

DATE: 30 December 2010

TO: ██████████, Office of the Inspector General (IG), Department of Defense

FROM: Don J. DeYoung, Technical Joint Cross-Service Group (Mar '03- Nov '05)

SUBJ: IG Report No. H08L106854060 of 22 September '09

I eventually obtained a copy of the subject report. It is unfortunate that I was not given an opportunity to review a draft after providing testimony in October '08. I could have alerted you to some serious problems. As an analyst for three closure studies, and a participant in the process you investigated, I will do so now to ensure that the IG's case file includes a perspective that is broader and more accurate than the one reflected in the official report. This is especially relevant now that the Secretary of Defense (SecDef) has authorized the services to again consider closing bases.

According to Report No. H08L106854060, the IG did not substantiate the allegation made by five members of Congress that information was improperly withheld from the Base Realignment and Closure (BRAC) Commission. As stated in the report, the IG's finding is based on evidence that the data were made available in a "disaggregated format" [p. 1], and that "equations, minutes, and raw data were available to the Commission and enabled the relevant calculations and projections" [p. 22]. Frankly, that line of reasoning is weak. This paper will explain my viewpoints, justify claims with evidence, and in the process, add some relevant information that was absent from the report's discussions.

MISSING THE ISSUE

It is unrealistic to presume that the Commission, with a crowded agenda paced by severe time constraints, would do remedial analysis to reconstitute an entire category of data (i.e., Future Required Capacity) that the Pentagon had already derived but not reported. This notion also presupposes the Commissioners would: (a) realize the need to perform the task, (b) know where to look for the data in its disaggregated state, and (c) learn how to execute the calculations from the very people who chose not to report it. Given the last point, it should be noted that the calculations were not simple or intuitive.¹ Moreover, as one Commissioner testified, some questions the Commission did ask the Technical Joint Cross-Service Group (TJCSG) were never answered or were answered "in a way that wasn't actually an answer" [p. 19].

The investigative report missed the issue, which was that the TJCSG did not inform the Commission and Congress about the *message* in the data. There was a reason we invested more than a year to collect and analyze the data on future required capacity. It was supposed to tell us something — and it did. The data told us that closures and realignments of Army, Navy, and Air Force laboratories would deepen projected deficits in the DoD's required number of scientists and engineers (S&Es), placing tomorrow's armed forces at some risk due to a potential erosion of technological superiority.

Specifically, the failure to ensure sufficient technical support meant that the TJCSG and Service laboratory proposals *did not support the DoD's 20-year force-structure plan, as the law requires*. This failure made the proposals subject to modification or rejection. BRAC law states: "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" [Sec. 2903(d)(2)]. The plan's pivotal role in governing the Commission's final decisions is obvious.

¹ A 2005 audit by the DoD IG called the TJCSG's process for calculating capacity "complex and requires analytical and computer proficiency skills" (Audit # D-2005-086), 7.

So it is surprising that the IG report cites six sections of BRAC law as *standards* for the investigation [p. 3-4], but fails to include Sec. 2903(d)(2). Why? This is a crucial clause. By requiring that the proposals support the 20-year plan, it is a “firewall” that prevents the Pentagon from cutting too deeply. *This clause also happens to be the key to understanding the TJCSG’s actions from May through August 2005.*

THE DEFICITS

The IG report notes correctly that I “accused the TJCSG of using ‘metrics of dubious value’” in a November ‘04 paper [p. 22]. But it fails to note that months earlier, in a June ‘04 paper, I argued for using *work-years* (i.e., numbers of government and on-site contractor S&Es) as the sole metric for measuring both current and future capacity. Time proved me right when, in March ‘05, as the report does note, the TJCSG abandoned five of the eight metrics for their unreliability [p. 5]. From that point on the TJCSG used three metrics: (1) work-years, (2) building use (a poorly conceived metric that yielded colossal excess capacities by measuring the square footage of areas irrelevant to R&D, such as hallways and stairways), and (3) test hours (a specialized metric for T&E, but one that is inappropriate for R&D).

The report also fails to say that, in a May ‘05 analysis, I examined historical data provided by the office of the Director for Defense Research and Engineering (DDR&E) and concluded that, unlike the other two metrics, the work-year data were credible and defensible. Therefore, Table 4-4 in the TJCSG’s 10 May ‘05 report posed a big problem. Its work-year data *showed deficits in the required number of S&Es for 23 of 39 technical areas in 2025*, and the minimal excess shown to exist in 2005 was projected to disappear without any BRAC action. In other words, the proposals failed to support the 20-year plan. That one table (see attached) made the Commission’s rejection of the proposals possible, if not likely.

The IG report finds the deficits to be “generally small” [p. 21-22]. However, Table 4-4 does not support that conclusion. Ground Vehicles development, Air Platforms research, and Space Platforms research show shortfalls of 36%, 32% and 26%, respectively. Deficits for research in Materials, Sensors, Battlespace Environments, and Sea Vehicles are each around 15%. These are the size of deficits *before* BRAC cuts are applied.

Deficits should not have surprised the TJCSG’s leadership. In a July ‘04 paper, I questioned the prevailing expectations for high levels of excess capacity and suggested they may not be confirmed by the forthcoming data. The paper cautioned that, while “conventional wisdom after the last closure round in 1995 held that substantial excess capacity remained”, in a post-9/11 world “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.” Time again proved me right when, nine months later, Table 4-4 revealed deficits of future required capacity.

TIMELINE OF DECISIONS

I find the deficits worrisome, but my opinion is irrelevant. The same is true for opinions held by the TJCSG and the DoD IG. *The only judgments that mattered belonged to the Commissioners and elected members of Congress.* But they never learned of the deficits. The TJCSG’s leadership failed to mention them in a report to the Commission, in public testimony, and in responses to questions from Senate staff.

The following timeline documents the steadfast silence. Written records exist to confirm each event.

25 Apr 05: I provided an analysis to the TJCSG executive director, Alan R. Shaffer, showing that, based on preliminary work-year data, our proposals failed to support the 20-year plan. He replied, “we have excess capacity at present — so it is ok to cut.” That decision, however, belonged to the Commissioners, not to DoD.

11 May: I resubmitted my analysis using final official data, which revealed larger deficits. The paper, “Defending the Technical Infrastructure Proposals”, explained how Table 4-4 could lead the Commission to reject the proposals for deviating substantially from the 20-year plan.

16 May: A DDR&E staffer notified TJCSG members by email that 254 pages of data had been removed from the final report due to concerns held by the DDR&E, Ronald M. Sega, that “the aggregation of work years, test hours and building information should be classified.”

18 May: As part of the DoD’s classification review, the Interagency Operations Security Support Staff, a part of the National Security Agency (NSA), recommended, “that OSD release the long volume to the Commission.” The “long volume” contained the full complement of data from the 10 May TJCSG report. In addition, the Deputy Undersecretary of Defense for Intelligence, Counterintelligence and Security (DUSD CI&S) — who served as chair of BRAC’s Intelligence JCSG — also *approved release of the data*.

19 May: The Chief of Security, Washington Headquarter Services (WHS) stated that Dr. Sega had serious concerns about the aggregation of information, disclosure of which would “provide clear advantage to the enemy.” *WHS approved redaction of the data from public release.*

That same day, Dr. Sega testified to the Commission. He did not mention the deficits, their relationship to the 20-year plan, or the potential risk they pose.

20 May: Despite verification by NSA and DUSD (CI&S) that the data were releasable, the DDR&E issued a “short version” of the report, without the subject data. It did not mention deficits or potential risks. And it was missing some key phrases that had appeared only days earlier in the 10 May version:

- The 10 May report had stated, “The TJCSG examined both the current excess capacity, and projected future excess capacity” (p. 21). The final version of the report said only that, “The TJCSG examined current excess capacity” (p. 19).
- The 10 May report acknowledged the importance of future required capacity data to the 20-year plan by stating, “*This step was critical to ensure that the TJCSG recommendations provided the Department with sufficient technical infrastructure to meet the future threats described in the force structure plan* (p. 25).” This key sentence was deleted and did not appear in the final version.
- Two sections titled “Future Required Capacity” (p. A-7) and “Future Excess Capacity” (p. A-8) were deleted even though they did not contain the purportedly sensitive data and addressed only its derivation.

21 Jul: Sen. John Warner requested all “BRAC related papers written by Mr. DeYoung.” A response, signed by Mr. Shaffer, provided five of the seven papers. Two papers were not sent to the senator. One was my May analysis, which would have confirmed the existence of unreported data and revealed the deficits.

Sen. Warner’s staff also requested “projections for excess capacity in 2025.” A DDR&E official told TJCSG members, via email, to answer “without lengthy essays” because “current and future excess capacity is a sensitive area.” Mr. Shaffer replied to Sen. Warner’s staff, but did not provide the data and failed to disclose both the deficits and their potential risk.

24 -27 Aug: The Commission voted on the proposals.

Four Years Later ... The IG’s 2009 investigative report shows that under testimony:

- The WHS reversed its 2005 decision and declared that the long-version “did not contain any damaging information, is releasable to the public, and is properly marked unclassified” [p. 3].
- Dr. Sega testified “he was not aware of 254 pages of data being removed from Appendix A and could not recall the final disposition of the security review” [p. 18].

- The Pentagon's BRAC attorney recalled concerns about the aggregation of data and a foreshortened report to address them, but said the TJCSG did not have to put the data in "pretty form" [p. 14].

EXPLAINING THE DECISIONS

It appears from testimony that the data's threat to national security vanished sometime after the Commission's final vote. In other words, disclosure no longer poses a "clear advantage to the enemy," as the WHS cautioned in 2005. This sharp about-face reinforces the already reasonable doubt regarding the IG report's basic assumption that national security was the only motivation for removing the data. Clearly, even if the TJCSG genuinely over-erred on the side of security, there were other ways to convey sensitive data and several opportunities to notify the Commission and Congress about the data's message. So it is reasonable to ask, why was there a persistent silence on the data, deficits, and risk?

Theory A: BRAC-05 had two goals: eliminating costly excess capacity and transformation.² However, the laboratory proposals deepened projected deficits in required capacity and made only "limited progress"³ toward transformation. So the silence did not protect high-payoff proposals that met official goals. Instead, it may have served an undeclared goal, such as closing government capacity in order to outsource more work and funding to contractors. However, a reckless pursuit of this goal can harm national security. Excessive outsourcing impairs the DoD's ability to preserve its internal technical capability, a critical source of innovation that, in partnership with the private sector, helps to equip the warfighter with advanced technologies and avoid technological surprise from our adversaries.⁴

This capability also does what the private sector cannot do. As former SecDef William J. Perry observed, it is there to "assure that the public interest is served." In fact, a landmark presidential report on federal contracting warns that, "No matter how heavily the Government relies on private contracting, it should never lose a strong internal competence in research and development."⁵ Free from commercial pressures, the in-house laboratory system is the Pentagon's "yardstick." It must be capable of providing objective and authoritative scientific and engineering advice to the acquisition workforce so that it can choose intelligently among competing technologies offered by contractors, and then at a later point judge the quality of contracted work. In short, acquisition reform will not succeed without a healthy yardstick.

There has been some recent recognition that DoD's internal competence is eroded or bypassed as a result of excessive outsourcing. Former Secretary of the Navy, Donald C. Winter, noted in 2008 that "in-house expertise is the source of independent judgment in the acquisition process", and reductions to in-house technical personnel and workload "has produced an over-reliance on contractors."⁶ Nevertheless, the pressure to move government work to contractor labs has been strong and persistent since the 1990s. For example, a Defense Science Board (DSB) study in 1996 urged that the DoD privatize its laboratories. The DSB stated, "It is quite likely that private industry would compete heavily to obtain the DoD laboratories, particularly if they come fully equipped."⁷ A recent case is discussed below to give evidence that the urge to outsource government functions at ever-higher levels, even at the cost of a broken yardstick, is real and it continues — all of which makes such outsourcing pressures a serious candidate for explaining the TJCSG's decisions.

² Secretary of Defense Memorandum, subj. "Transformation Through Base Realignment and Closure," 15 November 2002.

³ Government Accountability Office, *Military Bases: Analysis of DoD's 2005 Selection Process and Recommendations for Base Closures and Realignments*, Appendix XII, (GAO-05-785, July 2005), 219.

⁴ Don J. DeYoung, "Breaking the Yardstick: The Dangers of Market-based Governance", *Joint Force Quarterly* (JFQ), (October 2009). JFQ named it the year's "Best Feature Article." [<http://www.ndu.edu/press/lib/images/jfq-55/21.pdf>]

⁵ *Report to the President of the United States on Government R&D Contracting*, April 1962. Members of the presidential panel included the Secretary of Defense, President's science advisor, and the leaders of NASA and the National Science Foundation.

⁶ Secretary of the Navy Memorandum, subj. "Department of the Navy Acquisition," 10 October 2008.

⁷ Defense Science Board, Gordon England and Jacques Gansler (co-chairs), *Achieving an Innovative Support Structure for 21st Century Military Superiority* (1996), II-48.

The Stimson Center, with Department of Energy (DoE) funding, looked at how the DoE nuclear weapons labs might transform into a “national security enterprise.” The Center’s March ‘09 report found additional funding was required “to make national security beyond nuclear weapons a core mission requirement.” It suggested, “strengthening relationships with other agencies to induce investments” and proposed a governance structure whereby the DNI, DHS, and DoD would support the DoE labs with capital investments and annual funding commitments.⁸ In December ‘09, directors of the three DoE labs (one of whom has a yearly salary of \$1.7 million)⁹ visited the White House where they, according to the vice president, described the dangerous impact of budgetary pressures.¹⁰ The administration soon after announced plans to increase investments in the nuclear weapons complex to \$8.6 billion per year over the next decade, in contrast to the previous 20-year average of \$6.2 billion per year,¹¹ almost a 40% increase in sustained funding.

In July ‘10, the DNI, DHS, and DoD, as the Stimson Center had urged, signed a charter to “foster coordination of individual investments” at the three DoE labs.¹² As a result, the DDR&E is currently developing a catalog of DoE laboratory capabilities in order to derive an investment plan.¹³ Higher financial costs to the DoD will need to be acknowledged by the DDR&E’s plan because the DoE contractor labs are “more expensive per FTE than elsewhere,”¹⁴ even costing “an average of two to three times more” than industrial firms according to the Stimson Center.¹⁵ Therefore, such contract expenditures must be weighed carefully in light of DoD’s efforts to cut costs. [Some would attribute the more expensive labor to a higher quality workforce. This is disputable. The U.S. Naval Research Laboratory has 10 national academy members with a workforce of 2,500. This compares to a collective 15 members among the three DoE nuclear weapons labs with a combined workforce of 27,000.]¹⁶

It should be stressed here that the Stimson Center urged the DoE labs to induce new commitments from agencies that already fund them through a large Work For Others (WFO) program. The DoD provided about \$900 million to the three DoE labs in FY08,¹⁷ and WFO has risen to comprise 40% of one lab’s total program as its nuclear weapons work declined over the last five years.¹⁸ The new funding commitments would also be added on top of the labs’ share of \$36.7 billion in DoE stimulus funding (e.g., one lab received \$66 million for renewable energy research that includes studies of tree mortality).¹⁹

So with a considerable increase to the budget of the nuclear weapons complex (i.e., nearly 40% higher than the average of the previous 20 years), \$900 million annually from DoD (assuming the WFO level for FY08 is roughly stable from year to year), and stimulus dollars that already support non-traditional missions, it is unclear how national interests are served by siphoning funds from the Pentagon’s yardstick (i.e., the internal capability needed “to assure that the public interest is served”) in order to support new missions for a contract workforce costing an average of two to three times that of other industrial firms.

Unlike other panels, the Stimson Center *chose not to explore closure and downsizing as a solution to DoE’s excess capacity in its contract workforce.* In 1995, the Secretary of Energy’s Advisory Board proposed a regular process to consider options for closure and consolidation. Its report described the DoE lab system as “oversized” due to “excess capacity in areas associated with nuclear weapons design and development, and political considerations which have inhibited downsizing.” It concluded that, “it is unrealistic for these institutions to attempt to retain their current size by laying claim to ‘new missions’.”²⁰ In 2005, a second Advisory Board report raised the prospect that one of the labs might close by stating, “the long-term requirement for two physics design laboratories will be determined through overall Complex performance and needs.”²¹

⁸ Stimson Center, *Leveraging Science For Security*, (March 2009), 3-4 and 42-43.

⁹ The directors’ salaries were reported as a condition of accepting federal stimulus money from DoE’s total of \$36.7 billion.

¹⁰ “The Path to Nuclear Security”, remarks of Vice President Biden at the National Defense University, (18 February 2010).

¹¹ Nuclear Watch New Mexico, (24 November 2010); data from the Section 1251 Report.

¹² *Governance Charter for an Interagency Council on the Strategic Capability of DOE National Laboratories as National Security Assets*, (July 2010), 3.

¹³ Office of the DDR&E, “Strategy for the Defense Laboratory Enterprise”, 33-34.

¹⁴ JASON Summer Study: S&T for National Security, (2009), 52.

¹⁵ Stimson Center, 37.

¹⁶ Websites of the National Academy of Sciences and National Academy of Engineering (memberships as of December 2010).

¹⁷ Department of Energy Office of Inspector General, *Audit Report: Work for Others*, (October 2009), 1.

¹⁸ John Fleck, “Sandia’s Non-DOE Work Rises to 40 Percent”, *Albuquerque Journal Online*, (May 2009).

¹⁹ Kate Nash, “Los Alamos Lab’s New Golden Age”, *The New Mexican*, (23 May 2010).

²⁰ Secretary of Energy Advisory Board: *Alternative Futures for the Department of Energy National Laboratories* (1995), 5, 10.

²¹ Secretary of Energy Advisory Board: *Recommendations for the Nuclear Weapons Complex of the Future*, (2005), 4.

Theory B: Another possibility is what one congressman called “egregiously bad judgment.”²² Perhaps. But does ineptitude explain such a bold series of actions; i.e., excising data even though two classification authorities approved its release, ignoring the option to use the official process for reporting sensitive data, withholding material requested by a U.S. senator, and remaining silent on the data’s vital message? Does bad judgment really explain the deletion of this sentence from the TJCSG’s report to the Commission: “*This step was critical to ensure that the TJCSG recommendations provided the Department with sufficient technical infrastructure to meet the future threats described in the force structure plan*”?

Only the decision-makers know what drove their decisions. Ironically, the Commissioners might have judged the deficits as acceptable if the TJCSG reported the data, acknowledged the deficits, and offered a plan to mitigate potential risks. Improving the DoD’s management of its laboratories would have been one effective approach to reduce risk. Scores of panels have already “exhaustively investigated”²³ this subject and are “remarkably uniform in their findings.”²⁴ In fact, one report outlines a strategy to rebuild the DoD S&E workforce as a retirement wave depletes its numbers over the coming years.²⁵

DWINDLING SAVINGS

In my May ‘05 analysis, I warned that, “Costs will be higher for BRAC actions that occur in an environment with insufficient excess infrastructure.” A minimal level of current excess capacity, coupled with future deficits, were clear signs of constrained infrastructure and growing workload. Costs were therefore underestimated — for at least some actions — due to unrealistic expectations, such as anticipating cheaper refurbishment of existing facilities instead of expensive construction of new ones.

For example, the Government Accountability Office (GAO) estimates that Fort Monmouth’s closure (BRAC 5) will cost an additional \$971 million, or 125% more than originally projected.²⁶ Realignment of Army and Air Force research functions (BRAC 187) will cost an additional \$137 million, or 100% more. And realignment of Navy weapons workload (BRAC 184) will cost an extra \$64 million, or about 20% more; however, this does not include costs to fill more than 1,000 positions. According to Navy officials, “very few employees have committed to moving to Naval Air Weapons Station China Lake.”²⁷

In a non-lab case, BRAC 133 (developed by the Headquarters & Support Activities JCSG) was approved to relocate offices of the IG and WHS from leased locations in Arlington, Virginia to government-owned land at Fort Belvoir. During the hearings, one Commissioner (a retired Army general) voiced doubt about the capacity of the post and local roads to handle the influx. He was told it was “quite feasible to take on that load.”²⁸ By 2008 the original capacity estimates had proved unrealistic so the Army purchased 16-acres of private land within the city of Alexandria. GAO estimates BRAC 133 will now cost an extra \$838 million, or 140% more — and this may not include costs to provide base support (e.g., security and fire protection) and adequate access in a congested area. The new government-owned complex will be designated “Fort Belvoir Annex” and it will bear the rare distinction of a base opened by base closure.

These examples show that incomplete or inaccurate representations of capacity can increase costs. It also helps explain, in part, why the GAO now estimates the 20-year savings from all BRAC-05 actions to be 70% less than the Commission’s original projections.²⁹

²² Bill Bowman, “Congressmen Ask Obama to Halt Fort’s Shutdown”, *Asbury Park Press*, (24 September 2009).

²³ *Science & Technology Community in Crisis*, (May 2002). This is a joint report by the services’ research advisory boards.

²⁴ Federal Advisory Commission, “Consolidation and Conversion of Defense Research and Development Laboratories” (1991).

²⁵ Timothy Coffey, *Building the S&E Workforce for 2040: Challenges Facing the Department of Defense*, NDU (2008).

²⁶ GAO, *Military Base Realignments and Closures* (GAO-10-98R), 13 November 2009, 13.

²⁷ GAO, *Military Base Realignments and Closures* (GAO-10-725R), 21 July 2010, 12.

²⁸ Public Hearing, Testimony of the Deputy G-8 (U.S. Army) to the BRAC Commission (19 May 2005), p. 54.

²⁹ GAO-10-98R, 4.

FAILURE OF OVERSIGHT

The IG and GAO each assigned one analyst to monitor the TJCSG. They attended meetings and were privy to data and documents (e.g., my May analysis was emailed to them). In June '05, the IG issued its closeout audit, "Report on the Technical Joint Cross-Service Group," which found no significant issues. Four years later, the IG's investigative report pointed to this audit's access to future required capacity data as evidence that the TJCSG "did not seek to conceal this data but rather made it available" [p. 23]. Upon reading the audit, however, one sees clearly stated caveats that disprove the investigation's claim.

Citing "time and resource limitations", the June '05 audit states that its findings were based on the IG's *March* audit of a *January* TJCSG report that contained incomplete *December '04* capacity data (p. 7 and 13). So the TJCSG actually gave the IG access to old capacity data in March, which was before the TJCSG learned how deficits threatened the proposals' chances with the Commission. In other words, the IG used its March audit and the May TJCSG "short version" official report to prepare the June close-out. This raises some questions. How did the IG fail to notice in June that an entire category of data — which it examined in March — was missing in the May report to the Commission? And if it did notice, how did a pivotal decision like excising data go undocumented in the June audit?

The investigative report fails to mention the full extent of the IG's BRAC duties during the events in question. Given its two-year responsibility to monitor the TJCSG, the IG's decision to investigate seems problematic. How is it not a conflict of interest to judge the nature of actions taken on its watch? It appears the IG could have assigned this case to an independent investigator, as it did recently with regard to issues concerning BRAC 133. If this option was available, why did the IG choose direct involvement?

In the end the investigation decided that, "required *data* (emphasis added) was 'made available' within the meaning of the BRAC statute" [p. 24]. Frankly, the IG set the bar for compliance too low. The statute actually uses the word *information*, not data. And standard #4, which the IG established to guide its investigation, also specifies information, not data. I contend that the information required by statute to be reported to the Commission were: (a) Table 4-4, (b) an acknowledgment that closures and realignments would deepen projected deficits in required numbers of S&Es, and (c) a plan for risk mitigation. Compliance within the letter and spirit of the statute must surely demand more than, as the IG suggests, mere availability of raw data, in a disaggregated format, with equations and minutes that enable the Commission to reconstitute the information it needed to make decisions in our nation's interest.

While I chose to confine this analysis to the IG's record, suffice it to say; far better performance by both the GAO and IG was needed to ensure the integrity of DoD's process to close government defense laboratories. In fact it was vital to public trust. Adlai Stevenson's words best explain why this is so: "Public confidence in the integrity of the Government is indispensable to faith in democracy; and when we lose faith in that system, we have lost faith in everything we fight and spend for."



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Research

Bin	Current Average	Ratio	Required	Peak	Excess
Air Platforms	1,970	1.755	3,457	2,352	-1,106
Battlespace Environments	1,014	1.284	1,301	1,102	-199
Biomedical	1,760	1.201	2,113	2,290	176
Chemical Biological Defense	1,884	1.100	2,072	2,199	127
Ground Vehicles	1,068	1.071	1,144	1,885	741
Human Systems	1,980	1.387	2,747	2,671	-76
Information Systems Technology	3,319	1.192	3,956	3,752	-204
Materials and Processes	1,731	1.358	2,350	1,996	-354
Nuclear Technology	221	1.095	242	238	-4
Sea Vehicles	694	1.396	969	823	-145
Sensors, Electronics, and EW	3,927	1.381	5,424	4,591	-833
Space Platforms	1,652	1.526	2,522	1,878	-644
Weapons Technology	4,400	1.167	5,135	5,319	184

D&A

Bin	Current Average	Ratio	Required	Peak	Excess
Air Platforms	14,726	1.227	18,068	19,530	1,462
Battlespace Environments	488	1.145	559	560	1
Biomedical	171	1.195	205	286	81
Chemical Biological Defense	2,247	1.069	2,402	2,676	274
Ground Vehicles	2,613	1.936	5,058	3,253	-1,805
Human Systems	3,266	1.231	4,021	3,980	-41
Information Systems Technology	20,726	1.169	24,229	21,832	-2,397
Materials and Processes	917	1.247	1,143	1,097	-46
Nuclear Technology	921	1.020	940	1,008	68
Sea Vehicles	5,098	1.222	6,230	5,546	-683
Sensors, Electronics, and EW	8,960	1.141	10,223	9,833	-390
Space Platforms	5,083	1.194	6,069	6,647	577
Weapons Technology	26,791	1.067	28,586	30,696	2,110

T&E

Bin	Current Average	Ratio	Required	Peak	Excess
Air Platforms	9,744	1.308	12,745	11,526	-1,219
Battlespace Environments	366	1.226	449	487	38
Biomedical	212	1.491	316	232	-84
Chemical Biological Defense	866	0.757	655	1,046	390
Ground Vehicles	2,033	1.802	3,664	3,176	-487
Human Systems	794	1.281	1,017	964	-54
Information Systems Technology	3,435	1.187	4,078	4,044	-34
Materials and Processes	394	1.239	488	451	-37
Nuclear Technology	457	0.993	454	527	73
Sea Vehicles	1,406	1.306	1,836	1,524	-312
Sensors, Electronics, and EW	3,619	1.248	4,517	4,368	-149
Space Platforms	652	1.225	799	981	182
Weapons Technology	12,547	1.171	14,693	15,526	833

Table 4-4. Future Technical Capacity - Work Years (FTEs).

From: TJCSG Final Report to the BRAC Commission
(10 May 2005)