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THE SHIPBUILDING&
FORCE STRUCTURE ANALYSIS TOOL
A USER'S GUIDE

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SUMMARY

Each time a major defense review is undertaken, policymakers must confront a range of complicated issues about the Navy's future force structure, including resource concerns and significant changes in the shipbuilding industrial base. To help answer these concerns, analysts in the Office of the Secretary of Defense (OSD) and the Chief of Naval Operations (CNO) staff turn to the available analytical tools to help provide options to decisionmakers. Although an array of such tools exists, there is a significant need for improvement to ensure that policy and resource decisions are well analyzed and supported.

In earlier research, RAND identified the types of issues that arise during these defense reviews and evaluated the capacity of current analytical models to help address these issues. We found that the most common concerns of defense analysts were cost, schedule, industrial base capacity, shipyard performance, and program management strategies. Further, we found that existing tools lacked an integrated approach that would allow analysts to consider not just individual elements (e.g., manpower and procurement funding requirements) but the interaction and interrelationships among the industrial base components—from attrition rates to ship life extensions, from labor learning curves to overhead costs. We then outlined an overarching analytical architecture that could provide this integrated analysis environment—an environment in which the user is able to understand the implications of force structure choices on resource requirements and the private shipyard industrial base.

This document describes the result of efforts to implement this integrated architecture, the Shipbuilding and Force Structure Analysis

Tool. The purpose of the tool is to assist the OSD, Navy, and other organizations in addressing the difficult naval ship–related questions. The general architecture of the tool is shown in Figure S.1.

The tool consists of four linked models. The first model, the Force Transition Model, determines when new ships are acquired and when existing ships retire, based either on a given acquisition plan or on a desired force structure. The outputs from the force transition model serve as important inputs to the next two models: the Industrial Base Model and the Operating and Support (O&S) Cost Model. The Industrial Base Model calculates workforce demands and labor costs based on the acquisition plan. The O&S Cost Model determines the operating and support costs for ships in the fleet. The last model, Financial Adjustments and Assumptions Model, allocates the various funding streams to the appropriate budget categories, adjusts the base year of the costs to a fixed year, and applies a discount rate for discounted cash flow analysis. This model also determines whether the inputs used by the other models violate basic assumptions or whether data are incomplete, thus producing misleading results.

This document serves as a basic introduction to the tool. It describes the general architecture and outlines some basic concepts that may
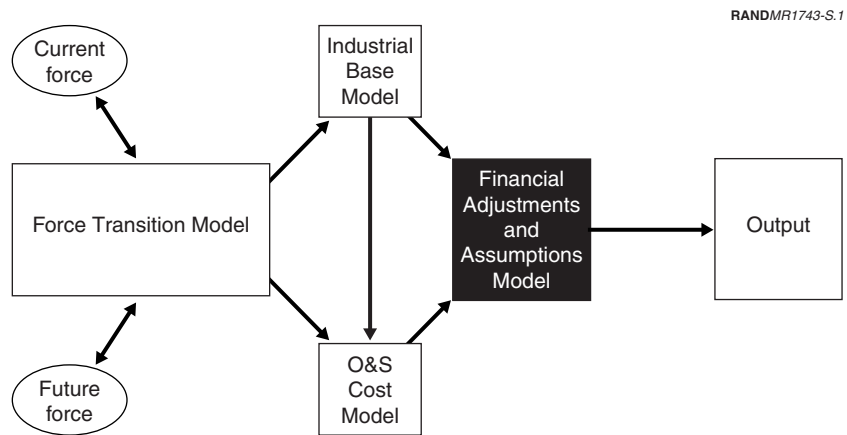

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Figure S.1—Summary Tool Architecture

be necessary to understand before using the tool. The tool's primary user is meant to be an analyst seeking to determine the industrial base and resource implications of a desired force structure choice. We intend this document to provide users with the tool's basic navigational capacities, guiding them through the user interface, providing background concepts and a description of methodology, offering data field definitions, and pointing out the tool's central features. We also provide more detailed discussions of two of the tool's primary models—the Force Transition Model and the Industrial Base Model. Finally, we consider the tool's current limitations as well as common issues the user will confront. The appendices serve as a user's guide and data dictionary for analysts interested in using the tool.