Appendix B
Industrial Base Models and Databases

Introduction

Access to accurate and timely information and analysis on the defense technology and industrial base (DTIB) will be essential to manage the transition to a downsized yet efficient base. Although the various Services and defense agencies have constructed databases and models aimed at fulfilling their specific missions, these efforts have been uncoordinated. As a result, it is difficult to obtain a broad overview of the national defense-industrial capabilities and requirements in particular sectors (e.g., electronics). Moreover, while the quality of available data may be good at lower levels, the data are not presented in a form or at a level of aggregation useful to national decisionmakers.

In addressing this problem, it will first be necessary to decide what types of information and models are needed for national DTIB policymaking and how much the Nation is willing to pay for this analytical capability. Since the majority of analysts working on this problem agree that it would be costly and time-consuming to collect and enter large amounts of information into a single integrated DTIB database, it would be preferable to find ways of coordinating the existing databases and to make better use of current industrial base models than to develop any major new capabilities. While networking among databases is now technically possible, such an approach would require major procedural changes.

This appendix reviews the major DTIB models and databases for defense manufacturing data, outlines some steps for improving overall database and modeling capabilities, and considers future approaches for providing key decisionmakers with accurate and timely industrial-base information. Many of these issues were examined in detail at a North American Defense Industrial Base Organization (NADIBO) Industrial Base Data Workshop.[1] To gain further insights into the issue of defense industrial database and model needs and current capabilities, OTA sponsored a l-day workshop on DTIB information requirements and capabilities. Participating in the OTA workshop were analysts involved in model development, senior officials from the Department of Defense (DoD), the Department of Commerce, and the Federal Emergency Management Agency (FEMA), and congressional staff members.[2]

Current Models and Databases

Individual military organizations and commands have developed a number of computer models and databases to support DTIB decisionmaking and to keep track of vendors involved in the acquisition of particular systems (see table B-l). Some of the recent models, including the Joint Chiefs of Staff's Joint Industrial Mobilization Planning Process (JIMPP), FEMA's Resolution of Capacity Shortfalls (ROCS), and the Office of the Secretary of Defense's Defense Industrial Network (DINET), incorporate a hierarchy of submodels of industrial sectors and subsectors, along with databases, making it possible to assess the ability of selected industrial sectors to meet the military demands for a specific crisis or wartime scenario. Collecting and updating the data needed to keep these systems current is difficult and costly, and in many cases has not been adequately supported.

The JIMPP model developed for the Joint Chiefs of Staff has been constructed to deal with DTIB issues both at the level of industrial sectors and individual firms. It is the most ambitious and sophisticated of all of the models shown in table B-1 in its ability to deal with the defense industrial requirements of a given scenario. JIMPP has been used to support DoD mobilization exercises and analysis of the national stockpile. Its principal drawback is the lack of accurate data on the ability of specific industries to produce goods during an emergency. The ROCS model is currently being expanded and made more flexible. This upgrade will make the output of ROCS more comparable to those of JIMPP and allow closer coordination between FEMA and the Joint Chiefs of Staff on industrial mobilization matters.[3]

DINET differs from the others shown in table B-1 in that it is not a model and embodies no analysis or simulation. Instead it is a collection of numerous databases on suppliers and procurement activities and can be queried to extract information about a wide range of topics concerning the base. DINET has recently been revamped to provide a more complete picture of the current DTIB. It is now structured to answer questions related to: acquisitions, mergers, and takeovers; dependencies on single and foreign sources; the effects of government policies on the industrial base; surge and mobilization in crisis and war; U.S. ability to respond to and recover from natural disasters; and critical defense-

[1] North American Defense Industrial Base Organization, *Strengthening Defense Manufacturing Data: Proceedings of Industrial Base Data Technical Workshop* (Dayton, OH, Apr. 18-20, 1990).

[2] Workshop participants are listed at the front of this report.

[3] FEMA also has a new industrial base model called the Integrated Civilian Industrial Mobilization Planning Process (ICIMPP), but that model was not evaluated during the OTA workshop.

Table B-I—Models and Databases Currently in Use for Evaluating the DTIB

Model Acronym	Full name of model	Type	Proponent/User	Developer
DID	Defense Industrial Demand Model	macro	Department of Commerce, Office of Policy Analyses	in-house
DINET	Defense Industrial Network	set of databases	Office of the Undersecretary of Defense (Acquisition), Office of Industrial Base Assessment (DoD)	Systems Research and Analyses Corp. and in-house
EDIO	Energy Disaggregate Input/Output Model	macro	Department of Commerce, Office of Policy Analyses	in-house
IMAP	Industrial Mobilization Analytical Process	macro, multiple	Army Material Command, Industrial Engineering Activity	General Research Corp.
JIMPP	Joint Industrial Mobilization Planning Process	macro/micro, multiple	Joint Chiefs of Staff-J4	Institute for Defense Analyses
MAX DSS	Maximum Army Expansion Decision Support System	micro, multiple	Army Material Command, Industrial Engineering Activity	in-house
NAVEASY	Navy Economic Analysis System	macro/micro	NavSea Shipbuilding Support Office	in-house
NIIS	National Infrastructure Information System	general, multiple	Federal Emergency Management Agency	in-house
ROCS	Resolution of Capacity Shortfalls	macro	Federal Emergency Management Agency	in-house
STIM	Systems Dynamic Model For Testing Industrial Mobilization	macro/micro, general	Army Material Command, Industrial Engineering Activity	General Research Corp.
TASCFORM-MOBE	Technique to Assess Comparative Force Mobilization	micro/macro	Office of the Secretary of Defense, Program Analyses and Evaluation, and Office of the Undersecretary of Defense (Acquisition)	The Analytic Sciences Corp.
TASCMAIN	Technique for Assessing the Capability to Mobilize American Industry	macro, multiple	Office of the Secretary of Defense	The Analytic Sciences Corp.

SOURCE: OTA Defense Industrial Base Database Workshop, 1990.

related technologies. Nevertheless, DINET is not currently capable of providing a comprehensive view of the manufacturing subtiers or the ability of the base to respond to emergency requirements.

Problems With Current Models and Databases

Officials attending the OTA workshop expressed dissatisfaction with available models, data, and collection plans. Some specific problems were noted:

- **Most of the current models are not linked to one another, limiting their usefulness beyond those specific problems for which they were designed.**
- **All DTIB models are short of data because data collection efforts are generally underfunded and are not standardized.**
- **There are major differences in the methodology and rigor with which industrial preparedness data are collected and validated. Each Service and model developer independently collects and evaluates its own data according to its own procedures, including** questionnaires, interviews, solicitations, and other methods.

From a technical standpoint, there is no reason why the models and databases cannot be linked and the data standardized. But in order for such integration to occur, the organizations that possess the models and data would have to cooperate. Currently, most of these organizations see few incentives to do so. As issues become more global and cross departmental boundaries, however, cooperation becomes more essential.

Solving the Problems

At the **OTA workshop, participants made the following observations and recommendations.**

Senior decisionmakers need to specify what types of DTIB information they need. The types of information required by officials varies depending on their level and responsibilities. For example, in a crisis the Secretary of Defense would be interested in the overall ability of the DTIB to respond and support overall U.S. military objectives. This broad question would then be broken down into specific questions about the production of U.S.

weapon systems, critical components, and the extent and projected duration of the crisis. Program managers and contractors also require an indication of the priority of weapon systems for surge and mobilization in the particular contingency.

Because DTIB information requirements can be large, there is a need to develop priorities on what types of data are essential to gather and maintain. Several methods for identifying weapon system development and procurement priorities have been established within DoD. For example, the Commanders-in-Chief's Critical Items List (CINC-CIL) identifies those weapon systems that the CINCs determine are essential for achieving their wartime missions. The Master Urgency List (MUL) prepared by the Office of the Secretary of Defense (OSD), sets overall priorities for procurement. The Weapon Systems Essentiality Code is used by the Defense Logistics Agency to ensure maximum supply support for high priority weapons in the field. Finally, the Key Asset Protection Plan (KAPP), maintained by U.S. Forces Command, contains the names and addresses of contractor facilities that the Services and Defense Agencies view as essential for defense production and thus should be protected by U.S. military forces against sabotage. These various indicators of priority are by no means exhaustive, nor may they be the best for industrial base planners to use in developing data collection plans. OSD, in conjunction with the CINCs and the other defense agencies, should therefore perform a thorough analysis of these various systems to determine their relevance for defense industrial responsiveness in a crisis, as well as peacetime development of weapon systems and other DTIB requirements.

To date, a high-level commitment to obtaining data on the DTIB has been lacking. A good example is that the most recent input/output table of the U.S. economy published by the Census Bureau describes the economy as it existed in 1977, making it of historical interest but of little practical value to DTIB planners. Moreover, while the Census Bureau collects extensive corporate data that could be used to answer many DTIB questions, under Title 14 of the U.S. Code requiring the protection of proprietary data, the Census Bureau is prohibited from making this information available to other U.S. Government agencies for analytical purposes. Solutions to the problem of obsolete data include: more funding for data gathering, greater reliance on the Commerce Department to provide analytical support, and a proprietary information security system.

Current DTIB databases and models concentrate on prime contractors for weapon systems and major subcontractors. Monitoring the health of subtier suppliers is difficult and has been neglected in current databases. Since many of these firms provide important spec ialized technology, however, keeping track of selected capabilities is important. Several participants in the OTA workshop argued that it would be too costly to establish and maintain a complete database on subtier suppliers of parts and subsystems, and that such data should be gathered only for critical items. This observation again points to the importance of developing priorities for data collection.

Participants in the OTA workshop concluded that DoD organizations and Canada (as part of the North American Defense Industrial Base) should collectively adopt a standard weapon system coding scheme to support analyses, acquisition decisions, and industrial preparedness planning. Most current data have been collected without the use of any standard definitions or formats, making it difficult to know the mcaning of a given data element and virtually impossible to cross-reference information in different databases. The result is a "Tower of Babel" of databases that cannot communicate with one another. The lack of a common identification scheme also limits DoD's ability to assess the capabilities of subtier suppliers. If the Joint Chiefs of Staff employed a coding scheme to identify equipment for the CINCs' Critical Items List, it would significantly improve the information available for DTIB assessments.

Mechanisms must also be created for improved coordination among databases. Much of the DTIB information required by decisionmakers is already contained in a variety of databases developed and maintained by the individual Services, the Defense Logistics Agency, the Office of the Secretary of Defense, and the Joint Chiefs of Staff. Technology currently exists for networking databases installed indifferent types of computers. Since each database has a "dictionary" describing the data it contains, it should be possible to interlink these dictionaries to permit cross-referencing among databases. Thus, instead of creating a new centralized database at enormous cost, data from existing dispersed databases could be exchanged in a coordinated fashion.

Summary

Achieving either of the **DTIB objectives of responding to crisis or producing affordable weapons in peacetime requires information and analytical modeling support. OTA workshop participants indicated that models and databases exist at various levels to support many of DoD's information requirements. There is a need for high-level officials to determine what types of DTIB data are essential for decisionmaking and to support data collection and maintenance. Any new effort should make use of existing models and databases rather than starting over.**

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