MEMORANDUM FOR THE RECORD

FROM: AAC/DC(A)

SUBJECT: SDB Increment I Program Performance

1. At the 1 April 2005 Overarching Integrated Product Team (OIPT) review of the Small Diameter Bomb Increment I (SDB Inc I) program to determine its readiness to enter Low Rate Initial Production (LRIP), the presiding officer, Dr. Lamartin, requested that I prepare a paper outlining, "why the SDB Inc I program met the cost, schedule and operational performance commitments in its original baseline when so many programs in the DoD do not." The key enablers to program success are grouped below into four main categories: Leadership Support, Acquisition Strategy and Source Selection Tailored to Realistic Requirements, a Warrior Attitude, and a Team Approach. I based this paper on inputs from the Program Manager, now retired Col James McClendon, my personal experiences, and additional inputs from various team members and stakeholders. The information below pertains to two phases of the SDB Inc I program: the Component Advanced Development (CAD) competitive phase between the Boeing and Lockheed Martin corporations conducted from September 2001 until the downselect in August 2003; and the System Design and Development (SDD) phase, with prime contractor Boeing, conducted from October 2003 until the LRIP Milestone C decision in April 2005.

   a. Leadership Support. While leadership support is always important in an acquisition program, SDB Inc I enjoyed extraordinary leadership in three areas. The Chief of Staff of the Air Force (CSAF) clearly established his Commander's Intent, experienced leadership was chosen to manage the program, and the Air Armament Center Commander made SDB Inc I the top priority at Eglin Air Force Base (AFB).

      (1) Commander's Intent. Early in the competitive CAD phase, the SDB program was designated a pathfinder program by the AF Service Acquisition Executive (SAE). The pathfinder programs were established to pioneer ways to gain speed and credibility in acquisition. Under the pathfinder umbrella, the CSAF, Gen John Jumper, published his Commander's Intent: SDB Required Assets Available (RAA) in 4QFY06. From that day forward, "Schedule is #1 – RAA in 06" became the rallying cry for the program. It is impossible to overstate the positive impact of the CSAF establishing a clear priority among the competing demands of cost, schedule, and performance. This clear direction and priority fostered a "don't accept no" attitude within the program office, forced hard decisions by the warfighters to live with a spiral/incremental approach – the "80% solution" – and gave the program team leverage to focus stakeholders on meeting

commitments. A few team members left, some stakeholders really never embraced the program, but overall, Col McClendon was able to maintain momentum by walking the talk: "Schedule is #1 – capability for the warfighter, not acquisition for acquisition's sake." The Commander's Intent was an effective way to establish a realistic program baseline, and to keep requirements and budget stable.

(2) Leadership based on Experience. During the two-year competitive risk reduction program and the subsequent eighteen months of the System Design and Development phase leading to the LRIP Milestone C decision, Col Jim McClendon served as the Program Manager, while I served first as the Air Force Program Executive Officer for Weapons (AFPEO/WP) and then as the Deputy for Acquisition. Both of us had a long prior history, well over 15 years each, in technology transition and development and test of weapons. Both of us had years of experience with Washington staffs on ACAT 1D programs. We had in our heads the lessons learned from many cost and schedule overruns of the past. Given this background, we were determined from the outset to base the competitive downselect to a single prime contractor on <u>demonstrated</u> system performance of mature, production representative hardware, and on <u>realistic</u> costs. We consistently articulated and practiced rabid aversion to viewgraph promises, marketing, and under-bidding. Col McClendon's personal style is part technical expert, part bulldog, and part diplomat. Steeped in the technical details of weapon development and aircraft integration, he sniffed out and preempted technical risks, made quick decisions, and aptly convinced stakeholders to support his positions.

(3) Priority at the Air Armament Center. The AFPEO for Weapons, Maj Gen Robert Chedister, is also the Center Commander, Air Armament Center (AAC). The AAC includes the AF armament laboratory (AFRL/MN), the 46th Test Wing, the 53rd Operational Test Wing, the Acquisition Wings and, of course, an Air Base Wing (the 96th) that runs the huge infrastructure for a mega-mission base. Early in the SDD phase, Gen Chedister issued policy to all agencies at the AAC that completing the Small Diameter Bomb on schedule and within cost was the top priority of the AAC. Col McClendon was given full support to expedite test missions when needed, to put program commitments ahead of other tasks, and to ask for and get all the help we could provide. We persuaded various audit agencies to leave SDB alone during the countdown to the LRIP Milestone C decision (SDB was even excluded from an Operational Readiness Inspection). Col McClendon posted week-by-week countdown scores around the base, including Gen Chedister's front office. In short, the dual-hatted AFPEO/WP and Center Commander harnessed all the energies available at Eglin AFB to enable the SDB to meet its cost, schedule and operational performance commitments.

b. <u>Acquisition Strategy and Source Selection Tailored to Realistic Requirements</u>. In order for SDB Inc I to succeed in meeting the Commander's Intent, realistic requirements had to first be established, an acquisition strategy tailored specifically to those requirements was formulated, and source selection criteria that based selection on system maturity and realistic commitments had to be put in place. All three of these elements were essential.

(1) Realistic Requirements. Paramount to SDB Inc I success was working with the warfighter to set realistic requirements. While leadership support is key, even the most charismatic leader cannot overcome requirements too complex for the schedule and budget provided. Early on we worked hand in hand with both Air Force and Navy warfighters, to help them understand the "art of the possible" in laying out the SDB Operational Requirements Document (ORD). This enabled us to proceed with an evolutionary acquisition strategy where we focused on providing an initial capability based on mature technologies. The warfighters agreed to establish only two Key Performance Parameters (one of which was required by DOD and Joint Staff directives) and did not lock down any threshold requirements until near the end of CAD. This allowed maximum flexibility up front, enabled our competing contractors to trade performance to lower risk, and allowed the critical stakeholders to mature the ORD as we made these trades. The warfighters also agreed to defer other requirements, which were inconsistent with a 4QFY06 RAA due to budget, need for technology maturity, or both. This collaborative approach among the warfighters, program office, and contractors allowed us to reduce risk associated with meeting operational requirements and to actually demonstrate that we could meet those requirements by flight testing in an operational-like environment. Throughout this acquisition, the leadership and proactive participation by the Director of Requirements and his action officer at the Air Combat Command enabled successful execution.

(2) Acquisition Strategy and Source Selection Criteria (SSC). The acquisition strategy and budget provided for a two-year rolling downselect between Boeing and Lockheed Martin during the CAD phase of the program. The companies were given equal amounts of money to build and demonstrate their weapons and carriage systems. Demonstrated maturity of their systems was the number one criteria for downselect to a single prime for SDD. We called it "Results-Based Systems Engineering." The contractors were evaluated on demonstrating maturity of a system that would meet the threshold performance required; they did get credit if they demonstrated performance greater than threshold. This is key: Under many pressures to do otherwise, we did not allow the contractors to get credit for promising greater performance in plans or future spirals. Our criteria provided no avenue for the companies to gain credit or advantage for promises backed up only by plans or claims of applicability of demonstrations under other venues, studies, etc. It must be noted that in general, industry does not like this, and did a lot of marketing, unsuccessfully, to officials other than those in the formal source selection structure to overturn our approach. Also, we did not have a category of "additional considerations," because I believe that they offer an entry point for viewgraph promises or red herrings to divert the source selection from the program's primary commitments.

(3) Source Selection Criteria based on system maturity and realistic comments. Demonstrated performance of production representative hardware was the most heavily weighted criteria and the key discriminator between the competitors. Col McClendon and his Source Selection Evaluation Team (SSET) implemented in the SSC a new scale of 1-10 to measure system design maturity (this scale is roughly analogous to the Technology Readiness Levels for component technologies defined in the Defense

Acquisition Guidebook.) This criteria moved the SSET from difficult-to-discriminate low/moderate/high ratings to very objective 1-10 assessments of exactly what had been flown and to what result. Motivated by this criteria, both contractors accomplished a robust Critical Design Review (CDR) during the CAD phase – the only time I am aware of us achieving this level of maturity prior to SDD. Another key feature of the SSC was the use of interim feedback to both contractors during the competition. This is what made it a "rolling" downselect. The competition was divided into three periods with each contractor receiving two interim evaluations prior to the final evaluation in August 2003. They were evaluated on Risk, Affordability, Contractor Performance, and Mission Capability. Except for Contractor Performance, interim ratings did not count in the final evaluation, but provided the contractor with a vector check to make mid-course corrections where needed. The Contractor Performance ratings counted for all three periods. Our intent was to make the contractors accountable for their performance by scoring both their responsiveness and performance to plan.

What does this mean? It means that we entered SDD with production representative hardware that met the requirements – building more units, readying the factory for low rate production, and completing tests were the only jobs remaining for the then sole source contractor during SDD.

Our entire strategy was driven by our philosophy that we wanted to enter the SDD test program with the configuration we planned to produce. When we entered SDD, the level three build-to drawings were at least 85% complete and the contractor's Configuration Control Board was already established and functioning. Again, in our experience, this is an unprecedented level of maturity in design and production readiness prior to entering SDD.

A second part of the criteria that enabled successful execution of SDD was in the cost area. We carefully designed criteria that would make it close to impossible for either company to gain competitive advantage by under-bidding the work, which then results in cost overruns during SDD and/or price hikes during production. We ensured that neither company would be motivated to low-bid SDD by making that element of their proposals pass/fail. Pass/fail was determined by their ability to show our cost estimators the details of their estimates and their estimates had to fall within 15% of our government estimate for SDD. For production prices, we required the contractors to offer fixed prices for lots 1 and 2 and price commitments for lots 3 through 7, and we did independent cost estimates of each contractor's design. Their bid had to fall within 15% of our government estimate of their design costs to be adjudicated realistic by our SSET. Two good things from these criteria: contractors had sufficient funds to do the work during SDD; and the resultant sole source prime contractor had to work hard during SDD to keep a lid on production costs to meet his seven-year price commitment. In addition to forcing early stabilization of the design through our source selection criteria, we also put incentives on the low rate initial production lots to reward the contractor for keeping the design stable. He was thus inherently motivated to avoid the typical marketing that leads to requirements creep and design instability. Boeing had about 10% management reserves (MR), Col McClendon held another 5%, and the AF gave the program about

$2M each year of additional funds for further risk reduction activities. It is important to note that we received this additional funding because of our stellar financial execution. We emphasized funds execution with the contractor and tracked their performance weekly. Because we executed so well, we were positioned to accept "fallout money" when available. We left nothing on the table. We bought spare test assets and we did early parallel testing to wring out any residual "got ya's" in the design. Even with the unprecedented maturity entering SDD, we found a few problems, but we found them early enough and had the reserves to correct them within our program baseline.

I cannot overstress how important the overarching strategy, philosophy, priorities and criteria were to the overall goal of meeting cost, schedule and operational performance commitments to the warfighters, commitments driven by the CSAF's Commander's Intent to field the SDB in FY06. Achieving technical maturity while industry is under the pressures of competition combined with realistic cost proposals enabled us to enter SDD with a fighting chance of achieving our program commitments.

    c. Warrior Attitude. As he approached each major milestone, Col McClendon and his entire team took on what I would call a "warrior attitude." Their battle cry was "RAA in 4QFY06." Based on our experiences on many ACAT 1D weapon programs, we knew there would be significant requirements for meetings, reviews, audits, and documentation. Col McClendon hired a support contractor, a retired AF officer with experience on HQAF staff, as the full-time POC for the OSD staff. The battle-charged SDB team prepared and coordinated through the AF and OSD staffs over 23 documents (total of about 1800 pages) for the Milestone B in October 2003, and then updates to those plus new ones (15 documents, 1150 pages) for the Milestone C in April 2005. In addition, the team responded to fourteen new OSD policy memos issued after Milestone B. Col McClendon deployed with six or so personnel from his program office to Washington for two months prior to the Milestone B in 2003, and again for the Milestone C in 2005, to push through the coordinations and endorsements needed from the Joint Staff and the staffs of the OSD. Obviously, these people made huge personal sacrifices, long hours, weekends, time away from families, to propel this program forward. During these critical months leading to a milestone review, Col McClendon and his team of warriors really saved the day. They learned when to bend, when to stand firm, when to ask for help from AF and /or OSD senior officials. For example, Col McClendon agreed to change some tests to gain endorsement from the Live Fire officials, but he stood firm on the strategy to limit increment I requirements to what we could realistically achieve within the cost and schedule embedded in the Commander's Intent. The POC for documentation rapidly coordinated changes in verbiage in documents as long as the basic strategy and philosophy of the program construct were preserved. Col McClendon took young people with him on these deployments to Washington, lieutenants and young civilians, and mentored them on how to collaborate with stakeholders to enable successful program execution.

    d. Team Approach. Col McClendon fostered an environment of early and frequent communications with a large, diverse group of stakeholders, including representatives from developmental, live fire and operational test agencies, safety boards, C4ISR

organizations, the Air Combat Command, the Joint Staff, and about a dozen offices within the OSD staff. As a pathfinder program, the SDB was one of the first to establish successfully a Seamless Verification (SV) Test program. Due to DOT&E's early involvement, the developmental test were more operationally realistic and challenging. The early involvement of all the stakeholders helped the SDB team do the right things early and avoid scrap and rework later.

2. Summary. Why did the SDB program meet its commitments when most programs in the DoD do not? The CSAF's Commander's Intent established priorities, the program baseline was built on realistic requirements and budget, the source selection criteria shunned viewgraph promises and under-bidding in favor of results-based systems engineering and realistic commitments, the AFPEO for Weapons prioritized all the resources under his Command for SDB, and a tenacious, experienced, brilliant program manager rallied his warrior-minded team and his stakeholders behind the cry, "RAA in 4QFY06!"

/s/

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