* understanding of a business activity, follow a four-step financial analysis as summarized in this section. **Appendix A** provides the detailed procedures you should use in performing each of these steps.

Step 1. Collect financial statements

Step 1. Gather the relevant financial statements that accurately reflect the current financial health of the company. You will collect Income Statements and Balance Sheets which the company can provide at your request. These documents provide the company's financial results of operations for a given year, along with an accounting for the resources of a business, and the claims against those resources by lenders and owners. Since the expressed concern is about the *financial contribution of the product* that the Department of Defense purchases, you should collect these documents at the *corporate* and *business unit* or *product level*. Follow the steps outlined in Appendix A to obtain the data you need.

Step 2. Calculate profitability

Step 2. Use the financial data you have collected to perform a preliminary profitability screen and determine whether the company is profitable, i.e., making money. The results of this screen will help you determine whether any further financial analysis is necessary.

The primary measure of profitability for your financial analysis is Operating Profit Margin. Operating Profit Margin is simply the company's operating income divided by its sales; this result is then multiplied by 100 so that it is stated as a percentage. Use the procedures in Appendix A to determine the company's Operating Profit Margin for a five-year period: the past two years, the current year, and two projected (future) years. Appendix A also provides a sample profitability analysis, and defines Return on Assets (ROA), an additional measure of profitability.

After calculating the Operating Profit Margin, use the following two criteria to evaluate the business unit's or product's profitability: (1) the Operating Profit Margin is a negative percentage in current or future years, or (2) the Operating Profit Margin is positive in current and future years, but has declined by more than 50% over a three- to five-year period.

- If the answer in either case is true, the company's financial viability merits further analysis to determine the causes of its weakening performance. Proceed then to Step 3.
- If neither criterion holds true for the company, no further financial analysis is *generally* needed.

Step 3. Perform a comparative analysis

Step 3. Compare the financial performance of the business unit or product with those of other companies or with other business units within the same corporation. *At this point you may want to seek assistance from a more experienced financial or cost analyst.* You will be using the two measures of profitability that you have calculated in Step 2, Operating Profit Margin and ROA, as a basis for this comparison.

From the company's perspective, the question is whether its operations are earning an *adequate return*. Such a determination requires judgment. You will compare company returns across a number of dimensions (e.g., over time, between divisions of the corporation) as the basis for this judgment. Follow the procedures in Appendix A to compare profitability measures for the company with internal, external, and peer business unit measures.

Step 4. Identify the problem

Step 4. Use the information obtained in Step 3 to identify the specific financial problem that the company is encountering, as well as potential solutions. Having compared the measures of financial performance across a number of important dimensions, you should now be able to assess the company's financial viability. There are three potential outcomes from your assessment, as follows:

No real financial problem

The following examples are typical situations where there is no risk or minimal risk to financial viability.

- The company is making profits that are acceptable when compared with other business units, firms, or similar industries. Profits may well have declined but still should not represent a major concern. This may happen for a number of reasons, such as (1) the business unit could still be performing well compared to the corporation as a whole or to other companies in the same market, or (2) the entire market may be at a cyclic low point.

- While there is a short-term profitability problem, the situation is temporary and future sales should be sufficient to sustain the company. For example, a new contract is about to be awarded.
- The business may be experiencing a downturn from which recovery is expected (e.g., a cyclical industry). Sales and revenue are expected to turn around due to natural market forces.

Company should take action

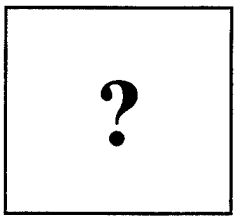
The following are situations where the financial problem is real, but within *the company's responsibility* to correct.

- As sales volume has decreased, the company has not adequately controlled the ratio of indirect to direct costs, thereby reducing profits. Assess whether indirect cost reductions can be achieved to reduce the high overhead costs and increase profitability.
- The company has not upgraded its facilities, modified its processes, or applied available new technology to reduce costs. Investment may have to be made in more efficient production processes, and older production lines may have to be shut down.
- The company is seeking investment, loans, or cost reimbursement from the Department of Defense prior to exhausting corporate and outside sources. If future profitability is contingent on refinancing, ascertain commitment of lenders for a bank loan or underwriters for financing. Confirm that the cost of debt will be lower and will enable the company to become profitable. See the next *Help* box.

Government action should be considered

If the financial problem is real and *Government action* should be considered to maintain the company's desired capability, use Chapter 5 of this Handbook to assess potential alternatives available for Government action.

NEED HELP? If you need help in performing the financial analysis, contact your Budget/Accounting or Comptroller organization, or call the DUSD (IA&I), the Pentagon, Room 2A318, (703) 695-0121 or 695-7915; DSN 225-7915 or 225-0121; e-mail to ICA@acq.osd.mil.



4.3.2 Will the capability be lost if development or manufacturing is reduced or interrupted?

Many capabilities can be interrupted and restarted

Very complex and finely tuned industrial capabilities—processes, skills, and equipment—are often needed to make defense products. However, because of their very complexity, these capabilities are often documented, automated, and tightly controlled by statistical and other precise process metrics. Highly skilled employees in such specialized areas are usually capable of working on related products or processes. *Thus many industrial capabilities can be duplicated or restarted—with acceptable performance—despite some lapse in development or production activity.*

A few industrial capabilities may be such intricate combinations of science and art that they must be sustained continuously to be viable; however, these are exceptional instances.

A major DoD product area has three large prime contractors that build very different types of the same product. An in-depth DoD analysis determined that despite the unique and complex industrial capabilities needed to make the different product types, any of the manufacturers could build the others' products. This is possible because all three primes have basically equivalent engineering competencies and manufacturing capabilities, and there are sufficient documentation and process knowledge to produce the different types.

Evaluate the technical risk for each capability of concern

You need to perform a technical analysis to determine whether your capability will be degraded unacceptably, or effectively lost, if the development or manufacturing activity it supports was not sustained continuously or at some minimal rate. Your analysis objectives are to determine:

- Whether a specific skill, process, or piece of equipment is affected by changes in the activity rate or level.
- Whether these rate-sensitive capabilities are driven by a product performance specification (e.g., specifications that are extremely complex or narrow in tolerance.)

Work with the organization currently performing the development or production activity. Answer the following questions for each product component or capability of concern to discern or disprove the risk of loss.

Can workforce proficiency be maintained by other activity? Before answering, you should investigate:

- Maintaining qualified, certified, or licensed skills by full or part-time work on other product lines. Can any restrictions on cross-training and job repetition (e.g., union requirements) be altered?

- Expanding workforce idle span times. How much can idle span time, relative to "time on task," be expanded and yet still maintain proficiency?
- Reducing the minimum repetition frequency needed to meet current proficiency requirements for repetition sensitive tasks. What is the lowest level that engineering estimates support as necessary to sustain viable skills?
- Using simulation, testing, and other exercise techniques to supplement process or product line experience requirements.

Skilled workforce

Can a skilled workforce be reestablished? Before answering, you should determine:

- The minimum number of workers from the highest skill level needed to sustain the capability. What is the lowest number of "highest skilled" workers used historically?
- How personnel losses are normally accommodated. Can the hiring, training, and certification time or process for new employees be altered?

Proven process

Can the process provide quality products at various rates? Before answering, you should investigate:

- The effects of dramatically reduced rates on process and product performance. Project these effects using historical process metrics. Is the process mature and repeatable? Have process output or product yield and quality remained acceptable across historical variations in activity rate?
- Specific effects on product performance when the "sensitive" process has been altered or replaced with a new process (historically).
- Is Statistical Process Control in place?
- Whether the process is documented in a drawing package. Has the package been used by other firms in competitions, spares buys, or maintenance? Does the Department own, or can we buy or license, these data?

Usable equipment, tooling, and material

Will the equipment, tooling, and material be available when needed? Before answering, you should investigate:

- Keeping equipment ready by extra maintenance or calibration. How sensitive is equipment tolerance and performance to interruption in operation? What time lapse or condition of equipment would necessitate refurbishment or replacement?

- Equipment down-time history. What has happened during previous interruptions in equipment operation due to down time (maintenance, equipment changes, changeout, etc.)? How has equipment been brought up or taken down to match production rate?
- Advance actions to ensure availability of exotic raw materials.

Restart history

Has the activity been restarted after previous interruption, however brief? Before answering, investigate:

- Whether there have been previous activity breaks and restarts for this product, or for a product that employs very similar capabilities. Include interruptions for delayed contract awards, product or process modifications, or equipment or personnel changes.
- Why there would be a risk of losing the capability now. Previous restarts should provide insight into how the capability might be sustained across activity breaks. Revisit the above analysis questions based on this insight.

If your analysis or product restart history shows that you can maintain or reestablish a skilled workforce, a proven process, and usable equipment, your capability will likely not be lost or unacceptably degraded by a lapse or reduction in activity. You can terminate any further analysis steps for that item or capability.

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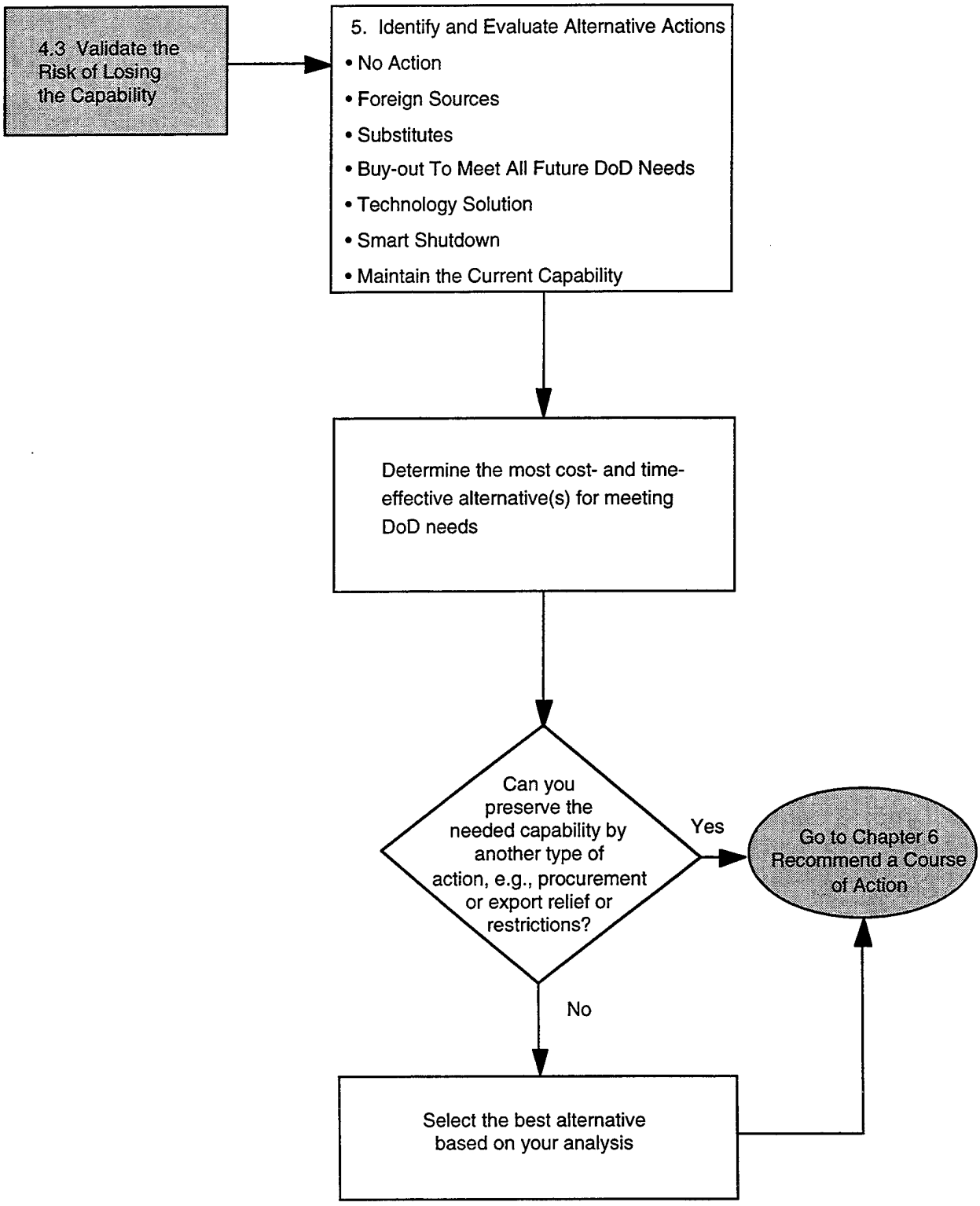
Figure 6. Identify and Evaluate Alternative Actions



5. IDENTIFY AND EVALUATE ALTERNATIVE ACTIONS

If a needed capability is determined to be truly endangered, you must examine and compare all reasonable alternatives for DoD action, including the option of taking no action. Figure 6 illustrates the sequence of events in this phase of the analysis.

Your objective is to determine and compare the cost, lead-time, consequences, and risks of pursuing the alternatives available to DoD.

The Department of Defense will only take action to maintain an industrial capability if the time or cost to regenerate that capability, once lost, would prohibit the Department from meeting its mission needs. You have already established an estimated DoD requirements timeline for the product or service this capability supports. Your goal in this evaluation is to determine which alternative or alternatives best meet the Department's needs, given time and cost. The following subsections describe alternatives and the considerations for analysis, and provide examples of situations where the alternative is an appropriate choice.

Alternatives	Section
No Action	5.1
Foreign Sources	5.2
Substitutes	5.3
Buy-out To Meet Future DoD Needs	5.4
Technology Solution	5.5
Smart Shutdown	5.6
Maintain the Current Capability	5.7
Additional Considerations for DoD Action	5.8

This list is not exhaustive; consider other alternatives.

Examine each of the alternatives using the procedure outlined below. If a given alternative is unrealistic, identify it as such.

Evaluating Alternatives

1. Perform a cost-risk-benefit analysis to compare alternatives. Determine:

⇒ The cost and lead time to achieve the alternative, including the costs to qualify or requalify products. Identify life cycle costs and effects. Use established DoD cost estimating techniques. Where costs are uncertain, provide cost estimates in ranges, along with the basis for estimates. DoD Instruction 7041.3, *Economic Analyses for Decisionmaking* (November 7, 1995), provides procedures for performing economic analyses. This should be available from your Budget or Comptroller organization.

⇒ Consider risks in terms of effects on performance, quality, mission capability, and readiness for each alternative. Work with the user to determine the acceptable flexibility of performance requirements.

2. Identify any assumptions made in analyzing alternatives.

3. Use reprocurement data. More alternatives are feasible when you have access to the technical data for the capability or product that the capability supports. The Department typically owns the data rights for products developed with defense funds. When a manufacturer owns the data rights, it may be willing to sell, license, or release the rights, particularly if it has terminated production.

5.1 No Action

If DoD takes no action to preserve the capability, is it feasible to regenerate the capability?

What will happen if the Department of Defense takes no action? This alternative literally means choosing to take no action and make no investment to extend or preserve any part of the capability. This alternative may be particularly appropriate in product areas for which the DoD near-term requirement is terminating and future requirements are unclear, or would likely be met by a much altered configuration.

Considerations:

Restart cost, time, and technical issues

The analysis of this option should identify and quantify the cost, time, and technical implications of regenerating (or *restarting*) the capability at some point in the future, given that all DoD programs or funds have stopped. Since capabilities exist in support of products, you probably need to assess restarting the capability as part of an activity, e.g., engineering or production of a given product.

Useful life

Estimate the rate at which the capability is expected to decline. When will the capability be completely lost? You also should consider the utility of the capability given the pace of technological change and changes to the DoD mission. When will the capability begin to become outdated?

Retaining future product capability

If production is terminating, you need to examine future research and development (R&D) capabilities. Are there DoD R&D programs or commercial product demands that will sustain engineering skills and knowledge?

5.2 Foreign Sources

Does any foreign supplier offer a product or capability that can be substituted for the one at risk?

Although the original manufacturer may have been domestic, viable alternative sources may exist if the market is more broadly explored. Reliable foreign suppliers are usually acceptable, and in fact are encouraged to allow the Department to obtain a wider competitive cost and technology base. Foreign dependence does not mean foreign vulnerability. The Department of Defense seeks to use foreign sources wherever advantageous and within the limitations of the law. The Department has reciprocal procurement agreements with many nations in which each party agrees to consider the other as a potential supplier for defense purposes.

The Department of Defense relies on foreign suppliers to play a major role in many weapon system acquisitions. Foreign suppliers are acting for the Department both as major subsystem providers (e.g., an Israeli firm is providing the

air vehicle for the Tactical Unmanned Aerial Vehicle program) and as primes (e.g., all prime teams bidding on the new Joint Primary Aircraft Training System Program include a foreign prime member).

DoD contractors rely on foreign sources for many strategic and critical materials, for example, cobalt, chromium, manganese, and tungsten. Currently, the only remaining sources of fibers needed to make certain types of composite materials are foreign. Both commercial and defense firms are successfully using these foreign sources to support composite manufacturing.

If you have not used or even solicited foreign sources for your product or service in the past, you may have to research potential feasible firms. Work with your procurement officer to perform this research and to analyze this alternative.

Excluding foreign sources requires special approval

If you believe that foreign sources should be excluded from a solicitation for mobilization base reasons, you must obtain approval for the exclusion before proceeding with the solicitation. The decision to use other than competitive procedures, or to exclude foreign sources from acquisition solicitation for mobilization reasons (that is, exclusions under FAR Part 6.302-3(a) and FAR Part 6.202 (a) (2)), must be approved by the official prescribed by FAR Part 6.304 and by the USD (A&T) for contracts over $50 million. Each CAE has instituted a process requiring formal approval of domestic source restrictions for procurements less than $50 million.

Domestic Source Restrictions

What exceptional conditions might warrant excluding foreign suppliers?

- Foreign sources may pose an unacceptable risk when there is a high "market concentration" *combined with* political or geopolitical vulnerability. A sole source supplier existing only in one physical location and vulnerable to serious political instability may not be available when needed. **Note:** Market concentration alone is not a reason to exclude foreign sources; there must also be a credible threat of supply disruption due to political instability. Sheer physical distance from the United States is *not by itself* a risk which merits foreign source exclusion.
- Suppliers from politically unfriendly or anti-American foreign countries, as defined by statute or U.S. Government policy, are not used to meet U.S. defense needs.
- A U.S. source may be needed for technologies and products that are either classified, offer unique warfighting superiority, or could be used by foreign nations to develop countermeasures. However, the Department has agreements with many allied and friendly nations for safeguarding classified military information. Foreign sources cannot be automatically excluded on the basis of a need to protect classified or unique technologies or products; this must be determined by individual circumstance.

Stealth technologies involve control of radar, infrared, or other signatures to reduce an adversary's detection of U.S. weapon systems. Technology or product transfer to foreign firms could jeopardize U.S. superiority in stealth technology. There are a number of statutory restrictions on the Department that prevents it from buying particular products from non-U.S. sources, for example, textiles, food products, and specialty metals.

- Suppliers that cannot or will not provide products for military applications for political reasons are not feasible sources.
- The Department of Defense is required by law to purchase a particular product from U.S. sources only. The Department is required by law to purchase a particular supply only from U.S. sources.

5.3 Substitutes

Is there a substitute for the industrial capability, or for the product the capability supports?

Simple, direct substitutes for a common part or material are typically adopted as a matter of course as a part of a DoD manager's routine "vendor management." This alternative examines finding a substitute when a simple part or ready source substitution is *not* an option. You should determine if other DoD programs, or industry products, employ a different capability or produce a product that could serve as a substitute to meet your needs. You should consider at least three approaches to substitution:

A substitute for the industrial capability

Even if the capability at risk appears to be unique, investigate the possibility that another industrial capability may be substituted for the current capability. Look beyond the industrial capability as defined today and try to find a capability that might replace it.

A particular defense transport vehicle is projected to go out of production. The Department is concerned that the skills and materials needed to manufacture the unique, heavy-duty transmission will be lost. The DoD manager finds that manufacturers of some commercial heavy transport vehicles employ the same technical skills and materials in manufacturing transmissions as those needed to manufacture the DoD vehicle transmission.

A substitute for the product

Investigate the possibility that a replacement product could provide the same defense mission capability. Try to find a substitute for the product

the industrial capability supports. Consider substitution at higher levels of assembly; i.e., if you cannot find a substitute component, can you find a substitute for the next higher assembly?

The manufacturer of a certain type of gyroscope used by the Department of Defense is warning that he may have to terminate his defense product line due to low quantities. If production ceases, this particular type of gyroscope technology will be lost. The DoD manager determines that a different type of gyroscope, based upon laser technology, can be used as a substitute for the gyroscope technology that is threatened.

A modified or nearly perfect substitute

- Investigate the possibility of modified or nearly perfect substitute for the capability or the product the capability supports. Most substitutes for the product or capability will require some alteration to meet DoD requirements, or some compromise in meeting form, fit, or functional requirements. Determine if a modified capability or product, or a nearly perfect substitute offering different but sufficient performance, could satisfy your need. These substitutes may be more cost effective than other options, even though they may entail longer delivery times, additional cost for qualification or logistics, or some performance degradation from the current product.

A landing gear used on a DoD cargo aircraft is built to a DoD specification and has some unique performance requirements. The landing gear production is ending but the Department of Defense will need to procure them again in low quantities in the future. Working with the user and the product engineers, the DoD manager is able to revise certain of the unique performance requirements so that another existing landing gear can be used with minor modification. The Department pays to modify and requalify the new gear.

Evaluating substitutes

You must determine whether the Department's requirements can be met by a substitute industrial capability or product. This requires a technical assessment in which you:

Analyze performance criteria

- Perform an engineering analysis of the technical drawings, data, and performance specifications of the product currently in use. Using performance parameters that describe or drive the current capability, identify how similar capabilities or products might meet, or fall short

of meeting, DoD needs. Work with the military user to determine where changes in performance parameters would be acceptable.

Qualify the substitute item

- After identifying a potential substitute, you may also need to demonstrate the performance of the substitute capability or product in factory and operating environments.

Compare costs fairly

- Be sure to compare the cost of the proposed substitute product to the likely *future* cost of the product it would replace. Product costs frequently begin to rise when capabilities are at risk. Costs to test or qualify the new substitute product for use should also be included.

The DoD manager estimates the price for the laser technology gyroscope and the expected price of the next buy for the gyroscope going out of manufacture. (The old gyroscope has been increasing in price as the production quantities have been decreased over time.) The analysis includes the cost of tests to qualify the new gyroscope's performance.

5.4 Buy-out To Meet Future DoD Needs

Is it economically or technically feasible to make a "life-of-type" buy of the product?

A life-of-type buy is the purchase and storage of anticipated lifetime quantities of the product which the capability supports. To analyze this option:

Determine technical limitations

- First, determine if a life-of-type buy is a practical alternative and is legally authorized. It is not practical for products that have shelf-life limitations or other technical characteristics that make long-term storage or delayed consumption undesirable.

Nerve gas antidote injectors, needed to support some types of military conflicts, have a limited shelf life due to drug and packaging degradation over time. Therefore, they cannot be purchased in "lifetime" requirements quantities. A viable supply source must be available when needed.

Determine requirements and costs

- Work with all DoD users of the product to project a realistic requirement quantity. It is very difficult to accurately project the lifetime quantity requirement for a capability; try to understand the users' assumptions in defining their demand. The cost of this option includes not only the direct cost to procure the total quantity but the cost of long-term storage, management, and the time value of money.

- The Under Secretary of Defense (Comptroller) (USD (C)) considers making life-of-type buys as "buying in advance of needs," a fiscal practice that is strongly discouraged. However, completing the analysis outlined in this handbook provides the type of data required by the USD (C) to authorize making a buy of at least some portion of the lifetime quantity.

Address fiscal limitations

When an electronic piece part becomes unavailable and no substitute item or source can be found, Defense Electronic Supply Center inventory control managers work with users to make a lifetime requirements computation. When properly justified, they seek Comptroller authorization to buy some portion *of the lifetime quantity, for example, two to three years' worth. During the subsequent two to three years, they work to find another solution to the problem.*

5.5 Technology Solution

A new technology solution might offer a feasible alternative to preserving an existing capability, even if it only partially meets the current need. A technology solution could be a substitute for a capability, for example, an advanced technology approach to manufacturing an item that promises to replace the current "at risk" manufacturing process. It could also be a replacement for the product or system that the current capability is used to support.

Is there a viable R&D or technology-based alternative? Could a technology or product under development provide a substitute for the capability or product?

The type of integrated circuits used on the electronics boards in the F-15 radar were becoming obsolete in increasingly large numbers. The F-15 weapon system manager chose to employ a technique where a special type of new technology part emulated the old parts' functions. This eliminated the need for making life-of-type buys of the old parts.

Work with the R&D community—inside or outside the Department of Defense—to explore and evaluate potential solutions. Determine whether a proposed technology solution adequately addresses DoD performance specifications. Since the technology capability probably requires development and risk, the military user must help determine if the cost, schedule, and performance implications of the technology solution are acceptable.

Analysis considerations

A raw material used to build a very high-energy propulsion system is becoming unavailable. An analysis of the capability (the raw material) determined that no other material was available that could meet the

performance requirements. The DoD manager works with DoD materials laboratory personnel to assess whether a new technology material might be available that, with demonstration, could meet the projected need.

5.6 Smart Shutdown

Should DoD invest in a "smart shutdown"? If we do, will restarting the needed production or development activity at a later date be faster or more effective?

Smart shutdown means purposely preserving certain elements essential to reproducing a product or service, while allowing the current development or production activity to stop. Examples of actions to preserve certain elements include storing and maintaining equipment and tooling, cataloging and tracking personnel skills, videotaping and photographing processes, stocking critical raw materials, and creating computer-based models of the product to be reproduced.

DoD programs are usually terminated because there is no longer a requirement for the current "version" of the product. Often, the Department of Defense will want to buy a significantly altered, next generation version in the future.

The Navy's torpedo production requirement is ending soon. There is no anticipated requirement for full production for at least 10 years. The Navy evaluated investing $15 million in "smart shutdown" actions, including buying production process specifications and videotaping processes. They ultimately decided not *to invest the $15 million because the next torpedo designs will be very different and use few of the current processes.*

However, if the current or a similar product or capability may be required in the future, smart shutdown investments should be considered.

Analysis considerations

There are two important analysis issues for smart shutdown and restart.

- Can you reasonably expect to successfully restart the activity to meet a future defense requirement in time, and at an acceptable cost?
- Is investing to preserve certain elements more effective than simply taking no action at all? Assess the costs of actions relative to the projected benefits of preserving these selected elements. Define how investing now to preserve certain elements will make restarting the activity later either less costly or more technically feasible.

The estimated time to go from a completely "cold" Abrams tank production base to a full surge production rate is roughly 56 months. Based upon analysis, DoD managers determined that this lead-time could

be reduced from 56 months to potentially as low as 36 months by employing "smart shutdown." Smart shutdown elements applied in the analysis included storing production equipment, maintaining registers of uniquely skilled personnel, and stockpiling certain tank components.

5.7 Maintain the Current Capability

Should DoD invest to sustain a current development or production activity in order to preserve a capability?

In this option, you will assess taking an acquisition action to preserve a capability by preserving the development or manufacturing of a current product or service. You should only consider this alternative if you have a known or projected future requirement for the current product or service. Possible actions include special DoD acquisition actions to sustain the following:

- Unique production capability that is at risk, such as:
  - ⇒ Issuing a "bridge" contract to maintain a predetermined production rate across a "requirements gap."
  - ⇒ Stretching out production quantities to keep a production line going at a production rate just sufficient to keep it "warm," that is, to keep critical capabilities intact.
  - ⇒ Directing spare parts or maintenance procurements to the production supplier to keep certain types of production skills intact.
- Engineering or research capability at risk, such as:
  - ⇒ Initiating new technology development or prototyping programs.
  - ⇒ Continuing or initiating sustaining engineering contracts, system updates, or a modification program.

In trying to determine whether to fund a special "bridge contract" to support a missile that will be needed again in three to five years, the DoD manager is considering a contract for production of only those components needed to support truly unique capabilities. He may buy the highly crafted nozzles with unique coatings, as they are not required by any other product. He is not considering buying the entire missile.

Scope of action needed

The capabilities at risk may only be a few among many capabilities that make up a product. Any special acquisition action being considered should be focused on how best to preserve the needed capability. This may not necessitate production or engineering work for the entire product, or for the same product that the capability currently supports.

Determining the needed level of effort

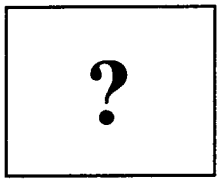
You need to perform an analysis to determine the appropriate pace (e.g., rate of production, level of engineering activity) required to sustain the needed capability, given the constraints of DoD resources.

Technical analysis

Is the needed capability endangered because any reduction or interruption in the capability will lead to its loss? If your near-term requirements are too low to sustain the technical viability or accuracy of the capability, you need to perform a technical analysis. This analysis must examine the specific technical aspects of the capability that make it volume, rate, or time sensitive. Try to define the risk that is associated with variations in this rate. You need to determine the lowest possible rate or level of effort that can be performed and yet still maintain the viability of the needed capability. Section 4.3.2 provides details of this type of analysis.

Break-Even analysis

If the capability is endangered due to supplier financial performance or product line profitability, you will need to complete a Break-Even analysis. A Break-Even analysis examines a business operation's fixed and variable costs relative to volume to calculate the point at which there is neither profit nor loss. The results of this analysis will help you to understand the rate or level of activity that the Department may want to consider funding if the current capability must be maintained. **Appendix B** describes how to perform a Break-Even analysis. You will probably also want to call on skilled cost or financial analysts for assistance.



NEED HELP? If you need help in performing the financial analysis, contact your Budget/Acc ounting or Comptroller organization, or call DUSD (IA&I), the Pentagon, Room 2A318, (703) 695-0121 or 695-7915; DSN 225-7915 or 225-0121; e-mail ICA@acq.osd.mil.

5.8 Additional Considerations for DoD Action

The analysis has thus far focused on comparing the costs and risks of feasible alternatives, once you have determined that a needed capability is endangered. There are other types of actions that might aid in preserving a capability, but that are more difficult to quantify or control. In some cases these actions require work with individual suppliers. Others are global actions to address an entire product area. Can you preserve the needed capability by one of the following measures?

Contract changes

Can the Department of Defense make a contract change to alter delivery, payment, or other conditions such that the supplier's business problems are eased? Is it possible to use multi-year contracts or other purchase planning tools to provide the supplier a more stable operation?

Procurement relief or restriction

Can the Department eliminate procurement restrictions that may be exacerbating the loss of capability? Or impose a restriction that limits DoD procurement of certain products from endangered suppliers?

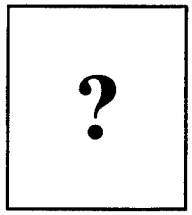
Export assistance

Can a capability be preserved by increased sales by the current suppliers of the same product or similar products to users other than the Department of Defense? If foreign sales are blocked due to a Government action, e.g., a trade barrier or an export license, could the Department help?

Policy relief

Can the Department eliminate policy that may be exacerbating the loss of capability? For example, are policies preventing you from soliciting from a wider set of potential sources of supply?

NEED HELP? If you need help in defining or assessing any of these alternatives for DoD action, contact your Component headquarters, or call DUSD (IA&I) Director, Industrial Capabilities and Assessments, the Pentagon, Room 2B322, (703) 697-1366 or 697-6833; DSN 227-1366 or 227-6833; e-mail ICA@acq.osd.mil.



6. RECOMMEND A COURSE OF ACTION

If you want to recommend an action or investment, take the results of your analysis, in the form of a Summary Report, to the designated decision authorities. Decisions to take actions or make investments of *less than $10 million* annually to preserve industrial capabilities are made by the CAE or DAE for ACAT programs, or by the HCA for all other programs. USD (A&T) approval and DUSD (IA&I) coordination are required on actions valued at *$10 million or more* per year. DUSD (IA&I) will also ensure appropriate OSD staff coordination for proposed investments.

Your Summary Report should address cost, schedule, effects on performance, and pertinent qualitative considerations. You need to define how and when the action would be incorporated into the budget and, if possible, identify budget offsets. *A copy of your Summary Report must be provided to DUSD (IA&I).*

If you recommend action or investment for more than one year, you will need to *revalidate your analysis each year.* As time passes, DoD requirements and defense industrial capabilities change. Given these changes, you may not need to take action in future years after all.

COMMENTS? This Handbook must be continuously updated and improved to remain current and meaningful. Please help us by providing your comments, suggestions for improvement, and current examples from the field. Contact the DUSD (IA&I) Director, Industrial Capabilities and Assessments, the Pentagon, Room 2B322, (703) 697-1366 or 697-6833; DSN 227-1366 or 227-6833; e-mail ICA@acq.osd.mil.

APPENDIX A. FINANCIAL ANALYSIS PROCEDURES

STEP 1. COLLECT FINANCIAL STATEMENTS

You will need to collect two types of financial statements, the Income Statement and the Balance Sheet, from the company. These statements provide the financial results of operations for the company's fiscal year, an accounting for the resources of a business, and the claims against those resources by lenders and owners.

Since the expressed concern is about the *financial contribution of the product* that DoD purchases, you should collect these documents at the *corporate level* and *business unit* or *product level.*

Statement Types

- Consolidated Income Statement (corporate level)
- Consolidated Balance Sheet (corporate level)
- Income Statement (at the lowest appropriate level, product or business unit)
- Balance Sheet (at the lowest appropriate level, product or business unit)

Time Span

- Collect Income Statements for a five-year period: Historical (the past two years), Current (the current year), and Projected (the next two years).
- Collect Balance Sheets for a three-year period: Historical (the past two years) and Current (the current year).

Both types of financial statements are discussed in the following sections, with calculations given for the information needed, and example worksheets.

Income Statement Description

The Income Statement summarizes the financial performance of the firm over a period of time, normally one year. A standard format is usually maintained in accordance with the *matching concept* in which sales (revenues), or the amounts received from selling goods and services, are matched against the associated expenses and costs incurred while operating the company. Table A-1 depicts the calculations you need to make for the Income Statement.

Table A-1. Income Statement Example

Income Statement
(January 1 through December 31, 19XX)

Sales	The revenue obtained for the product or service delivered.
- Cost of Goods Sold	All costs associated with converting raw materials into finished products.
= **Gross Income**	Income generated directly from the sale of products or services.
General and Admin Expenses	The cost of office space, support staff, and other such expenses.
- Depreciation	The estimated cost associated with or degree to which an asset is used up in producing a product (e.g., land is not depreciated).
= **Operating Income**[1]	The earnings generated from units sold minus expenses (cost of goods sold, selling, general and administrative expenses).
+ Non-Operating Income	Income that is not derived from the core business (e.g., interest income).
- Non-Operating Expenses	Expenses that are not derived from the core business (e.g., a one-time restructuring expense).
Earnings Before Interest & Taxes (EBIT)	Income before financing expenses and income taxes.
- Interest	Financing expenses on debt.
= Earnings Before Taxes	Taxable earnings of the firm.
- Taxes	Corporate income taxes.
= **Net Income**	The "bottom line" income generated for the period.

[1] Operating income represents the core earnings of a business before financing, taxes, and other non-operating income and expenses are taken into consideration.

Balance Sheet Description

The Balance Sheet provides a "snapshot" of a firm's financial position on a given day while the Income Statement covers a period of time. The Balance Sheet lists the assets, liabilities, and owner's equity on the date stated in the heading.

- Assets, which represent future economic benefits, are listed in descending order of their liquidity, i.e., how quickly they can be converted into cash.
- Liabilities, which represent obligations, are divided into debt and equity.
  - ⇒ Debt is listed in order of priority, i.e., which obligations need to be paid first or who would be paid first in the event of a liquidation.
  - ⇒ Equity is derived by subtracting liabilities from assets. In other words, equity equals the value of assets after subtracting obligations owed to debt holders.

Figure A-1 depicts an example of a format for a Balance Sheet.

Figure A-1. Balance Sheet Example Format

Balance Sheet
(December 31, 19XX)

Assets	Liabilities
Current:	Debt
Cash	Current:
Marketable Securities	Accounts Payable
Accounts Receivable	Notes Payable
Inventory	Current Maturities on Long Debt
	Long-Term Liabilities:
Fixed:	Long-Term Debt
Property, Plant & Equipment	
Land	Equity
Buildings	Common Stock
Machinery	Retained Earnings

The Balance Sheet tells you how healthy a company is at a particular time. You can ascertain whether the amounts listed for current assets (the first items on the Balance Sheet, such as cash, marketable securities, accounts receivable, which will shortly be turned into cash) exceed the current liabilities, or claims on the business that need to be paid in the near future. By looking at the fixed assets (property, plant, and equipment) and corresponding accumulated depreciation, you can see whether the company's production equipment is old or relatively new. If accumulated depreciation is a high percentage of fixed assets, production equipment may be obsolete; a lower percentage may indicate newer production equipment.

The Balance Sheet also shows you how the company is capitalized, or how it funds its growth, e.g., whether there is a high level of long-term debt or equity (common stock) financing. When contrasted with a Balance Sheet from an earlier period, you can identify problem areas or trends which may require additional evaluation or inquiry.

STEP 2. CALCULATE PROFITABILITY

Perform a Profitability Screen Using Operating Profit Margin

In Step 2, using the financial data collected, you will now perform a profitability screen and determine whether the company of concern is profitable. The results of this screen will help you determine whether any further financial analysis is necessary.

The best measure of the financial viability of a firm is the degree to which it is profitable (i.e., making money). The primary measure of profitability for the purposes of our financial analysis is Operating Profit Margin:

Operating Profit Margin (%) = Operating Income / Sales x 100

Operating Income represents the company's core earnings. It is equal to Sales minus Operating Expenses. Operating Income excludes interest payments and extraordinary items.

You will need to calculate the operating profit margin for the company of concern for the five-year period mentioned in the Step 1 section. Completion of the following summary table, Table A-2, will allow you to compute Operating Profit Margin and analyze profitability trends from the income statement. **Note:** Remember that you need *unconsolidated* divisional data, that is, data from the Income Statement at the lowest appropriate level, product or business unit. You will have to ask the company for this data.

Table A-2. Summary Table

	Historical		**Current**	**Projected**	
Year	**-2**	**-1**	**0**	**+1**	**+2**
Units					
Sales (Revenue)					
- Cost of Goods Sold					
- General & Admin Expenses					
- Depreciation					
= Operating Income (OI)					
Operating Profit Margin (%) = OI / Sales x 100					

At the corporate level, Operating Income can be determined from the consolidated Income Statement, which typically is provided in the format previously described. However, when determining the effect on profitability of a specific product being purchased by the Department of Defense, you need to calculate Operating Profit Margin at the lowest appropriate level, i.e., at the product or business unit level. Sometimes the Operating Income is not provided or cannot be obtained directly in the standard Income Statement format at this low level within the corporation. When this is the case, use the following to obtain Operating Income, which you can then use to compute Operating Profit Margin.

Operating Income = Sales - Direct Costs - Indirect Costs - Overhead - General and Admin Expenses

When Is a More Detailed Financial Analysis Necessary?

After calculating the Operating Profit Margin, use the following criteria to evaluate the business unit's or product's profitability: (1) the Operating Profit Margin is a negative percentage in current or future years, and (2) the Operating Profit Margin is positive in current and future years, but has declined by more than 50% over a three- to five-year period.

- If the answer in either case is true, the company's financial viability merits further analysis to determine the causes of its weakening performance. Proceed then to **Step 3**.
- If neither criterion holds true for the company, no further financial analysis is *generally* needed.

Profitability Analysis Example

An example of a profitability analysis is provided for the mythical CDE Widget Company (Table A-3).

Table A-3. Example of the CDE Widget Company Income Statement and Profitability Analysis (in thousands)

	Historical		Current	Projected	
Year	-2	-1	0	+1	+2
Units	2,000	1,750	1,250	1,000	900
Sales (Revenue)	100,000	87,500	62,500	50,000	45,000
- Cost of Goods Sold	40,000	35,000	25,000	20,000	18,000
- Selling Expenses	40,000	35,000	35,000	20,000	18,000
- General & Admin Expenses	7,000	8,000	8,000	9,000	10,000
= Operating Income	13,000	9,500	9,500	1,000	(1,000)
Operating Profit Margin	13%	11%	11%	2%	-2%

Looking at the Income Statement in Table A-3, we see numbers indicating there may be a financial problem with this company.

- Unit Production is declining, as is Sales (Revenue).
- Operating Income is projected to be negative in Projected Year 2, and is steadily declining.
- As we calculate percentage decrease,

$$\frac{\text{(Projected Year 2 - Historical Year 2)}}{\text{Historical Year 2}}$$

$$\frac{\text{(-1,000 - 13,000)}}{\text{13,000}}$$

$$= -108\%$$

- Operating Income decreases by 108%, which is far greater than 50%. Look up the Standard Industrial Code (SIC) for widgets, and obtain the same data from companies (with the same SIC) similar to CDE Widget Company. While the industry is experiencing a downturn in operating income, the average decrease is 42% over the same period.
- Likewise, Operating Profit Margin has a negative number in a projected year and has declined by more than 50% across the period.

Therefore, you should continue the analysis. The sample worksheet depicted in Figure A-2 may be provided to the Government's financial representative or the contractor as a guide to obtain this required profitability information.

Figure A-2. Industrial Capability Financial Analysis Worksheet

Industrial Capability Financial Analysis

Contractor: _____
_____
_____

Point of Contact: _____
Phone: _____
Fax: _____

Action Requested: _____
_____
_____

Agency Office: _____
_____
_____

Point of Contact: _____
Phone: _____
Fax: _____

Summary Table

	Historical		Current	Projected	
Year	-2	-1	0	+1	+2
Units					
Revenue					
- Cost of Goods Sold					
- General & Admin Expenses					
- Depreciation					
= Operating Income (OI)					
Operating Margin (%) = (OI / Revenue) x 100					

Calculate Return on Assets

So far you have used the Operating Profit Margin from the Income Statement as a primary indicator of a financial problem within the business. In addition to the Operating Profit Margin, other measures of profitability may be used, depending upon the specific business situation. For example, you can compute the company's Return On Assets (ROA) by adding information available from the Balance Sheet:

ROA (from primary operations)[2] = Operating Income / Total Assets

In this case, ROA indicates the amount of profitable return from the firm's primary operations being generated by the assets being used.

For the corporation as a whole, you can easily calculate ROA using numerical values taken directly from the Income Statement and Balance Sheet. To determine the profitability contribution by the product to the corporation, you should also calculate ROA at the product or business unit level:

ROA (product) = Operating Income Derived from the Product / Total Assets Used To Produce the Product

ROA presents another view of a company's financial health by gauging how efficiently the company's assets are being used to produce the product or service. It measures how much the company's assets are earning in Operating Income.

STEP 3. PERFORM A COMPARATIVE ANALYSIS

Compare the financial performance of the business unit or product with those of other companies or with other business units within the same corporation. *At this point you may want to seek assistance from a more experienced financial or cost analyst.*

Operating Profit Margin and ROA are two measures of performance that provide a means to evaluate the company's financial performance. From the firm's perspective, the question is whether its operations are earning an *adequate return*. Such a determination requires judgment. Comparison of returns across a number of dimensions (e.g., over time, between divisions of the corporation) provide the basis for this judgment. Formats in Table A-4 through Tables A-6 are examples of how to compare profitability measures for the company with internal, external, and peer business unit measures.

- Compare numerical measures calculated at the product or business unit level with similar calculations obtained at the corporate level to determine the importance of the product or business unit to the corporation (Table A-4).

Table A-4. Internal Comparison

	Sales	Operating Margin	ROA
Corporate			
Business Unit (BU)			
Item of Interest			

[2] The standard formula for ROA is Net Income divided by Total Assets. This standard definition is not as useful for our analysis because it does not focus on the firm's primary operations or products.

- Use these measures at various levels within the firm to compare the product or business unit performance on the DoD program of interest with other customers, e.g., commercial, other Government organizations, the DoD program of interest and other DoD customers outside program of interest (Table A-5).

Table A-5. External Comparison

	Sales	Operating Margin	ROA
Corporate			
Business Unit (BU)			
Item of Interest			
DoD			
Item of Interest			

- Compare the product or business unit performance being measured to consistent calculations for similar products or business units (Table A-6). For example, competitors or related businesses may produce products that are similar or can be directly substituted for the item of concern. You may have to ask other DoD managers in other programs or product areas for information on similar products or business units.

Table A-6. Peer Comparison

	Sales	Operating Margin	ROA
Item of Interest			
Substitute Product			
Similar Product			

STEP 4. IDENTIFY THE PROBLEM

Use the information obtained in Step 3 to identify the specific financial problem that the company is encountering, as well as potential solutions. Having compared the measures of financial performance across a number of important dimensions, you should now be able to assess the company's financial viability.

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APPENDIX B. PROCEDURES FOR BREAK-EVEN ANALYSIS

Appendix B provides procedures for the Break-Even analysis called for in Section 5.7, Maintain the Current Capability.

A Break-Even calculation shows the level of operations (in units produced) at which revenues just cover costs (i.e., neither profit nor loss). The Break-Even volume is computed by dividing fixed costs to produce the product by the contribution margin. The contribution margin is the selling price per unit minus the variable costs per unit, which are assumed to be constant in this discussion.

Break-Even = (Fixed Costs) / (Contribution Margin)

Contribution Margin = Selling Price - Variable Costs

Where

Fixed costs:	Costs that remain constant regardless of changes in the level of production (e.g., supervisors' salaries, lights and heat for the factory);
Variable costs:	Costs that vary directly with change in activity (e.g., direct labor and materials used to produce the product);
Contribution margin:	Selling price per unit for the product less the variable costs per unit; and
Break-Even (units produced):	The level of operations at which there is neither profit nor loss.

Example:

Unit Selling Price	$91.43
Unit Variable Costs	- $25.71
Unit Contribution Margin	$65.72
Fixed Costs	$230,000

Break-Even = $230,000 / $65.72 = 3,500 units

If a company were exiting DoD business for higher returns elsewhere, and had a target profitability (operating income), you would simply add operating income to the numerator in the above equation to determine the amount of business that the Department of Defense would need to provide the company to give the company incentive to remain in the defense business.

$$\frac{\text{Fixed Costs + Target Operating Income}}{\text{Unit Contribution Margin}} = \frac{\$230{,}000 + \$20{,}000}{\$65.72} = 3{,}804$$

3,804 units needed to produce the target operating income

It may not be possible to prepare a Break-Even analysis using only information from the financial statements. Usually these financial statements do not have clearly distinguished fixed and variable costs, nor do they show unit production data. Hence, this data must be obtained from the contractor. Once obtained, the information can be linked with the financial data for the same period to prepare the Break-Even analysis.