(OES) survey for the "Portsmouth, Dover, Rochester wage area" (which includes only the New Hampshire portion of the Portsmouth-Rochester NH-ME PMSA and thus does not include PNS), we found that the Shipyard has a high concentration of employees in certain occupations not common in the New Hampshire portion of the area otherwise. Examples of such occupations are *Riggers*; *Nuclear engineers*; *Lay-out workers*; and *Painters, transportation equipment*.

Modeling

Potential Impact of BRAC on the Portsmouth Naval Shipyard

This assessment of the potential economic impact of a closure of the Portsmouth Naval Shipyard on New Hampshire under BRAC 2005 was carried out using the Economic and Labor Market Information Bureau's New Hampshire 10-County Econometric Model[8]. Below is a discussion of the data used to estimate the direct impact of the closure scenarios and the assumptions that were made in modeling the closure impacts.

For this study, the policy modeled is the closure of the Portsmouth Naval Shipyard. The impact is assessed relative to the expected growth (baseline forecast) in the region's economy assuming no closure and growth as forecasted to 2021 by REMI.

Data and Assumption

The information used to develop the policy inputs to model the Shipyard closing was provided by the Portsmouth Naval Shipyard, some directly and some indirectly. The data provided indirectly was gathered from PNS by Seacoast Shipyard Association (SSA) and published in their "Portsmouth Naval Shipyard – Economic Impact" reports. Information provided included: 1) total military personnel and military payroll; 2) civilian payroll total and by place of residence; and, 3) total non-payroll contracts and expenditures. The information was for calendar year 2004.

BRAC is not an instantaneous process. Once a base is designated to be closed, several years may elapse before the closure is complete. This presents the first challenge which must be resolved in the modeling process, how to reflect the timing of the impact of a closure. This study takes the approach that the objective of the analysis is to identify the economic importance of the Yard. This is best accomplished by assuming that closure occurs instantaneously, that all expenditures associated with the base's operation and payroll cease at once. Since the data provided was based on 2004, the study simulates the closures as if they occurred on December 31, 2004.

Second, in previous rounds of BRAC, communities with significant economic impacts from closures were provided with Federal redevelopment funds. It may be that similar assistance will be provided

8 The New Hampshire 10-County Econometric Model is a REMI Policy Insight® model, a product of Regional Economic Models, Inc. of Amherst, MA (see Appendix A).

as part of the 2005 BRAC, however the timing as to when such support might be available and the amount of the support which may be provided are completely unknown. Therefore, for this study it was assumed that there would be no offsetting injections of Federal redevelopment funds to replace the lost military expenditures.

Third, in most cases the military facilities closed as part of the previous BRACs were offered for sale, though shipyards have been less likely to be completely turned over to private use. Communities were encouraged to prepare base re-use plans and to systematically market the base infrastructure for community-wide economic development. In the present round, it is unclear if facilities will be offered for sale and re-use. Some discussion has focused on the need to retain some capacity to provide flexibility in future military options. Further, even if bases are offered for sale and re-use again, one is confronted with the problem of speculating as to when and what type of re-use may occur. To avoid such long-range speculative assumptions, this study assumes no re-use of the facilities.

Simulating the Effects of a PNS Closure on New Hampshire Using the New Hampshire 10-county Model

Simulating a possible PNS closure offered some challenges. In an ordinary facility closure simulation removal of the facility's employment is straight-forward. But in this case, the baseline employment data[9] on which the model's control forecasts are based does not include the Yard's approximately 4,800 civilian jobs because it is a New Hampshire model and the jobs are physically located in Maine. So it is not possible to remove jobs that do not exist.

Civilian Employment Table

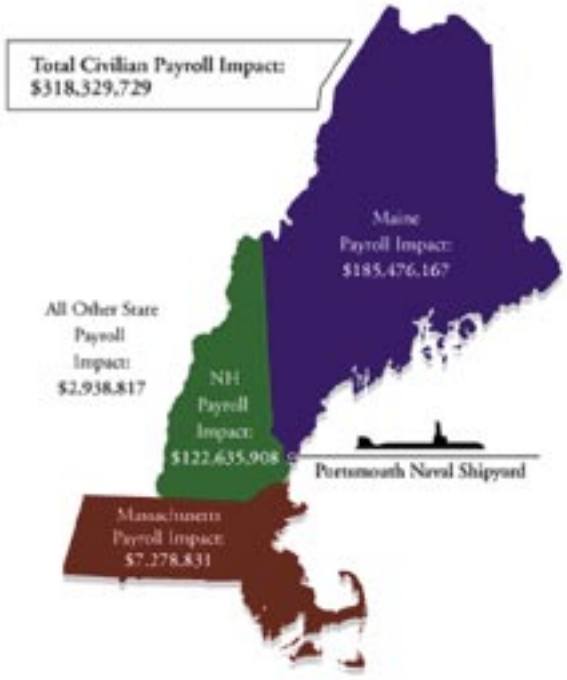
	Jobs
Number of Shipyard Employees	4,450
Number of Civilian Jobs for each Navy Tenant Activity:	
NAVSEA Shipyard Rep.	3
Resident Officer in Charge of Construction (ROICC)	8
Naval Health Care New England, Portsmouth	55
Naval Branch Dental Clinic	2
Navy Exchange	9
Defense Reutilization & Marketing Office (DRMO)	5
Submarine Maintenance Engineering Planning and Procurement Activity (SUBMEPP)	226
Defense Printing	4
Consolidated Civilian Personnel Office	57
Naval Criminal Investigative Service (NCIS)	4
Naval Telecommunications, Seavey Island	4
Naval Sea Systems Command Detachment, Naval Material (NAVSEA)	27
Sub Total	4,854
Total PNS (less NAVSEA in downtown Portsmouth)	4,827

is straight-forward. But in this case, the baseline employment data[9], on which the model's control forecasts are based, does not include the Yard's approximately 4,800 civilian jobs, because it is a New Hampshire model and the jobs are physically located in Maine. So it is not possible to remove jobs that do not exist.

The military employment data, however, comes from U.S. Department of Defense sources. The Defense Department reports the military contingent of the yard as if it were in New Hampshire.

The simulation was done in four stages:

2004 PNS Wages by State as Published by the "Seacoast Shipyard Association"



Graphic courtesy of: Nocturnal Mediagroup,LLC

Stage 1

The first stage of the simulation was to remove the New Hampshire wages by the county of residence. There is not a loss of 4,800 jobs in New Hampshire, but we can anticipate a rather substantial loss of wages paid to New Hampshire residents. The SSA's "Economic Impact – 2004" provided information about wages paid in 2004. The total of wages paid to civilians working at the yard was $318.3 million. Civilian workers residing in New Hampshire received $122.6 million in wages, $185.5 million went to Maine civilians, and $7.3 million to Massachusetts residents. "Economic Impact – 2004" provided information about wages paid by city or town of residence. This we aggregated by county to produce the information in the table above. This information was input into the model to yield the impact of the loss of these wages on the economies of New Hampshire and its counties. The wages were removed as a fixed amount for the entire period of the simulation. The assumption is made that no other employer or

NH 2004 Wages by County used to Model the Loss of Wages due to the Closing of PNS

County	Wages
Strafford	$73,199,717
Rockingham	$42,878,423
Carroll	$2,855,920
Hillsborough	$1,519,411
Belknap	$1,107,976
Merrimack	$1,074,461
NH Total	**$122,633,903**

9 U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts; and U.S. Department of Labor, Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

The model responded to this loss of purchasing power in the six New Hampshire counties by reducing employment, the labor force, and population. We recognize that a significant portion of the civilian workers are old enough and have sufficient longevity to be offered retirement options. If the Yard had closed in February 2005, nearly

Military Personnel at PNS

Personnel	Jobs
Assigned to Portsmouth Naval Shipyard	113
Number of Military Jobs for each Navy Tenant Activity:	
Resident Officer in Charge of Construction (ROICC)	2
Naval Health Care New England, Portsmouth	55
Naval Branch Dental Clinic	4
Naval Medical Command Detachment	8
Submarine Maintenance Engineering Planning and Procurement Activity (SUBMEPP)	1
Commander, Submarine Forces, US Atlantic Fleet (COMSUBLANT) Rep.	6
Fleet Technical Support Center Atlantic (FTSCLANT) Detachment	1
Naval Sea Systems Command Detachment, Naval Material	
Sub Total	**193**
Submarines at Shipyard for Overhall:	
Average Crew Size each Submarine	135
3 subs at yard on average	405
Total Navy	**598**
Each Coast Guard Tenant Activity:	
USCG Cutter CAMPBELL	98
USCG Cutter TAHOMA	98
USCG Cutter RELIANCE	77
USCG Maintenance Unit	22
Total USCG	**295**
Total Military Personnel at PNS	**893**

13 percent of the civilian employees would have been eligible for full retirement and another 33 percent would be eligible for a pension under early retirement provisions. Acknowledging that most of these laid off workers with pensions would have attachments to the area and would want to stay, we retained them in the area. Those with full retirement eligibility we retained in their home counties as "retirement migrants" and those with early retirement eligibility we retained as "economic migrants." We reasoned that those early retirees will remain in the labor force finding jobs to supplement their pensions until they reach full retirement age. We also estimated the amount of pensions[11] that would be paid to these early retirees still in the labor force and modeled this amount as an addition to transfer payments in their counties of residence.

10 REMI Policy Insight® is a long-term equilibrium model.

Stage 2

In the second stage, we accounted for the military employment. The table on page 14, shows the military employment of the Shipyard and its tenant activities in 2004. Our New Hampshire model contains the military employment because the defense department reports it as being in Portsmouth. Therefore, it is possible to model its loss by reducing the military employment in Rockingham County. We did not think that it was reasonable to remove employment representing the entire amount, however, because it is physically located in Maine. Therefore, a share of its impact belongs in Maine. In general, military personnel tend to do most of their spending on base.

We reasoned that the spending they do off base is likely to be nearby and for Retail trade purchases and on Accommodation and food services such as in Eating and drinking establishments. There are seven communities within a seven mile radius of the center of Kittery: the Maine towns of Kittery, Eliot, and York and in New Hampshire the city of Portsmouth and towns of Newington, New Castle, and Rye. In Retail trade and Accommodation and food service economic activity as measured by jobs in covered employment, about 70 percent of it is in the four New Hampshire communities. Most of this activity is in the City of Portsmouth, itself, a destination in the region for entertainment, fine dining, and cultural attractions, including the Albacore, the last non-nuclear U.S. Navy submarine.[12] We modeled the loss of military employment in New Hampshire by using 70 percent of the total 893 military employment at the Yard. We converted that amount into a share of the existing military employment in Rockingham County, and removed that share for the period of the simulation.

Stage 3

In the third stage of the simulation, we removed the 27 civilian employees of the Naval Sea Systems Command Detachment who are physically located in the Federal Building in downtown Portsmouth. Since their activity is directly connected to submarine operations, it seems unlikely that they would remain behind should the Shipyard close. We adjusted the wages because the average pay for NAVSEA employees in 2004 was $76,292.

Stage 4

In the fourth stage, we incorporated information published by the Seacoast Shipyard Association about the Yard's spending patterns in New Hampshire. Of the $49,469,785 spent by the Shipyard's supply department in 2004 for purchased goods and services, $3,552,392 went to New Hampshire firms. This is more than 50 percent more than what was spent in Maine. Connecticut firms[13] dominated this spending (at $18,203,736). We modeled the New Hampshire spending apportioning

11 The value of transfer money received by migrating early retirees was based on a formula from the FERS website (1 percent of your high-3 average pay times years of creditable service - converted to average pay times 22.5 years, which is the average of 20 years of service and 50 years old and 25 years of service and any age) which was applied to the 2004 New Hampshire PNS wages by county.

12 Though built on Seavey Island, the Albacore now rests on dry ground in Portsmouth as a museum, certainly a must-see for Navy personnel and their children.

it by industry as if were spent by a private Ship and boat building firm based on industry averages in the REMI control forecast.[14]

In the second part of stage four, we modeled the spending on contracted facility services by the Yard's public works department. The Seacoast published this amount as $46,469,785 but did not break it out by state. We were able to obtain some information on contracts with New Hampshire firms from the Shipyard and some from defense department web sites, but it was incomplete. Of the total of $46,418,335, a little over $14 million was spent on utilities (natural gas, fuel oil, sewer, electricity, communications). This, we reasoned, would most likely be spent in Maine, so we did not model it. The remainder was spent on maintenance, alterations, and support. To apportion this spending to New Hampshire, we made the assumption that the bulk on this spending would involve contractors nearest to PNS. We drew a 30-mile radius from Seavey Island selecting those towns whose geographic centroid fell within the circle and used private covered employment within those towns as a measure of economic activity. Within the circle, 60 percent of the private employment was in New Hampshire cities and towns, 23 percent was in Massachusetts, and 17 percent was in Maine. We then used 60 percent of the $32,261,052 total to model the Yard's spending on maintenance, alterations, and support. Since this spending represented expenditures required to maintain the physical plant and we had already taken care of the production-related spending in the first part of stage 4, we distributed it as if were spent to support a military base using the industry averages in the REMI New Hampshire control forecast for military employment.

Maintenance/Alterations/Support contractors are presumed to come from within a 30-mile radius of the Portsmouth Naval Shipyard

13 Presumably much of this went to submarine manufacturer Electric Boat Company, in Groton CT and its suppliers and contractors.

14 National input/output tables for each industry are imbedded in the Model.