

Billet Analysis Tool Development: Shore/Support Manpower Requirements Module

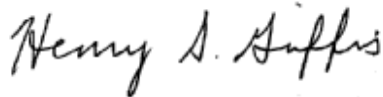
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A handwritten signature in black ink that reads "Henry S. Griffis". The signature is written in a cursive style with a clear, legible font.

Henry S. Griffis, Director
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Outline

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This annotated briefing describes development of the Billet Analysis Tool's Shore/Support Module, which CNA developed under the World Class Modeling (WCM) program for the Director of Total Force Programming and Manpower (N12). The report comprises five sections. The first discusses the reasons for this study and outlines the tasks and objectives. It also provides a brief review of the current BAT. The next section reviews our analytical approach and the criteria that we used to determine which functional work areas to study. The third section describes the force-structure-to-shore-manpower relationships that we developed for the main functional areas: individuals account, training and education, maintenance, and health care. The fourth section gives a brief overview on how to use the Shore/Support Module¹. The last section discusses what lies ahead for the shore/support module in next phase of BAT development.

1. A more in-depth users guide for the entire suite of BAT modules will be produced in the next phase of BAT development.

Background



- Rising manpower costs & declining endstrength authorizations have elevated importance of total manpower requirements and costs in assessing force structure alternatives
- Current assessments look only at manpower requirements of force structure units
 - E.g., if the Navy decommissions four destroyers, billets on the ships go away
 - Current BAT supports this analysis
- Need to assess the manpower effects of force structure changes within the shore infrastructure
 - E.g., if the Navy decommissions four destroyers, where should shore manpower requirements decrease and by how much?
 - Module to augment BAT

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.

To help manpower analysts extend their study of manpower requirements into the shore infrastructure when assessing the effects of force structure changes, N12 asked CNA to examine manpower relationships between the force structure and shore infrastructure and, where feasible, incorporate these relationships into the Billet Analysis Tool.

Before describing the study objectives and tasks, we give a brief overview of the current Billet Analysis Tool.¹

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

Billet Analysis Tool (BAT)

- Microsoft Access desktop application
- Enables manpower analysts to quickly analyze, manipulate, and review manpower requirements
- Outputs:
 - Billets: requirements & authorizations
 - Costs: program & composite rates
- Groupings/descriptors:
 - Appropriation: MPN, RPN, Civ
 - Active, FTS, SELRES, Civ
 - Rating/designator and paygrade
 - Management community
 - Enterprise
 - IGCA categories

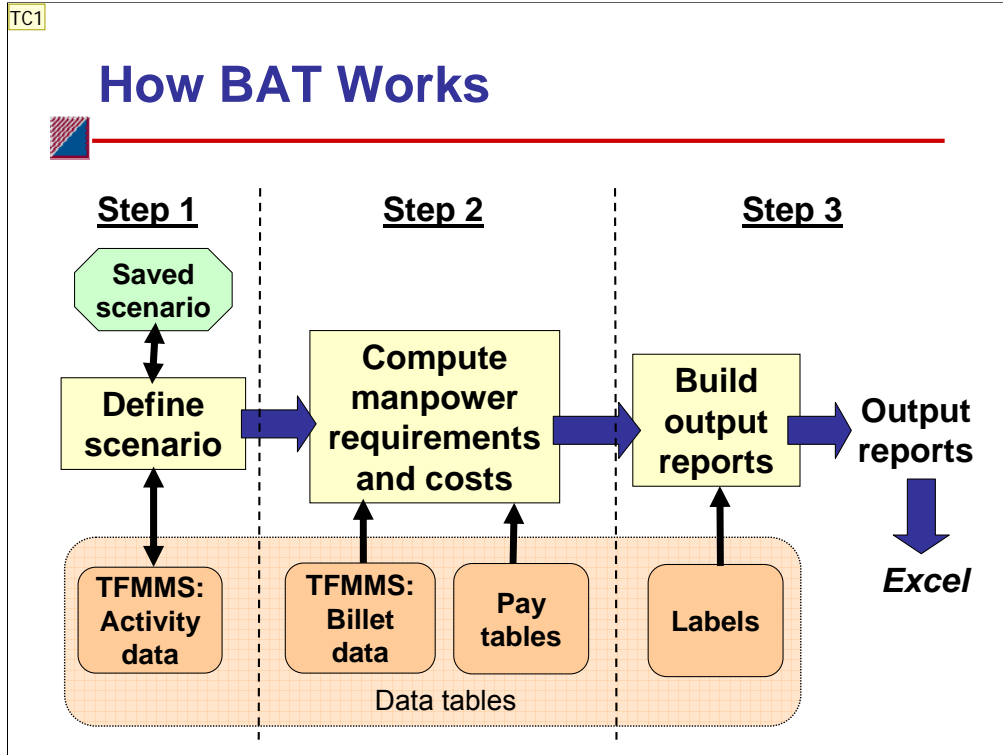


BAT is a *Microsoft Access* application that CNA developed to enable manpower analysts to quickly analyze, manipulate, and review manpower requirements data in the Total Force Manpower Management System (TFMMS). It can aggregate and display manpower results at various levels of detail down to the rating/designator and paygrade levels. BAT also calculates the cost of manpower requirements using both programming and composite manpower cost rates.

BAT computes two basic output measures: manpower requirements and the costs of these requirements. 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 tool computes two sets of costs—one based on manpower programming rates and one on manpower composite rates. Costs are calculated for both billet requirements and billet authorizations.

The tool provides the capability to group and display these measures at several levels of detail and by many descriptors. High-level groupings include those by appropriation category (active, reserve, and civilian), manpower category (active duty, full-time support (FTS), Selected Reserve (SELRES), and civilian), and manpower type (enlisted, officer, warrant officer, and civilian). More detailed breakouts include those by rating, paygrade, management community, and Navy Enlisted Classification (NEC) for enlisted requirements and by designator and paygrade for officer requirements. Community managers can use these detailed breakouts to see if manpower changes adversely affect their community paygrade structures. BAT can also display manpower requirements and costs by Enterprise and Inherently Governmental and Commercial Activity (IGCA) categories.

In addition, because BAT can include manpower requirements for future platforms (e.g., CVN-21, DDX), it can be used to study manpower requirements beyond the FYDP and to identify potential manpower issues that should be considered in developing future force structure procurement and decommissioning plans.



This slide illustrates how the Billet Analysis Tool 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 (UIC) 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 net¹ manpower requirements and costs for the scenario. Third, the user selects one of the “canned” output reports or uses the report generator to construct a custom output report. Options include both formatted reports and data sheet (spreadsheet format) output. The latter can easily be copied and pasted into a Microsoft Excel spreadsheet for further analysis and display.

The shore/support module uses output from BAT in its computations. It uses the scenario information, which defines the change in number and type of platforms (i.e., ships, subs, and aviation squadrons), and it uses the billet requirements on these selected operating units.

¹ 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 LCS ships).

Study Tasks and Approach



- Identify functional areas to study relationships between force structure and shore infrastructure manpower
 - Group Navy's shore activities into functional areas
 - Focus on areas with large manpower requirements
- Develop high-level relationships that tie shore manpower requirements to workload to force structure
 - Process analysis
 - Planning factors
 - Historic manpower relationships
- Incorporate relationships into BAT

Assumption: current manpower requirements are valid

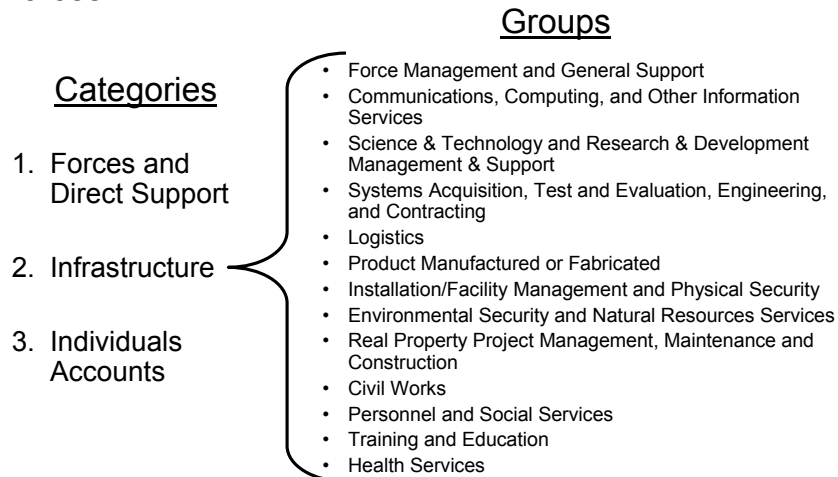
We organized our work into three main tasks. The first was to identify the functional areas on which to focus our efforts to develop relationships between force structure and shore/support manpower. Areas of interest are those that provide direct support to operational forces and have significant manpower requirements.

Once we identified candidate areas, the second task was to develop relationships that tie shore manpower requirements to some measure of workload that, in turn, can be tied to the size and composition of the force structure. The goal was to develop high-level relationships that will provide reasonable estimates of the impact of force structure changes on shore manpower requirements. The third task was to incorporate these relationships into the billet analysis computer tool.

A fundamental assumption underlying all our work is that the current manpower requirements, as programmed in TFMMS, are valid. This study is not about validating current shore manpower requirements. Rather, it looks at relationships between current shore manpower requirements and the size and composition of the force structure. Furthermore, these relationships are based on the current distribution of work between military personnel, government civilians, and contractors.

Inherently Governmental & Commercial Activity (IG&CA) Function Codes

IGCA function codes identify the type of work performed by activities in the Navy infrastructure and operating forces



To segment the Navy's shore/support universe into functional work areas, we used the IGCA function codes. These codes, which exist in the TFMMS, identify the type of work associated with every military and government civilian billet in the Navy's infrastructure and operating forces.¹ 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, and these subgroups are further segmented into functions. The *Infrastructure* category currently includes 13 functional groups (listed in slide), 43 subgroups, and 332 functions. See the appendix for the complete CA function code structure.

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.²

Although we relied on the CA function codes to segment the Navy's workforce, we discovered that this coding can be subjective because it is left up to individual commands to code their own billets. For example, CA function codes J501 and J502 represent intermediate maintenance work for aircraft and aircraft engines, respectively. In FY07, there were 4,740 military and 183 civilian billets coded to these functions. When we looked at billets for aviation intermediate maintenance activities (AIMDs), however, we noticed that all billets at CINCLANTFLT AIMDs map to these functions, but those at west coast AIMDs were split between maintenance functions and the direct combat support category. If the Navy relies on these codes when assessing its manpower needs by the type of work performed or to identify billets for possible military to civilian conversion, there needs to be more discipline and supervision in coding billets.

¹ IGCA code references can be found at the Navy's Competitive Sourcing website (<https://competitivesourcing.navy.mil>)

² We identify IA billets using the 10-digit activity code. Codes that begin with 0022 indicate UICs for transient, patient, prisoner, and holdee (TPPH) billets, and those that begin with 7000 are student billets.

CA Work Function Areas With Largest Manpower Requirements



CA Sub Group	Description	Total Manning ¹	Share of Total	Military Composition	Civilian Composition	
15A	Expeditionary Force Defense	228,709	36.2%	98.0%	2.0%	
Shore/support infrastructure	5B	Maintenance	53,401	8.3%	26.0%	74.0%
	IA	Individuals Account	52,886	8.6%	100.0%	0.0%
	13A	Health Services	27,725	4.4%	79.4%	20.5%
	12A	Military Education & Training	24,810	3.9%	76.7%	23.3%

1. FY07 Data

Focused our efforts on these four functional areas

Our first task was to identify which functional areas within the shore/support infrastructure to examine. We looked for areas with large manpower requirements where we could relate workload to the size and composition of the operating force. This slide shows the CA work function areas with the largest manpower requirements. It shows total manning (which includes military and government civilian billets), the share of the Navy's total manpower requirement, and the percentages that are military and civilian. The largest subgroup, Expeditionary Force Defense, represents the operational forces. Within the shore/support infrastructure, the largest areas, in decreasing order of size, are maintenance, individuals account, health services, and military education and training.

For each of these areas, we made a preliminary assessment as to whether the manpower levels were tied, at least in part, to the size and composition of the force structure. For maintenance, we felt that the workload is tied to the number of ships, submarines, and aircraft. The individuals account and military education and training are related to the number of military billets and their required skill sets and training tracks. Although part of the health service force is tied to the Navy's medical mission, we felt that part was tied to providing medical care to Servicemembers and their dependents (and thus to the size of the fleet). Consequently, we decided to focus our efforts on these four functional areas.

What the Tool Will Calculate



- Individuals account
 - Enlisted student billet requirements
 - A-school training
 - C-school training
 - Recruit training
 - TPPH requirements (officer and enlisted)
- Maintenance
 - Vessel & shipboard systems I- & D-level billet req.
 - Aircraft I- & D-level billet req.
- Training and education
 - Instructor billet requirements (A- & C-schools)
- Health care service
 - Nonmobilization billet requirements

After examining each of these areas down to the function level, we chose to develop relationships for the following areas. In the individuals account, we develop relationships to estimate enlisted student billet requirements and officer and enlisted billet requirements for transients, patients, prisoners, and holdees. For enlisted student billets, we tie changes in fleet billet requirements to changes in student throughput in A-school training, C-school (i.e., NEC) training, and Recruit training. For maintenance, we developed relationships to estimate changes in intermediate and depot-level maintenance that should result from changes in the number of vessels, shipboard systems, and aircraft. In the area of military training and education, we estimate the effects of force structure change on instructor billet requirements for A-school, C-school, and Recruit training. For health care services, we estimate billet requirements for the component of the shore medical force that is not directly tied to wartime/contingency mobilization requirements.

Next, we turn our attention to developing force-structure-to-shore-manpower relationships for each of these areas.

Developing Relationships



- Develop high-level relationships that tie shore manpower requirements to workload to force structure
 - Supply chain analysis
 - Budget planning factors
 - Current manning ratios
- Assumption: current manpower requirements are valid
- Trade off between level of detail and ability to update parameters

In developing high-level relationships that tie shore manpower requirements to force structure, we used several different techniques. Where possible, our preferred technique was to base shore manpower requirements on the workload that is required to support fleet units. For some work areas (e.g., maintenance), we tie this workload directly to the platform, so increasing/decreasing the number of platforms will increase/decrease the workload at shore/support activities performing this work. For other areas (e.g., schoolhouse training), we tie the workload to billets on these units. So adding/deleting units will increase/decrease billet requirements, which, in turn, will increase/decrease the workload at the shore/support activities that perform these functions.

For work function areas where we could not easily define workload or tie workload to shore manpower requirements, we developed relationships based on current or historic ratios of current manpower requirements to either total Navy endstrength or the size of the operating force. Implicit in this approach is the assumption that we discussed earlier: we assume that current manpower requirements are valid.

In developing these relationships, we also weighed the level of detail of the calculations against the added gain from including more details and the workload that would be required to update the data parameters. In general, we chose to keep the calculations at a high level that would provide reasonable estimates but would not require extensive work to update the parameters. As we describe each relationships in the next section, we will point out these tradeoffs.

Individuals Account (IA)



➤ Enlisted student billets

- Enlisted initial entry training includes recruit training, initial skills training, and other proficiency or development training accomplished before travel to the member's first permanent duty assignment
- All active military personnel who are attending non-initial entry course of instruction in a PCS status (> 20 weeks) or in a temporary duty status while executing a PCS

➤ TPPH billets

- Transients: Servicemembers not available for duty while executing PCS orders or during a no-cost move because of leave or temporary duty en route
- Patients, prisoners, and holdees (PPH)

Paygrade	Student Billets	Transient Billets
E-1	6,717	-
E-2	-	-
E-3	12,342	4,976
E-4	6,235	1,976
E-5	2,617	1,993
E-6	2,346	1,599
E-7	414	629
E-8	89	180
E-9	8	60
Total	30,768	11,413

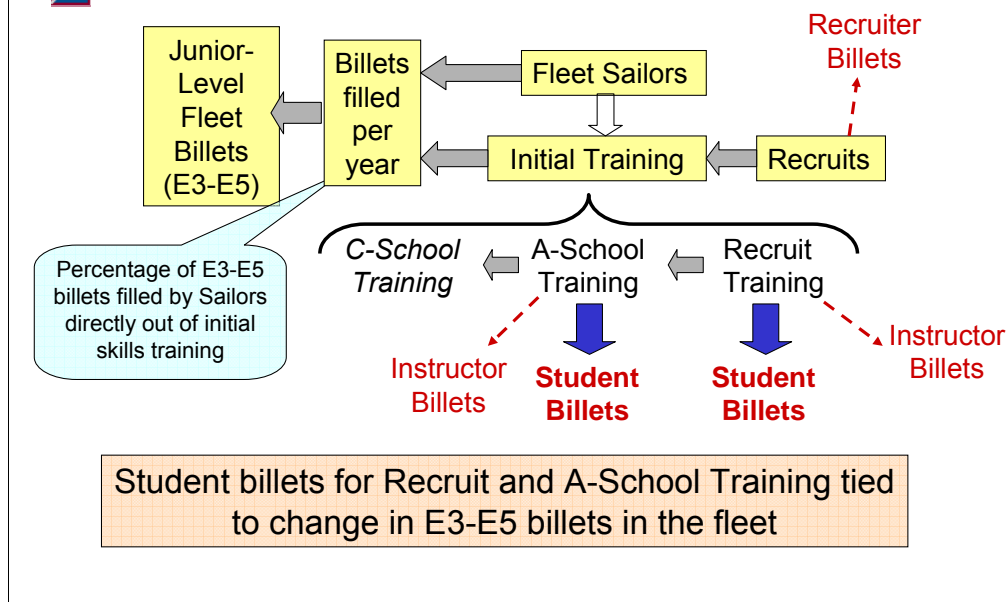
FY05 data

The first area we examined was the Navy's IA. This personnel overhead account comprises a student account and an account for transients, patients, prisoners, and holdees (TPPH). The student account is by far the largest with over 30,700 enlisted billets in FY05. On the enlisted side, most students billets represent Servicemembers who are in initial entry training. This includes recruit training, initial skills (or A-school) training, and other proficiency or development training that occurs before the first permanent duty assignment. Student billets also represent Servicemembers who are attending non-initial entry course of instruction in a Permanent-Change-of-Station (PCS) status (i.e., greater than 20 weeks) or in a temporary duty status while executing a PCS move. In most cases, these students are in training to earn an NEC.

The largest component of the TPPH account is billets for transient personnel. These billets account for military members who are not available for duty while executing PCS orders. This includes all military personnel who are in travel, proceed, leave en route, or temporary duty en route status on PCS orders while executing an accession, separation, training, operational, or rotation move. It also includes personnel who are not available for duty during a no-cost move due to leave or temporary duty en route. Transients do not, however, include military members who are on temporary duty for training en route to a new permanent duty station (they are counted as students), who are moving to or between initial entry courses of instruction, or who are participating in an organized unit move.

Patients are Servicemembers who (a) are assigned for medical treatment to a Navy medical facility for greater than 90 days, or for greater than 30 days if the treatment is for an injury sustained in a combat area, or (b) are undergoing treatment at a non-Navy medical facility. Prisoners are Servicemembers who are held in Navy disciplinary facilities for greater than 30 days but less than 6 months. Holdees are Servicemembers who are assigned to separation activities for out-processing or administrative discharge.

Enlisted Student Billets: Recruit and A-School Training Model



This slide illustrates the conceptual model that we used to estimate student billet requirements for A-school and Recruit training. At the most basic level, it ties the requirement for A-school training graduates to the number of junior-level (i.e., paygrades E-3 to E-5) fleet billets since these are the billets that graduates from initial training fill during their first fleet tour. The number of student billets required to support this training depends on the number of students that need to be trained each year and length of training. Because training pipelines differ by enlisted community, we calculate A-school billet requirements separately for each enlisted management community (EMC).

Most students attending A-school training come directly from Recruit training. Therefore, to estimate the requirement for Recruit training, we sum the A-school training requirements over all EMCs. (For modeling purposes, we consider apprentice training for GENDET accessions as A-school training.) We then factor in the length of recruit training to determine student billet requirements.

This slide also shows that we can use this model as the basis for estimating instructor requirements at A-school and Recruit training, relating the change in instructors to the change in student throughput. We can even tie the change in recruit training to a change in accession plan and ultimately to the number of recruiters.

Next, we discuss these calculations in more detail and describe how we compiled the required data parameters.

Calculating Student Billets for A-School Training

1. From BAT output, sum junior-level (E3 – E5) billets for each EMC
2. Estimate A-school training throughput to support billets from Step 1
 - Define fill rate as annual fleet arrivals/billet requirements
 - Compiled rate for each EMC using CNA's STF database & TFMMS

$$A_School_TP = \Delta Junior_BA \times Fill_Rate$$

3. Calculate student training days
 - Training pipeline length in UI days
 - Not-under-instruction time factor from CeTARs data

$$Student_Days = A_School_TP \times UI_Days \times NUI_Factor$$

4. Convert student days to student billets

$$Student_Billets = Student_Days / Student\ Days\ per\ Billet$$

To calculate student billets for A-school training, the tool starts with output from the original BAT. It sums junior-level billet requirements for each EMC and estimates the annual student throughput requirement for each training pipeline by multiplying the billet requirement by a fill rate—the percentage of junior paygrade billets that are filled each year by Sailors directly out of initial training.

Fill rate is the key parameter in this relationship. We compiled this rate by tracking the number of Sailors that enter the fleet for the first time each year relative to the number of junior-level fleet billets. CNA's Street-to-Fleet (STF) database tracks enlisted Servicemembers from the time they enter the Navy until their first duty assignment in the fleet. Thus, we compiled, for each EMC, the number of Sailors that enter the fleet each year. We also compiled from TFMMS the total number of junior-level fleet (i.e., non-IA) billets for each EMC. We then set the fill rate equal to the ratio of fleet arrivals over fleet junior-level billets. Some EMCs only have billets in senior paygrades and thus do not directly affect A-school training.

The third step is to calculate student training days. To do this, we multiply the student throughput (from step 2) by the length of training. Total training time consists of under-instruction (UI) time and not-under-instruction (NUI) time. For our purposes, we set UI time equal to the number of UI days in the training pipeline. (We realize the average UI days per graduate is higher as it accounts for student who fail or drop out for academic and nonacademic reasons and for students who are set back and take longer to complete the course.) The NUI factor represents the amount of NUI time based on a percentage of pipeline length. For example, the training pipeline for ADs is 22 weeks. In FY06, NUI time increased the total time to training by 15 percent. Thus, on average, the student spent 22×1.15 weeks in training. The last step is to convert student days to student billets. This is done by converting student days to student man-years using a factor of 350 days per year.

The shore/support module will include an interface that will allow users to view and, if desired, change the data parameters that are used in these calculations. For example, they could change the NUI factor to examine its effects on student billet requirements. The program keeps a copy of the original values, should the user want to reset these values.

Calculating Student Billet Requirements for Recruit Training

- Student throughput
 - Equals the sum of A-school throughput over all EMCs
- Length of training
 - *Under-instruction time*
 - *Not-under-instruction factor*
- Computations:

$$Student_Days = \sum A_School_TP(EMC) \times UI_Days \times NUI_Factor$$

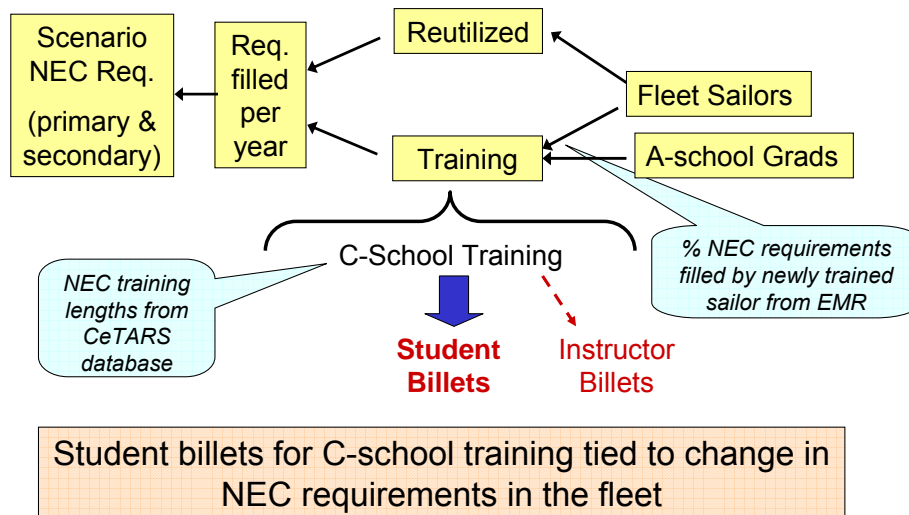
$$Student_Billets = Student_Days / Student\ Days\ per\ Billet$$

Like A-school training, the student billet requirements for Recruit training depend on the number of students that go through this training each year and the length of training. Because the vast majority of students who attend A-school come directly from Recruit training, our model calculates student billets for Recruiting training based on its student throughput estimates for A-school training.

As the slide shows, the model calculates student throughput by summing A-school training requirements over all EMCs. It then calculates total student days by multiplying the throughput times the total training time, which, as before, is the product of under-instruction time and a not-under-instruction time factor. The model then converts student days to student billets.

We purposely kept these calculations simple by omitting factors that have relatively small effects on the results, such as attrition and setback rates. In addition, not all A-school students come directly from recruit training; a small number come from the fleet or from other training pipelines. To include these factors would add to the data requirements while providing only minor improvements to the results.

Enlisted Student Billets: C-School Training Model



This slide illustrates the conceptual model that we used to estimate student billet requirements for NEC training. Due to sailor rotation, reassignment, and attrition, each year the Navy assigns sailors to fill unmanned NEC requirements. In making these assignments, detailers can select sailors who already hold the NEC (thereby reutilizing earlier NEC training) or they can select sailors who do not hold the NEC and send them to school en route to earn the NEC. It is this latter group that drives C-school student throughput requirements. Factor in the length of training and you can estimate the number of student billets needed to support this training.

Next, we discuss these calculations in more detail and describe how we compiled the required data parameters.

Calculating Student Billets for NEC Training



1. From BAT output, NEC requirements by rating & paygrade
2. Estimate NEC training throughput to support requirements in Step 1
 - Define training rate as ratio of NECs earned per year to NEC billets
 - Compiled rate for each NEC using data in EMR & TFMMS

$$C_School_TP = NEC_REQ \times Train_Rate$$

3. Calculate student training days
 - Training pipeline length in UI days
 - Not-under-instructor time factor from CeTARs data

$$Student_Days = C_School_TP \times UI_Days \times NUI_Factor$$

4. Convert student days to student billets

$$Student_Billets = Student_Days / Student\ Days\ per\ Billet$$

The process we developed to calculate student billets for NEC training is similar to the one for A-school training. The tool starts with output from the original BAT. In this case, it uses NEC requirements (both primary and secondary) for the user-defined scenario. For each NEC, it estimates the annual student throughput requirement by multiplying the scenario NEC requirement by a parameter we call training rate. This rate represents the percentage of NEC requirements that are filled each year with sailors directly out of NEC (or C-school) training.

To determine this rate for each NEC, we compared the number of sailors who earned the NEC during the year to the total number of authorized billets requiring the NEC that year. We defined earning an NEC as having an NEC appear on a sailor's Enlisted Master Record during that year. Because we only counted NECs as earned if they appeared for the first time on a sailor's record, we feel this provides a reasonable estimate of the number of sailors that went through training to earn the NEC. We compiled the number of authorized billets requiring the NEC from TFMMS.

We compiled the ratio of earned NECs to authorized NEC requirements for each NEC by fiscal year from 2002 to 2006. Although most ratios fell between 0.2 and 0.3, some fell well outside this zone. To reduce this variation, we calculated an average ratio for each NEC category: Rating Series, Aviation Maintenance, Aviation Initial, Naval Aircrewman, Nuclear Propulsion Plant Operator/Supervisor, SPECWAR/Diver, and Special Series. Users can run the module using either value, that is the computed value for each NEC and the average value for each category.

The last two steps are the same as for A-school training. The only challenge was compiling under-instruction days for NEC training tracks. Many NECs have more than one training track option. In some cases, these options are essentially the same training offered at different locations so the length of training is roughly the same. In other cases, the training tracks differ substantially in length; perhaps these training tracks are tailored to sailors with different backgrounds and experiences. For our model, we needed a single measure of training time for each NEC, so we used a weighted average of UI days over all training track options - weighted by the percentage of students that enrolled in each training track in FY06. To be consistent, we included the NUI factor, even though NUI time at C-school training is normally not that high.

¹ BAT tracks these requirements by rating and paygrade based on the billets requiring the NEC. The module uses this information in assigning ratings and paygrades to these student billets.

Distributing Student Billets Across Ratings and Paygrades



- A-school
 - Rating: same as billet requirements
 - Paygrade: E-2, E-3
- Bootcamp
 - Rating: Seaman, Airman, Fireman, CN, HN
 - Paygrade: E-1
- NEC training
 - Rating: Distribute across ratings of billets with NEC requirements??
 - Paygrade: Distribute across paygrade of billets with NEC requirements??

The module determines the rating and paygrade distribution of student billet requirements. We refer to this as “qualitizing” the billet requirement. For student billets that support A-school training, we use an EMC-to-rating mapping that assigns the student billets associated with each EMC training pipeline to that rating. We assign all A-school student billets to a paygrade of E-3.

For recruit training, the module distributes student billets between Seaman and Airman recruits. We constructed a data set that maps each EMC to one of these two rates so that the recruiting training required to support each A-school training requirement gets assigned to the appropriate rate. For example, students in recruit training who will go to A-school training for one of the aviation ratings are assigned to the AN rate. (We assign all initial training billets to E-3 paygrade.)

For NEC training, the module calculates the student billet requirement separately for each rating–paygrade combination that requires an NEC. It then assigns the student billet requirement to the same rating/paygrade combination as the fleet billet requirement. For example, NEC 1234 is a requirements for billets in both the ET or FC rating that are spread across paygrades E-6 through E-9. Because the module calculates the student billet requirement for each unique rating–paygrade combination, the results are distributed over rating and paygrade in the same proportion as the NEC requirements.

TPPH Billet Requirements



- Calculate billet requirements to account for military personnel in a transient or patient, prisoner, and holdee status
- Compute requirements based on ratio of # Servicemembers in these statuses relative to full-duty status
 - Compiled data from EMR & OMT using accounting category codes
 - Compiled percentages by paygrade over last 2 years
- Distribute billets by rating/designator and paygrade

Paygrade	Transients	PPHs
O-1	18.0%	4.9%
O-2	5.9%	0.6%
O-3	4.1%	0.7%
O-4	4.1%	0.5%
O-5	4.1%	0.7%
O-6	2.8%	0.5%
>O-6	2.5%	0.0%
E-3	3.8%	0.9%
E-4	2.9%	0.9%
E-5	3.2%	0.6%
E-6	3.2%	0.5%
E-7	3.0%	0.4%
E-8	2.7%	0.4%
E-9	2.2%	0.4%

**Average percentages from FY05-FY07*

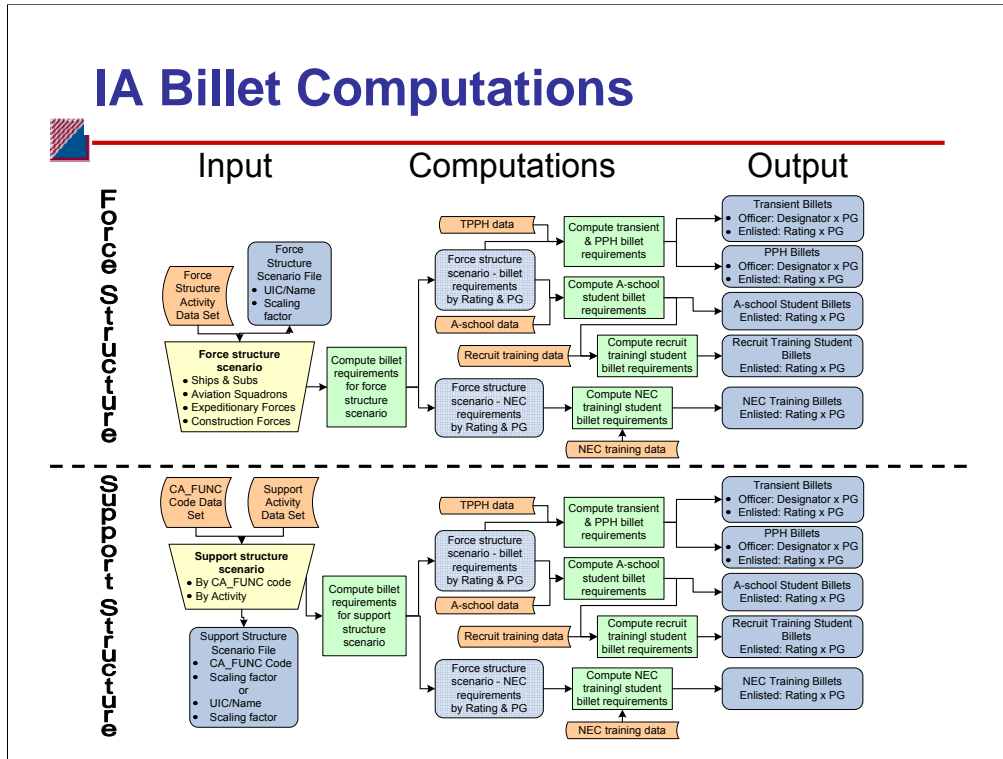
Transients, patients, prisoners, and holdees (TPPH) make up the nonstudent portion of the individuals account. Like student billets, these billets are part of the Navy's personnel overhead account and represent additional manpower required to support fleet billets. The shore/support module estimates the TPPH billets required to support active duty fleet billets in the user-defined scenario.

The module calculates billets for transients and billets for patients, prisoners, and holdees separately. Both calculations, however, are based on the concept that each fleet (i.e., full-duty) billet contributes to the size of these overhead accounts. Therefore, increasing or decreasing the number of fleet billets should increase or reduce the size of these accounts. To define these relationships, we looked at the distribution of active duty Servicemembers at specific times over the past several years to see how many were in (1) a transient status, (2) a patient, prisoner, or holdee status, and (3) a full-duty status. We used the accounting category codes in the EMR and OMT to compile these numbers by paygrade at 3-month intervals. At each point in time, we computed the ratio of Servicemembers in a transient status to those in full-duty status and the ratio of Servicemembers in a PPH status to those in full duty. We then took the average for each of these ratios over the past 2 years (i.e., last eight quarterly snapshots). The results are shown in the above slide.

The module uses these factors to calculate the number of transient and PPH billets that are required to support the fleet billets associated with the user-defined force structure scenario. Because BAT determines fleet billet requirements by rating/designator and paygrade, the module calculates transient and PPH billets separately for each rating/designator–paygrade combination. It then assigns the billet requirement to that rating/designator and paygrade.

As is the case with other data parameters, the module provides an interface that allows users to view and, if desired, change these ratios.

IA Billet Computations



This schematic shows how we integrated the IA billet calculations into the shore/support module. The module computes IA billet requirements for the user-defined force structure scenario separately from those for the user-defined support (i.e., shore/infrastructure) scenario. In each case, the scenario billet requirements feed the student billet calculations for A-school and Recruit training and the IA billets calculations for transients and PPHs. NEC requirements associated with these scenarios feed the student billets calculations for C-school training. Internal tables provide the other data parameters. The tool calculates billet requirements separately for each area: transients, PPH, A-school students, Recruit training students, and NEC training students. Users can view these results individually or they aggregate results over any combination of areas (e.g., all student billets, that is A-school plus recruit training plus NEC training).

Military Education & Training: Instructor Manpower Requirements

- Estimate instructor billet requirements for
 - A-school training
 - Recruit training
 - C-School training
- Tie instructor requirement to student throughput in student billet calculations
- Based on new instructor workload computations

Course Type	Podium Hours per Year	
	Military	Civilian / Contractor
Instructor Led (Group-Paced)	884	1539
Facilitated (Self-Paced or Blended)	1137	1664

In the CA function area of military education and training, we developed relationships that tie fleet enlisted manpower requirements to instructor requirements for A-school, C-school, and Recruit training. Instructor requirements depend on the number of students that need to be trained each year (i.e., throughput), the length of training, and the student-to-instruction ratio at which the course is taught. Because the shore/support module estimates student throughput in its student billet calculation, we use this throughput as the basis for determining instructor billet requirements.

In December 2005, the Navy cancelled its long-standing methodology for calculating instructor requirements (CNETINST 5310.4E). This past summer MPT&E leadership approved a new methodology that is based on results from a recent survey of instructor work weeks. It contains new workload planning factors for the annual amount of instruction (i.e., podium) time that an instructor can provide.

The table in the above slide shows these new factors. They differ for military and civilian/contract instructors. Because civilian instructors have fewer commitments and additional duty responsibilities, they can devote more time to teaching. The factors also differ by type of course. Instructor-led courses require more instructor preparation and related duty (IPRD) time than self-pace course in which the instructor plays more of a facilitator role. We used these workload factors in our instructor computations.

Instructor Billet Computation



1. Determine requirement in terms of instructor days
$$\text{Instructor_Days} = (\text{Student_TP} / \text{Ave_S:I}) \times \text{UI_Days}$$
 - Student throughput from student billet computations
 - Compiled average S:I ratio for each A- & C-school training pipeline
2. Calculate instructor billet requirement
$$\# \text{ Instructors} = \text{Instructor_Days} / \text{Instructor_Workyear}$$
 - Use new instructor workload factors (podium days per year)
3. Allocate instructors to military and civilian billets based on current split and equivalency ratio
 - 1 military workyear = 0.87 civilian workyear
4. Distribute military billets over rating and paygrade

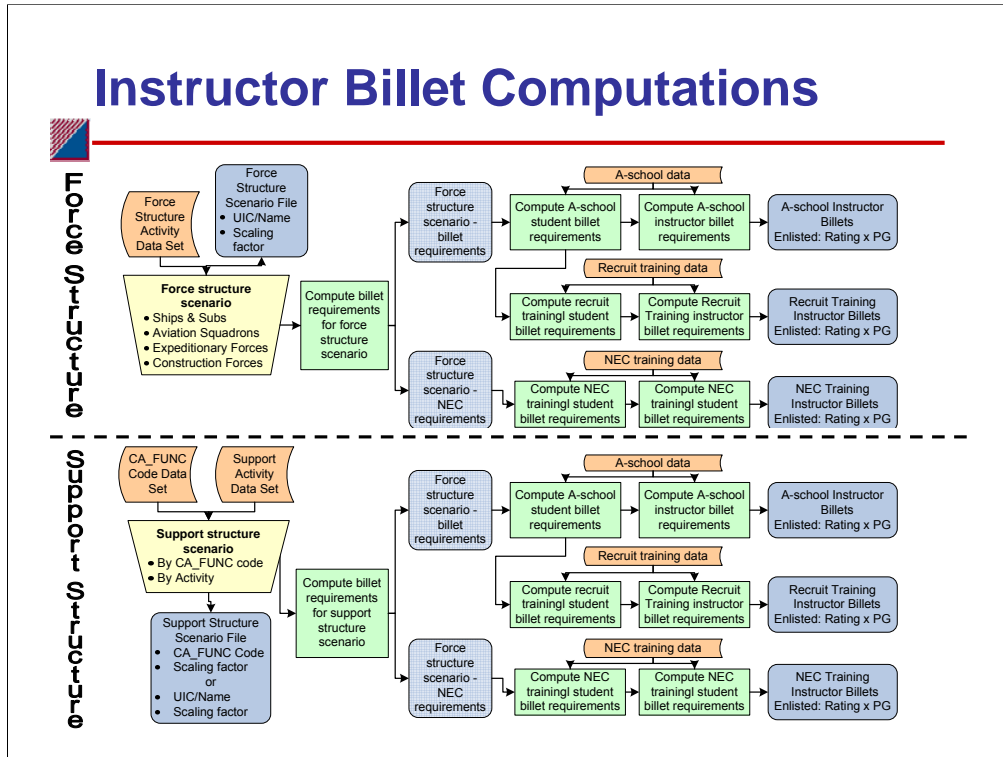
To calculate instructor billets for A-school and C-school training, the tool starts with student throughput estimates from its IA calculations. It calculates the number of instructor days required to teach these students by dividing the throughput for an A-school or NEC training track by the average S:I ratio for that training track, and then multiplying the results by the number of instruction days in the training track.

Compiling the average S:I for A-school and NEC training tracks was challenging. Most Navy courses of instruction are not taught at a single S:I. Instead, they consist of sections or segments that are taught at different ratios. For example, a course may start off with a lecture phase taught at a ratio of 25:1, then break into smaller sections for more hands-on instruction which is usually taught at much lower ratios (e.g., 8:1, 4:1, or even 2:1). Using data in the NITRAS Master Course Reference File (MCRF), we calculated the average S:I for each course in an A-school or NEC training pipeline. This weighted average accounted for the length of the course segments and the number of class sections for each segment. If the MCRF did not contain S:I data for a course, we used the average ratio for that course type. (or a default value of 25:1). Next, we calculated the average S:I for each A-school and NEC training track. For tracks with more than one course, we calculated a weighted average based on the length of each course. Finally, for ratings and NECs that have more than one training track option, we computed another weighted average based on the percentage of students that enrolled in each pipeline in FY06 (using data from the NTIRAS Training Summary File (TSF)).

Continuing with the instructor calculation, the tool converts instructor days to instructor billets using the new workload factors that we discussed in the previous slide. Because the annual number of instruction days differs between military and civilian instructors, the tool first computes the instructor requirement in terms of military billets. It then distributes the requirement between military and civilian billets based on the current split of instructor billets. It applies a factor to account for the difference in instruction time availability (i.e., one military billet equates to 0.87 civilian billets).

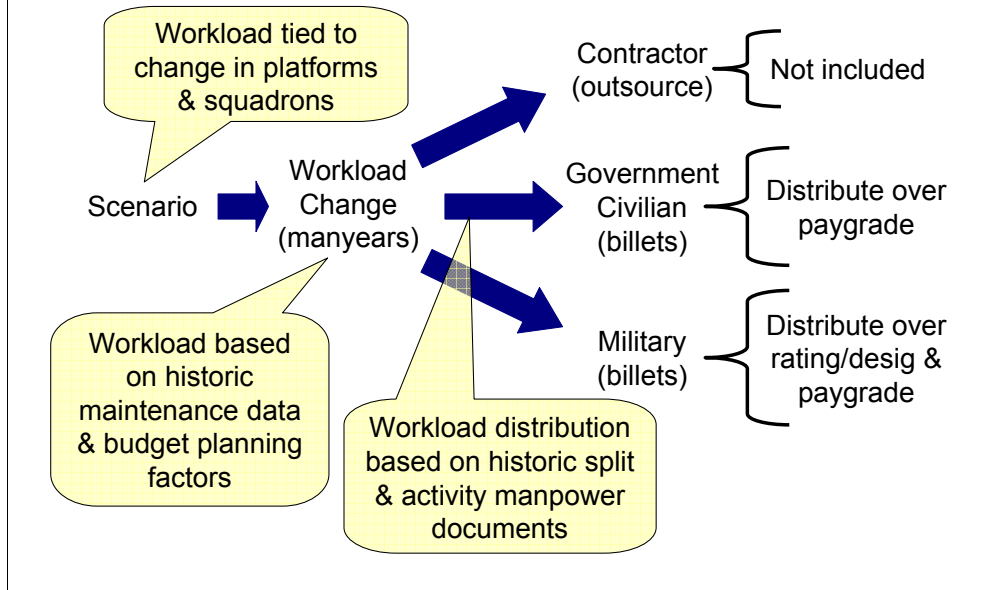
For military instructor billets, the tool determines the requirement by rating and paygrade. To allocate billets by rating, it uses the same approach that was used for student billets. To allocate across paygrades, we compiled the paygrade distribution of all enlisted instructor billets and allocated billets based on these results.

Instructor Billet Computations



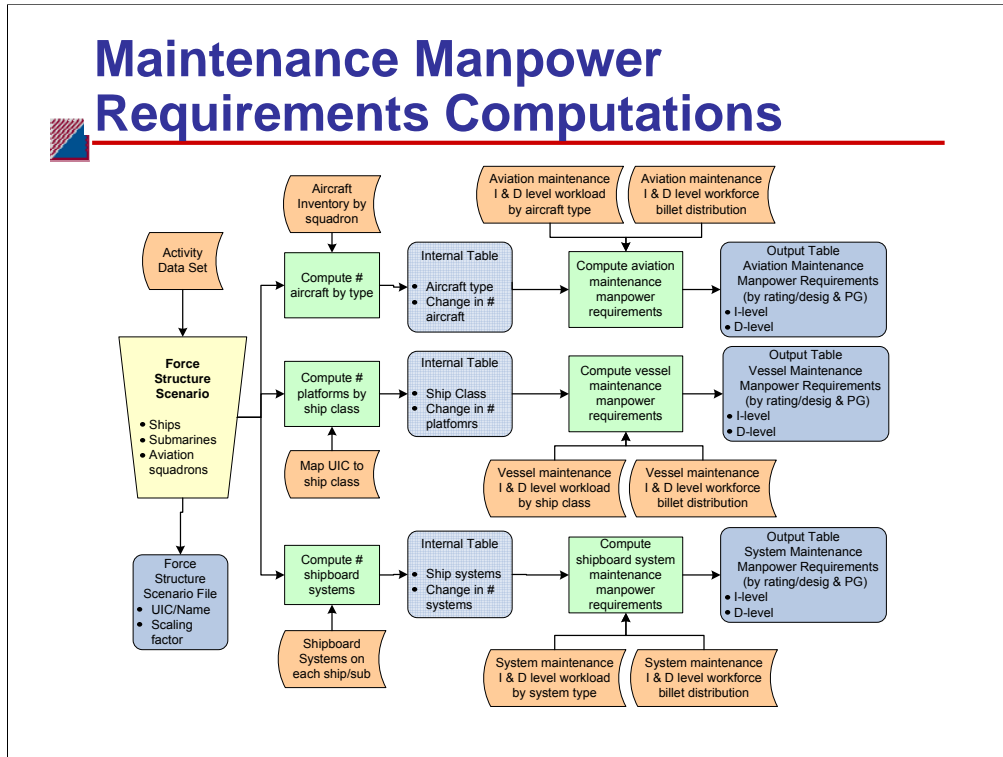
This schematic shows how we integrated the instructor billet calculations into the shore/support module. As with IA billets, the module computes instructor billet requirements separately for the two scenarios components: force structure and support structure. For each component, the scenario billet requirements feed the calculations of student billets for A-school and Recruit training which, in turn, feed the instructor calculations for these two types of training. NEC requirements associated with the scenario billet requirements feed the calculations of student billets for C-school training which, in turn, feed the instructor calculations for this training. Internal data sets contain the other calculation parameters. The tool calculates and outputs billet requirements separately for each type of training. Users can view these results separately or aggregate them over any combination.

Shore Maintenance Model: Intermediate & Depot Levels



This slide shows the conceptual model that we used to determine the shore manpower requirements for intermediate and depot level maintenance activities. The underlying concept is to tie workload at intermediate and depot level maintenance activities to the number of ships, submarines, and aircraft in the user-defined force structure scenario. We use historic maintenance data and budgeting planning factors to estimate the workload in terms of manyears of labor. Based on how the workload is currently distributed across the three components of the workforce (military, government civilian, and contractors), we will distribute the work accordingly. For military and government civilians, we convert manyears of labor into billet requirements. And for military billets, we allocate the requirement by rating/designator and paygrade, based on the current makeup of the workforce.

Maintenance Manpower Requirements Computations



This schematic shows how the maintenance calculations work within the shore/support module. There are three separate calculations, one for aviation maintenance, one for vessel maintenance (ships and submarines), and one for shipboard system maintenance.

For aviation maintenance, the module takes the results of the user-defined force structure scenario and determines the number of aircraft by type based on the aviation squadrons that are in the scenario. It then calculates the workload for intermediate and depot level functions using workload factors for each type of aircraft. The workload is then distributed among the military, civilian, and contractor workforce. We are working to compile a data set that will define the number and type of aircraft in each operational squadron. This will be completed in the next phase of BAT development.

For vessel maintenance, the module takes the results of the user-defined force structure scenario and determines the number of ships and submarines by ship class that are in the scenario. It then estimates the annual workload for intermediate and depot level maintenance functions by multiplying annual workload factors for each ship class by the number of ships of that class in the scenario. The workload is then distributed among the military, civilian, and contractor workforce.

Similarly, for shipboard maintenance, the module takes the results of the user-defined force structure scenario and determines the number of shipboard systems that are in the scenario. It then estimates the annual workload for intermediate and depot level maintenance functions by multiplying annual workload factors for each ship class by the number of ships of that class in the scenario. The workload is then distributed among the military, civilian, and contractor workforce. For this module, we compiled a data set that maps shipboard systems to individual hulls.

Ship & Submarine Maintenance Workload Data (VAMOSC*)



- Ship/submarine (class average)
 - Intermediate maintenance (annual man-hours of labor)
 - Broken out by afloat and ashore activities
 - Depot maintenance (annual man-days of labor)
 - Broken out by public and ship repair facility
- Shipboard systems (data for 67 systems)
 - Intermediate maintenance (annual man-hours of labor)
 - Data table maps shipboard systems to individual ships
- Aviation maintenance (by aircraft type)
 - Airframe
 - Engine

* *Visibility and Management of Operating and Support Costs*

We are in the process of compiling maintenance workload data to feed into the shore/support module. Our primary data source is the Visibility and Management of Operating and Support Costs (VAMOSC) data base.

For vessel intermediate maintenance, we will use Cost Element H.0, which represents the labor manhours performed by an intermediate maintenance activity for the repair and alteration of the indicated ship. It contains two sub-elements: 1) labor manhours performed by afloat activities (tenders, repair ships, or equivalent afloat activities) and 2) labor manhours performed by ashore intermediate maintenance activities. The VAMOSC data base contain these data for individual hulls by fiscal year. It also contains a report that provides the average annual workload by ship class.

For vessel depot maintenance, we will use Cost Element K.1 which represents the labor mandays at public shipyards for the indicated ship and Cost Element K.2 which represents the labor mandays at ship repair facilities for the indicated ship. Each of these cost elements have five sub-elements that further break out labor by type of availability. We also planned to supplement these data with information in OPNAV NOTICE 4700 which contains representative intervals, durations, maintenance cycles, and repair mandays for depot level maintenance availabilities for Navy ships.

We will also use data in the VAMOSC system to populate the workload data sets for shipboard systems and aircraft. We will complete construction of these data sets in the next phase of BAT development.

Health Care Services



- Initial attempt was to calculate workload based on claims data
 - Complicated and data incomplete
- Next approach:
 - About half BUMED's medical billets tied to operational requirements (via the medical augmentation program)
 - Premise: number of remaining billets tied to size of the force (i.e., Navy endstrength)
 - Want a relationship that can easily be updated as requirements change (without requiring an extensive analytical effort)

Our initial attempt to develop force-structure-to-shore-manpower relationships for the health care service area focused on compiling workload requirements for active duty personnel based on medical claims data. Our hope was to use these claims data to define the mandays of medical service required per year by active duty Servicemembers and their dependents. Unfortunately, after examining the available data we determine that this approach would consume too much of the project resources to generate usable results. One reason was the large amount of missing data. For example, of the various categories of personnel reporting claims (e.g., active duty or retirees), the largest number of claims appeared under the “other” category.

Our fallback approach was to develop relationships based on the current size of the health care force relative to the size of the active duty force.¹ About half of BUMED's shore billets are tied to operational requirement via the medical augmentation program. Personnel in these billets support medical mobilization requirements during wartime or in support of contingency operations. We excluded these billets from our analysis and focused on the remaining BUMED billets at medical and dental care facilities.

We discuss the details of this approach in the next slide.

¹ We recognize that, to some degree, the Navy's medical force also services retirees and their families. However, the Navy is under no obligation to use its own medical personnel and facilities to provide health care to this population. Therefore, we assume a linkage between the size of the Navy's health care force and the size of its active duty force.

Medical Functions: Peacetime Medical Care to Sailors & Dependents

Peacetime requirement

- Identify billets not mapped to wartime requirement ($\approx 50\%$)
- Exclude support to Marine Corps & Reserves
- BUMED billets at hospitals, medical centers, and clinics
- Determine ratio of billets to total Navy endstrength for each medical function
 - Seven medical services (A)
 - Medical administrative (B)
 - Medical other (C)

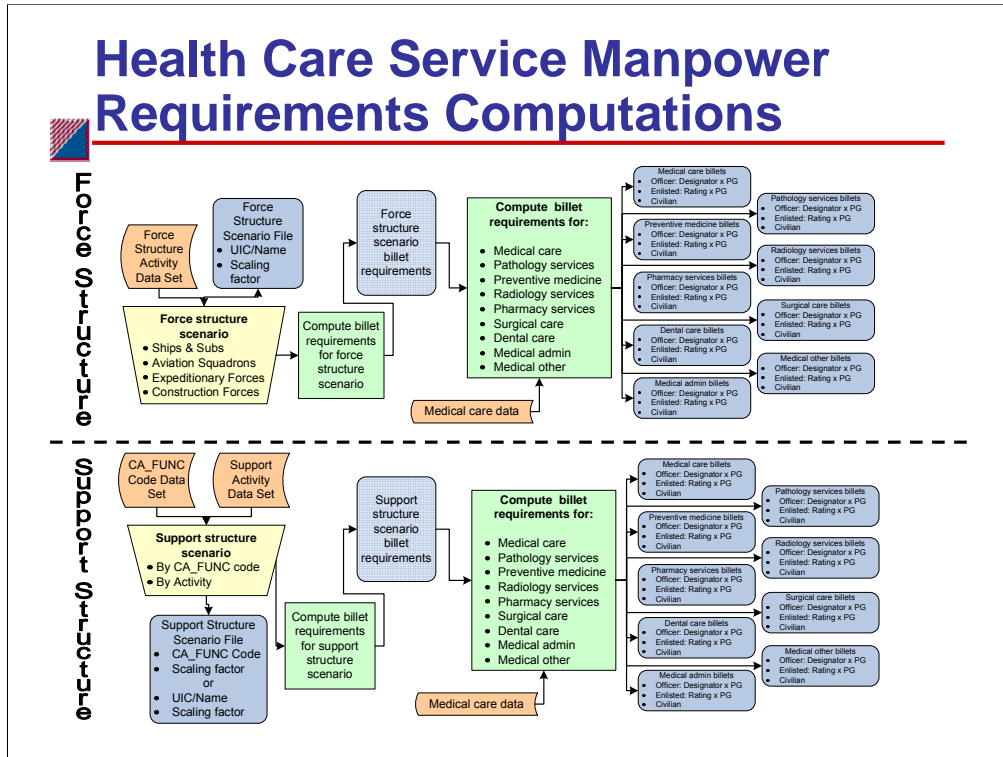
Medical Function	FY07 BA*
Medical Care	5,233
Pathology Services	2,249
Pharmacy Services	1,435
Preventive Medicine	1,524
Radiology Services	7,680
Surgical Care	3,102
Dental Care	1,103
Hospital/Clinic Management	368
Management Headquarters-Health Services	2,362
Alcohol and Drug Rehabilitation	415
Ambulatory Care Services	280
Hospital Food Services and Nutritional Care	75
Medical and Dental Devices Development	215
Rehabilitation Services	209
Veterinary Services	600
Grand Total	26,850

* Includes military and civilian

To identify the segment of the health care service force that we were interested in, we first excluded all health care billets that were mapped to mobilization requirements (denoted by an “additional duty” code in TFMMS). Next, we excluded all health care billets that do not belong to the BUMED claimancy. By doing this, we excluded billets that provide direct medical support to the Marine Corps. Of the remaining BUMED billets, we only considered those at medical or dental care facilities (i.e., hospitals, medical centers, dental centers, and medical clinics). The table in this slide shows the remaining billet totals by medical function. These numbers include both military and civilian billets.

Having determined the size of the current health care force, our next step was to calculate the ratio of medical billets to all active-duty military billets. We did this for each of the seven medical service functions (shaded light red). We also calculated a single ratio for the medical administrative functions (shaded light green) and a single ratio for all remaining functions which we refer to as medical other (shaded yellow). These ratios serve as key data parameters in our health care manpower requirements calculations.

Health Care Service Manpower Requirements Computations



This schematic shows how the health care calculations work within the Shore/Support Module. The module computes health care billet requirements for the user-defined force structure scenario separately from those for the user-defined support structure scenario. In each case, the scenario billet requirements feed the computations for each medical function. The module calculates manpower requirements for each of the nine medical functions. Internal data sets contain the ratios (discussed in the previous slide) and the distribution of health care billets for officer (by designator and paygrade), enlisted (by rating and paygrade), and civilian personnel. Users can view results separately or aggregate them over any combination of functions.

Using the Shore/Support Module



- Defining the scenario
 - Force structure component
 - Support structure component
 - Activity level
 - Functional area
- Editing data parameters
- Generating output reports

The next several slides describe how to use the Shore/Support Module. Using the tool basically involves defining a scenario and generating output reports. The tool also allows users to view and edit the data parameters that are used in the manpower requirements calculations.

Defining the Scenario



1. Define force structure scenario (add/delete units by UIC)
 - Ships
 - Submarines
 - Aviation squadrons
 - Expeditionary forces
 - Construction forces
2. Define changes to support structure (i.e., infrastructure plus any additional non-force-structure combat & combat support activities)
 - Change requirements by activity (i.e., UIC)
 - Activity categorization (in BAT)
 - Change requirements by functional area (i.e., CA_FUNC code)

The scenario in the Shore/Support module consists of two parts: a force structure component and a shore/support structure component. To define the force structure scenario, users select individual ships, submarines, aviation squadrons, expeditionary force units, and/or construction force units. As in the original BAT tool, 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.

Once the user has defined the force structure scenario, billet changes in the support structure will be calculated according to the relationships explained in this document. However, the user also has the option of defining additional changes to the support structure by defining a support structure scenario. The support structure scenario can be defined in one of two ways. Users can either select individual activities (as in the original BAT tool) or they can define changes to the support structure by changing manpower requirements in one or more CA function areas. We discuss this second method in the next slide.

Defining the Support Structure Scenario by CA Function Area

Operational Force Support Billet Requirements

Select	Group Titles	Description	CA_FUNCTION	CA Function Title	weight	BA	Ne
<input type="radio"/>	Systems Acquisition	Engineering	F310	Engineering Support at Maintenance Depots	0	584	
<input type="radio"/>	Systems Acquisition	Engineering	F320	All Other Engineering Support	0	11,096	
<input type="radio"/>	Systems Acquisition	Engineering	F320E	Ship Life Cycle Management	0	829	
<input type="radio"/>	Systems Acquisition	Engineering	F320F	Ship Construction Oversight	0	118	
<input type="radio"/>	Systems Acquisition	Engineering	F320G	In-service Engineering Services	0	3,208	
<input type="radio"/>	Systems Acquisition	Procurement and Contracting	F310	Management Headquarters Procurement and Contracting	0	70	
<input type="radio"/>	Systems Acquisition	Procurement and Contracting	F320	Contracting Administration and Operations	0	5,533	
<input type="radio"/>	Systems Acquisition	Procurement and Contracting	F320E	Contracting Officer Representative (COR)	0	410	
<input type="radio"/>	Systems Acquisition	Procurement and Contracting	F399	Other Procurement and Contracting Activities	0	141	
<input type="radio"/>	Systems Acquisition	Systems Acquisition	F110	Management Headquarters Systems Acquisition	0	152	
					<input type="button" value="Re-weight ALL"/>	<input type="button" value="Total"/>	

Records: 14 | 1 | 19

Although the main function of the Shore/Support Module is to determine the impact of force structure changes on shore manpower requirements using the relationships that we described in this report, the module provides another feature that can help users study shore manpower requirements. The original BAT allows users to change the shore/support infrastructure by adding, deleting, or scaling manpower requirements at individual shore/support activities. They select one or more activities (by UIC) and enter the appropriate scaling factor (just like for force structure units), and the tool will determine the manpower requirements. The Shore/Support Module provides a similar capability that is designed around CA function areas instead of activities. It allows users to change the shore/support manpower requirements in one or more functional areas and see the resulting change in the Navy's billet structure.

This slide shows the module's interface which displays CA function areas by group and subgroup. Users can control which functions are displayed by filtering at the group or subgroup level. For example, the slide show functions in the Systems Acquisition, Test and Evaluation, Engineering, and Contracting group. The user could refine this list by filtering on any of these subgroups. The interface shows the total number of authorized billets (military plus civilian) for each function for the current fiscal year. 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 calculates 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.

Editing Data Parameters



- 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 only change 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

The Shore/Support Module allows users to view and edit the key data parameters that are used in calculating shore manpower requirements for each functional area. This feature allows users to conduct many types of “what if” 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 tool stores two copies of each data set. One contains the original data 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 can be saved. The user, however, can reset this data set to the original values at any time.

Next Step: BAT Development - Phase II



- Complete maintenance workload module
- Integrate Shore/Support Module into original BAT tool
- Field test module and collect feedback
- Update module and add features as requested
- Update BAT's user guide

The next phase of development for the Billet Analysis Tool has begun and includes several tasks that involve the Shore/Support Module. First, we will complete the maintenance calculations by compiling maintenance workload data for ships, submarines, and aircraft. Second, we will integrate this module with the original BAT tool so that both modules will work as a single application in a seamless fashion. Third, we will field test this module with manpower analysts within the N1 organization. Based on feedback from this test, we will assess the module's strengths and weaknesses and make necessary changes to include adding features that will improve its utility. Once all these tasks are complete, we will update the BAT's users guide with a section that describes how to use this module.

Appendix A: CA Function Codes

Category	Group	Sub-group	CA_FUNC	Title
I	1	1A	Y105	Management Headquarters – Defense Direction and Policy Integration
I	1	1A	Y115	Management Headquarters – Joint Staff Direction of the Armed Forces
I	1	1A	Y199	Other Force Management and General Support Activities
I	1	1B	Y210	Management Headquarters – Operation Planning and Control
I	1	1B	Y215	Operation Planning and Control
I	1	1B	Y217	Combat Development Evaluations and Experimentation
I	1	1B	Y220	National Mobilization and Emergency Preparedness Management
I	1	1C	Y240	Management Headquarters – Manpower Management
I	1	1C	Y245	Manpower Management Operations
I	1	1D	Y310	Management Headquarters-Foreign Military Sales and Security Assistance
I	1	1D	Y315	Foreign Military Sales and Security Assistance Program Management
I	1	1D	Y320	Support Provided Outside the DoD
I	1	1E	Y405	Management Headquarters-Legal Services
I	1	1E	Y415	Legal Services and Support
I	1	1F	Y501	Management Headquarters-Public Affairs
I	1	1F	Y515	Public Affairs Program Activities and Operations
I	1	1G	Y525	Protocol Operations
I	1	1G	Y527	Other Protocol Activities
I	1	1H	Y560	Management Headquarters-Visual Information
I	1	1H	Y570	Visual Information Program Activities and Operations
I	1	1J	Y610	Management Headquarters-Legislative Affairs
I	1	1J	Y620	Legislative Affairs
I	1	1J	Y620E	Legislative Affairs – Healthcare
I	1	1K	Y710	Management Headquarters-Historical Affairs
I	1	1K	Y720	Historical or Heraldry Services
I	1	1K	Y730	Museum Operations
I	1	1L	Y810	Management Headquarters – Administrative Support & Federal Compliance
I	1	1L	Y815	Federal Compliance of Administrative Programs
I	1	1L	Y820	Administrative Management and Correspondence Services
I	1	1L	Y830	Documentation Services
I	1	1L	Y840	Directives and Records Management Services
I	1	1L	Y850	Microfilming and Library Services
I	1	1L	Y860	Printing and Reproduction Services
I	1	1L	Y880	Document Automation and Production Services
I	1	1L	Y899	Other Administrative Support Activities

Category	Group	Sub-group	CA_FUNC	Title
I	1	1M	I110	Management Headquarters-Audit
I	1	1M	I120	Audit Operations
I	1	1N	I510	Personnel Security Clearances and Background Investigations
I	1	1N	I520	Criminal and Administrative Investigative Services
I	1	1N	I530	Industrial Security
I	1	1N	I999	Other Audit and Investigative Activities
I	1	1P	C110	Management Headquarters – Financial Management
I	1	1P	C400	Budget Support
I	1	1P	C700	Finance/Accounting Services
I	1	1P	C999	Other Financial Management Activities
I	1	1P	C999E	Comptroller Function
I	2	2A	W100	Management Headquarters – Communications, Computing & Information Services
I	2	2A	W100E	Management Headquarters – IM/IT Strategic Planning
I	2	2A	W100F	Management Headquarters – IM/IT Workforce Planning
I	2	2A	W100G	Management Headquarters – IM/IT Capital Planning
I	2	2A	W100H	Management Headquarters – Performance Assessments
I	2	2A	W100J	Management Headquarters – Business Process Reengineering
I	2	2A	W100K	Management Headquarters – IT Risk Management
I	2	2A	W100L	Management Headquarters – Knowledge Management
I	2	2A	W100M	Management Headquarters – Information Architecture/ Infrastructures
I	2	2A	W100N	Management Headquarters – IM/IT Project Management
I	2	2A	W100P	Management Headquarters – eBusiness Innovation
I	2	2A	W100Q	Management Headquarters – Other IM/IT Functions
I	2	2B	W210	Telephone Systems
I	2	2B	W220	Telecommunication Centers
I	2	2B	W299	Other Communications Systems
I	2	2B	W299E	Emergency Operations Centers
I	2	2C	W310	Computing Services and Data Base Management
I	2	2C	W310E	End-User Support
I	2	2C	W310F	Software and Application Development
I	2	2C	W310G	Network Systems
I	2	2C	W310H	Systems Administration
I	2	2C	W310J	Systems Analysis
I	2	2C	W310K	Data Base Management

Category	Group	Sub-group	CA_FUNC	Title
I	2	2C	W310K	Data Base Management
I	2	2C	W310L	Web Site Development and Maintenance
I	2	2C	W310M	IM/IT Strategic Planning
I	2	2C	W310N	IM/IT Workforce Planning
I	2	2C	W310P	IM/IT Capital Planning
I	2	2C	W310Q	Performance Assessments
I	2	2C	W310R	Business Process Reengineering
I	2	2C	W310S	IT Risk Management
I	2	2C	W310T	Knowledge Management
I	2	2C	W310U	Information Architecture/ Infrastructures
I	2	2C	W310V	IM/IT Project Management
I	2	2C	W310W	eBusiness Innovation
I	2	2C	W399	Other Computing and Information Management Services
I	2	2D	W410	Information Assurance
I	2	2D	W430	Mapping and Charting
I	2	2D	W440	Meteorological & Geophysical Services
I	2	2D	W499	Other Information Operation Services
I	3	3A	R110	Management Headquarters – Research and Development
I	3	3A	R120	Science and Technology
I	3	3A	R140	Management and Support to Research and Development
I	3	3A	R999	Other S&T and R&D Management and Support Activities
I	4	4A	F110	Management Headquarters – Systems Acquisition
I	4	4A	F120	Systems Acquisition – Program Management
I	4	4A	F140	Technology Transfer & International Cooperative Program Management
I	4	4A	F150	Systems Acquisition – Demonstration and Development
I	4	4A	F160	Systems Acquisition – Other Program Support
I	4	4A	F199	Other Systems Acquisition Activities
I	4	4B	A610	Management Headquarters – Test and Evaluation
I	4	4B	A620	Developmental and Demonstration Test and Evaluation
I	4	4B	A630	Management and Support to Test and Evaluation
I	4	4B	A699	Other Test and Evaluation Activities
I	4	4C	F310	Management Headquarters – Procurement and Contracting
I	4	4C	F320	Contracting Administration and Operations
I	4	4C	F320E	Contracting Officer Representative (COR)
I	4	4C	F399	Other Procurement and Contracting Activities
I	4	4D	F510	Engineering Support at Maintenance Depots

Category	Group	Sub-group	CA_FUNC	Title
I	4	4D	F520	All Other Engineering Support
I	4	4D	F520E	Ship Life Cycle Management
I	4	4D	F520F	Ship Construction Oversight
I	4	4D	F520G	In-service Engineering Services
I	5	5A	P110	Management Headquarters – Logistics
I	5	5A	P119	Other Logistics Activities
I	5	5B	J410	Organizational & Intermediate Repair & Maintenance Management
I	5	5B	J501	Aircraft
I	5	5B	J502	Aircraft Engines
I	5	5B	J503	Missiles
I	5	5B	J504	Vessels
I	5	5B	J505	Combat Vehicles
I	5	5B	J506	Non-Combat Vehicles and Equipment
I	5	5B	J507	Electronic and Communications Equipment
I	5	5B	J511	Special Equipment
I	5	5B	J518	Support Equipment
I	5	5B	J519	Industrial Plant Equipment
I	5	5B	J520	Test, Measurement & Diagnostic Equipment (TMDE)
I	5	5B	J550	Software Support for Embedded and Mission Systems
I	5	5B	J555	Tactical Automatic Data Processing Equipment (ADPE)
I	5	5B	J570	Armament and Ordnance
I	5	5B	J575	Munitions
I	5	5B	J600	Metal and Other Containers, Textiles, Tents and Tarpaulins
I	5	5B	J700	Portable Troop Support Equipment
I	5	5B	J750	Portable Field Medical and Dental Equipment
I	5	5B	J999	Organizational and Intermediate Repair & Maintenance of Other Equipment
I	5	5B	K410	Depot Management
I	5	5B	K531	Aircraft
I	5	5B	K532	Aircraft Engines
I	5	5B	K533	Missiles
I	5	5B	K534	Vessels
I	5	5B	K535	Combat Vehicles
I	5	5B	K536	Non-Combat Vehicles and Equipment
I	5	5B	K537	Electronic and Communications Equipment
I	5	5B	K539	Special Equipment

Category	Group	Sub-group	CA_FUNC	Title
I	5	5B	K541	Industrial Plant Equipment
I	5	5B	K546	Test, Measurement & Diagnostic Equipment (TMDE)
I	5	5B	K549	Support Equipment
I	5	5B	K550	Software Support for Embedded and Mission Systems
I	5	5B	K555	Tactical Automatic Data Processing Equipment (ADPE)
I	5	5B	K570	Armament and Ordnance
I	5	5B	K575	Munitions
I	5	5B	K600	Metal and Other Containers, Textiles, Tents, and Tarpaulins
I	5	5B	K700	Portable Troop Support Equipment
I	5	5B	K750	Portable Field Medical & Dental Equipment
I	5	5B	K999	Depot Repair and Maintenance of Other Equipment
I	5	5B	P120	Management Headquarters – Maintenance
I	5	5C	T101	Management Headquarters – Supply
I	5	5C	T110	Retail Supply Operations
I	5	5C	T110E	Consolidated Mail Facility/Fleet Mail Carriers
I	5	5C	T110F	Hazardous Material (HM) Management (HM)
I	5	5C	T120	Wholesale/Depot Supply Operations
I	5	5C	T120E	Logistics Support Center Operations
I	5	5C	T130	Storage and Warehousing
I	5	5C	T140	Supply Cataloging
I	5	5C	T150	Warehousing and Distribution of Publications
I	5	5C	T160	Bulk Liquid Storage
I	5	5C	T165	Distribution of Petroleum Oil and Lubricant Products
I	5	5C	T167	Distribution of Liquid, Gaseous and Chemical Products
I	5	5C	T175	Troop Subsistence
I	5	5C	T177	Food Supply
I	5	5C	T180	Military Clothing
I	5	5C	T190	Preparation, Demilitarization and Disposal of Excess and Surplus Inventory
I	5	5C	T199	Other Supply Activities
I	5	5C	T199E	Ordnance Supply
I	5	5D	T701	Management Headquarters – Transportation
I	5	5D	T710	Traffic/Transportation Management Services
I	5	5D	T710E	MSC Operations
I	5	5D	T800	Ocean Terminal Operations
I	5	5D	T810	Air Transportation Services

Category	Group	Sub-group	CA_FUNC	Title
I	5	5D	T811	Water Transportation Services
I	5	5D	T812	Rail Transportation Services
I	5	5D	T824	Motor Vehicle Transportation Services
I	5	5D	T826	Air Traffic Control
I	5	5D	T899	Other Transportation Services
I	6	6A	X931	Ordnance
I	6	6A	X932	Products Made from Fabric or Similar Materials
I	6	6A	X933	Container Products and Related Items
I	6	6A	X938	Communications and Electronic Products
I	6	6A	X939	Construction Products
I	6	6A	X944	Machined Parts
I	6	6A	X999	Other Products Manufactured and Fabricated
I	7	7A	S100	Management Headquarters – Installations
I	7	7A	S200	Installation, Base or Facility Management
I	7	7A	S210	Building Management
I	7	7A	S310	Housing Management
I	7	7A	S310E	Housing Management (Berthing BOQ/BEQ)
I	7	7A	S310F	Family Housing Management
I	7	7A	S410	Custodial Services
I	7	7A	S420	Collection and Disposal of Trash and Other Refuse
I	7	7A	S430	Collection and Disposal of Hazardous Material (HAZMAT)
I	7	7A	S435	Pest Management
I	7	7A	S440	Fire and Emergency Services
I	7	7A	S450	Laundry and Dry Cleaning Operations
I	7	7A	S499	Other Building and Housing Management Services
I	7	7B	S500	Management of Security Operations at Installations/ Facilities (Law Enforcement, Physical Security Antiterrorism, and Chemical/Biological/Radiological/Nuclear/High Explosives (CBRNE) Operations)
I	7	7B	S510	Security Operations at Installations/ Facilities (Law Enforcement, Physical Security, Antiterrorism, and CBRNE)
I	7	7B	S520	Support Services to Security Operations at Installations/ Facilities (Law Enforcement, Physical Security, Antiterrorism, and CBRNE) Operations
I	7	7B	S520E	Primary Support Services to Security Operations at Installations/Facilities
I	7	7B	S520F	Secondary Support Services to Security Operations at Installations/ Facilities
I	7	7B	S540	Information Security
I	7	7B	S560	Protective Services Operations
I	7	7B	S719	Confinement Facility Operations

Category	Group	Sub-group	CA_FUNC	Title
I	7	7B	S720	Prison Operations
I	7	7B	S722	Detention of Enemy Prisoners of War (EPW), Retained Personnel (RP), Civilian Internees (CI) and other Detainees (OD)
I	7	7B	S724	Other Security Operations
I	7	7C	S725	Electrical Plant and Distribution Systems Operation and Maintenance
I	7	7C	S726	Heating Plant and Distribution Systems Operation and Maintenance
I	7	7C	S727	Water Plant and Distribution Systems Operation and Maintenance
I	7	7C	S728	Sewage and Waste Plant and Distribution Systems Operation and Maintenance
I	7	7C	S729	Air-Conditioning and Cold Storage Plant and Distribution Systems Operation and Maintenance
I	7	7C	S730	Incinerator Plant and Sanitary Fill Operation
I	7	7C	S799	Other Utility Plant and Distribution Systems Operation and Maintenance
I	8	8A	E110	Management Headquarters – Environmental Security
I	8	8A	E120	Environmental and Natural Resource Services
I	8	8A	E120E	Natural Resource Services
I	8	8A	E120F	Cultural Resource Services
I	8	8A	E120G	Environmental Services
I	8	8A	E220	Safety
I	8	8A	E220E	SOH Program Oversight and Management
I	8	8A	E220F	Program Management
I	8	8A	E220G	Technical Support
I	8	8A	E225	Occupational Health Services
I	8	8A	E230	Explosives Safety
I	8	8A	E250	Response to Hazardous Material Mishaps
I	8	8A	E999	Other Environmental Security Activities
I	9	9A	Z101	Corps of Engineers Program and Project Management
I	9	9A	Z110	Management of Major Construction of Real Property
I	9	9A	Z120	Real Estate/Real Property Acquisition
I	9	9A	Z135	Title, Outgranting and Disposal of Real Estate/Real Property-National Projects
I	9	9A	Z138	Title, Outgranting and Disposal of Real Estate/Real Property-Local Projects
I	9	9A	Z145	Architect-Engineering-National Projects
I	9	9A	Z148	Architect-Engineering-Local Projects
I	9	9A	Z199	Other Real Property Program and Project Management Activities
I	9	9B	Z991	Minor Construction, Maintenance & Repair of Family Housing and Structures
I	9	9B	Z992	Minor Construction, Maintenance & Repair of Buildings and Structures Other Than Family Housing
I	9	9B	Z993	Maintenance and Repair of Grounds and Surfaced Areas
I	9	9B	Z997	Maintenance and Repair of Railroad Facilities
I	9	9B	Z998	Maintenance and Repair of Waterways and Waterfront Facilities

Category	Group	Sub-group	CA_FUNC	Title
I	9	9B	Z999	Maintenance, Repair and Minor Construction of Other Real Property
I	10	10A	Q120	Management Headquarters-Civil Works
I	10	10A	Q220	Water Regulatory Oversight and Management
I	10	10A	Q240	Natural Resources Oversight and Management
I	10	10A	Q260	Civil Works Planning Production and Management
I	10	10A	Q420	Bank Stabilization
I	10	10A	Q440	Maintenance of Open Waterways for Navigation
I	10	10A	Q460	Maintenance of Jetties and Breakwaters
I	10	10A	Q520	Operation and Maintenance of Locks and Bridges
I	10	10A	Q540	Operation and Maintenance of Dams
I	10	10A	Q560	Operation and Maintenance of Hydropower Facilities
I	10	10A	Q580	Operation and Maintenance of the Washington Aqueduct
I	10	10A	Q620	Operation and Maintenance of Recreation Areas
I	10	10A	Q999	Other Civil Works Activities
I	11	11A	B710	Management Headquarters – Civilian Personnel
I	11	11A	B720	Civilian Personnel Operations
I	11	11B	B810	Management Headquarters – Military Personnel
I	11	11B	B820	Military Recruiting and Examining Operations
I	11	11B	B830	Military Personnel Operations
I	11	11C	B910	Management Headquarters – Personnel Social Action Programs
I	11	11C	B920	Personnel Social Action Program Operations
I	11	11C	B999	Other Personnel Activities
I	11	11D	G006	Commissary Management
I	11	11D	G008	Commissary Operations
I	11	11D	G013	Military Exchange Operations
I	11	11D	G013E	Exchange Services Management
I	11	11D	G050	Management Headquarters – Community and Family Services
I	11	11D	G055	Morale, Welfare, and Recreation (MWR) Services
I	11	11D	G060	Family Center Services
I	11	11D	G065	Child Care and Youth Programs
I	11	11D	G080	Homeowners' Assistance Program
I	11	11D	G090	Employee Relocation Assistance Program
I	11	11D	G105	Recreational Library Operations
I	11	11D	G210	Postal Services
I	11	11D	G220	Military Bands
I	11	11D	G900	Chaplain Activities and Support Services

Category	Group	Sub-group	CA_FUNC	Title
I	11	11D	G902	Casualty and Mortuary Affairs
I	11	11D	G910	Temporary Lodging Services
I	11	11D	G999	Other Social Services
I	11	11D	G999E	Special Guard Duties (non-security).
I	12	12A	U001	Management Headquarters-Education and Training
I	12	12A	U050	Military Institutional Education and Training Management
I	12	12A	U100	Recruit Training
I	12	12A	U150	Multiple Category Training
I	12	12A	U200	Officer-Acquisition (Pre-Commissioning) Training
I	12	12A	U300	Specialized Skill Training
I	12	12A	U400	Flight Training
I	12	12A	U510	Professional Military Education
I	12	12A	U520	Graduate Education
I	12	12A	U530	Other Full-Time Education Programs
I	12	12A	U540	Off-Duty and Voluntary Education Programs
I	12	12A	U550	Training Development and Support for Military Education & Training
I	12	12A	U599	Other Military Education and Training Activities
I	12	12A	U599E	Bombing Ranges
I	12	12B	U605	Management Headquarters-Civilian Education and Training
I	12	12B	U620	Management of Civilian Institutional Training Education & Development
I	12	12B	U630	Acquisition Training, Education, and Development
I	12	12B	U640	Civil Works Training, Education, and Development
I	12	12B	U650	Intelligence Training, Education, and Development
I	12	12B	U660	Medical Training, Education, and Development
I	12	12B	U699	Other Civilian Training, Education, and Development
I	12	12C	U710	Management Headquarters-Dependent Education
I	12	12C	U720	Dependent Education Field Management
I	12	12C	U760	Dependent Education – Teacher Instruction
I	12	12C	U770	Dependent Education – Substitute Instruction
I	12	12C	U780	Dependent Education – Aides for Instruction
I	12	12C	U799	Other Dependent Education Activities
I	13	13A	H010	Management Headquarters-Health Services
I	13	13A	H050	Hospital/Clinic Management
I	13	13A	H100	Medical Care
I	13	13A	H102	Surgical Care

Category	Group	Sub-group	CA_FUNC	Title
I	13	13A	H106	Pathology Services
I	13	13A	H107	Radiology Services
I	13	13A	H108	Pharmacy Services
I	13	13A	H113	Management Headquarters-Health Services
I	13	13A	H116	Hospital/Clinic Management
I	13	13A	H119	Medical Care
I	13	13A	H125	Surgical Care
I	13	13A	H127	Pathology Services
I	13	13A	H203	Radiology Services
I	13	13A	H250	Pharmacy Services
I	13	13A	H350	Dental Care
I	13	13A	H450	Veterinary Services
I	13	13A	H650	Preventive Medicine
I	13	13A	H710	Rehabilitation Services
I	13	13A	H999	Alcohol and Drug Rehabilitation
I	13	13A	H999E	Ambulatory Care Services
I	13	13A	H999F	Medical and Dental Devices Development
I	13	13A	H999G	Hospital Food Services and Nutritional Care
II	14	14A	M120	Combatant Headquarters-Combatant Commander Command Authority
II	14	14A	M145	Combatant Headquarters-Military Department Command Authority
II	14	14A	M150	Support to the Combatant Commander – Information Sharing Systems
II	14	14A	M150E	Meteorological/ Oceanographic Support
II	14	14A	M199	Other Operational Command and Control Activities
II	14	14B	M301	Management Headquarters – Intelligence
II	14	14B	M302	Intelligence Policy and Coordination
II	14	14B	M310	Counterintelligence
II	14	14B	M311	Human Intelligence (HUMINT)
II	14	14B	M312	Imagery Intelligence (IMINT)
II	14	14B	M313	Signals Intelligence (SIGINT)
II	14	14B	M316	Geospatial Information Production
II	14	14B	M318	Geospatial Information Acquisition and Processing
II	14	14B	M320	Open Source Intelligence (OSINT) Collection/Processing
II	14	14B	M322	Language Exploitation
II	14	14B	M324	Multidisciplinary Collection & Processing
II	14	14B	M326	Intelligence Communications and Filtering

Category	Group	Sub-group	CA_FUNC	Title
II	14	14B	M328	All Source Analysis
II	14	14B	M330	Intelligence Production Integration and Analytic Tools
II	14	14B	M334	Intelligence Requirements Management and Tasking
II	14	14B	M399	Other Intelligence Activities
II	15	15A	M415	Combat
II	15	15B	M480	Combat Support
II	15	15C	M510	Combat Service Support
II	16	16B	M610	Homeland Defense Operations
II	17	17A	M810	Military Space Operations
IA	IA	IA	S	Student Billets
IA	IA	IA	T	Transients
IA	IA	IA	PPH	Patients, Prisoners, Holdees

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