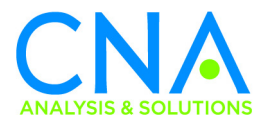# Enhanced Billet Analysis Tool (BAT V2)

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CNA
ANALYSIS & SOLUTIONS

Approved for distribution: October 2008

Henry S. Griffis

Defense Workforce Analyses Team
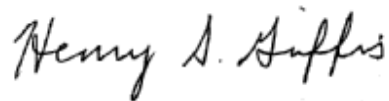Resource Analysis Division

Enhanced Billet Analysis Tool (BAT V2)

- ➤ *Microsoft Access* application – complies with Navy/Marine Corps Intranet (NMCI)
- ➤ Enables analysts to quickly compile, forecast, and analyze Navy manpower requirements (both military and civilian)
- ➤ Major capabilities:
  - Compute the effects of force structure changes on manpower requirements within the Future Year Defense Plan (FYDP)
  - Determine how force structure changes affect shore manpower requirements and enlisted training requirements
  - Forecast future manpower requirements (beyond FYDP)
  - Examine the effects of changing manpower requirements for individual force structure units or shore activities on Navy's total requirements

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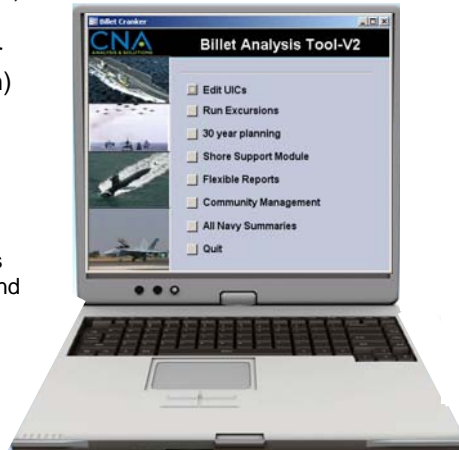
The Enhanced Billet Analysis Tool (BAT V2) is a *Microsoft Access* application that allows manpower analysts to quickly determine how changes to the force structure and/or shore infrastructure affect the Navy's overall manpower requirements. BAT V2 grew from the original Billet Analysis Tool, which CNA developed in 2006, and the Shore/Support Module, which CNA developed in 2007. In addition to having all the capabilities of these tools, BAT V2 includes new features (e.g., the ability to forecast requirements beyond the Future Year Defense Plan (FYDP)) that enhance its value by expanding the range of issues it can address.

BAT V2 provides four major capabilities to help analysts study current and future manpower requirements. First, using data from the Total Force Manpower Management System (TFMMS), it can determine how changes to the force structure (and shore infrastructure) affect manpower requirements and costs within the FYDP. Second, it can estimate how changes to the force structure (and shore infrastructure) affect shore manpower requirements and the size of the Navy's Individuals Account (e.g., enlisted student billet requirements). Third, it can forecast future manpower requirements beyond the FYDP (out to 30 years). And, fourth, it provides the capability to examine the effects of changing manpower requirements for individual force structure units or shore activities on the Navy's total requirements. This last capability also allows users to define manpower requirements for future platforms (not yet in TFMMS) and include these platforms in scenarios to forecast future requirements.

With these capabilities, BAT V2 can help analysts answer a wide range of manpower questions, such as:

- What are the manpower implications of replacing ten CG-52 cruiser with eight DDX destroyers?
- What will the Surface Warfare Officer requirement look like in 10, 15, 20, and 30 years?
- How will force structure changes affect student billet requirements for A- and C-school training?
- How will new platforms, such as the LCS, affect the paygrade structure of individual enlisted communities?
- How would a 15-percent cut in logistic shore/support billets affect enlisted, officer, and civilian manpower requirements?
- How would relocating five destroyers from Norfolk to Jacksonville affect geostability opportunities in both areas?

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Report Outline

- Background and tasking
  - History of BAT development
  - Tasking for phase II development
- Enhanced BAT
  - Run Excursions (FYDP Planning)
  - Shore/Support Module
  - 30-Year Planning Tool
  - Define Manpower Requirements (Edit UIC)
  - Output Report Generator
  - All Navy Summary
  - Community Management
- Model management, utility, and the road ahead
  - Data update requirements
  - Examples of using BAT V2 to study manpower issues
  - Implementation and test plan

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This annotated briefing describes the Enhanced Billet Analysis Tool, which CNA developed for the Director of Total Force Programming and Manpower (N12). The report comprises three sections. The first section reviews the history of BAT development and then discusses the task objectives for this most recent phase of BAT development. The second section describes the product of this development: the Enhanced BAT (BAT V2) application. Here, we review each of the modules in BAT V2, describing what they do and how to use them. The third section reviews BAT's management requirements, walks through some examples of how the tool can be used to answer manpower issues, and recommends a schedule to implement and field test this application.

Background

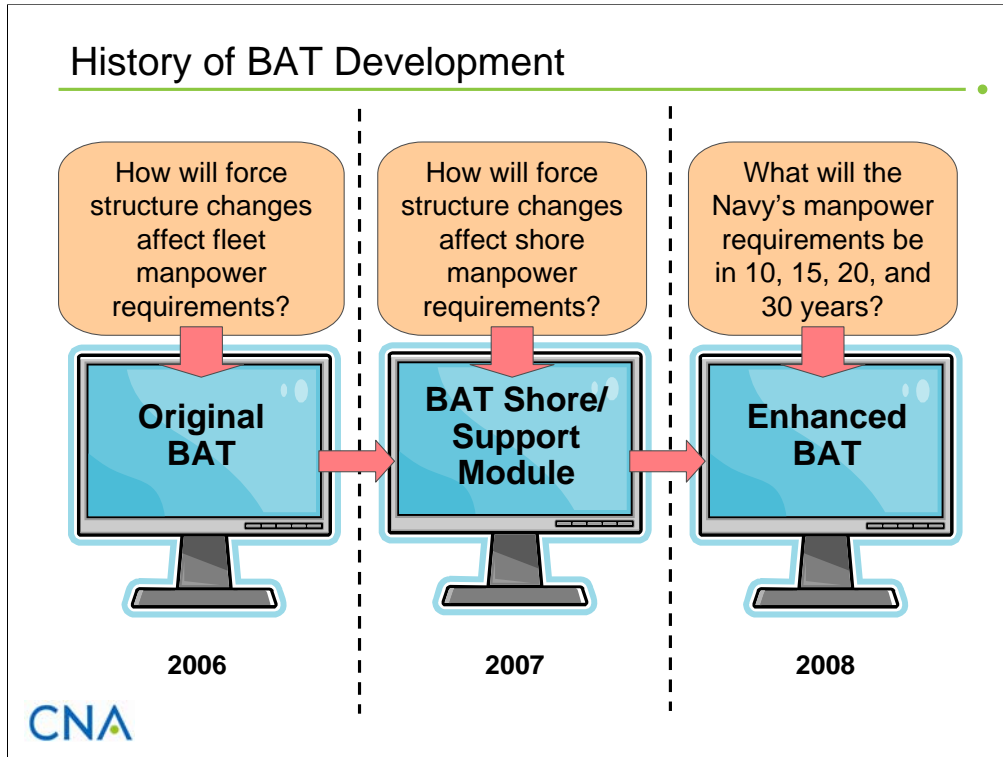**Why the Navy needs an analytic tool to study manpower requirements:**

➢ Rising manpower costs and declining endstrength have elevated the importance of manpower requirements and costs in assessing force structure alternatives

➢ Previous tools to extract and compile TFMMS data to assess these alternatives were cumbersome and tedious to use

➢ Most assessments looked only at manpower requirements of force structure units
  – For example, if the Navy decommissions four destroyers, only the billets on these ships go away

➢ Need to assess the manpower effects of force structure changes within the shore infrastructure
  – For example, if the Navy decommissions four destroyers, where should shore manpower requirements decrease and by how much?

➢ Need to forecast requirements beyond the FYDP
  – What will requirements look like in 10, 15, and 20 years?
  – May require changes well in advance to ensure that inventory matches requirements or that requirements are executable

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In preparing force structure plans and programs to meet future mission requirements, Navy planners develop, evaluate, and compare numerous alternatives. In recent years, rising manpower costs and declining endstrength authorizations have combined to elevate the importance of total manpower requirements and costs in assessing these alternatives. The Director of Total Force Programming and Manpower (N12) is responsible for assessing the manpower implications of force structure changes.

Most assessments of force structure changes consider only the manpower requirements of the force structure units themselves. To properly evaluate force structure alternatives from a total manpower perspective, however, the Navy needs to account for potential changes in manpower requirements within the shore infrastructure. For example, decommissioning three CG-47 Ticonderoga-class cruisers would reduce Navy manpower requirements by the number of authorized billets on those ships (887 enlisted billets and 81 officer billets). Yet the manpower effects of decommissioning these ships should extend into areas of the shore infrastructure. For example, one would expect workload reductions at certain training and maintenance activities, which, in turn, should reduce the manpower requirements at these activities.

The Total Force Manpower Management System is the authoritative source for Navy manpower requirements. It contains authorized manpower requirements for the current fiscal year through the FYDP years (i.e., it contains projected manpower requirements for the next 7 years). Although TFMMS projects requirements only out to 7 years, the Navy needs to be able to accurately forecast what its manpower requirements will look like beyond the FYDP (i.e., in 10, 15, and 20 years and beyond). This is especially important for requirements that come from force structure units because this drives the inventory profile for many communities. Abrupt or substantial changes in requirements (e.g., major changes in the paygrade structure of billets) may require action by the Navy well in advance of the change in order to shape the inventory to match the new requirements. In extreme cases, the Navy may conclude that the requirements are not executable under current policies and processes. At present, no data systems or analytic tools are designed to project manpower requirements beyond the FYDP. The Enhanced BAT addresses this deficiency.

History of BAT Development

How will force structure changes affect fleet manpower requirements?	How will force structure changes affect shore manpower requirements?	What will the Navy's manpower requirements be in 10, 15, 20, and 30 years?
Original BAT	BAT Shore/ Support Module	Enhanced BAT
2006	2007	2008

In 2006, CNA developed the Billet Analysis Tool (BAT), a computer-based tool that allows users to quickly determine the manpower implications (in terms of both billets and costs) of changes to the Navy's force structure, shore/support infrastructure, and manning level policies.[1] Users define scenarios by selecting force structure units and/or shore activities. Using military and civilian billet data from the Total Force Manpower Management System, BAT calculates billet requirements and manpower costs for these scenarios. The tool can display these results at several levels of detail and by many descriptors (e.g., from appropriation categories to rating/paygrade levels).

In 2007, CNA developed the Shore/Support Module to augment the capabilities of the original BAT.[2] This computer model estimates the effects of force structure changes on manpower requirements in several of the Navy's shore/support infrastructure's work function areas—namely, the Individuals Account, training and education, maintenance, and health care services. When used in conjunction with BAT, the model provides manpower analysts with more robust estimates of how changes to the force structure affect the Navy's overall manpower requirements.

Over the past year, we upgraded BAT by adding features and capabilities that significantly improve its value and expand the range of issues that it can address.

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[1] For a more complete description of BAT, see CNA Annotated Briefing D10014545.A2, *Billet Analysis Tool (BAT)*, Sep 2006.

[2] For a more complete description of the Shore/Support Module, see CNA Annotated Briefing D0017103.A1, *Billet Analysis Tool Development: Shore/Support Manpower Requirements Module*, Sep 2007.

More Features and Capabilities

- ➢ Collected and analyzed feedback from BAT users
- ➢ Identified several additional features and capabilities that would improve BAT's value and expand the range of issues it can address:
  - – Incorporate additional billet-descriptor data fields from TFMMS
  - – Enhance scenario development module
  - – Improve output reporting
  - – Construct a module that allows users to define a unit's/activity's manpower requirements
  - – Incorporate women-at-sea berthing capacity
- ➢ N12 asked CNA to add these enhancements

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After a year of testing and using the original BAT to analyze manpower issues, users have identified additional features and capabilities that would significantly improve the tool's value and expand the range of issues that it can address. In response, N12 asked CNA to develop and add the following enhancements to the Billet Analysis Tool:

1. **Incorporate additional TFMMS billet-descriptor data fields.** The original BAT included only a subset of the billet-descriptor fields in TFMMS. Users have requested that we add fields—for example, the primary and secondary Functional Area Codes, which are needed to identify general-duty billet requirements. To address this task, we incorporated several new billet-descriptor fields from TFMMS into the application.

2. **Enhance scenario development module**. Building scenarios is a key part of using the BAT. In the original tool, if an issue required examining a scenario that changed over time, users would have needed to run the BAT multiple times and combine the output from each run offline. To address this shortcoming, we added the capabilities to define scenarios that change over time and to compute manpower requirements over all years in a single run. We also improved the interface through which users search for and select force structure units and shore activities to build scenarios.

3. **Improve output reporting**. Users have requested that we improve the tool's output display capabilities. We responded by adding more report options and redesigning the interface to make it easier for users to tailor and display output results. We also updated the tool's output report generator so that users can aggregate and display results by new fields, such as billets by location.

4. **Define activity manpower requirements**. BAT calculates manpower requirements for a scenario using the billet structure for each force structure unit and shore activity that exists in TFMMS. Other than uniformly increasing a unit's/activity's
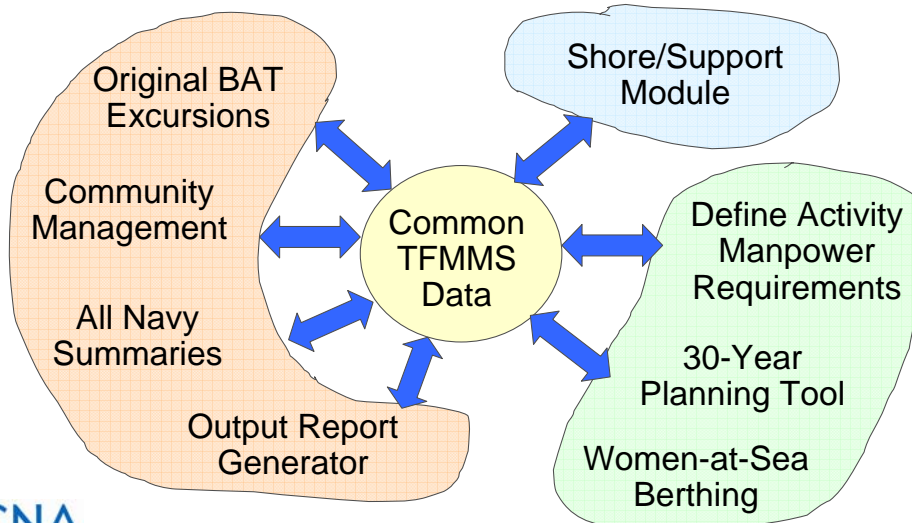
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manpower requirement by applying a scaling factor, the original version of BAT did not allow users to change the billet structure of individual force structure units or shore activities (e.g., change the rating or paygrade structure). Similarly, BAT did not provide a module for defining manpower requirements for new platforms. These requirements had to be added to the tool's database through the update process. To address these limitations, we constructed a module that allows users to define manpower requirements for new (or future) force structure units (ships, squadrons, expeditionary units, etc.). This module also allows analysts to view and make changes to the manpower requirements of existing force structure units or shore activities.

5. **Incorporate women-at-sea berthing capacity**. Ships have limited berthing capacity for women. Force structure changes affect the Navy's overall women-at-sea berthing capacity, which, in turn, may limit the number of women in sea-intensive ratings. To help the Navy examine this issue, we added to BAT the ability to determine the change in women-at-sea berthing capacity for a user-defined scenario.

BAT Development: Final Integration

Objective: Integrate all Billet Analysis Tools into organized suite of modules that share common data

Original BAT Excursions

Community Management

All Navy Summaries

Output Report Generator

Common TFMMS Data

Shore/Support Module

Define Activity Manpower Requirements

30-Year Planning Tool

Women-at-Sea Berthing

CNA

In addition to the new features and capabilities discussed in the previous slide, another objective for this phase of BAT development was to integrate all the Billet Analysis Tools into a single easy-to-use application that shares common data elements.

In the next section, we describe the product of this integration: the Enhanced Billet Analysis Tool (BAT V2).

Enhanced Billet Analysis Tool (BAT V2)

➢ Integrates the original BAT, the Shore/ Support Module, and the newly developed features and capabilities

➢ *Microsoft Access* application

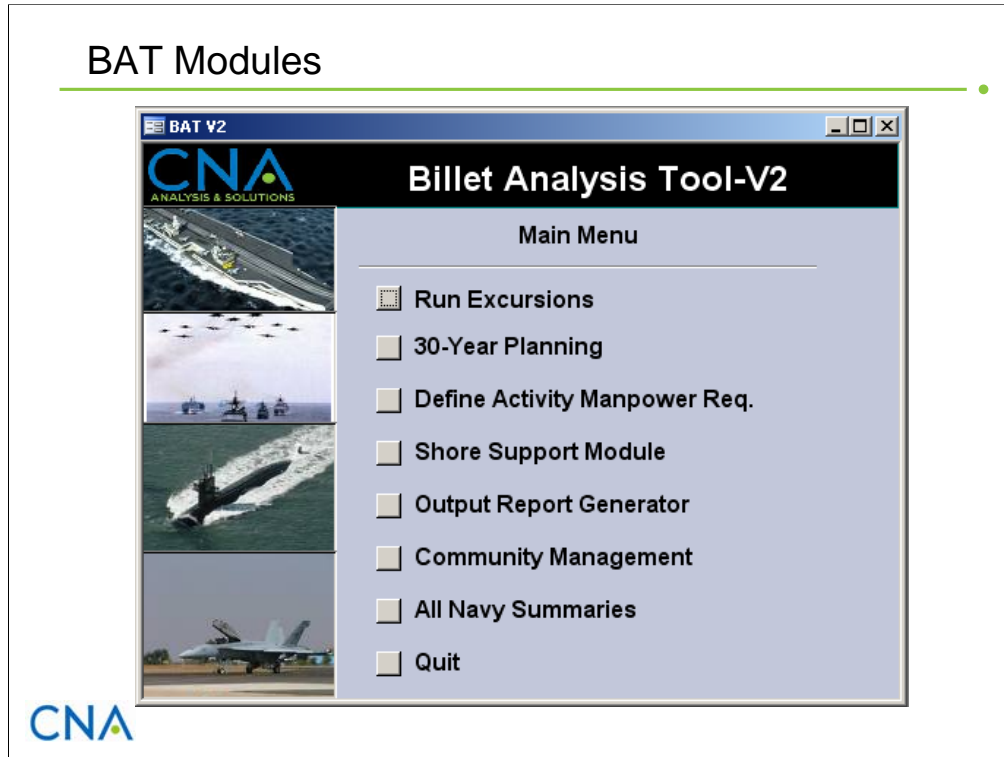➢ Consists of several linked *Access* database files

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The Enhanced Billet Analysis Tool is a *Microsoft Access* application that allows manpower analysts to quickly determine how changes to the force structure and/or shore infrastructure affect the Navy's overall manpower requirements. It includes all the new features and enhancements while integrating all the capabilities of the original BAT and the Shore/Support Module.

The application consists of several linked *Access* database files. Most of these files represent a specific capability (which we referred to as a module) and include user-interface forms, output report queries, and unique data tables. There is one data file (Support.mdb) that includes common data sets used by more than one module. This structure facilitates the monthly data update process and configuration management.

From a user's perspective, the application consists of a suite of modules that address different components of manpower requirements (requirements to man force structure units versus requirements to operate the shore infrastructure) and different time horizons (requirements within the FYDP versus requirements beyond the FYDP). There is also a module that allows users to define manpower requirements for new force structure units and change the requirements of existing units.

BAT Modules

Billet Analysis Tool-V2

Main Menu

- Run Excursions
- 30-Year Planning
- Define Activity Manpower Req.
- Shore Support Module
- Output Report Generator
- Community Management
- All Navy Summaries
- Quit

The Enhanced Billet Analysis Tool consists of seven modules that are accessed through the tool's main screen, as shown on the slide. These modules are:

- **Run Excursions**. This is the main module from the original BAT with a few modifications. It determines military and civilian manpower requirements (or change in requirements) for a user-defined scenario that can include both force structure units and shore activities. It is best suited to examine manpower requirements in the execution, budget, and Program Objective Memorandum (POM) years using TFMMS data.

- **30-Year Planning**. This module is used to forecast future manpower requirements. Users can specify scenarios out to 30 years. The module calculates the manpower requirements for each of these years at the rating/designator and paygrade level.

- **Define Activity Manpower Requirements**. This module enables users to define manpower requirements for future platforms or to change manpower requirements of existing platforms or activities.

- **Shore/Support Module**. This module estimates the effects of force structure changes on manpower requirements in several of the Navy's shore/support infrastructure's work function areas—namely, the Individuals Account, training and education, maintenance, and health care services.

- **Output Report Generator**. This module produces customized output reports. Users select the output measures, data descriptors, and level of aggregation. Output results are displayed in data sheet format.

- **Community Management**. This module provides the capability to quickly display Navy manpower requirements for individual enlisted ratings and Navy Enlisted Classifications (NECs) and for officer designators.

- **All Navy Summaries**. This module provides a quick way to display manpower requirements and costs for the entire Navy as programmed in TFMMS. It gives the user the option to include or exclude manpower requirements for future platforms (which are not in TFMMS).

Next, we describe each of these modules in more detail.

Run Excursion Module

➢ Original BAT with slight modifications
➢ Calculates military and civilian manpower requirements for a user-defined scenario consisting of force structure units and/or shore activities
  – Billet authorizations and requirements
  – Manpower costs
➢ Ability to analyze/break out billet requirements and costs by:
  – Active Component, Reserve Component, FTS, civilian
  – Skill requirement (rating/EMC/NEC/designator/paygrade)
  – Inherently Governmental/Commercial Activity (IGCA) coding
  – Enterprise data
  – Budget Submitting Office (BSO) data
  – Sea/shore duty
  – Unit Identification Code (UIC) function (38 functions)
➢ Best suited to examine manpower requirements in the execution, budget, and POM years using TFMMS data
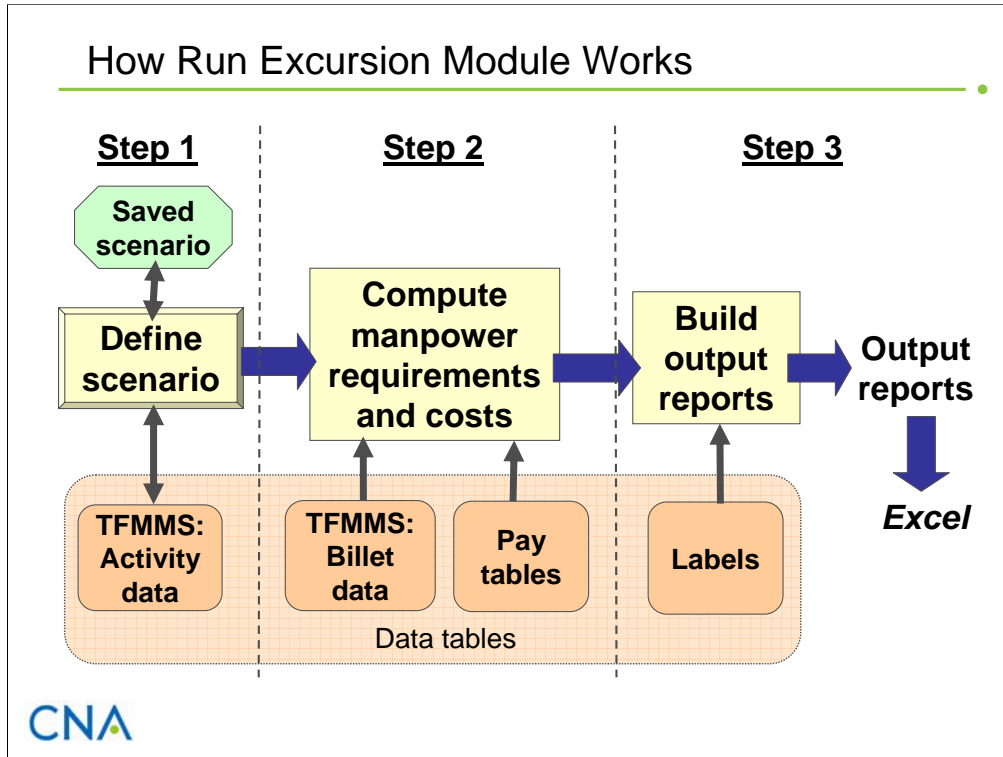
CNA

The main module from the original BAT is the basis of the Run Excursion Module. We made only a few modifications. The primary function of the Run Exercise Module is to compute military and civilian manpower requirements (or changes in requirements) for a user-defined scenario, which can include both force structure units and shore activities. The module computes two output measures: manpower requirements and their costs. Manpower requirements are expressed in terms of billet requirements (i.e., what's required to perform the mission according to the ship, aviation, and shore manning documents) and billet authorizations (i.e., billets that have been funded). The module also calculates the costs of these requirements using N10 programming pay rates (defined for officer, enlisted and civilian personnel at the paygrade level). Costs are calculated for both billet requirements and billet authorizations.

This module provides the capability to group and display these measures at several levels of detail and by many descriptors. High-level groupings include those by manpower type (i.e., active duty (MPN), full-time support (FTS), selected reserve (SELRES), civilian, and contractor), and OEWC (i.e., enlisted, officer, warrant officer, and civilian). More detailed breakouts include those by rating, paygrade, Enlisted Management Community (EMC), and NEC for enlisted requirements and by designator, paygrade, Naval Officer Billet Classification (NOBC), and Additional Qualification Designation (AQD) for officer requirements. Community managers can use these detailed breakouts to see if manpower changes adversely affect their communities' paygrade structures. BAT can also display manpower requirements and costs by Enterprise, IGCA category, and Function Area Code.

The Run Excursion Module is best suited to study manpower requirements for the execution year, budget year, and POM years (i.e., current FY to current year plus 7) using TFMMS data.[3] It should also be used if a detailed breakout of the manpower requirements (by the descriptors discussed above) is required.

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[3] We added a field, labeled *CFY_Now,* that represents billet requirements or authorizations for the current FY at the time of the TFMMS extract (which is denoted on the screen) as opposed to at the end of the current FY. CFY represents the billet authorizations at the end (September 30th) of the current FY.

How Run Excursion Module Works

Step 1 | Step 2 | Step 3

Saved scenario

Define scenario → Compute manpower requirements and costs → Build output reports → Output reports → Excel

Data tables: TFMMS: Activity data, TFMMS: Billet data, Pay tables, Labels

CNA

This slide illustrates how the Run Excursion Module works. First, the user defines a scenario by selecting one or more operating force units (i.e., ships, subs, aviation squadrons, expeditionary force units) and shore activities by Unit Identification Code from a listing of all Navy activities. (The scenario can be saved and recalled for later use.) Second, using military and civilian manpower data extracted from TFMMS, along with military and civilian pay tables, the tool calculates the net[4] manpower requirements and costs for the scenario. Third, the user constructs custom output reports. The output is presented in a data sheet (spreadsheet) format that can easily be copied and pasted into a *Microsoft Excel* spreadsheet for further analysis and display.

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[4] BAT computes the net change in requirements because a scenario can include both force structure additions and deletions (e.g., replacing four destroyers with eight littoral combat ships).

What Is a BAT Scenario?

- Scenarios can consist of force structure units and/or shore activities
  - Scenario additions and deletions (net effect of replacing 4 cruisers with 5 destroyers)
  - Listing includes every Navy platform/activity with Navy billet requirements
- Apply weights to each fiscal year in TFMMS – weights scale manpower requirements
  - Applying a weight of 0.5 will reduce billet requirements by 50%
  - Applying a weight of 4 is equivalent to adding the unit/activity four times
- Scenarios can be saved and retrieved

CNA

The user-defined scenario in the Run Excursion Module can include both force structure units and shore activities. A unit/activity can be incorporated into a scenario as an addition (+1) or a deletion (-1). A scenario can consist of all additions, all deletions, or a combination. For example, determining the manpower implications of replacing 5 DDG ships with 4 DDX ships would involve a scenario with -5 DDGs and +4 DDXs. The tool computes the net manpower requirement, which could be positive or negative.

In defining a scenario, the user selects from a listing that contains all activities (i.e., platforms, squadrons, commands, shore activities) in the Navy that have billet requirements, as defined in TFMMS. This list also contains two types of activities that are not in TFMMS: (1) future platforms for which preliminary manpower requirements exist and were added to the database by model managers and (2) activities that the user created through the Define Activity Manpower Requirements Module. Both of these types of non-TFMMS activities are identified by UICs that begin with the underscore symbol "_". (We discuss this module later in this report.)

When selecting an activity for a scenario, the user can reduce or increase the manpower requirements for this activity by specifying a scaling factor. This factor (or weight) uniformly scales the requirements across all ratings/designators and paygrades. A weight from 0 to 1 will reduce the manning requirements; a weight greater than 1 will increase the requirements (the default setting is 1). For example, to compute the effects of manning an activity to 80 percent of requirements or authorizations, the user would enter a weight of 0.8. To define a scenario that involves multiples of the same units (e.g., 4 DDX ships), the user would enter an integer scaling factor equal to the number of units (in our example, 4, for the DDX UIC).

How To Use the Run Excursion Module
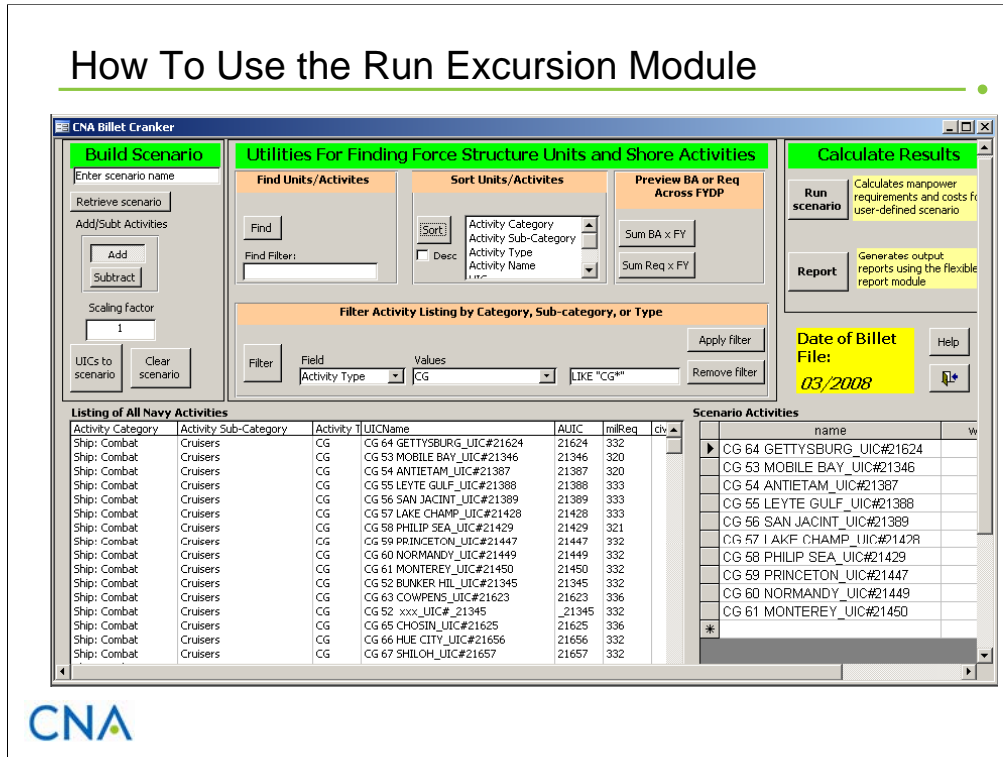
This slide shows the Run Excursions interface through which the user defines a scenario and calculates results. To define a scenario, the user selects (highlights) one or more activities from the Listing of All Navy Activities window (bottom left) and clicks the *UICs to Scenario* button. These activities will then appear in the Scenario Activities window (bottom right). Users can select and add activities one at a time, or they can highlight and add multiple activities at one time. Users must also define the weight (i.e., scaling factor) and whether the activity will be an addition or deletion (subtraction). If multiple activities are added at one time, the scaling factor will be applied to all the selected activities. A new feature that we added to this module is the ability to define a different weight for each fiscal year in TFMMS. With this feature, users can define scenarios that decommission ships sooner or extend them longer than what is reflected in TFMMS.

To help the user identify activities when defining a scenario, we included several data fields (in the activity list window) that provide amplifying information about each activity. These include activity categorization (category, subcategory, and type), location (city, state, and geolocation code), claimant, duty type (sea, shore), and activity code (which shows relationships between parent and subordinate activities). We also included a set of utilities to help users locate activities of interest: Find, Sort, and Filter. The Find function allows you to search for a specific activity. The Sort function sorts the list of activities by the field and order (ascending or descending) you select. The Filter function displays only activities that meet a defined search criteria. In the screen above, the activity listing was filtered to show only activities with an activity type of CG (Guided Missile Cruisers). There is one other utility that allows users to see the yearly manpower requirements for an activity across the FYDP. This allows users to quickly see if manpower requirements change for an activity during this time frame. For example, some ships are scheduled to be decommissioned during the FYDP, so their manpower requirements in the out-years may be zero.

Once the scenario has been defined, the user clicks the *Run Scenario* button in the top right corner of the screen. This prompts the user to save the scenario to a text file. (BAT saves only the list of UIC/activity names and weights (i.e., the information in the scenario window). Users can retrieve a scenario by clicking the *Retrieve Scenario* button in the top left corner of the screen. This will automatically populate the scenario window with the previously saved scenario. Once the scenario is saved, the module calculates the manpower requirements and costs, and stores these results in a temporary table. To view the results, the user clicks on the *Generate Reports* button, which opens the Output Report Generator. Here, the user can create customized output reports by selecting the output measures and data descriptors. We describe the Output Report Generator in more detail later in this report.

BAT Modules
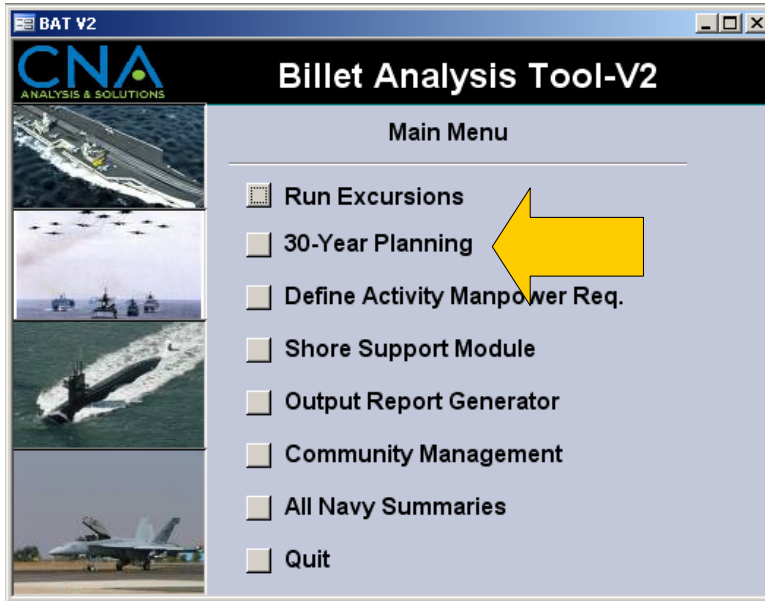
The next module we describe is the 30-Year Planning Tool.

30-Year Planning Module

➢ Designed for forecasting manpower requirements beyond the FYDP

➢ Can define scenarios that change over time

➢ Calculates requirements for every year in a single run

➢ Three output reports:
  – BA by manpower type
  – BA by rating/designator and paygrade
  – Enlisted BA by EMC and paygrade

➢ Tracks berthing capacity for women at sea

CNA

The Total Force Manpower Management System is the authoritative source for Navy manpower requirements. It contains authorized manpower requirements for the current fiscal year through the FYDP years (i.e., it contains programmed manpower requirements for the next 7 years). Although TFMMS projects requirements out to only 7 years, the Navy needs to be able to accurately forecast what its manpower requirements will look like beyond the FYDP (i.e., in 10, 15, and 20 years and beyond). This is especially important for requirements that come from force structure units because this drives the inventory profile for many communities. Abrupt or substantial changes in requirements (e.g., major changes in the paygrade structure of billets) may require action by the Navy well in advance of the change in order to shape the inventory to match the new requirements. In extreme cases, the Navy may conclude that the requirements are not executable under current policies and processes. Currently, there are no data systems or analytic tools that are designed to project manpower requirements beyond the FYDP.

We developed the 30-Year Planning Module to forecast future manpower requirements beyond the FYDP. It allows users to define scenarios that change over time. A scenario can cover up to a 30-year period. The module calculates manpower requirements for every year of the scenario in a single run. In calculating these requirements, the module uses activity billet authorizations for the last fiscal year in TFMMS (i.e., FY+7). Users can select from three output report options: (1) billet authorizations (BA) by manpower type, (2) BA by rating/designator and paygrade, and (3) enlisted BA by EMC and paygrade.

This module also tracks women-at-sea berthing capacity for the user-defined scenario. It outputs the net change in berthing capacity for three categories: (1) Chief Petty Officers, (2) E6 and below, and (3) E3 and below.[5]

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[5] Maximum berthing capacity for E3 and below will not exceed 40 percent of capacity for E6 and below, as stated in OPNAVINST 1300.17A.

30-Year Planning Module: How It Works
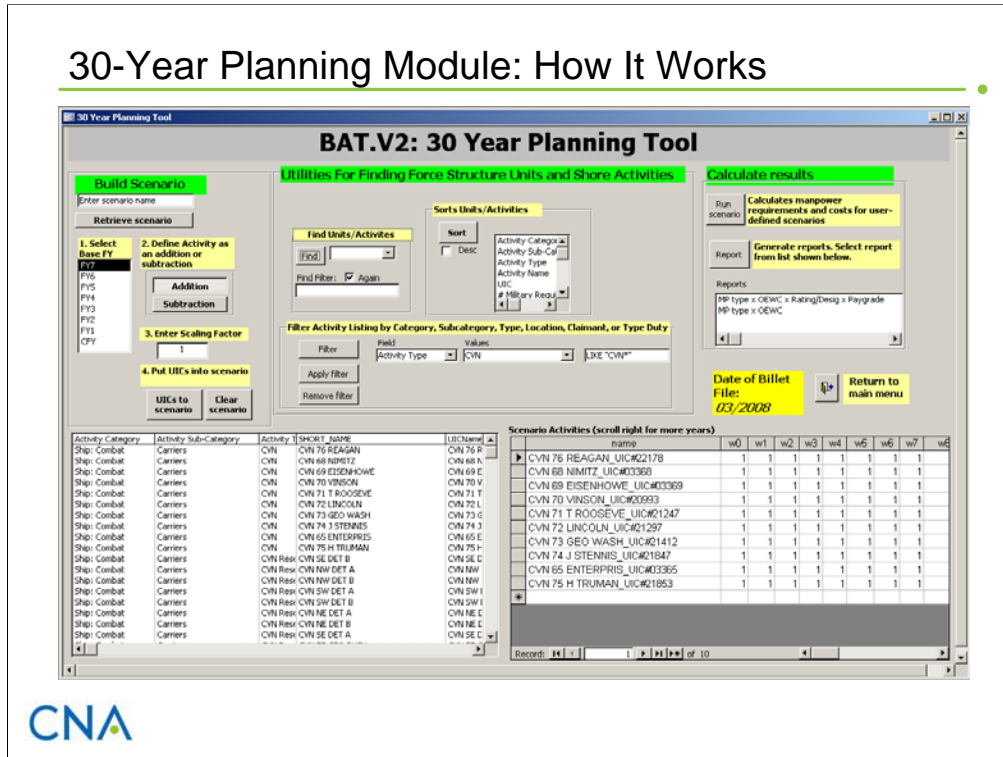
This slide shows the user interface for the 30-Year Planning Module. The design is nearly identical to the Run Excursion Module. The main difference is that the user can define the scenario out to 30 years (vice the 7 years of the FYDP). Users define a scenario the same way as in the Run Excursion Module. When an activity is added to the scenario, the same weight is applied to all years. Users can change this weight by year in the scenario window by clicking on the cell and entering a new weight (including negative numbers).

Once the user has defined the scenario, he or she clicks the *Run Scenario* button. The application prompts the user to save the scenario and computes results. To display the results in the standard data sheet format, the user selects one of the three report options.

BAT Modules
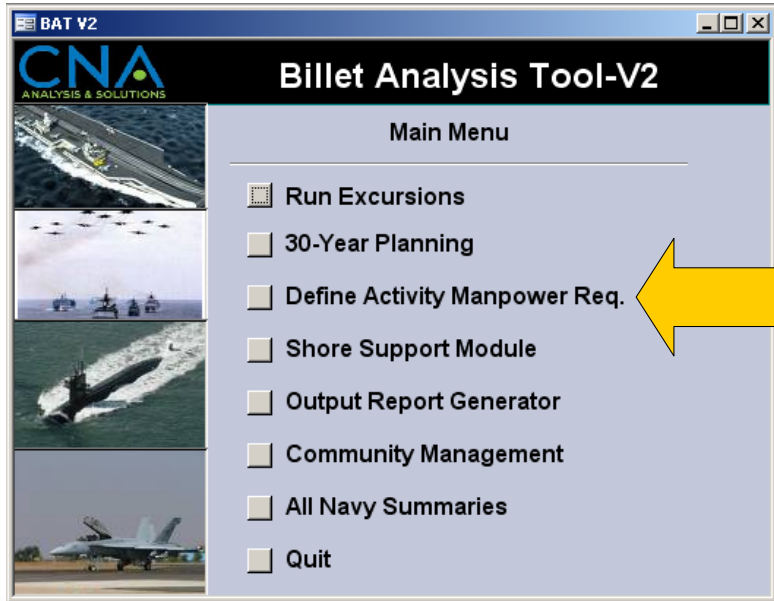
Next, we describe the Define Activity Manpower Requirements Module.
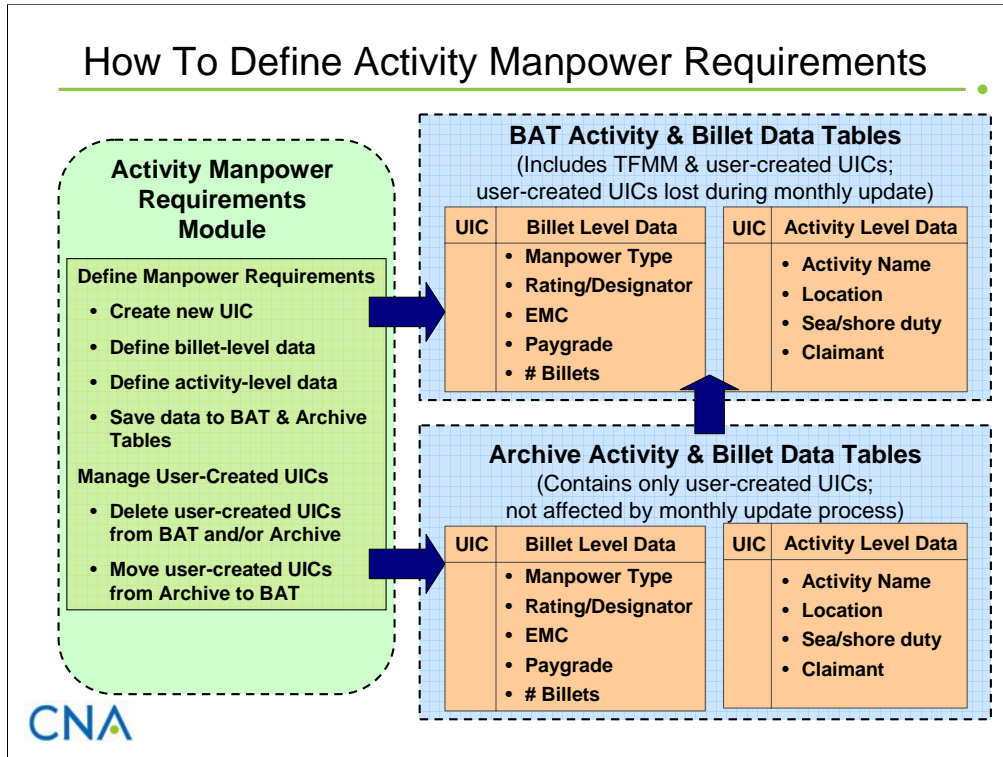
Define Activity Manpower Requirements

➢ Original BAT (Run Excursion Module) was limited to activities and their manpower requirements in TFMMS plus those added by model manager in update process

➢ Users could scale an activity's manpower requirements in a scenario, but this would uniformly change requirements across all ratings/designators and paygrades
  – Could not change rating/designator-paygrade structure

➢ Ability to define new manpower requirements for a platform/activity has two powerful applications
  – Define manpower requirements for future platforms (not yet in TFMMS) to better project future requirements
  – Change manpower requirements of existing platforms and/or shore activities (in TFMMS) to study effect of alternative manning options

CNA

The original BAT calculates manpower requirements for scenarios using the billet structure for each force structure unit and shore activity as defined in TFMMS. Other than uniformly increasing or deceasing a unit's/activity's manpower requirement by applying a scaling factor, that version of BAT does not allow users to change the billet structure of individual force structure units or shore activities (e.g., changing the rating or paygrade structure). Similarly, the original BAT does not allow users to define manpower requirements for new platforms. These requirements must be added to BAT's database by model managers through the update process. Both these limitations restrict the range of manpower issues that this tool can address.

To give users the option to circumvent these limitations, we developed the Define Activity Manpower Requirements Module. This module enables users to define manpower requirements for new force structure units (ships, squadrons, expeditionary units, etc.) and to change the manpower requirements of existing force structure units or shore activities. The capability has two powerful applications. First, it allows users to define manpower requirements for future platforms (that are not yet in TFMMS) to better project future requirements. Second, it allows users to change manpower requirements of existing platforms and/or shore activities (in TFMMS) to study the effect of alternative manning options on the Navy's total manpower requirements and costs. For example, analysts can study alternative manning options for the Littoral Combat Ship (LCS) or explore changing the ratings of general duty billets to improve geostability in a Fleet Concentration Area while tracking the Navy-wide impact on these communities.

How To Define Activity Manpower Requirements

This slide illustrates how the Define Activity Manpower Requirements Module works. This module (depicted in green) performs two functions.

The first function is to create a new activity (i.e., UIC) and define its manpower requirements. This new activity may represent a future platform that does not yet exist in TFMMS, or it could represent an alternative manning option for an existing platform or shore activity. Through this module, users define billet level data by specifying billet requirements at the rating/designator and paygrade levels. (Billet authorizations are set equal to billet requirements.) They also define activity-level data, such as location, duty type (sea or shore), and major claimant. Once this new activity is defined, the module save these data to the activity and billet data sets within the BAT application. It also saves these data to a separate data base, which we call the Archive data set. The reason for storing these data in two locations is that, during the monthly update process, the BAT activity and billet data sets are updated with new TFMMS data and any user-created activity data are lost. Because the user-created activities reside in the user's Archive database, they can easily be added back to the BAT data sets after an update. All user-created activities remain in the Archive database until deleted by the user.

The second function performed through this module is to manage the manpower requirements data for the user-created activities. Through this module, users can delete these activities (and associated data) from the BAT data sets and/or from the Archive database. Users can also copy user-created activities (and associated data) from the Archive database to the BAT database. As mentioned above, this latter feature allows users to add user-created activities back to BAT after they have downloaded a new version of BAT with updated TFMMS data.

Define Activity Manpower Requirements Module

Gen_UIC : Form

Create/Edit Activity Manpower Requirements Module

The module is used to change manpower requirements of an existing unit/activity or to define manpower requirements for new unit/activity. It also allows users to add or remove the UICS they create or modify from the list of activities in BAT.

Return to main menu

Help — More detailed instructions

Edit or Create Manpower Requirements

Step 1. Search for UIC: Type in search string and click on "Find UIC" button

Refresh form

[*]   **Find UIC**

Step 2. Select a UIC from list to edit or serve as the starting point for defining requirements for a new platform/activity, then click on "Select UIC" button. At that point the user can view the manpower requirements for that UIC or change the requirements. To change requirement, the UIC must first be saved (BAT will place an underscore before the UIC which indicates that this UIC was created by the user). Once the UICs is save, the user can edit billet requirements by clicking "Edit New Data"

UICs

UICs
CV 63 KITTY HAWK_UIC#03363
CVN 65 ENTERPRIS_UIC#03365
CVN 68 NIMITZ_UIC#03368
CVN 69 EISENHOWE_UIC#03369
COM CVW 14_UIC#09261
COM CVW 3_UIC#09731
COM CVW 1_UIC#09732
COM CVW 5_UIC#09733

Select Activity   **View Original TFMMS Data**

Save UIC Data   Selected UIC [ ]

Edit New Data   New UIC name: [_]

Add or Remove User-Created UICs from BAT

User created UICs are stored in a separate database. To added these UICs to BAT (so the appear in the scenario definition window), click "Add User-Created UICs to BAT" button. To view the user-created UICS that are in BAT click the "List User-Created UICS in BAT" button. To delete user-created UICs from either BAT or the Archived Dataset, click the "Delete Created UICs" button.

Add User-Created UICs to BAT   **List User-Created UICs in BAT**   **Delete User-Created UICs**

CNA

This slide shows the first level interface for the Define Activity Manpower Requirements Module. To define manpower requirements for an activity, the user must first create an activity. To do this, BAT forces the user to select an existing activity to serve as a starting point. The selected activity may be an activity in TFMMS or a user-created activity (which was previously created and resides in BAT). The module includes a utility to search for an activity to use as a starting point. Simply type in the activity name (or part of the name and a wildcard symbol) and click the *Find UIC* button. Next, highlight the desired activity in the list box and click the *Select Activity* button. The UIC for the selected activity will appear in the designated text box. The manner in which BAT assigns a UIC to a new activity is to simply add the underscore character ("_") to the beginning of the UIC of the selected activity. For example, the new UIC for an activity created from the activity with UIC 12345 would be _12345. This structure keeps a visible link to the parent activity (i.e., the activity whose data was modified). The user enters the name of the new activity in the designated text box.

Once the new activity is created, the user can define the manpower requirements by clicking the *Edit New Data* button. This opens a new window, which we describe in the next slide.

Define Billet-Level Data

This slide shows the interface through which the user defines manpower requirements (i.e., billet-level data). The first step is to select which user-created UIC to edit from the listing in the upper right box (labeled *Select UIC)*. Once selected, the manpower requirements for that UIC appear in the display box on the left (labeled *UIC Data).* It is possible to change the rating or designator (i.e., Occ field), the paygrade, and the number of billets for the rating/paygrade combination. To change the rating, click in the cell of the record to change, then double-click on the desired rating/designator from the list box below (labeled *Rating/Designator*). Use the same approach to change the paygrade. To change the number of billets, click in the BA cell and enter the new number. If the new unit/activity has more rating/paygrade combinations than the foundation activity, simply add records to the bottom of the table and select the appropriate values for each field. To delete records, highlight the record and press the delete key.

BAT allows the user to change only the rating/designator and paygrade structure. In user-created UICs, all the other data fields associated with billet requirements are assigned an unknown value. This includes EMC, NEC requirements, Enterprise, and IGCA Function codes.

Once the billet-level data are defined and the data saved, the user can change the activity-level data by clicking the *Edit UIC Specs* button. This opens another form, which we describe in the next slide.

Define Activity-Level Data

new_activity

Click in paramter box for options

Activity Category	Ship: Combat	Claimant	COMPACFLT
		Location	CA, SAN DIEGO
Activity Sub-Category	Cruisers	GEO_LOC	02063260
Activity Type	CG	Sea_shore	Sea Duty
SHORT_NAME	CG 52 xxx	UICName	CG 52 xxx_UIC#_21345
AUIC	_21345	parent_UIC	21345
milReq (double click)	332		
civReq (double click)			
Comments:			

Meteorology & Oceanography
Military Sealift
Operational Bases
Other
Personnel
Recruiting
Reserve Activities
Security Group Activities
Ship: Combat

COMUSSOCOM
COMVAQWINGPAC
Construction Battalion
Construction Battalion Center
Construction Battalion Maint Unit
Construction Regiment
Contact Support
Contracting Det
Cruisers

COA
COMPACFLT
COMSC

Preferred Overseas Shore Duty
Sea Duty
Shore Duty

CA, SAN CLEMENTE
CA, SAN DIEGO
CA, SAN FRANCISCO

ATF
BMU
Brig
CBMU
CC
CENSERSUPP
CEODD
CG

Record: 1 of 1 (Filtered)

CNA

This slide shows the interface through which the user defines activity-level data for the newly created activity. Users can change information in all the white text boxes. (Data displayed in the grayed-out text box cannot be changed.)

Users redefine the Activity Category, Activity Subcategory, and Activity Type (which are used to arrange and filter activities during scenario development). They can also be assigned a different manpower claimant, location, and type of duty (i.e., sea or shore). A box for comments allows the user to enter additional descriptive information about the newly created activity. An example of a comment follows:

> This activity represents preliminary manpower requirements
> for the new SSN class based on data provided by the
> undersea warfare enterprise on 25 July 2008.

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BAT Modules

Billet Analysis Tool-V2

Main Menu

- Run Excursions
- 30-Year Planning
- Define Activity Manpower Req.
- Shore Support Module
- Output Report Generator
- Community Management
- All Navy Summaries
- Quit
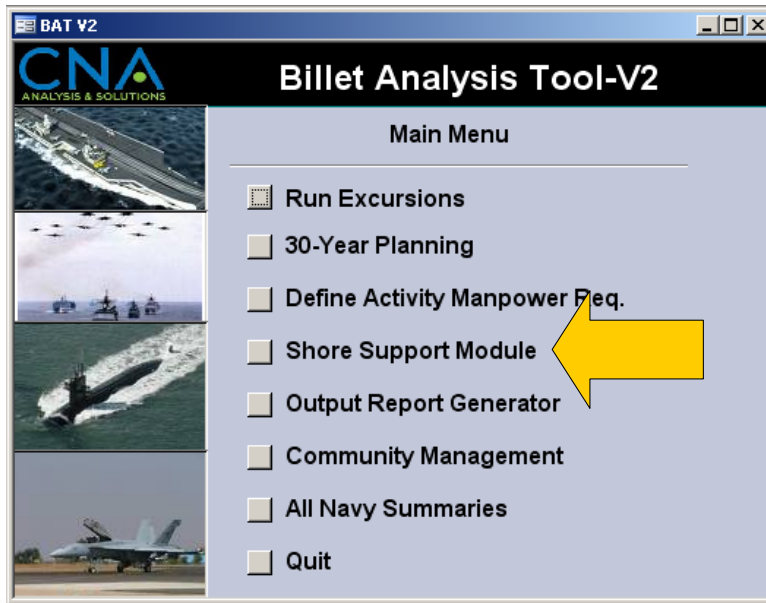
We now turn our attention to the Shore/Support Module.

Shore/Support Module

➢ Estimates how changes to the force structure affect the size of the Individuals Account:
  – Enlisted student billets
  – Enlisted and officer T&H billets
➢ Estimates how changes to the force structure affect shore/support manpower requirements in areas of:
  – A- and C-school instructor requirements
  – Intermediate and depot-level maintenance activities
    • Aviation
    • Ship and shipboard systems
  – Health services
➢ Calculates billet requirements by rating/designator and paygrade
➢ Examines shore/support billet base by Commercial Activity (CA) function area

CNA

To help the Navy study manpower requirements within its shore/support infrastructure, CNA developed the Shore/Support Module to augment the capabilities of the Billet Analysis Tool. This module, when used in conjunction with other BAT modules, will provide manpower analysts with more robust estimates of how changes to the force structure affect the Navy's overall manpower requirements.

The Shore/Support Module models two types of relationships: (1) it estimates how changes to the force structure (and shore infrastructure) affect the size and composition of the Navy's Individuals Account, and (2) it estimates how changes to the force structure affect shore manpower requirements. For the Individuals Account, it estimates the change in student billet requirements for enlisted initial skills training (A-school), skills progression training (C-school), and recruit training. It also estimates the change in enlisted and officer billet requirements for transients and holdees (i.e., T&H account).

For shore/support activities, this module estimates manpower requirements in several work function areas—namely, training and education, maintenance, and health care services. In the area of training and education, it estimates the change in instructor requirements for A- and C-school training. For maintenance functions, it estimates the changes in billet requirements at intermediate and depot-level maintenance activities that result from increasing or decreasing the number of ships, submarines, and aviation squadrons. And, in the area of health care services, it estimates the changes in manpower requirements for the segment of the health care force that provides medical care to nondeployed active duty Servicemembers and their dependents but is not directly tied to medical mobilization requirements during wartime or in support of contingency operations.

The shore/support module estimates not only the manpower effects in terms of number of billets but also the type of billets in terms of enlisted rating (or officer designator) and paygrade. This enables manpower analysts (e.g., community managers) to see the effects on individual communities as well as the entire Navy.

Using the Shore/Support Module

1. Define the scenario
   - Force structure component
   - Shore/support structure component
2. Edit data parameters (optional)
   - Update data
   - What-if analysis
3. Generate output reports

CNA

The Shore/Support Module has two main steps: (1) defining a scenario and (2) generating output reports. The module also allows users to view and edit the key data parameters that are used in the manpower requirements calculations. Over the next several slides, we describe each of these steps in more detail.

Defining a Scenario in the Shore/Support Module

- ➤ Force structure scenario component
  - – Select individual ships, submarines, aviation squadrons, and other force structure units
  - – Interface similar to Run Excursion Module
  - – Units can be additions or deletions
- ➤ Shore/support infrastructure component[1]
  - – Define by activity (i.e., UIC)
    - ▪ Select individual activities and units
    - ▪ Interface similar to Run Excursion Module
    - ▪ Units can be additions or deletions
  - – Define requirements by functional area
    - ▪ Based on IGCA function codes

1. *Includes shore and non-force-structure combat & combat support activities.*

CNA

The scenario in the Shore/Support Module consists of two parts: a force structure component and a shore/support infrastructure component. A scenario may include only a force structure component, only a shore/support infrastructure component, or both components.

To define the force structure component, users select individual ships, submarines, aviation squadrons, expeditionary force units, and/or construction force units. As in the Run Excursion Module, they designate each unit as an addition or deletion and, if desired, apply a scaling factor. We configured the force structure scenario module so that only force structure units can be selected. Like the original BAT, users can save scenarios and reload previously saved scenarios.

There are two options to define the shore/support infrastructure component of the scenario. Users can either select individual activities (as in the Run Excursion Module) or define changes to the support structure by changing manpower requirements in one or more IGCA function areas. The first option uses the same interface that is used to define the force structure component, except that only shore/support activity can be selected. Two toggle buttons on the interface (labeled Force Structure and Support) switch the type of activities that are available for selection.

The second option uses the Shore Work Function Analysis Module, which we discuss in the next slide.

Shore Work Function Analysis Module

Two functions:

➤ Analyze shore/support manpower requirements by CA function areas
  - Examine current manpower requirements
    - Total requirements by function area, subgroup, and group
    - Detailed breakout of requirements by rating/designator and paygrade
  - Determine effects of increasing or decreasing manpower requirements for CA function area, subgroup, or group
    - Total requirements by function area, subgroup, and group
    - Detailed breakout of requirements by rating/designator and paygrade

➤ One option for defining the shore structure component of a scenario in the Shore/Support Module
  - Shore/Support Module estimates training tail to support shore enlisted manpower requirements

CNA

The Shore Work Function Analysis Module serves two functions. First, it enables analysts to study shore manpower requirements by displaying billet authorizations by Commercial Activity (CA) function area. The CA function codes, which exist in the TFMMS, identify the type of work associated with every military and government civilian billet in the Navy's operating forces and shore infrastructure. The coding scheme defines a hierarchical structure of work functions. At the highest level, work functions are grouped into Infrastructure and Forces and Direct Support. These categories are segmented into functional groups and subgroups, which are further divided into functions. The Infrastructure category includes 13 functional groups, 43 subgroups, and 332 functions. In addition to work areas, the Navy allocates billets to a personnel overhead account known as the Individuals Account (IA). We identify and treat IA billets as a third category.

The module displays the total BA (military plus civilian) for the current fiscal year for each function, subgroup, or group. The module can also output the these requirements at the rating/designator and paygrade levels. Another feature of this module is that it calculates the effects of increasing or decreasing manpower requirements for a CA function area, subgroup, or group at both the aggregate and detailed levels.

The second function of this module is to define the shore structure component of a scenario in the Shore/Support Module. The user defines the scenario by selecting CA function areas. Just as in the other scenario modules, the user can define the scenario using the requirements as reflected in TFMMS, or he/she can increase or decrease these requirements by entering a scaling factor. For example, a user may want to include a 15-percent reduction in shore logistics services as the shore component of a scenario that reduces the number of surface ships. The Shore/Support Module will compute the effects of this decrease on IA account billets, instructor billets, and health care service billets.

Using the Shore Work Function Analysis Module

The interface for the Shore Work Function Analysis Module, which is shown on the slide, displays CA function areas by group and subgroup. The user selects which functions to display by filtering at the group or subgroup level. In the example shown in the slide, the user chooses to display functions in the Logistics group/Supply Operations subgroup. The interface displays the function's group, subgroup, code, title, and number of authorized billets (military plus civilian) for the current fiscal year. The Quick Report button provides a breakout of these billets by officer, enlisted, and civilian.

To change manpower requirements, users select a function (or functions) and enter a scaling factor (or factors) under the column labeled "weight." The module automatically recalculates and displays the new billet total for each selected function as well as an overall total for all selected functions. These new billet requirements feed into the shore manpower calculations for IA billets, instructor billets, and health care service billets.

Users can save and retrieve scenarios that are defined through this module just as they can for scenarios that are defined by activity.

View or Edit Data Sets

➢ Users can view and edit the data sets for each functional area
  – Allows many types of "what if" analysis

➢ The tool stores two copies of each data set
  – Original data
    ▪ Can change only through the update process
  – Data used in the computations
    ▪ Can be changed by the user
    ▪ Contains most recent changes
    ▪ Can easily be reset to original values

CNA

The Shore/Support Module allows users to view and change key data parameters that are used in calculating shore manpower requirements for each functional area. We included this feature for several reasons. First, it allows users to see the data values used in the relationships to estimate shore manpower requirements. Second, it allows users to enter values that they feel are more reflective of the current relationship. Third, it allows users to conduct "what if" types of analysis by changing certain parameters and comparing results. For example, users can examine the effects of increasing the annual intermediate-level maintenance requirements for a class of ships or decreasing the length of one or more A-school or NEC training pipelines.

The module contains two copies of each data set. One copy contains the original data (generated by the model managers) and can only be changed through the update process. The other contains the data that are used in the manpower calculations. Users can modify this data set, but only the most recent changes are saved. The user, however, can reset this data set to the original values at any time.

Data Sets That Users Can View/Edit

- ➤ Ship maintenance
  - – Hull maintenance
  - – Shipboard system maintenance
  - – Intermediate- and Depot-level workforce skills
- ➤ Aviation maintenance
  - – Squadron aircraft inventory
  - – I & D-level aircraft maintenance workload
- ➤ Training (student billets and instructors)
  - – Recruit training
  - – A-school training
  - – NEC training
- ➤ Transients and holdees
- ➤ Work-year constants (for converting man-days to billets)

CNA

The Shore/Support Module allows users to view and change the values of nearly all the data parameters that are used in estimating shore manpower requirements. For example, they can view and change ship hull and shipboard system maintenance workload data (i.e., annual man-hours of Intermediate- and Depot-level maintenance per hull). They can view and change aviation squadron inventories and aircraft maintenance workload data. They can view and change fill rates (i.e., the percentage of junior paygrade billets that are filled each year by Sailors directly out of initial training), training pipeline lengths, and student-to-instructor ratios for A-school training.

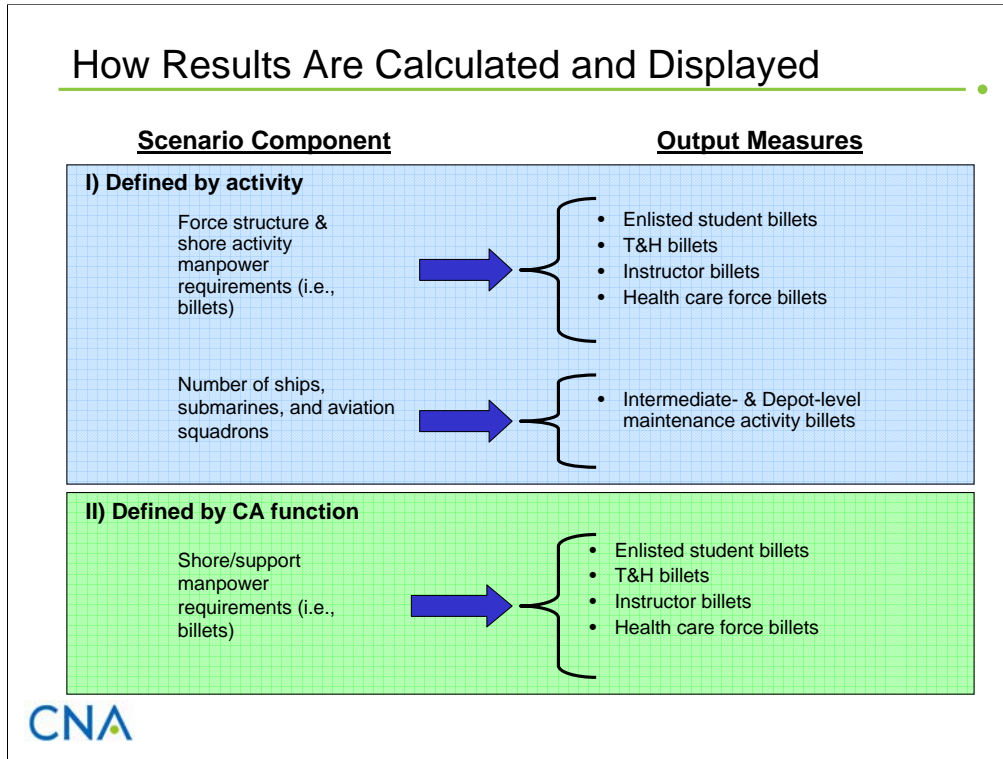In the next slide, we show how to access these data and make changes.

How To View or Change Data Parameters

This slide shows the sequential screens to view or edit the data used in calculating billet requirements for Ship Hull Intermediate- and Depot-level maintenance. At the first level, the user clicks on "Platform maintenance." This opens a screen through which the user selects between ship and aviation maintenance and whether the intent is to just view the data or to view and make changes. Selecting the option to view and edit opens another screen that displays the choice to access ship hull maintenance data or shipboard system maintenance data. Selecting ship hull maintenance opens the screen that displays the data elements by ship class. The user can change any of the parameters to the right by entering a new value. To view/edit data for another ship class, simply highlight the desired class in the Ship Class List box. Once new values have been entered, the module will use them in its calculations. The user always has the option to restore the original (default) values by clicking on the *Reset Default Values* button.

How Results Are Calculated and Displayed

Scenario Component — **Output Measures**

I) Defined by activity

Force structure & shore activity manpower requirements (i.e., billets) →
- Enlisted student billets
- T&H billets
- Instructor billets
- Health care force billets

Number of ships, submarines, and aviation squadrons →
- Intermediate- & Depot-level maintenance activity billets

II) Defined by CA function

Shore/support manpower requirements (i.e., billets) →
- Enlisted student billets
- T&H billets
- Instructor billets
- Health care force billets

CNA

Because of differences in how the module defines and stores each part of the scenario, the Shore/Support Module computes output results separately for the activity-defined scenario and the CA function area scenario. Furthermore, as shown on the slide, enlisted student billets, T&H billets, instructor billets, and health care service billets depend on changes in Navy endstrength, which we associate with changes in Navy billets. Thus, both the force structure component and the shore/support component (defined either by activity or by CA function area) affect the billet requirements in these areas. Billet requirements at Intermediate- and Depot-level maintenance facilities, however, depend on the number of ships, submarines, and aviation squadrons, so only changes to the force structure (which is defined in the activity component) affect these requirements.

Displaying Output in Shore/Support Module

Reports For Activity-Defined Scenario

Reports For CA Function-Defined Scenario

Report : Form

Data source
- ○ UICs
- ○ CA_Functions

Run report

Ensure no open reports

Activity BA
* AC Maintenance
AC Maintenance D-level
AC Maintenance I-level
* Ship Maintenance
Ship Hull Maintenance I_level
Ship Hull Maintenance D_level
Ship System Maintenance I_level
Ship System Maintenance D_level
A-school IA billets
A-school instructor billets
NEC training IA billets
NEC training instructor billets
Recruit training billets
Recruit training instructors
Transient billets
Health care billets
PPH billets

Show detail

* Run seperately

Report : Form

Data source
- ○ UICs
- ○ CA_Functions

Run report

Ensure no open reports

Activity BA
A-school IA billets
A-school instructor billets
NEC training IA billets
NEC training instructor billets
Recruit training billets
Recruit training instructors
Transient billets
Health care billets
PPH billets

Show detail

* Run seperately

CNA

This slide shows the output report options that are currently available in the Shore/Support Module. The screen on the left shows the options for the activity-defined component of the scenario. The screen on the right shows the options for the CA function area component of the scenario.[6] Users select reports that display manpower requirements for:

- Scenario activities or CA Function areas (*Activity BA*)
- Aircraft maintenance (*AC Maintenance D-level* and *AC Maintenance I-level*)
- Ship Hull Maintenance (*Ship Hull Maintenance I-level* and *Ship Hull Maintenance D-level*)
- Ship System Maintenance (*Ship System Maintenance I-level* and *Ship System Maintenance D-level)*
- Student billets (*A-school IA billets*, *NEC training IA billets*, and *Recruit training billets*)
- Instructor billets (*A-school instructor billets*, *NEC training instructor billets*, and *Recruit training instructors*)
- Transients, Patients, Prisoners, and Holdees billets (*Transient billets* and *PPH billets)*
- Health care services billets (*Health care billets*).

All reports display current year billet authorizations and manpower costs by manpower type (civilian and military), OEWC (officer, enlisted warrant, and civilian), rating/designator, and paygrade.

Users can display aggregated results for two or more areas simply by highlighting all the desired areas before clicking the *Run Report* button.

There are more output report options for aircraft and ship maintenance. To access these reports, select the report entitled **AC Maintenance* or **Ship Maintenance* and click the *Run Report* button. This will bring up another screen with more report options.

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[6] Because manpower requirements for maintenance activities depend on force structure units, these reports are not available for the CA function area scenario.

BAT Modules
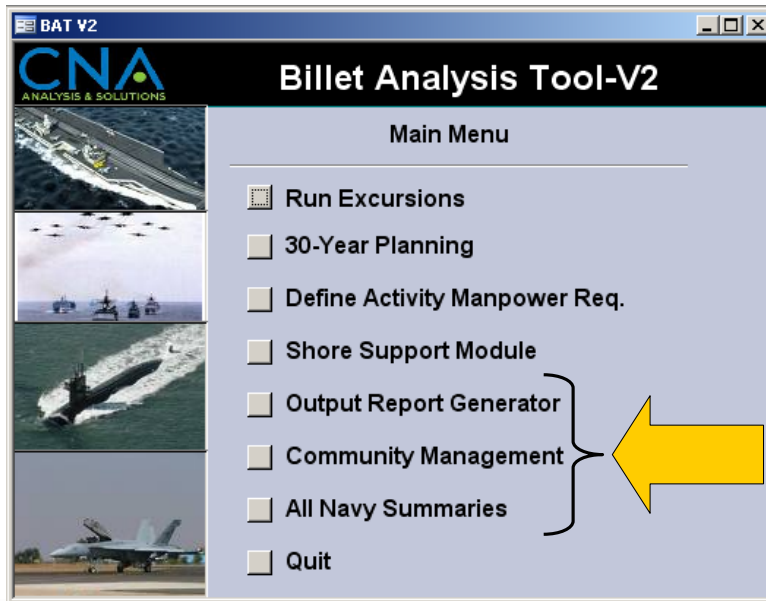
We now describe the Output Report Generator, the Community Management Module, and the All Navy Summary Module. The function of all these modules is to display the results of BAT calculations.

Output Report Generator

The Output Report Generator Module creates output tables that display the results of a user-defined scenario (from the Run Excursion Module) or the Navy's total manpower requirements. Users specify the output measures to display (billet data and/or costs), the time period (by fiscal years), and one or more billet descriptors that define the level of detail (or aggregation). The module uses this information to construct a query, which generates an output table that displays the results in data sheet format. Users can easily copy and paste data from these tables to *Excel* for further analysis and display.

To create a report, the user first selects the type of output: billet requirements or billet authorizations. Next, he/she selects whether to display results for the active scenario (by checking the Filter UICs box) or the entire Navy (by leaving the box unchecked).[7] The user then builds the output table by selecting data fields. The two types of fields are data descriptors and output measures. Data descriptors determine how to group and display the output measures. Output measures are manpower requirements (billet authorizations or requirements) or costs for a specified fiscal year. If the user selects more than one data descriptor field, the order of the selection determines the grouping hierarchy. For example, selecting rating, manpower type, and CFY—in that order—will produce a table that contains manpower requirements for the current fiscal year grouped first by rating and then, within each rating, by manpower type (Regular, FTS, SELRES).

In the example on this slide, the output report will display billet authorizations and associated costs for the active user-defined scenario in the Run Excursion Module. This report, which will include results for three fiscal years (CFY, FY+3, and FY+6), will display these results grouped first by OEWC, then by rating/designator, and within each rating, by paygrade.[8]

_____

[7] The default setting is for the active scenario.

[8] OEWC stands for officer, enlisted, warrant officer, and civilian.

Community Manager Module

- ➤ Generates reports of manpower requirements and costs for selected designators and/or ratings by fiscal year across FYDP

- ➤ Option to include requirements for platforms/activities in BAT but are not in TFMMS

- ➤ Report options:
  - – BA x UIC
  - – BA x PG
  - – Billet req. X UIC
  - – Billet req. X UIC
  - – NEC requirements
  - – Costs x PG
  - – Costs x UIC

The Community Management Module provides the capability to quickly display all Navy manpower requirements for a set of enlisted ratings and/or officer designators. To produce a report, the user selects one or more ratings and/or designators from a pull-down menu. The selected ratings and designators will appear in a text box to the right of the pull-down menu. Once all the ratings and designators of interest are selected, the user selects the type of output report from another pull-down menu. Report options include billet requirements and authorizations by paygrade or by UIC, manpower costs, and NEC requirements. As in the All Summary Report Modules, the user can choose to include manpower requirements for platforms/activities that were added to BAT but are not in TFMMS.

Community Manager Module - Output

MP Type	OEWC	Occ	EMC	EMC Name	PG	CFY_ Now	CFY	FY1	FY2	FY3	FY4
FTS	E	ET	CANRECR	CANVAS RECRUITER, RPN	E5	11	11	11	11	11	11
FTS	E	ET	CANRECR	CANVAS RECRUITER, RPN	E6	1	1	1	1	1	1
FTS	E	ET	ETSW	ELECTRONICS TECHNICIAN, SURFACE WARFARE	E3	12	12	12	12	12	12
FTS	E	ET	ETTAR	ELECTRONICS TECHNICIAN, TAR	E3	9	9	9	9	9	9
FTS	E	ET	ETTAR	ELECTRONICS TECHNICIAN, TAR	E4	28	25	23	23	23	19
FTS	E	ET	ETTAR	ELECTRONICS TECHNICIAN, TAR	E5	64	57	48	48	48	48
FTS	E	ET	ETTAR	ELECTRONICS TECHNICIAN, TAR	E6	66	65	66	63	63	62
FTS	E	ET	ETTAR	ELECTRONICS TECHNICIAN, TAR	E7	32	29	28	28	28	28
FTS	E	ET	ETTAR	ELECTRONICS TECHNICIAN, TAR	E8	5	5	4	4	4	4
FTS	E	ET	ETTAR	ELECTRONICS TECHNICIAN, TAR	E9	3	3	4	4	4	4
MPN	E	ET	ETNUCSS	ELECTRONIC'S TECHNICIAN, NUCPOW, SUBMARINE	E4	140	136	141	145	147	150
MPN	E	ET	ETNUCSS	ELECTRONIC'S TECHNICIAN, NUCPOW, SUBMARINE	E5	470	452	451	453	451	453
MPN	E	ET	ETNUCSS	ELECTRONIC'S TECHNICIAN, NUCPOW, SUBMARINE	E6	493	477	476	476	473	475
MPN	E	ET	ETNUCSS	ELECTRONIC'S TECHNICIAN, NUCPOW, SUBMARINE	E7	179	177	175	176	174	174
MPN	E	ET	ETNUCSS	ELECTRONIC'S TECHNICIAN, NUCPOW, SUBMARINE	E8	31	31	30	30	30	30
MPN	E	ET	ETNUCSS	ELECTRONIC'S TECHNICIAN, NUCPOW, SUBMARINE	E9	30	30	30	31	32	32
MPN	E	ET	ETNUCSW	ELECTRONIC'S TECHNICIAN, NUCPOW, SURF WARFARE	E4	49	49	49	49	49	49
MPN	E	ET	ETNUCSW	ELECTRONIC'S TECHNICIAN, NUCPOW, SURF WARFARE	E5	552	552	551	550	550	550
MPN	E	ET	ETNUCSW	ELECTRONIC'S TECHNICIAN, NUCPOW, SURF WARFARE	E6	283	283	282	281	281	281
MPN	E	ET	ETNUCSW	ELECTRONIC'S TECHNICIAN, NUCPOW, SURF WARFARE	E7	65	65	65	65	65	65
MPN	E	ET	ETNUCSW	ELECTRONIC'S TECHNICIAN, NUCPOW, SURF WARFARE	E8	23	23	23	23	23	23

CNA

This slide shows an example of an output report that was created by the Community Manager Module. In this case, the user selected a report for the ET rating that displays billets authorized by manpower type and paygrade across the FYDP. The output is displayed in a data sheet format that can easily be copied and pasted in *Excel* for further manipulation and display.

All Navy Summary Reports

➢ Generates summary reports of Navy's total manpower requirements and costs from CFY through the FYDP

➢ Option to include requirements for platforms/activities that were added to BAT but are not in TFMMS (future platforms and user-created requirements)

BAT.V2: All Navy Summary Reports

AllNAV Reports
- ○ Billet Authorizations x Manpower Category, OEWC, and FY
- ○ Billet Requirements x Manpower Category, OEWC, and FY
- ○ BA x Manpower Category, OEWC, Paygrade, and FY
- ○ Billet Req and BA x Rating/Desigator, PG, and FY
- ○ Manpower Costs for BA x Category, OEWC, and FY

DWNLD_DATE 03/2008

☐ Include manpower requirements for added UICs (i.e., not in

Generate Report

This module generates summary reports of Navy's total manpower requirements and costs by fiscal year from the CFY through the FYDP. Users select from a list of report options. They also select whether to include manpower requirements for platforms/activities that were added to BAT but are not in TFMMS (i.e., future platforms and user-created requiremients)

CNA

The Billet Analysis Tool provides additional data display capabilities through the All Navy Summary Report Module. This module offers quick access to summary reports of the Navy's total manpower requirements and costs by fiscal year from the current fiscal year (CFY) through all the years of the FYDP. These requirements can serve as a baseline when analyzing the manpower effects due to force structure changes. Users select from a list of report options that include data on billet authorizations, billet requirements, and manpower costs. The cost report is based on billet authorizations and N10's program manpower cost rates (i.e., cost rates by paygrade). Users also select whether to include manpower requirements for platforms/activities that were added to BAT but are not in TFMMS (i.e., future platforms and user-created UICs).

BAT V2 Management, Utility, and Road Ahead

➤ Model management
  – Data update and maintenance requirements

➤ Examples of BAT V2 utility
  – Manpower effects of force structure change
  – Forecasting future manpower requirements
  – Estimating enlisted training requirements
  – Effects of downsizing shore/support functions
  – Manpower effects of homeport changes

➤ Road Ahead
  – Implementation and test plan

CNA

We now turn to the final section of this report in which we discuss BAT's management requirements, walk through some examples that illustrate how this tool can be used to examine different types of manpower issues, and present a schedule to implement and field test this application.

Model Management: Data Sources/Update Rqmts.

BAT Data Sets & Source	**Management Requirements**
• Billet data: TFMMS	
– Military billet authorizations & requirements	Update monthly
– Civilian billets	
• Activity data: TFMMS	
• Enterprise data: N10	
• Activity categorizations: BAT managers	Update quarterly
• Manpower requirements for new platforms	
• Manpower cost rates	
– N10 POM/PR guidance	
• Maintenance requirements	
– VAMOSC/NAVINSTR	
• Student billets	Update annually
– Fill-rates: TFMMS/STF/EMR	
– Pipeline length: NITRAS	
• Transient and holdee billets	
– Overhead rate: TFMMS/EMR/OTF	
• Instructor requirements	
– NITRAS	

Shore/Support Module [1,2]

1. Most data sets supporting the Shore/Support Module can be modified in BAT
2. Health care data parameters calculated from TFMMS within BAT

CNA

BAT contains many data sets that support manpower requirements and cost calculations. To keep the application and its output relevant, these data sets need to reflect current data through periodic updates. This slide lists the main data sets in BAT along with the primary source(s) for these data. It also shows the management requirements in terms of how often we recommend updating each data set. From a management requirement, we divide the data sets into two groups: those that should be updated monthly and those that should be updated annually.

Nearly all the billet data come from TFMMS. The only exception is Enterprise data (maps each billet to an Enterprise), which come from N10's Intelligent Workbook. We developed a program that integrates Enterprise data with the TFMMS data during the monthly update process. (For billets in TFMMS that are not in the Enterprise data set, we assign an "Unknown" flag to this field.)

All activity-level data come from TFMMS except the categorization fields (category, subcategory, type). These need to be updated by the model manager.

The manpower cost rates that are used to calculate manpower costs come from N10's most recent POM/PR guidance. These data define cost rates by paygrade for enlisted, officer, and various civilian pay scales.

All the other data sets support calculations in the Shore/Support Module. These data come from a variety of sources. We feel that these data should be updated once a year to reflect the latest maintenance requirements, retention rates, and training pipelines. As discussed earlier, BAT allows the user to view and change most of these data.

Example 1: Determining Effects of Force Structure Change

> Task: Determine manpower effects of replacing 5 DDGs and 5 CGs with 10 DDXs
> Use Run Excursion Module

BAT V2 Scenario

Activity/UIC	Weight
DD X 2_UIC#20121	10
DDG 51 A BURKE_UIC#21487	-1
DDG 52 BARRY_UIC#21660	-1
DDG 53 J P JONES_UIC#21313	-1
DDG 54 C WILBUR_UIC#21640	-1
DDG 55 STOUT_UIC#21685	-1
CG 54 ANTIETAM_UIC#21387	-1
CG 55 LEYTE GULF_UIC#21388	-1
CG 56 SAN JACINT_UIC#21389	-1
CG 57 LAKE CHAMP_UIC#21428	-1
CG 58 PHILIP SEA_UIC#21429	-1

BAT V2 Output

Paygrade	BA	Costs	NEC Req.
E3	-383	-$15,683,615	-66
E4	-648	-$33,618,453	-545
E5	-452	-$29,920,954	-690
E6	-149	-$12,047,123	-254
E7	+1	+$96,265	-84
E8	-40	-$4,337,936	-57
E9	-20	-$2,609,560	-40
Total	-1,691	-$98,121,376	-1736

Paygrade	BA	Costs	AQD Req.
O1	-90	-$6,856,104	-15
O2	+15	+$1,473,094	0
O3	-5	-$599,812	-21
O4	-12	-$1,744,084	-20
O5	0	$0,000	-5
O6	-5	-$1,004,927	-5
W2	0	$0,000	0
W3	-10	-$1,265,972	-5
Total	-107	-$9,997,805	-71

CNA

In this first example, we illustrate the utility of the enhanced BAT by using it to examine how force structure changes affect manpower requirements and costs. The tasking was to determine the manpower effects of replacing five guided missile destroyers of the Arleigh Burke class (DDG-51) and five Aegis cruisers of the Antietam class (CG-54) with ten destroyers of the next generation DD(X) destroyer program. More specifically, we want to know the net change in billet authorizations by paygrade and in skill subspecialties as defined by total enlisted NEC and officer AQD requirements.

Because the manpower requirements for each of these ship classes resides in TFMMS and because we are interested in NEC and AQD requirements in addition to billet counts, we used the Run Excursion Module to address this task.

The table on the left of the slide shows the scenario that we entered in the Run Excursion Module. Because TFMMS contains manpower requirements for only the first two DDX platforms, we selected one of these UICs and entered a weighting factor of 10 to represent manpower requirements for ten platforms. Also note that, because we are interested in the net change in billet requirements, we entered the DDX platforms as additions (+) and the DDG and CG platforms as deletions (-).

The two tables on the right show the BAT output. For enlisted personnel (upper table), the scenario results in a decrease of 1,691 billet authorizations at a savings of just over $98 million (based on FY+5 programming cost rates) and a decrease of 1,736 NEC requirements. For officers (lower table), the net change is a decrease of 107 billets at a savings of almost $10 million and a net decrease of 71 AQD requirements.

Example 2: Forecasting Future Requirements

> Task: Project requirements to man the carrier force over the next 25 years
> Use 30-Year Planning Module

BAT V2 Scenario

Activity/UIC	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20
CV 63 KITTY HAWK_UIC#03363	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
CVN 65 ENTERPRIS_UIC#03365	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CVN 71 T ROOSEVE_UIC#21247	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CVN 75 H TRUMAN_UIC#21853	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CVN-76 REAGAN_UIC#22178	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CVN 72 LINCOLN_UIC#21297	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CVN 73 GEO WASH_UIC#21412	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CVN 68 NIMITZ_UIC#03368	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
CVN 74 J STENNIS_UIC#21847	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CVN 69 EISENHOWE_UIC#03369	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
CVN 70 VINSON_UIC#20993	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
_CVN21_UIC#_CVN21	0	0	0	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3	4
Total # CVNs	11	11	10	10	10	10	10	10	10	10	11	11	10	11	11	11	11	11	11	11

CNA

In our second example, we illustrate BAT's ability to forecast future manpower requirements. Here, the task was to forecast enlisted manpower requirements for the carrier force over the next 20 years. Because this task involves manpower requirements beyond the FYDP, we used the 30-Year Planning Module.

The table on this slide shows the scenario that we entered in the 30-Year Planning Module. It contains all the current aircraft carriers and the next-generation carrier known as CVN-21.

We present the results in the next slide.

Example 2: Forecasting Future Requirements (cont.)

BAT V2 output from 30-Year Planning Module
- Aggregate level requirements
  - Officer
  - Enlisted
  - Civilian
- Detailed level requirements
  - Rating & paygrade
  - EMC & paygrade

Total Enlisted BA

Nuclear Machinist Mate BA

CNA
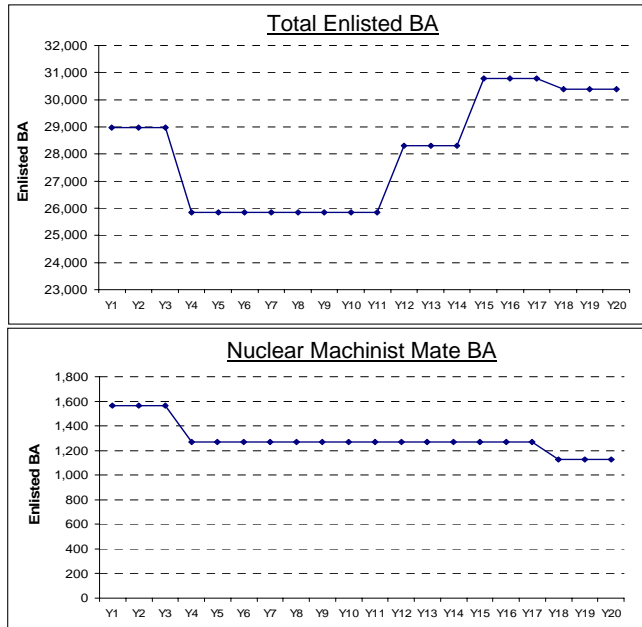
This slide shows the results for our forecasting future requirements example. We used data in BAT output reports to construct two charts. The top chart shows total enlisted billet authorizations for the carrier fleet by fiscal year. Over this time period, BA varies from a low of just under 26,000 to a high of almost 31,000. The bottom chart shows BA for nuclear machinist mates. Billet requirements for this community follow a different pattern as the older carriers (which required more MM-NFs) are decommissioned and replaced by the next-generation carriers.

Example 3: Estimate Training Requirements

> Task: Estimate the annual enlisted training costs (i.e., student training time) to sustain all Active Component F/A-18 squadrons (including FRS)
> Use Shore/Support Module

BAT V2 Scenario

Activity/UIC	Activity/UIC
+1 | VFA 102_UIC#09717	+1 | VFA 154_UIC#09678
+1 | VFA 105_UIC#65183	+1 | VFA 192_UIC#09076
+1 | VFA 106 E/F DET_UIC#4544A	+1 | VFA 195_UIC#09706
+1 | VFA 106_UIC#09679	+1 | VFA 2_UIC#09113
+1 | VFA 113_UIC#09092	+1 | VFA 22_UIC#09561
+1 | VFA 115_UIC#09604	+1 | VFA 25_UIC#09637
+1 | VFA 122_UIC#09355	+1 | VFA 25_UIC#09637
+1 | VFA 125_UIC#09485	+1 | VFA 27_UIC#65185
+1 | VFA 131_UIC#63934	+1 | VFA 34_UIC#09070
+1 | VFA 136_UIC#55141	+1 | VFA 37_UIC#09478
+1 | VFA 137_UIC#55142	+1 | VFA 41_UIC#09774
+1 | VFA 14_UIC#09084	+1 | VFA 81_UIC#09221
+1 | VFA 146_UIC#09063	+1 | VFA 83_UIC#09223
+1 | VFA 147_UIC#63925	+1 | VFA 86_UIC#09943
+1 | VFA 15_UIC#09015	+1 | VFA 87_UIC#63922
+1 | VFA 151_UIC#09558	+1 | VFA 94_UIC#09295
	+1 | VFA 97_UIC#63923

Rating	BA
AM	1,292
AO	1,100
AD	912
AT	872
AE	651
AME	494
SK	354
AZ	315
AN	198
PR	191
YN	175
CS	92
PS	90
IT	65
IS	64
MA	51
HM	36
NC	35
CMD	32
AF	29
SH	28
Other	14
Total	7,090

BAT V2 Output

Training	Student BA	Costs
A-school	74	$2,598,406
NEC	83	$4,890,110
Recruit	116	$4,099,813
Total	273	$11,588,329

CNA

In this third example, we use BAT to estimate the annual enlisted training costs (for student training time) to sustain all Active Component F/A-18 squadrons, including both Fleet Replacement Squadrons (FRSs).[9] We used the Shore/Support Module to estimate these requirements.

The table on the left shows our scenario. It consists of 31 active component F/A-18 squadrons and two F/A-18 FRSs. The middle table shows the current year enlisted billet authorizations, by rating, for all these squadrons (total of 7,090 billets). The table to the right shows BAT's estimate of the average annual training costs to prepare Sailors to fill these billets. Training costs are defined in terms of student billets and the costs of these billets in current-year dollars.

Results show that A-school training requires about 74 student billets at a cost of nearly $2.6 million. NEC training requires about 83 student billets at a cost of almost $4.9 million. The higher cost for NEC training reflects the more senior paygrade distribution for these student billets. Recruit training requires about 116 student billets at a cost of about $4.1 million. Thus, the total average enlisted training cost to support F/A-18 squadrons is about 273 student billets and almost $11.6 million.

_____

[9] In the example, we define training costs as the time students are in either NEC training schools, A-school training schools, or recruit training. BAT can also provide estimates of the instructor requirements for this training.

Example 4: Changing Levels of Shore/Support Function

➤ Task: Determine how a 15% cut in the shore/support Force Protection work function areas affects military and civilian manpower requirements and costs
➤ Use Shore Work Function Analysis Module

In this example, we illustrate the utility of the Enhanced BAT to study shore manpower requirements. The issue at hand was to determine the manpower reductions and savings that would results from a 15-percent reduction in the Navy's shore/support Force Protection work function areas. Because Force Protection is a subgroup within the hierarchical structure of work functions as defined by the Commercial Activity function codes, we used the Shore Work Function Analysis Module (within the Shore/Support Module) to answer this question.

To define the scenario, we first used the filter function to display all the CA function work areas that belong to the Force Protection subgroup. (Force Protection is a subgroup of the Installation/Facility Management & Physical Security group.) After selecting all these work areas, we applied a 0.15 weighting factor to each area to represent a 15-percent reduction in both military and civilian billets.

This slide shows the Shore Work Function Module interface with the scenario that we just described. The interface also shows the current number of military (active duty and reserve) and civilian billets (including contractor billets) for each work function area (as defined in TFMMS) and the total number of billets that represent a 15-percent reduction.

To examine these reductions in more detail, we saved this output (click the Save Output button) and returned to the Shore/Support Module main menu page to use the output report options. We discuss these results on the next slide.

Example 4: Changing Levels of Shore/Support Function (cont.)

Task: Determine how a 15% cut in the shore/support Force Protection work function areas affects military and civilian manpower requirements and costs

BAT V2 Output:

Billet & Cost Reduction

OEWC	Billets	Costs
Civilian	725	$46,713,422
Enlisted	1,277	$69,656,727
Officer	38	$3,755,155
Warrant	3	$273,811
Total	2,039	$120,399,115

Top Officer Designators

Rating	BA
LDO- General	19
URL- any	4
URL- any warfare spec	2

Top Civilian Occupations

Occupation	BA
Police	372
Security Administration	111
Security Guard	101
Security Clerical and Assistance	37
Miscellaneous Clerk and Assistant	17
Miscellaneous Administration and Program	13

Top Enlisted Ratings

Rating	BA
MA	1,051
BM	26
YN	25
EN	18
GM	15

CNA

Using the report option—Activity BA—which is available within the Shore/Support Module, we generated an output report that shows the results for our Force Protection scenario at a more detailed level. This report displays billet authorizations and costs by (1) manpower type (i.e., Civilian, MPN, and RPN), (2) OEWC (i.e., Officer, Enlisted, Warrant Officer, and Civilian), (3) rating, designator, or occupation, and (4) paygrade.

From this report, we generated the data for the tables on this slide. The first table shows the billet and cost reductions for civilians, enlisted personnel, officers, and warrant officers. The overall reduction for government civilian and active duty military was 2,039 billets at a savings of just over $120 million. We also show the civilian occupations, enlisted ratings, and officer designators with the most billet reductions. As expected, the largest reductions were in the civilian police occupation and the Master-at-Arms (MA) rating.

In this last example, we illustrate BAT's ability to examine geostability issues that result from relocating force structure units and/or shore activities. The task was to determine the effects on geostability opportunities in the Mayport/Jacksonville Fleet Concentration Area (FCA) that would results from relocating five Aegis class cruisers from Norfolk, VA, to Mayport, FL.

In working this task, we used BAT's Run Excursion and Define Activity Manpower Requirements Modules. First, we used the Run Excursion Module to determine enlisted manpower requirements, by sea and shore duty, for the Mayport/Jacksonville FCA before the move. To define this scenario, we simply filtered the list of activities by location—filtering first on Mayport and adding all these activities to the scenario, then filtering on Jacksonville and adding those activities to the scenario.

Next, we used the Define Activity Manpower Requirements Module to define new activities (i.e., UICs) for five cruisers currently homeported in Norfolk, VA. (The actual ships we selected are listed on the slide.) In defining these new activities, we only edited the activity-level data by changing the location from Norfolk, VA, to Mayport, FL. We then used the Run Excursion Module to determine enlisted billet requirements for the Mayport/Jacksonville FCA after the move. We followed the same filtering procedure in defining the scenario, only this time the activity listing for Mayport included the five new cruiser UICs.

We present the results in the next slide.

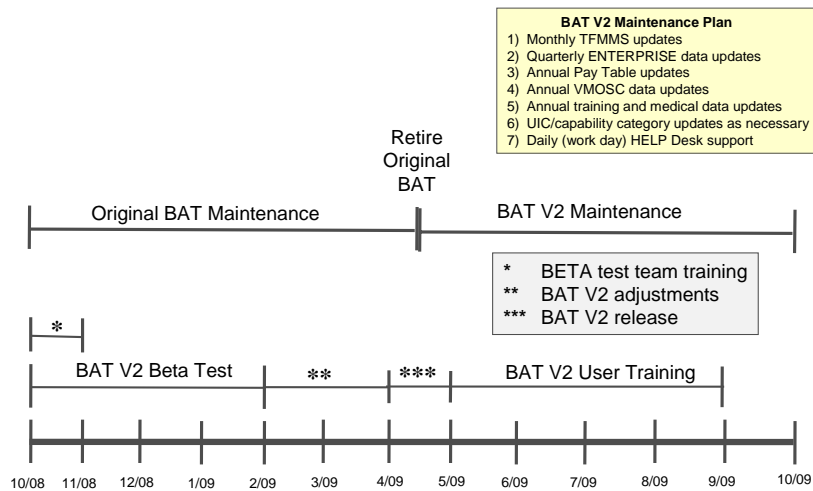## Example 5: How Homeport Changes Affect Geostability Opportunities (cont.)

- ➤ Task: Determine the effects of relocating 5 Aegis cruisers from Norfolk, VA, to Mayport, FL
- ➤ Used the Define Activity Manpower Requirements and Run Excursion Modules
- ➤ BAT output shows BA in the Mayport and Jacksonville areas before and after relocating 5 CGs from Norfolk
- ➤ Can use these data to determine effects on geostability opportunities in Mayport/Jax FCA

CNA

Rating	Before Move			After Move		
	BA Sea	BA Shore	Sea:Shore	BA Sea	BA Shore	Sea:Shore
FC	418	48	8.7	633	48	13.2
OS	466	102	4.6	606	102	5.9
SN	452	1	452.0	570	1	570.0
GSM	308	34	9.1	404	34	11.9
ET	221	125	1.8	303	125	2.4
STG	260	33	7.9	340	33	10.3
GM	195	84	2.3	272	84	3.2
IT	247	116	2.1	317	116	2.7
CS	243	147	1.7	311	147	2.1
EN	181	60	3.0	242	60	4.0
SK	255	255	1.0	311	255	1.2
DC	132	59	2.2	182	59	3.1
BM	204	108	1.9	243	108	2.3
CTT	109	21	5.2	145	21	6.9
GSE	118	15	7.9	153	15	10.2
QM	113	40	2.8	148	40	3.7
EM	117	52	2.3	151	52	2.9
CTR	36	7	5.1	66	7	9.4
SH	112	38	2.9	142	38	3.7

This slide shows our results. The table shows sea duty and shore duty billet authorizations, by rating, for the Mayport/ Jacksonville FCA both before and after relocating five cruisers from Norfolk, VA. The table also shows the ratio of sea to shore billets for each scenario. We could also generate these results at the rating/paygrade level.

Proposed POAM For BAT V2 Release*

BAT V2 Maintenance Plan
1) Monthly TFMMS updates
2) Quarterly ENTERPRISE data updates
3) Annual Pay Table updates
4) Annual VMOSC data updates
5) Annual training and medical data updates
6) UIC/capability category updates as necessary
7) Daily (work day) HELP Desk support

Retire Original BAT

Original BAT Maintenance   BAT V2 Maintenance

*   BETA test team training
**   BAT V2 adjustments
*** BAT V2 release

*

BAT V2 Beta Test   **   ***   BAT V2 User Training

10/08   11/08   12/08   1/09   2/09   3/09   4/09   5/09   6/09   7/09   8/09   9/09   10/09

* Timeline based on proposal developed by Whitney, Bradley and Brown

CNA

This slide lays out a proposed POAM for testing and releasing the Enhanced BAT. The schedule calls for a four-month Beta Test phase during which we allow selected users to test the tool. During this time, we would offer training to these users and collect their feedback. Following this phase, there would be a two-month period to make necessary adjustments based on the feedback we collected. Once the adjustments are completed, we would officially release BAT V2 to all users within the N1 domain. We would also offer training to any user at this time.

We recommend that we keep the Original BAT operational until BAT V2 is officially released.