

**Statement by Mike Hall, President Erickson-Hall Construction Company on Requirements of State of the Art Measurement Science Technology Laboratory**

The Corona measurements lab is a custom facility designed and constructed for a specific use. It consolidated numerous outdated facilities into a single, modern, "state of the art" facility. Many of the outdated facilities were "make-shift", converted spaces incapable of providing the precise temperature and humidity control that is now provided in the Corona facility. Much of the testing is performed over an extended period of time. If the test environment does not remain constant, the testing has to be restarted. I was advised that this was one of the problems encountered in the previous "make-shift" test facilities.

Replacement construction cost would range from \$300 to \$350 per SF. As I remember, the facility is approximately 40,000 SF putting construction costs at \$12 to \$14,000,000 for a new facility. Soft costs including the design effort can be budgeted at 20% (\$2.6 mil). Additionally, moving costs need to be considered. Special equipment was utilized to relocate extremely large slabs of granite and equipment. The floor slabs were engineered to handle heavier equipment and rolling loads because of the specific nature of this facility.

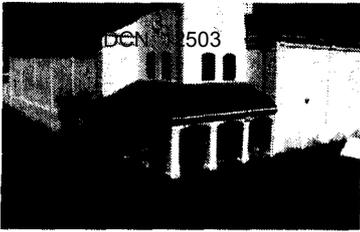
The lab has approximately 26 individually controlled temperature zones. Some of these zones provide temperature controlled environment of +/- .5 degree temperature and humidity control. Drywall partitions between labs are double framed, include interior wall liners and function as air returns. Perforated ceiling panels and specially design supply air ductwork provide laminar air flow for constant room temperatures from the ceiling to the floor. Walls are insulated and sealed to isolate each space from adjacent spaces.

The facility includes several high capacity overhead cranes to move materials for testing. Other special features include two pits to accommodate test equipment. One of these pits is 21' deep with access ladders and staging to monitor equipment below grade.

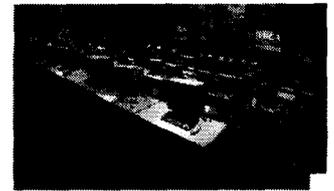
Conversion of existing spaces is difficult. On a room by room basis, conversions typically involve the construction of a new isolated lab facility with-in an existing space. New walls, ceiling, mechanical, electrical, etc. are required. Power requirements are also extensive to run mechanical equipment and the lab test equipment.

Good luck on your efforts to save the facility. The construction industry recognized the complexity of the facility as it received an award for the mechanical design and construction.

Mike Hall  
Erickson-Hall Construction Co.  
July 5, 2005



## Joint Warfare Assessment Laboratory (JWAL) Data Sheet



**Current Cost for New MILCON \$23.0M**

### Space requirements

Current space

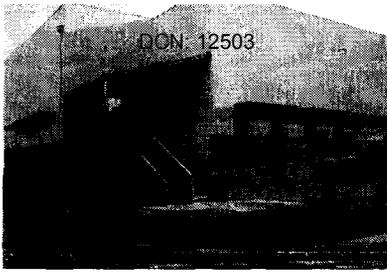
• Warfare Analysis	14,540 ft <sup>2</sup>
• Data Processing	7,740 ft <sup>2</sup>
• Project Support	10,944 ft <sup>2</sup>
• Other Ops Support	<u>2,071 ft<sup>2</sup></u>
Total (Net)	35,295 ft <sup>2</sup>
Other	<u>12,705 ft<sup>2</sup></u>
Total (Gross)	48,000 ft <sup>2</sup>

### JWAL Capabilities

- Sole site for comprehensive battle group equipment, training, and tactics assessment.
- Theatre provides unique environment for direct contact between analysts performing collaborative analysis of Test & Evaluation and Fleet test events.
- Consolidated site for joint service and industry with the resources and capability, using an onsite server, to store large classified data files and, using the classified network, distribute data to analysis support teams and the Analysis Control Board (ACB) for review.
- Data collected from test events can be transmitted from ships and ranges to the JWAL using APAN, LOS, or SIPRNET.
- Secure project rooms with spin lock combination locks and card swipe readers for access for classified activities.
- Two hundred Person Theater with 12 large-screen displays for group presentations, and data displays. The theater is equipped with access to the Internet as well as connectivity to commercial media outlets.
- Designed to allow storage and processing of classified data to the Top Secret level using large vault doors with combination spin locks and the use of an access list and security personnel.
- Includes a Sensitive Compartmented Information Facility (SCIF) for project development requiring special handling.
- Unique West Coast facility for secure homeland security operations.

### Additional Issues

- Direct communication in a classified environment between analysts and ACB that is only possible within JWAL permits immediate resolution of issues and avoidance of delays.
- Direct interaction between analysts possible within JWAL permits immediate changes in scenarios in response to changing threat information.
- Prior to JWAL, physical separation between analysts resulted in miscommunication and flawed and/or incomplete analysis of weapon system performance data.
- Physical isolation of analysts provides opportunities for security breakdowns.
- Capability for analysts to directly communicate indispensable.
- Costs to convert existing facilities to completely replicate JWALS physical capabilities could easily exceed new construction costs.
- Cost for new facility to replace JWAL could exceed \$23 mil. (Assumptions – original MILCON in 1990 was for \$8.9 mil. 5%/year increase in construction from 1990 to 2010)



## Measurement Science Technology Laboratory (MSTL) Data Sheet



### Current Cost for New MILCON \$12-14M

#### Space requirements

##### Current space

- |  |                           |
|--|---------------------------|
| • Lab space (tightly environmentally controlled)   | 21,000 ft <sup>2</sup>    |
| • Warehouse, shipping/receiving, machine shop<br>(normal environment, Currently no special controls) | 16,000 ft <sup>2</sup>    |
| • Admin space (normal environment, no special controls)  | 1,500 ft <sup>2</sup>     |
| • Miscellaneous  | <u>500 ft<sup>2</sup></u> |
| • Total Space (Bldg 575)   | 39,000 ft <sup>2</sup>    |
| <br>   |                           |
| • Additional gage storage (Bldg 542, metal building,<br>Currently uncontrolled environment)          | 3,900 ft <sup>2</sup>     |

#### Examples of MSTL Capabilities

- Dimensional measurements (gage block calibration): accuracies of 0.1 millionth of an inch (0.000,000,1")
- CMM: accuracy of 94 millionths of an inch (0.000,094") – **Most accurate in Western US**
- Force: ± 0.01% of load to 102K Lbs – **Highest capacity with this accuracy in Western US**

#### Relocation from Pomona to Corona in 2002:

- Cost \$1.2 - \$1.5 mil (moving costs only)
- Consolidated from 3 sites (Pomona lab, Pomona warehouse, Seal Beach)
- 85% operational in 3 months, 100% operational in 8 months.

#### Additional Issues

- NBVC personnel acknowledge that no existing facilities at Pt Mugu are suitable for conversion to meet the mission requirements of the MSTL. Lab foundation must be secured to bedrock. NBVC personnel proposed vacant land at Pt Mugu for a new laboratory. **MILCON required.**
- Contractor that built MSTL stated that structure was designed with end mission in mind and that rehabilitation of existing structures is not cost effective and would cost more than building new.
- Attempts to rehabilitate existing space for lab use were unsuccessful. Attempted to use Bldg 517 for calibration support prior to MSTL. Lost JNACT accreditation (i.e. shut down calibration lab) due to: (1) inability to maintain required environment for optical/dimensional calibration, and (2) mixing electrical/electronic calibration and engineering activities. In order to solve environmental control problem and regain accreditation, a \$100K Control Solutions 20'x20' module was installed.
- Proximity to ocean poses significant challenges to maintain required measurement accuracy and prevent deterioration due to corrosion. **Costs unknown.**
- Tidal activity (vibration and ground movement), aircraft operations (vibration), and EMF due to range operations encountered at Pt Mugu would negatively impact precision measurement.
- Current facility requirements (FR-06) are more stringent than those applied to existing facility; therefore, cost to replace MSTL will be higher.
- Due to arid conditions, gages and other equipment can be stored at Corona without extraordinary environmental control. More extensive and costly environmental control would be required for storage areas at Pt. Mugu due to higher humidity and salt conditions.
- Regarding security level for the MSTL; classified gages exist, however, none have been inspected at Pomona or Corona since 1996. No work done by the standards lab is classified.

# **Economic Impact of the Closure of Naval Surface Warfare Center, Corona**



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**September 12, 2004**

**Economics & Politics, Inc.**

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# Economic Impact of the Closure of Naval Surface Warfare Center, Corona

## Table of Contents

Topic	Page
Exhibit List	ii
<b>Loss of Direct Jobs &amp; Payroll</b>	<b>1</b>
<b>Impact of Losing High Paying Jobs</b>	<b>3</b>
<b>Total Local Impact of NSWC, Corona</b>	<b>5</b>
U.S. Navy Used \$2.00 Bills To Show Full Economic Impact	5
Calculating Full Economic Impact l	5
Primary Tier	5
Secondary Tier: The Start	5
Secondary Tier: Additional Rounds of Spending	6
Full Impact	8

**Economic Impact of the Closure of  
Naval Surface Warfare Center, Corona**

**Exhibit List**

<b>Exhibit</b>	<b>Description</b>
<b>1</b>	Direct Employment Due to NSWC, Corona & CSC, Norco, 1998-2003
<b>2</b>	Direct Payroll Due to NSWC, Corona & CSC, Norco, 1998-2003
<b>3</b>	Direct Job & Payroll Share of Corona-Norco Economy, NSWC, Corona; CSC, Norco, 2002
<b>4</b>	Percent Local Residents Able To Afford Median Priced Home, So. Calif., April 2004
<b>5</b>	Percent Willing To Work For Less Locally
<b>6</b>	Average Pay Per Job, NSWC-CSC, Corona-Norco Area, 2003
<b>7</b>	Estimated Use of NSWC-CSC Payroll, 2003
<b>8</b>	Multiplier Impacts, By Sector, Spending From NSWC-CSC Payroll, 2003
<b>9</b>	Multiplier Impacts, By Sector, Spending From NSWC-CSC Payroll, 2003
<b>10</b>	Total Economic Impact of NSWC Operations, 2003

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## Economic Impact of the Closure of Naval Surface Warfare Center, Corona

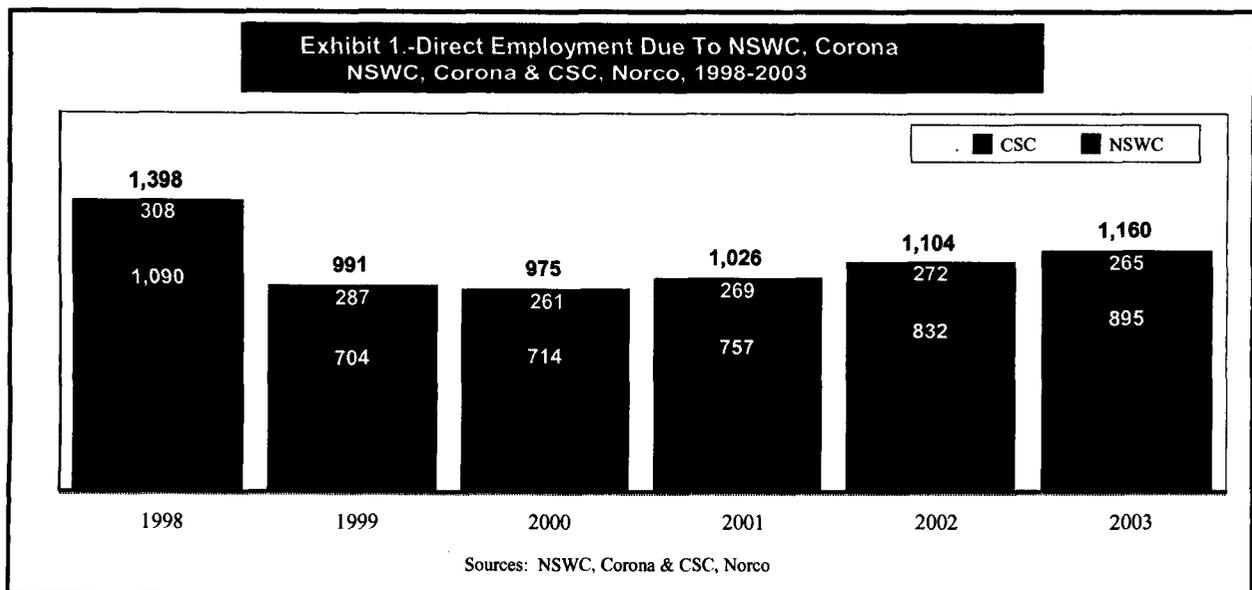
By John E. Husing, Ph.D.

Like any DOD operation, the Naval Surface Warfare Center (NSWC), Corona has an important impact on the economy of the area in which it is located. The impact of closing the facility can be measured in two ways. One is the qualitative impact of losing high paying technical jobs in a region that is increasingly being populated by well-educated professionals, technicians and executives, many of whom are forced to commute long distances to their jobs. The other is the quantitative impact of losing 3,288 jobs and \$308.3 million in economy activity. Such a decline would be on top of the \$3.1 billion in economic activity already taken from the Riverside-San Bernardino Metropolitan Statistical Area (Riverside SMA) during earlier base closures. These qualitative and quantitative issues are discussed below, in detail.

**Loss of Direct Jobs & Payroll.** The direct economic influence of NSWC, Corona is most strongly felt in the Corona-Norco area of the Riverside SMA in California. This is an area undergoing extraordinarily rapid population growth due to the lack of land in Southern California's coastal counties (*Los Angeles, Orange, San Diego*). The impact comes from two sources:

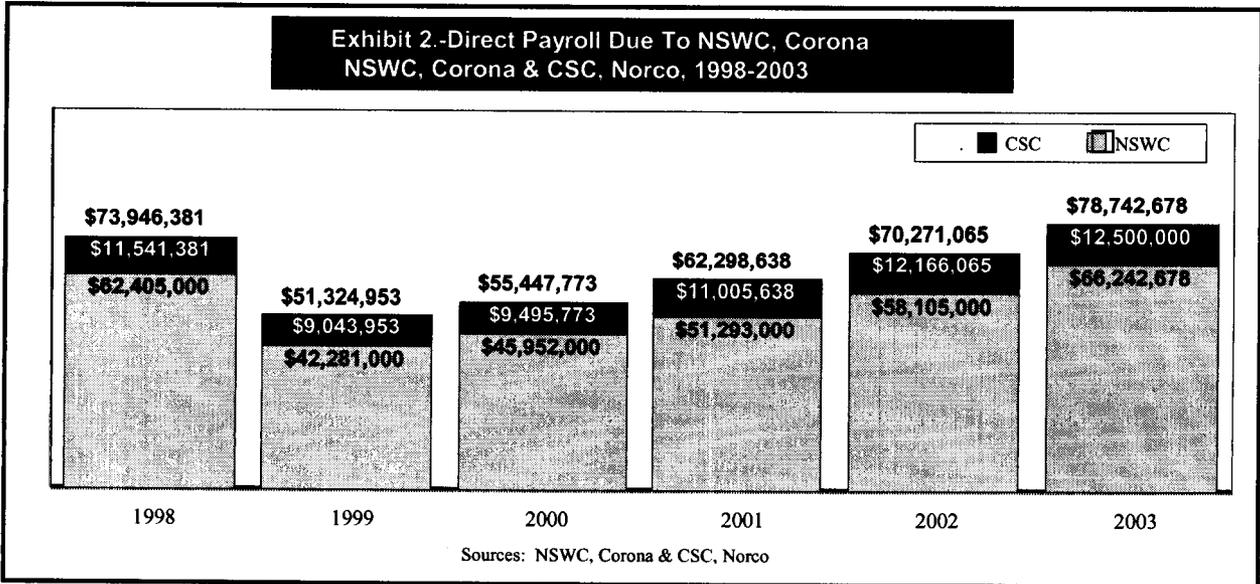
- **The number of jobs associated with NSWC, Corona and its affiliated civilian contractor Computer Science Corporation (CSC), Norco.**

In 2003, NSWC, Corona employed 895 people while CSC had another 265. That was a total staff of 1,160. This is down from the 1,398 used in 1998, but represented a slow increase in staffing from the low of 975 in 2000. The expansion has occurred as the number of systems evaluated by the operation has gradually grown. The loss of the NSWC, Corona operation would withdraw these 1,160 jobs from the Corona-Norco area economy (*Exhibit 1*).

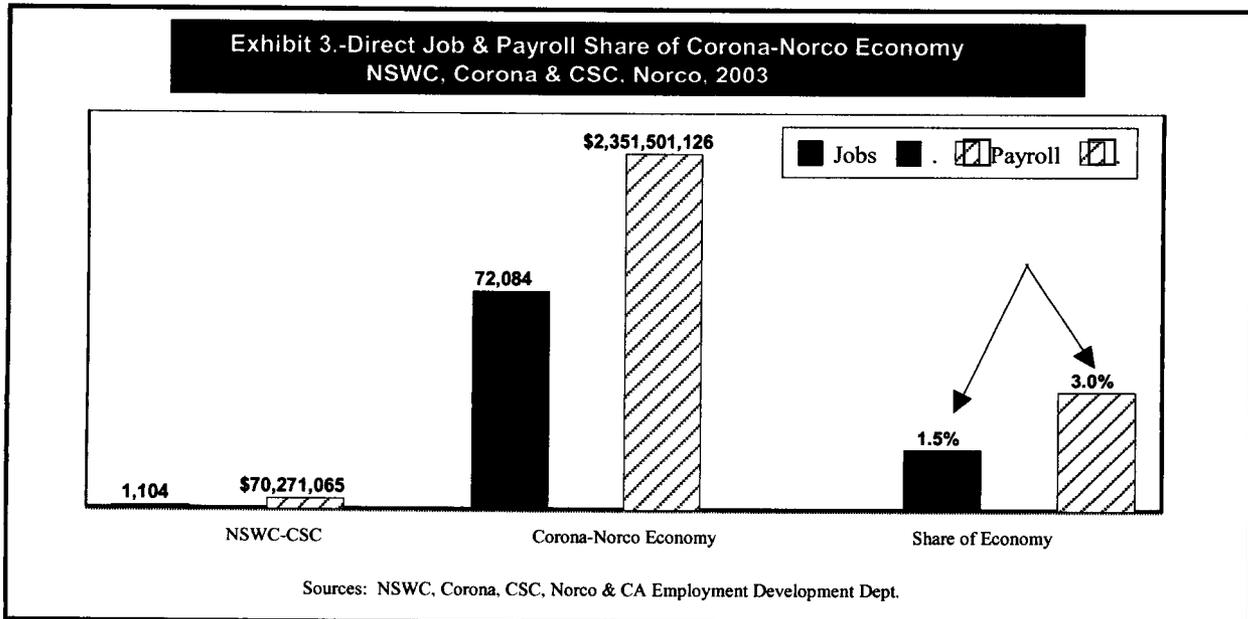


- **The dollars flowing through NSWC, Corona and CSC, Norco into the local economy.**

In 2003, NSWC, Corona had a payroll of \$66.2 million, while CSC had a payroll of \$12.5 million. That was a total payroll of \$78.7 million. The combined payroll was up 6.5% from the \$73.3 million spent in 1998. However, this was well below Southern California's 1998-2003 inflation rate of 15.2%. The 2003 payroll was up from the \$51.3 million that existed at the low in 1999. Again, this gain was due to the expansion in the number of systems evaluated by the operation. The loss of the full NSWC, Corona operation would withdraw this \$78.7 million payroll from the Corona-Norco area economy (*Exhibit 2*).



To put these 2003 data into context, the employment loss would represent a 1.5% decline in the number of jobs in the Corona-Norco area economy. The payroll loss would represent a 3.0% decline in the payroll being introduced into the area by its firms and agencies (*Exhibit 3*).

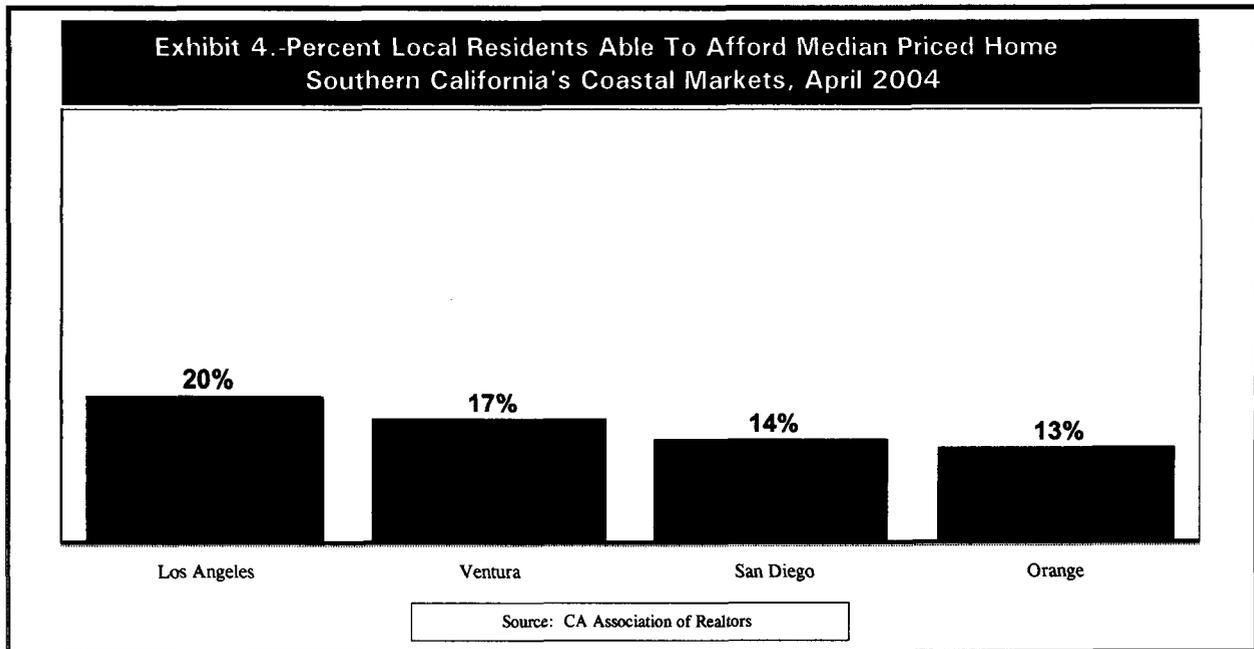


Of course, the job and payroll losses are not the full economic loss to the area. The reason being that the combined NSWCC, Corona-CSC operations also spend non-payroll dollars buying supplies and utilities from local vendors plus using local non-professional and professional service providers (*see analysis below*).

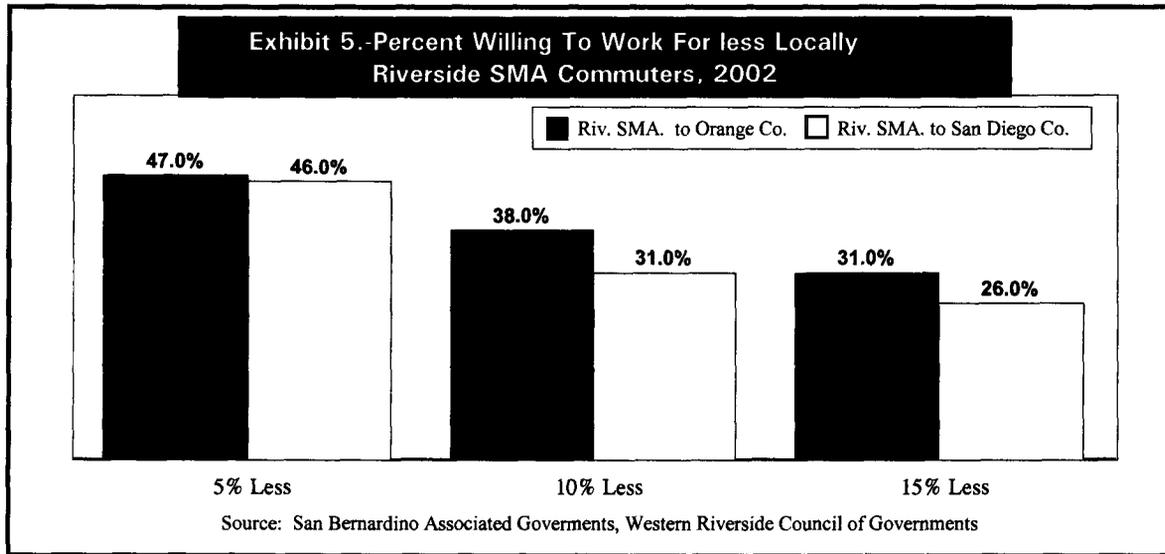
**Impact of Losing High Paying Jobs.** For the Corona-Norco area, the potential loss of jobs at NSWCC, Corona-CSC, Norco could not come at a worse time. Since 2000, the Riverside SMA has seen thousands of well-educated technicians, programmers, professionals and executives migrate to its accelerating stock of new high-end neighborhoods. They are doing so because the lack of undeveloped land in Los Angeles, Orange and San Diego counties has caused their housing prices to reach extraordinary heights. This is evident from California (CA) Association of Realtors data showing that (*Exhibit 4*):

- Just 13% of Orange County’s families could afford their county’s median priced new or existing home despite having median incomes of \$74,200.
- Just 14% of San Diego County’s families could afford its median priced home despite a median income of \$63,400.
- Just 20% of Los Angeles County’s families could afford its median priced home despite a median income of \$53,500.

As the area closest to wealthy Orange County, this has given the Corona-Norco a growing base of highly skilled workers who no longer want to make the long commute to their former jobs.

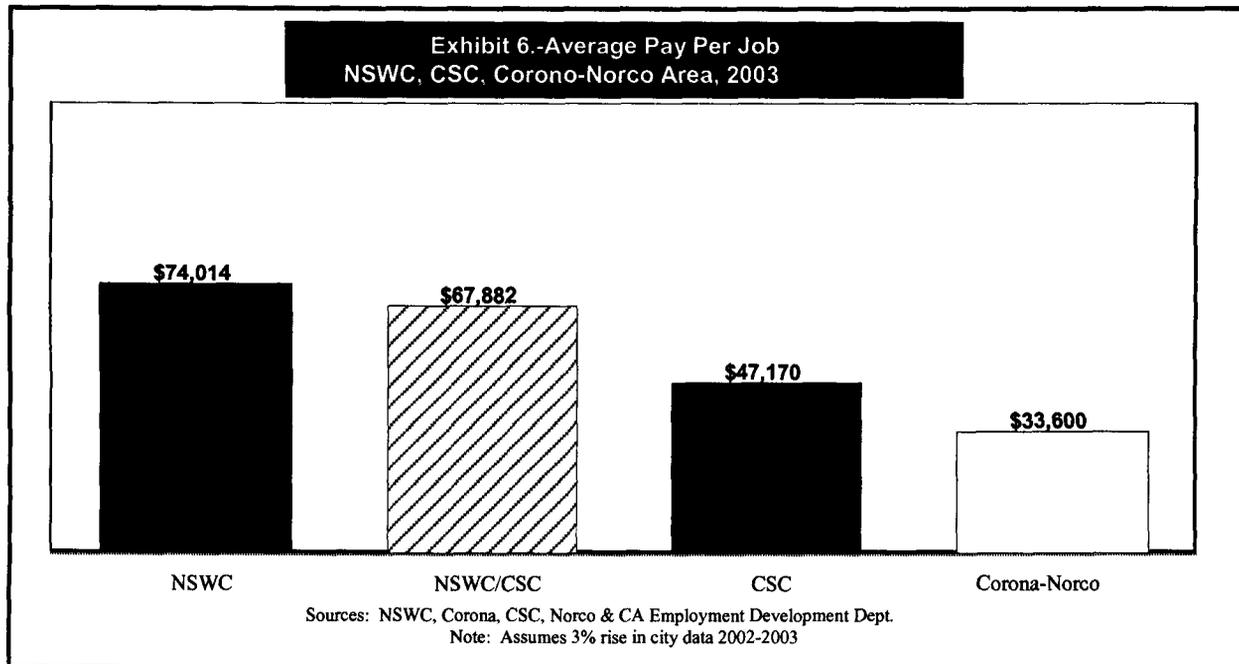


Surveys show that they will work for less in the local area to avoid the lost time, energy and harassment spent in their cars. For instance, 31% of those commuting from the Riverside SMA to Orange County would sacrifice 15% of their income for a local job. At the same time, 26% of commuters to San Diego County would make the same sacrifice. These data include a large number of workers in Corona and Norco, two communities in which this new breed of highly educated workers is congregating (*Exhibit 5*).



This situation has made it imperative for the Corona-Norco area and the Riverside SMA to undertake economic development strategies to bring high-end jobs to the region. To do so, the area must show the executives and entrepreneurs running firms located elsewhere that there are technology operations that have succeeded by using locally-based knowledge workers. One of the most outstanding example of this fact is NSWC, Corona. Its importance is seen in that the 2003 average annual pay for its combined entities was \$67,882 in 2003, with workers at the larger NSWC, Corona operation averaging \$74,014 and those at CSC averaging of \$47,170. This compared to an average pay level of just \$33,600 for the Corona-Norco area as a whole.

It would be devastating to the Corona-Norco and Riverside SMA's economic development strategy to lose the NSWC, Corona operation at such a crucial time.



**Total Local Impact of NSWC, Corona.** To measure the full impact of the loss of the NSWC, Corona operation on the Corona-Norco and Riverside SMA areas, the operation is best thought of as a large high tech company that brings *outside* money to the region through its spending on local employees, suppliers and service providers. The people and firms initially receiving the money represent the “primary” tier of the operation’s economic impact. But as they spend the same dollars supporting themselves, a “secondary” tier of non-defense related sectors is also supported. The acceleration in activity in the combined “primary” and “secondary” tiers of the economy represents the economic effect that the operation is having on the region.

**U.S. Navy Used \$2.00 To Show Full Economic Impact.** Here, an analogy can be made to the fact that the U.S. Navy once paid its sailors in \$2.00 bills just before they hit a port. These payments represented the “primary” tier of economy as they supported the sailors. As these men and women spent their funds in the harbor, the \$2.00 bills might first show up in entertainment venues. When these groups paid their employers or bought supplies, the \$2.00 bills would start reaching other “secondary tier” operations such as food stores, clothing stores, or accountants. These “secondary” tier firms might never see a sailor. The flow of \$2.00 thus showed the port community how important the U.S. Navy was to their entire economy.

**Calculating Full Economic Impact.** Short of using \$2.00, the full impact of U.S. Navy on the Corona-Norco and Riverside SMA areas must be measured by modeling the way in which the budget of NSWC, Corona and CSC, Norco affect the area’s economy. The starting point is the 2003 payroll spending of the two operations:

- **\$78,742,678** total “primary” tier payroll to **1,160** “primary” tier local employees

**Primary Tier.** This is the “primary” tier of economic and employment impact since the funds come from outside the local area and support local families. As indicated, the two operations paid their labor force a weighted average payroll per worker of \$67,882.

**Secondary Tier: The Start.** When the families receiving this money spend it, they start the cycle by which the secondary tier of the economy is affected. However, though the workers received \$78.7 million, not all of these funds affect the secondary tier of the local economy:

- Some funds are saved
- Some monies are spent outside of the local economy

To estimate these two deductions, data showing the use of funds by the “average” Los Angeles area family are used (*Exhibit 7*). This information was prepared by the U.S. Bureau of Labor Statistics as part of its work in estimating the U.S. and local Consumer Price Indexes. The exhibit shows :

- The share of a typical family’s budget estimated to go to each category of income use.
- Using a budget of \$78.7 million, it shows how much spending would go to each sector.
- Estimates are then made of what share of spending for each use would likely go to outlets in the Riverside SMA. This allows estimates of the local spending going to each sector.
- Based upon these calculations, it is estimated that **\$48,308,762** of the \$78.7 million (*61.4%*) would actually reach the secondary tier of the Riverside SMA’s economy.
- Note, for instance that none of the \$10.8 million in savings, federal and state taxes, or \$5.9 million in social security or other pension payments are assumed to reach the local economy.

Exhibit 7.-Estimated Use of NSWC-CSC Payroll, 2003					
Sector	Percent	Use of Funds	Riverside SMA	Local Spending	
Food at Home	6.4%	\$5,017,621	100%	\$5,017,621	
Food Out	4.6%	3,612,687	95%	3,432,052	
Alcohol	0.8%	632,992	100%	632,992	
Home Mortgage Interest	8.9%	6,997,265	15%	1,049,590	
Home Property Tax	1.2%	932,969	100%	932,969	
Home Maintenance & Repairs	1.8%	1,399,453	100%	1,399,453	
Rented Dwellings	5.9%	4,648,633	75%	3,486,474	
Other Dwellings	1.1%	870,750	100%	870,750	
Utilities	4.9%	3,865,884	100%	3,865,884	
Household Services	1.5%	1,182,615	100%	1,182,615	
Household Supplies	1.0%	810,539	100%	810,539	
Furniture & Fixtures	3.4%	2,681,725	90%	2,413,553	
Apparel	3.5%	2,757,376	80%	2,205,900	
Vehicle Purchases	7.5%	5,879,107	95%	5,585,152	
Gas & Oil	2.7%	2,108,945	95%	2,003,497	
Vehicle Insurance	2.0%	1,549,765	15%	232,465	
Vehicle Maintenance/Repair/Other	3.4%	2,638,790	100%	2,638,790	
Public Transportation	0.9%	722,537	100%	722,537	
Health Insurance	3.0%	2,400,275	25%	600,069	
Medical Service	0.9%	685,793	100%	685,793	
Drugs & Medical Supplies	0.4%	342,896	100%	342,896	
Entertainment	4.6%	3,611,143	75%	2,708,357	
Personal Care Products	1.1%	841,416	100%	841,416	
Reading	0.3%	247,021	100%	247,021	
Education	1.7%	1,349,354	80%	1,079,483	
Tobacco	0.5%	367,444	100%	367,444	
Miscellaneous	1.7%	1,341,635	100%	1,341,635	
Contributions	2.6%	2,044,101	75%	1,533,076	
Life & Other Personal Insurance	0.7%	524,920	15%	78,738	
Pensions & Social Security	7.5%	5,868,300	0%	0	
Taxes & Savings	13.7%	10,808,727	0%	0	
<b>LOCAL SPENDING</b>	<b>100.0%</b>	<b>\$78,742,678</b>	<b>61.4%</b>	<b>\$48,308,762</b>	

Source: U.S. Bureau of Labor Statistics, 2002

**Secondary Tier: Additional Rounds of Spending.** However, this spending only starts the secondary impact of the NSWC, Corona operation's 2003 payroll. This amount is analogous to the first round of \$2.00 bill spending by the sailors. Each of the local entities receiving payments, in turn, has its own spending on payroll plus supplies and services.

Once dollars reach a regional economy, economists have conducted a great deal of research estimating the full "secondary" impact they have as they change hands locally. To facilitate research, the U.S. Department of Commerce publishes "multipliers" showing, sector by sector, how many times \$1.00 dollar reaching that sector turns over before it has entirely drifted away. Their work is called the Regional Input-Output Modeling System (*RIMS II*). Data are available for the Riverside SMA (*Exhibit 8*):

- For each sector, RIMS II shows the number of times \$1.00 reaching the local economy will turnover creating new economic output. For instance, each \$1.00 spent on "food at home" will change hands a total of 1.7364 times before being lost to the local economy.
- For each sector, RIMS II also shows the multiple by which \$1.00 reaching the local economy will increase the area's household incomes. For "food at home," that is 0.5335.

- Multiplying these factors by the spending in each sector yields the increase in output and household income it will cause. In the case of “food at home,” that is estimated at \$8,712,596 in additional output plus \$2,676,901 in additional household income for a total “secondary” economic impact of \$11,389,497.
- Altogether, the \$48.3 million in local spending by NSWC, Corona related workers would thus simulate **\$106,925,088** in “secondary” activity in the Riverside SMA.

Exhibit 8.-Multiplier Impacts, By Sector, Spending From NSWC-CSC Payroll, 2003								
Sector	Local Spending	Multipliers			Output	Earnings	Economic Impact	Jobs
		Output	Earnings	Jobs				
Food at Home	\$5,017,621	1.7364	0.5335	24.8346	\$8,712,596	\$2,676,901	\$11,389,497	125
Food Out	3,432,052	1.8305	0.503	30.9463	\$6,282,372	\$1,726,322	\$8,008,694	106
Alcohol	632,992	1.7364	0.5335	24.8346	\$1,099,128	\$337,701	\$1,436,829	16
Home Mortgage Interest	1,049,590	1.5905	0.3731	11.1222	\$1,669,372	\$391,602	\$2,060,974	12
Home Property Tax	932,969	1.9772	0.4873	13.6505	\$1,844,666	\$454,636	\$2,299,301	13
Home Maintenance & Repairs	1,399,453	1.7483	0.6657	38.6805	\$2,446,664	\$931,616	\$3,378,280	54
Rented Dwellings	3,486,474	1.484	0.2026	8.5719	\$5,173,928	\$706,360	\$5,880,288	30
Other Dwellings	870,750	1.8313	0.4319	22.0745	\$1,594,605	\$376,077	\$1,970,682	19
Utilities	3,865,884	1.5258	0.2717	6.2602	\$5,898,565	\$1,050,361	\$6,948,926	24
Household Services	1,182,615	1.8548	0.6013	33.5544	\$2,193,514	\$711,106	\$2,904,620	40
Household Supplies	810,539	1.7364	0.5335	24.8346	\$1,407,419	\$432,422	\$1,839,842	20
Furniture & Fixtures	2,413,553	1.7364	0.5335	24.8346	\$4,190,893	\$1,287,630	\$5,478,523	60
Apparel	2,205,900	1.7364	0.5335	24.8346	\$3,830,325	\$1,176,848	\$5,007,173	55
Vehicle Purchases	5,585,152	1.7364	0.5335	24.8346	\$9,698,058	\$2,979,679	\$12,677,737	139
Gas & Oil	2,003,497	1.7364	0.5335	24.8346	\$3,478,873	\$1,068,866	\$4,547,739	50
Vehicle Insurance	232,465	1.9181	0.5884	16.2867	\$445,891	\$136,782	\$582,673	4
Vehicle Maintenance/Repair/Other	2,638,790	1.7806	0.4859	18.4817	\$4,698,629	\$1,282,188	\$5,980,817	49
Public Transportation	722,537	1.7074	0.5376	23.5868	\$1,233,660	\$388,436	\$1,622,096	17
Health Insurance	600,069	1.9181	0.5884	16.2867	\$1,150,992	\$353,080	\$1,504,073	10
Medical Service	685,793	1.8985	0.7084	20.7975	\$1,301,978	\$485,816	\$1,787,794	14
Drugs & Medical Supplies	342,896	1.7364	0.5335	24.8346	\$595,405	\$182,935	\$778,341	9
Entertainment	2,708,357	1.7364	0.5335	24.8346	\$4,702,791	\$1,444,909	\$6,147,700	67
Personal Care Products	841,416	1.7364	0.5335	24.8346	\$1,461,035	\$448,896	\$1,909,931	21
Reading	247,021	1.7364	0.5335	24.8346	\$428,928	\$131,786	\$560,714	6
Education	1,079,483	1.6922	0.4499	26.5128	\$1,826,701	\$485,659	\$2,312,361	29
Tobacco	367,444	1.7364	0.5335	24.8346	\$638,030	\$196,031	\$834,062	9
Miscellaneous	1,341,635	1.7364	0.5335	24.8346	\$2,329,614	\$715,762	\$3,045,376	33
Contributions	1,533,076	1.9066	0.5934	25.4127	\$2,922,963	\$909,727	\$3,832,690	39
Life & Other Personal Insurance	78,738	1.9181	0.5884	16.2867	\$151,027	\$46,329	\$197,357	1
Pensions & Social Security	0	NA	NA	NA	\$0	\$0	\$0	0
Taxes & Savings	0	NA	NA	NA	\$0	\$0	\$0	0
<b>LOCAL SPENDING</b>	<b>\$48,308,762</b>				<b>\$83,408,624</b>	<b>\$23,516,464</b>	<b>\$106,925,088</b>	<b>1,069</b>

Source: U.S. Bureau of Labor Statistics, 2002 & RIMS II Riverside SMA 2002

- The RIM II data also show the number of “secondary” tier jobs that will be supported for each \$1 million spent in a sector. For “food at home,” it is 24.8346. Multiplying those factors by spending in a sector yields the number of “secondary” jobs that will be created. The total was 125 for “food at home.”
- The grand total of “secondary” jobs created by \$48.3 million by NSWC, Corona related workers was **1,069**.

Payroll spending is not the only way that the NSWC, Corona's operations affect the Corona-Norco and Riverside SMA economies. There is also a good deal of money spent on buying supplies and equipment plus professional and non-professional services. When these funds reach various sectors of the local economy, they also have multiplier impacts.

Exhibit 9.-Multiplier Impacts, By Sector, Spending From NSWC-CSC Payroll, 2003										
Sector	Spending	Percent Local	Spending	Multipliers			Output	Earnings	Economic Impact	Jobs
				Output	Earn	Jobs				
Utilities	\$1,706,202	100.0%	\$1,706,202	1.5258	0.2717	6.2602	\$2,603,323	\$463,575	\$3,066,899	11
Professional Service	\$35,930,895	75.0%	\$26,948,171	1.8165	0.6573	19.0624	\$48,951,353	\$17,713,033	\$66,664,386	514
Non-Professional Service	\$2,203,685	100.0%	\$2,203,685	1.6316	0.4543	16.3278	\$3,595,532	\$1,001,134	\$4,596,666	36
Supplies	\$14,244,094	100.0%	\$14,244,094	1.7364	0.5335	24.8346	\$24,733,444	\$7,599,224	\$32,332,668	354
Equipment	\$1,655,571	75.0%	\$1,241,678	1.8154	0.4739	11.895	\$2,254,142	\$588,431	\$2,842,574	15
Other	\$18,232,505	25.0%	\$4,558,126	1.9197	0.7523	26.7722	\$8,750,235	\$3,429,078	\$12,179,314	122
Benefits	\$2,500,000	15.0%	\$375,000	1.8355	0.6489	22.0244	\$688,313	\$243,338	\$931,650	8
<b>TOTAL</b>	<b>\$76,472,952</b>	<b>67.1%</b>	<b>\$51,276,956</b>				<b>\$91,576,343</b>	<b>\$31,037,813</b>	<b>\$122,614,156</b>	<b>1,059</b>

Source: U.S. Bureau of Labor Statistics, 2002 & RIMS II Riverside SMA 2002

An analysis of the NSWC, Corona & CSC, Norco budgets shows that (*Exhibit 9*):

- Total spending on non-payroll items was \$76,472,952 in 2003. Of this 67.1% or \$51,276,956 was spent within the Riverside SMA. This money is the beginning of the "secondary" impact which these operations have on the Corona-Norco and Riverside SMA areas.
- RIMS II multipliers show the sector by sector effects of this spending on the Riverside SMA economy. For example, the \$1,706.202 spent on utilities results in 1.5258 times that in total "secondary" output in the area. It also causes 0.2717 of that amount in additional local household income. Together, these impacts result in an impact of \$2,603,323 in output plus \$463,575 in household earnings or a full "secondary" impact of \$3,066,899.
- In addition, each \$1 million spent in the utility sector has the "secondary" impact of creating 6.2602 jobs before the funds trickle away. The \$1,706,202 spent on utilities thus creates 11 additional jobs.
- Altogether, the \$76.7 million in non-payroll spending by the NSWC, Corona operations results in \$51.3 million reaching the local economy. That, it turn has a full "secondary" impact of \$122,614,156 in economic activity and adds 1,059 jobs.

**Full Impact.** The full impact of losing NSWC, Corona and CSC, Norco is the sum of the "primary" impact of their payrolls, plus the "secondary" impact of the payroll that is spent locally, plus the "secondary" impact of the local non-payroll spending by the two entities (*Exhibit 10*):

- **\$308.3 million in economic activity**
- **3,288 jobs**

Exhibit 10.-Total Economic Impact of NSWC Operations, 2003		
Type of Impact	Economic Impact	Job Impact
Payroll Spending Directly Reaching Riverside SMA	\$78,742,678	1,160
Secondary Impact from Payroll Reaching Riverside SMA	\$106,925,088	1,069
Secondary Impact from non-Payroll Spending Reaching Riverside SMA	\$122,614,156	1,059
<b>Total Impacts of NSWC, Corona &amp; CSC, Norco</b>	<b>\$308,281,922</b>	<b>3,288</b>

Though it is not part of the Base Reuse and Closure process this time, it still needs to be pointed out that the total BRAC process has had a huge impact on the Riverside SMA. Should NSWC, Corona be withdrawn from the area, its \$308.2 million in economic impact would be on top of the loss of \$3.1 billion in economic activity as a result of the closing of George (*\$602 million*) and Norton (*\$1.9 billion*) Air Force Bases and the downsizing of March Air Force Base (*\$500 million*) to reserve status. That is a huge economic hit for any one region of the United States to have to withstand.

**Excerpted Quotes*****Report of IEG Deliberations***

Ms. Davis advised the IEG that COBRA data for this scenario has been substantially revised from that presented to the DAG due to an adjustment in the SRM rate, leading to a significant reduction in steady-state savings and 20-year NPV savings. The scenario now shows Payback in 15 years vice six years . . . IAT is continuing to refine data for this scenario . . . it is thought likely that additional billet elimination can be found, leading to increased savings.

*IEG Deliberations, April 14, 2005*

The IEG noted that relocating NSWC Division Corona assets to NAS Pt. Mugu would maximize synergies by locating these assets on a Navy installation in proximity to a sea range and a Fleet concentration area. The IEG also noted that relocation to NAS Pt. Mugu would allow NSWC Division Corona assets to maximize efficiencies and synergies by collocating available capacity (i.e., an available building complex vice scatter buildings at NSA Corona or new MILCON at March ARB).

*IEG Deliberations, March 31, 2005*

Synergy with Port Hueneme technical functions and Fleet operational units

Slide 6, April 14, 2005

Col. Kennedy advised the DAG that the Technical JCSG will meet this week to decide whether to recommend relocation of NSWC Corona assets to NAS Pt. Mugu or March AFB. The JCSG is reported to favor the March AFB option as a shorter distance move that would allow civilian employees to continue to work at the receiving site, thus preserving intellectual capital. The DAG noted that the position stated at the Technical JCSG probably places excessive emphasis on preservation of intellectual capital at, and relatively moderate distance to, NAS Pt. Mugu, and because this emphasis on intellectual capital has not been used consistent to evaluate other Technical scenarios.

*IEG Deliberations, March 29, 2005*

***Miscellaneous Navy Testimony Sources***

According to Navy testimony, MCRD (Marine Corp Recruit Depot) San Diego was spared because of the cost of single siting recruit training despite the synergies/efficiencies that would be gained. (Note: USMC, the smallest of all the services, is the only branch with two recruit training bases.) In defending the Corona closure, Secretary Gordon England stated that military value is the first criteria. Clearly, the Navy switches between military value and cost arguments as it best suits their case.

In response to a question by BRAC Commissioner Hill, DASN Davis stated that they paid close attention to the possible effects of brain drain, especially in recommendations dealing with technical areas. Specifically, she stated that “[loss of critical skills] became a key aspect of the JCSG deliberations on what recommendations to move forward to the IEC [Infrastructure Executive Committee] to make sure that if moves were contemplated that they had looked hard to make sure that there were folks either willing to move or that there was sufficient potential on the other end for the right skill sets to be employed.”

Secretary Mike Wynne who headed up the Defense Department’s BRAC effort testified that he felt that the careers of the Corona folks would be enhanced by moving to Pt. Mugu. He stated further that “It’s not that far [from Corona to Mugu]. It’s a reasonable distance. And we [DoD] felt like that in moving them to Point Mugu, we would actually preserve some of them, and reduce some of the commute for some people.”

**Robert Everly, Managing Director**

**NSWC Corona Experience**

- USN veteran
- Twenty-nine years supporting all NSWC Corona Departments, 25 years as manager
- Projects at NSWC Corona support NAVSEA, NAVAIR, OPNAV, Program Executive Offices, Joint Forces Programs, Coalition Interoperability, COMNAVSURFLANT, SECONDFLT, THIRDFLT, SEVENTHFLT, OPTEVFOR, US ARMY and FMS

**Qualifications**

- Providing technical management for multiple projects in support of NSWC Corona engineering and technical services at multiple sites. Conducts program, budget and status reviews at the corporate executive level
- NSWC Corona project disciplines support missile flight analysis, cooperative engagement capability, systems integration testing, reliability engineering, missile telemetry, weapons impact scoring, certification of electronic hardware, metrology and gage engineering
- Thirty-eight years experience in Combat Systems Environment
- Bachelor of Arts, Business Administration

**Ken Gunn, Contracts Administrator**

**NSWC Corona Experience**

- Retired career USAF officer
- Eleven years at NSWC Corona
- Six years as manager of Logistics in TOR C.3.1.1.2

**Qualifications**

- Administer four major federal contracts valued more than \$1 billion, and 46 subcontractors
- Write SOPs, proposals, subcontracts, and legal agreements
- Twenty-nine years federal procurement experience
- Five years as a federal contracting officer
- Sixteen years working with federal contracting officers
- Master of Business Administration
- Master of Arts, International Relations

**Denis Plambeck, Controller**

**NSWC Corona Experience**

- Five years at NSWC Corona
- Organized and established cost reporting scheme in Attachment E format
- Established a regular reporting cycle for accrual input into NSWC Corona Accounting System

**Qualifications**

- Extensive Financial Management System management, including Subcontractors
- Experience with numerous finance and accounting systems, including Dynamic and DIFMS
- More than 15 years of financial management of CPFF and cost-reimbursable contracts
- Extensive experience in a multiple charge number environment.
- Bachelor of Arts, Finance

DCN: 12503  
**Fred Brayton, Information Technology Manager**

**NSWC Corona Experience**

- USAF veteran
- Twenty-five years supporting NSWC Corona providing data communications, computer resources and software development projects
- Twenty years as manager providing Information Technology (IT) support
- Working to establish NSWC Corona as on Emergency Operations Center in Southern California for Homeland Security
- Twelve years managing projects identical to Tasks 22-24, 28

**Qualifications**

- Skilled at database design and normalization; system design and implementation; and configuration management
- Experience using project management tools for planning, scheduling, monitoring, and controlling software development
- Experience providing NSWC computer hardware/software and network support
- Bachelor of Science, Computer Information Systems

**Sheryl Eberwein, Senior Process Engineer**

**NSWC Corona Experience**

- Sixteen years providing support to NSWC Corona as a government and CSC employee
- Twelve years in support of Quality Program including 5 years as CSC's ITS Quality Manager
- Ten years as information and quality systems manager
- Responsible for oversight of more than 140 NSWC Corona-specific documented processes

**Qualifications**

- Achieved ISO 9001:2000 Registration of two CSC contracts in the last two years
- Director of Regional Councils for the State Baldrige Program
- Board member, American Society for Quality and California Council for Excellence
- Audit guide and lead auditor
- Manage, direct, plan, schedule, monitor and control entire Quality Program at CSC Information Technology Solutions (ITS)
- Bachelor of Science, Workforce Education and Development

**William Schwab, Security and Safety Manager**

**NSWC Corona Experience**

- Retired USMC Aviator
- Twenty-one years supporting all NSWC Corona Departments
- Twenty-one years at CSC managing projects identical to Tasks 1, 26, and 28

**Qualifications**

- Demonstrated Security and Safety Management experience at NSWC Corona
- DSS Trained FSO. NSA-Trained COMSEC
- Course Completion; "Essentials of Industrial Security Management" and "Protecting Secret and Confidential Documents" through AIPD
- Master of Business Administration, Financial Management

**Dave Scott, Trouble Systems Process, Information Technology Manager****NSWC Corona Experience**

- Retired USN officer
- Ten years at NSWC Corona
- Supported Command Staff and Chief Scientist
- Seven years as a CSC Group Manager supporting Combat Systems and Joint Force Assessment
- Member of NSWC Corona Innovation Team

**Qualifications**

- Thirty-three years Navy Combat Systems experience
- Twenty-seven years Fleet exercise experience
- Conducts project reviews and briefs customers on a regular basis

**Sandy Flores, AEGIS Combat Systems Support Information Technology Manager****NSWC Corona Experience**

- Twenty-eight years at NSWC Corona
- Eleven years CSC AEGIS Performance Assessment data group
- Three years AEGIS Test Team data processing group supervisor

**Qualifications**

- Twenty-eight years data management experience
- Communicates with customers and employees coordinating various phases of data management
- Trained in computer hardware systems including UNIX, SGI, Linux, and Windows workstations
- APAN-trained for data transmissions and telecommunications
- Manages network user accounts and permissions
- Eleven years AEGIS Combat System experience
- Associate of Science, Computer Information Systems

**Willis Bay, Trouble Systems Process Systems Engineer****NSWC Corona Experience**

- Retired USN Master Chief Petty Officer
- Supported TSP for past year as manager
- Provides formal training
- Current services to C2F, C3F
- Nine years supporting NSWC Corona

**Qualifications**

- Plans, organizes, executes and assists CNSL inspections for Troubled Systems Program
- Thirty years experience in combat and communications systems
- Master of Business Administration

**Russ Cryder, Subject Matter Expert****NSWC Corona Experience**

- 40 yrs experience as a missile telemetry expert

**Qualifications**

- Develops the firing data from telemetry collected and assisted the analysts developing the true performance of the weapon. This firing data analysis has kept the Navy on the leading edge of threat elimination and protection to the Fleet.

DCN: 12503  
**Richard Domine, Subject Matter Expert**

**NSWC Corona Experience**

- 18 Years supporting NSWC Corona as database systems administrator and developer with a Master's Degree in the field
- A Lotus Notes database developer for the critical AEGIS performance data.
- As administrator, installed and configured software on both the server and client machines, and establish LAN/dial-up communication between them.

**Qualifications**

- Over Twenty-one years of database systems administration and development experience, using a variety of DBMS/languages.
- Masters degree from Purdue University in Information Systems.
- Masters degree from Purdue University in Mathematical Psychology.
- Bachelor's degree in Mathematics.
- Installed and configured the server and clients for the Oracle and Notes databases and their supporting processes.

**Jerry Pitts, Technician III**

**NSWC Corona Experience**

- A network expert for the AEGIS Performance Assessment Network (APAN).

**Qualifications**

- Provides operation support to this network during test events to ensure all the data is distributed in a timely manner.
- He has assisted remotely with the setup and operation both in CONUS and overseas. His Network IT expertise is excellent.

**Yancy Bradford, Technician III**

**NSWC Corona Experience**

- A network expert for SIPRNET and classified LAN systems.

**Qualifications**

- Provides operational support to NSWC Corona SIPRNET. He maintains all the connections in both the JWAL and external support buildings.

**Gary Smith, Metrology Program Support Information Technology Manager**

**NSWC Corona Experience**

- Twenty-nine years supporting NSWC Corona Division metrology, calibration, inspection, product engineering, and test programs
- Twenty-five years managing NSWC Corona projects
- Thirteen years at CSC managing projects identical to Tasks 5, 17, 18, 19, 20, and 21

**Qualifications**

- Proven leadership experience managing CSC Measurement Science and Product Engineering Assessment Support Group for seven years
- Proven experience working with Measurement Science Dept, Product Engineering Assessment Dept, and NSWC Corona Command senior staff
- More than 35 years directly related experience in metrology, calibration, interface assessment, product engineering, and test certification
- Skilled at calibration requirements analysis; documentation development; and technical training program development, presentation, and administration
- Bachelor of Arts, Psychology

DC# 12503  
**Peter Nemeth, Engineering Technician VI**

**NSWC Corona Experience**

- 30 years direct experience with the U.S. Navy METCAL (Metrology and Calibration) Program.
- Considered an expert in the Navy's Metrology Program

**Qualifications**

- Responsible for providing Quality Assurance support for the Navy's Metrology Calibration (METCAL) Program.
- Serves as permanent member of the METCAL Users Group to provide guidance on program requirements.
- Reviews and tests new software. Provides feedback on problems and provides recommendations for fixes.
- Writes guidelines and business rules for METRL, NCE and NCA.

**Roy LaParry, Engineering Technician V**

**NSWC Corona Experience**

- 40 years of aircraft related metrology, calibration, and logistics support experience as an Air Force technician;
- A civilian employee of the NSWC Corona Division, Measurement Science Department (MSD);
- Considered by the NSWC MS Dept to be the recognized expert on metrology and calibration support issues for Navy F/A-18E/F Aircraft.

**Qualifications**

- Develops Calibration Support Plans
- Reviews Calibration Measurement Requirements Summaries
- Provides engineering technical expertise to identify calibration support requirements for NAVAIR support equipment, by performing Calibration Requirements Analysis (CRAs). He is considered by the NSWC MS Dept to be the recognized expert on metrology and calibration support issues for Navy F/A-18E/F Aircraft.

**Chester Franklin, Systems Engineer**

**NSWC Corona Experience**

- Responsible for providing technical support for CSC's Measurement Science Department (MSD) metrology R&D tasking.

**Qualifications**

- Provides direct support to the MSD Department Head and the Product Engineering Assessment Department Head by serving as a working member of key US, foreign, and industry associations (e.g. MSC, IMEKO, NCSLI, NACLA) critical to the present and future success of the Navy's metrology program.
- Provides support to the MSD R&D Program Manager. Metrology R&D program support includes liaison with program sponsors, and advising the R&D Program Manager on processes and procedures for program planning and implementation.

**Lloyd Boyde, Engineering Technician V**

**NSWC Corona Experience**

- Over thirty years of experience in Navy metrology and calibration, twenty years of which have been focused on engineering policy definition and strategic planning for U.S. Navy surface ship and submarine main and auxiliary propulsion systems, hull and mechanical (H&ME) systems, radar equipment, and sonar systems.

**Qualifications**

- Employee is considered by our Navy customer to be the definitive expert on metrology and calibration requirements for the US/UK TRIDENT Missile Program.

DCN 12503 PE has extensive experience with the development and implementation of critical US/UK TRIDENT Missile Program metrology and calibration related policies and procedures is well recognized by CSC's local Navy customer, the Strategic Systems Program's (SSP) Office, and key personnel with the UK TRIDENT Missile Program.

- He is co-chairman of the US/UK annual calibration technical exchange meeting and coordinates and participates in the annual audit of UK TRIDENT II support facilities.

### **Harvey Dilulo, Engineering Technician V**

#### **NSWC Corona Experience**

- 30 years (Military, Contractor) experience with various Navy surface launch missile systems.

#### **Qualifications**

- His knowledge and experience is added value to the CSC contract because he provides missile systems analysis to improve systems performance, efficiency, and reliability while using best business practices to be cost effective.
- Harvey is contracted to provide technical assistance on special projects for NSWC Corona Division, PE30

### **Wendy Lara, Computer Programmer III**

#### **NSWC Corona Experience**

- 25 years contractor experience with Standard Missile System. With her extensive knowledge, experience and comprehensive computer skills, she is able to perform and provide detail missile system and database analysis.

#### **Qualifications**

- She communicates well, provides technical assistance and workable solutions to resolve data issues. Wendy is sought out by our customers and peers to assist in resolving technical data issues.

### **Debora Rasch, Computer Systems Analyst I**

#### **NSWC Corona Experience**

- Performs several diverse, complex tasks on the Surface Missile Engineering Process System (SMEPS), Envolved SeaSparrow, and RAM missile systems.

#### **Qualifications**

- Her task requires a wide program knowledge base, that includes Web design, graphic layouts, database administration using specific software applications, on-line help support, and documentation for all aspects of the SMEPS project. Debora is a highly respected member of the SMEPS task.

### **Earl Clifford, Government Industry Data Exchange Program Information Technology Manager**

#### **NSWC Corona Experience**

- Nineteen years combined CSC support to NSWC Corona
- USN veteran, active Naval service at NSWC Corona
- Supported Combat Systems, Quality Assessment, Force Training, and Product Engineering

#### **Qualifications**

- D20 Group Manager
- Management experience more than 30 years
- GIDEP Project Manager
- Bachelor of Science, Business Administration

**Sal Hernandez, Analyst**

**NSWC Corona Experience**

- More than 22 years experience with Navy systems

**Qualifications**

- Install Galaxy GPS tracking hardware on U.S. and Allied Navy ships to obtain ground-truth data for the reconstruction and analysis of Joint Task Force (JTFEX) and Rim of the Pacific (RIMPAC) naval exercises.
- Collect and process data.
- Install/Deinstall data collection hardware, shiprid

**Richard Cordova, Engineering Technician**

**NSWC Corona Experience**

- More than 20 years of post Navy experience in engineering, computer operations, data acquisition, processing and analysis, fleet operations, training, technical manual preparation, and program management

**Qualifications**

- System Operator of the Battle Force Tactical Training (BFTT) Debrief system
- Provide operations analyst providing analytical support for fleet exercises.

**John Edmiston, Electronics Technician**

**NSWC Corona Experience**

- Over 12 years of experience in operation, installation and maintenance of Portable Telemetry Data Collection Equipment/Telecommunications Equipment

**Qualifications**

- Operate, maintain and install Portable Telemetry Data Collection, Telecommunications/Support equipment.
- Project lead of fabrication and installation and modification of various telecommunications equipment.
- Provide logistics support
- Research and process various weapons and media providing telemetry data for analysis

**Robert Higelin, Engineering Technician**

**NSWC Corona Experience**

- Over 14 years of experience in operation, installation and maintenance of telemetry, microwave and satellite and project management

**Qualifications**

- Development, deployment and troubleshooting of telecommunications systems.
- Data acquisition, plan development and execution
- System design, development and implementation

**Julie McLaren, Engineering Database Support**

**NSWC Corona Experience**

- More than 20 years experience on the NSWC Contract

**Qualifications**

- Providing requisition data for the Industrial Logistics Support Management Information SYSTEM (ILSMIS)
- Providing support for engineering activities creating and maintaining TACTS Financial databases
- Supporting TACTS sites creating and maintaining TACTS Range Management databases

**Richard Flory, Data Analyst**

**NSWC Corona Experience**

- Retired after 26 years with career in United States Navy
- NSWC OIC from 1976 to 1980
- Two Years as XO of Seal Beach Command

**Qualifications**

- Two Years as XO of Seal Beach Command
- Created and maintained the Integrated Logistical Support documentation and the TACTS Range Site Directory
- Performed Integrated Logistic support functions including preparing change proposals and support documentation and attending program review.
- Provided analysis and validation of Large Area Tracking range (LATR) and Naval Tactical Training Range (NTTR) data.

**Darrick McVay, Lead Engineering Technician**

**NSWC Corona Experience**

- More than 20 years experience on the NSWC Contract

**Qualifications**

- Design, Install, Test the Weapons Impact Scoring Set (WISS) systems.
- Design, Install, Test the Improved Remote STRAFE Scoring System (IRSSS) systems.
- Certified Tower Climber and Safety Course Trainer (for CSC Contract support)
- Travel to Navy, Air Force, and Army Range sites throughout the world for installations and user training.

**Jon-Erik Nelson, Engineering Technician**

**NSWC Corona Experience**

- More than 10 years experience on the NSWC Contract

**Qualifications**

- Eight years of Weapons System operations support as Scoring Specialist at the Utah Test and Training Range Saylor Creek.
- 3 years at NSWC Designing, Installing, Testing the Weapons Impact Scoring Set (WISS) systems hardware and software.
- Certified Tower Climber.
- Traveled to Navy, Air Force, and Army Range sites throughout the world for installations and user training.

**Sudad Al-Wahab, GIDEP, Senior Engineer, Subject Matter Expert**

**NSWC Corona Experience**

- 21 years experience at NSWC Corona
- Three years experience supporting NSWC Corona
- Expert with GIDEP database structure, designed the current GIDEP database
- Expert in process management and measurement of effectiveness

**Qualifications**

- Designed the current GIDEP Database
- Bachelor of Science, Statistics
- Master of Science, Industrial Engineering
- Subject matter expert in GIDEP metrics and processes
- Combined 13 years experience as supervisor in MRDB & GIDEP
- Database design & project management

PCN: 12502  
**Jake Hurse, GIDEP, Subject Matter Expert**

**NSWC Corona Experience**

- Retired USAF Master Sergeant
- Nineteen years at NSWC Corona
- Seventeen years as GIDEP Production Supervisor

**Qualifications**

- Manage GIDEP Information Management support
- Provide 24/48 hour delivery processing for Failure/Product information
- Develop/implement data base structural changes to GIDEP database
- Forty seven years Government Inventory/Logistics Management experience

**Philo Smith, GIDEP, Subject Matter Expert**

**NSWC Corona Experience**

- 15 years experience in support of the Government-Industry Data Exchange Program (GIDEP)
- Responsible for managing MS Windows 50 user Network including server maintenance and upgrades, software installation, anti-virus management and training
- Responsible for overall Program Management of annual GIDEP Information Sharing Conference and Workshop for GIDEP users
- Responsible for supervising, directing and managing personnel efforts related to GIDEP trade show participation, GIDEP newsletters publication, and GIDEP program Utilization data collection and reporting.
- Responsible for supervising, directing and managing GIDEP Customer Technical Support and Help Desk
- Responsible for course development and training in use and application of GIDEP database

**Qualifications**

- Numerous technical courses in network system engineer certification
- Total Quality Management training for Team Leaders and Managers
- Program Management and leadership training
- Program Manager for 15 years of Depot Level Repair and Overhaul programs and various Logistics Support contracts for US Army, US Navy and NATO (NAMSA)
- Bachelor of Science, Electrical Engineering
- Master of Science, Electrical Engineering

**Robert Bordeaux, Senior Systems Engineer Subject Matter Expert**

**NSWC Corona Experience**

- More than 30 years experience in NAVSEA organizations
  - NSWC Corona, Systems Engineering Director
  - NSWC Corona, Deputy Executive Director
- HPO program implementation utilizing aggressive Strategic Planning and Malcolm Baldrige quality principles
- Devised strategies for organizational long-term financial viability

**Qualifications**

- More than 33 years experience with Navy systems in
  - Acquisition Program Management
  - RM&A Assessment
  - Calibration & ATE Certification Programs
- Extensive program and enterprise management experience
- Organizational assessment and strategic planning expertise
- DAWIA-Certified Acquisition Professional
- Master of Science, Electrical Engineering

**Dennis Casebier, Senior Systems Engineer Subject Matter Expert**

**NSWC Corona Experience**

- USMC veteran
- More than 26 years experience as department head of the Ship Systems Department and combat Systems department with a budget approaching \$50M.
- Management of multitude of Navy programs largely relating to Terrier, Tartar, Talos and AEGIS Combat systems.
- Member of the Strategic Management Team at NSWC Corona providing advice and analysis to top management

**Qualifications**

- More than 40 years experience with Navy systems in
  - Managing technical and engineering projects and programs in DoD environment
  - Organizational assessment, process analysis, process re-engineering, organization development and strategic development
- Master's in Management, Business Administration, and Management Science

**Pete Young, Senior Systems Engineer Subject Matter Expert**

**NSWC Corona Experience**

- USN veteran
- Eight years NSWC Corona experience
- Strategic business planning and organization assessment for CSC support of NSWC Corona
- Supported NSWC Corona IRM realignment and wedge savings reporting efforts

**Qualifications**

- More than 37 years experience with Navy systems
- Extensive project and enterprise management experience
- Organization assessment and strategic planning expertise
- Doctorate in Management/Administration

**Thomas Kufta, Engineering Technician IV**

**NSWC Corona Experience**

- Provided programming, database development, and web development support for NSWC Corona Div for over twenty (20) years
- Develops multi-user software systems in support of the navy METCAL Program as well as other NSWC Corona Div activities
- Primary software and web developer for the Measurement Science and Product Engineering Assessment Departments

**Qualifications**

- Experienced with C, C++, BASIC, Clipper, Power Builder, web development, and all Microsoft applications
- BSEE, MSEE, and MBA degrees
- Programming and web development skills in conjunction with engineering and metrology experience provide a unique resource

**George Aleman, Senior Systems Engineer**

**NSWC Corona Experience**

- Eleven years Active Duty Navy before coming to Corona
- Thirty two years at NSWC Corona
- Twenty four years as Civil Servant, eight years as Contractor

**Qualifications**

- Bachelor of Science Electronics Engineering
- Thirty two years of Weapon System Performance Analyst experience
- Project Leader during development of several SEASPARROW weapons systems
- Extensive experience in Test Plan development
- Extensive experience in project management
- Extensive experience in shipboard missile launch system and missile flight test and evaluation
- Extensive experience in comprehensive reporting.
- Expert knowledge in AIM-7C series, AIM-7D series, RIM-7E series, RIM-7H series, RIM-7F series, RIM-7M series, and RIM-7P missiles and Japanese versions of these missiles

# NSWC Corona

## ***BRAC Criteria and Military Value Principles Matrix***

## **Introduction**

The following matrix and attached pages address the military value of the NSWC Corona in accordance with guidance provided by DoD. First are the ***BRAC Principles*** to be considered by the Military Departments and the Joint cross-Service Groups when applying military judgment in their deliberative process. These principles follow the general categories of:

- Recruit and Train
- Quality of Life
- Organize
- Equip
- Supply, Service, and Maintain
- Deploy & Employ (Operational)
- Intelligence

Secondly, are eight final selection Criteria to be used to make recommendations for the closure or realignment of military installations inside the United States. Criteria 1 through 4 address specific ***Military Value*** for priority consideration. They are generally worded as follows:

1. The current and future mission capabilities and the impact on operational readiness of the total force of the DoD, including the impact on joint warfighting, training, and readiness.
2. The availability and condition of land, facilities, and airspace at both existing and potential receiving locations.
3. The ability to accommodate contingency, mobilization, surge, and future total force requirements at both existing and potential receiving locations to support operations and training.
4. The cost of operations and the manpower implications.

Criteria 5 through 8 are ***Other Considerations*** and are as follows:

5. The extent and timing of potential costs and savings, including the number of years beginning with the date of completion of the closure or realignment, for the savings to exceed the costs.
6. The economic impact on existing communities in the vicinity of military installations.
7. The ability of the infrastructure of both the existing and potential receiving communities to support forces, missions, and personnel.
8. The environmental impact, including the impact of costs related to potential environmental restoration, waste management, and environmental compliance activities.

This matrix identifies NSWC Corona's contributions and impacts with respect to these principles and criteria where applicable, and further identifies correlation between attributes through use of the matrix format.



<b>Organize</b> Force structure sized, composed and located to match demands of the National Military strategy. Taking advantage of Joint basing.	<b>Equip the Warfighter</b> DoD needs research, development, acquisition, test and evaluation capabilities that efficiently and effectively place superior technology in the hands of the warfighter to meet current and future threats and facilitate Knowledge-Enabled and Net-Centric Warfare	<b>Supply, Service and Maintain</b> DoD needs access to logistical and industrial infrastructure capabilities optimally integrated into a skilled and cost efficient national industrial base that provides agile and responsive global support to operational forces.	<b>Deploy &amp; Employ Operational</b> DoD needs secure installations that are optimally located for mission accomplishment including (homeland defense) that support power projection, rapid deployable capabilities and expeditionary force needs for reach back capability, that sustain the capability to mobilize and surge and ensure strategic redundancy.	<b>Intelligence</b> DoD needs intelligence capabilities to support National Military Strategy by delivering predictive analysis, warning of impending crises, providing persistent surveillance of our most critical targets and achieving horizontal integration of networks and data bases.
Page 3	Pages 4-5	Page 6	Page 7	Page 8
Page 11	Page 12	Page 13	Page 14	Page 15
Page 18  <b>No Data</b>	Page 19	Page 20	Page 21  <b>No Data</b>	Page 22
Page 25 <b>No Data</b>	Page 26	Page 27 <b>No Data</b>	Page 28	Page 29
Page 32	Page 33	Page 34	Page 35	Page 36
Page 39	Page 40	Page 41	Page 42	Page 43
Page 46	Page 47	Page 48	Page 49	Page 50

Page 53

Page 54

Page 55

Page 56

Page 57



**Current and future mission capabilities and the impact on operational readiness of the total force of the DoD, including the impact on joint warfighting, training and readiness.**

***Recruit and Train.*** DoD must attract and train personnel who are highly skilled and educated to ensure current and future readiness, to support advances in technology and to respond to anticipated developments in Joint and service doctrine and tactics.

NSWC Corona is staffed by highly educated and degreed scientists and engineers with an average of 13 years experience. Personnel are continually educated in advances in technology, Joint and services tactics, and with such extensive skills, knowledge and ability in the methodology and application of independent analysis and assessment processes.

- NSWC Corona's mission is unique and focuses specifically on Fleet Performance and Readiness
- Workforce composition is highly technical and specialized, primarily scientists and engineers
- There is an abundance of colleges and universities in the vicinity of the Inland Empire
- Inland Empire is affordable with high Quality of Life and attracts technical talent
- NSWC Corona has demonstrated the ability to recruit and retain scientists and engineers

**Current and future mission capabilities and the impact on operational readiness of the total force of the DoD, including the impact on joint warfighting, training and readiness.**

**Quality of Life.** Quality of workspace that supports recruitment, learning and training and enhances retention.

NSWC Corona is centrally located in Southern California where intellectual capital is high, and the opportunities for higher-level technical training are great. Numerous universities, community colleges, technical schools, and high tech industries are all located within 60 miles of NSWC Corona. Various amusement parks, national parks, forests, deserts, beaches, and major metropolitans are all within 1 hour driving distance from NSWC Corona.

- Inland Empire Quality of Life and learning institutions supports learning and retention
- Median home prices by county (April 2005), Press Enterprise
  - Riverside: \$374K
  - Ventura: \$529K
- Homes of equal comparison
  - 1600-200 sf in Riverside \$374,000
  - 1600-200 sf in Ventura \$700,000 to \$895,000

**Current and future mission capabilities and the impact on operational readiness of the total force of the DoD, including the impact on joint warfighting, training and readiness.**

**Organize.** Force structure sized, composed and located to match demands of the National Military strategy. Taking advantage of Joint basing.

NSWC Corona is staffed by over 1000 civilian and contracted personnel, highly educated and degreed scientists and engineers with an average of 13 years experience. NSWC Corona is centrally located in southern California, close to 4 international airports, within 20 miles of March ARB, and near a freeway hub to drive south to San Diego Naval Stations, north to Naval Base Ventura County, east to Fort Irwin, and west to Seal Beach Weapons Station. The base is also near a number of accredited universities, colleges, and high tech industries, prime source supply our intellectual capital.

- NSWC Corona is currently and has been consistently focused on a joint support role
- NSWC Corona has experienced substantial growth in the Joint Forces areas particularly in Air Combat training range systems utilized by the Air Force, Navy and Marine Corp. Corona has designed and installed Bombing and Strafe Scoring Systems at virtually all Navy, Marine Corp, and Air Force training ranges, thereby replacing costly obsolete systems and replacing with common systems which greatly enhance interoperability.
- Less than 10% of the work at Corona is NAVSEA funded. Claimant could be Joint Force Command or Air Force

**Current and future mission capabilities and the impact on operational readiness of the total force of the DoD, including the impact on joint warfighting, training and readiness.**

***Equip the Warfighter.*** DoD needs research, development, acquisition, test & evaluation capabilities that efficiently and effectively place superior technology in the hands of the warfighter to meet current and future threats and facilitate Knowledge-Enabled and Net-Centric Warfare

Provides independent assessment of the Navy's joint warfighting capabilities from unit to theater level. Provides analytical assessment in accordance with DON policy, ensuring appropriate force readiness under realistic threat environments.

- NSWC Corona's collaborative assessment work contributes towards the Navy goal of developing the capability of electronically mapping the battle space for strategic and tactical commanders, and providing situational awareness and combat identification for all echelons of warfighters.
- Provides performance assessment of SIAP and CEC. Both these programs contribute significantly to the Navy key future requirement of providing a network-centric capability that integrates and correlates a wide variety of multi-spectral sensors (i.e. sensor fusion) to obtain a much-improved all-weather, all-geometry threat situation awareness.
- Provides the government's technical assessment of material readiness, requirements, products and processes for Weapons and Combat Systems during all life-cycle phases to improve quality, reliability, performance, and Fleet Readiness.
- Assesses Weapons and Combat Systems performance using consistent, government-controlled evaluation criteria, procedures, techniques, and analysis methodology to gauge success. Provides an objective determination of war-fighting capability of unit, joint, and combined forces in threat-representative scenarios and operational environments to evaluate mission area effectiveness, and analyzes current system capability against emerging and evolving threats.
- STILO- Conduct Scientific and Technical Intelligence Liaison operations to assess "real-world" threats and capability
- Provides total lifecycle support to foreign, domestic, and joint service program offices during the acquisition, development, deployment, and sustainment of weapons and combat systems. Ensures operational requirements are met by analyzing performance and supportability metrics.

- Provides expertise in performance assessment, risk assessment, mission assurance, product integrity and technical program management engineering disciplines. Ensures concurrence with DOD and OSN guidance and policy.
- Provides assessment support for emerging technology programs, particularly at the platform level, identifying test and evaluation flow down requirements, providing Test and Evaluation Master Plan inputs, and supporting Probability of Raid Annihilation (PRA) assessment.
- Provides training performance assessment for Fleet exercises, from individual platform level to Battle Force commander. Corona provides analytic and technical support to Fleet commands in planning exercises, maintaining data requirements definition, determining exercise-specific instrumentation and data collection requirements, collecting data during operations, and transmitting data in near real-time to support rapid feedback requirements.
- Provides reconstruction of significant events, generation of debrief products, and transmission of debrief/display products to afloat force commanders.
- Corona quantifies performance metrics in supported areas to assist Fleet with tactics development and evaluation. Assists Fleet units in implementing Naval Mission Essential Task Lists by identifying meaningful and measurable performance standards.
- Participation in JNTC and FRP activities to identify future training needs and quantify the resources and capabilities required to support them.
- Develops measurement standards to ensure that the Navy's test equipment is accurate and capable of maintaining the readiness of Fleet weapon systems.
- Provides assessment of weapon system calibration requirements and initiates the development of engineering products to ensure that those requirements are met and the weapon system performance accuracy is not compromised.
- Provides technical oversight and metrology engineering products and services for deployed calibration laboratories on ships and in theater supporting Navy and Marine Corps test equipment wherever it is used.

**Current and future mission capabilities and the impact on operational readiness of the total force of the DoD, including the impact on joint warfighting, training and readiness.**

***Supply, Service and Maintain.*** DoD needs access to logistical and industrial infrastructure capabilities optimally integrated into a skilled and cost efficient national industrial base that provides agile and responsive global support to operational forces.

NSWC Corona manages the operations of Government Industry Data Exchange Program (GIDEP). The GIDEP program is a cooperative activity chaired by the Joint Logistic Commanders to provide for full exchange of information between government and industry.

- NSWC Corona provides threat-driven performance assessment and capability of weapons and combat systems
- Corona systems engineering processes provide linkage between Warfighter's performance and engineering changes required in the industrial Base
- Corona provides an engineering "closed loop" feedback and corrective action approach to improving Fleet readiness

**Current and future mission capabilities and the impact on operational readiness of the total force of the DoD, including the impact on joint warfighting, training and readiness.**

***Deploy & Employ Operational.*** DoD needs secure installations that are optimally located for mission accomplishment including (homeland defense) that support power projection, rapid deployable capabilities and expeditionary force needs for reach back capability, that sustain the capability to mobilize and surge and ensure strategic redundancy.

The NSWC Corona Joint Warfare Assessment Laboratory and the Measurement Science and Technology Laboratory provide unique independent assessment capabilities. These laboratories contain specialized assessment facilities and equipment designed to collectively support the unique needs of the collaborative assessment process from the system of systems perspective to the test equipment level.

The Joint Warfare Assessment Laboratory (JWAL) is a 48,460 sq. ft. secure facility with internal vaults and special access spaces configurable for work centers supported by secure LAN with satellite/landline telecommunications. The JWAL includes computer facilities for software workstations, software engineering development and assessment; modeling and simulation workstations, Fleet information databases and management systems. The Metrology Research and Development Laboratory supports the development and prototyping of metrology research projects and a Calibration Standards Laboratory that supports the calibration or measurement equipment, machines, and/or devices utilized in the Metrology/Calibration (METCAL) laboratories and other special investigations.

The Corona workforce centered in the Inland Empire is a cornerstone of technological growth. The high quality of life and affordable housing attract and retain a highly specialized and technical workforce.

**Current and future mission capabilities and the impact on operational readiness of the total force of the DoD, including the impact on joint warfighting, training and readiness.**

***Intelligence.*** DoD needs intelligence capabilities to support National Military Strategy by delivering predictive analysis, warning of impending crises, providing persistent surveillance of our most critical targets and achieving horizontal integration of networks and data bases.

- STILO- Conduct Scientific and Technical Intelligence Liaison operations to assess “real-world” threats and capability
- Performs threat assessments in support of the development, test, and evaluation of specific U.S. Missile Defense Systems.
- Performs engineering studies related to foreign ballistic missile systems, foreign cruise missile systems, and U.S. missile defense systems.
- Ensures the use and timely availability of current validated threat information.
- Maintains current knowledge of all technical programs and all relevant developments in the intelligence world.
- Performs analysis of threat information relative to weapon system programs to determine impact on capability assessment and assigned tasks.
- Maintains the Intelligence/Warfare Publications Library, and establishes a tailored set of secure computer-based URLs to various Secure Internet Protocol Network Websites within the intelligence community.
- Participates in long range planning to ensure that technical goals are developed with full awareness of current intelligence information.
- Enables the workforce by providing regular and routine intelligence briefings and ongoing information exchange with project leads.
- Ensures that measuring and monitoring devices are maintained accurately to ensure the transmission of data accurately and reliably to the decision makers.

**Availability and condition of land, facilities and associated airspace.  
(Encroachment Issue)**

***Recruit and Train.*** DoD must attract and train personnel who are highly skilled and educated to ensure current and future readiness, to support advances in technology and to respond to anticipated developments in Joint and service doctrine and tactics.

NSWC Corona is optimally situated in a large and culturally rich metropolitan area surrounded by educational institutions of the highest caliber, resulting in relative ease of recruiting and training. Colleges within a 30 mile radius include:

**Availability and condition of land, facilities and associated airspace.  
(Encroachment Issue)**

**Quality of Life.** Quality of workspace that supports recruitment, learning and training and enhances retention.

The land and facilities at NBVC are much more scattered at Pt Mugu which would have a negative impact on the Corona workforce. Land in Corona has area for wildlife habitat, endangered species. Some buildings designated as historical site. Buildings are adequately maintained and fully utilized.

**Availability and condition of land, facilities and associated airspace.  
(Encroachment Issue)**

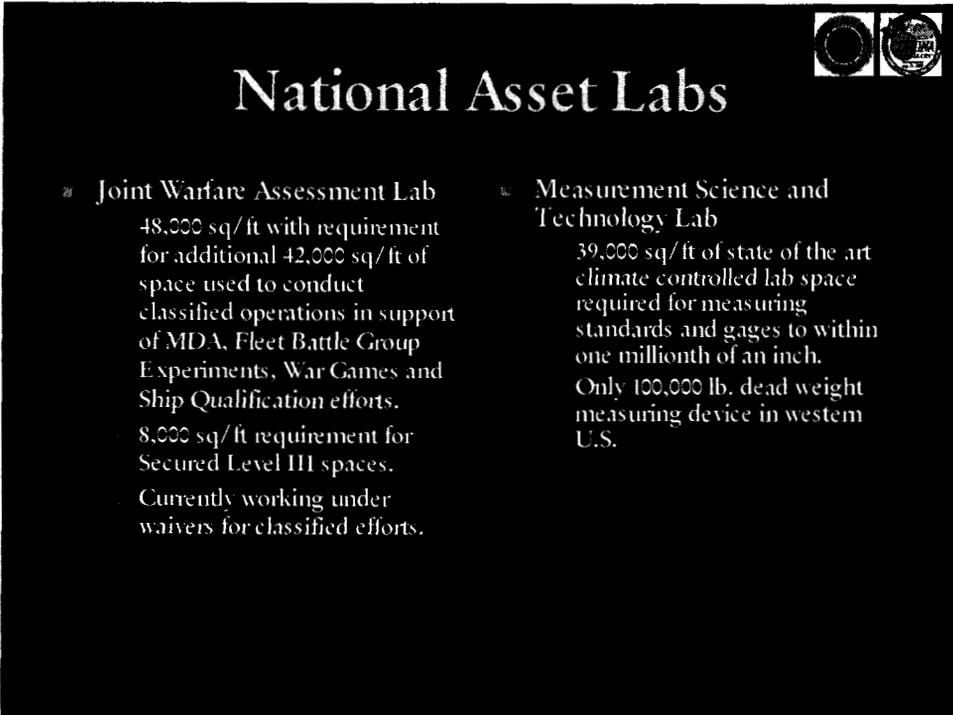
**Organize.** Force structure sized, composed and located to match demands of the National Military strategy. Taking advantage of Joint basing.

Many NSWC Corona projects are joint involving more than on service and even private industry. This effort is expanding and the land and facilities are optimal to realize this potential. It would be of no advantage to NSWC Corona to relocate to NBVC.

**Availability and condition of land, facilities and associated airspace.  
(Encroachment Issue)**

***Equip the Warfighter.*** DoD needs research, development, acquisition, test & evaluation capabilities that efficiently and effectively place superior technology in the hands of the warfighter to meet current and future threats and facilitate Knowledge-Enabled and Net-Centric Warfare

The land, facilities and associated airspace are optimal to execute the evolving NSWC Corona missions into the future.



## National Asset Labs

- **Joint Warfare Assessment Lab**
  - 48,000 sq/ft with requirement for additional 42,000 sq/ft of space used to conduct classified operations in support of MDA, Fleet Battle Group Experiments, War Games and Ship Qualification efforts.
  - 8,000 sq/ft requirement for Secured Level III spaces.
  - Currently working under waivers for classified efforts.
- **Measurement Science and Technology Lab**
  - 39,000 sq/ft of state of the art climate controlled lab space required for measuring standards and gages to within one millionth of an inch.
  - Only 100,000 lb. dead weight measuring device in western U.S.

**Availability and condition of land, facilities and associated airspace.  
(Encroachment Issue)**

***Supply, Service and Maintain.*** DoD needs access to logistical and industrial infrastructure capabilities optimally integrated into a skilled and cost efficient national industrial base that provides agile and responsive global support to operational forces.

NSWC Corona is optimally located for the appropriate logistical and industrial infrastructure that provides global support to operational forces.

**Availability and condition of land, facilities and associated airspace.  
(Encroachment Issue)**

***Deploy & Employ Operational.*** DoD needs secure installations that are optimally located for mission accomplishment including (homeland defense) that support power projection, rapid deployable capabilities and expeditionary force needs for reach back capability, that sustain the capability to mobilize and surge and ensure strategic redundancy.

State of California Office of Emergency Services (OES) and FBI (LA Office) selected NSWC Corona as an Alternate Regional Emergency Operations Center (EOC) and will rely on NSWC Corona's technical personnel expertise, technical capabilities, physical facilities, and secure infrastructure to conduct emergency operations due to natural or man-made emergency disasters in the event that they cannot conduct their respective state/regional mission at their main location.

**Availability and condition of land, facilities and associated airspace.  
(Encroachment Issue)**

***Intelligence.*** DoD needs intelligence capabilities to support National Military Strategy by delivering predictive analysis, warning of impending crises, providing persistent surveillance of our most critical targets and achieving horizontal integration of networks and data bases.

The existing intelligence facilities specially built into the JWAL, appropriately support NSWC Corona projects.

**Ability to accommodate contingency, mobilization, surge and future total force requirements at both existing and potential receiving locations to support operations and training.**

***Recruit and Train.*** DoD must attract and train personnel who are highly skilled and educated to ensure current and future readiness, to support advances in technology and to respond to anticipated developments in Joint and service doctrine and tactics.

NSWC Corona's location in a huge metropolitan area provides maximum potential for rapid expansion and mobilization. At NBVC, the options would be somewhat more limited due to and also exacerbated by the disruption to the Corona workforce in moving to NBVC.

**Ability to accommodate contingency, mobilization, surge and future total force requirements at both existing and potential receiving locations to support operations and training.**

***Quality of Life.*** Quality of workspace that supports recruitment, learning and training and enhances retention.

Once again, Corona is in the most favorable position because of the size of the adjoining metropolitan area and because of the less expensive cost of housing and living conditions.

**Ability to accommodate contingency, mobilization, surge and future total force requirements at both existing and potential receiving locations to support operations and training.**

***Organize.*** Force structure sized, composed and located to match demands of the National Military strategy. Taking advantage of Joint basing.

**Ability to accommodate contingency, mobilization, surge and future total force requirements at both existing and potential receiving locations to support operations and training.**

***Equip the Warfighter.*** DoD needs research, development, acquisition, test & evaluation capabilities that efficiently and effectively place superior technology in the hands of the warfighter to meet current and future threats and facilitate Knowledge-Enabled and Net-Centric Warfare

Operations research being one of the driving disciplines at NSWC Corona, a major dimension of the kind of flexibility required in the face of rapid expansion or mobilization is built into the workforce and the command structure. It could be expected that the broader scope of the command structure at NBVC would stifle this flexibility.

**Ability to accommodate contingency, mobilization, surge and future total force requirements at both existing and potential receiving locations to support operations and training.**

***Supply, Service and Maintain.*** DoD needs access to logistical and industrial infrastructure capabilities optimally integrated into a skilled and cost efficient national industrial base that provides agile and responsive global support to operational forces.

The NSWC Corona geographical location in the heart of the Los Angeles basin ensures optimum opportunity for ensuring continuation of supply support in the face of emergency.

**Ability to accommodate contingency, mobilization, surge and future total force requirements at both existing and potential receiving locations to support operations and training.**

***Deploy & Employ Operational.*** DoD needs secure installations that are optimally located for mission accomplishment including (homeland defense) that support power projection, rapid deployable capabilities and expeditionary force needs for reach back capability, that sustain the capability to mobilize and surge and ensure strategic redundancy.

**Ability to accommodate contingency, mobilization, surge and future total force requirements at both existing and potential receiving locations to support operations and training.**

***Intelligence.*** DoD needs intelligence capabilities to support National Military Strategy by delivering predictive analysis, warning of impending crises, providing persistent surveillance of our most critical targets and achieving horizontal integration of networks and data bases.

Intelligence spaces and communications built into the JWAL could accommodate rapid expansion in case of rapid mobilization. The corresponding facilities at NBVC are marginal in that respect.

## **Cost of operations and manpower implications**

***Recruit and Train.*** DoD must attract and train personnel who are highly skilled and educated to ensure current and future readiness, to support advances in technology and to respond to anticipated developments in Joint and service doctrine and tactics.

Southern California's wealth of engineering talent, combined with its network of research universities and laboratories, cannot be easily replicated.

## **Cost of operations and manpower implications**

**Quality of Life.** Quality of workspace that supports recruitment, learning and training and enhances retention.

Employee surveys indicate over 48 percent of the engineering workforce would not relocate over 50 miles outside the Inland Empire (Corona/Riverside) area. The loss of intellectual capital would seriously degrade the ability to execute individual assessment disciplines, eg., missile performance assessment, and render top level, integrated assessment processes, eg., force level interoperability assessment, inoperative. This loss of intellectual capital would undermine the ability to measure Naval and Joint warfighting performance and capabilities.

### **Cost of operations and manpower implications**

***Organize.*** Force structure sized, composed and located to match demands of the National Military strategy. Taking advantage of Joint basing.

## **Cost of operations and manpower implications**

***Equip the Warfighter.*** DoD needs research, development, acquisition, test & evaluation capabilities that efficiently and effectively place superior technology in the hands of the warfighter to meet current and future threats and facilitate Knowledge-Enabled and Net-Centric Warfare

NSWC Corona consistently rates among the most inexpensive scientific and engineering organizations in terms of hourly rates. Overhead is kept to a minimum, while productivity is maximized. In addition, NSWC Corona scientists, engineers, and analysts are trained in the assessment and collection of data. Movement of these assessment personnel from a system of system assessment role to test equipment assessment roles in order to address emergent requirements can be done rapidly, since the underlying function (data assessment) is similar. Only the types of data change.

## **Cost of operations and manpower implications**

***Supply, Service and Maintain.*** DoD needs access to logistical and industrial infrastructure capabilities optimally integrated into a skilled and cost efficient national industrial base that provides agile and responsive global support to operational forces.

## **Cost of operations and manpower implications**

***Deploy & Employ Operational.*** DoD needs secure installations that are optimally located for mission accomplishment including (homeland defense) that support power projection, rapid deployable capabilities and expeditionary force needs for reach back capability, that sustain the capability to mobilize and surge and ensure strategic redundancy.

NSWC Corona consists of 39 mission related buildings with a total area of 432,030 square feet and a plant replacement value (PRV) of approximately \$116 million and an addition 15,316 square feet of support facilities and infrastructure with a PRV of \$52 million. Size, location, and existing infrastructure enables Corona to utilize local, state, and contractor resources for infrastructure support functions thus lowering overhead and base operating support costs. Utilities costs per square foot remain low due to energy projects, building efficiencies, and existing agreements with State, County and local agencies. Limited access points and agreements with the local community have enabled Corona to maintain reduced security and fire protection manpower requirements relative to its employee population.

### **Cost of operations and manpower implications**

***Intelligence.*** DoD needs intelligence capabilities to support National Military Strategy by delivering predictive analysis, warning of impending crises, providing persistent surveillance of our most critical targets and achieving horizontal integration of networks and data bases.

**Extent and timing of potential costs and savings, including the number of years, beginning with the date of completion of closure or realignment, for the savings to exceed the cost.**

***Recruit and Train.*** DoD must attract and train personnel who are highly skilled and educated to ensure current and future readiness, to support advances in technology and to respond to anticipated developments in Joint and service doctrine and tactics.

The BRAC recommended move to NBVC is estimated to result in a loss of 60 % of the existing technical staff. Replacement and training would be at a minimum of \$70,000 per new engineer and could total \$25 M or more and require three years to reconstitute the workforce.

**Extent and timing of potential costs and savings, including the number of years, beginning with the date of completion of closure or realignment, for the savings to exceed the cost.**

**Quality of Life.** Quality of workspace that supports recruitment, learning and training and enhances retention.

The move to NBVC would lower the quality of life for employees are 100% higher on the average and there will be a large negative impact as the result of prop 13 on property taxes. The effects of this move will never be overcome.

**Extent and timing of potential costs and savings, including the number of years, beginning with the date of completion of closure or realignment, for the savings to exceed the cost.**

**Organize.** Force structure sized, composed and located to match demands of the National Military strategy. Taking advantage of Joint basing.

The move to NBVC involves a 60% loss in personnel and we cannot expect the negative effects to be distributed evenly over the various work areas. Hence the Force Structure will be functionally disrupted. It is estimated that at least 3 years will be required to rectify the situation. In its present position NSWC Corona is optimally situated from a Command Structure point of view to expand joint work. The same Command base situation does not exist at NBVC.

**Extent and timing of potential costs and savings, including the number of years, beginning with the date of completion of closure or realignment, for the savings to exceed the cost.**

***Equip the Warfighter.*** DoD needs research, development, acquisition, test & evaluation capabilities that efficiently and effectively place superior technology in the hands of the warfighter to meet current and future threats and facilitate Knowledge-Enabled and Net-Centric Warfare

DoD BRAC recommendation will result in higher costs from both a recurring expense and required MILCON such that number of years for cost recovery would exceed 100 years, consequently there will be a negative impact on the warfighter.

**Extent and timing of potential costs and savings, including the number of years, beginning with the date of completion of closure or realignment, for the savings to exceed the cost.**

***Supply, Service and Maintain.*** DoD needs access to logistical and industrial infrastructure capabilities optimally integrated into a skilled and cost efficient national industrial base that provides agile and responsive global support to operational forces.

DoD BRAC recommendation will result in higher costs from both a recurring expense and required MILCON such that number of years for cost recovery would exceed 100 years

**Extent and timing of potential costs and savings, including the number of years, beginning with the date of completion of closure or realignment, for the savings to exceed the cost.**

***Deploy & Employ Operational.*** DoD needs secure installations that are optimally located for mission accomplishment including (homeland defense) that support power projection, rapid deployable capabilities and expeditionary force needs for reach back capability, that sustain the capability to mobilize and surge and ensure strategic redundancy.

NSWC Corona is a small compact, easy to secure installation. Being in the midst of a major metropolitan area it has great potential for expansion of homeland defense missions on short notice.

**Extent and timing of potential costs and savings, including the number of years, beginning with the date of completion of closure or realignment, for the savings to exceed the cost.**

***Intelligence.*** DoD needs intelligence capabilities to support National Military Strategy by delivering predictive analysis, warning of impending crises, providing persistent surveillance of our most critical targets and achieving horizontal integration of networks and data bases.

The intelligence facilities at NBVC are inadequate to support the NSWC Corona mission. This would jeopardize NSWC Corona support of emerging systems, threat analysis, and new technologies.

**Economic impact on existing communities in the vicinity of military installations**

***Recruit and Train.*** DoD must attract and train personnel who are highly skilled and educated to ensure current and future readiness, to support advances in technology and to respond to anticipated developments in Joint and service doctrine and tactics.

Economic Impact study performed by Dr. John Husing, leading economist in the Inland Empire concludes that closure of NSWC Corona would result in loss of 1.5% of the jobs in the Corona/Riverside area with the corresponding loss of 3.5% of salaries.

**Economic impact on existing communities in the vicinity of military installations**

**Quality of Life.** Quality of workspace that supports recruitment, learning and training and enhances retention.

The NSWC Corona's economic impact to the Corona-Norco and Riverside MSA is about \$308.3M.

Economic Impact study performed by Dr. John Husing, leading economist in the Inland Empire concludes that closure of NSWC Corona would result in loss of 1.5% of the jobs in the Corona/Riverside area with the corresponding loss of 3.5% of salaries.

**Economic impact on existing communities in the vicinity of military installations**

**Organize.** Force structure sized, composed and located to match demands of the National Military strategy. Taking advantage of Joint basing.

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**Economic impact on existing communities in the vicinity of military installations**

***Equip the Warfighter.*** DoD needs research, development, acquisition, test & evaluation capabilities that efficiently and effectively place superior technology in the hands of the warfighter to meet current and future threats and facilitate Knowledge-Enabled and Net-Centric Warfare

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**Economic impact on existing communities in the vicinity of military installations**

***Supply, Service and Maintain.*** DoD needs access to logistical and industrial infrastructure capabilities optimally integrated into a skilled and cost efficient national industrial base that provides agile and responsive global support to operational forces.

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**Economic impact on existing communities in the vicinity of military installations**

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**Economic impact on existing communities in the vicinity of military installations**

***Intelligence.*** DoD needs intelligence capabilities to support National Military Strategy by delivering predictive analysis, warning of impending crises, providing persistent surveillance of our most critical targets and achieving horizontal integration of networks and data bases.

Economic Impact study performed by Dr. John Husing, leading economist in the Inland Empire concludes that closure of NSWC Corona would result in loss of 1.5% of the jobs in the Corona/Riverside area with the corresponding loss of 3.5% of salaries.

**Ability of the infrastructure of both the existing and potential receiving communities to support forces, missions and personnel.**

***Recruit and Train.*** DoD must attract and train personnel who are highly skilled and educated to ensure current and future readiness, to support advances in technology and to respond to anticipated developments in Joint and service doctrine and tactics.

Nearby Los Angeles County, Orange County, San Bernardino County and Riverside County offer numerous universities, junior colleges, technical schools, and high tech industries accessible to supplement the intellectual capital required to perform the mission.

**Ability of the infrastructure of both the existing and potential receiving communities to support forces, missions and personnel.**

***Quality of Life.*** Quality of workspace that supports recruitment, learning and training and enhances retention.

NSWC Corona is centrally located with various employees residing in the Los Angeles County, Orange County, San Bernardino County and Riverside County. Affordable housings are readily available, especially at the Corona-Norco and Riverside MSA. Numerous universities, colleges, technical schools, and high tech industries are available resources to support recruitment, as well as the pursuit of advance degrees and training to enhance retention.

**Ability of the infrastructure of both the existing and potential receiving communities to support forces, missions and personnel.**

***Organize.*** Force structure sized, composed and located to match demands of the National Military strategy. Taking advantage of Joint basing.

**Ability of the infrastructure of both the existing and potential receiving communities to support forces, missions and personnel.**

***Equip the Warfighter.*** DoD needs research, development, acquisition, test & evaluation capabilities that efficiently and effectively place superior technology in the hands of the warfighter to meet current and future threats and facilitate Knowledge-Enabled and Net-Centric Warfare

**Ability of the infrastructure of both the existing and potential receiving communities to support forces, missions and personnel.**

***Supply, Service and Maintain.*** DoD needs access to logistical and industrial infrastructure capabilities optimally integrated into a skilled and cost efficient national industrial base that provides agile and responsive global support to operational forces.

**Ability of the infrastructure of both the existing and potential receiving communities to support forces, missions and personnel.**

***Deploy & Employ Operational.*** DoD needs secure installations that are optimally located for mission accomplishment including (homeland defense) that support power projection, rapid deployable capabilities and expeditionary force needs for reach back capability, that sustain the capability to mobilize and surge and ensure strategic redundancy.

**Ability of the infrastructure of both the existing and potential receiving communities to support forces, missions and personnel.**

***Intelligence.*** DoD needs intelligence capabilities to support National Military Strategy by delivering predictive analysis, warning of impending crises, providing persistent surveillance of our most critical targets and achieving horizontal integration of networks and data bases.

**Environmental impact, including the impact of costs related to potential environmental restoration, waste management and environmental compliance activities.**

***Recruit and Train.*** DoD must attract and train personnel who are highly skilled and educated to ensure current and future readiness, to support advances in technology and to respond to anticipated developments in Joint and service doctrine and tactics.

The Navy property at NSWC Corona has no hazardous waste. The 45 acre lake is managed by the US Fish and Wildlife Service as a preserve for migratory and other birds. The property contains structure on the historic register. None of these things impact that part of the property used as laboratory space by the Navy now or in the foreseeable future. NBVC has similar concerns including archeological sites, which will have a major impact on any new construction.

**Environmental impact, including the impact of costs related to potential environmental restoration, waste management and environmental compliance activities.**

***Quality of Life.*** Quality of workspace that supports recruitment, learning and training and enhances retention.

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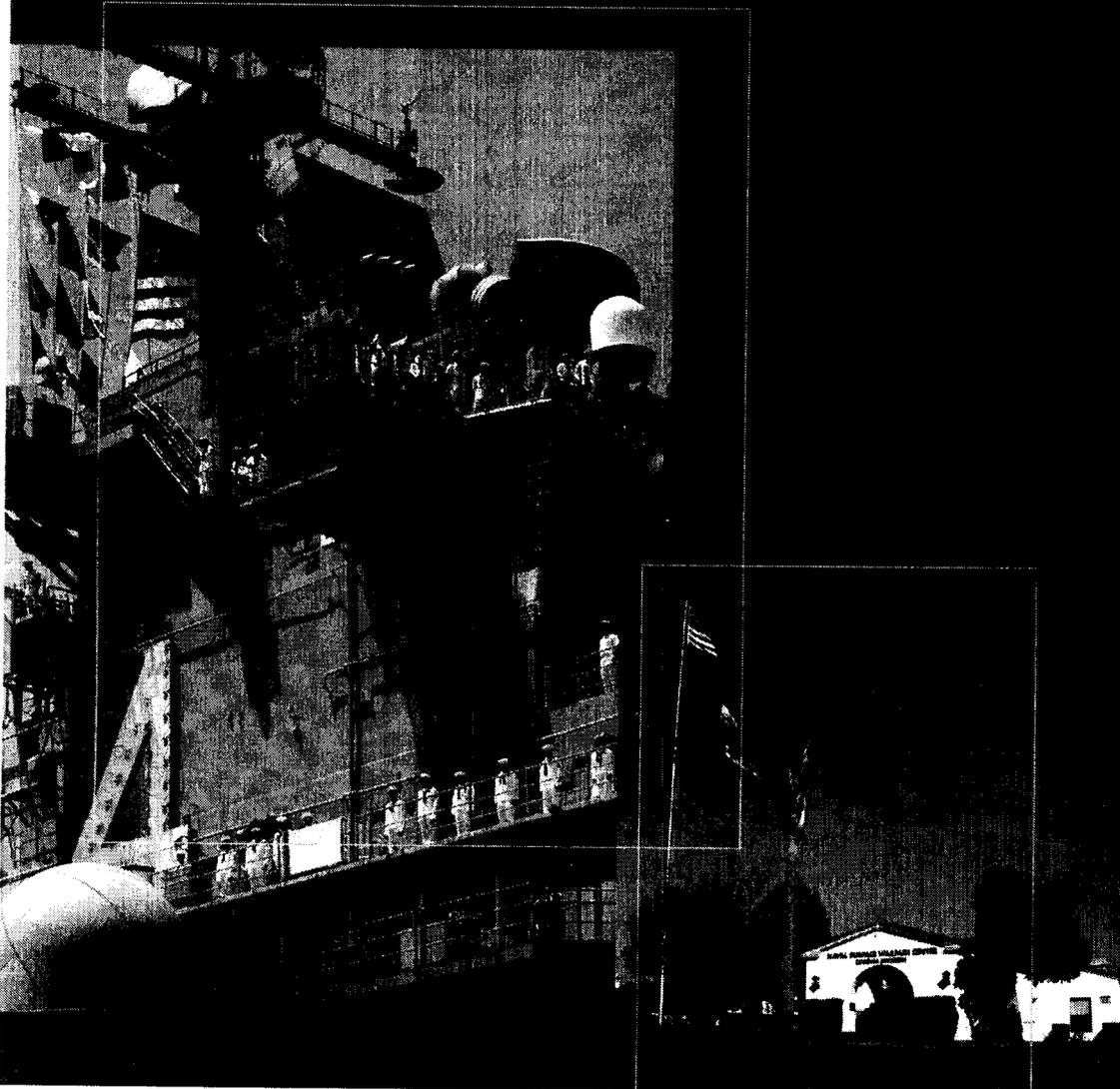
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# MILITARY VALUE & PROGRAM IMPACT

NAVAL SURFACE WARFARE CENTER  
CORONA DIVISION  
CORONA, CALIFORNIA

This Report was Commissioned by the  
NSWC Corona Community Partnership Committee



## EXECUTIVE SUMMARY



Naval Surface Warfare Center (NSWC) Corona is the sole U.S. Navy command charged with providing independent assessment of the warfighting effectiveness of platforms, systems, and combat units and personnel. Its reputation for early, consistent identification of performance deficiencies and its ability to collaboratively develop optimal remedies has (conservatively) saved the Navy and the Defense Department more than \$2.0 billion over 10 years. It has also resulted in a growing demand by the other branch services and defense agencies for their expertise. Currently, 15% of the work performed by NSWC Corona is classified as joint or non-Navy.

NSWC Corona has been able to achieve these results through a workforce that is a national asset. Their expertise and ability to apply their talents across a diverse array of programs sets them apart from all other labs, federal or academic. To illustrate this point, consider the breadth and critical impact NSWC Corona has made on the following:

- Developed and currently maintains the Quality Assurance standards for the \$10 billion annual Missile Defense Agency's National Missile Defense program;
- Designed, built and rapidly deployed a Joint Radio Relay for use in Operation Enduring Freedom (Afghanistan) which relieved the need to continuously deploy AWACs for communication conductivity. Associated cost avoidance: \$8.5 million per month;
- Identified defective chemical-biological sensors through their in-house testing and analysis which prevented the expenditure of approximately \$800 million; and
- Recruited to identify and recommend corrective action for two CEC (Cooperative Engagement Capability) equipped ships that were electronically blind and unable to deploy. Estimated cost savings from NSWC Corona's actions: \$340 million.

By themselves, these 4 programs provide ample evidence to maintain (if not grow) NSWC Corona mission areas. As it is, however, these programs represent simply a prelude of the diverse, operationally significant contribution that NSWC Corona provides.

To capture the military significance of NSWC Corona, this report is divided into three sections and has purposely been constructed to include detailed data and illustrative case studies that quantitatively support the Corona community's major contention that,

*Operationally, technically and financially, the U.S. Navy and the Department of Defense can ill afford the risk of closing Naval Surface Warfare Center Corona.*

## EXECUTIVE SUMMARY *(continued)*

**Section I: The Cost of Closure**—seeks to analyze the true value of NSWC Corona and the likely costs should Corona be closed or its missions re-located. This section outlines several arguments that are supported and proven by real-life examples/incidents. The case for Corona is predicated on three key points:

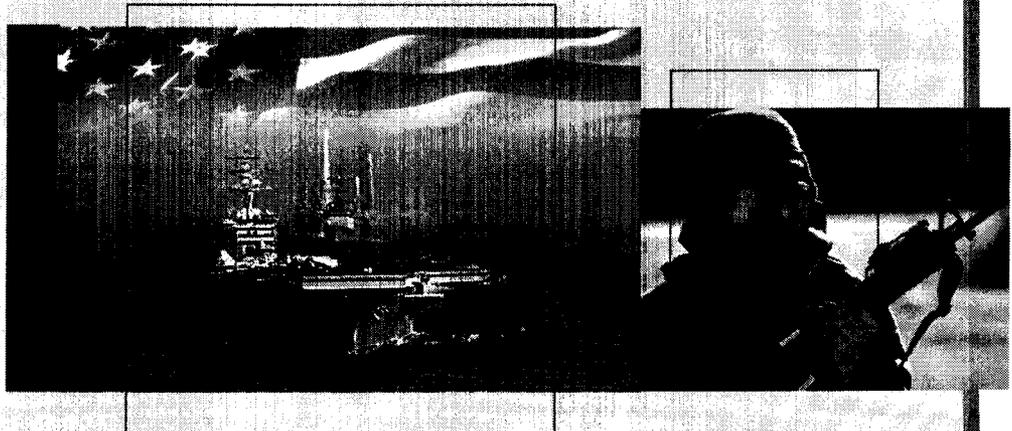
1. Corona's assessment mission is a core government function that has saved both money and lives, and should not be transferred outside the Department of Defense
2. With more than 100 subject matter experts that would require approximately 15 years to replace, loss of Corona's intellectual capital will have a devastating and long-term effect on the operational success and safety of the U.S. military
3. With a return-on-investment in excess of six years, there is insufficient financial gain to warrant closing NSWC Corona

**Section II: Command Overview**—is designed to provide basic facts on the warfare center, its core competencies, its competitive advantages, and the fact that NSWC Corona is the Navy's only Independent Assessment Agent charged with gauging the war-fighting capability and effectiveness of ships and aircraft, from unit to battle group level. In executing this mission, Corona has demonstrated its role and value as an agent of change. By providing objective, unbiased assessments, Corona enables senior defense officials to transform the military for a more dangerous and unpredictable era.

**Section III: Capabilities and Results**—contains dozens of specific examples of operational and programmatic accomplishments attributed to Corona's highly skilled professional staff. Collectively, these case studies factually demonstrate the cost effectiveness of Corona while also highlighting the impressive return-on-investment that NSWC Corona provides the Navy and the nation. This section also brings to the forefront the diversity of programs in which Corona is involved. Although classified as a naval warfare center, Corona has increasingly been recruited to work on programs that have national and joint applications such as missile defense, tactical communications, and the establishment of government and industry-wide calibration standards.

As a public document, the information contained in this report is limited to unclassified, open-source material. As such, this report makes only passing reference to the special-access programs that NSWC Corona is centrally involved in. Nevertheless, any decision affecting Corona's status should not be considered without first fully assessing its impact on Corona's role in these highly classified (and often, hidden) programs.

At its core, this document is intended to highlight for senior defense officials specific aspects of NSWC Corona that may not have received sufficient attention. It is designed to alert and educate military officials of the true capabilities resident at Corona, causing further examination of the role of Corona in our military. For as impressive as NSWC Corona's past is, its future is even brighter.



# TABLE OF CONTENTS

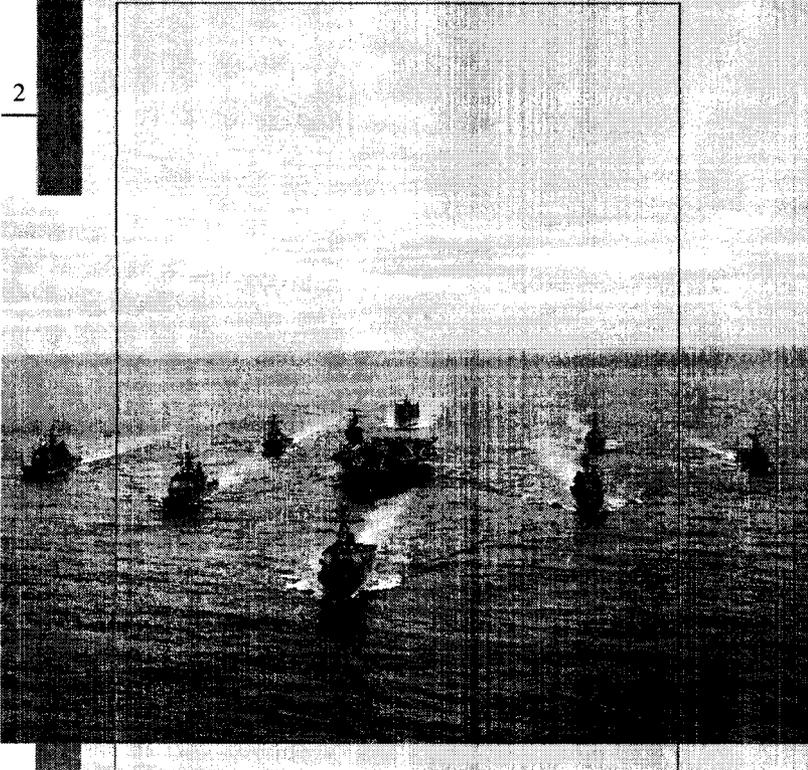
**THE COST OF CLOSURE:  
MAKING THE CASE FOR CORONA . . . . .3**

**COMMAND OVERVIEW . . . . .7**

**CAPABILITIES & RESULTS . . . . .10**

**REPORT POINT OF CONTACT . . . . .21**

**APPENDIX  
(UNDER SEPARATE COVER):  
LOCAL ECONOMIC IMPACT REPORT**



## THE COST OF CLOSURE: MAKING THE CASE FOR CORONA

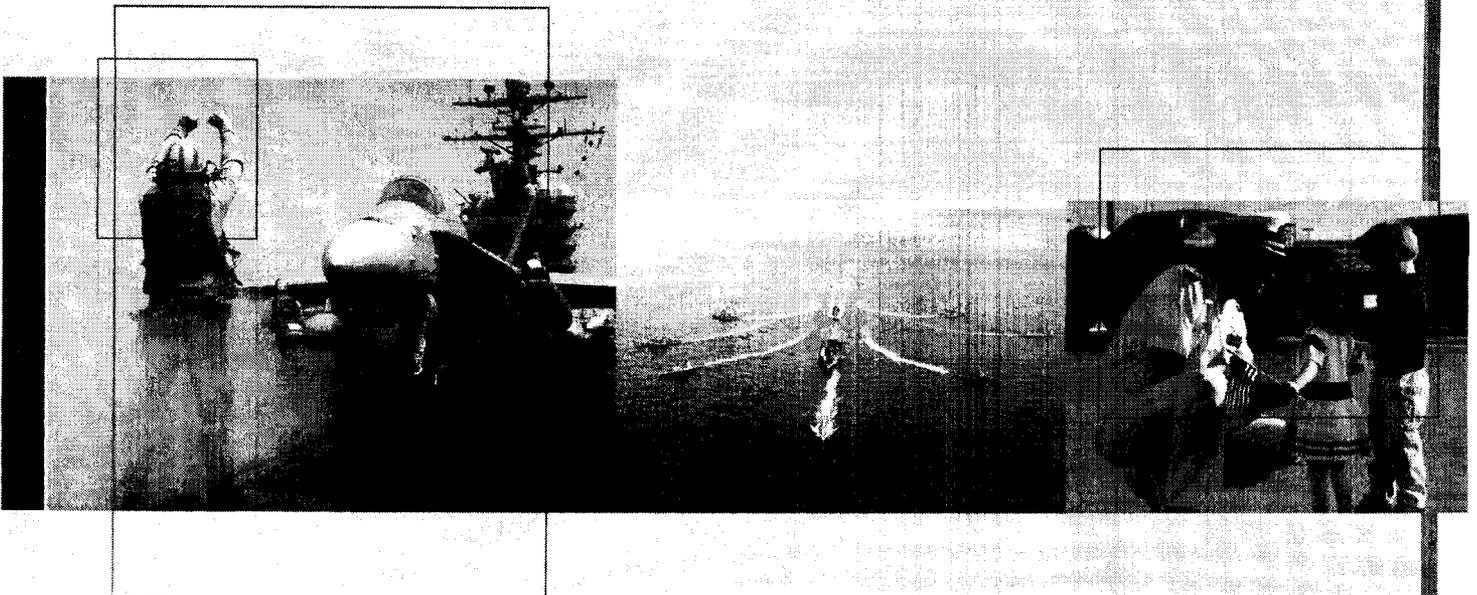
Base closure is a necessary and useful tool to properly align critical resources and transform the U.S. military for modern warfare. As a practical matter, decisions to close or realign military installations should achieve at least one of several basic objectives:

- a. Eliminate or transfer to a non-DOD agent current military functions which are unnecessary or classified "non-core"
- b. Improve the efficiency and effectiveness of military functions which should remain within the Defense Department's jurisdiction
- c. Act as a catalyst to reshape military organizations, procedures, operations, and culture
- d. Better align infrastructure with the size and missions of current and future military forces
- e. Achieve a financial savings which can then be invested back into modernizing U.S. forces

A thorough examination of Naval Surface Warfare Center Corona's mission, its business practices and methodologies, its capabilities and applicability across the entire joint military spectrum, argue persuasively for retention, and possible expansion, in order for it to provide the valuable (and critically important) national service. Briefly, the case for Corona rests on the following:

### 1. Importance of Independent Assessment in Military Operations and Weapon Acquisition.

As detailed throughout this report, NSWC Corona provides relevant and highly specialized independent technical assessment of weapon and combat systems, as well as the operational and material readiness of deploying forces. This is a mission that should, and in fact, must remain within the purview of the federal government. Ensuring that weapon systems perform to established parameters is a fundamental and unwavering requirement that must reside within government. Delegating or outsourcing this essential mission to a non-DoD 3rd party is done only at great financial and operational risk. There are inherent and inescapable pressures placed upon private industry that can (and have) affect the objectivity in performing this critical mission. These pressures include an overarching need to maintain a business unit's profitability—a need which may adversely impact schedule and cost. In addition, with the continued consolidation of the defense industry, it is quite likely that a contractor responsible for performance assessment and certification may also be financially engaged in product development.



## THE COST OF CLOSURE: MAKING THE CASE FOR CORONA *(continued)*

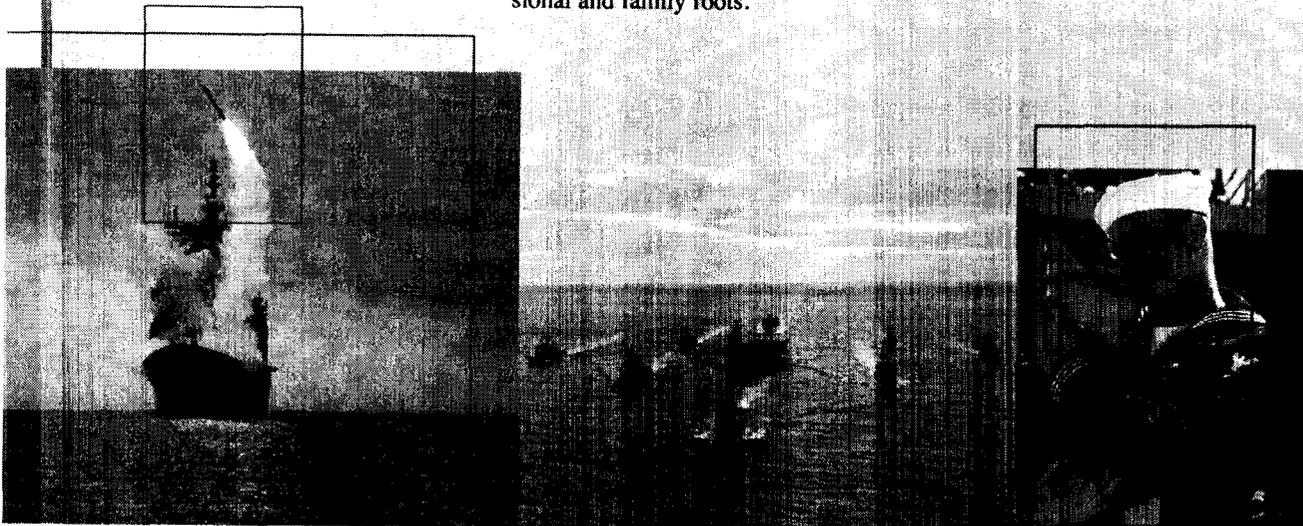
This problem was highlighted in a September 2004 article in "National Defense" Magazine which stated that, "it is not unusual to hear defense officials complain that contractors are too focused on their financial bottom lines, rather than on the quality of their products and the needs of the customer. They also blame the industry's rapid consolidation into a handful of conglomerates for a perceived decline in technical innovation." In response to concerns about industry quality control, the article later quotes LtGen Brian Arnold, Commander of the U.S. Air Force Space and Missile Systems Center, as saying, "We [the military] see a lot of quality problems."

One must only look to the Columbia Shuttle disaster to witness the consequences of relying on non-government agents to oversee and ensure that adequate testing is performed. Following the crash, the Columbia Accident Investigation Board was commissioned to determine the causes of the disaster and recommend corrective actions. Chaired by retired Navy Admiral Harold Gehman, the CAIB published an exhaustive report that explored both the immediate technical causes of the crash as well as organizational elements that contributed to the death of the seven-member crew. Among the CAIB's key findings were: (a) the NASA Shuttle program was under intense pressure to remain on schedule resulting in a series of exemptions and waivers of safety and performance requirements; (b) NASA lacked a robust independent program technical authority that had complete control over specifications and requirements; and (c) there appeared to be an over reliance on aerospace contractors who constituted nearly 70% of the workforce. Among its recommended changes, the CAIB argued that all level-one specifications, requirements, and waivers should be vested within a technical and engineering organization that is divorced from the cost and schedule process. It was the opinion of the Board that this one management change could directly and positively affect a fundamental cause of the disaster. During subsequent congressional testimony, Admiral Gehman specifically cited NSWC Corona, an organization that provides independent assessment, as a very attractive model to emulate for fixing a number of NASA's shuttle problems.

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### 2. NSWC Corona's Intellectual Capital.

Corona possesses a professional staff that is recognized as a national, not simply a naval, asset. Among Corona's specialized workforce are approximately 100 individuals that are identified as one-of-a-kind and which do not exist in private industry, government, or academia. These high value subject matter experts are specifically detailed on page 11 of this report. A review of previous BRAC actions reveals that approximately 70-75% of civilian workers employed at a base identified for closure or realignment refuse to transfer. A recent survey of Corona employees indicated that fewer than 20% of current staff would consider relocating should Corona close, and its functions move beyond 50 miles of Corona/Riverside, California. This survey supports earlier ones which found a similar resistance to leave a community for which they have long-time professional and family roots.



While it is true that given sufficient time and money the Defense Department could replicate NSWC Corona's capability at another DoD facility, the question must be asked: at what cost? NSWC Corona provides a necessary service to numerous complex, high-value military programs such as the Aegis combat system, Cooperative Engagement Capability (CEC), strategic Missile Defense, and many highly classified programs. These programs represent the cornerstone of this country's national defense capability. To disrupt, degrade, or disband Corona's ability to ensure consistent and effective system performance should not be undertaken without complete confidence that comparable capabilities exist and are readily available now, not theoretically in the future.

Neither the federal government nor private industry are immune to the upheavals and programmatic disruptions associated with the loss of intellectual capital that generally accompanies a physical transfer of core competencies, vice general technical support or "touch labor". In the case of Corona, relocation would result in the following:

- Loss of independent assessments affecting combat systems, missile performance and Fleet readiness, resulting in unknown performance areas, conformance to specifications, and identification of factors that enhance or limit system capability and effectiveness with significant cost impact for redesign.
- Loss of Material Readiness Data Bases (MRDB), which measure Fleet Readiness contributors in areas of systems availability, reliability, and identification of troubled equipment, modal problems that affect fleet readiness to deploy, and overall systems effectiveness when engaged in combat.
- Loss of Government technical authority and oversight required to ensure product and technical integrity at prime contractor facilities and across multiple contractor sources. At risk is the ability to conduct: interface analysis; test systems assessment; metrology engineering; product-oriented surveys and program risk assessment; and, other Technical Program Management disciplines necessary for effective local plant government acceptance and contract administration services. Loss of these technical disciplines would result in degraded product integrity and increased risk of acceptance of non-compliant weapons.
- Loss of the missile and combat systems performance data collection and distribution process through the utilization of telemetry, test and training range networks, telecommunication and instrumentation systems, which support the assessment, analysis, evaluation function, in determining and improving military proficiency and readiness. Loss of control of these instrumentation functions would result in loss of data necessary for assessment.
- Loss of global connectivity of every major range facility utilized in the US Navy with the Joint Warfare Assessment Laboratory (JWAL) for real-time community collaborative assessment of test and training exercises across the technical communities. Loss of associated synergies of technologies and personnel.
- Loss of centralized technical authority for all Navy Metrology and Calibration (METCAL) programs. Loss of Measurement Science Laboratory with subsequent break in traceability of calibration and standards to National Institute Standards and Technology (NIST), and the inability to provide independent verification and validation of dimensional integrity of weapons.
- Loss of a single point of responsibility and contracting for Tactical Training Range (TTR) Instrumentation Operation and Maintenance (O&M) for Navy, Marine Corps and Air Force systems, resulting in range commands assuming responsibility for individual range O&M contracting at a greater cost.
- Loss of products and services across NAVSEA, NAVAIR, Marine Corps, Air Force customer base resulting in divergent processes, systems and loss of interoperability, particularly in the test and training range instrumentation applications.

Loss of any one of these capabilities would be detrimental to military operations, while the loss of most, if not all, would be catastrophic.



THE COST OF CLOSURE: MAKING THE CASE FOR CORONA (continued)

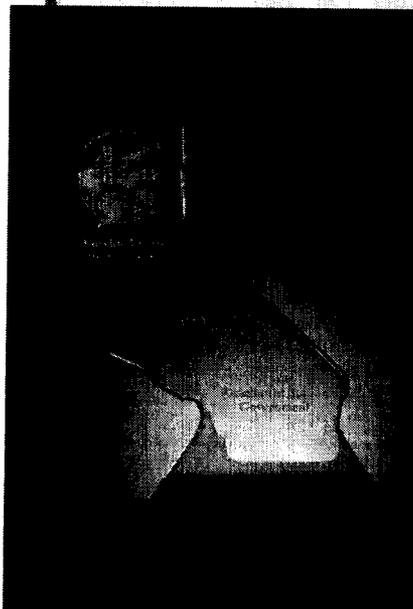
**3. Return on Investment.**

Fiscal pressures associated with retaining excess military infrastructures, as well as inefficiently aligned resources, have always been a motivating factor for the conduct of a department-wide BRAC exercise. In response to both sound business practices and congressional directives, recommended closures and realignments must demonstrate financial savings within six years of implementation in order to receive consideration and approval. Given NSWC Corona's physical and operational characteristics, it is difficult to conceive of a scenario in which closing or significantly realigning this facility would garner the Defense Department with a net savings, either within or beyond the six year ROI window. This contention is based on the following:

- **Workforce Demographics**—Corona is staffed by a highly educated, well trained professional workforce. Of the nearly 1000 civil servant employees, 82% are classified as technical or professional, and thus directly support Corona's core function areas. Of the 18% that are not categorized as technical staff, approximately 25% are considered essential and would be required regardless of whether Corona's functions were moved. As such, only 10% of Corona's total workforce would be eligible for possible elimination in the event that the warfare center's missions were transferred onto an existing base. This demographic breakout is not a product of happenstance. Rather, it is the end result of a deliberate effort by senior Corona and Navy management to shape its workforce as efficiently as possible, retaining and training only those individuals that directly contribute to its mission. Recognizing that workforce reduction is one of the principal methods to capture (short-term) savings, and acknowledging that Corona's missions are essential to the military and thus must continue to be performed, it is clear that Corona is simply not a viable "bill-payer" candidate.
- **Business Rates**—NSWC Corona functions as a Defense Working Capital Fund entity and, as such, must aggressively market its services and capabilities. It must also take steps to establish and maintain competitive service rates vis-à-vis other Test & Evaluation facilities. Corona has accomplished this task and offers one of the lowest rates among federal and private industry providers, as is cited below:

NAVAL WARFARE CENTERS	
NSWC, Carderock	\$87.24
NSWC, Crane	\$77.50
NSWC, Dahlgren	\$81.20
NSWC, Elmhurst	\$80.00
NSWC, Port Hueneme	\$72.25
NSWC, Crane	\$68.00
NON-FEDERAL T&E FACILITIES	
Center for Naval Analysis	\$200.00
Applied Physics Laboratory	\$200.00
Aerospace Corporation	\$250.00

Again, any attempt to replicate NSWC Corona's capabilities would adversely impact both its methodologies and business practices, and thus result in higher rates.



## COMMAND OVERVIEW

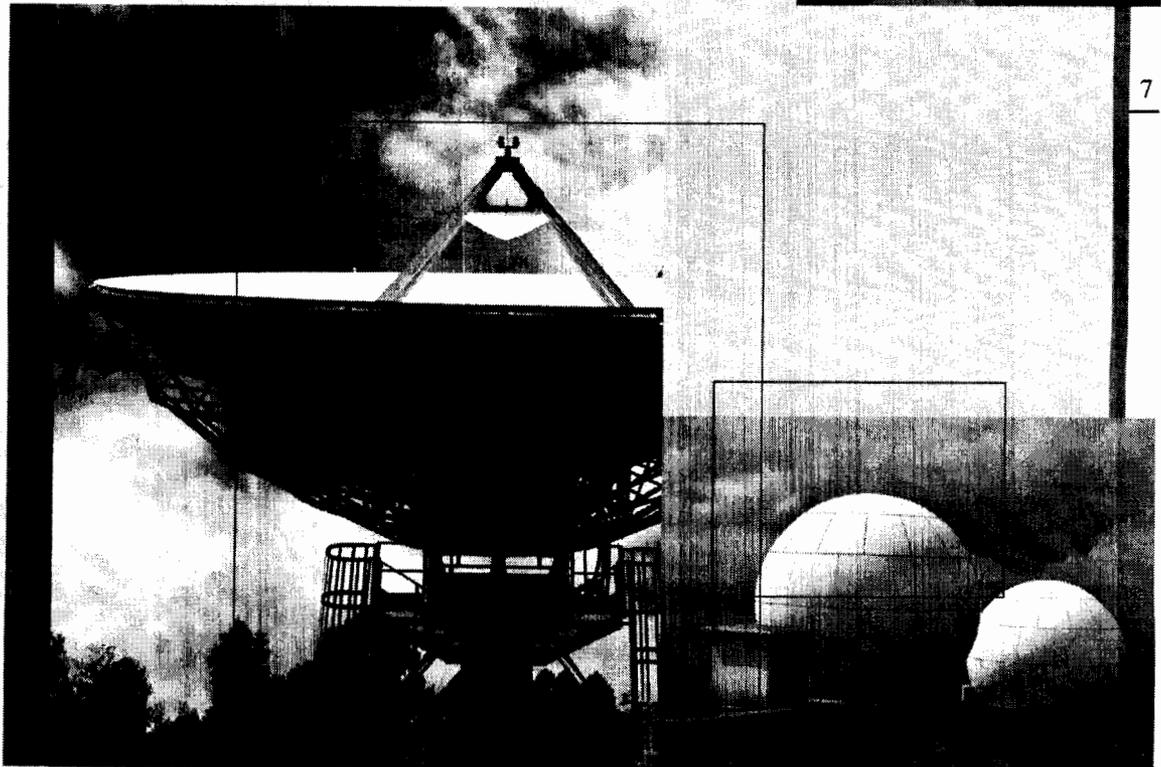
### MISSION:

NSWC Corona is the Navy's only Independent Assessment Agent chartered to gauge the war-fighting capability of ships and aircraft from individual unit to battle group level. Accomplishment of this function is achieved by assessing the suitability of combat system design, evaluating the performance of equipment and weapons, and assessing the adequacy of fleet training.

Corona is a highly leveraged, widely sought-after partner that excels at assessing the design, performance, and material readiness of equipment and weapons, as well as the adequacy of operational testing at every stage of program development:

- Concept Development
- Prototype Test & Evaluation
- Initial Deployment
- Fleet Training and Use
- Life-cycle Upgrades
- Product/System Replacement

NSWC Corona is also home to the Navy's only metrology and calibration laboratory where it is responsible for developing methodologies and equipment necessary to precisely measure system performance, test results, and weapon certification and acceptance.



**COMMAND OVERVIEW (continued)****PHYSICAL FACILITIES & CAPABILITIES:**

NSWC Corona is an efficient, low-cost technical complex. It is located approximately 50 miles east of Los Angeles in Riverside (CA) County. The warfare center consists of:

- 56 Buildings and Labs
- 467,000 ft<sup>2</sup> Technical Space
- 1766 Professional Workforce
  - 6 Military
  - 1000 Civil Servants
  - 760 Contracted Employees
  - \$72.8M Annual Payroll
- Fleet support at all Navy Tactical Training Ranges and at more than 20 sites worldwide, including routine embarkation for fleet exercises and testing.
- Joint Warfare Assessment Laboratory (JWAL) a secure facility equipped with satellite and landline communications which facilitates world-wide, collaborative assessment of weapon and platform performance.

**COMPETITIVE ADVANTAGES:**

NSWC Corona is a national asset that directly serves vital Navy and joint military community missions. These include:

- Identification and correction of performance flaws through a collaborative process with program management/system contractors while maintaining technical independence that promotes critical, objective assessments;
- Enhancement of fleet effectiveness, mission success, and safety of personnel through continuous life-cycle product development and improvement; and
- Quantification of performance gaps between enemy weapon systems and U.S. countermeasures for current as well as evolving threat systems.

NSWC Corona's achievement of these essential missions is accomplished through the advancement of technical expertise in the following core areas:

**PERFORMANCE ASSESSMENT:**

Assesses weapons and combat systems performance using consistent, government-controlled evaluation criteria, procedures, techniques, and analysis methodology to gauge success. Provides an objective determination of war-fighting capability of unit, joint, and combined forces using threat-representative scenarios and operational environments to evaluate mission effectiveness, and analyzes current system capability against emerging and evolving threats. This technical area is essential in validating weapons and combat systems performance in a realistic battle environment to preclude undetected anomalies which may fail to meet or limit system capability, resulting in required redesign with a significant cost impact.

**QUALITY & READINESS ASSESSMENT:**

Provides the government's technical assessment of material readiness, requirements, products, and processes for weapons and combat systems during all life-cycle phases to improve quality, reliability, performance, and Fleet readiness. Measures ship, weapons, and combat systems elements' availability and reliability which contribute to the readiness of the Fleet to deploy, and achieve overall systems effectiveness when engaged in combat.

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IS A NATIONAL  
ASSET THAT  
DIRECTLY  
SERVES VITAL  
NAVY AND  
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COMMUNITY  
MISSIONS.”**

### MEASUREMENT & TEST ASSESSMENT:

Serves as the Department of the Navy's technical authority for metrology programs. Evaluates system interface requirements, test requirements, and processes to assure interchangeability of complex components, measurement effectiveness, test system certification, and government acceptance; and, validates and certifies the conformance of critical interfaces of key weapon components (e.g., missile to launcher, missile to canister, rocket motor to missile, etc.) produced by one or more prime contractors, and requiring 3rd party technical integration. Non-compliance in these areas could result in catastrophic failure during operational use.

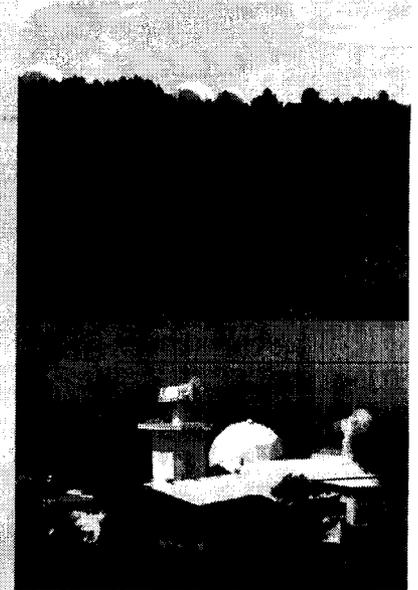
### RANGE INSTRUMENTATION ENGINEERING MANAGEMENT:

Provides government oversight and contract management for acquisition, systems engineering, and life-cycle support for range instrumentation and telecommunication systems for the test and training range communities; allows for and supports the collection, assessment, analysis, evaluation, and distribution of data to determine and improve the military proficiency and readiness of surface, subsurface, and air-combat weapons systems, while in support of joint training exercises.

### CAPACITY TO GROW:

NSWC Corona has the physical and intellectual assets that would allow for the rapid and relatively inexpensive incorporation of new or expanded missions. Among the possibilities that represent the most logical and beneficial to the nation's national security posture are the following:

- Co-location/consolidation of DoD's measurement science capability. As the branch services become increasingly interdependent, the development of joint or multi-service weapon systems and platforms has increased in volume and importance. Maintaining service-specific calibration and measurement laboratories in support of these systems is no longer viable... or sustainable. NSWC Corona already performs this service on many joint programs and has the capacity to consolidate under a single command all of DoD's measurement science equipment and expertise.
- Distributive multi-service training. Leveraging the existing worldwide communication infrastructure that currently resides within Corona's Joint Warfare Assessment Laboratory (JWAL), as well as its expertise in range instrumentation and evaluation of fleet readiness, NSWC Corona could (with no physical expansion) readily assume the critical role of integrating, organizing, and evaluating joint training exercises that entail multiple units performing simultaneously at geographically dispersed training sites. The opportunity exists to finally achieve the electronic integration of service-specific training ranges while maintaining the operation of the individual ranges with their host service.
- Emergency Operational Command Center. NSWC Corona possesses a secure, global communication infrastructure that permits decision makers to send and receive information and exert direct control during national or regional contingencies. Corona is equipped with its own water supplies and a reliable critical infrastructure posture that would help ensure continuous operations in the most severe national disaster. As such, it is an ideal candidate for selection as a Homeland Security/ Homeland Defense EOC.
- Technical Agent for Joint Forces Command. As JFCOM assumes greater responsibility for the interoperability of forces and equipment, NSWC Corona is ideally suited to lend its expertise and experience in assessing the performance of specific programs and training readiness. While this is not necessarily a new function—NSWC Corona currently performs this mission on selective programs—it is an area that Corona could readily assume a larger, more active role and thus provide DoD with a consistent standard across all the military services.



## CAPABILITIES & RESULTS

**“WITH DECADES OF EXPERIENCE, NSWC CORONA’S NATIONALLY RECOGNIZED STAFF IS RIGHTFULLY VIEWED AS A CRITICAL AND VALUABLE PARTNER IN DOD’S EVALUATION PROCESS OF WEAPONS AND ORGANIZATIONAL SYSTEMS ”**

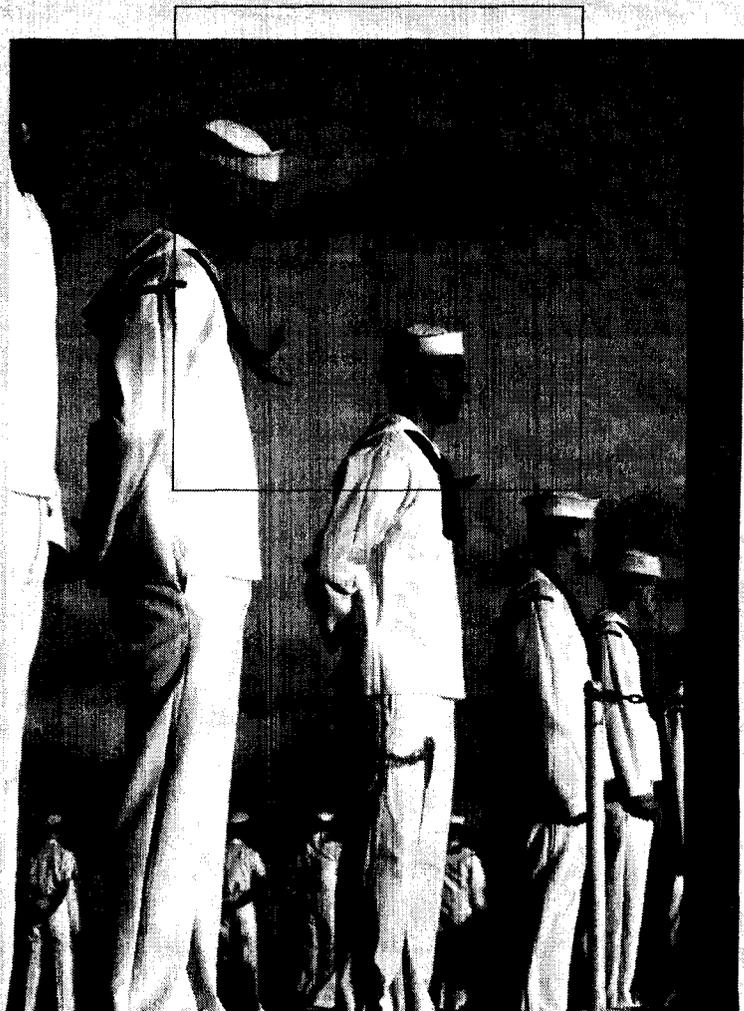
With decades of experience, NSWC Corona’s nationally recognized staff is rightfully viewed as a critical and valuable partner in DOD’s evaluation process of weapons and organizational systems. In very real and demonstrative ways, Corona’s expertise has resulted in:

- Preservation of lives
- Achievement of greater mission success
- Better expenditure of critically-needed program funding

Achievement of these accomplishments is due in large part to the many technical skill sets that exist only at NSWC Corona and which represent knowledge that has taken years of professional experience to acquire. Efforts to replicate this expertise would require an average of 15 years of training and practical application with some positions requiring upwards of 20 years and would result in the serious degradation of weapon system performance and reliability during any attempt to reconstitute elsewhere. Some Systems Analysts for complex weapons systems are irreplaceable due to experience and knowledge being developed during the design phase of the system or weapon. Only when the system or weapon is removed from the U.S. arsenal will their knowledge no longer be required. The high degree of interdependency and synergy within the technical capabilities across the Corona command further increases the risk of impacting mission success should these individuals be lost due to Corona being closed or realigned.

Among the skills at Corona are approximately 100 key positions which require subject matter expertise (SME) and for which incumbents are regarded as national experts. The following are examples of skills and the number of positions present at Corona:

10





FUNCTION	PERSONNEL
• Missile Flight Analysts	12
• Distributed System Assessment Analysts	5
• Ship Self Defense Senior Analyst	10
• Force Level and Combat Systems Assessment Analysts	5
• Quantitative Fleet Feedback (QFF) Program Manager	1
• Material Readiness Analysts	16
• GIDEP Program Manager	1
• Training Readiness Assessment Analyst	3
• Telemetry Systems SME	6
• Telecommunications SME	6
• Test Systems Assessment Analyst	8
• Metrology Program Manager	2
• Metrology Execution Agent	1
• Measurement Reliability and Traceability	3
• NMD Senior Liaison	1
• COMOPTEVFOR Senior Liaison	1
• Product Integrity SME	12

All positions are sensitive and require a security clearance. Duties falling under special access programs include positions with additional security protection and handling measures, special investigative, adjudicative and clearance procedures, or special briefings, reporting procedures or formal access lists. Some positions may require access to special access programs that have been designated by the Navy such as North Atlantic Treaty Organization, Single Integrated Operational Plan-Extremely Sensitive Information, Nuclear Weapon Personnel Reliability Program, Navy Nuclear Weapon Security Manual, Critical Nuclear Weapon Design Information, Presidential Support Duties and programs for foreign intelligence information under the control of the Director of Central Intelligence or the NCSC.

Evidence of the specialized talent that resides at Corona is illustrated below, along with each of the core functions and enabling capabilities that has earned NSWV Corona the respect of fleet operators, system developers, and program managers.

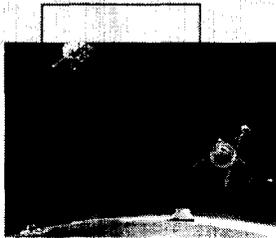


CAPABILITIES AND RESULTS *(continued)***CORE TECHNICAL FUNCTION: PERFORMANCE ASSESSMENT**

**Enabling Capability: Independent Assessment** of weapons and combat systems performance using consistent evaluation criteria, procedures, techniques, and analysis methodology to objectively gauge the success of war-fighting capability of unit, joint, and combined forces using threat-based scenarios and operational environments.

**Applicable Subject Matter Expertise:**

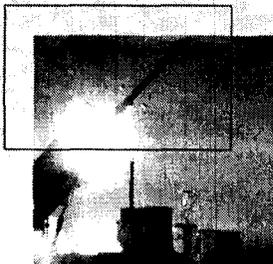
- Multi-Target, Multi-Sensor data fusion techniques for detection, identification, and tracking
- Statistical Analysis
- Software Assessment
- Coding Theory-- error detection and correction
- Discrete and combinatorial mathematics, especially in its applications to Computer Science and computer programming
- Simulation Modeling and Analysis
- Uncommon software languages such as LISP and PASCAL

**CASE STUDY: MISSILE DEFENSE**

The skills and experience found at NSWC Corona are directly supporting the development and deployment of the national missile defense program, working with program managers in the Pentagon and at other key support organizations including the Naval Sea Systems Command, Space and Missile Defense Technical Center, Joint National Test Facility, and Kwajalein Missile Range (KMR). Corona serves as the Execution Agent (EA), with primary responsibility for the planning, execution, analysis, and reporting of the campaign. This was for Systems Integration Test 01 which was the first attempt to integrate the family of systems designated for use in Ballistic Missile Defense. This responsibility includes the ability to plan, coordinate, monitor, and evaluate the technical aspects of achieving program goals while providing responsible and proper fiscal management and control. The staff at Corona possesses knowledge of Battle Group operations, Naval Tactics, Naval Protocol, and Naval Weapons Systems capabilities and employment in a Battle Group, Battle Force environment.

More recently, MDA specifically sought out Corona to support the development of the MDA Quality Assurance Program citing Corona's Quality Assurance experience (which has been a core competency since the 1950's) and more recently because of their involvement with the Trident Missile nuclear program.

NSWC Corona is responsible for developing MDA provisions for safety, quality and mission assurance and provides the primary technical expertise to execute these requirements for all involved parties, both government and private sector.

**CASE STUDY: COOPERATIVE ENGAGEMENT CAPABILITY**

NSWC Corona's expertise sought out by the Chief Engineer for the Assistant Secretary of the Navy (Research, Development and Acquisition) to identify and recommend corrective action for two CEC ships that were electronically blind and unable to deploy. NSWC developed and implemented a successful test plan and applied a rigorous and disciplined engineer assessment with recommendations to the engineering community resulting in an estimated saving to the Navy of \$340M.

### CASE STUDY: SEASPARROW MISSILE

NSWC Corona functions as the lead for the SEASPARROW Performance Assessment Process as directed by NATO SEASPARROW Project Office (NSPO). This includes analysis, documentation, and assessment of the performance of the NATO SEASPARROW AAW Self Defense weapons and combat systems utilizing the SEASPARROW Missile. Corona has the unique ability to provide technical direction, oversight, and leadership to the program office, field activities, OPTEVFOR, Surface Warfare Development Group (SWDG), contractors, and Ministries of Defense/naval organizations in the non-US Consortium countries with regard to the assessment of the weapons systems (including missiles) they employ. This includes the ability to oversee the performance assessment process chartered by the US program office.

The criticality of Corona's role is heightened even more by the fact that NATO members are often hesitant to share information among other members. NSWC Corona provides the ability to assess and provide information to each member and has the ability to assess the overall performance and readiness as it pertains to NATO as a whole. The result is that Corona provides U.S. and NATO militaries with the ability to gage the combined and individual war-fighting capability based on parameters developed by NSWC Corona.

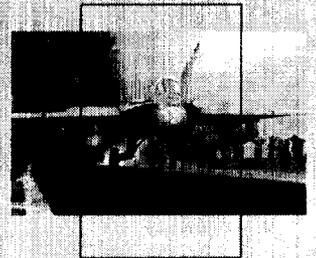


### CASE STUDY: STANDARD MISSILE (SM-2)

In 2002, NSWC, Corona conducted an analysis of Standard Missile SM-2 moisture damage and its effect on preflight and flight reliability. Analysis showed preflight reliability was affected but flight reliability was not. This discovery avoided possible costly corrective actions to prevent a supposed degradation in flight reliability. Non-routine maintenance was avoided saving at a minimum about \$14,000 per missile.

In 2003, NSWC, Corona identified a negative trend in preflight data for a subpopulation of Standard Missile SM-2 Block IIIA/IIIB missile guidance section rate integrating gyros. The problem gyros would have caused hard flight failures and possible safety issues if fired missiles were configured with them. Gyros were replaced avoiding the potential loss of the weapon if it were fired. Cost per weapon is \$800,000.

NSWC Corona's involvement in the total life cycle of the Standard missile has lead to identification of flight performance limitations and corrective action to allow for interception of low flying foreign missile threats. It has also yielded break through in development of systems capable of detecting and intercepting tactical ballistic missiles.



### CASE STUDY: STANDARD MISSILE DEPOT

In 2002-2003 there was a concern that cross-country shipping of Standard Missiles degraded reliability. It was believed this reliability degradation would justify standing-up an depot facility on the East coast. Analysis by Corona showed that there was no significant reliability degradation from cross-country shipping, thus the cost of building and maintaining an East Coast depot facility to process Fleet returned Standard Missiles was avoided.

### CASE STUDY: JOINT RADIO RELAY

In 2001, as U.S. military forces successfully engaged in Operation Enduring Freedom (Afghanistan), NSWC Corona was requested to design, build, and deploy a battlefield communication system that would provide for greater tactical conductivity with combat and support units in the area of operation. Corona's solution, the JR2, was fielded in six months and eliminated the requirement to deploy AWACS aircraft on a continuous basis to provide the necessary ground support communications. Cost savings: \$8.5 million per month.

## CAPABILITIES AND RESULTS *(continued)*

### CASE STUDY: CHEMICAL-BIOLOGICAL DETECTORS

As part of their normal cooperative testing services, NSWC Corona identified sensor deficiencies in a planned \$1 billion procurement of chemical and biological detectors. Corona's analysis prevented the purchase of defected detectors at a cost of approximately \$800 million

### CASE STUDY: JOINT WARFARE ASSESSMENT LABORATORY (JWAL)

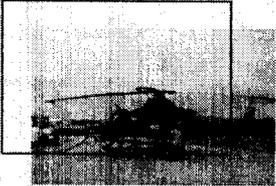


The JWAL is a 48,460 sq. ft. secure facility that provides global connectivity with every major range facility utilized in the U.S. Navy to allow for real-time collaborative assessment of test and training exercises across the multiple technical communities. The JWAL is equipped with internal vaults and special access spaces configurable for work centers and supported by secure LAN with satellite/land-line telecommunications. Its one-of-kind capabilities allow for rapid evaluation of critical events, live and simulated, during developmental testing (DT), operational testing (OT), Fleet, and joint operations, via integrated data collection, distribution, and analysis tools/processes.

### CASE STUDY: INFORMATION FRIEND OR FOE (IFF) TEST SET

In 2003, the Navy planned to procure approximately 100 IFF Test Sets from an Air Force Contract. NSWC Corona reviewed the Air Force procurement specification and determined that the units would not meet Navy specifications. As a result, the Navy avoided expending \$6-8 million for equipment that would not adequately test Navy IFF systems.

### CASE STUDY: AEGIS EMBEDDED DATA COLLECTION



Embedded data collection for the Aegis weapons system is a direct result of NSWC Corona's involvement with the program from its inception. This concept works much like a computer-aided fault detection in today's cars. It has led to the isolation of relevant operation factors and continuous improvement in system capabilities and performance. NSWC Corona's extensive involvement in the Sea Based aspects of MDA has yielded instrumentation capable of extracting and displaying near real time information during tests.

## CORE TECHNICAL FUNCTION: QUALITY & READINESS ASSESSMENT

**Enabling Capability:** Evaluation of material readiness, requirements, products and processes for weapons and combat systems during all life-cycle phases to improve quality, availability, reliability, and performance. Assessments contribute directly to gauging and maintaining fleet readiness and ensuring combat effectiveness for deployed units.

#### Applicable Subject Matter Expertise:

- Missile Readiness Assessment and Analysis
- Independent Logistics Assessment
- Technical Data Exchange
- Software Assessment
- Statistical Analysis
- Coding Theory—error detection and correction
- Discrete and combinatorial mathematics, especially in its applications to Computer Science and computer programming
- Quality Management and Engineering (Design & Production Processes)
- Reliability Assessment

### CASE STUDY: CROSS PLATFORM ANALYSIS/PERFORMANCE EVALUATION TOOL

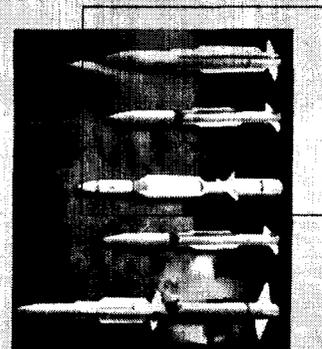
NSWC Corona developed the Performance Evaluation Tool to accurately analyze data transfer/ data linkage from AEGIS, PATRIOT and other joint systems. In addition, Corona has developed PHOENIX, a tool that analyzes AEGIS and CEC data. PHOENIX is in the process of becoming the only tool that will perform cross platform analysis of all Open Architecture platforms.

### CASE STUDY: JOINT THEATER AREA MISSILE DEFENSE ORGANIZATION (JTAMDO)

NSWC Corona has been designated as the Independent Assessment Agent for JTAMDO and is directly involved in assisting JTAMDO in the selection of solutions. They have provided analysis of sensor networks for JTAMDO and identified numerous deficiencies in the joint force picture. These deficiencies have resulted in problems with identifying friend or foe and have resulted in friendly fire fratricide in the Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF). NSWC Corona's recommendations provided the program manager with a decision management tool to invest in the solutions to these problems. Corona's analysis tools have provided a baseline for comparative analysis of proposed solutions to the Single Integrated Air Picture for DoD and the National Capital Region commercial air picture.

### CASE STUDY: JOINT TRAINING FLEET EXERCISE ASSESSMENT

During a Joint Training Fleet Exercise in 2001, NSWC Corona assessment discovered a Blue-on-Blue incident, where a friendly aircraft was misidentified as a possible threat and was constructively engaged by Blue surface-to-air missiles. One of the debrief points provided to the firing ship was that the aircraft in question was flying a steady altitude, not descending, and therefore was not presenting a threatening profile. A few months later, on deployment after 9/11, a firing ship reported an incident where an unidentified aircraft was inbound to the Battle Group. Although tensions were high, one of the reasons cited for not engaging the possible threat with live surface-to-air missiles was that its altitude was steady and not descending. The unidentified aircraft was ultimately identified as a friendly. These events and the results are directly attributable to Corona's consistent application of procedures for data collection, analysis and comparison of historical information that have had a major impact on evaluation threats and non-threats and changes in the rules of engagement.



### CASE STUDY: STRATEGIC WEAPONS DEVELOPMENT & ACQUISITION

As key technical agent, NSWC Corona provides acquisition and deployment support for Strategic Weapons, TRIDENT, SSGN, as well as the development of programs evaluation criteria, support-threat based scenario development, and development of data collection and analysis plans for Commander, Operational Test & Evaluation Force. NSWC Corona will act as COMOPTEVFOR'S trusted agent in assessing TOMAHAWK weapons system SSGN capabilities.

**CAPABILITIES AND RESULTS** *(continued)***CASE STUDY: MK41 VERTICAL LAUNCHING SYSTEM (VLS)**

Corona's Material Readiness Database (MRDB) was used to assist in determining the cause and necessary corrective actions for a serious of problems plaguing the MK41 VLS, the Navy's principle surface ship missile launch system. Analyzing an extensive database for which Corona developed and maintains Corona engineers participated in a study of the VLS cell hatch problems that resulted in an update of the deck resurface of all VLS ships. In addition, Corona provided data on the root cause failure of the VLS knife-edge uptake hatch. The data were used to update the VLS gas management monitoring after missile launches. Finally, Corona provided data on the VLS reliability of failures and malfunctions which is being used to correct the VLS spare parts requirements.

**CASE STUDY: GOVERNMENT INDUSTRY DATA EXCHANGE PROGRAM (GIDEP)**

NSWC Corona manages the operations center of GIDEP. GIDEP is a cooperative activity chartered by the Joint Logistic Commanders to provide for the full exchange of information between government and industry participants. Participants share the desire to reduce or eliminate unnecessary duplicative resource expenditures by making maximum, efficient use of existing technical information. GIDEP has realized a cost avoidance of \$1.8B since 1964. Corona has been the managing activity for this program since its inception and has actively contributed to cost savings realized through efficiencies improvements in calibration intervals and procedures.

**CORE TECHNICAL FUNCTION: RANGE INSTRUMENTATION ENGINEERING MANAGEMENT**

**Enabling Capability:** Government oversight and contract management for acquisition, systems engineering, and life-cycle support for range instrumentation and telecommunication systems for the test and training range communities. Use in the application of automated and instrumentation weapons scoring technology used during training and evaluation exercises by the Air Force, Navy, and Marine Corps.

**Applicable Subject Matter Expertise:**

- Pulse and Doppler radar systems
- Coding Theory - error detection and correction
- Discrete and combinatorial mathematics, especially in its applications to Computer Science and computer programming
- Telecommunications Engineering
- Telemetry Systems Engineering
- Scoring Systems Engineering
- Statistical Analysis
- Network Engineering

### CASE STUDY: WEAPONS IMPACT SCORING SET (WISS)

An excellent example of Corona's ability to improve the effectiveness of a weapon systems is with the Weapons Impact Scoring Set (WISS), a video-based, triangulation system that automatically scores practice bombs or mines dropped from aircraft. Corona has built 23 WISS systems and installed them on 11 Navy ranges.

The Air Force had an aging, unsupportable scoring system of its own called Tactical Ordnance Scoring System (TOSS). It opted to fund Corona to build and field 21 WISS at 12 of their ranges. In addition, the Army at Fort Drum NY has recently funded Corona to install a WISS to be used by National Guard units on their range.

Not only is the WISS more accurate (1-5 feet accuracy vs. 8-10 feet for TOSS), but it is greatly more accurate than the manual scoring used at approximately half of the USAF ranges that were scheduled but have not received a WISS system. In addition, the manually scored ranges require at least two people in the field to obtain and record the placement of each bomb drop while none are required with the auto-scoring WISS. Maintenance is both cheaper and possible with WISS vs. TOSS. More pilots can be trained in a shorter length of time using the WISS than either TOSS or manual scoring.

### CASE STUDY: TACTICAL AREA SAFETY SURVEILLANCE SYSTEMS (TASSS)

NSWC Corona designed TASSS as a surveillance system used at practice bombing and strafing ranges. The TASSS (with optional Loud Hailer Systems) allows the operator to remain at a central control point (often miles away from the tactical range) and use television cameras to remotely pan the target areas to ensure no human or other intruders have strayed into the target areas. If an intruder is spotted, the remote Loud Hailer System can be used to issue verbal warnings to depart the area. Human presence is not necessary at these locations as was required earlier, with the electronic detection and warning systems installed.

Also, the TASSS and Loud Hailer System have been used as part of NSWC Corona's contribution to the Homeland Defense. It is set up at the majority of the range sites as intrusion detection system for monitoring the integrity of the base and ranges facilities with upgrades in the system to support infrared night vision capability. The organization has also been tasked to install surveillance systems at military bases, security gates, and on such prime locations as base water towers, etc.

### CASE STUDY: LASER DESIGNATION

It became apparent during recent conflicts that although the systems passed test bench parameters, targets were not being hit. NSWC Corona developed, designed and built laser standards 100,000 times more sensitive than were available in the world to increase the accuracy of test equipment used to align systems on the planes. NSWC Corona has the only certified laser ranges certification instructors and surveyors in the Navy. These skills are critical to the laser designators that are widely used by the joint services to identify and spot targets for engagement. Training ranges must have their laser ranges safety-regularly certified. That capability would be lost with these staff members since there is no commercial requirement for laser target designators in the private sector and, as such, has no technical capability.

## CAPABILITIES AND RESULTS (continued)

**CASE STUDY: TACTICAL AIR COMBAT TRAINING SYSTEMS (TACTS)**

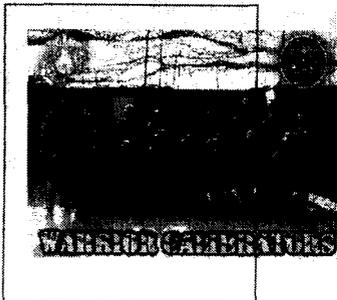
Because NSWC Corona possesses extensive knowledge of training range instrumentation systems including Tactical Air Combat Training (TACTS) systems, Electronic Warfare (EW) systems, telemetry receiving stations, bombing/strafe scoring systems it was specifically asked to assume program responsibility. Corona's involvement was instrumental in the development of the TACTS range capabilities beyond its original concept and resulted in a program cost far below the original contractor. Corona's involvement has saved the Navy, Air Force and Marines \$1M per year since they have assumed responsibility. Corona engineers have the ability to direct, plan, and develop the overall policy for managing the O&M of the systems and equipment that comprise and integrate the range operations functions. Ability to conduct liaison with other high-level personnel at Navy, Marine, Army, and Air Force commands that utilize the FRTC or require information regarding the utilization of the FRTC assets. This liaison involves utilization of an extensive knowledge of range systems to provide information and recommendations to assist those commands concerning the development and employment of the FRTC training systems and equipment. The incumbent also analyzes the changing requirements of the Navy, Marine Corps, Army and Air Force and investigates alternative systems and techniques for meeting those requirements.

**CORE TECHNICAL FUNCTION: MEASUREMENT & TEST ASSESSMENT**

**Enabling Capability:** Establishment of department-wide metrology standards and processes to assure effective integration and performance of critical weapon components such as missiles, launchers, and rocket motors. Overall management and technical direction for METCAL programs across the Navy Systems Commands (SYSCOM's) to ensure the Navy's vision of METCAL is translated into program objectives. Establishment and definition of the scope of Navy METCAL technical efforts and projects to be performed, identify new efforts, and appraise state-of-the-art advances in related technology at government, private sector, and foreign activities.

**Applicable Subject Matter Expertise:**

- Test System Certification
- Test System Assessment
- Scientific Calibration Requirements Analysis
- Calibration Standards Development
- Calibration Procedure Development
- Interval and reliability analysis for Measurement Science
- Calibration laboratory auditors
- Physical Interface Assessment
- Physical Interface and Gage Certification
- Coding Theory - error detection and correction
- Discrete and combinatorial mathematics, especially in its applications to Computer Science and computer programming

**CASE STUDY: INFANTRY WEAPON GAGES PROGRAM**

Improved measurement techniques developed by NSWC, Corona caused a 60% reduction in the calibrations and verifications time for Infantry Weapons Gages when compared to labor required at previous calibration location. Illustrating the value of NSWC Corona, staff engineers provided timely support to the Marine Corps Infantry Weapon Gages Program in October 2002 when they were tasked to fabricate and

calibrate 2,450 Infantry Weapon Gages for the Marine Corp in support of rapid deployment and operational safety. Although these gages usually take more than 10 weeks for fabrication and calibration, NSWC Corona worked with vendors around the clock to have the gages fabricated and delivered to the Measurement Science and Technology Laboratory in half the normal time. Upon receipt, the gages were then calibrated and shipped by the Marine Corps' due date.

### CASE STUDY: MISSILE TEST CERTIFICATION

NSWC Corona Test Equipment Certification personnel found manufacturer faults in TOMAHAWK missile firmware through normal day-to-day analysis of data received at NSWC Corona. The fault could have caused errant operation of the missile. NSWC Corona personnel were able to determine which missiles were affected and were able to advise which missiles required a reload of the firmware thus saving the Navy the cost of reloading all of the missiles. This effort minimized the cost associated in accomplishing the corrective action. Potential savings was \$800,000 for each missile that could have been launched with the incorrect firmware.

### CASE STUDY: CALIBRATION STANDARDS MODERNIZATION

Corona was responsible for a calibration equipment program that replaced multiple models of separate, but similar, equipment with fewer, more reliable models that required less maintenance. For example, there were over 23 model numbers of Universal Counters in Navy inventory representing 365 pieces of test equipment. These models were used to perform over 91,000 calibrations each year. Modernization caused a reduction in the model numbers to 3 and a reduction in quantities to 114. After an initial procurement cost of \$1.9M, annual support costs were cut from \$1.6M to \$20,000. Return on investment was secured within 18 months.



### CASE STUDY: METBENCH

NSWC Corona is developing METBENCH, the Navy's next-generation calibration platform. METBENCH will replace existing outmoded and obsolete bench top calibration technology, and improve the retrieval of correct metrology requirements data (calibration intervals, approved procedures, authorized standards, etc.) at the technician's bench top where they are required. METBENCH is a unique calibration system that increases the efficiency and effectiveness of the U.S. Navy Metrology and Calibration (METCAL) Program including:

- 33% reduction in calibration run-time through automation
- 50% reduction in tech data work package assembly time
- 50% reduction in technician manual data entry tasks

METBENCH is a forward looking platform-independent architectural design to capitalize on emerging technologies. It is a fast and inexpensive method for converting our library of over 5,000 calibration procedures and is driven by a relational engine that links instrument commands, calibration methods, and "plain language" procedure instructions that allows for preserving investments made on each procedure. It offers a new paradigm for lowering the skill sets required for writing new procedures as well as for performing calibration.

**CAPABILITIES AND RESULTS (continued)****CASE STUDY: GUIDED BOMB UNIT (GBU-24)**

While operationally deployed, the USS J.F. Kennedy reported a problem in assembling the airfoil to the GBU-24 bomb bodies. Fifteen days after notification of assembly problem, NSWC Corona was tasked to analyze the data components for design interface deficiencies. Corona engineers identified the root cause and recommended a solution. A portable milling fixture was designed and built and a tiger team was trained to allow repair of the problems at deployed locations. Repairs were conducted at minimal cost and without impacting fleet operations.

**CASE STUDY: TEST SET CERTIFICATION**

Test equipment must be certified before it is released for use in acceptance testing of weapon systems and their constituent parts. Software that drives automated test equipment used in acceptance testing must be evaluated to verify that all required tests are correctly implemented. Manual verification of this software is a tedious, protracted, error-prone, and often unreliable process.

NSWC Corona personnel developed what is called Computer-Aided Test Software Evaluation (CATSE). It is a sophisticated software tool that automates the software review process. Under CATSE, test system software can be executed without the physical presence of instrumentation and weapon system hardware. Instruments and their associated readings and measurements are simulated, thus providing test software performance identical to that of a fully configured and instrumented test system. It significantly enhances the accuracy and reliability of test software evaluations while substantially reducing the cost and time required for in-depth test software analysis. The biggest cost saving has come through the reduction in time to verify changes in extremely complex software. What use to take four people a year now can be done by one person in a few hours.

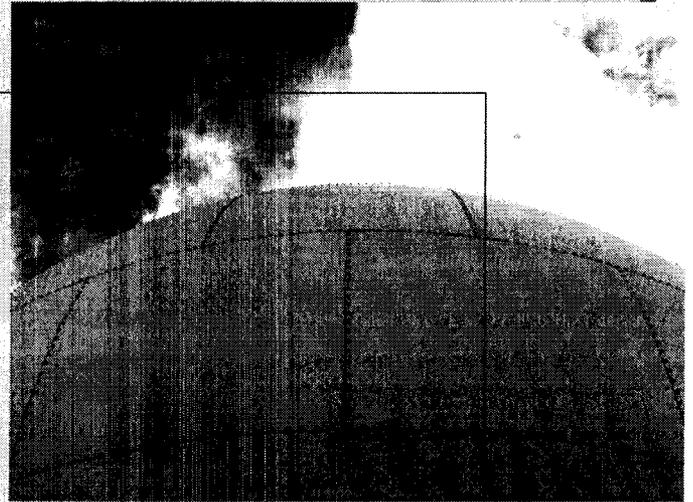
**CASE STUDY: LASER TRACKER SYSTEM**

Laser measuring device was design and built to check for the integrity of the launch tubes onboard the Trident Class submarines. Due to the extreme depths these submarines dive the physical dimensions of the boat change due to pressure of the water. Previously, large mechanical devices were required to ensure the roundness of the tubes to prevent a missile from being jammed in the silo during launch. This device is much smaller and reduces measurement time for large geometric shapes such as the Trident D-5 Launch tube. It has reduced the time from 20 hours to 2 hours with much more robust measurements and dramatically improved accuracy. Cost savings is approximately \$35K per boat.

## POINTS OF CONTACT

Preparation of this report was conducted under the leadership and authority of the Naval Surface Warfare Center Corona Community Partnership Committee. Questions regarding the information contained in the report and its preparation should be addressed to:

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**Los Angeles Regional BRAC Hearing**  
**July 14, 2005**  
**NSWC Corona Division**  
**Community Partnership Backup Materials**

Table of Contents

<b>Item</b>	<b>Electronic Location</b>
COBRA Model data	<i>nswc_corona_community_backup_slides.ppt</i> , Slide 1
Cost Assumption	<i>nswc_corona_community_backup_slides.ppt</i> , Slide 2
Military Value Assessment	<i>nswc_corona_community_backup_slides.ppt</i> , Slide 3
Military Value Ranking Appendix	<i>nswc_corona_community_backup_slides.ppt</i> , Slide 4
NSWC Corona Military Value Score	<i>nswc_corona_community_backup_slides.ppt</i> , Slide 5
National Asset Labs	<i>nswc_corona_community_backup_slides.ppt</i> , Slide 6
Corona Engineer	<i>nswc_corona_community_backup_slides.ppt</i> , Slide 7
Financial Impact on Workforce	<i>nswc_corona_community_backup_slides.ppt</i> , Slide 8
NSWC Corona Division Employee/Contractor Residential Distribution	<i>nswc_corona_community_backup_slides.ppt</i> , Slide 9
Riverside "median-price" House Camarillo	<i>nswc_corona_community_backup_slides.ppt</i> , Slide 10
Independent Assessment process	<i>nswc_corona_community_backup_slides.ppt</i> , Slide 11
Joint T&E Using Structured Analytical Approach	<i>nswc_corona_community_backup_slides.ppt</i> , Slide 12
FY04 Key Customer	<i>nswc_corona_community_backup_slides.ppt</i> , Slide 13
Intellectual Resources	<i>nswc_corona_community_backup_slides.ppt</i> , Slide 14
Workforce Growth	<i>nswc_corona_community_backup_slides.ppt</i> , Slide 15
Revenue Growth	<i>nswc_corona_community_backup_slides.ppt</i> , Slide 16
Corona vs. Ventura County Footprint Comparison	<i>nswc_corona_community_backup_slides.ppt</i> , Slide 17
Military Value and Program Impact Report (Bound Report)	<i>military_value_program_impact.pdf</i>
Economic Impact of the Closure of NSWC Corona Division report (Bound Report)	<i>economic_impact_closure_ncws_corona.doc</i>
JWAL data sheets	<i>data_sheet_jwal.doc</i>
MSTL data sheets	<i>data_sheet_mstl.doc</i>

<i>High Technology Measures for Success Article</i>	<i>mstl_design_award_article.pdf</i>
MSTL New build contractor testimony	<i>building_contractor_statement.doc</i>
Quote Excerpts from Various BRAC Reports	<i>excerpted_quotes.doc</i>
Real Estate Price Report	<i>real_estate_price_report.pdf</i>
BRAC Staff Contractor Brief July 2005	<i>brac_staff_contractor_brief_july_2005.ppt</i>
Job Description of SMEs	<i>job_description_of_smes.doc</i>
Military Value Matrix Bound Report	<i>military_value_matrix_complete.doc</i>
Admiral Gehman Congressional Testimony video	<i>adm_gehman_testimony.mpg</i>
Base Promo video	DVD

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Contractors Lead Training,  
Recruitment Effort,  
page 10



**NEW CONSTRUCTION MORE THAN \$500,000  
CATEGORY D**

# High Technology Laboratory *Measures for Success*

By Michael S. Weil  
executive editor

**T**he Naval Surface Warfare Center (NSWC), Corona Division, is the Navy's only independent technology analysis and assessment center. Located in Corona, CA, the NSWC is where the Navy's proverbial rubber hits the road. In their words, "The mission of

administrative, as well as warehouse space. Its purpose: to provide critical measurement analysis of numerous top-secret military weapons and their related devices.

The science of measurement analysis is known as "metrology." Measurements by metrologists can be accurate to one millionth of an inch. Part pieces and measuring instruments expand and contract with minute changes in

the measurement process. This includes single point stability ( $\pm 1.5F$ ), as well as precision vertical/horizontal gradient control (less than  $\pm 1.5F$ ). Gradients are measured in time and in space.

For the U.S. Navy's Measurement Laboratory, the precision measurements required the lab areas to be maintained at a constant temperature with only  $\pm 0.5F$  from the floor to the ceiling.

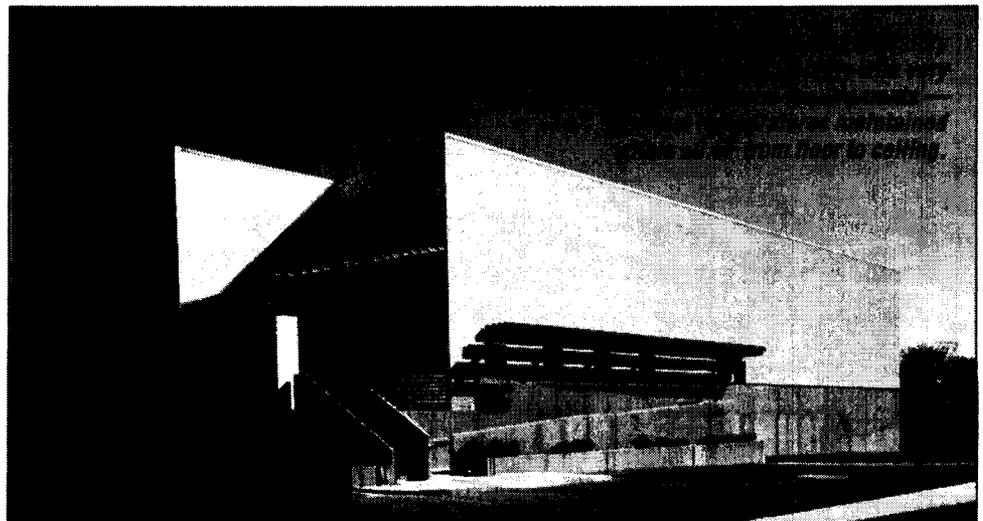
Like many construction projects let by the government, this one had all the potential of a giant plan-and-spec job. Instead, however, the Navy was looking for something better. With budget constraints and an eye toward getting more bang for the buck, the Navy decided to award the contract on a "best value" basis rather than on the traditional low bid.

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A. O. REED & CO,  
San Diego, CA  
.....

the NSWC Corona Division is to gauge the war-fighting capacity of ships and aircraft, from unit to battle-group level, by assessing the suitability of design, the performance of weapons and equipment, and the adequacy of training."

In order to carry out this mission, NSWC possesses a number of unique capabilities. Foremost among these is the Warfare Assessment and the Naval Measurement Laboratories. The latter was in dire need of updating, and the Department of the Navy was looking to build a new measurement laboratory. The new facility is in a 39,000 sq. ft. single-story building and is earmarked to be Navy's primary measurement facility. It contains laboratories, admin-

istrative, as well as warehouse space. Its purpose: to provide critical measurement analysis of numerous top-secret military weapons and their related devices. The science of measurement analysis is known as "metrology." Measurements by metrologists can be accurate to one millionth of an inch. Part pieces and measuring instruments expand and contract with minute changes in environmental conditions. When this occurs, measurement accuracy is compromised. For this reason, metrology laboratories require precision controlled environments. Precise temperature and humidity control is essential to



## A Design/Build Contest

The field of contractors was narrowed to four general contractors who were asked to put their best ideas forward. The four generals and their teams were then asked to come up with the preliminary designs, with the winner being the team that provided

### CATEGORY D New Construction More than \$500,000

#### WINNER AT A GLANCE

Project Name/Location  
**U.S. Navy Measurement Lab,**  
San Diego, CA

Key Customer Contact:  
**Jennifer Liams-Rubio,**  
project manager  
**David Marcroft,**  
Laboratory Manager

Nomination Submitted by:  
**Les Osterberger**  
vice president, A.O. Reed & Co.  
San Diego, CA

#### THE PROJECT TEAM:

##### At U.S. Navy Measurement Laboratory

- Jennifer Liams-Rubio, project manager
- David Marcroft, Laboratory Manager

##### At A.O. Reed & Co.:

- Les Osterberger, vp project planning/business development
- Thomas Schodorf, project manager
- Don Williams, piping superintendent
- John Stotz, piping foreman
- Dennis Murphy, sheet metal superintendent
- Dan White, sheet metal foreman
- Jim Henderson, project estimator

##### At Erickson-Hall Construction (general contractor)

- Michael Hall, project executive
- Randy Hinkle, project manager

##### At Architects Larson-Carpenter:

- Chris Gedrose, project architect

##### At LSW Engineers

##### (mechanical engineers)

- John Littrell, principal
- Larry Brooks, project manager

##### At Control Solutions

##### (Controls contractor)

- Doug Cooper, project manager



the best design as well as the best value, including building size, amenities, and cost.

One of the general contractors, Erickson-Hall Construction Co., decided the mechanical system would best be designed by a local San Diego contracting firm, with which they'd done business in the past — A.O. Reed and Co.

A.O. Reed, which was founded in 1914, targets the HVAC and plumbing/process piping needs in the commercial, industrial, and institutional marketplace. Vice President of Project Planning and Business Development, Les Osterberger headed up the A.O. Reed mechanical system design team and was responsible for ensuring that the U.S. Navy and Erickson-Hall's expectations were realized.

Osterberger explains that A.O. Reed had a great foundation with which to work. "We've worked closely with Erickson-Hall on many laboratory jobs, mostly in the healthcare industry."

Because the measurement lab was somewhat different, Osterberger says that the owner (the U.S. Navy) developed a very detailed project program, which was used by the team in the project design and construction process.

"A.O. Reed has a complete in-house engineering capability," he says, "but this particular project required a design consultant with previous Mea-

*A key issue for the customer was the distribution of sensible heat load-producing equipment in the lab. A.O. Reed's solution: to locate this equipment around the exterior wall so some heat went directly to the low wall returns.*

surement Laboratory experience. For that reason, we hired San Diego-based LSW Engineers to help us."

Another member of A.O. Reed's team was a company called Control Solutions; a company that Osterberger says is internationally recognized for designing and building of laboratories for metrology. He adds that Control Solutions brought the experience needed to properly commission this technically challenging project.

"Traditional comfort heating and cooling weren't the main objective," he explains. "Precise temperature control to within  $\pm 0.5F$  and humidity control of  $\pm 5\%$  were required by the laboratory equipment," he says.

#### Control Strategies

LSW Engineers developed control strategies for the research facility. LSW Project Manager Larry Brooks says he felt that by using computer-based direct digital controls, and precision sensing and monitoring equipment, the  $\pm 0.5F$  temperature and  $\pm 0.5F$  humidity criteria could be easily met.

He adds, "There was a need for staging the cooling and heating for in-

## CATEGORY D: New Construction More than \$500,000

### PROJECT-AT-A-GLANCE



#### SYSTEM DESCRIPTION:

Like many things that have to do with the military, measuring the efficiency of weapons is a closely guarded secret. The facilities necessary to carry out those measurements require the utmost precision with regard to the maintenance of temperatures humidity within the structure and in the testing labs themselves.

Such is the case for the **U.S. Navy Measurement Laboratory**, located in Corona, CA. The lab is part of the Naval Surface Warfare Center (NSWC), which serves as the U.S. Navy's technical authority for test, measurement, and calibration requirements.

The basic challenge of the project was to design and build a sophisticated environmental system within strict funding limitations. This project consisted of a 39,000 sq. ft. single-story building — including laboratories, administrative, and warehouse space —, which the Navy will use as its primary Measurement Laboratory.

The purpose of this building was to provide critical measurement analysis of numerous top-secret military weapons and related devices. Activities in the lab required very precise temperature and humidity control so that the tolerances in thousandths of an inch could be maintained, measured, and used on the development of military hardware. To take such precise measurements, the laboratories must be maintained at a constant temperature with only  $\pm 0.5F$  from the floor to the ceiling.

This contract was awarded by the government on a "Best Value" basis rather than the lowest bid. The general contractor, Erickson-Hall asked **A.O. Reed & Co.** to be part of its team as the Design/Build mechanical contractor. A.O. Reed took the job and sought outside expertise in designing for a precision laboratory like the Measurement Lab. They brought onboard LSW Engineers to perform this function.

The mechanical system cost was \$1.46 million and A.O. Reed paid close attention to laboratory equipment loads and air distribution — including laminar flow ceiling supply air and a low wall perimeter return air system.

#### PRODUCTS KEY TO SUCCESS

- Air Handlers - 20 Trane 4-pipe constant-volume air-handling units were used to maintain strict temperature and humidity requirements
- Chillers - Two York 135-ton air-cooled chillers provide comfort cooling and redundancy to the overall system.
- Boilers - Two Laars heating hot water boilers are used for space heating.

dividual labs to hold very precise temperature and humidity limits simultaneously. A chilled water system with variable pumping was used to supply each air handler with cooling. An extremely high air exchange rate was accommodated using face and bypass dampers. This avoided excess re-heating."

In addition, Brooks says the final temperature set point was achieved with precision electronic-controlled electric heat in response to a grid of space thermostats. Precision humidity control is achieved by overriding the face/bypass dampers in response to a space humidity sensor.

#### Meeting the Customer's Needs

Erickson-Hall brought its full Design/Build team to the table, and the U.S. Navy awarded the contract for the Measurement Laboratory to them. The me-

chanical cost of the project was \$1,460,000.

From that point on, the mechanical system design and installation was completely in the hands of A.O. Reed and Co. Key to Osterberger's team was Project Manager Thomas Schodorf. Schodorf worked closely with A.O.

Reed's project estimator, Jim Henderson, to make sure the project estimate, with regard to the schedule, manpower, large equipment purchases and delivery, and overall costs remained on target.

"Schodorf also prepared all construction document submittals," Osterberger adds, "and issued the subcontracts, coordinated information."

According to Schodorf, efficiency was certainly one of the customer's key requirements. "From an energy efficiency standpoint, our face and bypass control strategy also aided in reducing power consumption," he explains. "Competing designers were bidding 300 tons of cooling, while we found we could achieve equal results using just 134 tons. The outcome was a considerable reduction in energy use, with a very favorable life cycle cost."

In addition to energy efficiency, the team handled indoor air quality (IAQ) and environmental impact issues through the design of the system. IAQ quality was quite high because of the aforementioned airflow exchange rate and the extensive use of 99.97% HEPA filtration. According to Osterberger, his team's designs minimized any impact to the environment by using high efficiency motors and precision temperature control systems.

**Two 135-ton chillers were used to provide the Naval Measurement Lab comfort cooling and system redundancy.**



## NEW CONSTRUCTION MORE THAN \$500,000 CATEGORY D

An additional issue A.O. Reed faced was the distribution of the sensible heat load-producing equipment in the lab. This equipment was located around the exterior wall, allowing a portion of the heat to go directly to the low wall returns and not affecting the space sensible control load. Osterberger explains that a sophisticated psychrometric analysis was developed to ensure that all conditions were met.

### **The Metrology of Commissioning**

One of the main requirements of the project was the thorough commissioning of the mechanical system. "Commissioning a system of this size and nature requires some serious metrology of our own," Osterberger explains.

With this in mind, the system design was based on achieving the certification objectives. Control Solutions was responsible for the control system design/installation and certification process. A.O.

Reed and Control Solutions coordinated with the general contractor to ensure proper wall and roof system design because the walls and roof were integral to the environmental system.

According to Control Solutions Project Manager Doug Cooper, commissioning consisted of seven tests conducted on each lab for a duration of three days per lab.

"The most comprehensive testing was the temperature test," he says. "We used instrumentation that's calibrated in a NIST traceable procedure that includes a temperature bath, electronic super thermometer, data logging instrumentation, and a NIST calibrated super platinum resistance thermometer (SPRT).

"The total expanded uncertainty of the temperature test gear was  $\pm 0.0005C$ ," Cooper says.

He explains that the test gear consisted of a calibrated data logger and sensor ar-

ray. At least 12 sensors were installed at various elevations and locations in each lab. In essence, the entire lab environment was "mapped" to verify compliance with the temperature specification. After the temperature test, the remaining six tests were conducted with instrumentation traceable to NIST.

"We then produced a comprehensive report detailing all tests and their results, which was delivered to the Navy. The test results exceeded their expectations and specifications, and they accepted the metrology lab without further testing."

Says Osterberger, "The success of this project is attributable to an excellent team of highly experienced members consisting of the owner, general contractor, architect, and mechanical consultant. Each team member is well-versed in the the Design/Build project delivery method and this project demonstrates how that method works best." ■

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## Just Announced 2003 Dates

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St. Louis, MO April 23-25

Nowark, NJ May 14-16

Charlotte, NC June 4-6

Minneapolis, MN -

July 30-31 & Aug 1

Philadelphia, PA Oct 1-3

Phoenix, AZ Nov 5-7

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## COBRA Model Data

- The COBRA model is a complex, multi-faceted tool used to analyze the impact of various scenarios on the NSWC Corona facility.
- The model is based on a detailed understanding of the facility's operations and the potential impacts of different scenarios.
- The model is used to evaluate the impact of various scenarios on the facility's operations and the potential impacts of different scenarios.
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**When the Truth of the FACTS  
Are Used To Evaluate the Decision  
The Cost to Move NSWC Corona Makes No Sense**

## Cost Assumptions

- The cost assumptions for the move are based on a detailed analysis of the facility's operations and the potential impacts of different scenarios.
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**MOVE REPRESENT HUGE COST vs. ANY SAVINGS**

## Military Value Assessment

- Comparisons were against a set of criteria for comparing against all areas.
- Criteria include high percentile scores and a mix of having low work years.
- Criteria include high percentile scores and a mix of having low work years.
- Criteria include high percentile scores and a mix of having low work years.
- Criteria include high percentile scores and a mix of having low work years.

**Military Value Ranking in 72 Percentile**

## Military Value Ranking Appendix

Appendix B of Technical

Table	Table Name	Rank	Total MILVAL	Rankings	Placement %
3.1	Air Platform DAA	10	57	66%	
3.3	Air Platform T&E	16	51	66%	
3.13	Ground Vehicle DAA	9	25	64%	
3.15	Ground Vehicle T&E	6	27	67%	
3.18	Information Systems Technology DAA	17	106	66%	
3.20	Information Systems Technology Research	66	66	0%	
3.21	Information Systems Technology T&E	16	72	78%	
3.24	Materials & processes T&E	17	44	61%	
3.26	Sea Vehicle DAA	16	33	52%	
3.30	Sea Vehicle T&E	12	33	64%	
3.31	Sensors, Electronics and EW DAA	17	103	63%	
3.33	Sensors, Electronics and EW T&E	14	72	61%	
3.37	Weapons Technology DAA	21	78	73%	
3.38	Weapons Technology T&E	16	70	73%	

Funding "pass-through" - no associated workyears

**Military Value Ranking in 72 Percentile**

## NSWC Corona Military Value Score

The military value score for NSWC Corona is based on a detailed analysis of the facility's operations and the potential impacts of different scenarios.

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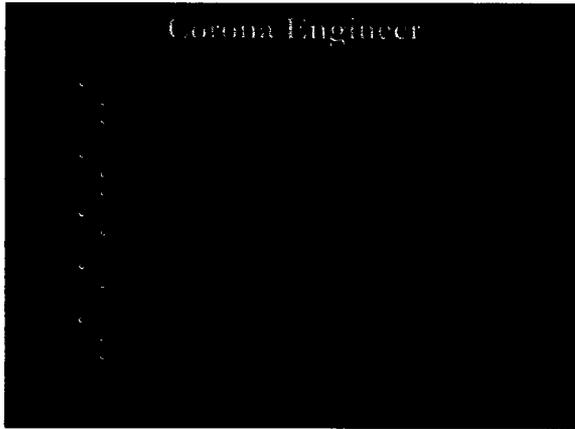
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## National Asset Labs

- Joint Warfare Assessment Lab: Providing with requirements for additional (12000 sq ft) of space used to conduct classified operations in support of MDA, Dec. Bank Group, Experiments, War Games, and Sup. Qualification efforts. Summary of requirement for Second Level OTH spaces. Currently working under waivers for classified operations.
- Measurement Science and Technology Lab: Providing with requirements for additional (12000 sq ft) of space used to conduct classified operations in support of MDA, Dec. Bank Group, Experiments, War Games, and Sup. Qualification efforts. Summary of requirement for Second Level OTH spaces. Currently working under waivers for classified operations.



### Financial Impact on Workforce

- Cost Of a 1600-2000 sq. ft home in Riverside County vs. 1600-2000 sq. ft home in Ventura County.
- Total Construction Costs:
  - \$625M For Construction Materials & Labor
  - \$125M For Architectural, Permit, Fees
- Loss Of Spousal Income

**Employees Bear Enormous Personal Financial Burdens**

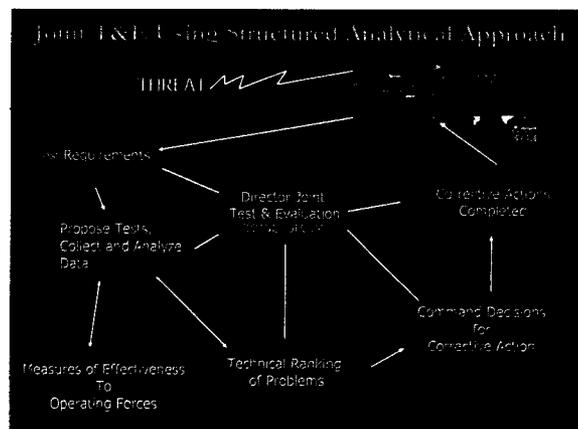
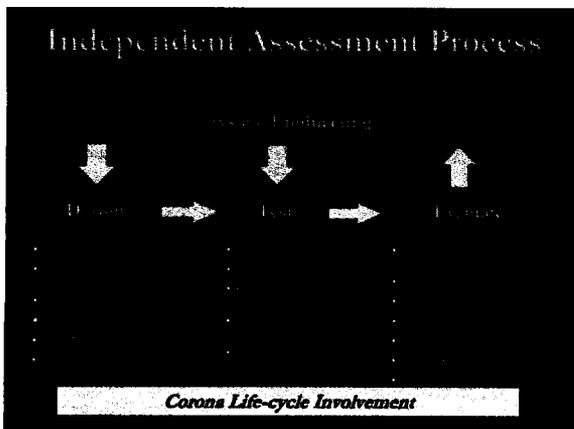
### N.W. Corona Division Employee - Contractor Residential Distribution

### Riverside "medium-price" House Camarillo

\$370,000 - 1900 sq. ft.

248 Glend Dr  
Camarillo, CA 93010

Total Bedrooms:  
Total Baths:  
Sq. Feet:  
Lot Size:  
Average:  
Year Built:  
Type:  
File #:





**NAVSEA**

**Engineering, Technical, Ancillary,  
and Operational Support Services Contract  
In Support of  
Naval Surface Warfare Center, Corona Division**

**Presentation to  
BRAC Staff  
6 July 2005**

**NAVSEA**

- Cost Issues
  - On-site contractor space/costs not included
  - Office Space 52,000 sq/ft
    - Dramatically Higher at NBVC
  - GFE Moving Costs Not Included
- Workforce is about 300 people
  - Ninety percent dedicated to support of NSWC Corona
    - 135 personnel on-site at NSWC Corona
  - Nearly 40 Years of Support
  - About 15 percent provide SME support
  - Average Salary is \$54K per year

**NAVSEA**

- Impact on Workforce
  - Unable to Commute due to 5 hour daily round trip
  - No PCS for contractors
  - Unable to relocate due to high cost of housing at NBVC
  - Loss of SME support in all areas
  - Workforce Survey Indicates ninety percent unwilling to relocate

**NAVSEA**

**CSC Project Team Experience**

Years Supporting NSWC Corona	Percentage
0-5	22%
5-10	18%
10-15	19%
15-20	18%
20-25	12%
25-30	7%
30+	6%

Average of 15 Years

60 Percent of Project Personnel have More Than a Decade of Direct NSWC Corona Experience

**NAVSEA**

**CSC Project Team  
Total Years Experience with Specific Systems and Processes  
Directly Related To NSWC Corona Mission Areas**

Mission Area	Total Years Experience
Information Technology	338
Combat Systems	1,283
Fleet Exercise Support	1,283
Metrology Support	744
Missile Systems	744
Range Support	802

**40 YEARS OF DEDICATED SUPPORT GIVES OUR TEAM  
INTIMATE KNOWLEDGE OF NSWC CORONA'S  
ENVIRONMENT, SYSTEMS, AND PROCESSES**