DEFENDING THE TECHNICAL INFRASTRUCTURE PROPOSALS OF THE 2005 BASE REALIGNMENT AND CLOSURE ROUND

Issue # 04-23-05-01

Issue: Our country is at war. A successful Base Realignment and Closure (BRAC) round will therefore depend on our ability to make the transition from four peacetime rounds to a wartime round. Doing so requires a shift from cost savings to military value as the primary consideration, from functional efficiency to mission effectiveness as the goal, and from "bigger is better" to "performance is paramount" as the basis for consolidations. This paper examines the process and proposals of the Technical Joint Cross Service Group (TJCSG) to: gauge how well they satisfy the goals of this BRAC round, provide a sense of the degree to which they serve the interests of national security, and judge how well they can be defended to the Commission. The findings show considerable cause for concern. Corrective action is necessary and still feasible.

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Issue Summary: Of the government defense functions analyzed by this closure round, the Technical function is the one most responsible for transforming the way America's military fights. From the development of the first U.S. radar,[1] to the invention and launch of the first intelligence satellite,[2] to the concept and satellite prototypes of the Global Positioning System,[3] to the vision technologies that "own the night,"[4] to the crash development of the "Bunker Buster"[5] and thermobaric weapon[6] — *the Department's in-house system of laboratories and technical centers have created dominant warfighting capabilities for our armed forces*. And, coupled with a well-trained all-volunteer force, the technologies produced by both the public and private sector have given America an unmatched ability to defend herself, protect her allies, and safeguard her global interests, for more than 30 years without a draft.

After the collapse of the Soviet threat, the U.S. responded in a fitting way for a liberal democracy by cutting military force structure judged to be in excess to its security needs. A significant amount of Department of Defense (DoD) infrastructure was no longer necessary. For the ensuing peacetime closure rounds, BRAC-I, II, III and IV, the primary consideration was *efficiency*, which meant saving money by eliminating what was considered excess to force requirements.

But BRAC-V is different. This is the first wartime BRAC. It also has a bigger agenda than the peacetime rounds. In addition to cutting excess capacity, it seeks to transform the Defense Department by maximizing warfighting capability and improving efficiency. According to the Secretary of Defense (SECDEF):

> "At a minimum, BRAC 2005 must eliminate excess physical capacity; the operation, sustainment, and recapitalization of which diverts scarce resources from defense capability. However, BRAC 2005 can make an

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[1] U.S. Patents: No. 1,981,884 to Taylor, A.H., Hyland, L., Young L.C., "System for Detecting Objects by Radio," 1934; No. 2,512,673 to Page, R.M., "Radio Pulse Duplexing System," 1950; R.M. Page, Laboratory Notebook 171, Vol. III, March 1934; letter from NRL to the Bureau of Engineering, June 11, 1936, in File S-S67-5 #1, National Archives Building.
[2] Secretary of Defense McElroy letter to President Eisenhower, August 18, 1959; Technical Operations Group Report, October 13, 1960; D. Day, "Listening from Above: The First Signals Intelligence Satellite," *Spaceflight*, Vol. 41, no. 8 (1999), 339-346; and D. van Keuren, "Cold War Science in Black and White," *Social Studies of Science*, Vol. 31, no. 2 (April 2001), 207-229.
[3] U.S. Patent No. 3,789,409 to Easton, R.L., "Navigation System Using Satellites and Passive Ranging Techniques," January 29, 1974; Easton, R.L., "Optimum Altitudes for Passive Ranging Satellite Navigation Systems," *Naval Research Reviews*, August 1970; Easton, R.L., "Role Of Time/Frequency in Navy Navigation Satellites," *Proceedings of the IEEE*, Vol. 60, 557-563 (1972); and Easton, E.L., et al., "Contribution of Navigation Technology Satellites to the Global Positioning System," NRL Report 8360, December 28, 1979.
[4] "Night Vision Goggles," (http://www.globalsecurity.org/military/ground/nvg.htm).
[5] "Guided Bomb Unit-28 (GBU-28) BLU-113 Penetrator," (http://www.globalsecurity.org/military/systems/munitions/gbu-28.htm).
[6] "BLU-118/B Thermobaric Weapon," (http://www.globalsecurity.org/military/systems/munitions/blu-118.htm).

> even more profound contribution to transforming the Department by rationalizing our infrastructure with defense strategy. BRAC 2005 should be the means by which we reconfigure our current infrastructure into one in which operational capacity maximizes ***both*** warfighting capability and efficiency."[7]

Unlike the peacetime rounds, *mission effectiveness*, expressed as "military value," is by law the primary consideration in the making of recommendations. A shift in emphasis, from efficiency to effectiveness, is right for a nation at war and a military that is transforming itself for the 21st century.

This paper examines the process and proposals of the TJCSG in order to: (a) gauge how well they satisfy the SECDEF's goals for BRAC-V; (b) provide a sense of the degree to which the proposals serve the interests of national security; and, (c) judge how well they can be defended to the BRAC Commission and to the communities.[8] Five "Red Flag" issues are identified in the assessment, each of which is sufficient to raise valid questions about the ability of BRAC-V to yield fair, accurate, and effective decisions with regards to the DoD's laboratories and technical centers. The findings show cause for concern.

- Capacity data demonstrate a modest current level of excess infrastructure at **7.3%**.[9] The data also shows this excess disappears in the future to become a deficit of **-2.2%** — *without any BRAC actions taken*. However, with BRAC action, the 3,098 Full-Time Equivalents (FTEs) eliminated by the TJCSG's 13 proposed actions will increase the deficit to **-3.9%** and cut deeper into the surge allowance, an amount required to be held in reserve. Finally, FTEs are the Technical function's link to the Force Structure Plan. Therefore, at a minimum, those actions taken within the eight Technical Capability Areas showing a future deficit may not be judged as conforming to the Plan.

- The proposed scenarios were developed by the TJCSG *before* the capacity and military value data were received and processed. Therefore the process was judgment-driven, not data-driven. Not one scenario was developed as a result of quantitative military value analysis or on the basis of excess capacity determinations.

- The scores for military value were driven by workload (numbers of people and dollars), not by metrics that could identify exceptional technical talent and accurately gauge operational impact.

- The study design promotes sub-optimal solutions that leave a large number of losing sites open, but weakens them by shredding the connectivity of their integrated programs and reducing their business base. This can lead to increased costs as overhead rates rise at the losing sites and additional infrastructure is built at the gaining sites. It is also likely to lead to the loss of top talent in the realigned workforces.

- Outside of the TJCSG, the HS&A JCSG proposes to assimilate the laboratories / centers into efficiency-focused, centrally-planned, management systems that do not recognize critical differences between, for example, a research laboratory and a shipyard. One of the proposed actions involves a direct challenge to civilian authority.

The outcome of these problems is likely to be a number of closure and realignment proposals that, if implemented, will contribute toward a degradation of national defense capabilities. Recommendations are provided to address the identified problems and enhance the defensibility of those TJCSG proposals passing the more rigorous review advocated by this paper.

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[7] SECDEF memorandum, "Transformation Through Base Realignment and Closure," 15 November 2002.
[8] The author was a member of the BRAC-95 Navy Base Structure Analysis Team and the BRAC-95 DoD T&E Joint Cross-Service Working Group. He is the Navy's alternate representative on the BRAC-05 TJCSG Capabilities Integration Team.
[9] The TJCSG calculated the percentage of excess capacity relative to *Current Required* capacity, which resulted in a slightly higher value — **7.8%**. This paper calculates it relative to *Peak Capacity*, which is the basis for the above value of **7.3%**. This latter method was chosen due more to an intuitive understanding than to a keen grasp of mathematics. For example, if a garage holds a maximum (i.e., "Peak") of four cars, and one is wrecked, then the excess capacity of the garage is 25% (i.e., one space divided by the garage's maximum capacity of four). Peak Capacity represents the maximum capacity of the total current configuration of the DoD in-house technical system (analogous to the garage). There are also slight discrepancies between the TJCSG Final Report's Summary chart on p. A-18 and its Table 4-1 on p. A-11. This paper uses Table 4-1 to reach the above calculation of 7.3%.

1. ***Goal: Cutting Excess Capacity***

With the SECDEF's guidance that, "At a minimum, BRAC 2005 must eliminate excess physical capacity," our first task was to determine whether that excess exists, and if so, where it is and how much there is of it. But the task is not a simple one. The unique and varied nature of technical infrastructure makes the measurement of capacity more difficult than that of other types of installations.

> "*Excess capacity* is a simple concept when applied to most installations, such as naval stations, air bases, hospitals, and test centers. Fewer ships need less berthing, fewer aircraft need less hangar space, fewer personnel need fewer hospital beds… But unlike conventional bases, there is no direct relationship between size of the force and that of Laboratory infrastructure (for example, buildings, roads, and utilities)."[10]

Nevertheless, *we must be able to confirm there is excess infrastructure*, if only because the U.S. Congress approved BRAC-V on the premise that the Pentagon's "tail" is diverting resources from its "teeth."

DoD's Methodology. BRAC law, as amended, required that the DoD certify the need for an additional closure round in early 2004, as part of its FY05 budget submission. In doing so, the DoD made preliminary estimates of excess infrastructure within the Department's system of laboratories and technical centers. When the estimates were provided in a March 2004 report to Congress, the DoD cautioned that,

> "…only a comprehensive BRAC analysis can determine the exact nature or location of potential excess."[11]

DoD's report used *floor space* as the metric to estimate Army and Air Force infrastructure (the Navy's infrastructure was evaluated on the basis of *work-years*). TJCSG Issue Paper #07-28-04-01, "Notional Scenarios" (28 July 2004) explained how the report's approach and metric led to a likely over-statement of Army and Air Force excess infrastructure, pegged at a stunning **62%** in the Army's case. The issue paper also showed why floor space is a poor choice of metric for technical infrastructure.

The direction of the capacity trends shown in the DoD report is surprising. FY09 floor space levels for Army and Air Force infrastructure are 5% and 22% *higher* than that of the baseline year (FY89)[12] — *despite three closure rounds in 1991, 1993, and 1995*. If this data is valid, then it means the Army is building R&D infrastructure slightly faster than the rate by which it is eliminated, while the Air Force's construction rate is outpacing its closure rate by more than one-fifth. Another surprise is that the combined floor space for those two services alone is projected to be 96.6 million square feet (SF) in FY09, which is 64% more than the current level calculated by the TJCSG for all four Services and Defense Agencies (i.e., 58.9 million SF).

TJCSG's Methodology. In contrast to the DoD report, the TJCSG originally planned to use eight metrics: Full-time Equivalents (FTEs); funding for Acquisition Category programs (ACATs); number of ACATs; equipment use (in days); facility use (in days); test hours; funding; and floor space. This approach was evaluated by TJCSG Issue Paper #08-06-04-02, "Proposed Contingency Plan" (4 August 2004), and again, several months later, by Issue Paper #11-15-04-01, "Military Judgment: *Necessary — But Not Sufficient*" (14 November 2004).[13] Both explained why work-years, or FTEs, are most appropriate for the task, and *each*

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[10] D.J. DeYoung, "The Silence of the Labs," *Defense Horizons*, No. 21 (January 2003), p.6. The paper can be found at: http://www.ndu.edu/ctnsp/defense_horizons.htm

[11] Department of Defense, "Report Required by Section 2912 of the Defense Base Closure and Realignment Act of 1990, as amended through the National Defense Authorization Act for Fiscal Year 2003," (March 2004), p. 3.

[12] Ibid., p.47, 52.

[13] The papers did not address equipment or facility use because the metrics were not clearly defined in terms that enabled the field sites to respond in a consistent fashion. The data was therefore not useful.

proposed that the TJCSG's methodology be simplified to focus on FTEs alone. One reason given to use work-years comes from the Navy's BRAC-IV report to the Commission:

> "As with BRAC-93, workyears were chosen to serve as the units in place of other tools such as square feet. Budgeted workyears were used as a measuring tool for capacity because of its commonality within the functionally diverse Technical Centers whose products range from published scientific papers to the installation of a new piece of shipboard equipment to the live testing of a new warhead or airframe."[14]

Another reason for using work-years is its defensibility. During BRAC-IV, the Government Accountability Office (GAO) examined the Navy's process, including its capacity analyses, and found that "the Navy's process and recommendations were sound,"[15] and that,

> "The configuration analysis for this subcategory (Technical Centers) involved complicated assessments of the existing capabilities and requirements for 29 functional categories…across four phases of work: RDT&E, acquisition, lifetime support, and general."[16]

Work-years met the analytical requirements of all RDT&E functions, plus acquisition. In other words, it is a useful measurement unit for all three of the TJCSG's technical functions: Research (i.e., Research, Applied Research, and Advanced Technology Development), Development & Acquisition (D&A), and Test & Evaluation (T&E).

Focusing on Floor Space. The TJCSG received the capacity data from the field in late-September 2004. For the next six months the TJCSG operated on the assertion that the data were unreliable. Five metrics — ACATs (numbers and dollars), facility and building utilization, and funding — proved obviously unreliable, which was predicted months earlier by the issue papers. Rather than focus on FTE data,[17] as advocated by those papers, the TJCSG chose to base capacity assessments on floor space.

- **Floor Space Data is Not Credible**

Like the DoD's March 2004 report, the TJCSG chose to focus on floor space. "Peak Capacity" was considered equal to a site's reported total floor space. "Current Capacity" was calculated by two averages. D&A and T&E FTEs were assumed to utilize a government-wide average for office space of 160 SF per FTE. Research FTEs were assumed to utilize 310 SF. The Research allowance was set higher to account for specialized equipment requirements.

After accounting for surge requirements, *the DoD's 58.9 million SF of technical infrastructure was shown to possess an excess capacity of 27.1 million SF, which translates into an excess capacity of **46%***. These are impressive numbers. The following exercise puts them in some perspective.

A total of 6.3 million SF was reported in excess Research floor space along with 20.8 million SF in D&A/T&E floor space. By applying the allowances of 310 SF per Research FTE and 160 SF per D&A/T&E FTE, then the DoD's technical infrastructure can accommodate an additional 150,323 FTEs. This means that the in-house system can still absorb — *after four BRAC rounds* — the technical

[14] DoN, Report to the Commission: Department of the Navy Analyses and Recommendations, Vol. IV (March 1995), p. X-5.
[15] GAO, "Military Bases: Analysis of DoD's 1995 Process and Recommendations for Closure and Realignment", p.87.
[16] DoN, Report to the Commission, p. 96-7.
[17] Budgeted work-years and FTEs are similar, but not identical units. For example, one FTE in Air Platform D&A can be a composite of three engineers working 1/3 of their time in that area, with the rest in T&E. However, the differences between the units are not considered significant in light of the much larger differences in analytical utility between a work-year and ACAT funding, for example, or an FTE and square footage.

workforces of the Department of Energy's three "weapons labs" (22,000),[18] NASA HQ and its 10 centers (17,529),[19] and the technical workforces of the Departments of Agriculture (19,056), Commerce (10,684), Health and Human Services (10,916), Housing and Urban Development (310), Interior (14,315), Justice (5,019), Labor (2,327), State (4,961), Transportation (6,169), Treasury (4,128), and Veterans Affairs (6,471), as well as the Environmental Protection Agency (8,598), National Science Foundation (407), Nuclear Regulatory Commission (1,699), U.S. International Development Cooperation Agency (192), and all other federal agencies (5,621).[20] All this scientific and engineering talent could fill the DoD's apparently cavernous infrastructure, with room to spare for 9,921 more.

The basic flaw at play here is that the analytical approach does not adequately account for space used by scientific equipment and technical facilities. For example, Eglin AFB no doubt reported its McKinley Climatic Laboratory, with its 65,520 SF main chamber.[21] By our approach, the National Science Foundation's 407 technical employees would fit nicely, but at -65 F degrees with 100 mph winds, they might find it hard to concentrate.

Course Correction. Over the last six months, the issue papers mentioned above urged that we simplify our approach by focusing on one proven metric — the work-year. It was used successfully in prior rounds, was found to be a sound analytical tool by the GAO, and is almost certainly the most auditable of the metrics. On 17 March 2005, the TJCSG decided that the FTE data are reliable.[22] Since that date, FTE data have been used in tandem with the floor space data when reporting capacity values for each candidate recommendation. All proposals gained final approval based on both capacity metrics.

Measuring the Excess. The estimates of excess capacity based on floor space are, to be blunt, absurd. However, by using the FTE data as an indicator of technical capacity, we can reliably answer the most basic questions required of us — does excess capacity exist, and if so, where is it and how much is there? The U.S. Congress will no doubt ask these questions, as will the BRAC Commission and the communities. It is these calculations of excess capacity that raise the first "red flag."

- **Red Flag #1 — *Excess Capacity is disappearing without BRAC***

  Current Excess Capacity = ***7.3%***,[23] well below pre-BRAC estimates of 35% and higher[24]

  Future Excess Capacity = ***- 2.2%***, the level after factoring in future technical requirements and the DoD Force Structure Plan.

Several things are important to note about these numbers.

First, as approved by the ISG, the TJCSG does not count a 10% surge allowance within the excess. The reserved ability to accommodate surge requirements was required by Public Law 108-375 and was added to the Final Selection Criteria.

[18] GAO, "DOE Weapons Laboratories," (April 2002: GAO-02-391), p.7.
[19] http://naade02.msfc.nasa.gov/workforce
[20] National Science Foundation, "Federal Scientists and Engineers: 1998-2002," (NSF-05-304), Table 2: Federal Scientists and Engineers, By Agency (1998-2002).
[21] http://www.eglin.af.mil/TS/climlab/main.html
[22] TJCSG Meeting Minutes of 17 March 2005.
[23] See Footnote #9 for explanation as to why Current Excess is cited to be 7.3% when the TJCSG's official reported value is 7.8%.
[24] GAO, "High-Risk Series: Defense Infrastructure," (GAO/HR-97-7), February 1997, p. 16; and, Business Executives for National Security, "Tail to Tooth: Defense Research, Development, Test & Evaluation Needs to Rightsize," 28 October 1998 [http://www.bens.org/upd24.html].

Second, the in-house infrastructure is more constrained than these top-line numbers indicate because the excess is not spread evenly across the 13 technical capability areas. In fact, only Biomedical, Chemical Biological Defense, Nuclear Technology, Space Platforms, and Weapons Technology show future excess infrastructure. *Therefore, any BRAC cuts made in the other eight areas (i.e., Air Platforms, Battlespace Environments, Ground Vehicles, Human Systems, Information Systems, Materials, Sea Vehicles, and Sensors) will come at the expense of infrastructure to meet future DoD requirements*.

Third, "Current Capacity" does not mean today's level. The Current Capacity level is based upon an average of technical workforce levels over a three year period, FY01-03, which means it is a composite number representing a workforce level that is 2 to 4 years old. A number with more relevance and accuracy for representing today's workforce would be the FY03 level of 158,826 FTEs. When using that level as an "operative capacity," excess infrastructure drops to **4.4%**. Therefore, given the trend in disappearing excess capacity, with almost two more years of combat operations in Iraq, the *Current Excess is probably some value less than 4.4%*.

These findings can be explained by the fact that in-house workload has been increasing due to the realities of the post-9/11 world. DoD R&D funding has grown by 56% since 2001; from $41.1 billion to $64.3 billion in 2004.[25] Furthermore, the TJCSG collected data only through FY03, so the current level of excess (derived from an average of FY01, FY02, and FY03 FTE levels) is based, only in part, on the first budget built from the bottom-up after the terrorist strikes. In fact, TJCSG capacity data reveal that the technical workforce grew by 9,700 or 6.5% in that short period, from 149,100 to 158,826 FTEs.[26]

In July 2004, *before* the capacity data was collected and processed, the TJCSG Issue Paper, "Notional Scenarios," questioned conventional thinking about excess infrastructure:

> "Conventional wisdom after the last closure round in 1995 held that substantial excess capacity remained. However, the circumstances supporting that contention were profoundly altered by a foreign attack on our homeland. As a result, (a) the nation's defense budget has risen steadily (with an accompanying increase in DoD lab/center workload)[27], (b) serious Congressional consideration is being given to *increasing* the size of the force structure, and (c) major technical challenges exist that require extensive levels of RDT&E, such as finding reliable means for the remote sensing of everything from conventional explosives, to bio-agents, to nuclear material."

The following analysis offers evidence to show that *the TJCSG is on solid ground in its decision to use the FTE data*.

- **FTE Data is Credible**

Exhibit A: *OSD Personnel Data*. The TJCSG data show "**Peak Capacity**" to be 182,892 FTEs, and "**Current Capacity**" to be 154,152 FTEs.[28] With a rule-of-thumb that on-site contractors comprise about 50% of the workforce, we can then approximate the numbers of *Government positions* to be about **91,500**

[25] http://www.whitehouse.gov/omb/budget/fy2005/defense.html.
[26] *Technical Joint Cross Service Group: Analyses and Recommendations* (Volume XII), 10 May 2005, p. 21.
[27] Navy Laboratory Community Coordinating Group data show a 10% increase in the one year from FY01 to FY02 in reimbursable funding, and direct cites (including non-Navy funding sources).
[28] TJCSG capacity data used in this paper is from *Technical Joint Cross Service Group: Analyses and Recommendations* (Volume XII), 10 May 2005. There are slight discrepancies between the Report's Summary chart on p. A-18 and Table 4-1 on p.A-11. This paper uses Table 4-1.

for "Peak Capacity" and **77,000** for "Current Capacity." These numbers appear to be within the ballpark when compared to official personnel data collected by OSD.[29]

Using data from the Defense Manpower Data Center, an OSD briefing (see Attachment A) quantifies the downward trend for Service laboratory / center end-strength in *Government positions* through the 1990s. OSD's data reveals a rate of decrease that was relatively constant at about 4,000 per year from FY90-99, and shows the level to have been 72,900 in September 1999. If that trend continued, then the total within the laboratories / centers may have bottomed out at roughly 65,000 by the time of the 9/11 terror attacks.

The TJCSG Current Capacity of **77,000** FTEs includes 9,400 FTEs within the Defense Agencies, so when the OSD and TJCSG data are normalized by removing the Defense Agency workforce, the TJCSG Current Capacity becomes **67,600** — a credible number when compared to the above rough estimate of 65,000 in September 2001 for the OSD data. The TJCSG estimate for Current Capacity makes sense given that it is an average over three years, FY01-03, with an increasing wartime workload since FY02.

The TJCSG's Peak Capacity data also appear credible. OSD's briefing shows a peak level of **114,000** in September 1990, which was after BRAC-I but before BRACs II-IV. TJCSG data reports Peak Capacity to be about **91,500** FTEs [Note: the field sites could report a peak within the FY01-03 timeframe, or choose a historical peak from any prior year for which there was auditable documentation]. A credible number must be substantially lower than **114,000** (i.e., OSD's Peak in 1990 before BRACs II-IV) and greater than **77,000** (i.e., the TJCSG's Current Capacity). The TJCSG's Peak Capacity of **91,500** is just off the mid-point of those values.

Exhibit B: *Service Audits*. FTE data is arguably the most auditable of the capacity metrics. Verifying the on-board government personnel levels is straight-forward. Contractor data is more difficult to verify; however, the TJCSG stipulated that only contractors working on-site were to be counted. Each of the Services' audit agencies were charged with verifying the responses, and to date, no significant discrepancies have been reported concerning the FTE data. Some will argue that Test Hours are just as verifiable as FTEs, but the very definition of a "test hour" is fuzzy. For example, when exactly does a test begin and end?

Exhibit C: *Field Responses*. There is field evidence corroborating the conclusion that there is little or no current excess at a number of sites. During the COBRA (Cost of Base Realignment Actions) phase of analysis, more gaining sites than expected reported that they required Military Construction (MILCON) in order to accept the increased workload. With little or no excess capacity, the need for new construction makes sense. The credibility of such responses is enhanced by the fact that large costs, like MILCON, reduce the gaining site's odds of winning the workload by incurring long payback periods.

As a side note on COBRA, more caution than usual is necessary when excess capacity is limited. In particular, two extremes must be avoided. The first is getting too assertive with disallowances of MILCON requests. Every disallowed MILCON must have a valid, documented rationale, especially given the higher probability, with a more constrained infrastructure, that the requests are legitimate. The other extreme is becoming lax in the effort it takes to ensure that gaining sites do not "low-ball" the cost of accepting workload or "double-book" buildings to win workload from multiple scenarios. TJCSG Issue Paper #07-16-04-05, "Scenario Conflict Adjudication" (13 September 2004), suggested an approach to deal with problems associated with "busting" and "gaming" the COBRA analysis.

[29] Director, Plans and Programs (ODUSD), "DoD Laboratory Initiative", (13 December 2000).

Exhibit D: *Long COBRA Payback Periods*. Circumstantial evidence that corroborates the finding of limited excess capacity is the fact that the payback periods for many of the TJCSG's 13 proposals are long, with eight being for 7 years or more. Three proposals have paybacks stretching for 12 years or more.[30] For the same reasons mentioned above, costs will be higher for BRAC actions that occur in an environment with insufficient excess infrastructure.

For comparison purposes, the Department of the Navy calculated an excess capacity of *27%* (the normalized value is *17%* because the Navy did not use a 10% surge allowance) within its technical center infrastructure in BRAC-IV, and proposed 19 closures.[31] Of those actions, 17 yielded an expected return on investment of 3 years or less. Two of the actions showed a payback in 4 years. These data are additional evidence that the TJCSG estimate of 7.3% in current excess capacity is credible (although, as shown earlier, the more accurate level is likely closer to 4.4%), and that *this modest (and fast disappearing) excess is one major factor driving the longer payback periods shown by our COBRA analyses*.

In summary, the above discussion does not prove the FTE data are accurate. There are too many assumptions at play. But, it does reveal two important things. First, the evidence suggests that *the FTE capacity numbers are credible, and therefore defensible*. And second, this analysis *finds no basis for assertions that the FTE data are unreliable*.

- **The Ramifications**

Unlike the lower workload levels of the 1990s, the post-9/11 wartime workload will likely remain at considerably higher levels for as long as it takes to defeat terrorism and, at the same time, deal with emergent traditional threats. America's security will continue to rely heavily on new technological capabilities, just as it did throughout the Second World War and the Cold War.

If the above analysis is correct, then it will be hard to defend the TJCSG's proposed actions by an asserted need to cut excess infrastructure. *Even by taking no action* — future excess capacity of the in-house system disappears. Underneath that top-line trend, which aggregates all 13 Technical Capability Areas, eight of the areas (i.e., Air Platforms, Battlespace Environments, Ground Vehicles, Human Systems, Information Systems, Materials, Sea Vehicles, and Sensors) show excess capacity disappearing. At some point before 2025 the excess vanishes within each of these areas, and a continued decrease in required infrastructure will then cut into the legally mandated surge allowance. The 3,098 FTEs eliminated by the TJCSG's proposals will have that effect.

These facts raise basic questions about the legitimacy of BRAC action within the Technical function. In BRAC-IV, the Navy pursued an aggressive closure round. Even so, when there was no meaningful excess capacity in a subcategory, no installation in that subcategory was considered for closure or realignment.[32] Of the 27 subcategories evaluated by the Navy, eight demonstrated little or no excess capacity. For example, the subcategory of Naval Meteorology and Oceanography Centers was exempted from further action due to the lack of significant excess infrastructure. As a result, individual sites like the Naval Oceanography Center at Stennis Space Center, Mississippi, and the Fleet Numerical Weather Center at Monterey, California were not subjected to closure analyses.

[30] *Technical Cross Service Group Analyses and Recommendations* (Volume XII), 10 May 2005, p 29-54.
[31] DoN, Report to the Commission, p. X-5, X-13-54.
[32] DoN, Report to the Commission, p. 21.

Are the TJCSG's closure and realignment proposals legitimate despite data that show excess capacity to be declining to a 2.2% deficit without BRAC action, and a 3.9% deficit with approval of all 13 proposals? Or, are the only legitimate actions those within the five Technical Capability Areas that demonstrate future excess capacity? These are important questions to answer,[33] especially in light of the role of the 20-year force structure plan.

The ISG directed that each JCSG "assess the relationship between the force structure plan and the capabilities required to support that plan."[34] Unlike other DoD functions that demonstrate a direct relationship with force structure, the Technical function's relationship is an indirect one. Whereas air bases might use hangar space and naval stations might use pier space, the relationship between the Technical function and the DoD force structure is made by using FTEs as the capacity metric. With ISG approval, the TJCSG anchored the FTEs to the DoD's force structure in 2025 by applying a Force Structure Adjustment, a growth or reduction factor determined by expert military judgment.

Therefore, *FTEs are the link to force structure in 2025*.

If the TJCSG's proposed actions are not validated by FTE data showing there to be a sufficient level of future technical infrastructure above the mandated surge allowance, could the Commission determine that the DoD "deviated substantially from the force structure plan"?[35] By BRAC law, a finding of that nature would risk at a minimum those proposals within the eight Technical Capability Areas showing no future excess capacity, regardless of whatever worth they may have in terms of military value.

[33] One answer suggested holds that increases in future program funding would allow the hiring of additional technical personnel to meet requirements. This idea has some flaws. The first is that the 3,098 personnel eliminations made by the TJCSG were, for the most part, based on the "15%" rule, where it was assumed that consolidations yield automatic efficiencies on that scale. If these efficiencies fail to materialize, then the problems presented by the deficits worsen, which will result in even more program funding being required. Second, COBRA analyses should reflect, as accurately as possible, the relative cost of performing the functions being realigned when compared to other options. If there is reason to expect the eliminations will result in the need to hire, then that cost should have been incorporated in the analyses.
[34] USD(AT&L) memo, subj: "20-Year Force Structure Plan and BRAC Recommendations," 23 September 2004.
[35] Department of Defense, "Report Required by Section 2912 of the Defense Base Closure and Realignment Act of 1990", p.7.

2. ***Goal: Maximizing Warfighting Capability***

This goal is vital to national security, and it finds expression in the closure process as "military value." In fact, BRAC law underscores its importance by stipulating that military value is "the primary consideration in the making of recommendations."[36] While military value has two components, judgment and quantitative, the basis for it is the quantitative value assigned to each site. DEPSECDEF policy directed us to:

> "…determine military value through the exercise of military judgment *built upon a quantitative analytical foundation* (emphasis added)."[37]

The BRAC background paper, "*Shadows on the Wall*: The Problem with Military Value Metrics," written in its first version in February 2004, and its fourth (and last) version in June 2004, offered OSD a number of ideas aimed at: (a) accurately and fairly assessing the military value of the Services' laboratories and technical centers, and (b) providing a credible way to judge their potential to create new warfighting capabilities. The paper took its title from Plato's famous allegory in order to draw the analogy where, like the prisoners in Plato's cave who could not see objects in their real form, we were making judgments about the laboratories and technical centers indirectly, by way of "shadows" cast by problematic metrics.

The paper started from the premise that the best metric for evaluating a laboratory's effectiveness in meeting national security requirements is its *track record*, an admittedly difficult thing to assess given the many variables, such as the site's precise contribution to any given innovation. Nevertheless, we routinely judge sports teams by their record, and not by surrogate means. What might the reaction be if we were tasked to determine the NFL's top teams, and we responded by collecting data on stadium square footage, revenue expended, number of luxury box seats, proximity to other sports complexes, number of first round draft picks, tackles made/missed, or whether the stadium had a dome?

"Shadows on the Wall" predicted unsatisfactory outcomes if corrections were not made to what it considered to be inadequate military value (MV) metrics and a stove-piped study design. The corrections were not made and evidence shows that the paper was right about its concerns. What the paper did not anticipate was the level of influence given to military judgment relative to the "quantitative analytical foundation."

- **Red Flag #2 — Premature and Excessive Use of Military Judgment**

  The level of influence given to military judgment has created problematic outcomes. Not one proposed scenario was the output of the Linear Optimization Model (LOM), and not one was developed as a result of quantitative military value analysis or on the basis of excess capacity determinations. *In short, not one scenario was the result of quantitative analysis.*

  Many of the scenarios were developed by the well-established but obsolete peacetime BRAC basis for consolidation where "bigger is better and biggest is best," as measured by gross numbers of people and dollars. And, many of them were developed through the application of military judgment. In one example where military judgment took priority over "bigger is better," Ft. Monmouth's RDAT&E was sent to the Army Research Laboratory's (ARL) two sites at Adelphi and Aberdeen, Maryland, despite the fact that the losing site is by far the "biggest" of the three when gross numbers of people or dollars are summed for Sensors and Information Systems Research, D&A, and T&E.

[36] Public Law 101-510, as amended through the National Defense Authorization Act of Fiscal Year 2003, SEC. 2913. (b)
[37] DEPSECDEF memo, subj: "BRAC 2005 Military Value Principles", 3 September 2004.

Military judgment[38] is a critical part of our process, but it is subjective by nature and strongly dependent on the mix of individuals within the TJCSG. The official process was designed to be *data-driven* for those reasons. The drift away from a data-driven process began on 23 July 2004 with the request for notional scenarios made by the Infrastructure Steering Group (ISG). The Issue Papers, "Notional Scenarios" and "Proposed Contingency Plan," argued that the ISG's request would risk fueling perceptions that the Department created the answers before the data was in. In fact, at that time, the field sites were still in the process of responding to the military value and capacity data calls. In a 30 July TJCSG meeting, the OSD BRAC Office gave clarifying guidance that these scenarios were to be notional, but nevertheless "useful," a somewhat mixed message, and that scenario development was "the front-end of the analytical process."[39] By contrast, in guidance issued the prior year, scenario development was called, "the final step."[40]

By direction of the ISG, the "vast majority" of the scenarios were to be registered by 1 November 2004.[41] However, the TJCSG's MV scores were not derived until late-November, with the MV analysis not scheduled for completion until 10 December.[42] Issue Paper # 07-30-04-05, "Decision Criteria for Scenario Proposals" (8 September), was written when the MV and capacity data appeared likely to arrive too late for use in formulating data-driven scenarios. It proposed criteria to help apply some analytical rigor to what might otherwise become a "black box" without them. Unfortunately, the criteria were used in deliberative session on 8 December, four months after they were proposed and long after the judgment-driven scenarios had been formulated. Some of the COBRA data calls had already been issued.

The moment we produced our first scenarios without the benefit of excess capacity and MV data, we lost the right to call the TJCSG process data-driven. It instead became *judgment-driven*. A fundamental deviation from the analytical process, the premature and disproportionate role given to military judgment and the problems associated with it, are best covered in "Military Judgment: *Necessary — But Not Sufficient*," and in TJCSG Issue Paper # 12-28-04-01, "Scenario Inconsistencies," (23 December 2004).

"Scenario Inconsistencies" analyzed some of the strategies used to justify actions that realign workload to sites with lower MV scores than the losing site. Some scenarios showed an inconsistent application of rationales that raised concern about the defensibility of the actions. The paper therefore recommended that the TJCSG stratify its proposals into four categories: (A) *Data-Driven / Judgment-Validated* (no scenario qualifies for this category for reasons explained above), (B) *Judgment-Driven / Data-Validated*, (C) *Judgment-Driven / Strategy-Validated*, and (D) *Judgment-Driven / Strategy-Rationalized*.

This discussion should not be taken to suggest that all use of military judgment was premature and excessive. That would not be the truth. In fact, a number of proposals applied military judgment in a sound and appropriate manner. TECH-0014, which would close Los Angeles AFB, California and realign the workload to Peterson AFB, Colorado, is one example. Unsupported by the MV scores, the scenario's origin was judgment-driven. However, the TJCSG principals analyzed and debated the merits of the asserted benefits, with the majority voting against the proposal based upon their military judgment of the total picture — the workforce, the Air Force business model, the mission, and the national interest.

TECH-0040 is another example. Collocating DARPA and the Service research contract offices creates an environment where the potential for innovative Joint technical interaction is enhanced. And, moving the workforces from expensive leased spaces and onto a military installation makes good business sense that

[38] Strictly speaking, *military* judgment is not the province of the TJCSG, whose considerations are different from those that focus on force structure and basing requirements. The TJCSG's area of competence is, instead, expert *technical* judgment.
[39] TJCSG Meeting Minutes of 30 July 2004
[40] USD(AT&L) memo, subj: "BRAC 2005 Guidance for the Technical Joint Cross-Service Group", 16 July 2003.
[41] USD(AT&L) memo, subj: "BRAC 2005 Scenario Data Calls," 3 November 2004.
[42] Briefing to the Infrastructure Steering Group, "BRAC 2005", 19 November 2004.

also addresses force protection needs that have become important in the post-9/11 world. Worries expressed over the additional effort required by non-DoD employees to visit the contract offices are not convincing. Good technical ideas in search of dollars will make the extra effort to go through installation security procedures. This proposal would lose its potential benefits if it were decided to relocate some, but not all, of the offices to the same location.

- **Red Flag #3 — Unsatisfactory Military Value Metrics**

The MV scores used by the TJCSG were strongly driven by *workload* (i.e., numbers of people and dollars). In this respect the scores support the established BRAC approach, used in every peacetime closure round, that "bigger is better" and "biggest is best." These big ideas have reached their ultimate expression within the TJCSG's Weapons sub-group where the three largest weapons sites (NAWC China Lake, Redstone Arsenal, and Eglin AFB) were called "Mega-Centers."

In the peacetime rounds, the centralization of RDT&E to larger organizations was asserted to be justified by greater efficiencies and cost savings. The fairest response to that claim is that, it all depends. But the effect of *excessive* centralization on mission effectiveness is clearly negative. The Secretary of Defense recently spoke on this subject, stating,

> "It seems to me there are two things you don't want to centralize excessively. One is research and development because no one has a monopoly on innovation or creativity or brains."[43]

Instead of workload-driven metrics, BRAC-V needed metrics that measured mission effectiveness. With the nation at war, and the Department transforming its forces, the quality of technical personnel and the operational impact of their work are *the* vital characteristics to measure. This is difficult, but not impossible. "Shadows on the Wall" argued that the key to simplifying our analysis, and succeeding in our task, was finding the exceptional talent.

> "…the best talent does not choose to work with lousy facilities. It does not choose to work for an organization with no record of success and no chance to make a difference. It does not choose to work with mediocre colleagues and poor leadership. And, it does not choose to work on yesterday's problems. If we can find the exceptional talent, we will find state-of-the-art facilities, capable leadership, top colleagues, a record of impact on the nation's security, a powerful desire for success, and a staff working on tomorrow's challenges. *Find the best talent, and the rest falls into place.*"[44]

However, the paper predicted that our *People Metrics* (i.e., Awards, Experience, and Education) would fail to discriminate the essential differences among the sites because they would lose important information in the noise of large aggregate populations. There were several causes for this. One was the decision not to give any value to some of the DoD's best and brightest (i.e., ST personnel). Another was the severely compressed range of assigned point values (e.g., the point difference between the National Medal of Technology and an unidentified patent). On the other hand, there was essentially only one problem with the *Operational Impact Metrics* — the over-emphasis on dollars.

To confirm its theory about the metrics' inadequacy, the final version of the paper (dated 18 June) reported the results of a test case to OSD before the TJCSG military value data call was issued to the field. Using the TJCSG's official methodology, a bona fide world-class research group[45] at the Naval Research

[43] DoD News Transcript, "Secretary Rumsfeld Osan Korea Town Hall Meeting," (18 November 2003).
[44] D.J. DeYoung, "Shadows on the Wall: The Problem with Military Value Metrics,"18 June 2004 (*Version 4*), p. 27.
[45] Section 913 Report #1: *Sensors Science and Technology and the Department of Defense Laboratories*, (National Defense University: March 2002), p.31.

Laboratory (NRL) was scored (with real data) against two hypothetical groups to see how it would fare. The two hypothetical groups, Projects X and Y, had large budgets but were otherwise deliberately designed to be unexceptional and unproductive. *This was done to see if our analytical process could in fact recognize world-class talent and evaluate each site accurately for its military value.* A sound process would, of course, rank the world-class group highest.

The 15-person (*13* PhDs – one of them a DoD ST), world-class research team — *with one technology transition to the U.S. Marine Corps, a successful rapid response project for the U.S. Fleet in Bahrain, a Homeland Security Award, a Presidential award, a Technical Society fellow, CRADA income, 3 patents and a license* — ranked *second*. Its score was little more than half of the top-ranked Project Y, a 35-person project with only 2 PhDs, no awards or recognition, no product, and no impact. It did have a $15 million dollar budget. Even more disturbing, the world-class group ranked only slightly higher than Project X, an unexceptional, 2-person (both PhDs) contract shop, with no recognition, no product, and no impact. But like Project Y, it had a fat wallet. The results were also insensitive to large artificial increases of brilliant talent. For example, even if 10 Nobel Laureates were added to the world-class group, it would still finish second to Project Y. As a side note, in the time since these calculations were made, a member of the world-class research team was elected to the National Academy of Engineering.

The paper offered a revamped scoring plan that was shown to yield rational rankings when applied to the test case. If we had switched approaches, the effect of the changes would not have been uniform. Sites that scored well under the TJCSG's two quality-focused metrics (i.e., awards/patents/publications and project transitions), as did NRL in the above test case, could be expected to do better under the alternative. In general, of those sites that did well under the TJCSG approach, some would have done even better under the alternative, while those relatively more dependent on gross numbers of people and dollars might have fallen in ranking. Of those that did poorly, some would have done better, while others would have fallen even lower.

For instance, it is probable that NSWC Indian Head's cadre of world-class chemists would likely have lifted the site to higher Weapons MV scores. The same might have been true for other sites with track records for high-impact achievement, like ARL Aberdeen in Weapons and the Army Night Vision Laboratory in Sensors.

The bottom-line, is that the TJCSG's People metrics were blind to exceptional talent and driven by gross numbers, the Operational Impact metrics were captured by dollars, and the rest of the metrics for Physical Environment, Physical Structures and Equipment, and Synergy were, for the most part, non-discriminators. The methodology *did not reliably assess the military value of the Services' laboratories and technical centers, and it failed to provide a credible way to judge their potential to create new warfighting capabilities.*

- **Red Flag #4 — A Study Design with 39 "Stove-Pipes"**

Ten years ago, BRAC-IV's Laboratory JCSG conducted a 23-bin analysis[46] in parallel to the T&E JCSG's 18-bin analysis.[47] The result of this combined, 41-bin, stove-piped process was, by general consensus, a collection of sub-optimal RDT&E realignment proposals. According to the GAO,

[46] "Shadows on the Wall" incorrectly reported the BRAC-95 Lab JCSG approach as constituting 36 bins. The "Common Support Functions" were divided into two categories: product and pervasive. Product functions (e.g., Weapons) included S&T, engineering development, and in-service engineering. By contrast, the eight pervasive functions (e.g., advanced materials) included only S&T.
[47] DDR&E memorandum, "1995 Base Realignment and Closure (BRAC) Laboratories Joint Cross-Service Group Guidance Package," (30 March 1994); Test and Evaluation Joint Cross-Service Group, "Analysis Plan for Base Realignment and Closure (BRAC 95) Cross Service Analyses," 3 August 1995.

> "The groups chose analytical frameworks that broke work down into such small pieces that some of the sets of alternatives they suggested to the services proposed numerous transfers of small workloads from one facility to another. The services did not find most of these options feasible or cost-effective."[48]

BRAC-V has repeated the stove-piped approach, albeit with variations in taxonomy and larger realigned workloads. The result is again a collection of actions that are questionable in their cost-effectiveness. The bigger issue, and one that presents potential risks to national security, is the likely damage they will do to technical programs remaining at sites that stay open but lose workload.

Dr. Robert Frosch (former NASA Administrator, Deputy Director of ARPA, and Assistant Secretary of the Navy for Research and Development) once observed that,

> "Great R&D must preserve the *connections* (emphasis added) between various kinds of knowledge…The problem of R&D management is, in a sense, the problem of the management of a variety of forms of knowledge that are deeply interconnected…It turns out to be a problem of *maximizing collision cross-sections among kinds of knowledge* (emphasis added): making sure people who need knowledge they don't have—and may not even know they need—have a good chance of learning about it."[49]

The importance of R&D connectivity was cited in "Shadows on the Wall", where concern was expressed that our 39-bin analytical approach would result in damaged synergies. The paper stated that,

> "…there is an important feature that our process shares with BRAC-95 — pushing highly interconnected work through technical and functional stovepipes…*This will sever the connectivity of critical multidisciplinary projects and vertically integrated programs, as well as decapitate top talent from any realigned work.*"

The paper proposed a solution that called for comparing:

> "…the whole R&D program at a corporate lab to that of another corporate lab, and the whole RDT&E program at a warfare/product center to another warfare/product center. This way the horizontal connectivity at multi-disciplinary corporate labs would be evaluated intact, and the vertically integrated connectivity at warfare/ product centers would be treated likewise. In addition, the military value of sites that maximize 'collision cross-sections among kinds of knowledge' by performing significant levels of joint work would also be recognized. *This proposed solution means assigning Military Value at a higher level, such as at the activity / installation level, and not to the Rubik's Cube 'facilities'.*"[50]

Metrics that accurately gauge technical talent and operational impact are critical to the success of this holistic approach. For instance, if a site scored below the cut line, then our ability to identify exceptional talent and high impact work at the losing site would ensure those specific functions are realigned to a gaining site that promises higher odds (by close physical distance or intellectual challenge) that the talented people move with the work.

The assignment of MV at a meaningful level of aggregation was proposed again, nine months after "Shadows on the Wall," in the Issue Paper, "Military Judgment: *Necessary — But Not Sufficient.*" Again the idea was treated like the "third-rail" of our analyses. This resistance cannot be explained by insurmountable difficulties. In BRAC-IV, the Navy "rolled-up" a 1,386-bin workload "footprint,"

[48] GAO, *Military Bases: Analysis of DOD's 1995 Process*, April 1995, p. 45
[49] R. Frosch, "The Customer for R&D is Always Wrong!," *Research•Technology Management*, (Nov-Dec 1996), p. 23-24.
[50] D.J. DeYoung, "Shadows on the Wall: The Problem with Military Value Metrics," 17 February 2004, p. 12-13 (*Version 1*).

comprising 18 life-cycle phases and 77 functional support areas, into MV scores for whole organizations.[51] By contrast, the TJCSG agreed only, after some debate, to "roll-up" the MV scores by zip code (i.e., where individual respondents, from the *same Service*, at the *same installation*, and within the *same bin*, are combined into one score).[52]

MV roll-ups are feasible. Not only has it been done in previous BRAC rounds, but the TJCSG Analytic Team developed a workable methodology that the Capabilities Integration Team (CIT) was tasked to review on 1 November 2004. Opponents rightly argued that a simple roll-up would result in the double-counting (or worse) of extramural funding. But, the Analytic Team accounted for that by excluding such dollars for that reason, and because those dollars introduce a measure of private sector infrastructure into an analysis of the public sector. Months earlier, "Shadows on the Wall" had also proposed eliminating extramural funding, along with other metrics, like the number of ACAT programs, a diagnostic tool about as accurate as using an oven thermometer for a child's fever.

On the other hand, the MV scores can apparently be "rolled-*across*." MV scores for the DoD "open air ranges" were provided to the TJCSG by a third party (the Education & Training JCSG), and were simply added to the TJCSG T&E scores — across all 13 technical capability areas.[53]

The MV "roll-up issue" is not a theoretical debate. It has real-world consequences. For example, one TJCSG proposal sends Fort Monmouth's Sensors and Information Systems (IS) *Research* to ARL Adelphi. Its *D&A* for both technical areas goes to ARL Aberdeen, which then enables the closure of Fort Monmouth.[54] The Army's Night Vision Laboratory would also lose its Sensors Research to ARL Adelphi under this scheme, and its sub-optimized Sensors D&A program would be left behind.

However, ARL Adelphi does not perform D&A in either Sensors or IS. So, if the Research and D&A bins for both Sensors and IS were "rolled-up" to achieve a single composite MV score for each *organization*, then one could justify sending ARL Adelphi's *IS* Research to Fort Monmouth, which performs Research *and* D&A in both areas.[55] And, ARL Adelphi's *Sensors* Research could be sent to the Night Vision Laboratory, which performs both Sensors Research *and* D&A. Those actions would enable the closure of ARL Adelphi, instead of Fort Monmouth. The Night Vision Laboratory's integrated Sensors program, which has made a major impact on U.S. military capabilities, would also not be sub-optimized by having its business base reduced and its innovative connectivity shredded.

Finally, "Shadows on the Wall" observed that unless changes were made to both the study design and metrics, the 39 bins "will be populated with data providing no clue as to the actual impact or value of the work." The following case study analyzes one proposed action in the Weapons area, and by doing so,

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[51] The workload "footprint" gave the Navy a detailed understanding of the types of work conducted at its sites. For example, unlike the TJCSG process where "Weapons Technology" allows no finer distinctions, the "footprint" made it possible to distinguish work related to missiles, torpedoes, mines, guns, and "other" *before* the development of scenarios. By contrast, the TJCSG relied on scenario cost-assessment, the last phase of analysis, to ascertain how much work at the targeted site was, for example, in energetics.

[52] MV "roll-up" by zip code, an analytically sound and common-sense approach took until 9 December to be approved.

[53] The simple sum of the two sets of numbers led to at least one anomalous MV ranking (i.e., Eglin AFB, the Air Force's *Weapons* test site, ranked higher in *Air Platforms* testing, than did Edwards AFB, where the Air Force does its Air Platforms testing).

[54] This recommendation realigns *IS Research* from higher-ranked Ft. Monmouth to lower-ranked ARL Adelphi based upon a strategy that *Sensors Research* is of higher value due to its more infrastructure intensive nature. ARL Adelphi has the higher score for *Sensors Research*, therefore both *IS* and *Sensors Research* are realigned from Ft. Monmouth to ARL Adelphi. But if this same strategy were applied to AFRL-Rome, then Rome's higher ranked IS Research would go to AFRL-WPAFB, which had a lower IS score but a higher Sensors score. However, it goes instead to Hanscom AFB, which does no IS Research but has a higher IS D&A score. In other words, the gaining sites for IS Research vary according to the strategy. The proposal is analyzed in Issue Paper, "Scenario Inconsistencies."

[55] Fort Monmouth has a higher MV score for IS Research than ARL Adelphi, and a simple sum of its Sensors and IS Research scores exceeds that of ARL Adelphi. ARL Adelphi has zero MV in both Sensors and IS D&A because it performs no work in those areas.

reveals how important it is to understand the impact and value of the work within each realigned bin. It also reveals the flaws in our excessive emphasis on military judgment, the unsatisfactory nature of our MV scores, and the incentives for sub-optimal solutions inherent in our stove-piped study design.

- **Case Study: *Degrading DoD's World-Class Energetics Capability***

Background

The TJCSG proposes realigning 111 RD&A personnel from the Naval Surface Weapons Center (NSWC) Indian Head (and its detachment at the Seal Beach Weapons Station) to the Naval Air Warfare Center (NAWC) China Lake, and 91 RD&A personnel from NSWC Indian Head (and its detachment at the Earle Weapons Station) to the Army's Picatinny Arsenal. Evidence shows that these actions risk serious damage to a laboratory that holds a proven record of success in meeting naval, Joint, and national mission needs.

A World-Class Capability

Energetic materials formulation is a critical weapons capability. NSWC Indian Head has the largest cadre of scientists and engineers dedicated to energetics, as well as the broadest spectrum of energetics facilities within DoD. It is the only activity in the country that has the demonstrated capability to go all the way from synthesizing new energetic molecules to developing energetic systems and providing them to industry and our warfighters. Built around a cadre of world-class chemists, this energetics capability is the foundation for the laboratory's synergistic work in explosives, propellant, and pyrotechnic material technologies.

A former president of the National Academy of Sciences once noted, "In science, the best is vastly more important than the next best." Indian Head's leadership in energetics was acknowledged in that manner when NRL, as a result of collaborating with Indian Head, realized that its partner's knowledge base was truly first-class and that it possessed the facilities and capabilities permitting experimentation not possible at NRL. Rather then be "next best" in this technical area, NRL voluntarily chose to transfer its energetics mission and scientists to the Indian Head laboratory in 2000.

Sustained Record of Warfighting Impact

Prior to the first Gulf War, *the Army came to Indian Head* seeking development of a propellant with unprecedented performance to be used in the 105 mm gun of the M-1 main battle tank. Indian Head combined its unique resources from its gun systems design branch, pilot plant facility, and nitramine gun / high energy propellant facility with synergistic effect to produce the low-vulnerability ammunition (LOVA) M43 propellant. With an on-site pilot plant, *its surge capabilities provided the Army with over 1 million lbs of propellant* to support Operation Desert Storm.[56]

LOVA propellant was used in the "Silver Bullet," tank ammunition developed in a collaborative effort by ARL Aberdeen, the Department of Energy laboratories, and the Picatinny Arsenal.[57] When coupled with night vision devices from the Army's Night Vision Laboratory, the Silver Bullet made the M-1 main battle tank the most lethal weapon of the war. Consider the testimony of a captured Iraqi commander.

> "On 17 January, I started with 39 tanks. After 38 days of aerial attacks, I had 32, but in less than 20 minutes with the M1A1, I had zero."[58]

[56] Tara Landis, "Indian Head Support to Operation Enduring Freedom — Thermobaric Weapons Delivered to the Warfighter," *Swoosh and Boom Quarterly*, (Summer 2004), p. 3.
[57] Information validated in personal conversation with Dr. John W. Lyons, former Director, Army Research Laboratory and current Distinguished Research Professor with the Center for Technology and National Security Policy at the National Defense University.
[58] Comment by Iraqi Battalion Commander captured by U.S. 2nd Armored Cavalry Regiment on April 16, 1991.

Tens years later, NSWC Indian Head made another warfighting contribution with the thermobaric explosive, PBXIH-135. After the 9/11 terror attacks, the thermobaric bomb was rushed into development for use against al Qaeda and Taliban forces holed up in Afghanistan's mountain caves and tunnels. With project leadership by DTRA, the efforts by Indian Head and the Air Force Armament Command at Eglin AFB had the weapon ready in only 67 days. According to a former Government official,

> "The capability to produce the explosive for those weapons existed only at the Indian Head facility… No private firm had the ability to produce thermobaric weapons."[59]

When detonated, the thermobaric weapon generates extremely high, sustained blast pressures and temperatures in confined spaces. Dropped by warplanes of the U.S. Air Force, the weapon spared allied ground troops the prospect of bloody tunnel-to-tunnel combat. *If Indian Head's energetics program had been sent to China Lake by BRAC-IV, as was considered, it is possible that lives would have been lost.*

During Operation Iraqi Freedom, the U.S. Marine Corps had an urgent need for a shoulder-launched enhanced-blast warhead. NSWC Indian Head teamed with the Marine Corps Systems Command, NSWC Dahlgren, and Talley Defense Systems. The result was a weapon (SMAW-NE) that includes a new warhead case design capable of penetrating brick targets and a thermobaric explosive fill that provides enhanced lethality. The Marine Corps received delivery of the SMAW-NE for their immediate use in Iraq.[60] This achievement spanned only nine months from concept development to weapon system fielding.

Shredding Connectivity to Achieve Navy Consolidation

In the TJCSG's TECH-0018 proposal, NSWC Indian Head loses its weapons simulation personnel to NAWC China Lake. These personnel were instrumental in developing a unique static rocket test capability that allows the performance of a Tomahawk missile to be monitored throughout its entire flight cycle, without ever leaving the ground. This capability saves the Navy the substantial costs of live testing when circumstances do not require it. In 2002, a static test was conducted to mitigate risks prior to the first live Tactical Tomahawk flight test at the NAWC sea test range. Due to the realistic nature of the ground test execution, design inadequacies within the propulsion, fuel and avionics sub-systems were identified and resolved.[61] On 8 May 2003, the first live warhead test, launched by the USS Stetham in the waters of the NAWC sea range, was a success.[62] It is not clear why test simulation personnel, who have performed successfully at their current site, should be relocated to the open air range that does the live testing.

NSWC Indian Head also loses its detachment at the Seal Beach Weapons Station to NAWC China Lake. Seal Beach performs the T&E of energetic and electronic components of strategic system reentry vehicles, and the radiographic and chemical analyses of energetic components of Marine Corps ammunition. This is a surveillance program that tests inventories to determine whether service life can be extended. If the viability of an item cannot be reliably assessed, then replacements must be purchased. The Seal Beach function is integrated into the energetics, propellant, and explosives expertise at Indian Head's main site. It is not clear what is gained by realigning this function to China Lake, especially in light of the costs to Indian Head resulting from shredded connectivity and the increased overhead due to a reduced business base.

This scenario also sends 147 NSWC Dahlgren personnel that perform warhead work to NAWC China Lake. But what is gained by moving Dahlgren's warhead work that seems closely coupled to high-quality energetics work only an hour away at Indian Head, an organization within the same systems command and one that performs work in underwater warheads (a mission it received in BRAC-III)? To substantiate this point, Attachment B provides a list of explosives developed by Navy technical centers. Indian Head has developed 13 of 15, and one can be found in 39 of the Navy's 50 explosive weapons.

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[59] James Colvard, "The Numbers Game," GovExec.com, "Federal Focus," May 13, 2002, accessed at <http://207.27.3.29/dailyfed/0502/051302ff.htm>.
[60] Kevin Gessner, "SMAW-NE: A Teaming Success Story," *Swoosh and Boom Quarterly*, (Summer 2004), p. 7.
[61] http://www.globalsecurity.org/military/systems/munitions/bgm-109-var.htm
[62] http://www.nawcwpns.navy.mil/~pacrange/s1/news/2003/TTomWarH.htm

Shredding Connectivity to Achieve Joint Collocation

The second part of the TJCSG's proposal sends Indian Head's guns and ammunition functions (along with those of NSWC Dahlgren) to the Army's Picatinny Arsenal. Picatinny's expertise is in the mature technologies of conventional ammunition. By contrast, naval gun programs, like the Extended Range Guided Munition (ERGM), rely on cutting edge technologies that need to be created with unique naval requirements in mind, such as an intense maritime electromagnetic environment and the fact that the "Navy sleeps on its ammunition." The Weapons sub-group justifies the realignment, in part, on the basis of "jointness." But what is gained when Indian Head's products, like the propellant for the Silver Bullet, are already extensively used by the Army?

In a more recent example, while ERGM is to be a key element of naval force projection, the Massachusetts Institute of Technology's Lincoln Laboratories concluded in its project assessment that, "ERGM will serve the Navy, the Marine Corps, *the Army*, and the Nation very well in the future."[63] Clearly, the gun and ammunition capabilities at Indian Head and Dahlgren already meet Joint needs, along with the vital naval requirement for insensitive shipboard munitions.

NSWC Indian Head also conducts extensive collaborative work with the Air Force, the predominant developer of air armaments. Its work with Eglin AFB on the thermobaric weapon is one example. Another is the fact that the Air Force relies on Indian Head's CAD/PAD (Cartridge Actuated Devices / Propellant Actuated Devises) program for the rocket catapult used in the ejection seats of *nearly all of its combat aircraft* (i.e., F-15, F-16, F-117, B-1, B-2, and A-10).[64] Indian Head is also collaborating with Eglin AFB on the development of the Integrated Maritime Portable Acoustic Scoring and Simulator. This system would provide an option to live-fire bombing ranges to address the increasing restrictions being placed on weapons training facilities.[65]

NSWC Indian Head also loses its detachment at the Earle Weapons Station to Picatinny Arsenal. This detachment helps ensure that naval weapons, which are transported worldwide and subjected to environments from the arctic to the tropics, are shipboard-safe. Proper packaging and storage of naval weapons is one way to achieve insensitivity and prevent accidental detonations. Like the work at Seal Beach, the program at Earle is integrated into the energetics, propellant, and explosives expertise resident at Indian Head's main site. Therefore, it is not clear what value is gained by realigning this function to Picatinny Arsenal, especially in light of the costs to NSWC Indian Head that will result from shredded connectivity and the increased overhead due to a reduced business base.

Dismissing Capacity Data

An interesting aspect of the realignment to the Picatinny Arsenal concerns the FTE capacity data. No LOM run would have produced this option because Picatinny has no current excess capacity to accept the people and the work. This is likely why, in its COBRA response, Picatinny reported the need for 50,000 SF of new construction and a total MILCON cost of $52.5 million — one reason why the realignment will not achieve a payback until 2021. Indian Head does have a lower MV score in Weapons Research and D&A, but as shown earlier, MV is strongly driven by numbers of people and dollars. Even assuming equivalent real-world intellectual talent and field impacts, the scores were likely driven by Picatinny's $2.4 *billion* in funding compared to Indian Head's $480 million, and its workforce of 1,000 more people.

Dubious Military Judgment

The narrative for the TECH-0018 recommendation states that it "preserves the sensitive intellectual capital in energetics at Indian Head." The recommendation also gives NSWC Dahlgren status as a specialty site for

[63] http://www.globalsecurity.org/military/systems/munitions/ergm.htm
[64] C. Pfleegor and S. Jago, "Celebrating the Team That Kept the USAF Flying," *Swoosh and Boom Quarterly*, (Summer 2004), p. 12.
[65] T. Landis, "Indian Head's IMPASS System Proves to be Right on Target," *NAVSEA News Wire*, (13 December 2002).

"Surface Ship Combat Systems Integration."[66] Ironically, both sites will instead be weakened by shredding the connectivity among their various technical functions and sub-optimizing what is left behind. Both stay open, but with a smaller business base and less innovative synergy to draw upon. Almost symbolic of the proposal's sub-optimal nature is the fact that the gun test range at Dahlgren stays open to accommodate tests of the work being realigned to Picatinny Arsenal, which has no range capable of meeting the requirements. In short, the only justification for this action would be if compelling data were provided that met the standard for "reproducible military judgment," a higher standard for military judgment that is defined and discussed later in this paper.

A judgment-driven process, inadequate MV metrics that are blind to exceptional talent and use dollars as a surrogate for operational impact, and a stove-piped study design have contributed toward a set of proposals that risk serious damage to a laboratory with demonstrated high military value in energetics and energetic systems. To again quote Dr. Frosch,

> "…you cannot measure the future; the only thing you can measure is past performance…*You have to measure R&D by what you have done*."[67]

What has been done by NSWC Indian Head has served the Army, Navy, Air Force, Marine Corps, and the Nation well. It would be a tragedy to lose it.

[66] Draft Narrative: Candidate Recommendation TECH-0018 Part 4.
[67] R. Frosch, "The Customer for R&D is Always Wrong!," p. 27.

3. ***Goal: Improving Efficiency***

Improving efficiency means doing more with less. As important as this goal is to the Defense Department, *its pursuit cannot be allowed to compromise mission effectiveness*. Peter Drucker, considered to be the most important management thinker of our time, stressed the point this way,

> "No amount of efficiency would have enabled the manufacturers of buggy whips to survive."[68]

The issue of cost-savings is tricky when dealing with R&D. Unlike a traditional "cost-center," such as a shipyard, a laboratory can *generate* savings. In fact, the one innovation described below saved two-thirds of what all 86 closures and 59 realignments of BRAC-I accrue in one year's time.[69]

> **Nearly $460 Million in Savings**. In the 1990s, the DoD introduced a new narrowband voice-processing algorithm called the Mixed-Excitation Linear Predictor (MELP), for supporting tactical communications. NRL was asked to investigate means of converting MELP voice data into the Advanced Narrowband Digital Voice Terminal (ANDVT) voice data (and vice versa) so that these tactical secure phones could interoperate directly.[70] NRL took six weeks to develop an algorithm for the translation process, which has been widely disseminated within DoD and NATO forces.[71] It provides direct interoperability, allowing the new and the legacy ANDVT phones to work together. The result was that 40,000 legacy phones did not have to be retired prematurely, and their *continued use resulted in a one-time savings of nearly $460 million for the DoD*.[72]

The TJCSG has approached efficiency in the same manner as the four peacetime closure rounds — by consolidating workload at larger sites. By contrast, the Headquarters & Support Activities (H&SA) JCSG has pursued "reengineering" concepts to save money. For instance, it proposes to create "super bases" where there currently are installations with shared boundaries. The idea is to consolidate the management functions of the component installations and have one Service operate them.

A few of the proposed "super bases" involve laboratories. This is probably an effective way to save money at operational bases, but the centralization of laboratory management is risky because R&D is different from operational functions and it thrives in a decentralized environment. Dozens of DoD reports have urged greater levels of decentralization, including the following DDR&E study that noted,

> "The special needs of the RDT&E process are not recognized by 'the system.' Too often, procedures, controls and administrative devices that are effective in operations and logistics are also applied to R&D organizations. Support activities must assist rather than control line laboratory managers in their missions."[73]

Drucker also makes the points that,

> "…innovation needs to be organized separately and outside of the ongoing managerial business…it has to be *autonomous* and *separate* from operating organizations",[74] and [decentralization is] "…the most effective design

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[68] Peter Drucker, *Management: Tasks, Responsibilities, Practices* (New York: Harper & Row, 1974), p. 45.
[69] The closures and realignments of BRAC-88 generate annual savings of $694 million. See Whitney, Bradley & Brown, Inc., "Base Realignment and Closure," (5 February 2005), p. 11.
[70] Kang, G.S., and D.A. Heide, "Transcoding Between Two DoD Narrowband Voice Encoding Algorithms (LPC-10 and MELP)," NRL Formal Report 9921 (1999).
[71] U.S. Navy, Office of Naval Research, Award of 2001 Vice Admiral Harold G. Bowen Award for Patented Inventions to George S. Kang and Larry J. Fransen, Naval Research Laboratory.
[72] The following numbers are from SPAWAR's ANDVT Program Manager and "Naval Advanced Secure Voice Architecture," SPAWAR Systems Center, (Version 0.1) 26 February 2004, p. AV-68. Total deployment was approximately 40,000 units (29,512 ANDVTs at $28,744/unit; 9,363 KY-99As at $6,207/unit; 342 KY-100s at $12,861/unit; and 700 Tacterm ANDVT Shore Systems at $10,000/unit), of which 26,917 units went to the Navy, at a total procurement cost of $917,807,531. Since 50% of the ANDVT life cycles are over, the DoD and Navy saved 50% of the total paid by avoiding replacement costs due to block retirement.
[73] DDR&E, "Task Group on Defense In-House Laboratories", (1971).

> principle for such [innovative] work…the autonomous organization should not have to depend on central service staffs…*Service staffs are, of necessity, focused on their functional area rather than on performance and results* (emphasis added)."[75]

There was a time when the DoD crusaded against centralization. Some 20 years ago, before the "reinvention" years, the Model Installation Program (MIP) urged installation managers to, "*Discourage conformity, uniformity, and centralization because they stifle innovation*."[76] David Packard, chairman of the President's Blue Ribbon Commission on Defense Management, endorsed the value and work of the MIP.[77]

In 1989, the DEPSECDEF was even more direct about decentralizing support functions, increasing the authority of the laboratory director, and treating R&D as a "profit-center" rather than a "cost-center:"

> "Provide Laboratory Technical Directors greater authority over the organizations they direct. Their authority should be modeled on the separate 'profit center' concept of the private sector… Support-function personnel (Personnel, Procurement, etc.) are to be co-located at the laboratory and *under the direct supervisory control of the Director* (emphasis added)."[78]

It is ironic that the DoD fought the Cold War using a more decentralized approach to managing its bases, but with victory it adopts the Soviet model — a management style not known for its innovative prowess. One reason for the failure of centralized control, especially when applied to R&D, is that too often fails to make rational business decisions, which "can occur only when managers receive adequate information on the effects of their decisions."[79] Decentralization, on the other hand, fosters effective action based on adequate and timely information.

Despite warnings made by experts who understand the different requirements for R&D organizations, the Army and Navy centralized the management of their installation facilities over the last few years. The push to centralize laboratories and technical centers has been difficult to challenge, in part, because the RDT&E community cannot prove that today's centralization prevents what would have otherwise been tomorrow's new discovery or invention.

Instead of trying to prove what cannot be proven, it is possible to describe how a laboratory met a national-level mission by having control over its support functions, which in this unclassified (and therefore dated) example, was the ability to *rapidly reconfigure and modify facilities*.

> *Operation Earnest Will*. During the Iraq-Iran "tanker-war" of the 1980s, NRL was tasked to solve the problems anti-ship missiles posed to U.S. Fleet operations in the confined waters of the Persian Gulf. Its simulations proved that an American naval escort of Kuwaiti oil tankers could succeed in the face of Iranian and Iraqi attacks, and were used to design the tactics for the successful operation to keep the Straits of Hormuz open. Special receiver technologies, hundreds of millions of times more sensitive than ordinary receivers, allowed detection of previously undetectable attack warning signals. Foreign military hardware was exploited in days, with new electronic warfare techniques developed and installed on warships within weeks. On a crash basis, NRL's technical expertise and sophisticated facilities enabled a National-level goal. *NRL's ability to modify its facilities on a crash basis to support this work was integral to success.*[80]

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[74] Drucker, p., 782- 803.
[75] Drucker, 582- 585.
[76] Principles of Excellent Installations, U.S. Department of Defense.
[77] David Packard, *A Quest for Excellence, Final Report to the President*, The President's Blue Ribbon Commission on Defense Management (June 1986), xii.
[78] DEPSECDEF memorandum, "Laboratory Demonstration Program," 20 November 1989.
[79] Francis Fukuyama, *The End of History and the Last Man*, (New York: The Free Press, 1992), p. 93.
[80] From the supporting documentation for a 1999 Navy Distinguished Civilian Service Award, and http://www.globalsecurity.org/military/ops/earnest_will.htm.

It remains to be seen if the H&SA JCSG's concept goes further than consolidated facility management, but it would not be surprising if it includes functions like supply and procurement. It should therefore be useful to survey the approach of the Navy's installations command to gauge how the H&SA JCSG's actions might affect the DoD laboratories and technical centers. *This issue must be addressed because, for at least the duration of BRAC-V deliberations, their long-term viability is the responsibility of the TJCSG.*

- **Red Flag #5 — Centralization of Facilities Management**

Commander, Navy Installations (CNI) was implemented on 1 October 2003, with a vision of, "*Nothing Extra…Nothing Missing*,"[81] and a mission to "prioritize shore installation requirements in support of warfighter readiness."[82] This excerpt is from implementation guidance on CNI's concept of service:

> "CNI will establish a standard level of service to be provided to all Navy funded tenant activities that is consistent across all regions…*Requests from Navy tenants to exceed Navy level of service standards will be handled on a case basis, with CNI approval* (emphasis added)."[83]

The Commander, Navy Installations, has described his command's approach in the following ways: "…the installation will be controlled by a central committee,"[84] and "…processes can be *a lot more standard than they have been for 225 years*."[85]

Managing functions with "nothing-extra" efficiency, controlling by central committee, prioritizing projects by readiness requirements, and standardizing processes to levels not seen since the birth of the American Navy, are descriptions of an operating environment that is harmful to good R&D. In particular, the relatively more expensive technical facility requirements are at risk of being sacrificed for short-term, day-to-day operational needs.

A month after CNI's establishment, a draft paper titled "Labs Misérables" appeared on the website of the Federation of American Scientists.[86] It analyzed the CNI concept and how it might affect naval R&D. A review of the paper finds a fact-based analysis, well-documented evidence, informed speculation, some acerbic rhetoric, and only two errors. Therefore much of the information in this section is taken from that paper. The paper cites a battery of experts and studies that criticized the CNI concept and its application to Navy laboratories and technical centers. Some of the criticisms are as follows:

> Center for Naval Analyses
>
> [Note: CNA was commissioned by the Navy to assess the centralization of facility management. A single claimant structure was established despite CNA's strong arguments against it.]
>
> "*There is a difference between RDT&E and upkeep and maintenance*…the objective is different from that of fleets and requires a different type of thinking…*we think scientific and research-focused organizations need their own claimants* (emphasis added)"[87]

[81] Facilities Management Panel, "Final Report for the Secretary of the Navy," 7 February 2003, p. 4.
[82] Ibid., p. 13.
[83] "Guidance for Assimilating Divesting Claimant Activities into Regions," 22 May 2003, p. 4.
[84] JO2(SCW) Eric Clay, "Rear Adm. Weaver Explains Role of CNI," *Homeport*, (1 September 2003), p. 2.
[85] "Navy's Installation Commander Says Private Sector will Play Significant Role," *Defense Communities 360*, (7 August 2004).
[86] "Labs Misérables: *The Impending Assimilation of the Naval Research Laboratory and the Threat to Navy Transformation*," found at http://www.fas.org/irp/agency/dod/nrl.pdf
[87] Cesar A. Perez and Perkins Pedrick, "Number of Shore Installation Claimants — Revisited," (CNA, September 2001), p. 27.

> "[R&D] facilities and equipment include costly, high-precision, delicate, and easily damaged instrumentation. *Risks are high, in that damage or failure can cause delay or setbacks that translate into huge amounts of money or shortfalls in readiness* (emphasis added). Perhaps most significant in making comparison with other installations perilous is that the products of the scientific installations are years into the future."[88]

> "This approach (the working capital fund) provides their installations with incentives for cost visibility and savings. *No additional savings are expected from switching their shore installation responsibilities to the fleets; perhaps there would be additional costs* (emphasis added)."[89]

RAND Corporation

> "*Almost all the previous consolidation attempts and all the DMRDs* (Defense Management Review Decisions) examined in a recent RAND study *failed to create cost savings* (emphasis added)."[90]

The Army and Navy built their approaches to facility centralization upon selected private sector experience, with the Army using Microsoft as a benchmark, and the Navy using General Motors as its model. "Labs Misérables" finds problems in the choice of an automobile maker as a model and uses Drucker's description of GM as a starting point for assessing it. An expert on GM, Drucker states,

> "General Motors is essentially a single-product, single-technology, single-market business."[91]

The paper finds that centralized facilities management may work well in mono-technology environments like GM's, where product innovation is marginal from year to year. That type of environment is a match for the characteristics of naval readiness requirements, which are *predictable*, *short-term*, *low-risk*, and *focused on efficiency*. Therefore, the paper posits that the GM model may work for shipyards and depots. But it argues that one cannot conclude it will satisfy R&D requirements, which are *unpredictable*, *long-term*, *high-risk*, and *focused on effectiveness.* It offered the following analogy to drive home the point.

> "Naval warfighting requirements require innovative efforts across a wide range of scientific disciplines and technology areas. The Fleet's operating environments, such as steel-crushing ocean depths, demand high levels of technical sophistication and reliability. GM makes cars. The U.S. Navy fights wars. The benchmark might have more validity if GM's job was to police highways that are cruised by Fords firing pavement-skimming missiles, Chryslers launching strike aircraft, Toyotas laying mines, and Volkswagens rigged to ram and explode in Kmart parking lots."[92]

The paper argues that a company more closely resembling the Navy in both size and diversity of product lines is General Electric (GE), a company that grants independence to its product divisions (large appliances, aircraft engines, medical equipment, lighting products, locomotives, synthetic materials, etc.) to operate and manage their own facilities and support services. In fact, *GE Global Research — a world-class laboratory — owns its land and facilities and has an organic on-site facility capability. And, it contracts out the facilities work it cannot accomplish in-house.* This decentralized approach is effective for the R&D mission, as well as more efficient in that is has the flexibility to choose the best sources to do the job, the right way, and in the timeliest manner.

As predicted by the paper, the CNI did assume a central role in the Navy BRAC-V process. However, there is no evidence that the integrity of the process was compromised. Infrastructure data, as in previous

[88] Ibid., p. 28.
[89] Ibid., p. 26 – 27.
[90] Marygail Brauner and Jean Gebman, "Is Consolidation Being Overemphasized for Military Logistics?," RAND, IP-103, (1993); Michael Kennedy, "Report on DMRD Direct Assistance Effort," RAND Briefing (December 1992).
[91] Drucker, 521.
[92] "Labs Misérables, p. 14.

BRACs, continued to be reported by the field sites, not by the CNI. But, the BRAC implementation phase gives the CNI budget, schedule, and execution authority with regard to the warfare centers now that it owns their facilities.[93] CNI need only *coordinate* with the "mission claimants" (i.e., NAVAIR, NAVSEA, and SPAWAR), the former owners of the warfare centers that remain responsible for meeting mission requirements.

"Labs Misérables" also predicted that the CNI would eventually outsource base support functions to the private sector in one package, like the Navy Marine Corps Internet, making it more difficult to get responsive support for R&D missions. This remains to be seen given that the command has been in existence less than two years.

The paper makes two factual errors. First, the expected savings from the Navy's worldwide consolidation of base management was over-estimated. It is not $250 million over the next six years, which the paper approximated based on a Navy briefing. The number is much less — *$65 million*, according to the CNI's Commander.[94] The second error is an over-estimation of savings from NRL's voice-processing algorithm, described earlier. It saved the Navy $272 million, not the reported $375 million.

Other than the two cost errors, and concerns about two issues that have not yet fully played out, the analysis in "Labs Misérables" is solid and defensible by the evidence presented. The issues raised by it warrant serious attention by the DoD, including the one that involves the CNI's efforts to assimilate NRL.

- **Case Study: *Challenging Civilian Authority***

Defying Navy Secretariat Policy. On 7 June 2003, NRL received a message from the Naval District Washington (NDW) Commandant informing it of imminent assimilation into the new facilities command.[95] But, unlike the Navy's other 97 installations, NRL belongs to the Navy Secretariat in the civilian chain of command. By laying claim to NRL's land, facilities, and BOS functions, the CNI action defies Secretariat policy set in 1997, during the first round of consolidation. The policy, provided as Attachment C, was set by the Assistant Secretary of Navy (Research, Development, and Acquisition), ASN(RD&A), and states,

> "NRL is a Secretary of the Navy corporate activity that has been assigned unique Navy-wide and national responsibilities…*Real property and BOS functions imbedded inseparably* (emphasis added) with the research and industrial functions at NRL will remain with the Commanding Officer."[96]

The Navy Secretariat's policy has not been rescinded, and there is no official document from the Secretariat that transfers ownership of NRL's facilities to the CNI. In fact, after testimony to the Senate Armed Services Committee (SASC) on 23 September 2003, the Secretary of the Navy (SECNAV) answered a "question for the record" from Senator Pat Roberts (R-KS) as follows.

> "*It is not my intention to cede any functions considered essential to NRL's research and development mission*. However, I feel the transfer of certain facility and base operation support functions not essential to NRL's mission is appropriate...
>
> …As part of this process, the CNI and NRL staffs worked together to identify additional functions or other economies and efficiencies not previously captured by earlier consolidations. The two staffs identified and transferred functions that provide for economies of effort, but do not infringe on NRL

[93] "Operating Agreement between Deputy Assistant Secretary of the Navy (Installations & Facilities) (DASN I&E) and the Commander, Naval Installations", 3 March 2005.
[94] R.A. Hamilton, "Weaver Says Savings is Only One of the Impacts of New Shore Command," *New London Day*, 7 December 2003.
[95] NDW msg 071401Z Jun 03
[96] ASN(RD&A) letter to Deputy Chief of Naval Operations (Logistics) of 2 Oct 97.

> responsibilities or authorities. *Those functions identified as inseparably imbedded within NRL's research mission will remain under the Laboratory's control* (emphasis added)."

It is important to note that the SECNAV not only reaffirmed, but reiterated the 1997 policy that functions "*inseparably imbedded* within NRL's research mission will remain under the Laboratory's control." Moreover, as the SECNAV stated, NRL did in fact identify appropriate additional non-essential functions that were not previously transferred in the 1992 Public Works Center (PWC) regionalization and the initial Installation Claimant Consolidation in 1997.[97] As a result, in October 2003, NRL transferred its guard services, some additional facility support functions, and the operation of its Morale, Welfare and Recreation (MWR) facility and Non-Appropriated Fund Instrumentalities — each of which is a function that, in the SECNAV's words, were "not essential to NRL's mission."

But in March 2004, in spite of the SECNAV's stated position, the operative 1997 Secretariat policy, and the mutually agreed transfer in October 2003 of remaining non-essential support functions, NRL received a letter from the NDW Commandant (a regional command of the CNI) stating that *all* of its facilities and property had been transferred to NDW:

> "As part of the Installation Claimancy Consolidation Two (ICC2) process, the Naval Research Laboratory became a tenant command of Naval District Washington on 1 October 2003. Class 1 and 2 property ownership transferred from NRL to NDW on that date."[98]

Exceeding Orders Given by the Chief of Naval Operations

The CNO owns 97 Navy installations. His March 2003 directive, provided as Attachment D, established the new installations command for those 97 bases, and it *did not* include NRL within the CNI span of control.[99] The directive was therefore aligned with Navy Secretariat policy. Subsequent actions taken by subordinates swept NRL into the consolidation, which exceeds the CNO's orders. On the other hand, the CNO's two other exclusions have been obeyed: the Bureau of Medicine (which is under the CNO's command), due primarily to the tri-service mission of Navy hospitals, and U.S. Marine Corps installations.

More evidence that the CNO's orders were exceeded was the composition of the Executive Oversight Group, a group established by the CNO to guide implementation of the CNI. It was composed of representatives from each divesting command, but there was no representative from the Office of Naval Research (ONR), NRL's parent command (see Attachment E). The CNO would have specified ONR's participation if NRL was in his plans for consolidation.

Conflicting with U.S. Law

On 1 August 1946, Congress passed Public Law 588, Chapter 727, Sec. 7, by which Congress authorized the transfer of NRL's "buildings, facilities, and other property" to the Secretariat. It states:

> "The Secretary of the Navy is authorized to transfer to the Office of Naval Research…such research and development functions as are now assigned to the various bureaus and other agencies and offices of the Navy Department, together with any or all personnel, *buildings, facilities, and other property used in the administration thereof, including without limitation the Special Devices Division and the Naval Research Laboratory* (emphasis added)."

A logical interpretation of this language is that the law must be amended before any legal transfer of NRL's land and facilities can be made from the Secretariat to the CNI.

[97] These prior transfers resulted in non-essential BOS functions and property appropriate for consolidation having already been transferred or otherwise being performed by NDW, PWC, or the Naval Facilities Engineering Command.
[98] NDW ltr, subj: "Additional Information for BRAC 2005 Capacity Data Call for Naval Research Laboratory," (March 2004).
[99] ADM Vern Clark, msg 271955Z Mar 03

Clashing with Interests of the U.S. Congress

Congress has expressed concerns about the CNI's relationship to NRL, stating that in a section titled, "Unforeseen Impact of Base Operations Funding on Future Naval Research Laboratory Activities" of the FY04 Defense Authorization Bill, that:

> "The conferees are concerned about changes in the management of base operations funding and its potential to adversely impact on-going and emergent research activities. The conferees urge the Navy to be sensitive to the special nature of such research activities and to ensure sufficient flexibility to accommodate unforeseen research needs."[100]

Wasting Navy and Taxpayer Money

As shown above, savings from the worldwide regionalization of the Navy's bases over six years is projected to be $65 million, or about 10.8 million per year. Given that NRL has ½% of the Navy's total facility square footage,[101] *it is reasonable to estimate NRL's share of the savings to be about $54,000 per year*. However, *over a 6-year period, the five NRL achievements cited in "Labs Misérables" (with the corrected savings for the voice processing algorithm) achieve roughly $1.4 billion in Navy savings, nearly 22 times greater than CNI's worldwide savings* — enough for the Fleet to purchase 25 new F/A-18 Super Hornets.[102] Moreover, the recurring annual savings from three of the achievements total as much as 25% of the annual savings generated by the 86 closures and 59 realignments of BRAC-I.

Not only are these five innovations a small sample of a larger number of cost savers, they do not take into account new warfighting technologies that save lives and protect equipment. One example is NRL's ALE-50, an electronic warfare decoy that protects combat aircraft so well that it earned the nickname "Little Buddy" from our pilots.[103] In the Kosovo campaign alone, 1,479 were used and the system was credited with saving several aircraft.[104] It is now used on the Super Hornet and just one of them costs $57 million.[105]

The DoD has a responsibility be a good steward of public funds. But what CEO would jeopardize a proven source of billions of dollars in savings to gain a theoretical $54,000 a year?

Jeopardizing the Success of Naval Transformation

The greatest cost of assimilating NRL into CNI would not be financial; it would be the loss of NRL's ability to create technologies that help keep our naval forces the most formidable in the world. Rather than cite a list of the Laboratory's contributions, it may be best to survey the experts who made the following comments to honor NRL's 75th anniversary in 1998.

> "What you do here [at NRL] is probably the biggest force-multiplier that we have in our military."
> **— Senator John Warner**, (Chairman, Senate Armed Services Committee)

> "NRL has a reputation for clever solutions where others thought none were possible. NRL continues to be a national treasure."
> **— VADM Arthur K. Cebrowski**, (USN, Ret.) (former Director, Force Transformation)

[100] 108th Congress, *Conference Report: Making Appropriations for the DoD*, (Report 108-283), 24 September 2003, p. 292.
[101] According to the FMP report, "Enhancing Naval Readiness Through Effective Facilities Management," (p. 1) the Navy's total is 712 million square feet.
[102] http://www.fas.org/man/dod-101/sys/ac/f-18.htm
[103] "Order for ALE-50 Doubles After Success in Kosovo," *Aviation Week & Space Technology*, 15 November 1999.
[104] http://www.lexingtoninstitute.org/defense/ewarfareqdr.htm, and B. Lambeth, *Aerospace Power Journal*, Summer 2002, p. 21.
[105] http://www.globalsecurity.org/org/news/2003/030324-fa-1801.htm

> "I know from experience that there are few other institutions—public or private—which have had a greater impact on American life in the 20th century, both in terms of military needs and civilian uses."
>
> **— Norman Augustine**, (CEO of Lockheed Martin)

> "This efficient, relatively small government agency has had an enormous impact, touching the lives of just about every American…the Naval Research Laboratory is a national asset, not just a military asset."
>
> **— Peter Teets**, (Undersecretary of the Air Force / Director, National Reconnaissance Office)

> "NRL is the equivalent of the most significant technology jewel in our country."
>
> **— Robert Galvin**, (Chair of the Executive Committee of Motorola, Inc.)

> "NRL is important to all of us — to defense industry and to science."
>
> **— Dr. Charles Townes**, (Nobel Laureate, Inventor of the laser)

Under the proposed HS&A JCSG recommendation (#HSA-0013), NRL's management functions (along with those of Bolling Air Force Base) would be assimilated into a "super base" that centralizes management functions within the Washington Navy Yard (headquarters for NDW and CNI). Not only are any asserted savings questionable, but a world-class laboratory is being placed at risk. To quote the last line in "Labs Misérables,"

> "Tomorrow's line between victory and defeat will likely be drawn by today's science and technology. OpNav (N4) and CNI threaten that important work by their pursuit of efficiency at all costs. America's vital interests and tomorrow's Sailors and Marines must not pay the price."

A More Defensible Approach: Two questions need to be answered by the TJCSG. Have we made a fair and defensible case for the proposed closures and realignments? And do we possess the confidence, rightly expected of us, that our actions will not jeopardize national security over the long term? *A substantial body of evidence indicates that we have failed to make the case, and that a number of our proposals are likely to weaken our country's defense*.

- Capacity data demonstrate a modest current level of excess infrastructure at **7.3%**. The data also shows this excess disappears in the future to become a deficit of **-2.2%** — *without any BRAC actions taken*. However, with BRAC action, the 3,098 FTEs eliminated by the TJCSG's 13 proposed actions will increase the deficit to **-3.9%** and cut deeper into the surge allowance, an amount required to be held in reserve. Finally, FTEs are the Technical function's link to the Force Structure Plan. Therefore, at a minimum, those actions taken within the eight Technical Capability Areas showing a future deficit may not be judged as conforming to the Plan.

- The proposed scenarios were developed by the TJCSG *before* the capacity and military value data were received and processed. Therefore the process was judgment-driven, not data-driven. Not one scenario was developed as a result of quantitative military value analysis or on the basis of excess capacity determinations.

- The scores for military value were driven by workload (numbers of people and dollars), not by metrics that could identify exceptional technical talent and accurately gauge operational impact.

- The study design promotes sub-optimal solutions that leave a large number of losing sites open, but weakens them by shredding the connectivity of their integrated programs and reducing their business base. This can lead to increased costs as overhead rates rise at the losing sites and additional infrastructure is built at the gaining sites. It is also likely to lead to the loss of top talent in the realigned workforces. *The point of BRAC is to close sites when warranted, and to leave the rest in a stronger competitive and innovative position, not a weaker one*.

- The *dollar efficiencies*, which the HS&A JCSG seeks by centralizing management and standardizing business processes at "super bases," will degrade the *mission effectiveness* of laboratories and technical centers. In particular, the CNI's claim to NRL's property and facilities defies civilian authority, exceeds the CNO's orders, conflicts with U.S. law, wastes taxpayer money, clashes with concerns expressed by Congress, and threatens naval transformation.

If the analyses presented in this paper are correct, then we are on the threshold of taking actions that bear risks to our country's security. We cannot do anything at this point to fix the MV metrics, or the stove-piped study design, but we can take analytical steps to mitigate the problems in an objective way.

One answer is to *run the LOM* to stratify the TJCSG's proposals into categories of defensibility.

The TJCSG should run the model as originally planned — but only for those five Technical Capability Areas that show future excess capacity (i.e., Weapons Technology, Biomedical, Chemical Biological Defense, Nuclear Technology, and Space Platforms). The LOM would drive workload to those sites having both the highest MV scores and the excess capacity in FTEs sufficient to accept the work.

- Proposals that match those of the model would comprise *Category B* because they are *Judgment-Driven / Data-Validated* (see Issue Paper, "Scenario Inconsistencies"). This group would have "Fair" defensibility because, even though validated by the model, they were not originally developed, assessed, and selected from among *the full range* of possible options. If that had been done, such actions would have "High" defensibility and be assigned to *Category A*: *Data-Driven / Judgment-Validated*.

- Proposals that fail to match the model's output would comprise *Category C* because they are *Judgment-Driven / Strategy-Validated*. This group is likely to have "Poor" defensibility because they

were developed by judgment and exhibit one or more of the following issues: the Technical Capability Area lacks future excess capacity, the workload goes from a site with a higher MV score to a site with a lower score, and / or the workload is sent to a site with little or no excess capacity.

Category C proposals should be cancelled — *unless compelling military judgment can be articulated as to why the action serves the national interest despite the risks indicated by the data* (i.e., cutting required infrastructure in a technical capability area with no future excess capacity, sending workload to a site with a lower MV score and / or with insufficient excess infrastructure to accept it without major construction expenses). *Military judgment that meets this standard must be supported with verifiable information of a nature making it probable that other teams of independent experts would reach the same judgment*. Military judgment that meets this standard can be called, "reproducible."

Without reproducible military judgment, cancellation is justified on two grounds: (a) expensive actions with unknown and / or risky consequences do not serve the best interest of the DoD or the country, and (b) actions that are hard to defend will place the TJCSG's more defensible actions at risk.

Admittedly, a significant number of TJCSG actions are likely to fall into Category C, but there are ways to add actions to Category B. Time is short, but proposals are still being modified at this late date. By using confirmable information on operational impact we can: (a) formulate scenarios that are based on reproducible military judgment, (b) validate the actions with LOM runs to verify that gainers possess the excess capacity to accept the work (MV scores are not necessary because the reproducible military judgment justifies the higher value assigned to the gaining site), and (c) adhere to the TJCSG principle of keeping a second site to provide for a competition of ideas. The following illustrates how this approach could work.[106]

- **Test Case: A DoD Specialty Site for Energetics and Energetic Systems**

  As shown earlier, Attachment B provides compelling operational impact data regarding the development of new energetic material. The list shows 63 explosive weapons in the Army, Navy, and Air Force inventory. For each one, the organizational source of the explosive material is identified. As the list reveals, NSWC Indian Head has developed 13 new explosives. One of them can be found in 3 of the Army's 5 weapons, 39 of the Navy's 50 weapons, and 5 of the Air Force's 8 weapons. In short, Indian Head developed the explosives for 47 of the 63 weapons. This data is from NAVSEA / NSWC Indian Head, which means that it must be validated. As a start, the information below from GlobalSecurity.org supports it.

  > "In FY01, Indian Head added a 13th new explosive, PBXW-17, to the list of Navy-qualified explosives deployed in over 43 Navy, Army, Marine Corps, and Air Force weapons — *all within the last decade, an achievement unmatched by anyone in the field* (emphasis added)."[107]

  The TJCSG's Weapons sub-group was also requested to review it.[108] The Air Force reported that the list is incomplete by missing AFX-757 (associated with 3 weapons systems in-service and/or being qualified), AFX-108 (associated with 3 weapons systems), PAX/AFX-196 (undergoing qualifications for U.S. Army grenades), AFX-760 (associated with 1 weapons system), and AFX-1100 (associated with 1 weapons system) — *all developed by the AFRL Munitions Directorate at Eglin AFB.* The list also did not include NAWC China Lake's CL-20, an important energetic material discovered in 1987, which Thiokol Propulsion is working to scale up for commercial production and availability for military applications.[109]

[106] The author is not a current or prospective employee of NSWC Indian Head or AFRL Eglin, and has no vested interest, financial or otherwise, in the potential outcomes of the proposed scenario.
[107] http://www.globalsecurity.org/military/facility/indian-head.htm
[108] D.J. DeYoung email to TJCSG Weapons & Armaments Sub-Group (6 April 2005).
[109] http://www.nawcwpns.navy.mil/r2/mj/Energet.htm#

Based on this sub-group feedback, Attachment B makes no errors of attribution on the sources of the explosive materials, misses some fielded Air Force innovations, and omits a number of Air Force and Navy innovations not yet deployed (which is to be expected given that the slide shows materials fielded in a weapons system).

Using this metric, a scenario can be developed to create a *DoD Specialty Site for Energetics and Energetic Systems* — on the basis of reproducible military judgment. Moreover, this approach, in effect, indirectly recognizes exceptional intellectual expertise, something our MV metrics could not identify or measure. With a Technical Capability Area as expansive as Weapons Technology, the relatively small Energetics sub-function, while militarily-critical, was lost in the sheer volume of FTEs and dollars associated with huge weapons programs.

Next, the LOM would be run for a two-site solution realigning all Navy and Army workload in Energetics (e.g., gun propellants, rocket and missile propellants, primary explosives, booster explosives, main charge explosives, reactive materials, and specialty chemicals) and Energetic Systems (e.g., air / surface warheads, underwater warheads, rocket / missile motors, gun projectiles and propulsion, mines and mine countermeasures, fuzes / ignitors / detonators, CAD / PAD, pyrotechnic devices) to NSWC Indian Head, the DoD Specialty Site. The second site retained for a competition of ideas, AFRL Eglin, would receive all related Air Force workload.

The objective of this approach is *mission effectiveness*, which is appropriate for a wartime closure round. So the rule of the Weapons sub-group, used in TECH-0018, (i.e., no "Mega-Center" should lose energetics workload by virtue of being a "Mega-Center)" would be ignored here as a vestige of the peacetime rounds. Mission-effectiveness is paramount. And, over the long-term, it is almost certainly less costly in dollars and lives.

NSWC Indian Head very likely already has the full-range of required facilities. This includes a pilot plant / prototype capability (which some wrongly call a production capability that competes with industry), a unique, and particularly expensive facility that is critical to successful scale-up investigations and short-term surge production. With data showing excess capacity at Indian Head, and in all likelihood, with little need for MILCON to accommodate work of a nature it already performs, the return-on-investment would probably be rapid. In this way, DoD energetics work would be consolidated at the site with a proven track record of success. It may also provide a recommendation with a payback period that is much more viable, which would address a concern voiced by the Infrastructure Executive Council (IEC).

NSWC Indian Head, as the third Weapons specialty site, would join Picatinny Arsenal and NSWC Dahlgren as sites previously chosen by the TJCSG as specialty sites for "Guns and Ammunition" and "Surface Ship Combat Systems Integration", respectively.

The Cost of Being Wrong: A healthy in-house system is a vital partner to the private sector. Both are indispensable to our nation's defense. President Harry S. Truman understood the importance of an effective balance in public and private R&D. His message to Congress at the end of World War II declared that,

> "No government adequately meets its responsibilities unless it generously and intelligently supports and encourages the work of science in university, industry, and in its own laboratories."[110]

Because of the special roles and responsibilities of the Government's military laboratories and technical centers, *it would be impossible for the private sector to offset serious damage done by BRAC-V*.

- **Roles of the DoD Laboratories and Technical Centers**

The DoD laboratories and technical centers are responsible for performing three roles: *performer* of long-term, high-risk projects free from excessive commercialization pressure; *quick responder* in national crises; and "*yardstick*,"[111] a term referring to the standard set by providing authoritative, objective advice to governmental decision-makers.

Our country needs Government laboratories and technical centers that are competent *performers*. Industry will not take on the full range of necessary defense work because many areas hold limited opportunities for profit. Specialized military technologies often have little or no applicability to commercial products, and the DoD market is often too small to justify a significant investment of capital. In addition, R&D is expensive, the time to achieve success is long, the work is often very risky, and the payoff (especially from research) is usually not immediate.

As for the role of *quick-responder*, the 67-day development of the thermobaric bomb by NSWC Indian Head and the 27-day development of the "Bunker Buster" by the Air Force Research Laboratory and Development Test Center at Eglin AFB are classic examples of how *strength as a performer enables a DoD laboratory to carry out its role as a quick responder in crises*. The DoD "Perry Report," endorsed by then Under Secretary of Defense for Research and Engineering, William Perry, found that,

> "…a cadre of highly skilled in-house specialists can best respond to situations of this nature."[112]

The Perry Report also addressed the "*yardstick*" role, explaining that to be a smart buyer the Government must be able to choose among competing options offered by industrial producers. The need for profit makes each company an advocate of its own product, so given those natural tendencies, the Government,

> "…requires internal technical capability of sufficient breadth, depth, and continuity to assure that the public interest is served."

Conversely, deficient in-house expertise is what political scientist Harold Nieburg called "losing the yardstick." When the yardstick is lost, the Government is forced to hire consultants to judge the work of its contractors. With its source of independent, objective technical expertise gone, the Government is forced to rely on advice from sources not insulated from commercial pressures to make a profit. This predicament was the subject of a recent article in the *Wall Street Journal*, "Can Defense Contractors Police Their Rivals Without Conflicts?" (28 December 2004).

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[110] President Harry S. Truman, Message to Congress on September 6, 1945.
[111] H. L. Nieburg, *In the Name of Science* (Chicago: Quadrangle Books, 1966).
[112] William J. Perry, *Required In-House Capabilities for Department of Defense Research, Development, Test and Evaluation* (Washington, DC: Department of Defense, 1980).

More than 40 years ago, the need for strong in-house performers, quick-responders to crises, and a knowledgeable "yardstick," led President Kennedy's Commission on Government R&D Contracting to affirm the importance of maintaining in-house technical competence. In words echoed often by subsequent studies, the report cautioned that,

> "No matter how heavily the government relies on private contracting, *it should never lose a strong internal competence in research and development* (emphasis added)."[113]

Unfortunately, after the Cold War, the DoD laboratories and technical centers have been increasingly viewed as illegitimate competition, and not as necessary partners to industry and academia. This trend was noted in a *Foreign Affairs* article that surveyed the institutional security arrangements that proved effective in winning the Cold War. It observed,

> "These changes in relationships that worked so well in the Cold War are worrisome. Total reliance on private arsenals to develop weapons wastes money by encouraging continued investment in old systems while neglecting experiments with new designs."[114]

When ARL Aberdeen and the Picatinny Arsenal (program manager) transferred the Silver Bullet to industry, General Dynamics produced more than 250,000 of them,[115] which it sold back to the Army for a profit. That was an example of healthy public-private cooperation that capitalized on the strengths of each while providing for the common defense. That is the type of interaction that needs to be preserved by BRAC-V.

- **BRAC-V and the New Threat**

A common view expressed during the peacetime BRAC rounds was that a closure mistake could be corrected by reconstituting lost capabilities. With hopeful notions of a New World Order, and serious strategic threats believed to be decades away, we would have *time* to make corrections.

That changed on 11 September 2001.

We can no longer rely on time to fix our errors, if in fact that was ever true. Research needs time, often a lot of it. Back in 1945, Secretary of the Navy James Forrestal said,

> "Wars, long as they are, move much more swiftly than the research processes… It follows, therefore, that if a nation is to be scientifically prepared, its preparedness must be worked out in peace-time."[116]

Much depends on our actions in this wartime BRAC. There are, and will continue to be, military threats from adversarial States, both the established and emerging, strong and failing, disciplined and reckless. But now America is engaged in a prolonged struggle with an opportunistic, fanatical enemy who has unlimited apocalyptic goals and is not deterred by traditional means. In *The Shield of Achilles*, Philip Bobbitt, writes about what he calls the end of the "Long War" and the start of a new threat.

> "Deterrence, assured retaliation, and overwhelming conventional force enabled victory for the coalition of parliamentary nation-states in the war that began in 1914 and only finally ended with the Peace of Paris in 1990.

[113] Report to the President of the United States on Government R&D Contracting, April 1962. The Study Team included Robert McNamara, Secretary of Defense, James Webb, NASA Administrator, and Dr. Jerome Wiesner, the President's science advisor.
[114] H. Sapolsky, E. Gholz, A. Kaufman, "Security Lessons From the Cold War," *Foreign Affairs*, (July/August 1999), p.89.
[115] General Dynamics Web site, accessed at <http://www.rocket.com/lca.html>.
[116] Navy Press Release, "New Office of Research and Inventions Established by Navy Department," (8 June 1945)

> These strategies cannot provide a similar victory at present because what threatens the states of the world now is too easy to disguise and too hard to locate in any one place…
>
> …the onslaughts in the autumn of 2001 on a warm, summerlike day on the East Coast of the United States are both the herald of further savagery and the call for defenses that, if they are sustained, offer the world's best hope of avoiding a world-rending cataclysm."

The TJCSG's task is twofold: first, we need to collect savings from the closure of infrastructure that is *confirmed* to be excess to military requirements, and second, we must ensure that the DoD's in-house system of laboratories and technical centers are capable of providing, in collaboration with the private sector and our allies, the technological options necessary to prevail over our country's enemies.

And we have one responsibility. For every BRAC decision, we must ensure that the pursuit of savings does not compromise national preparedness.

Recommendations: It is proposed that the DDR&E / TJCSG:

(1) Run the LOM to minimize excess capacity and maximize military value within the five Technical Capability Areas (i.e., Weapons Technology, Biomedical, Chemical Biological Defense, Nuclear Technology, and Space Platforms) that show future excess capacity;

(2) Place the TJCSG proposals appearing among the LOM-generated scenarios into Category B: *Judgment-Driven / Data-Validated*;

(3) Place all other TJCSG proposals in Category C: *Judgment-Driven / Strategy-Validated*;

(4) Proceed with the Category B proposals because they should have Fair defensibility;

(5) Cancel the Category C proposals because of Low defensibility, unless "reproducible military judgment" (i.e., military judgment that is supported with verifiable information of a nature making it probable that other teams of independent experts would reach the same judgment) can be articulated and provided;

(6) Explore the development of alternate Category B scenarios (e.g., a DoD Specialty Site for Energetics and Energetic Systems) that are founded upon reproducible military judgment and run the LOM to demonstrate that the gaining sites possess adequate excess capacity to accommodate the workload;

(7) Advise the IEC to protect DoD laboratories and technical centers from assimilation into "super bases" that would consolidate installation management and standardize business operations (Note: common force protection systems, MWR facilities, and other such functional consolidations are sensible and should be pursued), and in a related area;

(8) Urge the DoN to enforce the Navy Secretariat's policy, uphold the SECNAV's stated position for Congressional testimony, obey the CNO's orders, and respect Congressional concerns, by enforcing a separation between NRL and CNI / NDW to ensure that as a "corporate activity that has been assigned unique Navy-wide and national responsibilities… real property and BOS functions imbedded inseparably with the research and industrial functions at NRL will remain with the Commanding Officer."

Army Position: _____
AF Position: _____
Navy Position: _____
Marine Corps Position: _____
JCS Position: _____

Final Resolution: *No Vote / No Action*

POC Signature: _____ Date: 5/10/05

CIT Chair: _____ Date: _____

DOD LABORATORY INITIATIVES

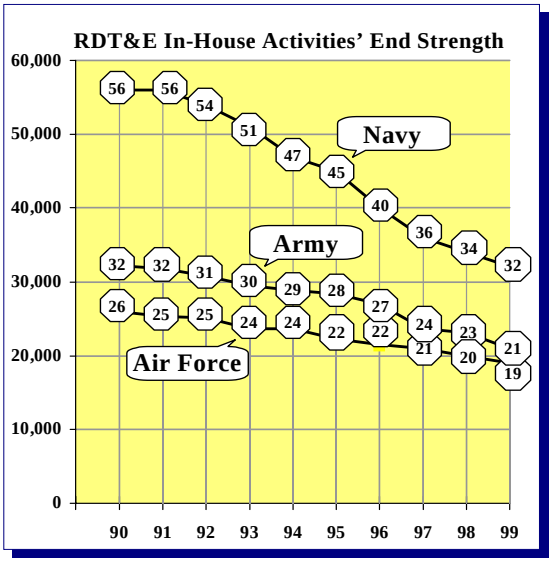
A Presentation to the Navy Laboratory/Center Coordinating Group

Mr. Bob Tuohy, Director Plans and Programs
Office of the Deputy Under Secretary of Defense for Science and Technology

13 December 2000

3

What Were FY90-99 End Strengths at Service In-House RDT&E Activities?



Source: Defense Manpower Data Center

END STRENGTH FELL 36%, OR OVER 41K PEOPLE

- Services down-sized from 114.0K to 72.9K people, consisting of:
  - 43% in Navy (24K fewer people)
  - 34% in Army (-10.8K people)
  - 25% in Air Force (-6.3K people)
- Rate of decline generally steady

In-House RDT&E End Strength (in 000)*

End Strength	Sep 90	Sep 98	Sep 99	90-99 Delta
Navy	56.2	34.3	32.2	-24.0K
Army	32.2	22.6	21.4	- 10.8K
Air Force	25.6	20.0	19.3	- 6.3K
Total	**114.0**	**76.8**	**72.9**	**-41.1K**

* May not add due to rounding

ATTACHMENT A

A leader in the DoD's Energetics Enterprise

Navy Expl-Wpn

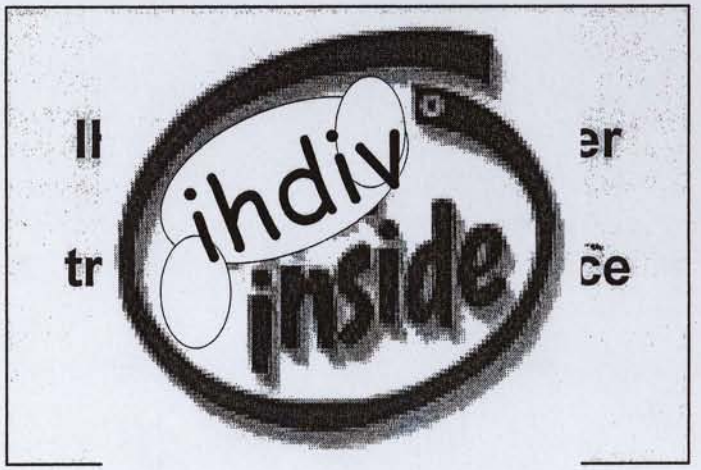
N-5 (Livermore) - APOBS, SM-80 ERGM, LAW, STD Missile Initiator, ERGM,, Hellfire Booster
AFX-757 (EGLIN) - JASSM
N-112 (CL) - SLAM-ER, 76MM Projectile
N-107 (CL) - Harm, Tomahawk
N-7 (IH) - MK50 Torpedo, MK98 MND, Quickstrike, RAW
N-8 (IH) - APOBS, SABRE
N-9 (IH) - 5/54" Projectile, JASSM, APOBS, LAW, Hellfire main charge
DXN-1 (IH) - APOBS, SABRE, ERGM, MK50 Torpedo, MK48-2 DFD, MK24 DFD SEAL Weapon,SRAW, MK98 MNS, MLRS etc.
W-11 (IH) - JSOW/BLU-108, ERGM, SABRE, AMRAAM, 5" CARGO, etc.
N-10 (I&II) (IH) - Formerly known as PBXW17, went into APOBS Main Charge (I), APOBS Booster (II)
N-103 (IH) - SABRE
N-109 (IH) - BLU-110, 111, & 116 GP Bombs, Tactical Tomahawk
N-110 (IH) - STD Missile, AMRAAM, MK50 Torpedo
N-111 (IH) - MK98 Mod 0 MNS, Tomahawk
W-203 (IH) - DET
IH-135 (IH) - SMAW NE

Army Expl-Wpn

N-5 (Livermore) - Hellfire Booster
PAX-21 (ARDEC) - 60MM Mortar
N-9 (IH) - Hellfire Main Charge
N-110 (IH) - Carl Gustaf
DXN-1 (IH) - MLRS

Air Force Expl-Wpn

N-5 (Livermore) - AIM-9X Sidewinder
AFX-757 (EGLIN) - JASSM
N-112 MAC (CL) - Hellfire (TB)
N-9 (IH) - JASSM
W-11 (IH) - AMRAAM
N-110 (IH) - AMRAAM
IH-135 (IH) - BLU-118B
N-109(IH) - GP Bomb Family



NAVSEA
INDIAN HEAD
Surface Warfare Center Division

ATTACHMENT B

THE ASSISTANT SECRETARY OF THE NAVY
(Research, Development and Acquisition)
WASHINGTON, D.C. 20350-1000

OCT 0 2 1997

MEMORANDUM FOR DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)

Subj: INSTALLATION CLAIMANT CONSOLIDATION

Ref: (a) DCNO memo #N464C/197-97 of 29 Sep 97
(b) CNO memo #N464C/185-97 of 11 Sep 97

1. In response to your acknowledgment (reference (a)) of the unique mission [illegible] Laboratory (NRL) the draft message, provided by reference (b), is acceptable [illegible] paragraph 3 is changed to read as follows:

"ONR - REAL PROPERTY AND BOS FUNCTIONS IMBEDDED INSEPARABLY WITH THE RESEARCH AND INDUSTRIAL FUNCTIONS AT NRL WILL REMAIN WITH THE COMMANDING OFFICER. TRANSFER ALL OTHER REAL PROPERTY AND BOS FUNCTIONS AT NRL TO THE CNO CLAIMANCY."

2. As you well know, NRL is a Secretary of the Navy corporate activity that has been assigned unique Navy-wide and national responsibilities. In this regard, I believe the foregoing change will both facilitate the achievement of your stated objectives and protect the unique corporate status of the NRL.

John W. Douglass

ATTACHMENT C
Attachment (3)

P 271955Z MAR 03 ZYB MIN PSN 885526I34
FM CNO WASHINGTON DC//N00//
TO NAVADMIN
BT
UNCLAS //N02300//
NAVADMIN 072/03
MSGID/GENADMIN/CNO WASHINGTON DC//
SUBJ/STREAMLINING SHORE INSTALLATION MANAGEMENT//
REF/A/RMG/CNO/082130ZAUG2000//
REF/B/DOC/CNO GUIDANCE FOR 2003/03JAN2003//
NARR/REF A IS NAVOP 010/00, THE WAY AHEAD. REF B PROVIDES GUIDANCE FOR NAVY LEADERS FOR 2003//

RMKS/1. REF A INFORMED YOU OF MY TOP FIVE PRIORITIES, INCLUDING A COMMITMENT TO IMPROVE NAVY-WIDE ALIGNMENT. SINCE 1997, THE NAVY HAS ADDRESSED IMPROVED SHORE INSTALLATION EFFECTIVENESS BY REGIONALIZING MANAGEMENT AND REDUCING THE NUMBER OF INSTALLATION MANAGEMENT CLAIMANTS FROM 18 TO 8. BY LATE 2000, WE BEGAN TO ASSESS THE VALUE OF FURTHER INSTALLATION MANAGEMENT CLAIMANT (IMC) REDUCTIONS WHILE USING INTEGRATED PROCESS TEAMS TO IDENTIFY BEST BUSINESS PRACTICES, SET NAVY-WIDE STANDARDS OF SERVICE, DEVELOP METRICS AND LINK THESE STANDARDS AND METRICS TO REQUIREMENTS AND FLEET READINESS.

2. PER MY GUIDANCE IN REF B, WE WILL CONTINUE FLEET AND ORGANIZATIONAL ALIGNMENT THROUGH **CONSOLIDATION OF THE EXISTING INSTALLATION MANAGEMENT CLAIMANTS (COMLANTFLT, COMPACFLT, COMUSNAVEUR, FSA, NAVSEA, NAVAIR, RESFOR, AND CNET) INTO A SINGLE IMC.** A **NEW COMMAND** ENTITLED **COMMANDER, NAVY INSTALLATIONS (CNI),** REPORTING DIRECTLY TO ME AS AN ECHELON II COMMANDER, WILL STAND UP EFFECTIVE 1 OCTOBER 2003. **CNI WILL BE A SINGLY FOCUSED INSTALLATION MANAGEMENT ORGANIZATION** WITH CORE RESPONSIBILITY **TO PROVIDE UNIFIED PROGRAM, POLICY AND FUNDING TO MANAGE AND OVERSEE SHORE INSTALLATION SUPPORT TO THE FLEET.** CNI WILL BE **THE BUDGET SUBMITTING OFFICE FOR INSTALLATION SUPPORT** AND THE NAVY POC FOR INSTALLATION POLICY AND PROGRAM EXECUTION OVERSIGHT. FUNDING FOR INSTALLATION SUPPORT WILL FLOW FROM CNO TO CNI, AND FROM CNI TO THE REGIONS.

3. CONUS REGIONAL COMMANDERS WILL REPORT OPCON TO CFFC; OCONUS REGIONAL COMMANDERS WILL REPORT OPCON TO THEIR RESPECTIVE NAVFOR. **ALL REGIONAL COMMANDERS WILL REPORT ADCON TO CNI FOR INSTALLATION SUPPORT FUNDING AND STANDARDIZATION OF PROCESS/POLICIES.**

4. ALL INSTALLATION COMMANDING OFFICERS WILL REPORT TO THE APPROPRIATE REGIONAL COMMANDER; SPECIFICS PROMULGATED SEPCOR. THE REGULAR REPORTING SENIOR FOR INSTALLATION COMMANDING OFFICERS WILL BE THE APPROPRIATE REGIONAL COMMANDER.

5. NLT 1 APR 03, OPNAV N4 WILL ANNOUNCE AN IMPLEMENTATION ORGANIZATION, ISSUE DETAILED IMPLEMENTATION GUIDANCE, AND PROMULGATE A POAM TO STAND UP CNI.

6. I KNOW THAT HARD WORK AND A STRONG BOND OF TRUST AMONG CLAIMANTS, REGIONS AND INSTALLATIONS ARE REQUIRED TO IMPLEMENT THESE CHANGES. THANK YOU FOR YOUR COOPERATIVE EFFORTS AND INNOVATIVE THINKING TO DATE. INITIATIVES AFFECTING INSTALLATIONS ARE SENSITIVE BOTH HERE IN WASHINGTON AND IN LOCAL COMMUNITIES. THUS, IT IS IMPORTANT THAT WE CLEARLY COMMUNICATE THAT THE INTENT OF THIS CHANGE IS TO ESTABLISH A SINGLE SHORE INSTALLATION MANAGEMENT ORGANIZATION THAT WILL FOCUS ON INSTALLATION EFFECTIVENESS. OUR PAST SUCCESSES IN THESE AREAS PROVE THAT WE CAN AND WILL SUCCEED AS WE CONTINUE TO ALIGN OURSELVES IN SUPPORT OF THE FLEET.

7. MINIMIZE CONSIDERED. ADMIRAL VERN CLARK SENDS.//
BT #0798
NNNN

ATTACHMENT D
Attachment (1)

Executive Oversight Group (EOG)

- Flag/SES, Divesting IMCs plus experts
  - FSA - Mr. Victor H. Ackley
  - CPF - Mr. Michael G. Akin (N46A)
  - NAVSEA - Mr. Pete Brown
  - OPNAV - RADM Chris Cole (N46)
  - CLF - Mr. Thomas R. Crabtree (N46)
  - CNE/CNRE - RADM David Hart (Deputy)
  - USMC - Mr. Paul Hubbell
  - CPF - Ms. Maureen Kleintop (N1)
  - FMB - Ms. Linda Meadows
  - CNRF - RDML Roger Nolan
  - NAVAIR - Dr. Al Somoroff
  - NETC - RADM John W. Townes III (Vice Commander)
  - NAVFAC - Dr. Jim Wright (Chief Engineer)
- Bi-weekly meetings initiated 17 Mar 03

ATTACHMENT E
Attachment (5)