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Subj: *The Conduct and Lessons of BRAC-05*

As a member of the Technical Joint Cross Service Group (TJCSG) from its start-up nearly three years ago, and as an analyst with experience in previous closure studies,[1] I am providing my perspectives on the 2005 Base Realignment and Closure (BRAC) round as it pertained to the Defense Department's technical infrastructure. They will no doubt represent a minority opinion. Nevertheless, I offer them for consideration as input to our forthcoming "Lessons Learned" report. As with my issue papers, all necessary references and relevant data are provided to the point of tedium so that the TJCSG can judge the merits of each argument.

1. THE ONLY EFFECTIVE METRIC FOR MEASURING TECHNICAL CAPACITY IS THE *WORK-YEAR*

Our first analytical task was to establish whether there was excess capacity within the in-house system of laboratories and technical centers, and, if so, to determine the extent of any excess both collectively and at each site. Unfortunately, and as predicted by Attachments A to D, much time was wasted collecting and analyzing useless data derived from a broad range of inadequate metrics (i.e., extramural funding, number and funding of Acquisition Category programs, test hours, building / equipment use, and floor space).

Unfortunately, floor space was used as the TJCSG's metric-of-choice throughout much of the analytical process. The metric had fervent advocates despite the clear problems with it. In the end, the metric yielded an inevitably absurd result — although we nonetheless reported it (28 million square feet of excess floor space) to validate our stated need for cutting infrastructure.

The 28 million square feet (SF) was enough, by our official conversion methodology,[2] to accommodate well over 150,000 additional technical personnel within the DoD's system of labs and centers. In other words, after four BRAC rounds that closed 19 laboratory/center sites and 43 RDT&E activities at host bases,[3] we still discovered a yawning excess capacity of **48%** and an in-house system cavernous enough to absorb the workforces of the Department of Energy's Los Alamos, Livermore, and Sandia weapons labs, NASA headquarters and its 10 centers, as well as the technical workforces of the Departments of Agriculture, Commerce, Health & Human Services, Housing and Urban Development, Interior, Justice, Labor, State, Transportation, Treasury, Veterans Affairs — *with room to spare*.

An issue paper, circulated in draft form on 23 April, one month before we issued our final report, proved the 28 million SF to be a preposterous outcome.[4] It should not have been reported to the Congress, the BRAC Commission, or the public.

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[1] The author was a member of the BRAC-95 Navy Base Structure Analysis Team and the DoD Test and Evaluation Joint Cross-Service Working Group (1994-1995), as well as the DoD VISION 21 Technical Infrastructure Study (1996-1997).
[2] D&A and T&E full-time equivalents (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.
[3] DoD, *Report to the President and Congress*, "VISION-21: The Plan for 21st Century Laboratories and Test-and-Evaluation Centers of the Department of Defense," 30 April 1996 (Appendix G: Closures and Realignments Under the BRAC Process, FY1989-2001).
[4] TJSCG Issue Paper: "Defending the Technical Infrastructure Proposals of the 2005 Base Realignment and Closure Round" (Draft: 23 April 2005, Final: 10 May 2005), p.4-5.

Our approach was flawed by its failure to identify space that is unusable for personnel, such as that used for equipment and technical facilities, as well as auditoriums and conference rooms. By our approach, Eglin's McKinley Climatic Laboratory, for example, with its 65,520 SF main chamber, could house more than 400 realigned personnel. But they would need to dress warm for the -65 degree temperatures and somehow ignore the 100-mph winds. This flaw was anticipated and communicated to the TJCSG Executive Director one year before the end of the analytical process, but the proposed solution (i.e., focus only on work-years) was not accepted.[5] Five months later another appeal was made. It too was rejected (Attachment E).

But, in the end, the only effective and appropriate metric proved to be the work-year (FTE or Full-Time Equivalent). It was finally accepted for use on 17 March 2005.[6] Its long delayed acceptance occurred two years after the Navy's proposed study design advocated using work-years (Attachment F),[7] and only two months before the end of our 26-month-long analytical process. The decision to use work-years occurred when it was clear that the credibility problems with floor space were severe enough to make its use as a stand-alone metric indefensible.

Unlike floor space, work-years yielded a credible result. The TJCSG reported the level of excess capacity in FTEs to be **7.8%** *when averaging FY-01 to FY-03*, and **4.4%** *for FY-03 alone*. The credibility of the data is supported by OSD's own historical data, and by evidence in the form of service audits, field responses, and the long COBRA (Cost of Base Realignment Actions) payback periods, whose high Military Construction costs suggest a constrained infrastructure.[8]

Moreover, *today's level is almost certainly less than 4.4% given the upward trend in wartime workloads*. In fact, the DoD's technical workforce grew by 9,700 FTEs, or 6.5% in the three years our analysis covered from FY01 to FY03.[9] The realities of the post-9/11 world are eliminating any excess capacity that remained after the last closure round in 1995. Congressional testimony by the Chair, Infrastructure Steering Group (ISG), the Hon. Michael Wynne, corroborates this finding of minimal and disappearing excess capacity, and he cites the role played by a growing workload and earlier personnel cuts.

> "I believe we are at the point where any further reductions beyond the levels of this workforce…will adversely impact our ability to successfully execute a growing workload."

Mr. Wynne continued by saying that earlier cuts to this workforce have led to:

> "… increased program costs resulting from contracting for technical support versus using in-house technical support."[10]

Another reason for the slim level of excess is that the TJCSG made a big improvement over previous BRACs by including on-site contractor personnel in the calculations of technical capacity. By doing so, a large source of error was avoided because contractors perform about half of DoD's RDT&E, and a great many of them work at the DoD technical sites and use their infrastructure.[11] The level of current excess capacity was far less than the various projections made over the last 10 years, due in large part to our more comprehensive accounting for all on-site personnel, both government and contractor.

The TJCSG's decision to use the work-year data restored credibility, accuracy, and integrity to the capacity analysis. *Work-year data, however, also presented a challenge because it showed that a marginal current*

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[5] D.J. DeYoung memo to A. Shaffer, subj: "Military Value and Capacity Analysis of DoD Laboratories and Centers", 18 June 2004.
[6] TJCSG Meeting Minutes of 17 March 2005.
[7] Attachment F is undated, but having drafted the proposal, I can attest to it being submitted in March 2003 at the TJCSG "kick-off."
[8] "Defending the Technical Infrastructure Proposals of the 2005 Base Realignment and Closure Round", p.6-8.
[9] *Technical Joint Cross Service Group: Analyses and Recommendations* (Volume XII), [DRAFT] 10 May 2005, p. 21.
[10] Testimony of Michael W. Wynne, Under Secretary of Defense (Acquisition, Technology, and Logistics) Before the U.S. Senate Committee on Armed Services Readiness and Management Sub Committee, 13 April 2005, p. 5-6.
[11] D.J. DeYoung, "The Silence of the Labs," *Defense Horizons* (National Defense University: January 2003), p. 6.

level of excess capacity was to vanish completely without BRAC cuts — and that any of the proposed cuts to the technical infrastructure would therefore fail to support the DoD Force Structure Plan.

2. ESSENTIAL DATA SHOULD NOT BE EXPUNGED AND WITHHELD FROM RELEASE

Data on *future required* capacity are the key to knowing if cuts in technical infrastructure support the DoD's Force Structure Plan. Our final report to the Commission stated that the determination of future capacity was one of three "discrete phases" in the analysis (TJCSG report, p. 17), and that the data were in fact calculated (TJCSG report, p. A-3). But despite those true statements, our final report did not contain any of the essential data on future capacity. The data had appeared in a 10 May draft of the report.

The data disappeared just after a 10 May issue paper (Attachment G) called attention to the serious ramifications of proposing BRAC cuts when data show that (a) excess capacity will vanish completely without the cuts, and (b) the Force Structure Plan will not be supported with the cuts. The paper's argument was never refuted. Instead, the paper itself was withheld from Senator John Warner when he requested, as the Chairman of the Senate Armed Services Committee (Attachment H), the "prompt transmittal of the requested documents, *and all other BRAC related papers* (emphasis added) written by Mr. DeYoung."[12] Attachment I is the DoD response, which clearly omits the 10 May paper.

A concern about security was the declared reason for expunging the data. On 16 May, the TJCSG and OSD(AT&L) were notified via email (Attachment J) that the DDR&E:

> "… has concerns that the aggregation of work years, test hours and building information should be classified … the vast majority of appendix A is gone (all but 13 pages)."[13]

But why was the data considered sensitive? Where is the rationale for expunging it documented? Why was data on future floor space and work-year requirements more sensitive than the current data, which was reported? Why was it more sensitive than each site's military value ranking? Whatever classification was intended to protect, evidence does not point to it being national security — especially since, in the end, *the data were never made classified*. It was left unclassified.[14]

The data were also never released to the public. In short, Appendix A (the report's section on capacity) went from 267 pages down to 13 pages for public consumption in our tardy final report, issued nearly a week *after* the closure list was announced and right after the DDR&E concluded testimony to the Commission on 19 May. The only documentation of the decision to expunge data appears to be the above email, which was distributed the same day that the SecDef presented the DoD's BRAC recommendations in testimony to the Commission. Moreover, the decision was not made in a deliberative session and documented in official minutes,[15] and the email's distribution did not include the DoD IG's office.

The data would have made for an awkward situation were it not expunged because it showed that excess capacity will vanish without any BRAC actions taken. This undermines the very basis for which the U.S. Congress approved the 2005 round — that a burdensome excess infrastructure, both current and future, must be cut to save resources. In other words, the primary reason for a BRAC round no longer existed.

The expunged data also showed that any BRAC cuts made to technical infrastructure will ensure insufficient support for the DoD's future force structure, a condition that conflicts with BRAC law. In fact, Section 2914(a) requires that the SecDef transmit,

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[12] Letter from Chairman, U.S. Senate Committee on Armed Services to the Acting Deputy Secretary of Defense, 21 July 2005.
[13] Email to the TJCSG, subj: "Streamlined TJCSG Report," 16 May 2005.
[14] I understood from OSD staff that a classifying agent reviewed the data but found it to be unclassified. If I misunderstood, and the data were made classified, then OSD needs to alert TJCSG members so that electronic files of the 10 May draft report are removed from servers and computers systems. Hard copies would also require control.
[15] The final set of publicly released TJCSG minutes are dated 9 May, one week before the decision.

> … a list of the military installations inside the United States that the Secretary recommends for closure or realignment *on the basis of the force-structure plan* (emphasis added)…

Did other closure analyses, outside the TJCSG, fulfill this legal requirement? A look at the Department of the Navy's BRAC-05 report reveals a sharp contrast with our process:

> "The capacities of all installations performing a given function were summed and then *compared with the capacity required to support the future force structure* (emphasis added). If total current capacity in a function was greater than the capacity required to support the future force structure, excess capacity was deemed to exist…two of the functions demonstrated little or no excess capacity"[16]

The Navy's approach in BRAC-95 was also the same. When there was no meaningful excess capacity in a subcategory when compared to future requirements, no installation in that subcategory was considered for closure or realignment.[17] If the TJCSG had conducted its analysis in that way (and in the way originally planned), it would have reported total current capacity as less than the level required to support the future force structure, a key fact for the U.S. Congress, the BRAC Commission, and the public to know.

The statutory requirement that BRAC actions be made "on the basis of the force structure plan" means that we were responsible for ensuring that tomorrow's armed forces are supported by sufficient technical infrastructure. By expunging the future required capacity data, OSD in effect based all BRAC-05 technical proposals — such as the one to close Ft. Monmouth or those that send thousands of personnel from sites along the Pacific coast and Potomac River to a Mohave Desert site — on *today's* force, not the *future* force.[18]

It should be noted that the choice to expunge data was preceded by another decision that shaped the eventual outcome of the process. Three weeks before the closure list was announced, the TJCSG Executive Director asserted that "we have excess capacity *at present* (emphasis added), so it is ok to cut."[19]

That would have been a fair decision — *if* we had also (a) publicly released the other half of the capacity data, and (b) articulated a reasonable and supportable defense as to why making cuts was appropriate even though data showed a deficit of future required capacity. Instead, the decision lacked integrity because the essential data on future required capacity was expunged and withheld. A necessary and appropriate public debate was thereby eliminated. Like the decision to expunge data, the decision that it was "ok to cut" was one of great consequence that appears to have been made outside of the official deliberative process. It is noted nowhere in the public record. Attachment K appears to be the only written reference.

As public servants we were responsible for conducting a fair and open process to determine the fate of public institutions whose mission is to provide for America's defense. It was unethical to expunge critical data from the official process, and then withhold it from the public and the affected DoD workforces. In addition, Section 2903(c)(4) of the Title 10, U.S. Code requires the DoD to provide to the Congress and Commission *all* information used by the Secretary to prepare his recommendations.

Finally, and most seriously, there will be risks to national security and to the lives of tomorrow's service men and women if these actions compromise the DoD's ability to meet future warfighting requirements. This is not hyperbole. In fact, the ISG Chair's recent testimony to the SASC confirms this concern. Addressing the current size of the DoD's technical and acquisition workforce, the Hon. Michael Wynne stated,

> "I believe we are at the point where *any further reductions beyond the levels of this workforce* (emphasis added)…will adversely impact our ability to successfully execute a growing workload."

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[16] Department of the Navy, *Analyses and Recommendations* (Volume IV), May 2005, p. 27-28.
[17] DoN, Report to the Commission: Department of the Navy Analyses and Recommendations, Vol. IV (March 1995), p. 21.
[18] These include technical proposals made by the Military Departments, such as the Army's closure of Ft. Monmouth for which the data show future deficits in required capacity for both of the site's relevant technology areas: Sensors and Information Systems.
[19] A. Shaffer email to the TJCSG, 26 April 2005.

> …Now more than ever, I believe *we need to increase the size of the acquisition workforce to handle the growing workload* (emphasis added), especially as retirements increase in the coming years."[20]

Mr. Wynne's testimony lends strong support to arguments that: (a) wartime workloads have reduced excess capacity to a minimal current level, which the expunged data show will become a deficit in the future, and (b) BRAC reductions in technical infrastructure (i.e., cutting personnel) will create insufficient support for our future warfighters, which fails to satisfy the statutory requirement to support the Force Structure Plan. Unfortunately, a necessary and appropriate public debate was prevented by expunging and withholding essential data from the U.S. Congress, the independent BRAC Commission, and the public.

3. RECOMMENDATIONS MUST BE DEVELOPED *AFTER* DATA ARE COLLECTED AND ANALYZED

In testimony to the BRAC Commission about the TJCSG's recommendations, Senator John W. Warner, Chairman of the SASC, commented that there was "an internal collapse of the quantitative analytical foundation."[21] He was right.

Our proposals were developed well before the data were received and processed. Not one was developed from a quantitative analysis of military value (MV) and excess capacity determinations. Nor was the Linear Optimization Model (LOM) used, as was originally planned, to objectively produce a limited number of options from a large array of potential options.

Instead, many proposals were developed through the application of military judgment. Others were developed by the familiar, but obsolete,[22] approach used in the four peacetime closure rounds where "bigger is better and biggest is best," as measured by gross numbers of people and dollars. The theory here is that absorption into larger organizations yields greater efficiencies. This judgment was codified in our standard rule that consolidations yield automatic 15 percent eliminations in personnel. For its part, the Government Accountability Office (GAO) was skeptical of these asserted savings, saying that:

> "…it is unclear to what extent the personnel reductions assumed in the group's [TJCSG] recommendations will be attained, largely because of uncertainties associated with the group's assumptions."[23]

While military judgment is a critical adjunct to closure analyses, it is subjective by nature and is strongly dependent on the mix of individuals chosen to perform those analyses. Our official process was designed to be data-driven for that reason. The drift away from a data-driven process began on 23 July 2004 with the ISG's request for notional scenarios. At that time, the field sites were still responding to the data calls. In a 30 July 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."[24] By contrast, prior guidance had called scenario development "the final step."[25]

The basic problem was that the MV results would not be completed until December.[26] The TJSCG issue paper, "Decision Criteria for Scenario Proposals" (Attachment L), was written because 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.

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[20] Testimony of Hon. Michael W. Wynne before the U.S. Senate, 13 April 2005, p. 5-6.
[21] Statement of Senator John W. Warner, *Hearing on Virginia Installations before the 2005 Defense Base Realignment and Closure Commission*, 7 July 2005.
[22] Unlike the post-Cold War peacetime rounds, *mission effectiveness*, expressed as "military value," was by law to be the primary consideration in making recommendations. A shift in emphasis, from efficiency to effectiveness, was necessary for a nation at war and a military that is transforming itself for the 21st century.
[23] Government Accountability Office, *Military Bases: Analysis of DOD's 2005 Selection Process and Recommendations for Base Closures and Realignments* (GAO-05-785), July 2005, p. 230.
[24] TJCSG Meeting Minutes of 30 July 2004.
[25] USD(AT&L) memo, subj: "BRAC 2005 Guidance for the Technical Joint Cross-Service Group", 16 July 2003.
[26] Briefing to the Infrastructure Steering Group, "BRAC 2005", 19 November 2004.

Unfortunately, a modified set of "decision factors" were used in deliberative session on 8 December, three months after the original criteria were proposed, and long after scenarios had been formulated. Some of the COBRA data calls had already been issued.

The ISG directed that the "vast majority" of the scenarios be registered by 1 November,[27] so on 3 November the TJCSG's Capabilities Integration Team (CIT) ranked the 31 proposed closure scenarios by order of importance. I abstained from voting because such determinations can be objective only with the analytical foundation provided by MV scores and excess capacity data (Attachment M). In fact, policy established by the Deputy Secretary of Defense (DepSecDef) directed us to:

> "…determine military value through the exercise of military judgment *built upon a quantitative analytical foundation* (emphasis added)."[28]

Some maintain that the proposals were based on data. That is a specious argument. It is true that a number of scenarios realigned functions to larger sites based on preliminary data regarding workforce size. This is not the same thing as quantitative analysis, where MV rankings and excess capacity determinations are evaluated, and then used (preferably by the LOM [29]) to objectively produce a limited number of options from a large array of potential options. The TJCSG's proposals were, by no means, data-driven.

To solve the problem of late arriving data, the TJCSG resorted to a strategy-driven approach.[30] As a result, the TJCSG's strategic framework became the justifying principle for the proposals. It called for:

> "…*establishing multifunctional and multidisciplinary technical (RDAT&E) Centers of Excellence* (emphasis added)…These Centers of Excellence are designed to maximize the synergies and efficiencies of the work these facilities produce."[31]

Unfortunately, this fix was too often inconsistently applied (Attachment N). For example, among all DoD sites performing work in Information Systems (IS), Fort Monmouth was ranked #3 in Research and #2 in D&A. Similarly, for the Sensors technology area, it ranked #9 and #4, respectively. The site's scores for these four "bins" show a *multidisciplinary* and *multifunctional* center (i.e., the work spanned two disciplines, IS and Sensors, and two technical functions, Research and D&A). No other Army site appeared within the Top 10 for more than one of the four bins. Therefore, the Army already had an existing multidisciplinary and multifunctional center at Fort Monmouth. By the TJCSG's stated strategy, it would have seemed a logical "gainer" for workload. But that did not happen. Fort Monmouth was proposed for closure.

In the biggest closure of technical infrastructure, the TJCSG proposed a Center of Excellence for Land Domain C4ISR at the Aberdeen Proving Ground (APG).[32] This requires realigning the 5,000-plus workforce and building a facility that does not currently exist at a site that *did not rank in the Top 10 for any of the four bins*. Mr. Wynne's congressional testimony that "more than 12 major studies warn of the deteriorating situation within the U.S. science and engineering workforce"[33] shows that, at best, it will be a challenge to create this new Center of Excellence. But the important point here is that to support this action, the TJCSG abandoned its strategy-driven process, which had been established to fix its lack of a data-driven process. This deviation was deemed justified by the asserted benefits of *transformation*.

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[27] USD(AT&L) memo, subj: "BRAC 2005 Scenario Data Calls," 3 November 2004.
[28] DEPSECDEF memo, subj: "BRAC 2005 Military Value Principles", 3 September 2004.
[29] The LOM would have offered two advantages: as a decision-aid to limit the number of options produced from a very large universe of potential options (e.g., given any 10 sites, there are 175 possible alternatives that close 1, 2, or 3 of them); and as *an objective means by which to defend the proposals when so many other possibilities existed but were never considered.*
[30] TJCSG Meeting Minutes of 21 October 2004.
[31] Technical Joint Cross Service Group, "Analyses and Recommendations," (Volume XII), 19 May 2005, p. 11.
[32] Ibid., p. 16.
[33] Testimony of Michael W. Wynne, 13 April 2005, p. 10.

A new C4ISR facility would, it was asserted, yield much sought after synergies at a site that currently does Materials RD&A. The Department of the Army co-sponsored the closure with a similar assertion, but instead claimed the desired synergies would result between C4ISR and *Human Behavior*, not Materials.[34] Both the TJCSG and Army ignored APG's low MV scores in C4ISR (# 11 in IS Research, #41 in IS D&A, #24 in Sensors Research, and # 21 in Sensors D&A). But, APG did happen to have a higher ranking than Fort Monmouth in Materials and in Human Behavior.

The above evidence shows two things about the co-sponsored closure: (a) military value was not "the primary consideration in the making of recommendations," as the law requires; and (b) the exercise of expert judgment was not "reproducible," a more stringent standard that could have minimized the negative effects of a judgment-driven process.[35] As shown above, the expert judgment at the basis of the TJCSG proposal failed to be reproduced in the Army proposal where each differed as to what skills at APG would enable the transformation. This disconnect does not inspire confidence in the asserted merits of the idea.

Without a quantitative foundation or compelling expert judgment to support it, the best that can be said for the proposal is that the desired transformation is *possible* — which is an unacceptably low standard. *Possibilities are too undemanding to formulate, and too hard to evaluate.*

For example, another possibility could have been to close APG and send its workload to the White Sands Missile Range to create a *multidisciplinary* and *multifunctional* Weapons and Materials RDAT&E Center of Excellence. Like the Fort Monmouth closure, the desired outcome has some merit and meets the low standard of being possible. Some may say the idea is far-fetched because it sends thousands of highly trained personnel from the Chesapeake Bay area to the remote sands of Alamogordo. But recall that thousands of personnel will be sent from the Pacific coast and Potomac River regions to the sands of the Mohave.

The above idea, which I do not endorse, is only offered to show there were other easily derived *possibilities*, even where APG was the losing instead of the gaining activity. This is why it was critical to have a data-driven process, where *all* essential data are disclosed, and where judgment is used to temper, not drive, the final outcomes. Based on the evidence, the TJCSG did not use a data-driven process, nor did it use a consistent strategy-driven process. Its process was compromised by a premature and excessive use of judgment.

4. MILITARY VALUE SHOULD MEASURE PERFORMANCE, NOT WORKLOAD

Military value was driven by workload, as measured by numbers of people and dollars. A "bigger is better" and "biggest is best" approach was used by each of the four previous BRAC rounds because workload centralization to larger sites was claimed justified by the attainment of greater efficiencies and cost savings. The fairest response to that assertion is that it really all depends.

Unlike the earlier peacetime rounds, BRAC-05 needed metrics to measure mission effectiveness instead of workload. With our nation at war, and the Department transforming its forces, the quality of technical personnel and the impact of their work were *the* vital characteristics to measure. There was much resistance to this. From February to June 2004, the four iterations of the paper entitled "Shadows on the Wall: The Problem with Military Value Metrics," argued against the steps taken to dumb down the personnel metrics and to measure field impact by the number of dollars spent.[36]

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[34] Department of the Army, "Analyses and Recommendations," (Volume III), May 2005, p. 87.

[35] This is where expert judgment is supported with verifiable information of a nature making it probable that other teams of independent experts would reach the same judgment. The standard was proposed in "Defending the Technical Infrastructure Proposals of the 2005 Base Realignment and Closure Round", 10 May 2005, p. 29.

[36] The paper did help to: (a) eliminate the use of contractor personnel in scoring for MV, and (b) reject the silly, but very nearly implemented, "percentage approach" to calculating personnel data, (e.g., calculating a score in this manner meant that a **40**-person site with 30 PhDs, or 75% PhDs *would outscore* a **1000**-person site with 700 PhDs, or 70% PhDs).

The paper predicted that our People Metrics (i.e., Patents/Publications/Awards, Experience, and Education) would fail to discriminate essential differences between the sites because truly important information would be lost in the noise of large aggregate populations. The paper argued that the major cause for this failure would be the severely compressed range of assigned point values given to the discriminators of quality. The following example uses the Patents/Publications/Award metric (PPA), which was the one metric with the most potential for measuring the quality of the workforce accurately.

The PPA metric had levels of recognition with different point values: *Elite* (e.g., the Nobel Prize and Collier Trophy), *Prestigious* (e.g., National Inventors Hall of Fame), Society Fellows, and patents / publications. The Collier Trophy, for instance, recognizes the greatest American achievement in aeronautics or astronautics. Past winners have been Orville Wright, Chuck Yeager, the Apollo 11 crew, and the Navy / Air Force GPS team. TJCSG methodology gave 30 points to a DoD site with the Collier Trophy. But an unidentified patent, of no known real-world application, was valued at 1 point. So the profound impact of the elite Collier Trophy could be offset by only 30 patents reported by another site. To put things in perspective, over the reporting period (2001-2003) of the TJCSG MV data call, the National Aeronautic Association recognized one DoD activity with the annual Collier Trophy,[37] whereas 1,772 patents of unknown real-world impact were granted to Army, Navy, and Air Force technical activities.[38]

The values for the other People metrics, Education and Experience, were also severely compressed. The Education metric assigned 3 points to a PhD, 2 points to a MS, and 1 point to a BS. I will not belabor the point. Anyone with the statistical aptitude of an avid baseball fan and an understanding of the non-linear difference between a PhD degree and a BS degree can see the flaw.

And finally, there was the choice to give no value to "ST personnel." An ST has an international reputation in his/her field and is "sought as an advisor and consultant on scientific and technological problems that extend beyond his/her specialty."[39] These are a very select and limited number of what a former Deputy Director for Defense Research and Engineering called "world-class experts."[40] Zero value for such high-level performers is, at minimum, a most peculiar decision.

The Operational Impact metrics suffered from one pervasive problem — the over-emphasis on dollars. Despite the fact that dollars are a standard resource input, 14 of the 16 metrics used funding to measure output. Some metrics (e.g., "ACAT Systems Currently in Work") did not even meet the standard of making an "impact" because they measured funding of work in progress. The over-emphasis on dollars was then compounded by the multiple-counting that occurs when the same dollar gets reported by co-located activities, as it passes from project sponsor to in-house performer to contractor.

To confirm its theory about the metrics' inadequacy, the final version of the "Shadows on the Wall" paper (distributed before the MV data call was released) conducted a test case using the TJCSG's official methodology (Attachment O). A bona fide world-class research group[41] at the Naval Research Laboratory (NRL) was scored (using real data) against two hypothetical groups to see how it would fare. The hypothetical Projects X and Y had large budgets but were otherwise deliberately designed to be unexceptional and unproductive.

> The Results: NRL's 15-person (13 PhDs – one of them a DoD ST), world-class research team — with a technology transition to the U.S. Marine Corps, a successful rapid response project for the U.S. Fleet in

[37] Found at: http://www.naa.aero/?CFID=609108&CFTOKEN=48703320
[38] Found at http://www.uspto.gov/web/offices/ac/ido/oeip/taf/apat.htm#PartB
[39] Found at: http://www.rdc.noaa.gov/~hrmo/er-3104.htm
[40] ODDR&E, *Memorandum for Director, Defense Performance Review Task Force*, (30 July 1993).
[41] Section 913 Report #1: *Sensors Science and Technology and the Department of Defense Laboratories*, (National Defense University: March 2002), p.31. Prior to his service as a BRAC Commissioner, ADM Gehman reviewed the work of this NRL research team as part of an NDU study panel. He stated that NRL's "Center for Bio/Molecular Science and Engineering demonstrated bio-warfare detection systems that are light years better than anything I have seen in DOD, CDC, DTRA, the Raid teams or anywhere else. This Center may be a life-saver sooner than we think."

> 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.
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> [Note: In the time since these calculations were done, OSD requested that the Air Force Surgeon General's office implement bio-surveillance technology, developed by the above research team, due to high-level concerns about public health during special events held in the Washington D.C. area in early 2005. The combined project team, composed of NRL scientists, Navy reservists, and Air Force staff, successfully made the first demonstration of a capability for rapidly (i.e., less than 24 hours) obtaining data for a broad range of pathogens in clinical specimens collected from the general population.[42]]

To minimize the inadequacies, the paper offered an alternative scoring plan that was shown to yield rational rankings when applied to the above test case. If we had switched approaches, the effect of the changes would not have been uniform. Sites that scored well under two of the more quality-focused metrics (i.e., PPA and project transitions), as did NRL in the above test case, would likely have done even better under the alternative scoring approach. In short, sites that are high performers would have increased their scores at the expense of those sites with scores relatively more dependent on workload. High performers that also had substantial workload *performed on-site* (i.e., not contracted to off-site performers), would have done best.

In the end, the alternative scoring methodology was disregarded. It is troubling such strong efforts were made to "dumb down" the metrics for intellectual capital, especially when so many high-level concerns have been voiced about the future of the DoD's technical workforce. By failing to score exceptional talent on a realistic point scale, the TJCSG also lost the opportunity to make its closure analyses easier and more accurate. This is because,

> "…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*."[43]

5. "STOVE-PIPED" STUDIES YIELD SUB-OPTIMAL RESULTS

Ten years ago, the BRAC-95 Laboratory JCSG conducted a 23-bin analysis alongside the T&E JCSG's 18-bin analysis.[44] 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,

> "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."[45]

BRAC-05 repeated the stove-piped approach, albeit with variations in taxonomy and with larger realigned workloads. The result was again actions that are questionable in their cost-effectiveness. It is quite likely that the Services will find a number of them much more expensive to implement than anticipated.

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[42] Stenger, D.A., et al., "Silent Guardian at NRL October 2004 - March 2005", NRL Formal Report, (In Press).
[43] D.J. DeYoung, "Shadows on the Wall: The Problem with Military Value Metrics,"18 June 2004 (*Version 4*), p. 27.
[44] 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.
[45] GAO, *Military Bases: Analysis of DOD's 1995 Process*, April 1995, p. 45

The stove-piped design promoted sub-optimal realignment actions that left a large number of losing sites open but in a weakened condition by (a) shredding the creative connectivity of their integrated programs, and (b) reducing their business base, which causes overhead rates to rise and makes them less competitive. Such actions can also increase costs for the Services when unexpected additional physical infrastructure must be built at the gaining sites to accommodate the realigned workload. One cause for this can be understated requirements made by gaining sites during the COBRA phase. This issue is treated in greater detail by the issue papers, "Defending the Technical Infrastructure Proposals of BRAC 2005" and "Scenario Conflict Adjudication" (Attachment P).

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. A better approach would have been a holistic one that evaluated the *whole R&D program* at one laboratory to that of another laboratory, and the *whole RDT&E program* at a warfare / product center to that of other warfare / product centers. The horizontal connectivity at multi-disciplinary laboratories would have been evaluated intact, and the vertically integrated connectivity at warfare/ product centers would have been treated likewise. This approach was originally proposed in March 2003 by the Navy, and again in February 2004, in the first version of the paper, "Shadows on the Wall." It is an analytical approach that was also favored by the Institute for Defense Analyses after reviewing the BRAC-95 process.

> "Maximizing infrastructure reduction can be better served by focusing the analysis methodology at the installation level rather than at the test-facility level."[46]

The TJCSG's used what could be called a "breakdown-buildup" approach to achieve its stated strategy to "establish multifunctional and multidisciplinary technical Centers of Excellence." First, the breakdown phase pushed highly interconnected work through technical (e.g., Sensors) and functional (e.g., Research) stove-pipes, severing the connectivity of multidisciplinary and multifunctional projects, as well as decapitating top talent from realigned work. Then, the buildup phase's general rule was to realign the workload of one organization's lower ranked bin to a higher ranked bin at another organization. In this way, a Center of Excellence was theoretically created by the accretion of bins from lower ranked organizations. A notable exception to this rule was the case of Fort Monmouth, which was discussed earlier.

The stumbling block for the alternative holistic approach was the need to assign MV at the installation level. This idea was proposed a number of times but was treated like the "third-rail" of our analyses. "Rolling up" MV from bins to organizations is difficult but not impossible. In BRAC-95, the Navy rolled-up a 1,386-bin workload "footprint," comprising 18 life-cycle phases and 77 functional support areas, into MV scores for whole organizations.[47] By contrast, the TJCSG agreed, only after much debate, to roll-up the MV scores by zip code where individual respondents, from the same Service, at the same installation, but within the *same bin*, are combined into one score.[48]

Resistance to doing the roll-ups came largely from the fact it would work in the Navy's favor. The relatively greater multidisciplinary and multifunctional scale of its technical sites would contribute more bins to the roll-up, yielding a higher MV score. By contrast, the Air Force's business model for RDT&E is poor match for this approach. This is a difficult issue. On one hand, no Service should suffer because it conducts business in a different and equally legitimate manner. And on the other hand, the TJCSG's BRAC objective was to establish multidisciplinary and multifunctional sites, so why stop short of supporting the ultimate goal by failing to recognize those two qualities appropriately in the scoring for military value?

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[46] Ackerman, C.T., Madl, D.O., Musson, T.A, and Tolis, G.C., "Lessons Learned from the BRAC-95 Joint Cross-Service Group for Test and Evaluation", (Institute for Defense Analyses: IDA Document D-1721), July 1995, p. S-3.

[47] 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.

[48] MV "roll-up" by zip code, an analytically sound and common-sense approach took until 9 December 2005 to be approved.

CONCLUSION

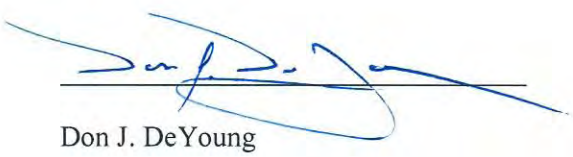
The TJCSG's mission was twofold: first, to collect savings from the closure of infrastructure *confirmed* to be excess on the basis of tomorrow's, not today's, military requirements; and second, to ensure that the DoD's in-house system of laboratories and technical centers remain capable of providing, in collaboration with the private sector and our allies, the technological options necessary to prevail over our country's enemies. With America at war, success in meeting both goals was vital.

The root problem throughout BRAC-05 was our inability to make the transition from four peacetime rounds to a wartime closure round. Such a transition required that we 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 laboratory and technical center consolidations.

That inability to shift to a wartime framework set the stage for an analytical process compromised by: a collapse in its quantitative analytical foundation, a premature and excessive use of judgment, a study design that by its nature produces sub-optimal outcomes, and a decision to withhold essential official data that, if publicly released, would have cast a different light on the advisability, justifiability, and defensibility of our recommendations.

In assessing our efforts, the opinion has been expressed that "we have done the best we can." Whether that is right or wrong is irrelevant. As Sir Winston Churchill once said,

> "It's not enough that we do our best; sometimes we have to do what's required."



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ATTACHMENT A

Date: 18 June 2004

To: Alan R. Shaffer,
Director, Plans and Programs, ODDRE

From: Don J. DeYoung

Subj: Military Value and Capacity Analysis of DoD Laboratories and Centers

Encl. (1) Analysis: *Shadows on the Wall: The Problem with Military Value Metrics*

1. I have taken the opportunity to update my ongoing analysis of the TJCSG Military Value scoring approach, sent on previous occasions to both you and Dr. John Hopps, the late Deputy, Director Defense Research and Engineering (earlier versions were dated 17 February, 1 April, and 24 May).

The changes to our approach, mandated on 4 June by the Infrastructure Steering Group (ISG), had a nominal effect on the outcomes for the test case that I alerted you of in the 24 May version. Minimal as the changes were, I nevertheless wanted to make you aware of them before Data Call #2 is issued to the field next week. The ISG's changes served to ameliorate the situation, albeit very slightly. The results of the trial run on a world-class research group are now merely irrational, instead of patently absurd. Finally, you will see that I offer some comments within this memo regarding our proposed approach to capacity analysis.

2. Military Value. In the 24 May version, I referred to the findings of the National Defense University (NDU) Lab Relevance Study. The NDU study team, and in particular Admiral H. Gehman (later appointed as the chair of the Columbia Accident Investigation Board), had singled out a DoD biosensors research team for their work and its potential criticality to public safety and national defense. ADM Gehman specifically stated that this world-class research group,

> "demonstrated bio-warfare detection systems that are light years better than anything I have seen in DOD, CDC, DTRA, the Raid teams or anywhere else. This Center may be a life-saver sooner than we think."[1]

Using the TJCSG's official analytical approach, I scored this bona fide world-class research group (with real data) against two hypothetical groups to see how it fared. The two hypothetical groups, Projects X and Y, have large budgets but were otherwise deliberately designed to be unexceptional and unproductive. *This was done to determine whether our analytical process could in fact recognize world-class talent and evaluate each site accurately for its military value*.

In short, if we cannot identify the exceptional talent within the DoD labs and centers, or the field impact they make, we will risk doing extensive damage to long-term national security. A sound analytical process would obviously rank the world-class group highest (by a significant amount) given its own elite credentials, and given the unexceptional personnel and non-existent operational impact of Projects X and Y.

[1] Section 913 Report #1: *Sensors Science and Technology and the Department of Defense Laboratories*, (National Defense University: March 2002), p.31.

The Results. Despite the ISG's changes, we still have a big problem. The 15-person (*13 PhDs*, 2 MSs), 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* — ranks *second*, with a total Military Value (MV) of **3.50** (1.93 for Intellectual Capital and 1.57 for Operational Impact). *This is little more than half of the top-ranked Project Y's score* of **6.06** (3.00 for Intellectual Capital and 3.06 for Operational Impact). *Project Y is a 35-person project with only 2 PhDs, no awards or recognition, no product, and no impact*. It does have a $15 million dollar budget.

Even more amazing, the world-class research team ranks *only 18% higher than Project X's score of **2.96**. Project X is an unexceptional, 2-person contract shop, with no recognition, no product, and no impact. But like Project Y, it has a fat wallet*.

Another disturbing sign is how insensitive these results are to artificial increases of exceptional talent. A quick experiment reveals the problem. If we add 10 Nobel Laureates, all with PhDs with more than 20 years experience, to the world-class group, it still finishes second to Project Y in Intellectual Capital (2.61 versus 2.85).

The reasons for these irrational scores are not surprising. Results like this were predicted in the earlier versions of the attached paper, as well as in numerous emails to the Capabilities Integration Team (CIT) and in meetings of both the CIT and TJCSG. The current version, which is provided as enclosure (1), contains discussion of the ISG changes and a detailed description of the above test. I should note that one arithmetic error in the last version was found and corrected.

The attached analysis shows that the People Metrics are "dumbed-down" to the point where we will be blind to exceptional talent. This jeopardizes the success of our entire endeavor. Absurd point value compression and use of an inappropriate DAWIA certification metric for world-class S&T performers are the major reasons for the problem. The other root flaw is that *dollars* (a lame surrogate for what some TJCSG members generously call "product") have achieved relative rock-star status as a preferred metric for military value.

Any community-hired BRAC consultant, worth his or her salt, will zero in on these problems a means of discrediting the study. For example, our compressed point values (e.g., 3 points for a PhD, 2 for a MS, and 1 for a BS) will be vulnerable to ridicule by anyone with the statistical aptitude of an avid baseball fan and an understanding of the non-linear difference between a PhD and a BS. It is unfortunate that my early proposals to eliminate the point compression failed to gain any traction.

The evidence strongly suggests that we have a fatally flawed study on our hands. If our approach to assessing military value is, as the attached analysis shows, blind to exceptional talent and to real field impact, then there is an unacceptably high probability of making serious mistakes. *BRAC actions built upon defective military value scores will almost certainly damage the DoD's ability to develop new defense technologies. And our capacity analysis will dictate the extent of that damage*.

A large calculated excess capacity within the DoD RDT&E infrastructure will cause large movements of workload. After the military value scores (which are almost certain to be inaccurate) determine the "winners" and "losers," these large movements will almost certainly damage some, if not many, technical centers of excellence. Large excess capacity will maximize

the damage; small excess capacity will minimize it. That brings me to some concerns that I have about our approach to calculating excess capacity.

3. Capacity Analysis. Selecting an effective unit for measuring RDT&E capacity is critical. Unfortunately, it is not easy to find one without disadvantages.

> *"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, and reduced weapons procurement equals less test range use. 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). If there were such a relationship, the Navy would not have resorted to a surrogate metric (that is, work-years) for capacity during the 1995 Base Realignment and Closure (BRAC) round…
>
> …the surrogate metric counted only in-house work-years, which means contractor work-years were excluded. This was not an oversight. Contractor numbers are notoriously hard to verify. With the high stakes of a BRAC, this raises the risk of fraud or, almost as bad, of rumors of it. Nevertheless, contractors perform about half of Navy RDT&E, and a great many of them work at the Laboratories and use their infrastructure. Therefore, the metric provided an incomplete picture, yielding inaccurate conclusions…this is like counting only [hotel] guests who occupy even-numbered rooms."[2]

For BRAC-05, the TJCSG is taking a more complicated approach that the Navy did in BRAC-95. I believe the TJCSG's approach has one advantage, but it also has several major problems that are potential "showstoppers." On the positive side of the ledger, by deciding to count on-site contractor work-years, the TJCSG fixed the problem identified in the excerpt above. There is of course the downside of verifying the numbers of on-site contractors, but this metric does stand the best chance of producing an accurate estimate of a site's true capacity.

Unfortunately, the TJCSG has developed four additional units of measure that will cause major problems for us down the road. They are (a) Acquisition Category (ACAT) programs (both numbers of and funding levels) as a capacity unit for Development & Acquisition (D&A), (b) extramural funding as a capacity unit for Science and Technology (S&T), (c) square footage, and (d) a Force Structure Adjustment (FSA) to be based on collective expert military judgment.

The first problem with the additional units is the complexity. We are making the job harder than it needs to be. The following advice is based on Service-specific experience, but it could help us sort things out.

As a former member of the Navy Base Structure Analysis Team (BSAT), I can say that the capacity unit for all RDT&E — including the acquisition function — was the work-year. The Navy's report to the BRAC Commission stated that,

> "Budgeted work-years 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."[3]

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[2] D.J. DeYoung, "The Silence of the Labs," *Defense Horizons*, No. 21 (January 2003) [http://www.ndu.edu/inss/DefHor/DH21/DH_21.htm]

[3] Report to the Commission: Department of the Navy Analyses and Recommendations, Vol. IV (March 1995), p. X-5, [http://www.defenselink.mil/brac/navy.htm].

This approach was successful. In BRAC-95, the GAO examined the closure process and decisions of each Service, including their capacity and military value analyses. It found that "the Navy's process and recommendations were sound."[4] In short, the Navy's use of *work-years as a capacity metric was effective and supportable*. In fact, the same GAO report stated about the Navy process that, "The configuration analysis for this subcategory (Technical Centers) involved complicated assessments of the existing capabilities and requirements for 29 functional categories, such as undersea and surface ship platforms, *across four phases of work: RDT&E, acquisition, lifetime support, and general* (p.96-7)." This comment shows that the work-year even satisfied requirements of functions beyond RDT&E and acquisition. In the end, the Navy recommended 21 lab/center closure or realignment actions, and was successful with all but a few. The process for analyzing capacity stood up to the inevitable challenges by being both defensible and equitable. *In short, work-years did the job — for S&T and D&A*.

(a) ACATs. On the other hand, the use of ACATs (count and funding) is analytically unsound and will be hard to defend. ACAT programs exhibit large ranges in cost and have great variances in complexity. This leads to considerable differences in personnel, funding, and infrastructure requirements between programs — even at the same ACAT level. ACATs have some use in measuring military value, but as a capacity unit they are much too imprecise. Finally, no proponent of using ACATs as a capacity unit has yet been able to assure me that we will not miss *non*-ACAT development programs when evaluating D&A (e.g., See "Major Navy Non-ACAT Programs"[5]). My concern here is that we will have compromised the whole process should we miss counting substantial workload at some sites.

(b) Extramural Funding. To be blunt, this unit is absurd. Dollars provided to external organizations in the private sector, and to other government (DoD and non-DoD) agencies, is not a measure of on-site capacity. How does spending the most money on private sector performance show that one performs the most work? This unit introduces private sector infrastructure into an analysis of the public sector. BRAC is about closing, reducing, and/or realigning government, *not private sector*, infrastructure. Also, by using dollars sent to other DoD organizations, we are ensuring double-counting (or worse) of the same dollar as it passes from sponsor, to program manager, to performer, and to sub-contractor.

Lastly, the unit is based the faulty assumption that the level of dollars is directly related to the workload level of a contract manager. Proponents for this unit should prove there is a one-to-one correspondence between number of dollars and number of required contract managers before this unit is approved. This unit does, however, continue a theme found in our military value approach where *more dollars equals greater operational impact*.

(c) Square Footage. If ever there were a seductive measure of physical infrastructure, it is square footage. It promises simplicity, clarity, and accuracy, but delivers none. Take the case of the estimates of excess capacity contained in the DoD's March 2004 report to Congress.[6] In it, the DoD estimates, by using square footage, that the FY09 excess capacity for Army and Air Force labs/T&E sites will be 62 and 18 percent, respectively.[7] Looking

[4] GAO, "Military Bases: Analysis of DoD's 1995 Process and Recommendations for Closure and Realignment" (GAO/NSIAD-95-133) April 1995, p.87.
[5] http://www.abm.rda.hq.navy.mil/navyaos/content/view/full/2876
[6] 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.47 and 52.
[7] Unlike these estimates using square footage, Navy estimates were based on in-house work-years.

more closely, these estimates are ratios where the "acquisition workforce" divides total square footage. But what is that workforce? Is it both contractor and in-house personnel, or is it a partial picture that uses just in-house government employees? The following evidence suggests the latter.

In a 1997 report to Congress, the Department's total (all Services, plus Defense Agencies) acquisition workforce was stated to be 617,000 *employees* in FY89.[8] It happens that the March 2004 report identifies 158,000 in the Army acquisition workforce for that same year — FY89. At the risk of being simplistic, assume an equal share of the acquisition workforce among the Army, Navy, Air Force, and Defense Agencies. An equal share of 158,000 among the four would yield about 632,000, which is very close to the number of employees cited in the 1997 report. It appears then that the 158,000-person Army workforce is made up of government employees, and therefore the estimate does not include the on-site contractors who also use the base infrastructure. This matters because the estimates of a cavernous 62% (825 square feet per person) excess capacity in the Army and 18% (750 square feet per person) in the Air Force, may be overstated at best, and way off at worst.

It should be recalled that since 1996 (a year after the last BRAC round) the Services have been complying with ambitious outsourcing goals levied by the DoD. Many of the positions formerly filled by government workers are now performed on-base by private sector employees. Assuming that 50 percent (which in many places is a significant under-estimate) of the on-site population is comprised of contractors, then both Services have instead about 400 square feet of available space per person. But what does that really mean? Is that a lot of space? Is it too much?

In 1876, Thomas Edison opened what has been called the first research and development laboratory, as well as one of the most productive, at Menlo Park, New Jersey. The lab building was a 100-foot by 25-foot structure with two floors (5,000 square feet).[9] Edison's staff numbered 25, which amounted to 200 available square feet per person. This was roughly half the space available to the average member of the Army and Air Force "acquisition workforce." When one factors in the facility requirements set by more powerful technical equipment that is much more dependent on carefully controlled environments than Edison's 19th century equipment, maybe 400-sq ft per acquisition worker is to be expected.

There is one last problem with square footage, one that is best revealed by using the example of the Air Force's McKinley Climatic Chamber. The 6-chamber facility is huge, with its main chamber being 65,520 square feet.[10] Assume the site downsized its acquisition workforce by 18 percent. I doubt anyone would argue that this unique, state-of-the-art facility would then have an excess capacity of nearly 12,000 sq. ft. All 65,000-plus sq. ft. would be necessary whether 100 persons, or 1 person, worked there. Again, the key metric for capacity appears to be work-years, not the amount of space available per person.

(d) <u>The Force Structure Adjustment (FSA)</u>. This metric is supposed to somehow identify any of today's capacity that may not be necessary in 2025 given the military force structure in place then. The plan is to use the expert military judgment resident in the TJCSG sub-groups for such determinations, and the idea is to adjust the estimated required capacity, up

[8] Office of the Under Secretary of Defense (Acquisition & Technology), "Right-Sizing the Department of Defense Acquisition Workforce", (28 January 1997).
[9] http://www.edisonnj.org/menlopark/taemenlo.asp
[10] http://www.eglin.af.mil/TS/climlab/main.html

or down, by what they think will happen. It is unclear how we will be able to defend a quantitative value based on such speculative judgments. Moreover, these judgments will be subject to the following significant limitations.

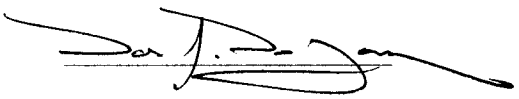
- First, over time, "the threat" shapes the force structure. Sometimes the threat is predictable, and sometimes it is not. For example, the DoD's concepts for future force structure after September 11 are different than they were before that date.

- Second, S&T's impact on the force structure 20 years hence is unknowable, especially given that basic research is unpredictable and often produces unexpected benefits. Moreover, many of the most revolutionary technologies born in S&T, like radar and GPS, will take as many as 20 years to reach operational use.

- Third, the impact of current D&A is less speculative than for S&T, but it is guess work nonetheless. For example, if the FSA metric was used during the first BRAC round in 1988, the Navy's experts would have said that the DoN's 1998 force structure (i.e., only 10 years later, not 20) would have had more than 850 A-12 Avengers streaming from the Fleet's carriers.[11] Things happen.

4. As before, the ideas and suggestions offered in both this memo and in the attached analysis are my own, and therefore do not necessarily represent the official views or positions of the U.S. Navy, RADM Jay Cohen, or Mr. George Ryan. I offer them again because I want to see our process succeed, and believe they provide effective ways to avoid the pitfalls of BRAC-95.

Very Respectfully,



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[11] http://www.fas.org/man/dod-101/sys/ac/a-12.htm

ATTACHMENT B

NOTIONAL SCENARIOS
Issue #07-28-04-01

Issue: On 23 July 2004, the Infrastructure Steering Group (ISG) directed the Joint Cross Service Groups to provide notional scenarios for discussion at its next meeting. Fulfilling this request is inadvisable due to the risk of consequential perceptions that the Department created the answers before the data was in. Any doubts among the Commission and communities that "a fair process"[1] was conducted will jeopardize the scenarios of the Technical Joint Cross Service Group (TJCSG) that are eventually derived through its ongoing analytical process.

Point of Contact: Don DeYoung, Capabilities Integration Team (Alternate), U.S. Navy

Issue Summary:

1. *The TJCSG's Dilemma.*

   The TJCSG is being asked to consider closure scenarios *before the analytical work has been completed on the critical precursor stages.* The stages yet to be completed include: (a) collecting the data; (b) establishing whether there is excess capacity within the DoD in-house system of labs, centers, and test ranges (and if so, to what extent); and (c) determining the military value of each site.

2. *Scenarios Should Not Be Generated Before Excess Capacity Has Been Determined.*

   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)[2], (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.

3. *Excess Capacity Estimates in the March 04 Report to Congress Were Very Likely Overstated.*

   Some will say that the DoD's March 2004 report to Congress already established the existing levels of excess RDT&E capacity.[3] That argument is weak.

   First, the report's findings of excess capacity are inexact and merely met a Congressional milestone that allowed the Department to proceed with the more rigorous analytical standards of a base closure round. In fact, the report itself states,

   > "*Only a comprehensive BRAC analysis can determine the exact nature or location of potential excess.* In preparing a list of realignment and closure recommendations in May 2005, the Department will conduct a thorough review of its existing infrastructure in accordance with the

[1] Public Law 101-510, as amended through the National Defense Authorization Act of Fiscal Year 2003, SEC. 2901. (b)
[2] 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).
[3] 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.47 and 52.

> law and Department of Defense BRAC 2005 guiding procedures, *ensuring that all military installations are treated equally and evaluated on their continuing military value to our nation.*"[4]

Second, solid evidence suggests that the report's estimates are much overstated. The report estimated that the FY09 excess capacity for Army and Air Force labs/T&E sites would be 62 percent (or 825 square feet per person) and 18 percent (or 750 square feet per person), respectively.[5] Looking more closely one finds that these estimates are ratios where the "acquisition workforce" divides total square footage. But what is that workforce? Is it both contractor and in-house personnel, *or is it a partial picture that uses just government employees*? Evidence suggests the latter.[6] This matters a lot. Since 1996 (a year after the last BRAC round) the Services have been complying with ambitious outsourcing goals levied by the DoD. Many of the positions formerly filled by government workers are now performed on-base by private sector employees. Assuming that 50 percent of the on-site population is comprised of contractors (an underestimate at many sites), then both the Army and Air Force have instead about 400 square feet per person. But what does that really mean? Is that a lot? Is it too much? An historical example might be useful here.

> In 1876, Thomas Edison opened what has been called the first R&D laboratory, as well as one of the most productive, at Menlo Park, New Jersey. The lab building was a 100-foot by 25-foot structure with two floors (5,000 square feet).[7] Edison's staff numbered 25, which amounted to 200 square feet per person. When one factors in facility requirements dictated by equipment that is far more powerful and dependent on carefully controlled environments than Edison's 19th century equipment, maybe 400-sq ft per "acquisition worker" is to be expected.

Third, if ever there were a seductive capacity metric for physical infrastructure, it is square footage. It promises simplicity, clarity, and accuracy, but delivers none. The above discussion reveals some of the challenges posed by DoD's use of this problematic "physical infrastructure metric." Using the example of the Air Force's McKinley Climatic Chamber shows another. The 6-chamber facility is huge, with its main chamber being 65,520 square feet.[8] Assume the site downsized its workforce by 18 percent. I doubt anyone would argue that this unique, state-of-the-art facility would then have a correlating excess capacity of nearly 12,000 sq. ft (i.e., 18% of 65,520). *All* 65,000-plus sq. ft. would still be necessary whether 1000 persons, or 1 person, worked there. *The key metric for capacity is work-years, not the amount of space available.*

4. *Notional Does Not Mean Acceptable.*

Some will argue that early scenario generation is acceptable because they are only notional, general, and do not specify names. The idea here is that the less they represent reality, the more acceptable they become. This rationale will not reassure a skeptical audience. This situation is also a "Catch-22". *If these scenarios are truly so general as to be safe from prejudicing the*

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[4] Ibid., p.3.

[5] Unlike these estimates using square footage, Navy estimates were based on in-house work-years.

[6] Office of the Under Secretary of Defense (Acquisition & Technology), "Right-Sizing the Department of Defense Acquisition Workforce", (28 January 1997). In this report to Congress, the Department's total acquisition workforce (i.e., all Services, plus Defense Agencies) was stated to be 617,000 *employees* in FY89.[6] It happens that the March 2004 report identifies 158,000 in the Army acquisition workforce for that same year — FY89. At the risk of being simplistic, assume an equal share of the acquisition workforce among the Army, Navy, Air Force, and Defense Agencies. An equal share of 158,000 among the four would yield about 632,000, which is very close to the number of *employees* cited in the 1997 report. It appears then that the 158,000-person Army workforce is made up of government employees, and therefore the estimate does not include the on-site contractors who also use base infrastructure.

[7] http://www.edisonnj.org/menlopark/taemenlo.asp

[8] http://www.eglin.af.mil/TS/climlab/main.html

process, then they will also be useless for any of the current tasks at hand. And, anything more than useless compromises the integrity of the process. It will not be difficult for a clever community consultant to show how the general features of a notional scenario resemble that of a base proposed for closure.

5. *The Private Sector is Not Responsible for Either the Analysis or a Fair Process.*

Some will argue that ideas for "transformational scenario options" were requested and received from the private sector (e.g., Business Executives for National Security) a year ago, so this request is merely gathering additional information. This argument does not recognize the fundamental objectivity and analytical integrity that must be preserved within the TJCSG. It is one thing for the private sector to offer its preferred solutions to the Department's perceived excess of infrastructure. And, it is another thing to ask the TJCSG for ideas before the data is in, excess capacity is verified and measured, and the sites are fairly evaluated on their military value.

6. *Do Not Deviate From the Established Analytical Process.*

When discussing the objective standards to be used by the Commission for evaluating DoD BRAC recommendations, the law provides that,

> "the Commission may make changes in any of the recommendations made by the Secretary if the Commission determines that the Secretary *deviated substantially from the force-structure plan and final criteria* (emphasis added) referred to in subsection (c)(1) in making recommendations."[9]

This means that the DoD's recommendations to close and/or realign laboratories, centers, and test ranges are theoretically the easiest of all BRAC proposals to defend before the Commission because there is (a) no clear relationship between RDT&E infrastructure and the force-structure plan (for 2025), and (b) no mention of RDT&E in the BRAC Final Criteria.

Why is there no clear relationship between RDT&E and the force-structure plan?

- First, over time, "the threat" shapes the force structure. Sometimes the threat is predictable, and sometimes it is not. For example, the DoD's concepts for future force structure after September 11 are different than they were before that date.

- Second, S&T's impact on the force structure 20 years hence is unknowable, especially given that basic research is unpredictable and often produces unexpected benefits. Moreover, many of the most revolutionary technologies born in DoD S&T, like radar and GPS, will take as many as 20 years to reach operational use.

- Third, the impact of current D&A is less speculative than for S&T, but it is guesswork nonetheless. For example, during the first BRAC round in 1988 the Navy's experts might have said that the DoN's 1998 force structure (i.e., only 10 years later, *not 20*) would have had more than 850 A-12 Avengers streaming off the Fleet's carriers.[10] Things happen.

As for the BRAC Final Criteria, they do not address RDT&E (although the criteria speak directly to other facets of national defense, like joint warfighting, training, and readiness). Last year the TJCSG requested that the criteria also address RDT&E, but the BRAC Office chose to "preserve flexibility."

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[9] Public Law 101-510, as amended through the National Defense Authorization Act of Fiscal Year 2003, SEC. 2903. (d)
[10] http://www.fas.org/man/dod-101/sys/ac/a-12.htm

That flexibility may well harden if we deviate from the established analytical process. Notions that we marshaled data to support preexisting, or preferred, solutions will be difficult, if not impossible to dispel if the scenarios precede analysis.

Recommendation: The TJCSG should urge the ISG to reconsider its request to generate notional closure scenarios before our analytical work on capacity and military value is accomplished. While beyond our charter, it may also be advisable to suggest that the other JCSGs also refrain from generating notional scenarios. Many of the above arguments pertain to them as well.

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

Final Resolution: *No Vote / No Action*

POC Signature: _____ Date: 11/11/04

CIT Chair: _____ Date: _____

ATTACHMENT C

PROPOSED CONTINGENCY PLAN
Issue #08-06-04-02

Issue: As requested by the CIT, the Sub-Groups spent great time and effort during the week of 19 July developing a timeline to get the TJCSG's BRAC analysis on track for success. Subsequent to that effort, a contingency plan was also requested by the CIT to mitigate risks should the incoming data for calculating excess capacity and military value prove unusable. The proposed contingency plan places a premium on: (1) scenario development *prior* to runs of the Linear Optimization Model (LOM), and (2) military judgment. An undefined "trigger event" for implementing the contingency plan occurs on 10 August. Issues of defensibility argue for rejecting the proposal. On the other hand, the valid need for mitigating risk argues simplifying our approach to calculating excess capacity.

Point of Contact: Don DeYoung, Capabilities Integration Team (Alternate), U.S. Navy

Issue Summary:

1. *Unanswered Questions*

   - Question #1. What happens, or does not happen, by 10 August that requires implementation of the plan?

   - Question #2. How do the milestones of the contingency plan map against the approved timeline developed by the Sub-Groups?

   - Question #3. Given that the contingency plan is the same analytical model (according to Mr. A. Goldstayn, Air Force CIT Principal) used by the Air Force during BRAC-95, how do we avoid the criticism made of that approach by the General Accounting Office which found that, "the Air Force's process made it difficult to easily track resulting recommendations."[1]? GAO's report went on to say,

     > "...the process was not sufficiently documented to substantiate the extent of deliberations and analyses leading to decisions to close or realign individual bases. This was especially problematic for bases where deliberations occurred and decisions were made that bases could not be closed or realigned."[2]

2. *Scenario Development Cannot be the Front-End of the Analytical Process*

   - To preserve the integrity of BRAC-05, scenario development *cannot* be the front-end of the analytical process. Issues of defensibility will almost certainly arise if scenario development is performed prior to the quantitative analyses. *Notions that we marshaled data to support preexisting, or preferred, solutions will be difficult, if not impossible to dispel.*

   - Before scenarios are developed, we need to ensure that our analytical process follows the objective sequence of precursor stages: (a) collecting the data; (b) establishing whether there is excess capacity within the DoD in-house system of labs, centers, and test ranges (and if so, to what extent and where); and (c) determining the military value of each site.

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[1] GAO, *Report to the Congress and the Chairman, Defense Base Closure and Realignment Commission*, "Military Bases: Analysis of DoD's 1995 Process and Recommendations for Closure and Realignment," (GAO/NSIAD-95-133), April 1995, p.51.
[2] Ibid., p. 53.

3. *Military Judgment is No Substitute for Capacity and Military Value Data*

- Military judgment is a critical adjunct to our analyses. It is the essential filter through which all proposed BRAC actions must pass. An extreme hypothetical example would be if a scenario generated by the LOM, or transformational option proposed by the private sector, led to closing Pearl Harbor. Military judgment would doubtless reject it on the solid ground of strategic and tactical military interests.

- Military judgment cannot, however, substitute for the objective quantitative data necessary for deriving excess capacity and military value. The uncomfortable reality of our situation is that *the data must be useful*.

- Capacity data must allow us to "*determine the exact nature or location of potential excess*," and military value data must be accurate, thus *"ensuring that all military installations are treated equally and evaluated on their continuing military value to our nation.*"[3]

- If the data is unusable, then we have failed. If we fail, then there will be no quantitative means by which to make fair, objective, and defensible assessments. Replacing quantitative data with the subjective military judgment of a small number of individuals will not pass the scrutiny of the Commission and the communities.

- The law is clear on the point that "military value is the primary consideration in the making of recommendations for the closure or realignment of military installations",[4] and on the requirement "to provide a fair process."[5] When it comes to collecting solid data for informed decision-making that meets those two goals, failure is not an option.

4. *Useful Capacity Data By Simplification*

- The root problem with our capacity data is complexity. We are making the job harder than it needs to be. The following is based on Service-specific experience, but it could help us sort things out. As a former member of the BRAC-95 Navy Base Structure Analysis Team, I can say that the capacity unit for *all* RDT&E — including the acquisition function — was the work-year. The Navy's report to the BRAC Commission stated that,

> "Budgeted work-years 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."[6]

- Although the metric was flawed in that it counted only government personnel (therefore missing the sizeable use of infrastructure by the on-site contractor workforce),[7] this approach was successful. In BRAC-95, the GAO examined the closure process and decisions of each Service, including their capacity and military value analyses. It found that "the Navy's

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[3] 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.
[4] Public Law 101-510, as amended through the National Defense Authorization Act of Fiscal Year 2003, SEC. 2913. (b)
[5] Public Law 101-510, SEC. 2901. (b)
[6] Report to the Commission: Department of the Navy Analyses and Recommendations, Vol. IV (March 1995), p. X-5, [http://www.defenselink.mil/brac/navy.htm].
[7] D.J. DeYoung, "The Silence of the Labs," *Defense Horizons*, No. 21 (January 2003), p.6.

process and recommendations were sound."[8] The same GAO report stated about the Navy process that, "The configuration analysis for this subcategory (Technical Centers) involved complicated assessments of the existing capabilities and requirements for 29 functional categories, such as undersea and surface ship platforms, *across four phases of work: RDT&E, acquisition, lifetime support, and general.*"[9] This shows that the work-year even satisfied requirements of functions beyond RDT&E and acquisition. In the end, the Navy recommended 21 lab/center closure or realignment actions, and was successful with all but a few. The process for analyzing capacity stood up to the inevitable challenges by being both defensible and equitable. *In short, work-years did the job — for S&T, D&A, and T&E.*

- By deciding to count on-site contractor work-years, the TJCSG has fixed the Navy BRAC-95 problem cited above. There is, of course, the downside of verifying the numbers of on-site contractors, but this metric stands the best chance of producing an accurate estimate of a site's true capacity.

- We can improve our odds for success by: eliminating two metrics (i.e., ACATs and Extramural Funding); firmly defining Force Structure Adjustment; and deferring square footage to the "feasibility-fit" phase of COBRA (Cost of Base Realignment Actions). For more detail on the square footage metric, see the issue paper, "Notional Scenarios."

    - ACATs: The use of ACATs (count and funding) is analytically unsound and will be hard to defend. ACAT programs exhibit large ranges in cost and have great variances in complexity. This leads to considerable differences in personnel, funding, and infrastructure requirements between programs — even at the same ACAT level. ACATs have some use in measuring military value, but as a capacity unit they are much too imprecise. Finally, this approach fails to capture *non*-ACAT development programs (e.g., see "Major Navy Non-ACAT Programs"[10]). We will compromise the whole process if we miss counting substantial D&A workload at some sites.

    - Extramural Funding. To be blunt, this unit is absurd. First, dollars provided to external organizations (either to the private sector or to other government (DoD and non-DoD) agencies), is not a measure of on-site capacity. By this rationale DARPA, with nearly $2.7 billion in FY03, should have a sprawling infrastructure, but it occupies merely an office building.[11] Second, this unit introduces private sector infrastructure into an analysis of the public sector. BRAC is about closing, reducing, and/or realigning government, *not private sector*, infrastructure. Third, by using dollars sent to other DoD organizations, we are ensuring double-counting (or worse) of the same dollar as it passes from sponsor, to program manager, to performer, and to sub-contractor. Lastly, the unit is based the faulty assumption that the level of dollars is directly related to the workload level of a contract manager; i.e., a one-to-one correspondence between number of dollars and number of contract managers.

    - The Force Structure Adjustment (FSA). This metric is supposed to identify any of today's capacity that may not be necessary in 2025 given what we believe the force structure will have in place 20 years from now. The plan is to use the expert military judgment resident in the TJCSG sub-groups for such determinations, and the idea is to adjust the estimated required capacity, up or down, by what they think will happen. It is unclear how we will be able to defend a quantitative value based on such speculative judgments. We need to firmly define a defensible and valid manner for the use of this metric so that FSA does not instead

[8] GAO, "Military Bases: Analysis of DoD's 1995 Process and Recommendations for Closure and Realignment", p.87.
[9] Report to the Commission: Department of the Navy Analyses and Recommendations, p. 96-7.
[10] http://www.abm.rda.hq.navy.mil/navyaos/content/view/full/2876
[11] http://www.darpa.mil/body/pdf/FY03BudEst.pdf

become known as a "Favored Scenario Adjustment." Moreover, the judgments leading to each FSA will be subject to the following significant limitations.

- First, over time, "the threat" shapes the force structure. Sometimes the threat is predictable, and sometimes it is not. For example, the DoD's concepts for future force structure after September 11 are different than they were before that date.

- Second, S&T's impact on the force structure 20 years hence is unknowable, especially given that basic research is unpredictable and often produces unexpected benefits. Moreover, the most revolutionary technologies born in DoD S&T, like radar and GPS, can take as many as 20 years to reach operational use.

- Third, the impact of current D&A is less speculative than for S&T, but it is guesswork nonetheless. For example, during the first BRAC round in 1988 the Navy's experts might have said that the DoN's 1998 force structure (i.e., only 10 years later, *not 20*) would have had more than 850 A-12 Avengers streaming off the Fleet's carriers.[12] Things happen.

5. *BRAC Mistakes Cannot be Undone by the Private Sector*

- The DoD laboratories and centers are responsible for performing three roles: *performer* of long-term, high-risk projects; *quick responder* in crises; and *yardstick*,[13] a term referring to the standard that it sets by providing authoritative, objective advice to governmental decisionmakers. This latter role is critical to good government. The Federal 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."[14]

- Industry will not take on the full range of necessary work because many areas hold limited opportunities for profit. Specialized defense technologies often have little or no applicability to commercial products. Unlike the situation during World War II, or even the Vietnam era, the DOD market is now often too small to justify a significant investment of scarce 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.

- A healthy in-house system is a vital partner to a healthy industrial sector, and both are indispensable to our nation's defense. Given the different roles that each play, *major damage done to the in-house system cannot be compensated by a mere increased investment in the private sector.*

- In all BRAC actions, America depends on our ability to cut fat while avoiding muscle. To show the high cost of failure, a short timeline may be useful. Over the years, the in-house system invented:

    - the *first modern U.S. radar,* fielded in time for duty in the great Pacific naval battles of *World War II* where it contributed to crucial victories at Coral Sea, Midway, and Guadalcanal

[12] http://www.fas.org/man/dod-101/sys/ac/a-12.htm
[13] H. L. Nieburg, *In the Name of Science* (Chicago: Quadrangle Books, 1966).
[14] William J. Perry, *Required In-House Capabilities for Department of Defense Research, Development, Test and Evaluation* (Washington, DC: Department of Defense, 1980).

- the critical *synthetic lubricants* needed for the new gas-turbine engines of high-performance jet aircraft, warplanes that dominated the skies in the *Korean War*
- the *world's first intelligence satellite*, launched at the height of the *Cold War*, which reestablished surveillance of the Soviet Union less than two months after an American U-2 spy plane was downed
- the *anti-corrosion coating* that solved the new M-16's tendency to corrode and jam in the hot, humid conditions of the *Vietnam War*, helping to restore the infantry's faith in its primary weapon
- the first four satellite prototypes (and the first operational satellite) for what became *NAVSTAR GPS*, the revolutionary navigation system that played a pivotal role in the *Gulf War*
- the *night-vision technologies* and lethal *"Silver Bullet"* ammunition that made the tank battles of the *Gulf War* a "turkey shoot"
- the *ALE-50* that protected combat aircraft over *the Balkans*, a decoy so effective it earned the nickname "Little Buddy" from U.S. pilots
- the *thermobaric warhead* used for defeating the Taliban and terrorists in the mountain caves and tunnels of *Afghanistan*, and
- the *F/A-18 SHARP reconnaissance system* that provided real-time digital imagery (vice the 3-9 day norm) and was credited with saving lives in *Operation Iraqi Freedom*.

The calculus of BRAC is not difficult. Every dollar spent on unnecessary infrastructure robs our treasury and burdens our armed forces. Our first task is to determine whether that excess exists, and if it does, where it is and how much there is of it. Our second task is to assess the military value of the Services' corporate laboratories and warfare/product centers. Both tasks must be accomplished *objectively* and *accurately*, and they must be done *prior* to the generation of any closure scenarios. Lack of objectivity damages the defensibility of the work, which in turn jeopardizes any potential savings that can be used for our troops. Lack of accuracy damages the DoD's ability to provide new warfighting technologies, which in turn jeopardizes national security and the lives of tomorrows' troops.

Much rides on our decisions and actions, even more so than ten years ago. Our country is engaged in a prolonged struggle with an opportunistic, fanatical enemy who has unlimited apocalyptic goals and is not deterred by traditional means. We need to identify and collect any potential savings — and we need all of the technical options we can get.

Recommendation: The TJCSG should (1) reject the proposed contingency plan on the basis of its threat to the defensibility of our analytical process, and (2) simplify our approach to calculating excess capacity.

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

Final Resolution: *No Vote / No Action*

POC Signature: _____ Date: 11/11/04

CIT Chair: _____ Date: _____

ATTACHMENT D

MILITARY JUDGMENT: *NECESSARY — BUT NOT SUFFICIENT*
Issue #11-15-04-01

Issue: The Technical Joint Cross Service Group (TJCSG) has registered 29 closure / realignment scenarios on the Department's Scenario Tracking Tool.[1] But 20 months after the TJCSG's first deliberations in March 2003, and with the Cost of Base Closure and Realignment (COBRA) data calls set to launch in a matter of days — not one scenario is the output of the Linear Optimization Model (LOM), not one is driven by data on excess capacity, and not one reflects data-derived military value. *In short, not one scenario is the result of quantitative analysis.* All are instead the product of "military judgment."

Military judgment 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 process was designed to be *data-driven* for those very reasons, but it has drifted into one that will be, at best, *data-validated*, and at worst, *data-rationalized.* Without proactive measures, the scenarios will be difficult to defend before the BRAC Commission.

Point of Contact: Don DeYoung, Capabilities Integration Team (Alternate), U.S. Navy

Issue Summary

1. *Background*

Military judgment is a filter through which all closure / realignment proposals must pass in order to gauge their practicality and prudence. An extreme hypothetical example would be a scenario that would close Pearl Harbor. Military judgment would doubtless reject it on the grounds of strategic and tactical interests. Strictly speaking, however, *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, *technical* judgment. For simplicity, the phrase "expert judgment" will be used hereafter.

2. *Drifting Away From a Data-Driven Process*

After 20 months, we have not accomplished two critical requirements: (a) confirming the assertion that there is excess capacity within the DoD's in-house system (and if so, where and to what extent), and (b) determining a score for each sites' military value. Both sets of data are needed for the LOM.

As described in the issue paper, "Decision Criteria for Scenario Proposals," (dated 8 September), the LOM has two advantages. The first is as a decision-aid that limits the number of options produced from a very large universe of potential options. For example, given any 10 sites, there are 175 possible alternatives that close 1, 2, or 3 of them.[2] The second advantage is that *the LOM provides an objective means by which to defend our chosen few scenarios when so many other possibilities existed but were never considered.*

The drift away from a data-driven process began on 23 July with the request for notional scenarios by the Infrastructure Steering Group (ISG). The issue paper, "Notional Scenarios," (dated 28 July) 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

[1] The Infrastructure Steering Group set 1 November as the deadline for the "vast majority of scenarios declared by JCSGs and MilDeps" (ref: USD(AT&L) memo, subj: "BRAC 2005 Scenario Data Calls and Revised BRAC Timeline", 23 September 2004).
[2] DON IAT Briefing, "Proposed Optimization Methodology: Generating Alternatives."

military value and capacity data calls. In our 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. OSD also asserted that scenario development is "the front-end of the analytical process,"[3] which was a departure from its guidance, issued a year ago, that called it "the final step."[4]

One month after the ISG's request, the JCSGs began providing scenarios that identified "gainers" and "losers."[5] The TJCSG initially kept its scenarios at a general level, specifying only the impacted sites,[6] but soon followed suit when the ISG: (a) required that all JCSGs begin registering scenario proposals into the Scenario Tracking Tool by 20 September[7] and, (b) scheduled the TJCSG to brief its scenarios (with "gainers" and "losers") to the ISG on 1 October.[8]

The moment we produced our first scenarios without the benefit of capacity and military value data, we lost the right to call the TJCSG process data-driven. It instead became *judgment-driven.*

3. *Not Mission Impossible*

It is difficult to measure capacity and assign military values, and do it in time to run the LOM — but not impossible, especially in 20 months time. In fact, during BRAC-95, the Navy derived the necessary data and used the LOM to generate scenarios in 10 months' time,[9] in a process that was data-driven from start to finish. As a member of the Navy's BRAC-95 Base Structure Analysis Team, I can attest to that fact. The following items give more evidence of the sound, analytical nature of that process:

- During BRAC-95, the General Accounting Office (GAO) examined the closure process and decisions of each Service, including their capacity and military value analyses, and found that the Navy's data-driven process and recommendations were sound.[10]

- The DoD honored C. P. Nemfakos, the architect of the Navy process, as a "Defense Career Civilian of Distinction." His plaque, featured in the Pentagon's A-Ring exhibit, "Career Civil Servants in the Nation's Defense," states that he "oversaw the department's base closure process so effectively that his methodologies were adopted[11] by the GAO and the Base Realignment and Closure Commission."

Even BRAC-95's much criticized Laboratory and T&E cross-service studies took only 9 months to produce capacity data and military value rankings (though the military value scoring was flawed by some bizarre results in the T&E arena). The two studies even ran the LOM.

To be fair, ten years later, some profoundly different circumstances have had a significant effect on our current process. First and foremost, the Pentagon is fighting a war. There are three other causes for progress' glacial pace, of even greater effect than the first, but they lie outside the scope of this paper.

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[3] TJCSG Meeting Minutes of 30 July 2004
[4] USD(AT&L) memo, subj: "BRAC 2005 Guidance for the Technical Joint Cross-Service Group", 16 July 2003.
[5] Briefing to the Infrastructure Steering Group, 27 August 2004
[6] DDR&E memo, subj: "Technical Joint Cross Service Group (TJCSG) Notional Training Scenarios", 4 August 2004.
[7] USD(AT&L) memo, subj: "BRAC 2005 Scenario Data Calls and Revised BRAC Timeline", 23 September 2004.
[8] USD(AT&L) memo, subj: "Template and Briefing Schedule for BRAC 2005 Scenarios", 17 September 2004.
[9] BSAT memo RP-0445-F8, subj: "Report of BSEC Deliberations on 16 November 1994," 16 November 1994.
[10] GAO, "Military Bases: Analysis of DoD's 1995 Process and Recommendations for Closure and Realignment", p.87.
[11] Use of the word "adopted" is probably inaccurate, since neither the GAO of the Commission would have the occasion to employ these closure methodologies. Perhaps the word meant here was "endorsed."

4. *The Problem — Defensibility of Our Recommendations*

Lately, our process has been described as "strategy-driven,"[12] because the scenarios generated by that process conform to the TJCSG's overarching strategy. That strategy is to:

> "Reduce excess capacity and reduce the number of technical sites through combined Research, Development & Acquisition, Test & Evaluation Centers aligned for functional and technical efficiency and synergy."[13]

The epithet, "strategy-driven," while technically correct at a superficial level, is hard to support. For one, we have not proven there is any excess capacity to reduce, which is one objective of the strategy. The other is to reduce the number of sites in a way that aligns them for efficiency and synergy, but how does one align them successfully without objective data on their military value?

A strategy-driven process would be if we were reducing proven excess capacity while enhancing vertically integrated platform work, or co-locating a broad range of multidisciplinary sciences, at sites *shown by data to possess the best people, state-of-the-art facilities, and an established record of success in making scientific advances and creating new warfighting capabilities*. By contrast, realigning work to sites that merely have the most people working in what are large, wide-ranging technology areas (e.g., Sensors) is not strategy. It is expedience, at best.

Defensibility problems will almost certainly result from the belated use of data because our judgment-driven scenarios now have two sub-optimal futures. The best-case has them *data-validated*; and in the worst-case, *data-rationalized*. In either case, without corrective action, notions that we marshaled data to support preexisting judgments, or preferred outcomes, will be difficult to dispel.

5. *A Remedial Plan of Action*

(a) Consult Other DoD Studies

The TJCSG does not have a monopoly on expert judgment, so it will be difficult to explain why we did not calibrate with the findings of high-level expert panels — *especially those that, unlike our study, actually examined projects at the sites*. Fortunately, there is still time to use the expert judgment of other DoD panels as a solution to our problem.

The issue paper, "Decision Criteria for Scenario Proposals," proposed that we, where possible, assess each scenario for whether it conforms or conflicts with any judgment(s) of a DoD study, like those of the Service Science Boards, Tri-Service RDT&E Panels, or any other DoD/Federal board of scientific and engineering experts. Conformance to other panel findings would enhance the credibility of our judgment-driven scenarios. Conflicts with other findings, while not a show-stopper, should be cause for re-examination.

Some may claim this approach compromises objectivity because such studies can be biased (a legitimate concern), or that such information is not certifiable because it draws from sources outside the closure process. These arguments are not convincing for the following reasons:

[12] TJCSG Meeting Minutes of 25 October 2004.
[13] DDR&E Briefing to the Infrastructure Steering Group, "Technical Joint Cross Service Group (TJCSG): Strategy / Initial Scenarios," 1 October 2004.

- Other studies are unlikely to be any more subjective than our judgment-driven process. *The more objective studies will be those that examined the R&D work itself*, which we have not done.

- These would be official reports, authorized and approved by the DoD / Services. *If this information cannot be considered authoritative and certifiable, then why does the DoD continue to charter such studies — at considerable public expense — and provide them to Congress*?

- BRAC-05 will use — for the first time in five rounds — closure ideas proposed by private groups outside the Government, such as the Business Executives for National Security. Surely, *if private sector opinions can be used for generating scenarios, then the official findings of DoD chartered and approved studies, must be acceptable and certifiable.*

- The DoD IG determined, after our 2 December 2003 off-site, when we first began our work on military value, that the use of DoD studies would be auditable, and therefore defensible.

If we can show that other DoD studies made similar judgments to our own, then the credibility, and defensibility, of our proposals are improved. One study of potential use is the Tri-Service "Fixed-Wing Aircraft T&E Reliance Study." Another is the study by the National Defense University (NDU) on S&T in the areas of sensors, IT, and weapons (three areas we are examining). The NDU team included experts with impressive credentials: former Service Vice Chiefs (one was later appointed Chair of the Columbia Accident Investigation Board), former Commanders-in-Chiefs (one was later appointed as the President's Special Envoy to the Middle East), a former DDR&E and Secretary of the Air Force, experts from academia, former lab directors, and a former National Security Council Special Assistant to the President.

In short, *what rationale could be offered for why OSD entertained ideas from the private sector, even as the TJCSG ignored expert judgments made in DoD's own studies — many of which have been provided to Congress and the Secretary of Defense*?

(b) Derive Valid Military Value Scores — *ASAP*

Even if we decide to consult other DoD studies, the fact remains that judgment alone cannot substitute for the objective data necessary for deriving military value. In fact, OSD policy, established by the Deputy Secretary of Defense (DEPSECDEF), directs us to:

> "...determine military value through the exercise of military judgment *built upon a quantitative analytical foundation* (emphasis added)."[14]

Deriving scenarios, without the foundation of quantitative analysis, causes problems. First, *it ignores the DEPSECDEF's policy and risks compromising the integrity of the BRAC process.* It was for this reason, at the 3 November CIT meeting that I abstained from ranking the 31 proposed scenarios by their order of importance.[15] How can one make such determinations, in an objective way, without the analytical foundation provided by military value (MV) scores or capacity data?

The second problem is that *accurate MV scores are essential if we are to avoid closing, or realigning work from, sites that have greater value than ones we have selected to be the gainers.* Again, this situation was caused by developing scenarios before the MV scores were available to inform our selection of gainers and losers. The key task after deriving the scores will be to modify any defective scenarios as quickly as possible.

[14] DEPSECDEF memo, subj: "BRAC 2005 Military Value Principles", 3 September 2004.
[15] D. DeYoung, Memo to DoD IG, subj: "Decision to Abstain from Scenario Prioritization", 4 November 2004.

Complicating matters is the fact that the COBRA calls will be launched soon, well before the MV scores are finalized. This is likely to waste dollars, time, and effort. Each defective COBRA squanders resources in the following ways.

- COBRA calls are expensive. Based on the cost of an actual BRAC-95 COBRA call, my estimated cost of a BRAC-05 TJCSG COBRA call, affecting 7 sites, might be roughly $495,000.[16] Assuming 20-30 COBRA calls, the total price tag could range between 10 and 15 million dollars.

- COBRA calls are labor intensive. Based on an actual BRAC-95 COBRA call, a BRAC-05 TJCSG COBRA call, affecting 7 sites, may generate 375 pages of data.[17] Assuming 20-30 COBRA calls, the sub-groups may be swamped with between 7,500 and 12,000 pages of data. Analyzing this data and resolving the likely conflicts between "gainers" and "losers", especially the inter-service conflicts, will take time that is in short supply. *Of all phases in our process, this is the most likely to be a "showstopper"* (see issue paper, "Scenario Conflict Adjudication," dated 13 September).

- COBRA calls disrupt important work. Labs and centers perform critical missions, many in direct support of our armed forces in Iraq and Afghanistan, as well as the global war on terrorism. COBRA calls are major distractions and divert resources away from mission needs. *The fact that we are risking the launch of unnecessary and/or defective COBRA calls, due to a lack of objective data, after 20 months of work, is more than unfortunate. It is inexcusable.*

One last issue regarding military value is the question of, "what gets assigned a score?" — i.e., will it be a bin, a group of bins, or an organization? Confining the scores to individual bins makes the least sense because it does not conform to the synergistic nature of how good R&D is conducted. Moreover, our 39 bins do not have clean, mutually exclusive borders — both people and facilities are shared across multiple bins. A bin-to-bin analysis will lead to realignments of workload packets, which will *sever the connectivity of critical multidisciplinary projects and vertically integrated programs*. The way out of this box is to assign MV to groups of bins, or to more meaningful organizational units, such as an activity (e.g., laboratory or center).

(c) Simplify the Capacity Analysis

Every dollar spent on excess infrastructure robs our treasury and burdens our armed forces. Our first task was to determine whether that excess exists, and if it does, where it is and how much there is of it. As with military value, this task must be accomplished *objectively* and *accurately*, and should have been completed *prior* to the generation of any closure scenarios.

Reliable capacity data is still needed to confirm assertions made about the existence of excess capacity. After all, this was the primary reason given to justify another round of closures. Conventional wisdom after the 1995 closures held that substantial excess capacity remained. However the circumstances supporting that contention were profoundly altered by a foreign

[16] The BRAC-95 COBRA call expended 1-2 WYs of effort in 48 hours (plus a weekend) at the "losing" site. Assume the level to be 1.5 WYs, at a fully-burdened compensation rate of a GS-13, and then the "losing" site spent approximately $225K to respond. Then assume the "gaining" site expended 1/5 the effort, which is probably conservative, and the cost for that site was roughly $45 K, *making the total for the COBRA call approximately $270 K.* But, that was a scenario that involved only 2 sites. Our three "notional" scenarios would have affected 7, 9, and 9 sites respectively. Let us assume that our COBRA calls affect an average of 7 sites, with a conservative ratio of 1 "loser" and 6 "gainers" for each. By applying the response costs of $225 K for the "loser" and $45 K for each "gainer", *the estimated cost for each scenario might be $495 K.*

[17] The BRAC-95 COBRA call generated 165 pages of data from the "losing" site. Again, assuming the "gaining" site expended 1/5 of the effort, about 35 pages may have been produced for a total data call response of 200 pages. Again, assuming the TJCSG data calls affect an average of 7 sites, with a ratio of 1 "loser" to 6 "gainers", and the total amount of information might be roughly 375 pages.

attack on our homeland. As a result, (a) the nation's defense budget has risen (with an accompanying increase in DoD lab/center workload),[18] (b) serious Congressional consideration is being given to increasing the size of the force structure, and (c) there are urgent wartime challenges that require extensive levels of RDT&E, such as finding reliable ways to detect, from a distance, everything from conventional explosives, to bio-agents, to nuclear material.

The TJCSG's approach to determining capacity is overly complicated. It uses too many metrics of dubious value. One is square footage, which has problems best addressed in the issue paper, "Notional Scenarios." A second, Force Structure Adjustment (FSA), is especially relevant here because of its total reliance on judgment. As explained in the issue paper, "Proposed Contingency Plan" (dated 4 August 2004), the FSA is intended to account for any current capacity that may not be necessary in 2025. Our individual judgments were merged into a collective judgment by means of a Delphi session, but it is unclear how to defend pure speculation about the world 20 years from now. Needless to say, the FSA is not certified data.

To be blunt, the third metric — extramural funding — is absurd. First, dollars given to external organizations is not a measure of on-site capacity. If it were, DARPA, with nearly $2.7 billion in FY03, should have a sprawling infrastructure, but it occupies an office building.[19] Second, it injects private sector infrastructure into an analysis of the public sector's capacity. Funding that goes outside of an installation's fence-line is immaterial to BRAC. Third, the issue paper, "Proposed Contingency Plan," predicted that we would risk multiple counts of the same dollar as it is passed around different organizations at the same location. The prediction was right. At the 1 November CIT meeting, the Analytic Team reported that a roll-up of capacity measures was necessary in order to compare apples-to-apples, but that this will also ensure double-counting (or worse). The Team's proposal to use only intramural funding, which would eliminate both the multiple-counting and private sector issues, was not adopted.

A fourth metric, ACATs (both count and funding), is analytically unsound. ACAT programs exhibit large variances in cost and complexity. This leads to big differences in personnel, funding, and infrastructure requirements between programs — even at the same ACAT level. ACATs are much too imprecise as a means for measuring capacity. As a diagnostic tool, it is not unlike using an oven thermometer to decide whether your child has a fever.

We need to simplify our analysis. Work-years and test hours were sufficient in BRAC-95's Lab and T&E cross-service analyses. And, work-years alone got the job done in the Navy's BRAC-95 process; a process that the GAO endorsed. The solution is clear. Instead, we are proceeding with COBRA calls — *even though no excess capacity has been proven to exist.* We owe it to the field sites and to our nation's security to determine whether there is in fact any excess capacity, and if so, where and by how much. If we fail to meet that obligation, then we owe it to ourselves to start working on some plausible explanations for the Commission.

Conclusion

There is an enormous difference between a closure process that is *data-driven & validated by judgment* and one that is *judgment-driven & rationalized by data.* The first approach, after proving excess capacity does indeed exist, can yield fair outcomes that reduces infrastructure and preserves an in-house system that meets long-term national interests. The second approach can heighten the risk to America's security.

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[18] 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).
[19] http://www.darpa.mil/body/pdf/FY03BudEst.pdf

While we no longer have a data-driven approach, we may be able to avoid the pitfalls of the latter one. To do this we must first calibrate our judgment-derived scenarios against the findings of other defense studies. This will minimize the risk of errors in judgment and give our proposals more credibility. Then we need to validate those scenarios in two steps: use valid capacity data, derived through a simplified and more analytically sound process, to verify that there is excess capacity within the Department's system of labs and centers, and if such excess is proven, then use accurate MV scores, at a meaningful level of aggregation (e.g., organizations vice the artificial 39 bins) to make the best choices regarding "gainers" and "losers." Accomplishing less than those three steps will create unacceptable risks.

Much has been said about this BRAC being about transforming the Department for future threats. Much less is said about the fact that the very mission of the Department's laboratories and centers is one of constant transformation — both incremental and radical. Whatever we do in this BRAC, *their ability to make technical contributions to national security must be preserved.* One example is the contribution made by world-class chemists with the Navy's laboratory at Indian Head, Maryland, who developed and fielded the thermobaric weapon in only 67 days for use against al Qaeda and Taliban forces holed up in Afghanistan's mountain caves and tunnels. Another is that made by engineers with the Army's laboratory and test center at Aberdeen, Maryland and its Tank Automotive R&D center in Warren, Michigan, who developed and fielded, within two months, the Armor Survivability Kits that are now being rushed into Iraq to better protect U.S. ground forces.[20]

Another in-house ability that must be preserved is its role as a *yardstick*,[21] a term referring to the standard that it sets by providing authoritative, objective advice to governmental decisionmakers. This is critical to good government. The Federal 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."[22]

A lot rides on our actions, much more so than ten years ago. America is engaged in a prolonged struggle with an opportunistic, fanatical enemy who has unlimited apocalyptic goals and is not deterred by traditional means. We need to identify and collect any potential BRAC savings — and our country needs all of the technological options it can get.

Recommendations: The TJCSG should require that the sub-groups: (a) calibrate the proposed scenarios against the findings of other DoD studies; (b) use capacity data, derived through a simplified and more analytically sound process, to verify that there is excess capacity within the DoD in-house system, and if so, then (c) use MV scores, at a meaningful level of aggregation, to *validate* the scenarios and make the best choices regarding "gainers" and "losers."

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

Final Resolution: CIT Chair tasked Sub-Groups to assess proposed scenarios against the forthcoming final MV scores

POC Signature: _____ Date: 12/17/04

CIT Chair: _____ Date: _____

[20] RDECOM Magazine, "Vehicles in Iraq Go From Workhorse to Warrior with New Kits," February 2004.
[21] H. L. Nieburg, *In the Name of Science* (Chicago: Quadrangle Books, 1966).
[22] William J. Perry, *Required In-House Capabilities for Department of Defense Research, Development, Test and Evaluation* (Washington, DC: Department of Defense, 1980).

ATTACHMENT E

Reply Reply to all Forward Close Help

From: Shaffer, Alan, Mr, OSD-ATL [Alan.Shaffer@osd.mil] Sent: Tue 11/2/2004 6:08 AM

To: DeYoung, Don; Forlini-Felix, Marie, Ms, OSD-ATL; Strack Gary Mr SAF/IEBB; Crisp, Mike, Mr, OSD-DOT&E; 'sielcr@navsea.navy.mil'; Carroll, Tom B. CIV BRAC; '/O=ORGANIZATION/OU=WPAFB1/CN=RECIPIENTS/CN=HQAFMCCONTAINER/CN=EILEEN.WALLING'; 'brian.simmons@dtc.army.mil'; Castle Fred F Brig Gen AF/XP; 'james.e.hogan@navy.mil'; Huo, Chien Dr ASA(I&E); 'gschief@earthlink.net'; Schiefer, Gerald, CTR, OSD-ATL; '/O=ORGANIZATION/OU=PENTAGON/CN=NON-AUTH/CN=SMTP/CN=DOD-IG/CN=RFLORENCE'; 'peter.cahill@saalt.army.mil'; Potochney, Peter, Mr, OSD-ATL; Porth, Andrew, Mr, OSD-ATL; 'EvansSS@mcsc.usmc.mil'; 'stevek@amsaa.army.mil'; 'desalvapn@mcsc.usmc.mil'; 'joseph.hoeg@navy.mil'; Arnold Robert SES AF/TE; '/O=ORGANIZATION/OU=EGLIN/CN=RECIPIENTS/CN=ARNOLDB'; 'guardh@onr.navy.mil'; Jerome, David, Dr, OSD-DOT&E; '/O=ORGANIZATION/OU=OSD/CN=OSD-DOT&E CUSTOM RECIPIENTS/CN=DOTE IDA/CN=IRVB.IDA'; 'DillonBL@mcsc.usmc.mil'; '/O=ORGANIZATION/OU=WPAFB1/CN=RECIPIENTS/CN=HQAFMCCONTAINER/CN=DAN.STEWART'; 'foulkjb@hqda.army.mil'; Sega, Ronald, Dr, OSD-ATL; Erb, John J, CIV, JCS J4; 'cohenj@onr.navy.mil'; Durante Blaise SES SAF/AQX 'eileen.shibley@navy.mil'; Purgal, Aurora, CTR, OSD-ATL; Buckstad, Robert, COL, OSD-ATL; Short, James, Dr, OSD-ATL; '/O=ORGANIZATION/OU=WPAFB1/CN=RECIPIENTS/CN=HQAFMCCONTAINER/CN=RONALD.MAHN';

Cc: 'Alcosern@gao.gov'; Miner, John M CIV BRAC; Melone, James W. CDR BRAC CP6,9,900,34; 'MurrishH@gao.gov'; Florence, Roger H., OIG DoD; 'Eileen.Walling@wpafb.af.mil'; 'GTolis@ida.org'

Subject: Re: CIT Action Item

Attachments:

View As Web Page

Don:

A. Thanks for the concur
B. I appreciate the concern about "double counting"....I believe that this will be ultimately nuetral...and may be too late
C. You are absolutely correct about capacity being too complex....only part of me wishes we could start over. We can't. The amount of unneeded obfuscation through this process still troubles me

Through it all, you have been a voice of reason

Thanks

Al

Sent from my BlackBerry Handheld.

-----Original Message-----
From: DeYoung, Don <deyoungd@ndu.edu>
To: 'Forlini-Felix, Marie, Ms, OSD-ATL ' <Marie.Forlini-Felix@osd.mil>; 'Strack Gary Mr SAF/IEBB ' <Gary.Strack@pentagon.af.mil>; 'Crisp, Mike, Mr, OSD-DOT&E ' <M.Crisp@osd.mil>; "sielcr@navsea.navy.mil' ' <sielcr@navsea.navy.mil>; 'Carroll, Tom B. CIV BRAC ' <tom.carroll@navy.mil>; "Walling Eileen M Col HQ AFMC/XP' ' [EX:/O=ORGANIZATION/OU=WPAFB1/CN=RECIPIENTS/CN=HQAFMCCONTAINER/CN=EILEEN.WALLING]; "Brian Simmons (E-mail)' ' <brian.simmons@dtc.army.mil>; 'Castle Fred F Brig Gen AF/XP ' <Fred.Castle@pentagon.af.mil>; "james.e.hogan@navy.mil' ' <james.e.hogan@navy.mil>; 'Huo, Chien Dr ASA(I&E) ' <Chien.Huo@US.ARMY.MIL>; "gschief@earthlink.net' ' <gschief@earthlink.net>; 'Schiefer, Gerald, CTR, OSD-ATL ' <Gerald.Schiefer.CTR@osd.mil>; "Florence, Roger H., OIG DoD' ' [EX:/O=ORGANIZATION/OU=PENTAGON/CN=NON-AUTH/CN=SMTP/CN=DOD-IG/CN=RFLORENCE]; "peter.cahill@saalt.army.mil' ' <peter.cahill@saalt.army.mil>; 'Potochney, Peter, Mr, OSD-ATL ' <Peter.Potochney@osd.mil>; 'Porth, Andrew, Mr, OSD-ATL ' <Andrew.Porth@osd.mil>; "evansss@mcsc.usmc.mil' ' <evansss@mcsc.usmc.mil>; "stevek@amsaa.army.mil' ' <stevek@amsaa.army.mil>; "desalvapn@mcsc.usmc.mil' ' <desalvapn@mcsc.usmc.mil>; "joseph.hoeg@navy.mil' ' <joseph.hoeg@navy.mil>; 'Arnold Robert SES AF/TE '

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<Eileen.Walling@wpafb.af.mil>; "Tolis, George' ' <GTolis@ida.org>
Sent: Mon Nov 01 22:35:19 2004
Subject: CIT Action Item

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RELEASE UNDER FOIA

Al,

As you requested at today's CIT meeting, I've reviewed the Analytic Team's
briefing on rolling up MilVal.

(1) Rolling up the MilVal scores is necessary, and the approach Steve
Kratzmeier presented was logical and practical. I vote to proceed.

(2) As noted on p.3, the Analytic Team also finds a roll-up of capacity
measures necessary in order to compare apples to apples. Predictably, this
presents a problem with regard to doubling-counting the same dollars, or
worse. I had concerns about this in early August and went on record with my
misgivings in the issue paper, "Contingency Plan" (dated 4 August).

Our approach to capacity analysis is overly complicated. Work-years and
test hours were sufficient to do the job in BRAC-95's Lab and T&E
Cross-Service analyses. And work-years alone were used by the Navy's
BRAC-95 process; a process that the GAO endorsed.

Square footage is a dubious metric for reasons better explained in the issue
paper, "Notional Scenarios" (dated 28 July).

The Force Structure Adjustment (FSA) is pure speculation over a 20-year time
period, and therefore not certifiable.

Extramural funding injects private sector infrastructure into a capacity analysis of the public sector. And, by using dollars sent from one DoD organization to another, we are ensuring double-counting (or worse) of the same dollar when it is passed around different organizations at the same location.

Finally, using ACATs as a measure of capacity is much too imprecise. Here we've chosen a diagnostic tool that's not unlike using an oven thermometer to decide whether your child has a fever.

I still believe we need to simplify our approach. One of the two justifications for the BRAC-05 round (the other being transformation) is to reduce purported excess capacity to save money. We owe it to the field sites and to our nation's security to determine whether there is in fact any excess capacity, and if so, where and by how much. If we fail to meet that obligation, then we owe it to ourselves to start working on some plausible explanations for the Commission.

vr/

Don DeYoung
CIT Alternate, U.S. Navy

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ATTACHMENT F

DRAFT – Input from RADM Jay M. Cohen

I. Functions Under JCSG's Scope

A. Corporate Science & Technology (all work, regardless of budget category, conducted and performed by the Services' Corporate Laboratories: ARL, NRL, and AFRL)
B. Air Platforms (includes air-breathing propulsion systems)
C. Space Science and Technology
D. Chem/Bio Defense, Biomedical, Human Systems
E. Sensors (excludes on-board missile sensors), Electronics, Electronic Warfare Systems
F. Information Systems / C3I
G. Battlespace Environment – Characterization & Mitigation (includes Oceanography, Atmospheric Sciences, Materials, Plasma Physics, Acoustics)
H. Weapon Systems (includes on-board missile sensors and propulsion systems), Energetic Materials
I. Nuclear Technology / Counterproliferation
J. Ground Vehicles
K. Sea Vehicles

II. Functions Selected for JCSG Analysis — Functions A through I above are selected for analysis.

III. Functions Excluded From JCSG Analysis

A. Ground Vehicles. This is not a "common business-oriented support function" that is conducted across two or more Services. The U.S. Army is responsible for developing and acquiring ground vehicles. The U.S. Marine Corps relies on the U.S. Army for this function.
B. Sea Vehicles. This is not a "common business-oriented support function" that is conducted across two or more Services. The U.S. Navy is responsible for developing and acquiring sea vehicles and is the sole user of such systems.

IV. Organizational Structure

A. Establish a Working Group (WG) for each of the 9 selected functional areas (see Section I, A through I)
B. Appoint a WG Lead from the Service having the largest number of in-house work-years (WYs) within the subject functional area. In-house WYs are to be civil servants, not private contractors. *Rationale*: The objective of BRAC is the elimination of excess DoD-owned infrastructure, not private sector infrastructure. The number of in-house scientists and engineers (S&Es) performing work in a given functional area is *directly related* to the amount of infrastructure. On the other hand, funding (budget or actual) is not directly related to DoD-owned infrastructure. Therefore, it does not conform to the BRAC objective and should not be the criteria used for IV B. Furthermore, in-house WYs are easily quantifiable and can meet the high verification standards of the BRAC process, which are intended to ensure decisions are made on a "fair and equitable" basis. Funding (budget or actual) does not meet that rigorous standard.

V. JCSG's Analytical Approach

A. Overall Approach.

1. By functional area, quantify each Services' level of effort (in terms of in-house WYs) in order to select WG Lead.
2. Select two analysts from each of the Service BRAC offices for each of the 9 JCSG WGs.
3. WGs develop Capacity and Military Value metrics.
4. Capacity and Military Value metrics are reviewed and approved by JCSG.
5. WGs perform Capacity analyses.
6. Capacity analyses are reviewed and approved by JCSG.
7. WGs perform Military Value analyses.

8. Military Value analyses are reviewed and approved by JCSG.
9. WGs perform Configuration analyses
10. Configuration analyses are reviewed and approved by JCSG.
11. JCSG develops scenarios. In the development of scenarios, two organizational types will be assessed separately: Corporate Laboratories and Product Centers. Scenarios will therefore compare Corporate Laboratory to Corporate Laboratory, and Product Center to Product Center. *Rationale*: It makes no practical sense to compare organizations that fundamentally differ by mission, role, type of work, mix of funding, culture, type of technical personnel, metrics of mission success, etc. Note that "T&E" and "Ranges" are not identified separately for analysis. "Big T&E", or range tests, are conducted at MRTFB Ranges, present at some Product Centers. "Little T&E", or modeling and simulation, is an adjunct to R&D and is present at Corporate Laboratories and Product Centers.
12. The scenario's "Losing" Service BRAC office performs the return-on-investment (ROI). The rationale is that the Service BRAC office will have the data access and COBRA expertise. More importantly, removing the "Gaining" Service will reduce the potential for, or the perceptions of, impropriety in the analysis. This also conforms to the process used by previous BRACs.
13. Service BRAC ROI results are reviewed by the WGs and approved by the JCSG.
14. "Losing" Service BRAC office assesses Community, Economic, and Environmental Impacts. The rationale is the same for #12.
15. Impact results are reviewed by the WGs and approved by the JCSGs.
16. JCSG develops recommendations.
17. JCSG writes report and submits it to the Infrastructure Steering Group.

B. Notional Metrics. Metrics will be grouped by the 2 organizational types: Corporate Laboratory and Product Center

1. Corporate Laboratory Metrics: Number of PhDs (not to include PhDs working in extramural program); number of external national scientific and technology awards (e.g., Collier Trophy, etc); number of individual national awards/recognition (e.g., National Medal of Science, NAS/NAE Fellows, IEEE fellows etc); number of papers published in refereed journals; number of citations; number of U.S. Patents granted; frequency of work cited in U.S. Patents (an indication of actual impact on U.S. competitiveness); number of CRADAs and licenses granted; level of funding provided from Services, other than parent Service, and other DoD sponsors; published technical assessments by reputable organizations (NAS/NAE, DSB, NDU, etc); level of funding provided by, and/or impact of projects performed for, Department of Homeland Security/White House Office of Homeland Security; and documented impact (from verifiable sources) on DoD mission, national competitiveness, and scientific and technological advancement (e.g., selection of technology as a national standard).

2. Product Center Metrics: Number of product transitions into field use; number of U.S. Patents granted; number of CRADAs and licenses granted; level of funding provided from Services, other than parent Service, and other DoD sponsors; level of funding provided by and/or impact of projects performed for Department of Homeland Security/White House Office of Homeland Security; impact on DoD mission (e.g., thermobaric bomb); published technical assessments by reputable organizations (NAS/NAE, DSB, NDU, etc); number of external national technology awards; number individual national awards/recognition (e.g., IEEE fellows); test range environmental threat metrics (e.g., threat to endangered species); test range encroachment metrics (e.g., population density 10, 20, 50, 100 miles from explosive testing); test limitations (e.g., maximum explosive test permitted on range); and test range maximum capability metrics (e.g., square miles of restricted airspace (not to include warning areas), land range, and sea range controlled or managed by the Product Center to perform its tests; maximum explosive test ever conducted and date of test; specialized capabilities (e.g., cat/trap launch).

ATTACHMENT G

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,"

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[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

[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.

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[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

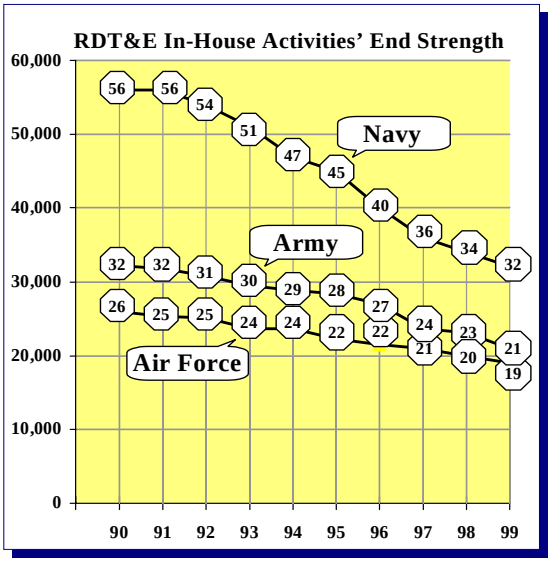
A Presentation to the Navy Laboratory/Center Coordinating Group

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

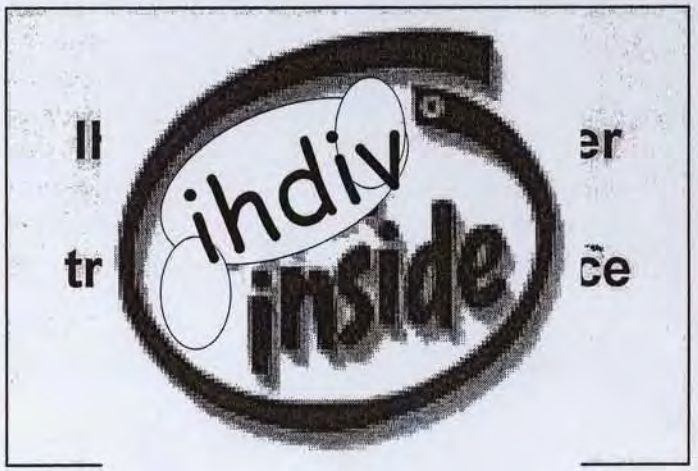
N-5 (Livermore) - APOBS, SM-80 ERGM, LAW, STD Missile Initiator, ERGM,, Hellfire Booster
AFX-757 (EGLIN) - JASSM
N-112 (CL) - SLAM-ER, 76MM Projectile
N-107 (CL) - Harm, Tomahawk
N-7 (IH) - MK50 Torpedo, MK98 MND, Quickstrike, RAW
N-8 (IH) - APOBS, SABRE
N-9 (IH) - 5/54" Projectile, JASSM, APOBS, LAW, 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 of Naval Research Laboratory (NRL) the draft message, provided by reference (b), is acceptable if paragraph 3c is changed to read as follows:

> "ONR - REAL PROPERTY AND BOS FUNCTIONS EMBEDDED 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)

ATTACHMENT H

United States Senate
COMMITTEE ON ARMED SERVICES
WASHINGTON, DC 20510–6050

July 21, 2005

The Honorable Gordon England
Acting Deputy Secretary of Defense
1010 Defense Pentagon
Washington, DC 20301-1010

Dear Mr. Secretary:

On June 30, 2005, my office requested six issue papers authored by Mr. Don DeYoung, the Navy CIT Alternate to the Technical Joint Cross Service Group (see attached). This request has been repeated twice by my office and twice by the Senate Armed Services Committee over the past three weeks.

As you know, section 2903(c)(4) of the Title 10, United States Code requires the Department to provide to the Congress and Commission all information used by the Secretary to prepare his Base Realignment and Closure (BRAC) recommendations. The integrity of the BRAC is based in large measure upon an open process where all information is made available to ensure that the best decisions are made for the American taxpayers and our men and women in uniform.

Given the short time frame that the Congress and the Commission have available to review the Secretary's recommendations, it is important that requested information be provided in an expeditious manner. I would appreciate your immediate attention to this matter and the prompt transmittal of the requested documents, and all other BRAC related papers written by Mr. DeYoung, by Monday, July 25, 2005.

With kind regards, I am

Sincerely,

John Warner
Chairman

ATTACHMENT I

DEPUTY SECRETARY OF DEFENSE

1010 DEFENSE PENTAGON
WASHINGTON, DC 20301-1010

JUL 25 2005

The Honorable John Warner, Chairman
Committee on Armed Services
United States Senate
Washington, DC 20510-6060

Dear Mr Chairman:

This is in reply to your letter requesting issue papers authored by a member of the Navy's support staff to the Technical Joint Cross-Service Group.

The information requested was provided to Mr. Cord Sterling in a letter signed by Mr. Al Shaffer, the Executive Director of the Technical Joint Cross-Service Group. I have attached that correspondence. As indicated in Mr. Shaffer's response, these papers represent the views of the individual analyst, not those of the Technical Joint Cross-Service Group.

I apologize for the delay in getting this material to your office.

Sincerely,

ACTING

Enclosure: as stated

OFFICE OF THE DIRECTOR OF
DEFENSE RESEARCH AND ENGINEERING
3040 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-3040

JUL 22 2005

Mr. Cord Sterling
Office of Senator John W. Warner
United States Senate
Washington, DC 20510-0001

Dear Mr. Sterling:

This letter responds to your request for issue papers. The response includes a review of your request, a summary of the Technical Joint Cross Service Group (TJCSG) use of issue papers, and an issue status. Your request follows.

> It is my understanding that there are a number of issue papers authored by Don DeYoung, the Navy Capabilities Integration Team (CIT) Alternate, Technical Joint Cross Service Group (TJCSG). Would you please provide the following:
>
> - July 28, 2004 - regarding: Notional Scenarios
> - August 4, 2004 - regarding: Proposed Contingencies
> - September 8, 2004 - regarding: Decision Criteria for Scenario Proposals
> - September 13, 2004 - regarding: Scenario Conflict Adjudication
> - November 4, 2004 - memo to Inspector General: Decision to Abstain from Scenario Prioritization
> - December 23, 2004 - regarding: Scenario Inconsistencies

The requested papers are attached, however, these papers are individual working papers and were not deliberated and agreed to by the TJCSG or even the Capabilities Integration Team. The TJCSG used issue papers to ensure open communications among its membership and to provide an orderly way to address concerns. Further, the issue papers represent a single person's position at a point-in-time. Many of the concerns raised in these papers were subsequently addressed and in some cases, changes made.

Status of issue follows.

July 28, 2004 – "Notional Scenarios." The TJCSG did not vote on the proposed recommendation. No action was taken because the Department of Defense directed all seven of the Joint Cross Service Groups to create notional scenarios for training and assessing the Base Realignment and Closing scenario evaluation process.

August 4, 2004 – "Proposed Contingencies." The TJCSG did not vote on the proposed recommendation. No action was taken because no contingency plan was necessary.

September 8, 2004 – "Decision Criteria for Scenario Proposals." The TJCSG did not vote on the proposed recommendation and no action was taken. The Capabilities Integration Team (CIT) meeting, September 9, 2005, defined additional factors used by the TJCSG to evaluate candidate recommendations.

September 13, 2004 – "Scenario Conflict Adjudication." The TJCSG did not vote on the proposed recommendation. Action was not deemed necessary.

November 4, 2004 – Memorandum to Inspector General, "Decision to Abstain from Scenario Prioritization." This paper reflects an individual position and does not reflect the TJCSG's position. Since the Analysis Team had not yet completed the quantitative Military Value calculations, the TJCSG did not yet have Quantitative Military Values at that time. However, the TJCSG, through the use of subject matter experts, derived scenarios using expert military judgment by applying the Military Value Principles as outlined in the September 3, 2004 memo from the Deputy Secretary of Defense, subject: BRAC 2005 Military Value Principles. The scenario prioritization process was used to manage subsequent workload. Once the Analysis Team completed the Military Value calculations, all scenarios were specifically revalidated using the calculated quantitative military value. Ultimately, both the Quantitative Military Value and Qualitative Military Value were used as the primary consideration for all TJCSG candidate recommendations.

December 23, 2004 – "Scenario Inconsistencies." The CIT Chairman required several reviews of TJCSG scenarios to prevent inconsistencies and improve scenario quality. Finally, the TJCSG Principals reviewed all formal recommendations prior to their final submittal to ensure consistency; lastly, all recommendations then were reviewed by OSD General Counsel to ensure consistently with statute.

Thank you for the opportunity to address your concerns. If you have any further concerns or questions, please contact me.

Sincerely,

Alan R. Shaffer
Executive Director
Technical Joint Cross Service Group

Enclosures:
As stated.

ATTACHMENT J

Reply Reply to all Forward Close Help

From: [redacted]

Sent: Mon 5/16/2005 12:47 PM

To: Short, James, Dr, OSD-ATL; Stewart Dan (Daniel.Stewart@wpafb.af.mil); (DillonBL@mcsc.usmc.mil); Shaffer Alan (shafaj@aol.com); Simmons Brian (brian.simmons@dtc.army.mil); Erb, John J, CIV, JCS J4; 'Cohen, Jay' Drake, Martin, CAPT, OSD-ATL; Knollmann, Michael, Mr, OSD-ATL; (DesalvaPN@mcsc.usmc.mil); Buckstad, Robert, COL, OSD-ATL; Castle Fred F Brig Gen AF/XP; Desalva, Peter N Col BRAC; DeYoung @ NRL (deyoung@utopia.nrl.navy.mil); DeYoung, Don; Evans Stephen (evansss@mcsc.usmc.mil); Evans, Steven S

Cc: Col BRAC; Forlini-Felix, Marie, Ms, OSD-ATL; Goldstayn Alan (alan.goldstayn@arnold.af.mil); Hamm, Walter B. Col BRAC; Rohde, Robert (robert.rohde@saalt.army.mil); Ryan, George R CIV; Strack Gary Mr SAF/IEBB; Schuette Lawrence (schuette@nrl.navy.mil); (MathesT@tacom.army.mil); Mleziva Matt (matt.mleziva@hanscom.af.mil); Berry, Bill (William.Berry@osd.mil); Higgins Karen (karen.higgins@navy.mil)

Subject: Steamlined TJCSG Report

Attachments:

View As Web Page

See TJCSG portal: TJCSG principal working folder/documents/TJCSG Final Report

TJCSG Principals,

At the reference above you will find a pdf document which includes the TJCSG report as Dr. Sega's proposes to release it to the Commission, perhaps today. The version we release today needs to be a public releasable document.

The vast majority of appendix A is gone (all but 13 pages). He asks the opinion of his TJCSG colleagues as to whether this document is just right or whether even less should be released to the public or if removed parts of Appendix A are releasable to the worldwide public and therefore should be reinserted..

Dr. Sega has concerns that the aggregated list of 282 locations should be FOUO. He has concerns that the aggregation of work years, test hours and building information should be classified. The mention of technologies which may be important in the future might be controlled information too. He solicits the advice of the Principals concerning the specific classification of each section of Appendix A being withheld.

The remainder of Appendix A will be offered to the Commission with the appropriate classification markings.

ATTACHMENT K

Reply Reply to all Forward Close Help

From: Shaffer, Alan, Mr, OSD-ATL [Alan.Shaffer@osd.mil] Sent: Tue 4/26/2005 2:16 PM

To: DeYoung, Don; "'Goldstayn Alan B Civ AEDC/CD ' '; Castle Fred F Brig Gen AF/XP; Forlini-Felix, Marie, Ms, OSD-ATL; Strack Gary Mr SAF/IEBB; Crisp, Mike, Mr, OSD-DOT&E; ""sielcr@navsea.navy.mil ' ' ' ' '; Carroll, Tom B. CIV BRAC; "'Walling Eileen M Col HQ AFMC/XP ' ' '; ""Brian Simmons (E-mail) ' ' ' ' '; ""james.e.hogan@navy.mil ' ' ' ' '; Huo, Chien Dr ASA(I&E); ""gschief@earthlink.net ' ' ' ' '; Schiefer, Gerald, CTR, OSD-ATL; Florence, Roger H., OIG DoD; ""peter.cahill@saalt.army.mil ' ' ' ' '; Potochney, Peter, Mr, OSD-ATL; Porth, Andrew, Mr, OSD-ATL; ""evansss@mcsc.usmc.mil ' ' ' ' '; ""stevek@amsaa.army.mil ' ' ' ' '; ""desalvapn@mcsc.usmc.mil ' ' ' ' '; ""joseph.hoeg@navy.mil ' ' ' ' '; Arnold Robert SES AF/TE; "'Arnold Robert J Civ 46 TW/CA ' '; ""guardh@onr.navy.mil ' ' ' ' '; Jerome, David, Dr, OSD-DOT&E; ""Boyles, Irv, CTR, IDA ' ' ' ' '; ""Barry Dillon (E-mail) ' ' ' ' '; "'Stewart Daniel J SES HQ AFMC/CD ' ' '; ""Dr. John Foulkes ' ' ' ' '; Sega, Ronald, Dr, OSD-ATL; Erb, John J, CIV, JCS J4; ""RADM Jay Cohen ' ' ' ' '; Durante Blaise SES SAF/AQX; Berry, William, Dr, OSD-ATL; ""Karen Higgins ' ' ' ' '; ""Larry Schuette ' ' ' ' '; Mleziva Matt Ctr SAF/AQX; ""Thom Mathes ' ' ' ' '; ""Dr. Bob Rohde ' ' ' ' '; Shaffer, Alan, Mr, OSD-ATL; Ryan, George R CIV; Hamm, Walter B. Col BRAC

Cc: ""Eileen Shibley (E-mail) ' ' ' ' '; Purgal, Aurora, CTR, OSD-ATL; Buckstad, Robert, COL, OSD-ATL; Short, James, Dr, OSD-ATL; "'Mahn Ronald L Maj HQ AFMC/XPX ' ' '; ""Alcosern@gao.gov ' ' ' ' '; Miner, John M CIV BRAC; Melone, James W. CDR BRAC CP6,9,900,34; ""MurrishH@gao.gov ' ' ' ' '; ""stevek@amsaa.army.mil ' ' ' ' '; Florence, Roger H., OIG DoD; "'Walling Eileen M Col HQ AFMC/XP ' ' '

Subject: RE: Issue Paper: "Defending the Technical Infrastructure Proposal s of BRAC-05"

Attachments:

View As Web Page

Don: Very interesting paper--but also a little troubling.

- I think, at an academic level, the paper raises some valid points. Some is opinion (the extolled virtues of Indian Head, for instace) seemed to have a great deal of hyperbole.

- Now the troubling part. Your first four recommendations come back around to running the LOM. That train has left the station. The ISG directed a strategy driven process, which is what we delivered. I do not agree that the TJCSG did not use data to generate CR's--we did. Even if we ran the LOM, I am not sure what we would do with the data now. It is 20 days until the report is delivered. The final report is being coordinated.

- Ref the other stuff about keeping NRL separate from the "super operating bases"; Fundamentally, I do not agree with your assertion that the operating Navy can't operate with NRL as a tenent. Labs are sound and healthy throughout the Depratment at locations where the lab is not the base owner. I cant' support your recommendation

- More significantly, I can't support the paper becoming part of the deliberative record, unless brought forward by the Navy principal.

You raise a number of sound points--but also poke ourselves in the eye for shortcomings....yes, capacity is an issue--but the reality is we have excess capacity at present--so it is ok to cut. Yes, MV is an issue; yes not runnign LOM is an issue.....but

BUT YES, WE ARE OUT OF TIME, and I believe we have done the best we can.

I think we are now trying to streamline and fix.

Best

Alan R. "Al" Shaffer
Director, Plans and Programs
ODDRE
(703) 695-9604

-----Original Message-----
From: DeYoung, Don [mailto:deyoungd@ndu.edu]
Sent: Monday, April 25, 2005 3:04 PM
To: "'Goldstayn Alan B Civ AEDC/CD ' '; "'Castle Fred F Brig Gen AF/XP ' '; ""Forlini-Felix, Marie, Ms, OSD-ATL ' ' ' '; "'Strack Gary Mr SAF/IEBB ' '; ""Crisp, Mike, Mr, OSD-DOT&E ' ' ' '; ""sielcr@navsea.navy.mil ' ' ' '; ""Carroll, Tom B. CIV BRAC ' ' ' '; "'Walling Eileen M Col HQ AFMC/XP ' '; ""Brian Simmons (E-mail) ' ' ' '; ""james.e.hogan@navy.mil ' ' ' '; ""chien.huo@us.army.mil ' ' ' '; ""gschief@earthlink.net ' ' ' '; ""Schiefer, Gerald, CTR, OSD-ATL ' ' ' '; ""Florence, Roger H., OIG DoD ' ' ' '; ""peter.cahill@saalt.army.mil ' ' ' '; ""Potochney, Peter, Mr, OSD-ATL ' ' ' '; ""Porth, Andrew, Mr, OSD-ATL ' ' ' '; ""evansss@mcsc.usmc.mil ' ' ' '; ""stevek@amsaa.army.mil ' ' ' '; ""desalvapn@mcsc.usmc.mil ' ' ' '; ""joseph.hoeg@navy.mil ' ' ' '; "'Arnold Robert SES AF/TE ' '; "'Arnold Robert J Civ 46 TW/CA ' '; ""guardh@onr.navy.mil ' ' ' '; ""Jerome, David, Dr, OSD-DOT&E ' ' ' '; ""Boyles, Irv, CTR, IDA ' ' ' '; ""Barry Dillon (E-mail) ' ' ' '; "'Stewart Daniel J SES HQ AFMC/CD ' '; ""Dr. John Foulkes ' ' ' '; ""Sega, Ronald, Dr, OSD-ATL ' ' ' '; ""Erb, John J, CIV, JCS J4 ' ' ' '; ""RADM Jay Cohen ' ' ' '; "'Durante Blaise SES SAF/AQX ' '; ""Berry, William, Dr, OSD-ATL ' ' ' '; ""Karen Higgins ' ' ' '; ""Larry Schuette ' ' ' '; "'Mleziva Matt Ctr SAF/AQX ' '; ""Thom Mathes ' ' ' '; ""Dr. Bob Rohde ' ' ' '; ""Shaffer, Alan, Mr, OSD-ATL ' ' ' '; ""Ryan, George R CIV ' ' ' '; ""Hamm, Walter B. Col BRAC ' ' ' ' '
Cc: DeYoung, Don; ""Eileen Shibley (E-mail) ' ' ' '; ""Purgal, Aurora, CTR, OSD-ATL ' ' ' '; ""Buckstad, Robert, COL, OSD-ATL ' ' ' '; ""Short, James, Dr, OSD-ATL ' ' ' '; "'Mahn Ronald L Maj HQ AFMC/XPX ' '; ""Alcosern@gao.gov ' ' ' '; ""Miner, John CIV BRAC ' ' ' '; ""Melone, James W. LCDR BRAC CP6,9,900,34 ' ' ' '; ""MurrishH@gao.gov ' ' ' '; ""stevek@amsaa.army.mil ' ' ' '; ""Florence, Roger H., OIG DoD ' ' ' '; "'Walling Eileen M Col HQ

AFMC/XP ' ' '
Subject: Issue Paper: "Defending the Technical Infrastructure Proposals of BRAC-05"

DRAFT DELIBERATIVE DOCUMENT - FOR DISCUSSION PURPOSES ONLY - DO NOT RELEASE UNDER FOIA

Al Shaffer, CIT Chair

I have uploaded issue paper #04-23-05-0 to the portal's folder for Issue Papers.

It examines the process and proposals of the TJCSG to: gauge how well they satisfy the goals of BRAC-05, 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. Recommendations are provided to address the problems and enhance the defensibility of those TJCSG proposals passing the more rigorous review advocated by the paper.

vr/

Don DeYoung
CIT Alternate, U.S. Navy
TJCSG

Senior Research Fellow
Center for Technology and National Security Policy
National Defense University

deyoungd@ndu.edu
202-528-9687

DRAFT DELIBERATIVE DOCUMENT - FOR DISCUSSION PURPOSES ONLY - DO NOT RELEASE UNDER FOIA

ATTACHMENT L

DECISION CRITERIA FOR SCENARIO PROPOSALS
Issue # 07-30-04-05

Issue: Scenario proposals will be developed from: (1) ideas proposed by OSD,[1] the MILDEPs, and the TJCSG, and (2) options generated by the Linear Optimization Model. To become closure / realignment scenarios, all options must be systematically evaluated for effectiveness and feasibility. This paper proposes some criteria to assist in that evaluation process and to help provide an "audit trail" to support each decision. Candidate scenarios that pass through this decision filter are eligible to become, with ISG approval, scenarios for COBRA (Cost of Base Realignment Actions) analysis.

Point of Contact: Don DeYoung, Capabilities Integration Team (Alternate), U.S. Navy

Issue Summary:

(a) *Background*

- Options generated by the Linear Optimization Model (LOM) are filtered by quantitative parameters, such as excess capacity and military value. The LOM has two advantages. The first is that a limited number of options are produced from a large universe of potential options. For example, given 10 sites, there are 175 alternatives that close 1, 2, or 3 sites.[2] The second advantage is that *it provides an objective means by which to defend the selected set of scenarios*. The disadvantage is that it does not provide "answers", but instead serves as a decision aid.

- Transformational options (i.e., those developed by the military judgment of the OSD, MILDEPs, and TJCSG) are limited only by imagination, which is appropriate for an innovative endeavor. *The advantage of deriving options in this manner is the potential for transformational payoff. The disadvantage lies in the difficulty we will have justifying our selected set of candidate recommendations when a much larger universe of potential options was not considered.*

- The above problem is compounded by the ISG's request for notional scenarios (for which some JCSGs have identified "winners"and "losers")[3], and its requirement that the JCSGs begin to register recommendations in September. Unfortunately, the TJCSG's actions to develop candidate scenarios began well before the military value data was received from the sites, and before the excess capacity and military value of each site was calculated.

(b) *The Decision Metrics*

- Keeping in mind the requirement "to provide a fair process"[4], both the LOM-generated and transformational options must be evaluated by the same decision criteria. Each option, however it is derived, can be evaluated by decision criteria grouped in two sets: those for *effectiveness* and for *feasibility*.

---

[1] Along with the closure scenarios that it formulates independent of the TJCSG process, OSD also solicited transformation options from the private sector (e.g., Business Executives for National Security) in August 2003.
[2] DON IAT Briefing, "Proposed Optimization Methodology: Generating Alternatives."
[3] Briefing to the Infrastructure Steering Group, 27 August 2004
[4] Public Law 101-510, as amended through the National Defense Authorization Act of Fiscal Year 2003, SEC. 2901. (b)

- Decision criteria for effectiveness are:
  - Do the components of the option possess the required workforce skill set and expertise?
  - Do the components of the option possess the required physical plant and scientific / engineering equipment?
  - Do the components of the option have an established track record of success? If not, does the gaining site have adequate technical and acquisition talent in a related technical area?
  - Do the components of the option possess an average military value equal to or greater than that of the original configuration? If not, is the decrease justifiable in military and economic terms?
  - Can the components of the option satisfy DoD required capacity (based upon their demonstrated historical peak capacity)?
  - Does the option increase or decrease synergy?
  - Does the option have the potential to increase interoperability or "jointness" of systems delivered to the warfighter?
  - Does the option decrease unwarranted duplication, or does it diminish a needed capability?
  - Does the option degrade or improve Life Cycle Management?
  - Does the option conform or conflict with any finding(s) or proposal(s) of the Defense Science Board, Service Science Board, Tri-Service RDT&E Panel, or any other DoD/Federal board of scientific and engineering experts? (See note[5])
  - Does the option increase average intellectual capital? (See note[6])

- Decision criteria for feasibility are:
  - Does the installation proposed for a consolidated mission have sufficient FTEs to perform the work or can sufficient FTEs be obtained from local industry or academic partners?
  - Does the installation proposed for a consolidation mission provide all of the essential physical conditions (e.g., weather, geography) essential to the conduct of the new mission element?
  - Does the installation proposed for a consolidated mission possess sufficient physical space (i.e., available square footage) and/or buildable acres to accommodate the workload? If not, is leased space an option?

- The above decision criteria are not "go/no-go" litmus tests. Instead, they are intended to be an objective and uniform way for us to make informed judgments about which of the potentially many candidate recommendations become COBRA data calls. Further, the criteria will not require exact answers, just some preliminary thought and judgment. Some of the required data will be more accurately derived by the COBRA data calls.

(c) *The Decision Metrics and COBRA*

- Some will argue that many, if not all, of the above criteria are unnecessary because (1) military judgment (unbounded by objective criteria) is sufficient to select the best COBRA data calls, and (2) those data calls will provide much of the above information. There are three problems with this argument.

---

[5] The TJCSG does not have a monopoly on expert military judgment. It would therefore be difficult to explain why we chose not to address the findings and proposals of other high-level expert panels — *especially those that, unlike our study, actually examined and evaluated the work of the sites.*

[6] This criterion is particularly critical. Exceptional talent is an indicator of the other important parameters. For example, 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 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.*

- Problem #1: COBRA calls are expensive. Based on the cost of one real-life BRAC-95 COBRA call, the estimated cost of the average BRAC-05 TJCSG COBRA call might be roughly $495,000.[7] That estimate is likely conservative. Assuming 20-40 COBRA data calls, which is the range most often mentioned, and the total price tag would range between 10 and 20 million dollars.

- Problem #2: COBRA calls are labor intensive. Based on the real-life BRAC-95 COBRA call, an average BRAC-05 TJCSG data call may well generate 375 pages of data.[8] Again, assuming 20-40 COBRA data calls, the sub-groups may be swamped with between 7,500 and 15,000 pages of data that will need to be *analyzed, addressed, and adjudicated* (see Issue Paper #07-16-04-05 titled "Scenario Conflict Adjudication"). Sorting through this information will take time that is in very short supply.

- Problem #3: Supportable BRAC actions require analytical rigor. A failure to show how we objectively selected the relatively few COBRA data calls, among all the various options possible, will place our efforts at risk during the review by the Commission and communities.

Conclusion: We do not have the luxury of abundant time — nor do the labs and centers have the massive level of resources necessary — to entertain an ineffective and inefficient "ready-fire-aim" approach to developing an optimal set of COBRA scenarios. We need to apply analytical rigor to a phase in scenario development that might otherwise become a "black box" without them.

Recommendation: Evaluate all options — LOM-generated, transformational, and any others — by the effectiveness and feasibility criteria identified above.

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

Final Resolution: *No Vote* / Superseded by Delphi
Session Held 9 September 2004

POC Signature: _____ Date: 11/11/04

CIT Chair: _____ Date: _____

[7] The BRAC-95 COBRA call expended 1-2 WYs of effort in 48 hours (plus a weekend) at the "losing" site. Assuming the level to be 1.5 WYs, at a fully-burdened compensation rate of a GS-13, and the "losing" site spent approximately $225K to respond. Then assume the "gaining" site expended 1/5 the effort, which is probably conservative, and the cost for that site was roughly $45 K, *making the total for the real-life COBRA data call approximately $270 K.* And that was a scenario that involved only 2 sites. Currently, our three "training" scenarios would affect 7, 9, and 9 sites respectively. Let us assume that our COBRA calls affect an average of 7 sites, with a conservative ratio of 1 "loser" and 6 "gainers" for each. By applying the response costs of $225 K for the "loser" and $45 K for each "gainer", *the estimated BRAC-05 cost for each scenario might be $495 K.*

[8] The BRAC-95 COBRA call generated 165 pages of data from the "losing" site. Again, assuming the "gaining" site expended 1/5 of the effort, about 35 pages may have been produced for a total data call response of 200 pages. Again, assuming the TJCSG data calls affect an average of 7 sites, with a ratio of 1 "loser" to 6 "gainers", and the total amount of information might be roughly 375 pages.

ATTACHMENT M

Date: 4 November 2004

To: Roger Florence, DoD IG

From: Don DeYoung, CIT Alternate

Subj: Decision to Abstain from Scenario Prioritization

Encl. (1) Scenario List and DEPSECDEF Policy Memo

1. On 3 November 2004, the Capabilities Integration Team (CIT) of the Technical Joint Cross-Service Group (TJCSG) met to prioritize 31 proposed scenarios.

2. I abstained from the CIT's voting for the reason noted on enclosure (1).

vr/

Don DeYoung

CIT Alternate, U.S. Navy
Technical Joint Cross-Service Group

DEPUTY SECRETARY OF DEFENSE

1010 DEFENSE PENTAGON
WASHINGTON, DC 20301-1010

SEP 3 2004

MEMORANDUM FOR INFRASTRUCTURE EXECUTIVE COUNCIL MEMBERS
INFRASTRUCTURE STEERING GROUP MEMBERS
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE

SUBJECT: BRAC 2005 Military Value Principles

The Department has determined that the most appropriate way to ensure that military value is the primary consideration in making closure and realignment recommendations is to determine military value through the exercise of military judgment built upon a quantitative analytical foundation. By applying the BRAC selection criteria to rank the facilities for which they have responsibility, the Joint Cross-Service Groups and the Military Departments build the quantitative analytical foundation. The exercise of military judgment occurs through the application of the attached principles. Limited in number and written broadly, the principles enumerate the essential elements of military judgment to be applied in the BRAC process. The Military Departments and the Joint Cross-Service Groups shall use the principles when applying military judgment in their deliberative processes.

Paul Wolfowitz

Attachment:
As Stated

OSD 13369-04

TJCSG Scenarios

001 - Establish Joint Centers for Air Platforms Centers
002 - Relocate W&A RDAT&E to 3 Primary & 4 Specialty Sites + Imperative
003 - Relocate DoD Directed Energy Research to One Location (Kirtland)
004 - Relocate DoD Directed Energy T&E and Selected Weapon T&E to One Location – WSMR
005 - Consolidate Rotary Wing RDAT&E into 2 Core Sites
006 - Establish Joint Centers for Fixed Wing Platform RDAT&E
007 - Relocate Ground Vehicle RDAT&E at Detroit Arsenal to Selfridge ANG Base
008 - C4ISR Cross DTAP & Function
009 - Defense Research Service Led Laboratories
010 - Consolidate Extramural Research Program Managers
011 - Joint Training Systems RD&A from AFRL-Mesa, ARI- Ft. Rucker, SPAWAR – San Diego, NAVAIR – PMA 205, WPAFB AFN-ASC/YW, Hill AFB – ASC/YW, PM-Joint National Training Center (JNTC) Suffolk, VA
012 - Deleted
013 - Consolidate Ground Platform RDAT&E into 2 Core Sites
014 - Establish Joint Centers for Space RDAT&E
015 - Establish a Joint Center for Space Research into One Core Site
016 - Establish a Joint Center(s) for Space D&A into One Core Site
017 - Relocate Guns & Ammo RD&A at One Location (Picatinny)
018 - Relocate W&A RDAT&E to 3 Primary & 4 Specialty; Retain/Relocate Energetics at Indian Head
019 - Relocate RD&A Energetic Capability from Crane, Aberdeen, and Yorktown to Indian Head
020 - Co-locate Battlespace Environments R, D&A, T&E to a single military installation (NRL Detachment Stennis Space Center)
021 - Co-locate "Medical" Chem-Defense Research and "Non-Medical" Chem and Bio-Defense RD&A to One Military Installation (Aberdeen, Edgewood Area MD)
022 - Co-locate Human Systems Training RD&A to a Single Military Installation (Joint Forces Command – Bridgeway, Suffolk VA (co-locate with JFCOM – Joint Training Analysis and Simulation Center)
023 - Co-locate All Medical Bio Defense RD&A to One Military Installation (Ft. Detrick, Frederick, MD)
024 - Co-locate All Chem-Bio Defense T&E to One Military Installation (Dugway Proving Ground, UT)
025 - Co-locate All Biomedical D&A to One Military Installation (Ft. Detrick, MD)
026 - Co-locate All Biomedical Research at 7 Military Installations (Ft. Detrick, Ft. Sam Houston, Walter Reed Army Medical Center_Forest Glenn Anex, Naval Health Research Center_San Diego, Soldier Systems Center, Navy Experimental Diving Unit_Panama City, FL)
027 - Combine Shipboard Integration at Dahlgren
028 - Combine Underwater Weapons Integration at Newport
029 - Establish Joint Land Network C4ISR Center
030 – Establish Joint Land Warfare Center (Remanded to Army for analysis)
031 – Combine Air Force Human Effectiveness R with Air Platforms R (Remanded to Air Force for Analysis)

Per DEPSECDEF memo subj: "BRAC 2005 Military Value Principles" (3 Sep 04), which states:
"the most appropriate way to ensure that military value is the primary consideration in making closure and realignment recommendations is to determine military value through the exercise of military ~~value~~ judgment built upon a quantitative analytic foundation."

And given that all 31 scenarios were generated by judgment alone, without the required foundation of quantitative analysis — I therefore recuse myself from what I believe constitutes a material violation of the BRAC process' integrity.

3 Nov 04

CIT Alternate, U.S. Navy

ATTACHMENT N

SCENARIO INCONSISTENCIES
Issue # 12-28-04-01

Issue: In late-November, Military Value (MV) scores became available for assessing the judgment-driven scenarios of the Technical Joint Cross-Service Group (TJCSG). On 24 November, the TJCSG's Chair of the Capabilities Integration Team (CIT) requested identification of any scenario found to be "inconsistent with the Mil value scores," (i.e., where an action realigns workload from a site with a higher score to a lower one).[1] Instances of inconsistencies were subsequently reviewed by the Sub-Groups and declared justified because they were found to be congruent with underpinning strategies. However, while the MV scoring inconsistencies were judged to be justified by strategy, a number of the strategies themselves appear to contradict each other within one of the more important scenarios, TECH-0008.

Point of Contact: Don DeYoung, Capabilities Integration Team (Alternate), U.S. Navy

Issue Summary

1. *Four Categories of Scenarios*

For each scenario, there are four possible categories of outcomes: (A) *Data-Driven / Judgment-Validated* (no TJCSG scenario qualifies for this category for reasons explained in Issue Paper #11-15-04-01), (B) *Judgment-Driven / Data-Validated*, (C) *Judgment-Driven / Strategy-Validated*, and (D) *Judgment-Driven / Strategy-Rationalized*. The definition for rationalized is a "rational but specious explanation" [Oxford Dictionary], so Category D would not portend viable scenarios.

2. *Very Few Scenarios Are Inconsistent*

The great majority of the TJCSG's scenarios were validated by the MV scores, which means they belong in Category B: Judgment-Driven / Data-Validated. A strong correlation between the selected "gainers" and their higher MV scores is not surprising given that the scenario "gainers" and "losers" were, with few exceptions, chosen by workload, and because MV scores are strongly determined by that workload (i.e., gross numbers of people and dollars).

The few actions that do, in fact, move workload from a site with a higher MV score to one with a lower score will receive close attention by the Commission and communities. Therefore, to be viable, these *must* fall into Category C: Judgment-Driven / Strategy-Validated. The Sub-Groups reviewed the MV inconsistencies and declared the proposed actions to be consistent with strategies formulated by their expert judgment. Unfortunately, strategies within scenario TECH-0008 contradict each other; one is built upon a false premise; and the overarching strategy is applied inconsistently across sites.

3. *Analysis of the Strategies in TECH-0008*

- *Strategy #1*: Consolidate Missions at Sites with Higher Military Value: The C4ISR Sub-Group's overarching strategy for the 40 individual actions within TECH-0008, is "mission consolidation," where improved synergies are gained by greater masses of workload at the gaining sites.[2] Of those 40 actions, three are "inconsistent" by realigning work from higher ranked sites to lower ranked sites. The following discussions analyze each action and its enabling strategy.

[1] Al Shaffer, Subj. "Mil Value Posting", 24 November 2004.
[2] The strategy was explained at the 8 December CIT session when scenarios were filtered and scored by the "decision factors."

- *Strategy #2*: Sensors Research Outweighs Info-Systems Research: Action 19 would realign both Ground *Sensors* and *Information Systems* (IS) *Research* from the Communications-Electronics Command (CECOM) Ft. Monmouth to the Army Research Laboratory (ARL) Adelphi.

> ***Data***: Ft. Monmouth (Loser) has a higher score than ARL Adelphi (Gainer) in *IS Research* (**0.4582** vs. **0.2563**). In addition to its higher MV score, Ft. Monmouth has a substantially greater workload as measured by FTEs and dollars (**380** FTE vs. **114** FTE, and **$96,000 K** vs. **$36,000 K**). ARL, on the other hand, has a higher MV score in *Sensors Research* (**0.5018** vs. **0.3397**) and a larger workload (**446** FTE vs. **238** FTE, **$147,000 K** vs. **$65,000 K**).

In explaining its enabling strategy, the C4ISR Sub-Group stated that:

> "preference was given to the more infrastructure intensive Sensors work…hence the Activity with the highest Military Value in Ground Sensors (Adelphi) was selected to host the consolidated activity."[3]

By applying a preference to *Sensors*, Ft. Monmouth's lower score in *Sensors Research* (**0.3397** vs. **0.5018**) causes it to lose *both* its *IS* and *Sensors Research*. When asked about the significant disparity in IS MV scores (where Ft. Monmouth has the higher score), the Sub-Group pointed out that it used a "cross-binning" technique where ARL's *Sensors Research* score, not its *IS Research* score, is the decisive metric based on the infrastructure intensive nature of Sensors work.[4]

The Sub-Group's use of a cross-binning technique for MV scoring — across two technical capabilities — is significant. Up to this point in the TJCSG's deliberations, the very idea of aggregating and / or weighting scores across functions (i.e., Research, D&A, T&E), or across capability areas (i.e., IS and Sensors), has been a "third-rail" issue. In fact, it was difficult to reach agreement on "rolling-up" the 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).[5]

In summary, this proposed action realigns *IS Research* from higher-ranked Ft. Monmouth to lower-ranked ARL Adelphi based upon an underpinning strategy that *Sensors Research* is of higher value due to its more infrastructure intensive. Therefore, both *IS* and *Sensors Research* are realigned from Ft. Monmouth to ARL Adelphi.

It should be noted that the cross-binning technique is used again in Action 40, which realigns both Air *IS* and *Sensors T&E* from NAWC-Pax River to Edwards AFB. The Sub-Group again states that "preference was given to the more infrastructure intensive Sensors work."[6] But, it also claims Edwards has the higher Sensors T&E MV score, which the MV data does not show. In fact, Pax River has a significantly higher MV score in *both* IS and Sensors T&E. This apparent discrepancy needs to be resolved, or the strategy statement needs to be better articulated.

- *Strategy #3*: Info-Systems Acquisition Outweighs Sensors Research: Action 29 would realign Rome's *Sensors Research* to Wright-Patterson AFB (WPAFB). Action 32 would realign Air *IS Research* from Rome Laboratory to Hanscom AFB.

[3] C4ISR Sub-Group, "Scenario Description & Rationale," 14 December 2004 [DRAFT].
[4] CIT Meeting, 8 December 2004.
[5] MV "roll-up" by zip code, an analytically sound and common-sense approach took until 9 December to be approved.
[6] C4ISR Sub-Group, "Scenario Description & Rationale.".

Data: In Action 32, Rome (Loser) has a far higher score than Hanscom AFB (Gainer) in *IS Research* (**0.6053** vs. **0.0421**). In addition, Rome's workload as measured by both FTEs and dollars shows a huge difference (**1,119** FTE vs. **0 FTE**, and **$535,000 K** vs. **$3,000 K**). In Action 29, Rome has a lower score in *Sensors Research* than WPAFB (**0.2345** vs. **0.5405**).

These two actions are identical to the Ft. Monmouth proposal in the sense that together they remove both *Sensors* and *IS Research* from the "loser", which in this case is Rome Laboratory. Given the Sub-Group's expert judgment in the previous action (i.e., Strategy #2) that the Sensors MV score is decisive, one would think that Rome's *IS Research* program would be realigned along with its *Sensors Research* to WPAFB, which has the #2-ranked Sensors Research program. But, that is not the Sub-Group's proposal.

Recall that ARL Adelphi received *both* Ft. Monmouth's *Sensors* and *IS Research* programs. ARL had a higher score in Sensors and a lower one in IS, just as WPAFB has with regards to Rome. However, in the case of Rome Laboratory, the Sub-Group does not invoke Strategy #2's "cross-binning" technique to realign Rome's higher-ranked *IS Research* work to WPAFB. Instead, the Sub-Group would send it to Hanscom AFB. Essentially, Action 32 sends work from a site that does Research, and no D&A, to a site that does D&A, and almost no Research. In explaining its proposal, the Sub-Group states that:

> "…preference was given to the significantly larger Development & Acquisition workload; hence the activity with the highest Military Value in Air Information Systems Development & Acquisition (Hanscom AFB) was selected to host the consolidated activity."[7]

Apparently, the synergistic gains that may accrue to Air Force C4ISR by realigning Rome's #2-ranked *IS Research* to the #2-ranked *Sensors Research* site at WPAFB are not judged to be as valuable as those that might accrue from collocation with Hanscom's D&A expertise. So, in this action, the expert judgment behind Strategy #3 is that Info-Systems Acquisition outweighs Sensors Research. But, Strategy #3 contradicts Strategy #2.

If Strategy #3 was used in the previous case, then Ft. Monmouth would have kept its *IS Research* because ARL Adelphi has no D&A and Ft. Monmouth has the highest MV score for Army *IS D&A*. But the Sub-Group found it more important to instead break Ft. Monmouth's *IS Research* away from high ranked IS D&A work, and consolidate it with ARL Adelphi's *Sensors Research*.

The Rome realignment to Hanscom may be founded on a desire to move the *IS Research* closer to Rt. 128, a center of commercial IS expertise. However, in the case of Ft. Monmouth, the Northern New Jersey area is not an IS backwater with local firms like Lucent and Honeywell / AlliedSignal. So, despite the similar circumstances, the Sub-Group proposes that Ft. Monmouth's work be moved away from that center of expertise and from the Army's highest ranked site for IS D&A.

To highlight the contradiction further, use of Strategy #3 would reverse the outcome in the previous case by sending *ARL Adelphi's IS Research program to Ft. Monmouth* where the Army's IS D&A function is located *and* there is a center of industrial IS expertise. This also has the advantage of being consistent with the MV scores for Ft. Monmouth and ARL Adelphi (**0.4582** vs. **0.2563**).

- *Strategy #4*: Coastal Sensors Integration Outweighs Inland Sensors Development: Action 1 would realign NRL's Maritime Sensors D&A to NSWC Dahlgren.

[7] C4ISR Sub-Group, "Scenario Description & Rationale."

Data: NRL (Loser) has a higher score than NSWC Dahlgren (Gainer) in *Sensors D&A* (**0.3633** vs. **0.3007**). In addition to a higher MV score, NRL has a greater workload measured both by FTEs and dollars (**280** vs. **245**, and **$79,000 K** vs. **$60,000 K**).

The C4ISR Sub-Group explains the strategy that underpins Action 1 in the following way:

> "…preference was given to where the Maritime Sensors, Electronic Warfare and Electronics were integrated with their host maritime platforms; hence the surface warfare center located near the coast with the Highest Military value (NSWC Dahlgren) was selected…"[8]

Strategy #4 gives preference to coastal proximity and sensors integration over MV scores. The Sub-Group asserts that NRL's mission is Research, therefore its "non-mission" Sensors D&A should be consolidated at a *"surface warfare center."*[9] This premise, upon which Strategy #4 is built, is false. NRL's mission is, in fact, broader in some technology areas than that of the Air Force and Army corporate laboratories, which focus on 6.1 through 6.3, and 6.1 through 6.2, respectively. This is why NRL has a sizeable workload in Sensors D&A and a substantial MV score — one that ranks higher than the selected warfare center, NSWC Dahlgren. The following evidence is provided to show that the strategic premise is false.

NRL has performed sensors development from its pioneering of the first U.S. radar, more than 80 years ago, to its development of Dragon Eye, a portable, hand-launched sensor system based on expendable countermeasures technology. Dragon Eye was mentioned in a *New York Times* front-page article about the U.S. Marines' fight for Falluja.[10] Another recent example is Specific Emitter Identification technology, which identifies any radar by its unique characteristics with accuracy enough to "fingerprint" it. The National Security Agency selected it as the national standard.[11] With the Coast Guard, naval warships, and aircraft using it to monitor the movement of materials used in weapons of mass destruction, its value to the nation's war on terrorism is obvious.

Finally, expert judgment from ADM Hal Gehman (ret.) also refutes the Sub-Group's premise. ADM Gehman was appointed Chair of the Columbia Accident Investigation Board shortly after he made this comment about NRL's sensors program, which he and other defense experts reviewed in September 2001.

> "What we saw was a Category A+ laboratory… its forté is sensors. What they showed us was impressive, relevant, and capable of being turned into fielded products… *nearly everything they develop they build a prototype on site and test it* (emphasis added), sometimes in an operational environment, sometimes not…they see the path to turning basic research into useful products."[12]

The harmful result of the Sub-Group's false premise is a proposed action that would sever the connectivity within an acknowledged center of excellence in sensors R&D. NRL's record of success is the product of the synergy achieved between its sensors systems development and its sensors research, which *ranks #1 in MV.*

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[8] C4ISR Sub-Group, "Scenario Description & Rationale," 14 December 2004 [DRAFT].
[9] CIT Meeting, 8 December 2004.
[10] Dexter Filkins, "In Falluja, Young Marines Saw the Savagery of an Urban War", *New York Times*, 21 November 2004, p.1.
[11] "Accordingly, NSA has selected the Naval Research Laboratory processor (L-MISPE) to be the standard for conducting SEI/UMOP collection operations…" [NSA Message DTG 01144OZ, June 1995]
[12] Section 913 Report #1: *Sensors Science and Technology and the Department of Defense Laboratories*, (National Defense University: March 2002), p. 31.

4. *Strategy #1 is Applied Inconsistently*

As mentioned earlier, the C4ISR Sub-Group's overarching approach for the actions within the TECH-0008 scenario is "mission consolidation," where improved synergies are gained by creating greater masses of workload at the gaining sites. For example, while Ft. Monmouth loses Research workload in Action 19 to ARL Adelphi under Strategy #2, it gains D&A workload by virtue of its top-ranked Army D&A score in Actions 21, 22, 23, 24, and 25.

The problem is that Strategy #1 is applied inconsistently. For example, while NRL's *Sensors D&A* is to be realigned to NSWC Dahlgren — Dahlgren's *Sensors Research* is not being sent to NRL, which has the #1-ranked *Sensors Research* program out of all sites evaluated by the TJCSG (66 sites). NRL's MV score in relation to NSWC Dahlgren is **0.8037** vs. **0.3009**. Even if one were to accept the false premise that NRL's mission is confined to Research, why is the *Sensors Research* mission not being consolidated at NRL?

Furthermore, in Action 8, NRL's *IS D&A* is being realigned to the SPAWAR Systems Center (SSC), the site selected as the location for Maritime *IS D&A* consolidation. However, SSC's *IS Research* is not being realigned to NRL, whose Research program has a much higher MV score than SSC's (**0.6059** vs. **0.3671**). Like its *Sensors Research* program, NRL's *IS Research* is also *rated #1 out of all sites evaluated by the TJCSG (68 sites).*

When asked about this inconsistency, a Sub-Group member responded that TECH-0008 defers Research consolidation to TECH-0009, "Defense Research Service-Led Laboratories." But the explanation does not hold up under scrutiny. As seen earlier, AFRL-Wright-Patterson and ARL Adelphi gain Research workload — and both are part of TECH-0009.

Since NRL is ranked #1 in both *Sensors* and *IS Research*, these inconsistencies can be readily fixed. Actions can be added where NRL gains NSWC Dahlgren's lower-ranked *Sensors* (ranked #10) and *IS* (#10) Research programs (78 FTEs and $18 M), as well as SSC's lower-ranked *Sensors* (#21) and *IS* (#6) Research programs (436 FTEs, and $170 M).

Conclusion: TECH-0008 contains: several actions whose enabling strategies contradict each other; one action based on a false premise; and an overarching strategy that is applied inconsistently. These problems require resolution. Correcting problems and errors and before going "prime-time" with our proposals will serve us, and the country, well.

Recommendations: Ensure that all actions within TECH-0008 qualify for Category (C) *Judgment-Driven / Strategy-Validated* by resolving identified problems, or by canceling the proposed actions if they cannot be validated by sound strategy.

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

Final Resolution: CIT Chair required that all approved TJCSG proposals be reviewed by an independent team

POC Signature: _____ Date: 3/1/05

CIT Chair: _____ Date: _____

Comments on Issue Paper # 12-28-04-01
(Scenario Inconsistencies

Contrary to the assertion in the issue paper, scenario TECH-0008 is internally consistent.

The TJCSG directed the C4ISR subgroup to cross-bin activities so as to minimize the number of installations. In order to do that, the C4ISR subgroup adopted a minimum set of cross-bin guidelines, such as giving preference to Sensors work when combining Sensors and Information Systems Research (cross-DTAP, same Function) or giving preference to D&A when combining Information Systems Research and D&A (cross-Function, same DTAP). Military Value (or early on, its surrogate – quantity of professional FTEs) was used to rank the Technical facilities in a "bin" and then the cross-bin guidelines were applied consistently. So in the issue paper, *Strategy #2* (Issue Paper terminology) is an application of the cross-DTAP, same Function guideline. Similarly, Strategy #3 is an application of the cross-Function, same DTAP guideline. Strategy #2 and #3 are not at odds with each other – they simply apply to different cross-bin situations.

Regarding the Issue Paper assertion that a corporate Laboratory should continue to work outside the Research area because of its track record, numerous organizations have and will continue to field great products. The single greatest challenge in the C4ISR world today is delivery of non-interoperable systems to the warfighter. Consolidating maritime C4ISR D&A under one Center provides the opportunity to address that #1 problem, and hence the C4ISR subgroup scenario proposes consolidation to achieve Jointness, economy and efficiency (the BRAC objectives). Status quo just perpetuates the problem of multiple "hobby shops".

Regarding the Issue Paper assertion that Applied Research activities should go to Corporate Laboratories, that is not what the TJCSG set about to achieve. The Framework is constructed to consolidate Basic Research into a DOD managed activity, but Applied Research is to be linked more closely with its D&A counterpart in Centers to the degree possible. This is especially true in C4ISR where one can go from Applied Research to D&A, T&E and electronic fielding in a matter of days, not years. Recognition of this reality is reflected in the C4ISR scenarios approved by the TJCSG.

As the C4ISR subgroup performs scenario analysis, we will revalidate the underlying assumptions before we offer draft Candidate Recommendations for TJCSG consideration. The TJCSG will have that additional opportunity to review the proposed actions with the insight gained from the analysis of the Scenario Data Call responses.

Date: 3 January 2005

To: Matt Mleziva (Lead, C4ISR Sub-Group),

I have read your comments on Issue Paper #12-28-04-01, "Scenario Inconsistencies," and remain concerned that the strategies in question (i.e., those that drive TECH-0008's realignment of work from sites with higher military value scores to sites with a lower scores) are not analytically sound. Some key questions remain for me regarding the reasons why, and when, different strategies are applied to proposed actions that have very similar circumstances. The success of TECH-0008 relies on the credibility of these strategies, especially when our process is not data-driven and the subject actions at issue here ignore the Military Value (MV) scores that we derived for these sites. There is no rule that prevents lower scoring sites from becoming "gainers" at the expense of higher scoring sites, but at a minimum, I believe the Sub-Group's strategies need a much more thorough justification and greater clarity in their supporting rationale.

In paragraph #2 of your response to the issue paper, you mention that the Sub-Group developed:

> "cross-bin guidelines, such as giving preference to Sensors work when combining Sensors and Information Systems Research or giving preference to D&A when combining Information Systems Research & D&A."

As you know, the above guidelines are called Strategy #2 and #3, respectively, by the issue paper. That paper may not have made its point clearly, so in the interests of clarity, its key question stated a different way is: "What is the rationale for the Sub-Group's decision to invoke Strategy #2 in one case, and to invoke #3 in another?" Just saying that the rationale was to optimize Sensors Research for one, and to optimize IS D&A for the other, and that these "guidelines were applied consistently," does not reveal *why* IS Research is realigned by different strategies in two actions with very similar circumstances.

Specifically, the first two actions analyzed in the issue paper involve realigning IS Research; one action realigns Ground IS Research, and the other realigns Air IS Research — and the strategies dictate where the realigned work is sent. In the Ground case, Strategy #2 sends the work from a site that performs both IS Research and D&A, to a site with a higher score in Sensors Research. But, if #3 was invoked to optimize IS D&A, the "loser" would instead become the "gainer" by gaining IS Research — *from the "gainer" under Strategy #2, who becomes the "loser" under Strategy #3*. In other words, the direction of the realigned work actually reverses by virtue of the strategy selected. Similarly, the destination of the Air IS Research is determined by the strategy selected. So, the key issue is *why*, in two cases involving IS Research, the C4ISR Sub-Group gives preference to optimizing D&A in the Air Force case, while in the Army case, it gives preference to optimizing Sensors work? Why was Strategy #2 not used in both cases? Or, why was Strategy #3 not used in both?

In paragraph #3 of your response, you raise the third case analyzed by the issue paper, where Maritime Sensors Research is realigned from a site with a higher MV score to a warfare center closer to the shore in order to optimize systems integration. You mention that the Sub-Group makes this proposal to:

> "achieve Jointness, economy and efficiency (the BRAC objectives)."

These are indeed BRAC objectives, but they do not support your case. TECH-0008 has 40 individual actions, of which 16 are Navy-to-Navy, 10 are Army-to-Army, and 9 are Air Force-to-Air Force. It is hard to defend this scenario as one that forges a significant degree of "jointness." Moreover, *none of the actions analyzed by the issue paper involve the few, and rather minor, "joint actions."* And, as far as the objectives of "economy and efficiency" are concerned, it is more likely that the proposed Maritime Sensors action will range anywhere from cost-neutral to very costly. By optimizing D&A (for systems integration purposes) at one site, we are sub-optimizing R&D at the losing site. The case for savings would be stronger if the losing site was being closed by the action.

In the end, the only relevant BRAC objective for this scenario — especially with our nation at war — is *mission effectiveness*, as measured by military value. In fact, the law is clear on the point that "military value is the primary consideration in the making of recommendations for the closure or realignment of military installations" [Public Law 101-510]. The primacy of mission effectiveness is why the track record of the "losing" site was addressed in the issue paper. The expert judgment of ADM Gehman that the site is a "Category A+ laboratory… its forté is sensors" was reported to show compelling, documented evidence for the high military value of the sensors development work at that site. Other experts on the panel with ADM Gehman included a former DDR&E and Secretary of the Air Force, a former CINC for Central Command who was later selected by the President as a diplomatic envoy to the Middle East, and a former NSC advisor to the President. The Sub-Group's expert judgment is at stark odds with that panel's assessment when it places the "losing" site, as you do in paragraph #3, in the class of a "hobby shop."

On the other hand, as a technical expert from Hanscom AFB, you and your Service-lead colleagues from ARL Adelphi and SPAWAR San Diego, possess expert judgment that is significant and valid in its own right. But your expert judgment that the site's sensors development program is a "hobby shop" must nonetheless be documented and justified in some manner. That justification should also account for the fact that the purported "hobby shop" has a higher MV score and a larger workload than the "gainer."

Finally, paragraph #4 of your response makes a point of differentiating "Basic Research" and "Applied Research" in order to explain an apparent inconsistency in mission consolidation (i.e., Strategy #1) that the issue paper describes as a "one-way street" with regard to the Navy's corporate laboratory. Your response is that the TJCSG's intent has been to realign Applied Research to "its D&A counterpart in Centers" instead of Corporate Laboratories. There are two problems with this explanation.

First, our analytical convention does not distinguish Basic (6.1) from Applied Research (6.2), and there is therefore *no data to make such distinctions*. In fact, both are combined with Advanced Technology Development (6.3) under our Technical Function called "Research." Second, the corporate laboratories in the Air Force and Army gain Sensors and IS Research (6.1-6.3), *which means they gain Applied Research.* This appears to contradict your assertion regarding the TJCSG's intent. The point made in the issue paper is that the Navy's corporate laboratory, despite being ranked by MV as #1 in IS Research *and* #1 in Sensors Research, does not gain any Research — even though it qualifies as a "gainer" under Strategy #1 (Mission Consolidation of IS and Sensors) and Strategy #2 (Optimize Sensors).

I offer these observations and arguments to help ensure that our product is ready for the close scrutiny it will receive in a matter of months. I hope my response to your comments, as well as the clarifications of issue paper #12-28-04-01, are helpful.

vr/

Don DeYoung
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Comments on DeYoung 3 Jan 2005 Paper

A facility's Military Value (MV) is a function of the other facilities in the bin the way we developed the MV scoring; hence MV is only a relative goodness within a bin and cannot be used across bins. The C4ISR subgroup used MV within the bins and when asked by the TJCSG to consolidate cross bins, used professional military judgment to determine the receiving facility from amongst the leaders in the bins.

The objective was to develop scenarios that implemented the TJCSG adopted Framework. The Air and Ground domain scenarios do involve more than one MILDEP, hence are Joint. The Maritime domain scenarios only involve the Navy as they were the only MILDEP known to be reporting maritime C4ISR RDAT&E. The strategies were selected to achieve the BRAC objectives of Jointness, Efficiency and Effectiveness.

In the C4ISR world, the potentially short timelines from applied research to operational capability led to the Warfare/Product Center construct. With respect to NRL, its high MV, the DRL concept, and its not being a Warfare center led to no recommended change to its Basic Research activities. Also, no C4ISR Maritime Basic Research activities outside of NRL were identified to realign to NRL. NRL is one of the organizations that has demonstrated the ability to rapidly field combat capability. Feedback from the field is that capability deployed by non-acquisition organizations tends not to interoperate with the rest of their equipment (provided by the traditional acquisition organizations) and tends not to have a supportability tail. The C4ISR subgroup developed scenarios which consolidated the Maritime C4ISR Applied Research and D&A activities in a domain (per the Framework) to address these issues rather than let them persist.

Date: 13 January 2005

To: Matt Mleziva (Lead, C4ISR Sub-Group)

In its 4 January meeting, the TJCSG decided that each candidate recommendation must have a thorough justification and sufficient clarity in its supporting rationale, especially those that realign workload from sites with a higher military value (MV) score to sites with lower scores (i.e., an "inconsistent scenario"). In issue paper #12-28-04-01, "Scenario Inconsistencies," I identified several inconsistent scenario actions, but missed one that needs to be marked for attention in the event it becomes a candidate recommendation.

Scenario TECH-0008 (Action 7) realigns Maritime (surface and above work only) Sensors RDAT&E from NUWC Newport to NSWC Dahlgren. NUWC Newport has a substantially higher MV score than NSWC Dahlgren *in all three technical functions*. Newport's across-the-board superiority to the gaining site in MV scores, from Research to T&E, makes this action unique among the other "inconsistent scenarios" identified in the issue paper.

Like Action 1, where NRL loses its higher-ranked Sensors D&A work to NSWC Dahlgren, Newport's higher-ranked RDAT&E work is also realigned to Dahlgren based on Strategy #4 where:

> "...preference was given to where the Maritime (surface and above) Sensors, Electronic Warfare and Electronics were integrated with their host maritime platforms; hence the surface warfare center located near the coast with the Highest Military value (NSWC Dahlgren) was selected..."[1]

Action 7, like Action 1, will almost certainly degrade the synergy of the site with the higher MV score. Parsing out Newport's "surface and above" sensors work from its undersea sensors work will likely shred innovative connectivity within a Sensors program that is integrated (with indistinct demarcations between "surface and above" work and "undersea" work) and holistic (where the whole is greater than the sum of its parts). Therefore, the rationale we provide must make a convincing statement as to why, and how, the risks are outweighed by the benefits perceived by the Sub-Group.

Also, your last paper (dated 4 January) discusses the DoD's problem getting interoperable C4ISR capabilities into service quickly, and it states that "NRL is one of the organizations that has demonstrated the ability to rapidly field combat capability." While this comment resolves an issue raised in my previous response, it also now begs a question. How will the Sub-Group defend two actions affecting NRL (i.e., Action 1 for Sensors, and Action 8 for Information Systems), which would sever innovative R&D connectivity at a site that is not part of the problem your Sub-Group is trying to solve? More to the point, what will be the justification for risking damage to a site that *is* rapidly fielding new C4ISR capabilities for the warfighter?

Almost a year ago, in a paper that Al Shaffer distributed among the TJCSG's Sub-Groups, I expressed some concern that our 39-bin (or 39-"technical facility") analytical approach would result in damaged synergies. The paper observed that,

> "While past closure rounds are not the focus here, 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.*

[1] C4ISR Sub-Group, "Scenario Description & Rationale," 14 December 2004 [DRAFT].

And, the paper proposed a solution that called for:

> ... *"assigning Military Value at a higher level, such as at the command / installation level, and not to the Rubik's Cube "facilities."*[2]

The proposal that MV be assigned at a meaningful level of aggregation was made again in issue paper #11-15-04-01, "Military Judgment: *Necessary — But Not Sufficient*" (14 November 2004).

Now that the C4ISR Sub-Group is at the point of evaluating the monetary costs for actions that will, in all likelihood, sever innovative connectivity at the "losing sites" (some with higher military value than the "gaining sites"), the development of sound justifications become more than a requirement of the TJCSG. They become critical to the goals of BRAC-05 and an obligation to national security.

vr/

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[2] D.J. DeYoung, "Shadows on the Wall: The Problem with Military Value Metrics," 17 February 2004, p. 12-13 (Version 1).

ATTACHMENT O

SHADOWS ON THE WALL

THE PROBLEM WITH MILITARY VALUE METRICS

> Behold! human beings living in a underground den…here they have been from their childhood, and have their legs and necks chained so that they cannot move, and can only see before them, being prevented by the chains from turning round their heads…
>
> Like ourselves, I replied; and they see only their own shadows, or the shadows of one another, which the fire throws on the opposite wall of the cave?
>
> True, he said; *how could they see anything but the shadows if they were never allowed to move their heads* (emphasis added)?
>
> — Plato, "The Allegory of the Cave", from Book VII, *The Republic*

Background

The use of Plato's famous allegory is not meant to suggest that we are held prisoner by the base closure process, though it may feel that way for those of us who have done this before. Instead, the allegory is intended to help articulate this paper's thesis — which is that, *without changes to our approach, we will fail to accurately and fairly measure the military value of the Department of Defense (DoD) laboratories and warfare / product centers*.[1]

Like the prisoners in Plato's cave who could not see objects in their real form, we are making judgments about the labs and centers indirectly, by way of "shadows" cast by very problematic metrics. The basic difficulties fall under three general areas. The first is that our metrics are unable to measure the actual *impact*, or effect, of the technical work itself on national security. A second is the study design itself, which does not recognize and protect the innovative connectivity within, and between, the three functional areas: science and technology (S&T), development and acquisition (D&A), and test and evaluation (T&E). Both problems were experienced during BRAC-95. Neither was solved.[2]

The third flaw is all but certain to be a fatal one. The following analysis show how we have built a "Dollars and No Sense" approach where (1) dollars have achieved relative "rock-star status" as our preferred metric for military value, and (2) the Intellectual Capital metrics have been "dumbed-down" to the point where they will generate irrational results like ranking "world-class" talent lower than mediocre talent. This latter issue remains a problem even though the BRAC Infrastructure Steering Group fortunately overturned our highly flawed "Percentage Approach" to scoring the data. If this situation is not fixed, BRAC-05 will damage the DoD's ability to develop new warfighting technologies. In other words, actions based on our flawed process will weaken national security.

The bad news is that we will never attain a perfect way to determine the military value of research and development (R&D) institutions. The very nature of R&D does not lend itself to easy quantification. But, the good news is that with some changes we can (using Plato's allegory) widen our constrained field

[1] The military value of test ranges is more easily measured because of its very strong correlation to physical parameters, such as airspace, seaspace, and isolation from population centers. Constraints on the parameters (e.g., explosive test limits, inadequate airspace, urban encroachment, etc) are the critical metrics and easily quantifiable.
[2] The author was a member of the BRAC-95 Navy Base Structure Analysis Team and the DoD T&E Joint Cross-Service Working Group.

of view and sharpen distorted images, without sacrificing the objectivity and certifiability demanded by the BRAC process.

Two Challenges

To achieve the transformation and capacity reduction goals of BRAC-05, while preserving an infrastructure that will continue to create new warfighting capabilities, the Technical Joint Cross Service Group (TJCSG) must meet two challenges.

(1) Accurately and fairly assess the military value of the Services' corporate laboratories, warfare/product centers, and test ranges

(2) Provide a credible way to judge their potential to create new warfighting capabilities that will help defeat currently unforeseen threats over the next 20 years

The First Step

To determine military value, we need to first know what it is. The BRAC Selection Criteria are only minimally helpful because they do not explicitly address RDT&E (although they speak directly to other facets of national defense, like joint warfighting, training, and readiness). During the public comment period on these criteria, at least one letter by a Congressional delegation was written to the DoD about this obvious omission,[3] but the criteria unfortunately remained as originally written.

Instead of using the deficient BRAC criteria, a clear working definition for the military value of labs and centers is suggested below:

> Military Value*: the level of effectiveness in meeting national security interests, both in terms of warfighting impact and contributions to science and technology.*

The next, and much more difficult step, is to develop metrics that accurately measure each sites' effectiveness in meeting national security interests. Given the inadequacy of the BRAC criteria, these metrics will be the determinant of military value.

Necessary — *But Not Sufficient*

One fact of life drives us to collect a broad range of disparate *input* metrics (e.g., experience, education level, dollars, etc.) and *output* metrics (e.g., technology transitions, patents, etc.), and then to segment the analysis into three functional areas (i.e., S&T, D&A, T&E). *This driver, experienced in all previous BRAC rounds, is the fact that corporate laboratories, warfare/product centers, and test ranges have very different missions that require diverse, and often unique, workforce skill mixes and types of facilities*.

Our menu of metrics for labs and centers contain the same as those used by the BRAC-95 Laboratories Joint Cross-Service Group (LJCSG),[4] plus a number of new ones to address acquisition functions, synergy, and jointness. But, like BRAC-95, none measure the *impact*, or real effect, of the work on national security. Such metrics have been the BRAC equivalent of the quest for the Holy Grail.

[3] U.S. House of Representatives, letter dated 30 January 2004 (signed by 16 U.S. Representatives).
[4] A Test & Evaluation Joint Cross-Service Group developed T&E metrics separately.

The TJCSG's input and output metrics are necessary, but not sufficient. If they showed where the best and most relevant R&D was being conducted today, and where the best and most relevant work were likeliest to occur tomorrow, then our task would be simplified. Nearly all of our metrics lack the power to distinguish critical differences, and a number of them are dubious. For example, the "Workload Focus Metric" scores highest in military value those sites with the largest workloads in a technical capability area (e.g., C4ISR). While this metric does show the degree of focus and scale of the work, it does not address quality or relevance. A more apt name might be the "Jiffy Lube Metric." After all, Jiffy Lube focuses on one area, but you may or may not want to bring your car there.

All but one (i.e., Elite & Prestigious Awards) of the metrics fails to directly gauge impact and quality. But unlike the prisoners of Plato's cave who were forced to surmise the real world by its shadowed images, we can widen our narrow field of view with 13 changes.

Proposal #1: Go Back to the Future

Dr. Robert Frosch (former NASA Administrator, Deputy Director of ARPA, Assistant Secretary of the Navy for Research and Development, Associate Director for Applied Oceanography at the Woods Hole Oceanographic Institution; and vice president of GM Research Laboratories) once observed that in R&D,

> "… 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"[5]

In other words, the only viable metric for evaluating a site's effectiveness in meeting national security requirements is its *track record*. After all, we routinely judge sports teams that way. 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? Why treat national security less seriously than athletic competition?

We can assess past performance by collecting information that directly ties the sites' work to national security interests. The following is an example of how this can be done.

- Identify and describe up to 15 technical contributions that demonstrate your site's impact on developing major new warfighting capabilities that were introduced into routine operations *since the end of the Cold War*, new technical developments during that period that may or may not be yet deployed, and new scientific breakthroughs which occurred during that period. (2,000 words max)
    - Specify exact role played by *in-house* personnel in the development of that capability
    - Cite any other DoD, Federal, or private sector organizations that also played a role and attempt to quantify those roles
    - Provide copies of primary references to substantiate all claims. References must be from authoritative sources external to the laboratory/center.

This is one way to capture critical information relating directly to military value. For example, this approach would gather information on: state-of-the-art night-vision technologies developed by the Army's Night Vision Laboratory and tank ammunition developed by the Army Research Laboratory, both used in Desert Storm with devastating results; the thermobaric bomb developed by the Navy's Indian Head laboratory and used in Afghanistan to avoid bloody tunnel warfare; and the F/A-18 SHARP

[5] R. Frosch, "The Customer for R&D is Always Wrong!," *Research•Technology Management*, (November-December 1996), p. 27.

reconnaissance system developed by the Naval Research Laboratory, which provided real-time digital imagery (vice the 3-9 day norm) and was credited with saving lives in Operation Iraqi Freedom.

Some may claim this approach is not objective or certifiable, or that it somehow violates the integrity of the BRAC process, because the information would come from the sites under study. This argument is not convincing. Most of the data we are gathering comes, in some form, from the sites themselves. The real issue is whether the requested information can be verified with official documentation and corroborated with sources outside the reporting site.

A preliminary IG review, performed after our 2-3 December off-site at the Bolger Conference Center, determined that the use of authoritative documentation would make this approach auditable, and therefore defensible.

Proposal #2: Use Expert Judgment

Again, using Plato's allegory, if we cannot look directly at the work of the labs/centers, then it makes sense to listen to those defense experts who have seen and evaluated it themselves. Since World War II, the DoD labs and centers have been the subject of more than 100 studies.

One of the more recent was a Congressionally mandated study to evaluate the projects of the labs/centers for relevance to future warfighting requirements. The defense experts on the "Sec. 913 Lab Relevance Study", completed in 2003, included retired "4-stars" General A. Zinni, Admiral H. Gehman (chair of the *Columbia* Accident Investigation Board), General W. Crouch, and General M. Carns, as well as a former Air Force Secretary and DDR&E, and various other technical experts. The findings of this expert team, along with others who have looked directly at the work, can help us measure the impact of labs and centers in meeting national security interests.

We can use DoD's extensive library of authoritative information to help assess actual performance. The following proposed data call question to the sites is an example of how this can be done.

- Quote up to 15 findings or comments made by DoD / Service chartered review panels, or made independently by national leaders in defense R&D, about your site since the last BRAC round in 1995. Provide references to substantiate all claims. (1,000 words max)

The sites' responses might take the form of the following sample excerpts from the Sec. 913 Relevance study, sent to Congress in early 2004:

- Regarding the Army Research Laboratory (ARL) at Aberdeen, the Armaments Research, Development, and Engineering Center (RDEC), and the Aviation and Missile RDEC, the report stated:

  "The Team was impressed with the relevance of the ARL and RDEC program, the high potential value it has to the warfighter, the strong links to the requirements of the warfighter, and the positive approach to jointness." One of the experts stated, "The Army ballistics program is one of the areas wherein the Army holds a dominant lead technically and the private sector carries out the Army's concepts. There is no concern over privatizing this work."[6]

- Regarding the Naval Air Warfare Center (NAWC) at China Lake, one of the Team's experts made the following statement:

[6] Section 913 Report #3: *Weapons Science and Technology and the Department of Defense Laboratories*, (National Defense University: December 2002), p.18.

"I believe their location is really important. Their proximity to other ranges is very valuable. They are close to the aerospace industry in this country as well as some quality academic organizations. Their distance from population centers allows for the testing of dangerous systems in a safe way. All in all it is an extremely valuable resource for the DoD and should be nourished and protected."[7]

- Regarding the Communications—Electronics Command (CECOM) RDEC at Fort Monmouth, the report stated:

  "The panel was impressed with the relevance of the CECOM RDEC's program…the work being done is competent and relevant to the missions of the Army…it was noteworthy that some important work has already been done in support of homeland security, and a good number of projects have potential applications in that area. There may be value in supporting and encouraging more contacts with non-traditional customers such as first responders, the National Guard, and border agencies, to make these technologies relevant to their missions."[8]

- Regarding the Air Force Research Laboratory (AFRL) at Rome, New York, the report stated:

  "The work being done at AFRL Rome is very relevant. The Laboratory is appropriately focused on the information and knowledge dominance components of information technology, and the work presented to the Study Team supports full spectrum dominance as defined in *Joint Vision 2020*…AFRL Rome is clearly tied in with various Air Forces exercises…One example was a team that was updating the chemical response monitoring capabilities at Osan air base. This was not transformational work, but it did vastly improve the CINC's capabilities in this area."[9]

- Regarding the Naval Research Laboratory (NRL), the report stated:

  "With significant funding from the other Services and DoD agencies, the program clearly addresses interoperability issues and joint warfighting requirements…Many of the projects represent new and innovative approaches to serious national and service problems…NRL moves new technology into field use and has, according to one Study Team expert, 'probably the best record of any DoD organization for transitioning products'…one of the Study Team 'four-stars' made the following assessment, 'What we saw was a Category A+ laboratory.'"[10]

- Regarding the CECOM Night Vision & Electronic Sensors Directorate (NVESD), the report stated:

  "The Laboratory's 'Own the Night' mission statement guides it in the conduct of a highly relevant S&T program. NVESD has done an outstanding job developing sensors that will enhance the ability of ground UAV and rotary-wing assets to detect and engage time-critical targets. In this area they are undoubtedly the world's best…its efforts in uncooled detectors must be viewed as a high-risk undertaking that, if successful, will have monumental implications for all U.S. IR sensors and IR-sensor-guided weapons."[11]

Some may claim this approach compromises the BRAC's objectivity because such studies can be biased (a legitimate concern), or that it is not certifiable because it draws from information outside the closure process. These arguments are not convincing. First, we would ask the sites to self-report the comments,

[7] Ibid., p.12.
[8] Section 913 Report #2: *Information Science and Technology and the Department of Defense Laboratories*, (National Defense University: July 2002), p.14 and 19.
[9] Ibid., p. 20, 22.
[10] Section 913 Report #1: *Sensors Science and Technology and the Department of Defense Laboratories*, (National Defense University: March 2002), p.26, 30-31.
[11] Ibid., p. 14.

which will presumably be positive ones, much like those in the above sample excerpts. Self-reporting eliminates the concern about studies that might convey undeserved criticisms.

Second, this data will come from official reports, authorized and approved by the DoD / Services, and from documented statements by national leaders in defense R&D. *If this information cannot be considered authoritative and certifiable, then why does the Defense Department continue to charter these studies — at considerable public expense — and provide them to Congress*?

Third, BRAC-05 will — for the first time in five rounds — entertain "transformational options" *proposed by private groups outside the Government*, such as the Business Executives for National Security. These options will be used during the phase where the DoD generates and evaluates proposed closures. *Surely, if private sector opinions can be used for such a sensitive phase of the process, then the official findings of DoD chartered and approved studies, and the independent conclusions of national leaders in defense R&D, must be acceptable to use when determining each site's military value*.

Finally, as noted previously, the DoD IG determined that the use of such authoritative DoD studies would be auditable, and therefore defensible. It would be unfortunate not to capitalize on the wealth of information and expert judgments available in such studies.

Proposal #3: To Transform and Enhance Jointness — *Stay Connected*

New technology is one of the two primary engines of military transformation, with the other being tactics. So it follows that if we can ensure, through our BRAC process, an innovative and agile R&D infra-structure for the future, we will also ensure that the DoD will gain important new technologies. *The point here is that we don't need to pick the technologies ahead of time* (which we are trying to do with the dubious Future Warfighting Capability metric)*, but we do need to pick the most innovative and agile sites*. The two previous proposals can help us do that, but more can be done.

To quote Dr. Frosch again, "Great R&D must preserve the *connections* (emphasis added) between various kinds of knowledge." He continues,

> "…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, and whose interconnectedness one learns as one tries to solve the problem. 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."[12]

A 1973 Battelle study on the elements of the innovative process makes a similar point.

> "Confluence of technology, unplanned in most instances, was important in all case histories, and to a substantial number of decisive events."[13]

These comments are relevant to our task because they reveal the importance of *synergy*: i.e., the degree of lab / center "interconnectedness" within its own organization, with each other, the private sector, and with the national and international scientific and technological community. This synergy finds expression in three different ways: *multidisciplinary programs*, *vertical integration*, and *jointness*.

[12] Ibid. p. 23-24.
[13] Battelle, "Interaction of Science and Technology in the Innovative Process," (1973).

A multidisciplinary program of collocated scientific disciplines and technology areas enhances the horizontal interconnectedness that Battelle found important to innovative success. And a multidisciplinary program, in Frosch's words, "maximizes collision cross-sections among kinds of knowledge." A vertically integrated program, on the other hand, optimizes connectivity across technical functions (S&T, D&A, and T&E). Finally, jointness happens when these horizontal and vertical connections jump Service boundaries.

The logic is as follows: (1) the key to transformation is identifying innovative and agile sites; (2) a key to recognizing those sites (in addition to the two previous proposals) is to measure connectivity, or synergy; and (3) we can measure synergy by gauging a site's level of multidisciplinary projects, vertical integration, and jointness. The following military value questions can help measure that synergy.

- How many patent citations of published refereed journal articles have there been over the last 5 years? (This shows the connectivity of real applications to research published in journal articles.)

- How many on-site projects (include project name and dollar level for each) have been funded by other Services since 1995? (This cross-service connectivity shows an ability to meet joint warfighting needs and indicates that the work is of superior quality for another Service to fund it.)

- How many refereed journal articles were written in collaboration with personnel in other scientific disciplines and technology areas, both inside and outside the lab / center over the last 5 years? List separately with name of collaborating organizations. (This shows the level of horizontal and vertical connectivity. This question can also include collaborative patents granted)

- What percentage of the lab / center budget is discretionary and allows the Director to pursue high-risk, high-payoff projects? (This measures the agility of a lab / center to pursue connections and "maximize collision cross-sections", without rigid conformance to higher level Service management.)

The above questions pertain largely to S&T, which makes sense given its seminal role in creating tomorrow's disruptive technologies. Data on shared patents can help gauge the connectivity of D&A.

Proposal #4: To Optimize Test Range Operations — *Stay Connected*

Connectivity, or synergy, is also important to T&E. It can be quantified by asking the test ranges to report total square miles of restricted airspace, seaspace, and land area of other contiguous sites that it uses to conduct tests. It is often said that the military fights the way it trains, which is why training is conducted in the most realistic ways possible. *Similarly, our analysis of the ranges should capture they way they actually test*.

For example, if Edwards AFB uses the airspace at NAWC China Lake, as well as the warning areas off NAWC Point Mugu for its tests, then it should report the total square miles that the *composite* test area represents. If it also uses the Utah Test and Training Range, the airspace above Nellis AFB, and elsewhere, then those totals should be included in the composite.

Other examples would include NAWC China Lake's similar composite use of available airspace and warning areas. Eglin AFB, White Sands Missile Range, and NAWC Patuxent River would likewise report whatever contiguous air, land, and sea space they actually use to test. *This information would capture the connectivity that exists between the DoD's test ranges during <u>actual</u> testing operations*.

Air, land, and sea space that is owned or controlled by each installation would be reported and scored separately. Only restricted airspace and warning areas shown on U.S. Government civil aeronautical

charts should be scored in order to eliminate the ambiguities that plagued BRAC-95's T&E analytical process and compromised the credibility of its results.[14]

Proposal #5: Avoid the Misguided Notion that Intellectual Capital is Fungible

Scientists and engineers were treated by BRAC-95 as interchangeable, conveyable, replicable items — much like military housing, piers, and hangar space — regardless of their competence and professional accomplishment.[15] Such simplistic treatment can be harmful to national security because top technical talent is critical to the success of defense RDT&E programs. While it is true that, with sufficient time and money, some personnel may not be difficult to replace, we all know the blunt truth is that the best will not move with the work. If we repeat BRAC-95's approach, we risk "decapitating" the intellectual drivers from the realigned workload.

Rather than repeat that flawed approach, our central focus should be on identifying and preserving high quality intellectual capital. Toward that end, the Intellectual Capital or "People Metrics" should receive weightings on the upper end of the ranges discussed thus far. However, we need to ensure that the quality of the personnel data we collect warrants the high weighting. *It does no good to give the People Metrics high weightings if they cannot identify the top talent*. The next proposal will address that concern.

Proposal #6: Fix the "Dumbed-Down" People Metrics

The accurate evaluation of intellectual capital — its quality, and in some cases, actual impact — is essential because, in the words of a former DDR&E,

> "The presence of *a few* (emphasis added) individuals of exceptional talent has been responsible for the success (and even the existence) of outstanding research and technology development organizations."[16]

Unfortunately, as currently written, our People Metrics (i.e., Elite & Prestigious Awards, Experience, Education) will, in all likelihood, fail to discriminate the essential differences among the labs / centers due to: (1) the failure to assign value to some of the DoD's best and brightest, (2) the highly compressed range of point values, and until recently, (3) the "Percentage Approach" to scoring the data, which was fortunately rejected by guidance issued by the Infrastructure Steering Group (ISG) on 4 June 2004 (see Attachment A). The result of these flaws will be the loss of meaningful information in the noise of large aggregate populations.

We can avoid this problem by *focusing on a very limited set of critical data and scoring it appropriately*. In the excerpt below, Peter Drucker describes how effective decisions are derived from studying the critical items that drive a given process.[17] The excerpt is lengthy, but best read in its entirety.

> "That the procurement and inventory policies of the U.S. armed services were in bad shape had been known ever since the Korean War. There had been countless studies – but things got worse, rather than better. When Robert McNamara was appointed Secretary of Defense, however, he challenged the

[14] The suggestions of proposal #4 are not the "no-brainers" they appear to be. During BRAC-95, the T&E JCSG awarded one site military value points for airspace 550 miles away that it did not control, while another was denied points for airspace 150 miles away that it did control. The scoring rules must be clear and equitable.
[15] D.J. DeYoung, "The Silence of the Labs," *Defense Horizons*, No. 21 (January 2003).
[16] Hans Mark and Arnold Levine, *The Management of Research Institutions* (Washington, DC: Scientific and Technical Information Branch, National Aeronautics and Space Administration, 1984).
[17] The OSD BRAC office director, Mr. P. Potochney, made the same point in our 23 January TJCSG meeting by suggesting that we capture only the most important data.

> traditional measurements of military inventory — measurements in total dollars and in total number of items in procurement and inventory. Instead, Mr. McNamara identified and separated the very few items — maybe 4 percent of the items by number — which altogether account for 90 percent or more of the total procurement dollars. He similarly identified the very few items – perhaps again 4 per cent — which account for 90 per cent of combat readiness. Since some items belong in both categories, the list of crucial items came to 5 or 6 per cent of the total, whether measured by number or by dollars. Each of these, McNamara insisted, had to be managed separately and with attention to minute detail. The rest, the 95 per cent or so of all items which account neither for the bulk of the dollars nor for essential combat readiness, he changed to management by exception, that is, to management by probability and averages."[18]

The above statements by both Drucker and the former DDR&E show the value of identifying *the few*. Therefore, *a way for us to recognize the top performing sites is to identify only the exceptional talent*. In our first step toward this goal, we originally developed an excellent framework to identify this talent with a three-tiered filter that included:

> *Elite Awards* (e.g., the Nobel Prize, Robert J. Collier Trophy, National Medal of Science, National Medal of Technology, Draper Prize, Bower Award and Prize for Achievement in Science, and members of the National Academy of Sciences and the National Academy of Engineering)
>
> *Prestigious Awards* (e.g., A.T. Waterman Award, Stellar Award, Goddard Astronautics Award, William Streifer Award, Lord Rank Award, National Inventors Hall of Fame, Space Technology Hall of Fame, and Technical Society Fellows, such as IEEE Fellows, AAAS Fellows, etc.)
>
> *Patents, Citations in Refereed Journals, and Software Licenses*

Unfortunately, some subsequent decisions jeopardize our success. They are as follows:

> (1) *Refusal to include Science and Technology (ST) positions in the analysis*. This decision will be impossible to explain to the Commission. The TJCSG's subgroups had the patience of Job when addressing the physical features of the Department's facilities, but steadfastly resisted including ST positions in the analysis. Deciding to ignore ST's means that zero value will be assigned to this competitively selected talent, or to the sites where they do their innovative work.
>
> The reason given for ignoring the ST was that "it is just a grade." On a minimal level, that is a true statement — much like saying the McKinley Climatic Chamber is "just a building," and China Lake's bombing range is "just a high desert plain." ST's are some of the best and brightest technical personnel in the DoD. This is a well-supported fact. For example, the Army Science and Technology Master Plan (1997) refers to the ST as a "world-class" scientist. And a former Deputy Director for Defense Research and Engineering stated,
>
> > "Science and Technology (ST) positions recognize a *world-class* expert level for researchers with pay comparable to equivalent managers, thus giving laboratories more tools to retain their *best researchers* without losing them to the private sector…The occupant of a ST position serves as the nucleus for 'growing' the capability of the organization, attracting skilled personnel, and *setting the technical standard* for the laboratory."[19]
>
> *STs should be captured and scored under the Experience metric*. As currently structured, this metric contributes little to our analysis. We are assigning 1-point to all those with 10 or less

[18] Peter F. Drucker, *The Effective Executive* (New York: Harper & Row, 1966), p.145.
[19] Office of the Director of Defense Research and Engineering, *Memorandum For Director, Defense Performance Review Task Force*, (30 July 1993).

years of experience, 2-points for all those between 10 and 20 years, and 3-points for all those with more than 20 years. *At best*, this metric grants higher military value to those workforces that have spent the most years doing work with significant military value. *At worst*, this metric grants the highest scores to workforces with the greatest seniority, and punishes those that have refreshed themselves with younger talent. Moreover, since many people begin new areas of endeavor at various points in their career, there will be no assurance that the reported level of experience is in fact relevant to the technical work at issue. Most likely, the metric will be doing all of the above — both the positive and the negative — to some unknown degree.

Collecting the STs and scoring them at 70 points (see T&E ratio in Section (4) below) would infuse this moribund metric with an actual confirmed measure of quality. Pegging the STs' value at 70 times that of an unknown person with less than 10 years of experience working at an unknown level of technical competence should be defensible because an ST is a "world-class" scientist who is of the quality that this metric purports to be awarding. STs also attract skilled personnel, so the 70-point value would also help counteract some of the unintentional penalty meted out to laboratories and centers that have refreshed their workforces with younger talent.

(2) *The Downgrade of Society Fellows*. Our original assignment of Society Fellows to the Prestigious tier for the awards / honors metric was changed by removing them and cutting their value by half. It is unclear why, or exactly when, that occurred. This decision further dampens our ability to differentiate high quality talent and separate it from the aggregate population. Why would we want to take this group of technically gifted government scientists and engineers, who have been recognized as such by the national and international technical community, and pull their value down toward that of the aggregate population? How do we defend the fact that our plan will now equate a Society Fellow to 5 unidentified patents of no known value?

It should be noted that each new class of IEEE Fellows, for example, is a highly select bunch that cannot number more than 0.1 percent of the total membership. It should also be noted that a non-scientific survey that I performed on the internet shows some IEEE fellows with between 100 and 200 patents to their name. In short, these are extraordinarily talented individuals, with an extensive record of accomplishment that has a confirmed, known, and substantial value.

In short, the decision to downgrade their value is inappropriate and compounds the already significant problem of point compression in our analytical plan.

(3) *Compressed Point Values*. The TJCSG sub-groups balked at assigning high point values to the *elite* and *prestigious* awards and honors, saying that it will unfairly "skew results." Part of this resistance stems from a perceived lack of quantifiable parameters as compared to other metrics, such as those under the Physical Environment attribute. However, the Physical Environment metrics show that large differences, if quantifiable, are acceptable.

For example, the Army's White Sands Missile Range (WSMR), the largest land test range in the Western Hemisphere, has nearly 4 million acres available for tests.[20] On the other end, the Aberdeen Proving Ground's ATC test range has 56,707 acres,[21] less than 1.5 percent of WSMR's. None would think point values based on this 70:1 ratio would unfairly skew results. Therefore, some statistics might help justify an equivalent range of point values for the Awards Metric.

[20] http://www.globalsecurity.org/space/facility/wsmr.htm
[21] Jeanne Ditter, Conference Briefing: "Test & Evaluation for Scalable Effects Capabilities: Aberdeen Test Center as the SEC Test Center of Choice," (4 June 2002).

For the Elite Awards, consider that there have been only 143 Nobel Laureates in Chemistry over the last 100 years, and the DoD has one of them.[22] Consider also that there are a total of 12,530,700 S&Es in the U.S,[23] but less than 1,900 members of the National Academy of Sciences (i.e., less than .01% of all American S&Es), and the DoD has a number of them.[24]

Regarding the Prestigious Awards, consider that ARL and one of its scientists, were inducted into the Space Technology Hall of Fame for work on Quantum Well Infrared Photo-detectors, an area of huge importance to military sensor systems. There have been 44 technologies inducted into the Hall of Fame over the last 15 years, about *3 per year nation-wide*. The Rank Award is given for exceptional achievement in electro-optics. One recipient, no longer with the DoD, was recognized for discoveries leading to development of the rare gas halide excimer laser. Aside from its DoD applications, this is the laser that made Lasik surgery possible. The Rank award has been granted to 123 persons over the last 28 years, about *4 per year world-wide*.

These statistics provide a solid quantitative rationale for assigning 70 points to the Elite Awards, 10 to the Prestigious Awards, and 1 point to each patent and software license. This range also corresponds to the 70:1 WSMR / ATC ratio. This scoring scheme is reasonable and would be defensible to the Commission.

Unfortunately, the Subgroups instead chose highly compressed point values that will decrease our ability to differentiate the exceptional talent from the rest. As currently written, our plan is to assign 30 points to the Elite, 10 points to the Prestigious, 5 points to Society Fellowships (which were for some reason broken out separately from the Prestigious awards), and 1 point to each patent and software license. What this means is that 5 unidentified patents of unknown military value will equate to one IEEE Fellow. The effects of this decision grow more absurd as it affects the Elite Awards.

For example, DoD's Nobel Laureate did work that now results in the molecular structure determination of more than 10,000 new substances a year, and he continues his work with applications ranging from the characterization of potent toxins all the way to making explosives and propellants that are safer and more powerful. But, by our study plan, *the military value of this Nobel Laureate is equal to 30 unidentified software licenses of unknown military value —* despite the profound impact of his work on warfighting capabilities, his ability to attract a staff of exceptional talent, and the pervasive and continuing value of his accomplishment to the DoD.

The point values for the other People Metrics (i.e., Education and Experience) are even more compressed. For example, the Education metric assigns 3 points to a PhD, 2 points to a MS, and 1 point to a BS. A wider spread, such as 10:3:1 would increase our ability to distinguish critical differences among the many sites under study. The next section shows how the Percentage Approach to scoring for military value exacerbates the problem with point compression.

(4) *The Flawed "Percentage Approach" to Scoring*.

> [Note: This highly flawed numerical approach was the TJCSG's official methodology for nearly 5 months, but it was fortunately overturned by the ISG on 4 June. The following discussion is

[22] http://www.nobel.se/help/faq/nobel_laureates.html#5
[23] National Science Foundation, *Science and Engineering Indicators*, (2000).
[24] http://www4.nationalacademies.org/nas/nashome.nsf/

retained in this paper's fourth version to demonstrate the level of energy devoted to dumbing-down the People Metrics. The following discussion appears as it did in the earlier versions.]

The Navy's objection to the percentage approach has been voiced in a number of different forums, including two occasions to the DDR&E (see Attachments B, and C). Each time it did so, data was presented to substantiate its concern that this approach will likely yield some number of irrational results. Proponents of the percentage approach were invited repeatedly to show instances where the Navy's recommended "absolute numbers" approach would yield irrational results, but each time the response was silence.

The Navy's concerns go beyond the irrational results. The Percentage Approach depresses the value for large masses of high quality talent (whether measured by the awards, education, or experience metrics) and exaggerates the value of small masses — across the board. Take the patently absurd case where the Percentage Approach gives a one-person site with one PhD the same military value score as a 1,000-person site with one thousand PhDs. Here it is obvious that the military value of the small mass is exaggerated and the military value of the large mass is minimized. This absurd case can be seen as the outer boundaries of the problem "box", but every case within the box will be affected to varying degrees. *And some number of them will yield irrational results*.

To illustrate the Navy's concerns, the following scenarios compare a small 100-person site versus a large 500-person site.

Absolute Approach:

Site A: **100** S&Es
(**50** PhDs, **50** MS)

3(50) + 2(50) = **250** **MV = 0.12**

Site B: **500** S&Es
(**300** PhDs, **100** MS, **50** BS, **20** AD, **30** No degree)

3(300) + 2(100) + 1(50) + .5(20) + 0(30) = **1160** **MV = 1.0**

Percentage Approach:

Site A: **100** S&Es
(**50** PhDs, **50** MS)

3(50) + 2(50) / 100 = **2.5** **MV = 1.0**

Site B: **500** S&Es
(**300** PhDs, **100** MS, **50** BS, **20** AD, **30** No degree)

3(300) + 2(100) + 1(50) + .5(20) + 0(30) / 500 = **2.32** **MV = 0.92**

Therefore, *despite having 6 times the number of PhDs and 2 times the number of MS, Site B's military value is almost 10% less than Site A*. This is irrational. Site A lacks the greater intellectual horsepower and sheer idea generation that comes with 250 more PhDs and 50 more MS, as well as the talent that 100 less degreed, and generally younger, individuals have to offer.

Proponents of the Percentage Approach counter that the Absolute Approach gives Site B a MV that is almost ten times Site A, which they found excessive. However, this is more the function of the compressed point range. For example, if a PhD was worth 10 points, an MS worth 3 points, and a BS worth 1 point, the MV for Site A increases to 0.19. But when such a change (specifically a 30:10:1 ratio) to the point range was suggested as a way to address their concerns and increase the MV of the hypothetical small site, the proponents for the Percentage Approach were not interested (see Attachment D).

The problem grows more acute when scoring for the Elite and Prestigious awards:

Absolute Approach:

Site A: **100** S&Es
No Elite awards
No Prestigious awards
5 IEEE Fellows
30 unidentified patents of unknown value in last 3 years

5(5) + 1(30) = **55** **MV = 0.21**

Site B: **500** S&Es
1 National Medal of Technology, **1** Nobel Prize, **1** Collier Trophy
1 Space Technology Hall of Famer
10 IEEE Fellows, **10** AAAS Fellows
60 unidentified patents of unknown value in last 3 years

30(1) + 30(1) + 30(1) + 10(1) + 5(10) + 5(10) + 1(60) = **260** **MV = 1.0**

Percentage Approach:

Site A: **100** S&Es
No Elite awards
No Prestigious awards
5 IEEE Fellows
30 unidentified patents of unknown value in last 3 years

5(5) + 1(30) / 100 = **0.55** **MV = 1.0**

Site B: **500** S&Es
1 National Medal of Technology, **1** Nobel Prize, **1** Collier Trophy
1 Space Technology Hall of Famer
10 IEEE Fellows, **10** AAAS Fellows
60 unidentified patents of unknown value in last 3 years

30(1)+ 30(1)+ 30(1)+ 10(1)+ 5(10)+ 5(10)+ 1(60) / 500 = **0.52** **MV = 0.94**

These results are irrational. *A site with only 5 fellows and 30 unidentified patents of unknown value scores 6% higher in military value than a site with a Nobel Prize, a Collier Trophy, a National Medal of Technology, 20 fellows, a Space Technology Hall of Famer, and twice as many unidentified patents of unknown value*? Bear in mind that Bill Gates, Steven Jobs, Admiral Grace Hopper, Norm Augustine, and David Packard all won the National Medal of Technology. The Nobel's value is self-explanatory. And the Navy and Air Force shared the Collier Trophy for

inventing and developing the Global Positioning System. This would not pass the smell test with either the Commission or the communities.

Also, note how Site A, even under the Absolute Approach, scores more than 1/5 of the MV compared to Site B, which is proportionally five times larger, but *far* more technically accomplished. *This is due to the point compression problem*. A 70:1 Awards ratio, which parallels the test range ratio of WSMR / APG, and the restoration of the Society Fellows to the Prestigious tier, whose demotion in value only compounded the compression problem, gives us a more credible comparison below.

Absolute Approach + 70:1 Point Ratio + Restoration of Fellows to Prestigious Tier:

Site A: **100** S&Es
No Elite awards
5 IEEE Fellows
30 unidentified patents of unknown value in last 3 years

10(5) + 1(30) = **80** **MV = 0.16**

Site B: **500** S&Es
1 National Medal of Technology, **1** Nobel Prize, **1** Collier Trophy
1 Space Technology Hall of Famer
10 IEEE Fellows, **10** AAAS Fellows
60 unidentified patents of unknown value in last 3 years

70(1) + 70(1) + 70(1) + 10(1) + 10(10) + 10(10) + 1(60) = **480** **MV = 1.0**

In reality, given that one point is awarded for any unidentified patent of absolutely no known value, a more accurate value for the Elite and Prestigious Awards would be on the order of 500 and 50 points respectively. Who would argue that an Elite award like the Collier Trophy — awarded annually for the greatest achievement in aeronautics or astronautics in America, to past winners like Glenn Curtiss, Orville Wright, Chuck Yeager, the "Mercury 7", the Apollo 11 crew, NASA's Voyager Team, and the Navy and Air Force GPS team — is not worth 500 unknown patents of no known value? *This 500:1 ratio eliminates the point compression problem and gives Site A the more realistic MV of 0.1 when compared to the internationally recognized heavyweight achievements of Site B*. The only reason this 500:1 ratio is not recommended is the convenient 70:1 fit with the test range ratio, which should make it acceptable to all TJCSG members.

In the end, this paper's recommended approach (i.e., the "Absolute Numbers" scoring for all people metrics, a 70:10:1 point spread for the Awards Metric, a 10:3:1 point spread for the Education Metric, scoring STs under the Experience metric at a point spread of 70:3:2:1, and restoring the Technical Society Fellows to the Prestigious tier of the Awards/Honors metric) would yield closure and realignment proposals that we can better defend to the Commission. These steps must be taken to gain the necessary differentiation to properly value the Department's intellectual capital. This is a vital key to identifying the most innovative sites, and it is critical to the credibility of the BRAC process.

On the other hand, if we fail to take this approach, we will have "dumbed-down" the People Metrics to the point where we jeopardize the success of our entire endeavor. Any community-hired BRAC consultant worth his or her salt would zero in on these problems a means of discrediting the study. For one, *the use of the Percentage Approach would put the TJCSG in the position of having to defend irrational results, as well as explain why it insisted on using it when the problems were apparent well*

beforehand and conveyed to the DDR&E. Furthermore, the omission of "world-class" scientists is leading with our chin, and devaluing Society Fellows loses them among the aggregated noise level of patents, software licenses, and paper citations. Lastly, our compressed point values will be vulnerable to dissection and ridicule by anyone with the statistical aptitude of an avid baseball fan and an understanding of the non-linear difference between a PhD and a BS, an ST and an unknown person with less than 10 years of experience, and a Nobel Prize and an unidentified software license.

Proposal #7: Do Not Include Contractors in Scoring for Military Value

> [Note: On 4 June, guidance issued by the ISG prohibited the TJCSG's use of contractor data for military value. However, the following discussion is retained in this fourth version because there is still an issue regarding the inclusion of personnel from Federally Funded Research and Development Centers. The following discussion appears largely as it did in the earlier versions.]

First, BRAC is not about private sector infrastructure; it is about the infrastructure of the Federal Government. If a lab or center is closed, but the DoD remains in need of a given contractor, then those services can continue to be bought by the sites receiving the workload of the closed site. The strength of the private sector is that its services will persist, if there is public money to pay for it. Contractors will follow the money.

Second, BRAC data *must* be auditable. However, it is doubtful that personnel data on *individual* contractors (i.e., education level, years of experience, awards, etc.) would meet the stringent audit standards of BRAC. If individual contractor data were not specified within the contract obtaining the contractor's services (which is acknowledged to be unlikely), then how would it be collected? Unlike data on government personnel, which is retained in auditable central federal databases, *contractor data would need to come from the companies themselves*.

In Attachment E, the DoD IG finds that contractor data "does not provide the TJCSG with consistently useable data" and that "BRAC 2005 is a DoD process, not a contractor process." Another interesting fact is that for the Capacity Data Call (which appropriately included on-site contractors to gauge base capacity) the DoD IG reports that, "in some cases, contractors *are requesting to be paid for their data*." Money raises an issue that needs discussion — i.e., the financial dependence of private contractors on the continued operation of the host laboratory / center increases the risk of fraud. Given the recent corporate ethics meltdown exhibited by scandals at Enron, Worldcom, Arthur Anderson, Tyco, and ImClone, most would find the DoD IG's judgment to be prudent.

Abiding by the DoD IG's guidance does three things for us. It avoids inevitable challenges of data that are not sufficiently auditable, prevents the occurrence of an ethics scandal, and avoids scoring private sector infrastructure for a process that will close or realign public sector infrastructure.

Lastly, personnel from Federally Funded Research and Development Centers (FFRDCs) should not be included in the analysis and scored like government personnel, as one Service argues strenuously. Arguments that they are not contractors, or that they are more like federal employees than contractors, are disingenuous. Indeed, if FFRDC staffs were in fact government personnel, they would be called civil servants, have the authority to contract public dollars, make financial decisions in the name of the U.S. government, and be subject to the same DoD outsourcing policies levied on the government workforce. On the other hand, it might be interesting to ask CEOs of the FFRDCs if they are willing to, like government infrastructure, (a) close shop should their host base be closed by BRAC action, and (b) include their workforce and federally-funded budgets under the same DoD outsourcing quotas and

policies currently levied on the federal workforce. I bet we would find out in a New York minute that they consider themselves to be neither civil servants nor public sector infrastructure.

While FFRDC personnel may possess some special status that distinguishes them slightly from a typical contractor, but they are still private sector contractors. For example, The Aerospace Corporation, a private sector entity, manages the Aerospace FFRDC that is mentioned often by FFRDC proponents as a model example. While the FFRDC personnel may work side-by-side with civil servants of the Air Force Space and Missile Systems Center (SMC), there are strict contractual rules that pertain to their management. The following is an excerpt from the SMC FFRDC Users Guide (1 August 2002), p.1-4.

> 1.3 *The Aerospace Corporation*. The Aerospace Corporation, through an annual incrementally funded research and development Air Force contract, which coincides with the Government's Fiscal Year, operates an FFRDC, which provides scientific and engineering support...
>
> The contract entered into between the sponsoring agency (AF) and The Aerospace Corporation for the operation of the Aerospace FFRDC places requirements on the Aerospace FFRDC for performance of technical work and specifies various terms and conditions under which that work shall be performed. It specifies the direct Staff-year of Technical Effort (STE) labor hours to be delivered, sets forth specific categories of effort (GSE&I, TR, and TS), and lists programs to be supported in each category. The categories of effort and related tasks in each program are specifically defined in the Technical Objectives and Plans (TO&Ps). Approved STE years and/or dollar constraints are contractually authorized by SMC/AXC...
>
> b. *Government Direction to Aerospace Personnel*. Any direction to the Aerospace FFRDC to perform work other than that required by the contract is prohibited and may constitute a violation of the Anti Deficiency Act, 31 USC 1341. Any question concerning the Aerospace FFRDC's responsibility to perform a given task must be immediately referred to the Contracting Officer for resolution. In the event the Aerospace FFRDC performs work other than that required by the SMC contract or any other FFRDC contract, The Aerospace Corporation does so at its own risk.

In short, it is hard to defend the notions that such personnel are not contractors or that they are more like government employees than contractors. The above conditions and constraints under which the Aerospace FFRDC operates are very much contractual in nature.

Proponents for including the FFRDCs have also argued that (a) they are authorized by 10 USC Sec. 2367, (b) the government is authorized to make sole source awards to them, and (c) that they are covered under a different portion of the Federal Acquisition Regulations from other A&AS contractors. Presumably these items are cited to support the fact that FFRDCs are a different breed of contractor because they have a "non-profit" status. I am not an expert on such matters, so I'll instead cite some findings made by a political scientist, H.L. Nieburg, who was an adviser to both President John F. Kennedy and Robert Kennedy.

In Nieburg's book titled, *In the Name of Science*, which focused on the post-World War II growth of the phenomenon known as the Contract State, he examines the role of FFRDCs, and Aerospace Corp in particular. He states,

> "The contracts under which they operate are largely comparable to those with profit-making firms, including a fee on top of costs and overhead, indistinguishable from profit taking…

> "with a fee that is at present 5 percent and in some years has been higher, Aerospace is receiving a higher percentage of fee in terms of retained income than a profit-making firm [quoted from a report by the House Committee on Armed Services, Subcommittee for Special Investigation]…[25]

The point here is that FFRDC personnel are quite clearly contractors, whether they have "non-profit" status or not.

Should we nevertheless decide grant special dispensation for FFRDC personnel in our military value analysis, are we prepared to then open the door for other types of special contractor personnel? One such type is the Post-doctoral researcher. They work side-by-side and co-publish with their civil service colleagues. They have special security badges that distinguish them from other contractors, and as a result they have out-of-hours privileges that are not granted to typical contractors. They form a sizeable pool of talented future recruits; so giving them military value in our analysis would be a way of accounting for future Intellectual Capital at the host lab or center. They are high quality talent and are managed by *non-profit* professional associations (e.g., the National Research Council).

Does this mean that Post-docs should be considered "government workers"? No. Post-docs are contractors. Does this mean they should nevertheless be included in our scoring for military value? No. BRAC is not about the infrastructure or workforce of the private sector. This is merely to say that if we grant special dispensation to FFRDC personnel, then we had better be prepared to give fair and equitable treatment to other types of contractors that reside in a special status. But, that step will then open up another debate — what constitutes "special?"

Proposal #8: Eliminate the Effects of Service Policy and Organizational Differences

Two of our metrics will be significantly affected by differences in policy and organizational structures within the Armed Services. Each would be easy to fix.

> (1) *Organizational Differences for Extramural Funding*. The corporate laboratories of the Army and Air Force, (i.e., ARL and AFRL), have organizationally embedded extramural funding organizations — the Army Research Office (ARO) and the Air Force Office of Scientific Research (AFOSR). Both ARO and AFOSR are organizational analogs to the Office of Naval Research (ONR), which performs the same function for the Navy. However, ONR is NRL's parent command, and is not embedded within NRL. As such, ONR reports to the TJCSG data calls separately. Unless ONR's funding is included, there will be an artificial penalty given to NRL for metrics that score extramural dollars, such as the Workload Focus metric.
>
> There are two ways to fix the problem: include ONR's funding in the NRL totals, or exclude ARO and AFOSR funding. Either approach can be addressed during the scoring phase and do not necessitate changes to the military value questions. This would level the playing field by eliminating an artificial organizational structure-based difference among the Services.
>
> (2) *Scoring DAWIA Certification for the S&T Function*. The Navy regards its S&T workforce as technical performers, not acquisition managers, and therefore does not mandate universal Defense Acquisition Workforce Improvement Act (DAWIA) certification. The Army and AF implemented universal DAWIA certification throughout their S&T workforces. Because of this difference in Service policy, there will be a major *artificial* MilVal difference between NRL and the other Services' corporate labs for this metric. This difference will have no real military value

[25] Harold L. Nieburg, *In the Name of Science* (Chicago: Quadrangle Books, 1966), p. 254.

significance, but would unfairly penalize one corporate laboratory by at least 4 percent for a different, but valid, Service policy.

This artificial difference is also easy to fix. Given that two of the five subgroups have zeroed out the weighting value of DAWIA certification for S&T in their scoring plans, it should be deleted in full for all S&T scoring. This would provide uniformity among the subgroups. It would also ensure defensibility of the process by leveling the playing field through the elimination of an artificial policy-based difference among the Services.

It should be noted that the 4 June ISG guidance changes the metric so that only those personnel at GS-14 and above are scored. Unfortunately this does not solve the problem, a fact that will be demonstrated later in this paper.

Proposal #9: De-Emphasize Dollars as an Indicator of Military Value

Fourteen of the 16 Operational Impact metrics use funding to measure output — despite the fact that dollars are a rather standard resource *input*. Oddly, despite talk by some about measuring "product" by these metrics, a few of them (i.e., "ATDs Currently In Work", "ACAT Systems Currently in Work", and "Workload Focus") do not even meet the standard of having made an operational impact because they measure the total funding of work *in progress*. In other words, these metrics do not measure "product."

All of the current "dollar metrics" suffer from the following problems:

- Dollars show level of investment, but reveal nothing about the work's impact on warfighting capabilities.
- They introduce the use of an *input* resource as a surrogate output measure for Operational Impact.
- They are founded on an unsupportable assertion that *more dollars equals greater Military Value*, an assertion that will be hard to defend to the Commission (in one sense the opposite is likely true — large dollar contracts represent today's, and in some cases yesterday's, technology, not the disruptive, transformational technologies of tomorrow).
- The lack of specificity in the ground rules for reporting "intramural" versus "extramural" funding will lead to double-counting, or worse.

Two of the metrics — the *Workload Focus* and *Future Warfighting Capability* metrics — are especially problematic because they include contract dollars executed in the private sector. This is a dubious approach to determining military value for the reasons above, plus those cited below.

- They convey the scale of private sector infrastructure into an analysis of the public sector. BRAC is about closing, reducing, and/or realigning government, *not private sector*, infrastructure.
- They grant military value to a resource that is highly fungible, i.e., dollars can be awarded by most any DoD R&D contract shop.
- They introduce the use of a resource that will not be closed, reduced, and/or realigned due to any decision by the Commission.

Furthermore, what do dollars spent show us? For example, if Site A does the same type of work at the same in-house level of investment as Site B, but Site B contracts out more money to the private sector,

can we really support the conclusion that Site B has more military value? And, can we defend the assumption that "more dollars equals greater military value" (i.e., he who spends the most wins) to either the Commission or the communities?

Finally, the "dollar metrics" are rife with triple-counting where many of the same dollars will be scored multiple times under three different metrics: "Advanced Technology Demos Currently in Work", "Workload Focus", and "Future Warfighting Capability." So, dollars with no discernable value to our analysis get counted three times, but *income* with confirmed value gets ignored (see next section).

Proposal # 10: Include Income from Industry

The S&T metric for "Tech Transitions" counts transitions from S&T projects into DoD acquisition programs, but it misses *direct* transitions to industry via legal arrangements known as Cooperative Research and Development Agreements (CRADAs). Income to the labs and centers from CRADAs should be captured and scored because the private sector dollars received in fact confirm the quality and potential promise of the work. Industry would not provide resources for public sector research that is poor in quality or show little promise of application.

CRADAs have been used successfully for such things as the development of novel techniques for airport luggage screening, detectors for drugs of abuse, location and mapping devices for unexploded ordnance, fiberoptic dosimeters for radiation exposure, and other technological advances that have impacted the military and the civilian sectors. Nevertheless, the metric has not been adopted because of the claim that CRADAs occur too early in the process to make an operational impact. That is a curious argument given the as yet null operational impact made by "ACATs in Work," "ATDs in Work," "Workload Focus", and "Future Warfighting Capability,"

In short, the Operational Impact metrics count dollars contracted to the private sector (in some cases three times for the same dollar), so why not dollars *from* the private sector? This omission is especially odd when the latter is a much better indicator of quality than the former.

Proposal #11: Kill the Future Warfighting Capability (FWC) Metric

Two factors make the idea of prognosticating a site's *future* military value hard, if not impossible, to realize:

- Different missions (i.e., S&T, D&A, and T&E) yield different products, some of which will not have discernable military value for as much as 20 years or more (e.g., GPS).

- The dynamic and unpredictable nature of R&D, especially S&T, does not lend itself to predictions of future performance (e.g., witness the problems applying the Government Performance and Results Act to R&D agencies[26]).

The analytical foundations for this metric, as currently fashioned, are much too speculative. How do we defend the dubious correlation between a site's *future* military value and its *current* funding for technologies *pre-selected* by the TJCSG and prognosticated to be critical to the force structure in 2025?

[26] Testimony Before the Committee on Science, U.S. House of Representatives, *Managing for Results: Key Steps and Challenges in Implementing GPRA in Science Agencies*, (GAO/T-GGD/RCED-96-214), July 10, 1996.

A far more legitimate, effective, and defensible approach is to just identify today's most innovative sites. With responsible stewardship of the in-house RDT&E community and infrastructure, they will most likely be the ones creating tomorrow's new warfighting capabilities. As it stands now, this metric merely provides yet another opportunity to score the same dollars included and scored under the other "dollar metrics."

Proposal #12: Break the Stovepiped Study Design

The BRAC-95 LJCSG performed its analysis by sorting 12 common support functions by 3 lifecycle areas: S&T, Engineering Development, and In-Service Engineering (T&E was addressed by a separate JCSG). That approach generated 36 possible "bins" of workload, as opposed to our 39. While past closure rounds are not the focus here, there is an important feature that our process shares with BRAC-95 — i.e., pushing highly interconnected work through technical and functional stovepipes.

It might be helpful to think of the 39 bins as a very complex Rubik's Cube when the 3rd dimension of organization / installation is added. To be successful, we need to align the bins in a way that: *maximizes military value, reduces capacity, enhances jointness, and ensures an innovative end-state that meets transformation goals.* And, all this must be done in a way that does not sub-optimize the program of the organization / installation by severing innovative connectivity when workloads are realigned.

If that does not seem daunting enough, unless changes are made, those bins will be populated with data providing no clue as to the actual impact or value of the work. In that case, our process will be an arithmetic exercise where packets of workload are moved around in an almost arbitrary fashion, which is the inevitable result of having no data on work value. *This will sever the connectivity of critical multidisciplinary projects and vertically integrated programs, as well as decapitate top talent from any realigned work*. Realignment by arithmetic is not good enough.

A real example clarifies the problem. Last December, the DDR&E presented a prestigious award to a Navy researcher whose work on inter-operability and embedding simulations within C4I systems "represent major scientific advances satisfying critical military information technology requirements." However, the award recipient was not from a "C4I lab" (thus demonstrating the dubious nature of the Workload Focus Metric, i.e., the "Jiffy Lube Metric"). Further, the researcher is a specialist in tactical electronic warfare (EW). In what bin should this EW specialist's work be assigned? Information Systems, Sensors & Electronics, Sea Vehicles, Air Platforms, or Ground Vehicles? The relevant point here is that the 39 bins do not have clean, mutually exclusive borders.[27]

After our analysis pulls the work of the labs and centers through the stovepipes, how many critical innovative connections will be severed by realignment? Given Dr. Frosch's observation that "great R&D must preserve the connections between various kinds of knowledge," we will potentially do a lot of damage. But one way to minimize this risk is to reengineer the analysis for conformance to real-world differences in missions, outputs, types of personnel, and connectivity.

[27] One benefit to this approach is that we may be able to tell if one, or more, of the Services attempts to "game" the answers to the data calls. If a Service issues "top-down" guidance to its field sites on how to fill the bins, then we may see a very clean *Service-wide* workload focus (from S&T through T&E) on a strategically limited number of *end-product* bins where inter-service competition is greatest (e.g., air platforms, weapons), vice a smearing of workload across a larger number of bins, which would likely be characteristic of data reported by field sites operating without a directed "game-plan."

A solution is to compare 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."

The Emerging Pattern: *A "Dollars and No Sense" Approach*

At this point, it should be beneficial to step back to assess the pattern that has emerged in the TJCSG's Military Value data call. Some will disagree, but our interminable 6-month-long debate has exposed a noticeably high level of energy directed toward "dumbing-down" the metrics for Intellectual Capital. Clearly, there was no credible analytical defense for a numerical approach based on percentages, especially when it was shown to carry a significant risk of yielding irrational results. Fortunately, the ISG struck down that misguided approach, however we are still ignoring known world-class scientists (i.e., the competitively selected STs), allowing the unexplained downgrade of technical fellows from the Prestigious tier of awards/honors, subjecting innovative bench scientists to a DAWIA metric that is appropriate only for "technology shoppers", and assigning ridiculously compressed point values for education, experience, and awards/honors.

Dollars, on the other hand, have achieved relative rock-star status as a preferred metric for military value. Fourteen of the 16 Operational Impact metrics use funding to measure output — despite the fact that dollars are a rather standard resource *input*. Eleven of these metrics (i.e., "ATDs Currently In Work" for S&T; "Workload Focus" for S&T, D&A, and T&E; "Future Warfighting Capability" for S&T, D&A, and T&E; Cost Effectiveness for S&T, D&A, and T&E; and ACAT Systems Currently in Work for D&A[28]) measure funding for work *in progress*, so they fail to even meet the standard of having produced anything, much less something with an operational impact.

Most dubious of all, the "Future Warfighting Capability" metric uses *today's dollars* to gauge a lab's aptitude for inventing the unforeseen future technologies necessary to combat the unforeseeable threats of the year 2025.

If this paper's thesis proves correct, we will not have the ability to identify the DoD's highest-quality talent, which means we will fail to accurately appraise sites with that kind of talent. With its acute dependence on intellectual horsepower, this will greatly affect our assessments of S&T, which is the source of powerful, disruptive, new technologies. Given this concern, is there a way to test our analytical approach before it goes "prime time?" Can we bump a real-life, "world-class" S&T test group up against our analytical process to see how well it fares? Ideally, we would have a test group that was "benchmarked" recently as "world-class" by technical and military experts who examined the work directly and confirmed it to be of high potential pay-off and relevant to future national security needs.

Luckily, such a test group exists.

[28] While not measuring actual dollars expended, as done by the other cited metrics, this metric scores highest those ACAT programs with the biggest budgets.

Testing Our Analytical Process…

The Congressionally mandated "Section 913 Study", completed in 2002 by the National Defense University (NDU), evaluated S&T projects at 10 DoD labs / centers for *their potential impact on future warfighting requirements* — an objective that is at the core of our BRAC endeavor. The customer for NDU's study was the DDR&E.

(1) *The Defense Experts*. NDU's defense experts included retired "4-stars:" General A. Zinni (replaced by General C. Wilhelm after being called away for State Department duties in the Middle East), Admiral H. Gehman (later to become the Chair, Columbia Accident Investigation Board), General W. Crouch, and General M. Carns. Technical experts included a former DDR&E (and Secretary of the Air Force), others with experience in DoD and non-DoD R&D management, and academic experts, of which one was also on the Columbia Accident Investigation Board. The project director was Dr. H. Binnendijk, Director of NDU's Center for Technology and National Security Policy and a former Special Assistant to the President on the National Security Council.

(2) *The Test Group and its Work*: NRL's Center for Bio/Molecular Science and Engineering (CBSE) was among a number of impressive research groups evaluated at the 10 DoD labs and centers. The CBSE performs a wide range of work in the area of biosensors and has been successful in transferring its technologies to industry. For example, a patented CBSE technology licensed to Lifepoint, Inc. was recognized by *Popular Science* magazine as one of the Top 100 Tech Innovations of 2002. The device, called the Impact System, is a drug and alcohol testing method based on the CBSE's Flow Immunosensor. Another marker of success is the fact that the CBSE has attracted over $1,000,000 in CRADA income from industry to support promising R&D. Also, the CBSE demonstrated the first fully automated optical biosensor for remote identification of biological warfare (BW) agents using a UAV.

Among the CBSE projects evaluated by the NDU team were two biosensors. The projects, RAPTOR and the Array Biosensor (AB), focus on developing portable, fully automated BW agent detectors for use by expeditionary forces, first responders, and UAV surveillance. In addition to detecting BW agents, these detectors are being developed to assure food/water safety, monitor treaties, and diagnose infectious disease. RAPTOR was successfully field-tested in Bahrain for monitoring Navy drinking water supplies and the technology was transferred to the U.S. Marine Corps. Funding sources for the projects have included the Navy, Marine Corps, Special Forces, Army, Defense Threat Reduction Agency (DTRA), and NASA (for monitoring recycled water and human arrivals to the Space Station). Because these two projects were evaluated by NDU, these will be the only CBSE projects scored in the following test.

(3) *Test Group's Credentials*: Dr. F. Ligler, an ST and an elected fellow of SPIE (Society for Photooptical Instrumentation Engineering), leads the two projects. On 5 May 2004, she was personally congratulated at the White House after receiving the 2003 Presidential Rank Award for Distinguished Senior Professionals for her exceptional scientific accomplishments.[29] This was the ST cadre's first year of eligibility for an award that had previously been given exclusively to managers. Dr. Ligler holds, and has held, many professional memberships, including the DoD Counter-terrorism Technology Advisory Group, the Department of State Technical Task Group L

[29] Dr. W. Bryzik, an Army ST, and member of a TJCSG sub-group, also received this prestigious 2003 award for his technical accomplishments. Dr. Bryzik strongly advocated the inclusion of STs in the TJCSG military value analysis, but his arguments were met with the same resistance that I experienced (i.e., an ST is "just a grade").

(Biotechnology), Head of the U.S. delegation to NATO Panel 33 (Automated Sensors), U.S. representative to International Task Force 24 (New Detection Technologies), and the International Biosensors Congress.

Dr. Ligler recently received the *Homeland Security Award*, which is awarded by the Congressionally-established Christopher Columbus Fellowship Foundation. The award credits both Dr. Ligler and her staff with a,

> "a profound impact on the development of bio-sensor based detection of biological warfare agents over the past 17 years, leading to significant improvements in the nation's capability for early and accurate detection."[30]

As far as the staff's intellectual capacity is concerned, there are 12 PhDs other than Dr. Ligler. Eight of the staff are postdoctoral researchers (i.e., postdocs). Another confirmation of the CBSE's quality is a recent "Best Places to Work" survey of postdocs by *The Scientist*. A total of 91 institutions were included in the rankings, with NRL ranked 13th. Other top 15 institutions were the National Cancer Institute, Harvard School of Public Health, Lawrence Livermore National Laboratory, Cal Tech, and Vanderbilt University Medical Center.[31]

It was the work of this world-class research group that impressed the NDU study team when it visited on 7 September 2001. In particular, Admiral Gehman, stated that the,

> "Center for Bio/Molecular Science and Engineering demonstrated bio-warfare detection systems that are light years better than anything I have seen in DOD, CDC, DTRA, the Raid teams or anywhere else. This Center may be a life-saver sooner than we think."[32]

Admiral Gehman's comments carry a prescient quality given that his critique was made a year or so before the White House and the Columbus Foundation conferred the above awards, and only four days before the terrorist attacks on America.

…By Targeting Exceptional Talent

Lest my choice of test group be regarded as parochial, it should be emphasized that the CBSE was not the only group to impress the NDU study team. For example, there is the Quantum Cascade Laser work of ARL's Dr. K.K. Choi, who was recently inducted into the Space Technology Hall of Fame. His work supports Army free space communications and chem-bio sensing programs.[33] And, there is the work of the SPAWAR Systems Center (SSC) in the area of nonlinear antenna technology. This work was found by the NDU team to be,

> "Impressive and contained some potentially very transformational thinking related to the shipboard antenna problem…This work demonstrated that the Center is capable of attracting top-notch basic research people and doing first-rate science."[34]

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[30] http://www.ccolumbusfoundationawards.org/homeland/past.cfm
[31] Anderson, Grimwade, Hunter, and Park, "Best Places to Work Survey: Postdocs Speak Up", *The Scientist*, (Feb 16, 2004), 17-19.
[32] Section 913 Report #1: *Sensors Science and Technology and the Department of Defense Laboratories*, (National Defense University: March 2002), p.31.
[33] Ibid., p. 9
[34] Section 913 Report #2: *Information Science and Technology and the Department of Defense Laboratories*, (National Defense University: July 2002), p.10.

The NDU team was also impressed with the intellectual climate at ARL-Aberdeen, the Armaments Research, Development, and Engineering Center, and the Aviation and Missile Research, Development, and Engineering Center. Upon evaluating the weapons work of S&T groups within these three sites, the study concluded that:

> "The Army ballistics program is one of the areas wherein the Army holds a dominant lead technically and the private sector carries out the Army's concepts. There is no concern over privatizing this work."[35]

The reason none of these groups were chosen to be the test group is because I have no personnel, funding, and programmatic data by which to score them. On the other hand, as an employee of NRL, I know enough about the CBSE to score it accurately. Regardless of my choice, all of these groups have exceptional S&T personnel. Therefore, *the exceptional talent working on the Quantum Cascade Laser at ARL-Adelphi, nonlinear antenna technology at SSC-San Diego, and ballistics S&T at ARL-Aberdeen, ARDEC, and AMRDEC will no doubt share the NRL CBSE's fate in our military value analysis*.

The Test Design

This following test compares the CBSE against two hypothetical S&T groups: Project X and Project Y. Project X is a two-person shop that manages a contracted biosensors Advanced Technology Demonstration (ATD) program of 15 million dollars. Project Y is also an ATD, performed mostly by on-site personnel at the same $15 million dollar funding level. Both have unexceptional staff and no product, or impact, thus far. *The data is purposely constructed this way in order to isolate the effect that both dollars and "dumbed-down" people metrics will have on the overall military value scoring of a benchmarked world-class research group*.

The data required for scoring are shown below in Table 1. The column for the CBSE contains real data.

Table. 1

	CBSE	Program X	Program Y
PhDs	13	2	2
MSs	2	0	23
BSs	0	0	10
STs	1	0	0
<10 yrs	11	0	5
10-20 yrs	4	0	15
>20 yrs	0	2	15
DAWIA (3)	n/a	2	5
DAWIA (2)	n/a	0	5
DAWIA (1)	n/a	0	5
DAWIA (Multi-3)	n/a	2	5
Patents	3 (1 is licensed)	0	0
Society Fellow	1	0	0
Funding/Year	$750,000	$15,000,000	$15,000,000
IH / OH Ratio	$500 K / 250 K	$0.5 M / 14.5 M	$10 M / 5 M
Tech. Transitions	1	0	0
ATD	No	Yes	Yes

[35] Section 913 Report #3: *Weapons Science and Technology and the Department of Defense Laboratories*, (National Defense University: December 2002), p.18.

Rapid Response	Yes (but no UNS)	No	No
Awards	Homeland Security Award Presidential Award	None	None
CRADA Income	$90,000	None	None

The calculations and the assumptions used are provided in Appendix A. The data is scored using three methods, of which two were developed by the TJCSG. I call the first one the "Mass Approach" (which, after the ISG's 4 June directive, is the TJCSG's official process), and the second is called the "Mass Plus Percentage Approach" (which was our official process for 5 months). The third scoring method is called the "Defensible Approach," which is a collection of alternatives and proposals, most of which have been advocated in the three earlier versions of this paper over the last four months.

The point of this test is to determine whether our analytical process can evaluate each site accurately. If our process is sound, then the CBSE will rank highest in military value given: (1) its world-class credentials, and (2) the unexceptional personnel and non-existent operational impact of Project X and Project Y.

On the other hand, if the CBSE does not rank highest, then we have a big problem on our hands — *and it is better to know that before we do irrevocable harm to national security*.

The Results — *Blind to Exceptional Talent and Field Impact*

We have a big problem on our hands. The CBSE ranks *second with just more than half the value* of the top-ranked Project Y under the official TJCSG scoring approach. It ranks *last* under the former TJCSG approach. This is a strong sign that we will be unable to identify exceptional talent and work. Therefore, *our analysis will almost certainly fail to accurately evaluate each site's military value, especially those with exceptional talent*.

- The *Mass Approach* ranks the CBSE second, with a total Military Value (MV) of **3.50** (1.93 for Intellectual Capital and 1.57 for Operational Impact). This is just more than half of the top-ranked Project Y's score of **6.06** (3.00 for Intellectual Capital and 3.06 for Operational Impact). Even more amazing, it ranks only 18% higher than Project X's score of **2.96** — which is an unexceptional, 2-person, no-impact program with a fat wallet.

- The *Mass Plus Percentage Approach*, which was our official approach until the ISG fortunately rejected it, yields absurd results that are not hard to fathom given the previously described vagaries of the Percentage Approach. The CBSE ranks last, with a total MV of **3.97**. *This is less than ¾ that of the top-ranked 2-person Project X (**5.51**)*.

First, let us look closely at the Intellectual Capital metrics. The CBSE, with a 13-PhD staff of widely recognized *world-class* talent, ranks second to Project Y's personnel — an unexceptional, undistinguished staff with just 2 PhDs. This kind of outcome was predicted months ago by earlier versions of this paper and in emails[36] to the TJCSG CIT. Now just how insensitive are these results to

[36] In Attachment F, the Air Force claims on page 4 that its sites would be more fairly scored against Army and Navy sites by use of the Percentage Approach. This claim raises a question. How does the Air Force know that the Percentage Approach has this effect given (a) that approach's grossly unpredictable dynamics, (b) the large number of sites and "bins" to be compared, and (c) that official data have yet to be collected? By contrast, the best this paper can do is offer the much more limited claim that our study cannot identify intellectual excellence and

exceptional talent? If we add 10 Nobel Laureates, all with PhDs and more than 20 years experience, the world-class group still finishes second to Project Y in Intellectual Capital (2.61 versus 2.85).

Such irrational outcomes for Intellectual Capital are almost certain to occur in our BRAC scoring, and will probably do so on a widespread basis. Foreseeing this problem was not hard. They are due to the absurdly compressed point values, as well as the fact that the DAWIA metric creates a penalty for an artificial policy difference with no military value significance. Navy policy does not require "hands-on" R&D performers to attend classes for DAWIA certification. Such certification is appropriate for *acquisition* personnel, or "buyers" of technology, but not the innovators themselves.

But it is the Operational Impact metrics (i.e., the "dollar metrics") that bury the world-class research group. *This is odd given that the CBSE is the only group of the three to deliver a product, or an impact, with a technology transition and a successful rapid response to a Navy need in Bahrain*. Most surprising is that the metric designed for gauging a lab's potential to create transformational technology (i.e., "Future Warfighting Capability"), scores the CBSE last — roughly 80% less than Project Y. This is incompatible with Admiral Gehman's expert assessment of the CBSE's potential importance to national security, not to mention the special recognition conferred upon it by President Bush and by the Columbus Foundation, which has a Congressionally-established mission to "encourage and support research, study and labor designed to produce new discoveries in all fields of endeavor for the benefit of mankind." *The relevant point here is that it took only a fat wallet to negate the confirmed military value of the CBSE*.

Finally, the CBSE scores a zero in "Rapid Response" and a minimal value in "Cost Effectiveness" due to the disqualification of its successful rapid response project. It is disqualified because it was not initiated by official paperwork known as an "Urgent Needs Statement" (UNS). The TJCSG's analytical process does not allow for the fact that urgent field requirements are not all met in response to formal bureaucratic requests.

So, what does this test show us?

To again use Plato's allegory, it shows that exceptional technical talent and real field impact *does not even cast a shadow*. In fact, our approach appears to be blind to locating "the best and brightest" and properly appraising operational impact. The test shows that the "dumbed-down" people metrics artificially suppress the CBSE's high talent quotient, and then the dollar metrics bury it from view. Bear in mind that when we perform the real analysis, this data will be mixed in a large "bin" with a variety of similar, and not-so-similar, data in a manner that eliminates any means of identifying discrete research groups. *Unless its data rise to the top, the CBSE will disappear without us knowing it was ever there*. Then, using our stove-piped analysis, its staff and work would likely be realigned elsewhere. Should that occur, the research group that impressed Admiral Gehman for its potential importance to our country would be lost.

This test also shows that *both TJCSG approaches are certain to generate irrational results*. In fact, it shows us that the bias of the Percentage approach is as obvious as a tarantula sitting astride a slice of angel food cake. While a tad subtler, the point compression issue (where the value of one PhD is offset by just three BSs) is no less problematic when used alone (as in the Mass Approach), or in combination with the Percentage Approach. In short, point compression and percentages result in "dumbed-down"

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meaningful operational impact, whether in the Army, Navy, or Air Force. How a given Service, or even site, will fare is completely unknowable without extensive data from all the Services.

people metrics, and *neither scoring approach will be defensible before the BRAC Commission or the communities*.

Proposal #13: Use a Defensible Approach

On the other hand, the third approach used in this test case, the Defensible Method, yields results one would expect given the data. This method is a collection of alternatives and proposals that have been advocated over the last four months, many of which appeared in earlier versions of this paper.

- The *Defensible Approach* ranks the CBSE first, with a total MV of **5.69** (3.00 in Intellectual Capital and 2.69 in Operational Impact). This is 20% more than Project Y's total of **4.71** (1.65 in Intellectual Capital and 3.06 in Operational Impact), and just more than 100% more than Project X's total of **2.73** (0.22 in Intellectual Capital and 2.51 in Operational Impact). Most importantly, the big difference is made by the fact that the CBSE scores well above the other two sites in Intellectual Capacity, as one would expect it should.

The "Defensible Approach" is comprised of the following scoring rules: (a) "Absolute Number" scoring approach for all people metrics, (b) a 70:10:1 point spread for the Awards Metric, (c) a 10:3:1 point spread for the Education Metric, (d) collecting STs and scoring them under the Experience metric at a point spread of 70:3:2:1, (e) restoring the Technical Society Fellows to the Prestigious tier of the Awards/Honors metric, (f) eliminating the superfluous DAWIA Certification as a scoring metric for S&T, (g) relaxing the Rapid Response requirement for a formal Urgent Needs Statement, (h) including CRADA income, and (i) allowing the flexibility to expand the very limited prescribed lists of "Elite" and "Prestigious Awards" to include such awards as the *Homeland Security Award* and the *Presidential Rank Award for Distinguished Senior Professionals*, both of which, amazingly enough, are not allowable for scoring in the two TJCSG approaches.

Conclusion

Left unchanged, our current course will produce a "Dollars and No Sense" approach to assessing military value. People metrics that fail to discriminate extraordinary talent from the mediocre, coupled with Operational Impact metrics that score by the dollar, will favor sites that spend a lot of money irrespective of their technical competence. To put it bluntly, that is a threat to national security.

Intellectual capital is the most critical resource to defense R&D (the physical environment is probably the most important for T&E). All else is secondary. By identifying the best talent in the DoD RDT&E system we also make the rest of our BRAC job easier because exceptional talent is an indicator of other important parameters. For example, 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 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*.

These 13 proposals do not ensure success, but they offer a good chance for it. Together, they present some advantages and solve a number of critical problems:

- For the first time in any BRAC round, military value would be based, at least in part, on a site's actual level of effectiveness in meeting national security interests, both in terms of warfighting impact and contributions to science and technology

- Creative synergy (i.e., connectivity) would be protected in its three forms: multidisciplinary projects, vertical integration, and jointness
- Intellectual capital would be accorded the importance it deserves, and the metrics that measure it would not be "dumbed-down" to the point where critical differences in workforce expertise are lost in the noise of large aggregate populations
- The analytical process would conform to real-world differences in missions, culture, outputs, and types of personnel
- The analytical process would eliminate: the unsupportable assertion that *more dollars equals greater military value*, the risk inherent in using personnel data from private companies that are financially dependent on the continued operation of the host laboratory / center, and the effects of artificial differences in Service policy and organizational structure
- The analytical process would avoid the sub-optimal realignments that result from a process that segregates workload by technical and functional stovepipes
- Test range operations would be evaluated for their real-world connectivity
- By identifying today's most innovative and agile sites, it will not be necessary to link unknowable future directions of technology to tomorrow's unforeseeable warfighting requirements

We must not damage the competence of the in-house system as a performer of long-term, high-risk work. We must not cripple the ability of the laboratories, centers, and test ranges, to respond to crises. We must not break the "yardstick" that serves as the Pentagon's strongest voice for independent, authoritative technical advice that is insulated from commercial pressures to make a profit.[37] And we must avoid the pitfalls of the previous BRAC.

Much rides on our decisions, even more so than ten years ago. Our country is engaged in a prolonged struggle with an opportunistic, fanatical enemy who has unlimited apocalyptic goals and is not deterred by traditional means. We need all of the technical options we can get. Moreover, the fast global pace of technological change will continue, and disruptive new technologies are unlikely to all be invented here. A creative and agile in-house system of defense labs, centers, and test ranges will be of great importance to our nation's security. We cannot afford to make the big mistakes that most assuredly will happen if our eyes remain fixed on the shadows.

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18 June 2004

[37] DeYoung, "The Silence of the Labs," *Defense Horizons*.

APPENDIX A

Assumptions and Military Value Calculations for Case Study

A. ASSUMPTIONS

(1) The Case Study tests the TJCSG's analytical approach for the S&T function only, using only the metrics for "Intellectual Capital" and "Operational Impact." While partial in scope, these metrics should be sufficient to identify where the DoD's best S&T talent resides.

- Metrics for "Physical Structure & Equipment" were not scored due to the unavailability of data. This is mitigated by the fact that the "Intellectual Capital" metrics should identify the best talent, and the "Operational Impact" metrics should identify where the work with the greatest impact is done. All other things being equal, the best minds will gravitate to the labs with the best equipment and the best work will tend to be performed with the best equipment.

- Metrics for "Synergy" were not scored due to the large number of required assumptions, many of which would be arbitrary. This is mitigated by the fact that there is a strong consensus among the TJCSG working groups that the Synergy metrics will not differentiate among the sites.

(2) All metrics are given equal weighting.

(3) All "dollar metrics" assume constant level of funding from FY01-04. To keep it simple, dollar amounts are project-sponsored funds and do not include salary.

(4) The "Defensible Approach" is comprised of the following rules: (a) "Absolute Numbers" scoring for all people metrics, (b) a 70:10:1 point spread for the Awards Metric, (c) a 10:3:1 point spread for the Education Metric, (d) scoring STs under the Experience metric at a point spread of 70:3:2:1, (e) restoring the Technical Society Fellows to the Prestigious tier of the Awards/Honors metric, (f) eliminating superfluous DAWIA Certifications as a scoring metric for S&T, (g) relaxing the requirement for a formal Urgent Needs Statement, (h) including CRADA income, and (i) allowing expansion of the existing list of "Prestigious Awards" to include the *Homeland Security Award* (awarded by the Congressionally-established Christopher Columbus Fellowship Foundation) and the Presidential Rank Award for Distinguished Senior Professionals.

B. MILITARY VALUE CALCULATIONS

INTELLECTUAL CAPITAL METRICS

Metric (1)	Education					
	Mass Approach		*Mass + % Approach*		*Defensible Approach*	
Raptor/AB	3(13)+2(2)=43	MV=0.69	43/15=2.9	MV=0.97	10(13)+3(2)=136	MV=**1.00**
Program X	3(2)=6	MV=0.10	6/2=3.0	MV=**1.00**	10(2)=20	MV=0.15
Program Y	3(2)+2(23)+1(10)=62	MV=**1.00**	62/35=1.8	MV=0.60	10(2)+3(23)+1(10)=99	MV=0.73

Metric (2)	Experience					
	Mass Approach		*Mass + % Approach*		*Defensible Approach*	
Raptor/AB	2(4)+1(11)=19	MV=0.24	19/15=1.3	MV=0.43	70(1)+2(3)+1(11)=87	MV=**1.00**
Program X	3(2)=6	MV=0.08	6/2=3.0	MV=**1.00**	3(2)=6	MV=0.07
Program Y	3(15)+2(15)+1(5)=80	MV=**1.00**	80/35=2.3	MV=0.77	3(15)+2(15)+1(5)=80	MV=0.92

Metric (3)	DAWIA Certification					
	Mass Approach		*Mass + % Approach*		*Defensible Approach*	
Raptor/AB	0	MV=0.00	0	MV=0.00	n/a	
Program X	3(2)+3(2)=12	MV=0.27	12/2=6	MV=**1.00**	n/a	
Program Y	3(5)+3(5)+ 2(5)+1(5)=45	MV=**1.00**	45/35=1.3	MV=0.22	n/a	

Metric (4)	Honors / Awards					
	Mass Approach		*Mass + % Approach*		*Defensible Approach*	
Raptor/AB	5(1)+ 1(2)+ 2(1)=9	MV=**1.00**	9/15=0.6	MV=**1.00**	10(3)+1(2)+2(1)=34	MV=**1.00**
Program X	0	MV=0.00	0	MV=0.00	0	MV=0.00
Program Y	0	MV=0.00	0	MV=0.00	0	MV=0.00

INTELLECTUAL CAPITAL			
	Mass Approach	*Mass + % Approach*	*Defensible Approach*
Raptor/AB	1.93	2.40	**3.00**
Project X	0.45	**3.00**	0.22
Project Y	**3.00**	1.59	1.65

THE "DOLLAR METRICS" (OPERATIONAL IMPACT)

Metric (5)	Technology Transition					
	Mass Approach		*Mass + % Approach*		*Defensible Approach*	
Raptor/AB	1	MV=**1.00**	1	MV=**1.00**	1+ [90K / 90K]=2	MV=**1.00**
Project X	0	MV=0.00	0	MV=0.00	0	MV=0.00
Project Y	0	MV=0.00	0	MV=0.00	0	MV=0.00

Metric (6)	ATDs Currently in Work					
	Mass Approach		*Mass + % Approach*		*Defensible Approach*	
Raptor/AB	0	MV=0.00	0	MV=0.00	0	MV=0.00
Project X	15 x 3= 45.0 45.0/15 x 3=1.0	MV=**1.00**	1.0	MV=**1.00**	1.0	MV=**1.00**
Project Y	15 x 3=45.0 45/45=1.0	MV=**1.00**	1.0	MV=**1.00**	1.0	MV=**1.00**

Metric (7)	Rapid Response					
	Mass Approach		*Mass + % Approach*		*Defensible Approach*	
Raptor/AB	0	MV=0.00	0	MV=0.00	1	MV = **1.00**
Project X	0	MV=0.00	0	MV=0.00	0	MV = 0.00
Project Y	0	MV=0.00	0	MV=0.00	0	MV = 0.00

Metric (8)	Workload Focus					
	Mass Approach		*Mass + % Approach*		*Defensible Approach*	
Raptor/AB	[.9(.5x3/10x3) + .1(.25x3/10x3) + 15/35] / 2 = 0.24	MV = 0.25	0.25	MV = 0.25	0.25	MV= 0.25
Project X	[.9(.5x3/10x3) + .1(14.5x3/14.5x3) + 2/35] / 2 = 0.10	MV = 0.10	0.10	MV=0.10	0.10	MV=0.10
Project Y	[.9(10x3/10x3) + .1(5x3/14.5x3) + 35/35] / 2 = 0.97	MV = **1.00**	0.97	MV = **1.00**	0.97	MV = **1.00**

Metric (9)	Future Warfighting Capability					
	Mass Approach		*Mass + % Approach*		*Defensible Approach*	
Raptor/AB	[.045 + .0025 + .43 + .75/15] / 3 = 0.18	MV = 0.18	0.18	MV = 0.18	0.18	MV = 0.18
Project X	[.045 + .1 + .06 + 15/15] / 3 = 0.40	MV = 0.41	0.40	MV = 0.41	0.40	MV = 0.41
Project Y	[.9 + .03 + 1 + 15/15] / 3 = 0.98	MV = **1.00**	0.98	MV = **1.00**	0.98	MV = **1.00**

Metric (9)	Cost Effectiveness					
	Mass Approach		*Mass + % Approach*		*Defensible Approach*	
Raptor/AB	[1 + 0 + 0] / 15=0.07	MV = 0.14	0.07	MV=0.14	[1 + 0 + 1] / 15 = 0.13	MV = 0.26
Project X	[0 + 1 + 0] / 2=0.50	MV = **1.00**	0.50	MV=**1.00**	[0 + 1 + 0] / 2 = 0.50	MV = **1.00**
Project Y	[0 + 1 + 0] / 35=0.03	MV = 0.06	0.03	MV=0.06	[0 + 1 + 0] / 35 = 0.03	MV = 0.06

"DOLLAR METRICS"

	Mass Approach	*Mass + % Approach*	*Defensible Approach*
Raptor/AB	1.57	1.57	2.69
Project X	2.51	2.51	2.51
Project Y	**3.06**	**3.06**	**3.06**

***TOTAL MILITARY VALUE*: INTELLECTUAL CAPITAL METRICS + "DOLLAR METRICS"**

	Mass Approach	*Mass + % Approach*	*Defensible Approach*
Raptor/AB	3.50	3.97	**5.69**
Project X	2.96	**5.51**	2.73
Project Y	**6.06**	4.65	4.71

THE UNDER SECRETARY OF DEFENSE

3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

ACQUISITION,
TECHNOLOGY
AND LOGISTICS

JUN 4 2004

MEMORANDUM FOR CHAIRMAN, TECHNICAL JOINT CROSS-SERVICE GROUP

SUBJECT: Technical Joint Cross-Service Group Report on Military Value Analysis

The Infrastructure Steering Group (ISG) has reviewed the Technical JCSG Military Value report submitted to it on March 25, 2004. The ISG appreciates the dedicated effort and military judgment that your members, as the experts in the field, put into revising this report in response to our initial comments. As part of the process to review issues raised by the Military Departments, the ISG tasked the BRAC Deputy Assistant Secretaries (DASs) to develop recommendations for resolving issues with the military value reports. The BRAC DASs met to review the issues pertaining to your JCSG. Representatives from the TJCSG participated in the discussion with the DASs to ensure the issues were well understood and potential solutions were implementable and reasonable. Subject to incorporation of the comments expressed herein, the ISG approves your report as the basis for your military value analysis.

In its report, the Technical JCSG proposes the use of out-year spending data as an indicator of the "Future Warfighting Capability." The use of out-year dollars is not appropriate for assessing the military value of facilities where your functions are currently being performed. The metric "Future Warfighting Capability" should be limited as follows:

$S(fwc) - [.9X(FTFEi/MTFEi_i) + .1X(FTFEe/MTFEe) + (FTFEf/MTFEf) + (FFTEs/MFFTEs)]/3$

FTFEi = funding executed internally by the technical facility (includes personnel salaries) over the last three years (FY01-03)

MTFEi= maximum funding executed internally by any like-facility (includes personnel salaries) over the last three years (FY01-03)

FTFEe = funding executed externally by the technical facility over the last three years (FY01-03)

MTFEe = maximum funding executed externally by any like technical facility over the last three years (FY01-03)

Attachment A

FTFEf = funding **appropriated** ~~identified over the FYDP~~ in FY 04 ~~(FY04-FY10)~~ by the technical facility

MTFEf = maximum funding **appropriated** ~~identified over the FYDP~~ in FY 04 ~~(FY04-FY10)~~ by the technical facility

FFTEs = In house FTEs at the technical facility over the last three years (FY01-FY03)

MFFTEs = maximum # of FTEs at any like facility over the last three years (FY01-FY03)

In its report, the Technical JCSG asks for specific personnel names in addition to qualifications. The TJCSG said that the names were requested to assist in auditing the data. The facilities submitting the personnel qualification information must have source data indicating the specific individuals having the qualifications and this source data is sufficient to allow auditing of the input. The Military Departments and Defense Agencies have data certification procedures to prevent respondents from providing false information. The audit process is the method to ensure the integrity of this process. Therefore, revise the relevant questions to eliminate the request for specific personnel names.

The rationale for the weighting and scoring process proposed by the TJCSG must be included somewhere in the group's formal record. This can be in the Military Value report or in the group's deliberative meeting record. Please review the group's deliberative meeting minutes and revise the Military Value report as necessary to provide a complete record of the rationale for the weighting and scoring process in the TJCSG formal record.

The TJCSG's current Military Value scoring plan uses percentages instead of absolute numbers as a measure of value in certain people-related areas. The use of percentages would skew Military Value by equating large and small installations. Please revise your report to change the method of measurement to use absolute numbers.

Because of differences in the way the military departments apply the Defense Acquisition Workforce Improvement Act (DAWIA) certification requirements, please revise your report to only request DAWIA certification data for those employees who are at the grade level of GS-14/NH IV and above.

The TJCSG proposes to use the qualifications of on-site contractors in their military value calculation. Because of the Office of the Inspector General concern about the auditability of this contractor data as well as the concern that this data is not consistently available at all locations, the metrics and related questions that measure the qualifications of on-site contractor data need be stricken from the TJCSG military report.

After incorporation of the directed revisions above, please provide a final copy of your Military Value Analysis report to the OSD BRAC Office no later than two weeks after the date of this memorandum. If you have any questions regarding these comments, please contact Peter Potochney, Director, Base Realignment and Closure, at 614-5356.

Michael W. Wynne
Acting USD (Acquisition, Technology & Logistics)
Chairman, Infrastructure Steering Group

cc: Infrastructure Steering Group Members
MilDep BRAC DASs

Close

From: DeYoung, Don

To: 'Short, James '

Cc: DeYoung, Don; 'Robert.Buckstad@osd.mil'; 'Harshad.Shah@osd.mil'; 'Andrew.Porth@osd.mil'; 'rflorence@dodig.osd.mil'; 'desalvapn@mcsc.usmc.mil'

Subject: TJCSG Minutes

Sent: 3/20/2004 6:56 PM **Importance:** Normal

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Jim,

Please ensure that the minutes of the 19 March 2004 TJCSG meeting contain my objection to the percentage approach for the People Metrics. Also, please make sure the minutes show that I advised the DDR&E that in all likelihood we will be in a position where "we have to defend an approach that yields irrational results." You may want to add the specific case I described to him.

The plausible scenario for the Awards Metric that I described to Dr. Sega is included in the paper I sent to the subgroup leads in a 27 Feb email appended below. I haven't re-done the arithmetic yet, but irrational results may be even likelier now that the award point scales have been compressed from a ratio of 30:10:1 down to 10:1.

In emails subsequent to the one below, I challenged the subgroup leads several times to show me where I'm wrong, and to cite examples where the alternative Absolute Numbers approach yields irrational results. Other than the woodland botany advice I received about my tendencies to examine the colors of individual leaves in the forest, I've received no responses.

Without any evidence provided to show where I'm in error, I remain convinced that we have a very flawed study on our hands. I can think of no rational defense to our approach if it is challenged by the Commission or the communities.

v/r,

Don DeYoung
U.S. Navy, CIT Alternate

-----Original Message-----
From: DeYoung, Don
To: 'Mathes, Thomas'; 'Rohde, Robert S Dr SAALT'; 'Blake Christopher L SES HQ AFMC/XP'; Mleziva Matt Civ ESC/NI; Shah, Harshad C Mr OSD-ATL; Shaffer, Alan Mr OSD-ATL; Ryan, George R CIV; Goldstayn Alan B Civ AEDC/CD; Berry, William Dr OSD-ATL; "karen.higgins@navy.mil' '; "schuette@nrl.navy.mil' '; "brian.simmons@dtc.army.mil' '

Cc: Buckstad, Robert COL OSD- ATL; Short, James Dr OSD-ATL; Strack, Gary Mr SAF/IEBB; DeYoung, Don
Sent: 2/27/2004 6:27 PM

Attachment B

Close

From: DeYoung, Don

To: 'Shah, Harshad C, Mr, OSD-ATL '; 'Buckstad, Robert, COL, OSD-ATL '

Cc: 'Ryan, George R CIV '; 'Cohen, Jay '

Subject: RE: Decision Time//BRAC FOUO -- MIL Val Rpt for Dr Sega Approval

Sent: 3/24/2004 1:46 PM **Importance:** Normal

Sirs,

I non-concur with the "Military Value Analysis Report" of the Technical Joint Cross Service Group (TJCSG), dated 24 March 2004.

I cannot with integrity approve a base closure study plan that has major, known, and yet uncorrected, flaws that will substantially affect the assigned military value for each of the Department's laboratories, warfare/product centers, and test ranges.

I have gone on record with my concerns, particularly to the "percentage approach" to determining the value of the Department's intellectual capital. My objections have been made in a number of different forums, and each time I presented quantitative data to both substantiate my concerns and invite informed debate. The last was the 19 March TJCSG meeting, where I showed how an irrational score is yielded for a likely scenario. In that meeting, the TJCSG principals agreed to use the percentage approach – but only if the OSD BRAC office decides that individual contractor data is not sufficiently auditable.

On several occasions I invited the proponents of the percentage approach to show instances where the alternative "absolute numbers approach" yields irrational results. Without any responses to that request, I remain convinced that we are heading down a path that will lead to the discrediting of the study if it is challenged by the BRAC Commission or the communities. That the problems have been known for at least one month before final approval of the report will be especially difficult to explain. Use of the percentage approach risks placing the DDR&E in the untenable position of having to defend an analytical process that yields irrational results.

I am also concerned by the fact that the Scientific/Technical (ST) Corps will not be separately scored for military value. According to high level OSD officials and to the Army's Science and Technology Master Plan (1997), STs are "world class" scientists, some of the best and brightest in the Department's technical workforce.

In short, the report requires changes to ensure that we are not "dumbing down" the very metrics used to assess the value of the Department's most essential resource – its scientific and technical talent.

Very respectfully,

Don J. DeYoung
CIT Alternate
U.S. Navy

-----Original Message-----
From: Shah, Harshad C, Mr, OSD-ATL
To: 'Goldstayn Alan B Civ AEDC/CD'; 'Desalva Col Peter N'; Castle Fred F Brig Gen AF/XP; Shaffer, Alan, Mr, OSD-ATL; 'Blake Christopher L SES HQ AFMC/XP'; Ryan, George R CIV; 'Rohde, Robert S Dr SAALT'; 'Mleziva Matt Civ ESC/NI'; 'karen.higgins@navy.mil'; Berry, William, Dr, OSD-ATL; 'schuette@nrl.navy.mil'; 'MathesT@tacom.army.mil'; 'Blake Christopher L SES HQ AFMC/XP'; DeYoung, Don

Attachment C

Close

From: Mleziva Matt Civ ESC/NI [SMTP:Matt.Mleziva@hanscom.af.mil]

To: DeYoung, Don; Mleziva Matt Civ ESC/NI; 'Lawrence C. Schuette '; 'Shaffer, Alan, Mr, OSD-ATL '; Goldstayn Alan B Civ AEDC/CD; 'Higgins, Karen L SES '; Blake Christopher L SES HQ AFMC/XP; 'Berry, William, Dr, OSD-ATL '; 'Simmons, Brian '; 'Rohde, Robert S Dr SAALT '; 'Shah, Harshad C, Mr, OSD-ATL '; 'Ryan, George R CIV '; "Mathes, Thomas' '; 'schuette@nrl.navy.mil '

Cc: 'Buckstad, Robert, COL, OSD- ATL '; 'Short, James, Dr, OSD-ATL '; Strack Gary Mr SAF/IEBB

Subject: RE: People Metrics -- Part II

Sent: 3/2/2004 7:55 AM **Importance:** Normal

Don, et.al. - my overall observations are:
. that there are a variety of views (percentage, absolute, combinations, etc.) that one can take to each metric
. not only must each metric be "fair and equitable" but the overall set must be "fair and equitable" too - this leads me to part company with the argument that all metrics (or an attribute set) must use the same view - views should be tailored to provide differentiation between reporting facilities, and must be "fair and equitable" for the topic being measured - hence I can rationalize quantity for one metric, quality for another and some combination for yet another

So for education, I envision "normal" organizations (not "corner cases" we can all construct to prove a point) and I think the objective to measure is the quality of the organization as the quantity is measured in other metrics - I think having all the metrics in a set being either quality or quantity may not be "fair and equitable" as it may inadvertently introduce a "cultural" bias in the result - hence diversity of "views" helps insure a lack of inadvertent bias

On the suggestion of changing the multipliers from (e.g.) 1,2,&3 to 1,20 & 30 that does not pass my "giggle" test - that is, is an MS worth 10x a BS - I have both and I can't rationalize that - and the same for grade/experience - and I have experience with both of those (no pun intended)

In summary, I've considered the arguments to change the Education metric and am not convinced the alternatives are an improvement on the current version

Cheers, Matt

-----Original Message-----
From: DeYoung, Don [mailto:deyoungd@ndu.edu]
Sent: Monday, March 01, 2004 9:31 PM
To: 'Mleziva Matt Civ ESC/NI'; 'Lawrence C. Schuette '; 'Shaffer, Alan, Mr, OSD-ATL '; Goldstayn Alan B Civ AEDC/CD; 'Higgins, Karen L SES '; Blake Christopher L SES HQ AFMC/XP; 'Berry, William, Dr, OSD-ATL '; 'Simmons, Brian '; 'Rohde, Robert S Dr SAALT '; 'Shah, Harshad C, Mr, OSD-ATL '; 'Ryan, George R CIV '; "Mathes, Thomas' '; 'schuette@nrl.navy.mil '

Cc: 'Buckstad, Robert, COL, OSD- ATL '; 'Short, James, Dr, OSD-ATL '; Strack Gary Mr SAF/IEBB; DeYoung, Don
Subject: RE: People Metrics -- Part II

Matt,

In my last email I asked if you would share your thoughts on how the Percentage approach plays out with the Awards metric. In the interim I've done some thinking on our mutual concern about quality and how it relates to the Education and Experience metrics.

What did you think about the plausible scenario I provided last Friday? It had Site A with 100 S&Es (50 PhDs, 50 MSs), and Site B with 1,000 S&Es (500

Attachment D

PhDs, 200 MSs, 75 BSs, 100 ADs, and 125 with no degree. With the Percentage approach, Site B is rated 20% lower in military value -- despite having 10 times the PhDs, 4 times the MSs, as well as the talent that 300 less degreed, and generally younger, individuals have to offer. Given our shared interest in measuring quality accurately, this irrational result must be a major source of concern for you as well.

A very interesting aspect about the Percentage approach is that it negates the value of large masses of high quality talent. For example, let's take the site you hypothesized with 100 S&Es (where all 100 have PhDs), and assume another site has 1000 S&Es (all 1000 have PhDs), and just for laughs, a third site has 1,000,000 S&Es (all one million have PhDs). By the Percentage approach, each would have the same MV. And, all would be equivalent even to a site with 1 person, who is a PhD. Clearly, these are irrational results, as I'm sure you'd agree. Unlike the plausible scenario I provided last Friday, the wrinkle with this scenario is its low likelihood due to the artificially uniform percentages across the board.

I read your comments below about the 100 PhDs vs. the 100 PhDs/300 BSs, and had the following thought. What if we took the same approach with Education as we are doing with the Awards? By that I mean construct a scale with larger differentials between a PhD and a BS, like 30 points for a PhD, 10 for a MS, and 1 for a BS. Using this scale and the Absolute numbers approach, Site A with 100 S&Es (all PhDs) would score a MV of 0.9, and the site with the 1000 S&Es (100 PhDs/300 BSs) would score 1.0. That sounds rational.

We would do the same with Experience. An ST would get 30 points, persons with greater than 20 years would get 10 points, 10 to 20 years would get 5 points, and zero to 10 years would get 1 point. The STs would not be counted under the >20, 10-20, and <10 bands to eliminate double-counting.

I know you and others have said that an ST is "just a grade," but there are mountains of evidence to show that is just not the case. Those positions are for "world-class" technical experts that the DoD wants to retain as productive, innovative scientists and engineers. The ST position grants the world-class expert greater compensation without being encumbered with ill-fitting management duties. Saying these positions are "just a grade" is like saying the McKinley Climatic Chamber is just a building, and that the Edwards' test range is just a high desert plain. Their omission will elicit skepticism about the merits behind our process, and inevitable challenges on this issue will be impossible to defend.

Again, since we're both concerned about the need to judge the quality of DoD's technical talent accurately, I'd be interested in what you think about these ideas. As for me, they go a long way toward rectifying our current approach, which at present yields very irrational results.

v/r,

Don

-----Original Message-----
From: Mleziva Matt Civ ESC/NI [mailto:Matt.Mleziva@hanscom.af.mil]
Sent: Monday, March 01, 2004 2:15 PM
To: 'Lawrence C. Schuette '; DeYoung, Don; Mleziva Matt Civ ESC/NI; 'Shaffer, Alan, Mr, OSD-ATL '; Goldstayn Alan B Civ AEDC/CD; 'Higgins, Karen L SES '; Blake Christopher L SES HQ AFMC/XP; 'Berry, William, Dr, OSD-ATL '; 'Simmons, Brian '; 'Rohde, Robert S Dr SAALT '; 'Shah, Harshad C, Mr, OSD-ATL '; 'Ryan, George R CIV '; "Mathes, Thomas' '; 'schuette@nrl.navy.mil '
Cc: 'Buckstad, Robert, COL, OSD- ATL '; 'Short, James, Dr, OSD-ATL '; Strack Gary Mr SAF/IEBB
Subject: RE: People Metrics

Afraid I'll have to part company with Larry on this one - the People discussion is the difference between the "quality" and "quantity" views of education - the quality view survived a long involved vetting process - and the group has shown it is willing to change the metrics/questions when convinced it is appropriate - I for one am not convinced that (e.g.) a facility with 100 PHDs and 300 BSs should get twice as much MV as a facility with 100 PHDs - the quality of the workforce of all PHDs is, in my view, greater and therefore should get more MV - you know that you are going to get a PHD to do your work if you go there - I'm not convinced that the quantity view should prevail over the quality one - and with the vetting given to the current metric, the burden should be on those advocating a change to convince the group of the need to change - cheers, Matt

-----Original Message-----
From: Lawrence C. Schuette
To: DeYoung, Don; Mleziva Matt Civ ESC/NI; Shaffer, Alan, Mr, OSD-ATL; Goldstayn Alan B Civ AEDC/CD; Higgins, Karen L SES; Blake Christopher L SES HQ AFMC/XP; Berry, William, Dr, OSD-ATL; Simmons, Brian; Rohde, Robert S Dr SAALT; Shah, Harshad C, Mr, OSD-ATL; Ryan, George R CIV; 'Mathes, Thomas' ; schuette@nrl.navy.mil
Cc: Buckstad, Robert, COL, OSD- ATL; Short, James, Dr, OSD-ATL; Strack Gary Mr SAF/IEBB
Sent: 3/1/2004 2:01 PM
Subject: RE: People Metrics

Hi Don,

I found your arguments very persuasive. A wise man once said we have permission to get smarter... (or words to that effect). I believe that when the new version of the Annex comes out (later today), we'll all be able to take 4th or 5th look at the questions. Your analysis leads me to change my mind regarding the use of % versus raw numbers in the

People category.

Regarding the list of Societies - I thought we were going to provide points only if they were Technical fellows from that list of societies, not simply members.
Again, I look forward to seeing the current wording of the metrics, questions, and scoring.

I (apparently) am also in the minority on the issue of work done in-house and out-house. I saw Matt's comments regarding the flexibility (and thus higher value) that out-house work provides. I disagree. In my mind if the % numbers that are currently in use for in-house vs out-house $$ aren't approved, then we should only count the in-house FTEs. Additionally, we're not going to close, or move Raytheon or M.I.T. The effect is to inflating the value of those people. We are counting their experience, education, certifications and individual output. We're also capturing the location they work at and their collective output. We're also capturing the synergy that they have achieved with their local community and their customers and tech base. That would seem sufficient.

v/r
Larry

-----Original Message-----
From: DeYoung, Don [mailto:deyoungd@ndu.edu]
Sent: Monday, March 01, 2004 1:34 PM
To: 'Mleziva Matt Civ ESC/NI'; 'Shaffer, Alan, Mr, OSD-ATL'; Goldstayn Alan B Civ AEDC/CD; 'Higgins, Karen L SES'; Blake Christopher L SES HQ AFMC/XP; Lawrence C. Schuette; Berry, William, Dr, OSD-ATL; Simmons, Brian; Rohde, Robert S Dr SAALT; Shah, Harshad C, Mr, OSD-ATL; Ryan, George R CIV; 'Mathes, Thomas' ; schuette@nrl.navy.mil
Cc: Buckstad, Robert, COL, OSD- ATL; Short, James, Dr, OSD-ATL; Strack Gary Mr SAF/IEBB; DeYoung, Don
Subject: People Metrics

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All,

I was asked to clarify my criticism of the Percentage approach as it applies to the People metrics. Since I'm not sure what was unclear, the following may not help, but I'll try.

The scenarios I used are hypothetical, but nonetheless very likely. In those test cases, the Percentage approach yielded what most would consider absurd, or at least irrational, results, for both the Education

and Awards metrics. By contrast, the Absolute numbers approach yielded rational results.

I believe this puts the burden of proof on the proponents of the Percentage approach to show that either (a) my math was wrong, (b) the Percentage approach's results in the test cases are, in fact, rational, or (c) the Absolute approach yields results, in likely scenarios, that are also irrational and would occur on a equally or more significant level. If neither (a), (b), or (c) can be supported, then the Percentage approach surely seems invalid.

So far, the only objection I've heard to using the Absolute approach is that it would mean "bigger is always better." Without providing evidence of why that is detrimental, that's just an assertion of what shouldn't be. Not liking an approach because it creates an end state that "shouldn't be" isn't very useful, and the Commission and losing communities are not likely to find the assertion very compelling. I understand most of the subgroup leads don't like the Absolute approach, but the key matter is the degree of reasonableness in the results.

But, maybe I'm missing something. It would be far from the first time. I'd be interested in knowing if either (a), (b), or (c) can be supported. If anyone can do so, it would be important because our job is to do the right thing by the DoD, the RDT&E sites, and the country.

v/r,

Don DeYoung

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INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202–4704

April 22, 2004

MEMORANDUM FOR DIRECTOR, BASE REALIGNMENT AND CLOSURE
(INSTALLATION AND ENVIRONMENT)

SUBJECT: Office of the Inspector General of the Department of Defense Views on Contractor Data

The Technical Joint Cross Service Group (TJCSG) has been holding discussions to determine whether contractor data is auditable. It is our understanding that the issue concerns whether the data on contractor education, experience, and certifications are auditable and certifiable.

"Transformation Through Base Realignment and Closure (BRAC 2005) Policy Memorandum One—Policy, Responsibilities, and Procedures," April 16, 2003, states "Section 2903(c)(5) of BRAC requires specified DoD personnel to certify to the best of their knowledge and belief that information provided to the Secretary of Defense or the 2005 Commission concerning the realignment or closure of military installation is accurate and complete." Policy Memo One further requires that all information used to develop and make recommendations must be certified. BRAC 2005 is a DoD process, not a contractor process.

The audit community has determined that contractor information obtained through e-mails or surveys is not acceptable supporting documentation because the information is not auditable. In addition, letters from contractor officials documenting personnel education, experience, and professional certifications is also unacceptable support because that is also not auditable. However, in some instances, if the contract used to obtain contractor services identifies education, experience, and professional certification requirements as a contract line item or a deliverable and the contractor personnel with those credentials correlates to a contractor invoice, then the information would be considered acceptable support as long as the contracting officer or contracting officer representative certifies it. The issue is that the acceptability of contractor data as support would be on a case-by-case basis and not across the board for all contractors, which, therefore, does not provide the TJCSG with consistently useable data.

A similar situation occurred in the capacity analysis data call regarding questions 690 and 691. The questions pertain to personnel education levels and Defense Acquisition Workforce Improvement Act certifications, respectively. The audit community is finding that the responses to questions are not properly supported nor are the installations able to obtain this information from their contractors.

Attachment E

In some cases, contractors are requesting to be paid for their data. These particular questions and issues will be highlighted in the OIG and Service audit agency reports that are related to the data validation efforts.

If you have questions, please contact Ms. Deborah Culp at (703) 604-9335.

David K Steensma

David K. Steensma
Assistant Inspector General
for Contract Management

Close

From: DeYoung, Don

To: 'Blake Christopher L SES HQ AFMC/XP '; 'Strack Gary Mr SAF/IEBB '; "brian.simmons@dtc.army.mil ' '

Cc: "Shaffer, Alan, Mr, OSD-ATL ' '; "George R CIV ' '; "'Dr. Bob Rohde' ' '; 'Goldstayn Alan B Civ AEDC/CD '; 'Mleziva Matt Civ ESC/NI '

Subject: RE: Signed ISG Memo and proposed draft TJCSG response - BRAC FOUO

Sent: 4/23/2004 6:15 PM **Importance:** Normal

Chris,

Thanks for your candid and, as usual, clear and useful feedback. Productive debate is always easier to achieve with that kind of input. I've appreciated your consistently even-handed role throughout this debate on how to score the People Metrics.

I still disagree with your proposal to put the Percentage Approach back into play, for reasons that you already know and understand. But, for the sake of the record -- and the fact that my thinking has evolved a bit more on this subject over the last few weeks -- I'll sketch out my reasons why the goals of the TJCSG, and the DoD, are best served by using the Absolute Numbers Approach, which was recently endorsed by the ISG.

First, I want to correct your assertion that I regard the Percentage Approach, and its use, to be irrational. I do not make that claim and never have. In fact, the approach itself is quite rational. However, I have claimed, and still believe, that use of the approach risks yielding some number of irrational results when we perform our closure scenario analyses.

Second, you link two issues – the contractor data and the Percentage Approach – and raise the issue of fairness. I believe you are saying that, if contractor data is excluded and the ISG continues to endorse the Absolute Numbers Approach, then the Air Force is being treated unfairly. I don't see it that way. Instead, each issue is being debated and evaluated independently, strictly on its own merits. To me, the "linkage" of separate issues is more a feature of political negotiation than it is of quantitative analysis.

My concerns about the Percentage Approach remain for the following reasons.

The Percentage Approach depresses (to varying degrees) the value of large masses of high quality talent (whether measured by the awards, education, or experience metrics) and exaggerates the value of small masses — across the board. Take the patently absurd case where the Percentage Approach gives a one-person site with one PhD the same military value score as a 1,000-person site with one thousand PhDs. Here it is obvious that the military value of the small mass is exaggerated and the military value of the large mass is minimized. I see this absurd case as the outer boundaries of the problem "box", but every case within the box will be affected to varying degrees. And it is likely that some as yet unknown number of them will yield irrational results.

The rudimentary sensitivity analyses I've performed varies all variables, the site populations along with the assessed qualities. As the Analysis Team itself acknowledged, in the case of the Awards/Patents Metric, they gave bases of all sizes roughly the same number of awards and patents.

To illustrate my concern regarding the high probability of irrational results, the following scenarios compare a small 100-person site versus a larger 500-person site (note that this is different from the 1,000-person example I've used on previous occasions).

Absolute Numbers Approach:

Site A: 100 S&Es (50 PhDs, 50 MS) MV = 0.12

Attachment F

Site B: 500 S&Es (300 PhDs, 100 MS, 50 BS, 20 AD, 30 No degree) MV = 1.0

Percentage Approach:

Site A: 100 S&Es (50 PhDs, 50 MS) MV = 1.0

Site B: 500 S&Es (300 PhDs, 100 MS, 50 BS, 20 AD, 30 No degree) MV = 0.92

Therefore, despite having disproportionately more PhDs (6 times vice 5 times) and 2 times the number of MS, Site B's military value is almost 10% less than Site A. This is irrational. Site A lacks the greater intellectual horsepower and sheer idea generation that comes with 250 more PhDs and 50 more MS, as well as the talent that 100 less degreed, and generally younger, individuals have to offer.

Proponents of the Percentage Approach will counter that the Absolute Numbers Approach gives (under the above example) Site B a MV that is almost ten times Site A, which they find excessive. However, this is more the function of the compressed point range. For example, if a PhD was worth 10 points, an MS worth 3 points, and a BS worth 1 point, the MV for Site A increases to 0.19. My suggestion of 2 months ago to change the point range as a way to address this concern never gained traction.

The problem grows more acute when scoring for the Awards/Honors:

Absolute Numbers Approach:

Site A: 100 S&Es
No Elite awards
No Prestigious awards
5 IEEE Fellows
30 unidentified patents of unknown value in last 3 years

MV = 0.21

Site B: 500 S&Es
1 National Medal of Technology, 1 Nobel Prize, 1 Collier Trophy
1 Space Technology Hall of Famer
10 IEEE Fellows, 10 AAAS Fellows
60 unidentified patents of unknown value in last 3 years

MV = 1.0

Percentage Approach:

Site A: 100 S&Es
No Elite awards
No Prestigious awards
5 IEEE Fellows
30 unidentified patents of unknown value in last 3 years

MV = 1.0

Site B: 500 S&Es
1 National Medal of Technology, 1 Nobel Prize, 1 Collier Trophy
1 Space Technology Hall of Famer
10 IEEE Fellows, 10 AAAS Fellows
60 unidentified patents of unknown value in last 3 years

MV = 0.94

These results are irrational. A site with only 5 fellows and 30 unidentified patents of unknown value scores 6% higher in military value than a site with a Nobel Prize, a Collier Trophy, a National Medal of Technology, 20 fellows, a Space Technology Hall of Famer, and twice as many unidentified patents of unknown value. Bear in mind that Bill Gates, Steven Jobs, Admiral Grace Hopper, Norm Augustine, and David Packard all won the National Medal of Technology. The Nobel's value is self-explanatory. And the Navy and Air Force shared the Collier Trophy for inventing and developing the Global Positioning System. This would not pass the smell test with either the Commission or the communities.

Also, note how Site A, even under the Absolute Numbers Approach, scores more than 1/5 of the MV compared to Site B, which is proportionally five times larger, but far more technically accomplished. This is due to the point compression problem.

In the end, I maintain that the Absolute Numbers Approach would yield closure and realignment proposals that we can better defend to the Commission. This approach more effectively gains the necessary differentiation to properly value the Department's intellectual capital. This is a vital key to identifying the most innovative sites, and it is critical to the credibility of the BRAC process.

I believe some of this rationale is why the TJCSG chose the Absolute Numbers Approach on 1 April, and why the ISG later endorsed that decision.

On the other hand, if we fail to take this approach, we will jeopardize the success of our entire endeavor. Any community-hired BRAC consultant worth his or her salt will zero in on an irrational result a means of discrediting the study. But either way, whatever approach we end up using, our compressed point values are vulnerable to dissection and ridicule by anyone with the statistical aptitude of an avid baseball fan and an understanding of the non-linear difference between a PhD and a BS, and a Nobel Prize and an unidentified software license.

Again, way too many words, but hopefully I've made a clearer and more logical case. We'll probably continue to disagree on this issue. Regardless of the outcome to this debate, I'll continue to respect both you and the integrity and honesty you've displayed throughout this unpleasant, disagreeable, but necessary process.

v/r,

Don

-----Original Message-----
From: Blake Christopher L SES HQ AFMC/XP
To: DeYoung, Don; Strack Gary Mr SAF/IEBB; Blake Christopher L SES HQ AFMC/XP; 'brian.simmons@dtc.army.mil '
Cc: 'Shaffer, Alan, Mr, OSD-ATL '; 'George R CIV '; "Dr. Bob Rohde' "; Goldstayn Alan B Civ AEDC/CD; Mleziva Matt Civ ESC/NI

Sent: 4/23/2004 3:52 PM
Subject: RE: Signed ISG Memo and proposed draft TJCSG response - BRAC FOUO

Don,

I remind you that at the AT outbrief of the sensitivity results, I asked whether the AT saw anything unexpected or irrational in the outcomes of their trails in this area. Pete made it clear they saw nothing they didn't expect to see. The only time the word irrational has been used has been by you and by the formal Navy inputs to our ISG report. Don't take that as a slap of any form, just attributing the phase to the source. I've heard no one else refer to the use of percents as irrational. As I explained in my short, but candid, note to you on your analysis, I don't consider a small but very wise workforce to be of lower Mil Value than a large generally knowledgeable one. Where you see irrational, I see logical and acceptable.

What is interesting about this debate is that it is completely service neutral, until contractor data is excluded. As peers, I believe we have made some major headway in advancing TJCSG efforts, by agreeing and disagreeing on matters. This is one of those disagreements. As I've said many times, I can accept either approach, but not because one is rational and the other isn't. They both have merits and faults. However, when a major part of the AF workforce is excluded from consideration, then I put my AF hat on and push back and am forced to normalize the size matter out of the debate, using percentages. I think it is not only rational, but FAIR.

With the respect of a peer,

Chris
Christopher L. Blake - SES
Associate Director - Plans and Programs
AFMC/XP
937-656-0308 Office
937-603-0576 Cell

-----Original Message-----
From: DeYoung, Don [mailto:deyoungd@ndu.edu]
Sent: Thursday, April 22, 2004 5:54 PM
To: 'Strack Gary Mr SAF/IEBB '; 'Blake Christopher L SES HQ AFMC/XP '; 'brian.simmons@dtc.army.mil '
Cc: 'Shaffer, Alan, Mr, OSD-ATL '; 'George R CIV '; "Dr. Bob Rohde' '; DeYoung, Don
Subject: RE: Signed ISG Memo and proposed draft TJCSG response - BRAC FOUO

Gary,

The statement that, "our preliminary TJCSG sensitivity analysis...did

not
produce irrational results..." is misleading. I've attached slide #6
provided by the Analysis Team for the TJCSG meeting chaired by Mr. Erb
on 1
April.

If I recall correctly, the TJCSG principals decided to use absolute
numbers
because of the radical inversion of results between the small and large
sites for both S&T and D&A. Note especially the 23 March S&T results
(actuals and percent).

The Principals found this shift significant enough to convince them that
the
percentage approach was not the way to go.

It should also be stressed that for the PPA metric, all sites had
roughly
the same number of awards, patents, and publications. Only the site
populations varied significantly. The scenarios I constructed, a month
or
so ago, varied the awards/patents along with the site populations. It
was
by doing so that irrational results occurred.

Finally, another problem with the percent approach that doesn't get
talked
about much is the compression of the results (due to the minimal range
in
point values). The attached slide demonstrates that compression. It's
a
problem because our ability to differentiate one site's talent from
another
is reduced. If all sites look alike people-wise, then I guess any
scenario
we run is as good or bad as the other when it comes to intellectual
capital.
That's a set up for some potentially big mistakes.

v/r,

Don

-----Original Message-----
From: Strack Gary Mr SAF/IEBB
To: Blake Christopher L SES HQ AFMC/XP; DeYoung, Don;
brian.simmons@dtc.army.mil
Sent: 4/22/2004 10:09 AM

ATTACHMENT P

SCENARIO CONFLICT ADJUDICATION
Issue #07-16-04-05

Issue: Cost of Base Realignment Action (COBRA) data calls will produce inevitable conflicts over what capabilities (in terms of people and physical infrastructure) *must* be moved from a "losing site" to a "gaining site." An effective and objective means to resolve the probable inter-service stalemates is required.

Point of Contact: Don DeYoung, Capabilities Integration Team (Alternate), U.S. Navy

Issue Summary:

- Losing sites have a strong incentive to argue that more capability (i.e., people and physical infrastructure) than necessary must be moved to the gaining site. In BRAC-speak, this is called "busting COBRA", where excessively long Return-on-Investment (ROI) periods are achieved by feeding the model a large number of unnecessary and expensive-to-move items.

- Gaining sites have an equally strong incentive to argue that they already possess most, if not all, the required capability (i.e., "just send us the money"). By "gaming COBRA", artificially short ROI periods are achieved, thus increasing the odds that the scenario will be accepted by the DoD.

- Identifying those capabilities that *must* be moved is difficult without very strong leverage on the sites, as well as a detailed technical understanding of the scope and nature of the sites' capabilities. Such leverage and understanding is usually present when each Service performs its own internal closure actions. However, where will the leverage come from for inter-service COBRA disputes?

- Failure to adequately resolve the potential stalemates will bear high costs to the DoD and the country. Successfully "busting COBRA" places a potentially beneficial closure action at risk, and "gaming COBRA" potentially jeopardizes national security by giving critical work to a site unable to perform it with resident personnel and / or facilities.

Recommendation: CIT propose to the TJCSG principals that a formal arbitration board be established — ahead of time — to resolve any COBRA stalemate(s). The DDR&E and the Service Vice-Chiefs would be the principal voting members, with the TJCSG principals serving as action officers who provide certified technical information on the disputed items.

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

Final Resolution: *No Vote / No Action*

POC Signature: _____ Date: 11/11/04

CIT Chair: _____ Date: _____