

TECHNICAL REQUIREMENTS DOCUMENT (TRD)

MISSILE APPLICATIONS SOFTWARE SUPPORT (MASS)

1. Scope. The scope of the effort is as follows:

- 1.1. System Description. This contract is for Missile Applications Software Support (MASS). It encompasses the software support presently provided by Ballistic Missile Strike Planning Software Support (BMSPSS), and the software support required for the next-generation missile planning system, Dynamic Application and Rapid Targeting System (DARTS), both of which are designed for use by the United States Strategic Command (USSTRATCOM). The Missile Graphics Planning System (MGPS) software rapidly and accurately allocates, and then assigns, Intercontinental Ballistic Missiles (ICBM) and Submarine Launched Ballistic Missiles (SLBM) to targets. This software produces the ballistic missile portion of Operations Plan (OPLAN) 8044. MGPS is a comprehensive system that also considers the allocation and application of aircraft weapon systems to ensure the ballistic missile portion of OPLAN 8044 is fully integrated with aircraft weapon systems; this process of "timing and deconfliction" includes analyses of missile and aircraft weapons effects. The analysis results are used to adjust weapon arrival or other parts of OPLAN 8044. The system has inherent reusability features that allow other systems with similar planning or analysis needs to re-use one or more of its components. The system must allow addition of new capabilities without significant impacts to existing capabilities, in order to incorporate changes required by USSTRATCOM, the Services (USN, USAF), other Government agencies, or national military policy.
- 1.2. Contract Capability. This contract delineates the contractor tasks to continue MGPS maintenance and to design, develop, test, deploy, and sustain the MGPS follow-on, DARTS. In MGPS, there were approximately 1.5M lines of contractor-maintained software code in late FY04. The code is primarily FORTRAN and Ada with small amounts of other languages.
 - 1.2.1. Support ISPAN A&I. Ballistic missile planning software operates within the larger structure of the Integrated Strategic Planning and Analysis Network (ISPAN). ISPAN is in the process of being modernized to provide the capability to plan adaptive, deliberate, and crisis missions; optimize those missions; provide decision support for course of action selection; and provide management and oversight of the planning process. The Contractor shall support ISPAN A&I activities, including:
 - 1.2.1.1. Modernize Applications. Legacy ISPAN software systems, such as MGPS, may be modified to provide relevant functionality to the modernized planning and analysis software. At government direction, legacy systems shall be partially or entirely redesigned to ensure the relevant functionality is accessible to the ISPAN modernization, or, at a minimum, selected functionality shall be modified so as to be accessible to the ISPAN modernized software.

Maintenance and enhancement support, consisting of software modifications and integration within the ISPAN computing environment will be required to sustain the ballistic missile portion of plans production.

- 1.2.1.2. Support Evolving Missions. The modernized ballistic missile planning system (DARTS) shall use an architecture that is scalable, flexible, extensible, and the system must provide for the efficient implementation of changing requirements. This includes future missions and system functions, and changing guidance.
- 1.2.1.3. Agreements. The Contractor shall make a corporate commitment to fully coordinate with all Government agencies and to include create/sustain other Associate Contractor Agreements (ACA) /Associated Contractors (ASCONs), to include the new Architecture and Integration (A&I) Contractor, to ensure system technical interfaces, software re-use, and other technical issues common to more than one program, planning process, or organization are optimized to the advantage of the Government.
- 1.2.2. Organizational Changes. This contract includes responding to changes in the strategic planning and the organizational environment. This aspect may result in deletion of, or additions to, ballistic missile planning capabilities that were formerly organized under other functional areas.
- 1.2.3. Software Changes. This contract includes correcting software deficiencies, updating software to reflect national guidance, implementing new planning requirements, and modifying or re-hosting software to meet performance requirements.
- 1.2.4. Technology Changes. This contract includes implementing technology-driven changes necessitated by performance improvements in the supporting computing disciplines or normal obsolescence of current technologies that support this system.
- 1.2.5. Weapon System Changes. This contract includes the requirements to accommodate and implement changes resulting from weapon system changes. The planning process is impacted by changes in deployed weapon systems, new weapon systems or weapons carried by these systems, changes in Service-furnished planning support products, and the national military policy that defines the use of weapons planned by USSTRATCOM. The nature of war planning requires the ballistic missile planning system incorporate or model weapon system changes defined by the Services. Conversely, the planning process may, rarely, define the nature of the Services' changes. These changes usually become new planning system requirements after the Services define the nature of the weapon system changes in response to a planning capability requirement. Knowledge of other weapon platforms, such as aircraft, is required to ensure any final ballistic missile plan is a fully integrated product that analyzes and adjusts the plan, where necessary, for these other systems.

- 1.2.6. Nuclear Planning and Execution System (NPES). The ballistic missile strike planning system also operates within the Nuclear Planning and Execution System (NPES). This additional application drives technical architecture constraints and considerations in addition to those of ISPAN.
 - 1.2.7. Software Reuse. Software products from other systems within ISPAN may be used within ballistic missile planning systems to minimize the need for independent and potentially duplicative developments.
2. Requirements. The requirements for this effort are as follows:
- 2.1. Enterprise Data Base (EDB) Compatibility. The Contractor shall adapt their software development to accommodate changes in scheduled EDB cutovers and emergency EDB changes or patch releases. Software releases should be timed to meet the major EDB cutover dates. Major ISPAN EDB Cutovers are expected to occur twice a year, normally in June and December.
 - 2.1.1. The Contractor shall optimize performance of ballistic missile planning software operations directly against the EDB. Optimization of old code will be completed under the direction of the Missile Applications Integrated Products Team (IPT) in accordance with, as a minimum, the overarching performance requirements specified in the ISPAN A&I TRD. Special emphasis should be placed on those requirements specified in Section 3.2, and Tables 4 and 5. Performance levels will be based on ISPAN A&I TRD and ORD requirements, and adjusted by the IPT in accordance with the needs of the missile planning team.
 - 2.1.2. The Contractor shall support future EDB modifications by adapting MGPS/DARTS software to ensure compatibility.
 - 2.1.3. The Contractor shall complete the conversion of MGPS from Sybase to Oracle, if not accomplished by contract start.
 - 2.1.4. Data structures created or modified shall be incorporated into the USSTRATCOM enterprise data model. New or reengineered software modules shall utilize modern database access technologies such as JDBC, ADO.NET, or ADO for all access to databases. If the Contractor wishes to deviate from this guidance, the Contractor shall provide justification to the Government for consideration and approval.
 - 2.2. Software Delivery Frequency. The Government may identify releases that do not coincide with EDB Cutover dates to implement user functionality requirements, based on Missile Applications IPT guidance. The Contractor shall make emergency deliveries if justified by extenuating circumstances, e.g. Level 1 or Level 2 defects (as defined in IEEE Standard 1044.1-1995) discovered in the Planning Production Environment, or necessitated by changes in national guidance.

- 2.2.1. The Contractor shall accommodate and implement software changes resulting from weapon system changes.
- 2.2.2. The Contractor shall incorporate into software changes resulting from changes in other ISPAN applications, as directed by the Missile Applications IPT.
- 2.3. Requirements Tracking. The Contractor shall track all requirements against each delivery using a Contractor/Government mutually agreed upon system.
- 2.4. CMM Level. The Contractor shall be certified at a minimum Capability Maturity Model Integrated Software (CMMI SW) Level 3 or equivalent. The Contractor business unit performing under this contract shall use those certified processes, specifically tailored to meet the Government's needs, and conform to the systems engineering guidance in the USSTRATCOM Systems Engineering Management Plan (SEMP).
- 2.5. Interfaces. The Contractor shall maintain and update interfaces to the following Government-furnished software products:
 - 2.5.1. Minuteman and Peacekeeper Operational Targeting Programs. The Contractor shall coordinate with Air Force Space Command through the Missile Applications IPT to integrate targeting program changes.
 - 2.5.2. SLBM Integrated Planning System (SIPS). The contractor shall coordinate with the Naval Surface Warfare Center Dahlgren Division (NSWCDD) through the Missile Applications IPT to integrate applicable SIPS component functions. The functions to be integrated into ballistic missile planning software include:
 - Range ARC Boundary (formerly RAINGR) ~~/~~ IFD (Intra Footprint Deconfliction) ~~/~~ DETFLY (Detailed Fly)
 - GRIG (Groundtrack)
 - FPIMPR (Footprint Improvement)
 - PKGCH (Package Chart)
 - GRVBND (Trident II Gravity Supported Launch Area Boundary) ~~/~~ EAMMAC (EAM Mission Accessibility)
 - FRITER (FASTRAM Reentry Iteration)
 - AIMGEN (Aimpoint Generation)
 - 2.5.2.1. The SIPS functions integrated into the Universal Rapid Accessibility Program include:

part

groundtrack - used for
satellites & other space based
- ex shuttle

- CRFRAT (Rapid Frat Exclusion Area)

- RAPACH (Rapid Achievability)

2.5.2.2. The SIPS functions integrated into the NPES include:

- EAMPRG (EAM Worksheet)

- MINDATCM Driver (TCM Generator Program)

2.5.3. Probability of Damage Calculator (PDCALC). The contractor shall coordinate with the Missile Applications IPT to remain current with the PDCALC model.

2.5.4. GOTS/COTS. The contractor shall coordinate with the Missile Applications IPT to remain current with the evolving ISPAN GOTS/COTS configuration.

2.6. Transition. The Contractor shall provide uninterrupted support to USSTRATCOM to facilitate the transition out of the previous contract to this contract, and out of this contract to the subsequent contract.

2.7. Maintenance. The Contractor shall provide two maintenance deliveries per year. The Contractor shall also implement high-priority changes to respond to Software Incident Reports (SIRs) as identified by the Missile Applications IPT. The Government will determine whether a SIR is considered corrective, adaptive, or perfective.

2.8. Dynamic Application and Rapid Targeting System (DARTS). The Contractor shall re-engineer/redesign current MGPS systems toward an object-oriented or modernized architecture. The new system shall be more portable, have a modern GUI, provide enhanced planner analysis tools, and interface with modern office automation and communication tools.

2.8.1. DARTS shall be interoperable with the ISPAN architecture and other Command-directed software packages, such as the Commercial/Joint Mapping Toolkit (C/JMTK). The DARTS architecture shall include the use of component-based N-Tier architecture using Web Services (e.g., Java 2 Enterprise Edition (J2EE) and Microsoft.NET), compatibility with USSTRATCOM C2 Modernization Programs and DoD enterprise initiatives such as Network-Centric Enterprise Services (NCES) and Global Information Grid (GIG), and accommodation of evolving net-ready key performance parameters.

2.8.2. DARTS shall be designed to allow its planning components to be used by other ISPAN software. DARTS shall be maximally componentized through object-oriented and component-based software development, thus making its elements highly reusable. DARTS shall be written in a modern, mainstream language (such as Java, C#, or C++) that is likely to have an abundance of available COTS software.

- 2.8.3. DARTS shall use an architecture that is extensible. DARTS shall be designed from the ground up with the expectation that it will grow to accommodate new and changing requirements and technologies. DARTS may reuse selected existing software modules (such as the flight models) from MGPS if deemed cost effective.
- 2.8.4. DARTS shall be designed in such a way as to minimize the cost, impact, and rework necessary to modify software to adapt to new changes in the EDB. DARTS shall be designed to accommodate the above requirement while maintaining acceptable database performance.
- 2.8.5. DARTS shall be designed to operate on relatively inexpensive hardware (e.g., PCs). There is more than sufficient "power" in a higher-end PC to serve as the system's user interface to a server/mini-computer. Moreover, this same PC could be used for a much wider variety of tasks (thus reducing the number of machines on a user's desk).
- 2.8.6. DARTS shall have a modern user interface, both in terms of its look and its implementation. DARTS should use a modern COTS GUI engine that is an industry standard.
- 2.8.7. DARTS shall have an interface that balances complexity with productivity. Missile planning requires a variety of complex activities, and these activities invariably have a multitude of user preferences, controls, etc. The DARTS interface shall be presented in such a way that novice users are not encumbered by the finer details, while advanced users have the ability to expand and adapt the system to a more sophisticated level. The interface shall be designed to enhance planner productivity and to reduce the learning curve for new planners.
- 2.8.8. DARTS shall incorporate an internal workflow management scheme that allows the current session state to be saved and resumed at a later time. The internal workflow management system shall integrate with the overall ISPAN system executive and workflow functions.
- 2.8.9. DARTS shall have a greater capacity for analysis and reporting. The ballistic missile planners presently spend as much as 75% of their time in doing analysis of a planned solution, whereas most of the MGPS development has been directed toward solution generation. To aid in this analysis, DARTS shall support interoperability with office automation products (e.g., MS Office) and web-based reports.
- 2.8.10. DARTS shall provide an integrated 3D capability. Today, MGPS interoperates with an external 3D viewer. This 3D capability should be integrated and expanded to allow the planners to analyze any aspect of their missions for better effects planning.

- 2.9. Nuclear Planning and Execution System (NPES) Support. The contractor shall maintain and modify the capability for ballistic missile planning tools within NPES. MGPS is currently required to provide NPES a planning capability via EDB direct and must continue to create a local database for NPES. The Contractor shall maintain and modify a MGPS database for missile planning capability to the NPES. This includes accommodating changes in EDB cutovers and emergency EDB changes. DARTS must include this capability, but may find a more efficient implementation methodology.
- 2.10. Safety Enhanced Reentry Vehicle (SERV) / Backup Ocean Area (BOA) Adaptation. ^{reimburse} The contractor shall provide software engineering support for the SERV/BOA implementation within MGPS/DARTS, if deployment dates so necessitate.
- 2.11. Training. The Contractor shall provide qualified personnel to conduct training for USSTRATCOM ballistic missile planners. Training must comprehensively cover ballistic missile planning concepts, detailed operation of the current system, and all changes made under the proposed contract. Training must provide thorough treatment of data inputs to the ballistic missile planning process and data outputs to subsequent processes and other organizations. The Contractor shall plan for five initial training classes per year, and numerous on-site training sessions for Patch Change Notices (PCNs) and major Cutovers.
- 2.12. On-site Support. The Contractor shall provide on-site support to MASS functional managers and MASS users in the areas of software installation, testing, training, technical support, and configuration monitoring. The Contractor will be prepared to provide 24-hour, seven day a week (24-7) support for services when deemed essential by the Government. Additionally, Contractor on-site support personnel shall interface between users, functional managers, and government program managers to ensure requirements are accurately incorporated into software deliveries.
- 2.13. Software Testing. For software developed under this contract, the Contractor shall follow the systems engineering guidance given in the latest version of the USSTRATCOM Test and Evaluation Master Plan (TEMP). The Contractor shall perform Formal Qualification Testing (FQT) to ensure the software meets user requirements. The Government will have sole responsibility for User Acceptance Testing (UAT). The Government may exercise the option of having the Contractor perform maintenance build testing at the Contractor's site. Government testing activities should be identified in schedules and work breakdown structures delivered by the Contractor.
- 2.14. Software Configuration Management. The Contractor shall have, or be able to establish prior to contract start, a configuration management process that provides thorough, efficient, and timely implementation of all software and database product changes and includes Government approval before product changes are initiated. All source code and documents shall be delivered to the Government for configuration management (CM) purposes. Deliveries shall include all source code, documentation,

BOA = Broad Ocean Area - used re ICBM range.
- also for peace time ICBM transits

and libraries required for compilation. The Contractor shall support functional configuration audits as required. The Government may exercise the option of having the Contractor perform or assist in CM at USSTRATCOM with Government oversight. Government CM processes should be identified in schedules and work breakdown structures delivered by the Contractor.

- 2.15. Software Documentation. The Contractor shall comply with military standards or an ISO 9000 compliant documentation standard.
- 2.16. Administrative Capacity. The Contractor shall provide various technical documents such as interface control documents, users' manuals, software design documents, product configuration control, schedules, quality assurance, and other reporting as required by USSTRATCOM.
- 2.17. Metrics. The Contractor shall collect, analyze, and report metrics which provide the Contractor and the Government with the insight necessary to effectively predict and manage contract cost, schedule, technical performance, and risk.
- 2.18. Systems Engineering. Government systems engineering processes will be governed by the SEMP. The SEMP defines how the Command will architect, procure, engineer, integrate, test, deploy, and support robust software systems under its management control. For software developed and maintained under this contract, the Contractor systems engineering processes shall be congruent with the guidance given in the latest version of the SEMP.
- 2.19. Application Acceptance. The Contractor shall use Air Force products as the standards to judge and accept software that processes ICBM planning data. These products include Minuteman III operational targeting programs and Air Force fratricide models. The Contractor shall use the PDCALC program as the baseline for installation assessment.
- 2.20. Application Evaluation. The Contractor shall provide for independent evaluations by the Naval Surface Warfare Center, Dahlgren Division, of software that processes SLBM planning data. This shall include Government evaluation of contractor-maintained software source code before Government acceptance of the product. The Government's right to conduct similar evaluations of other software components shall also be preserved.
- 2.21. Contractor Facility. The Contractor shall provide a computing environment at the Contractor's facility necessary to accomplish software maintenance, enhancements, development and associated testing. The computing environment includes equipment, COTS software, and databases. Typically these facilities are classified Secret due to the development and test databases.
- 2.22. Programming Languages. For new development and reengineering efforts, the Contractor shall develop software using modern languages such as Java, C#, or C++.

The Government will allow the use of other languages, such as FORTRAN, C, and Ada, for maintenance of legacy modules.

- 2.23. COE Compliance. For new software development, the Contractor shall use and implement the Defense Information Infrastructure Common Operating Environment (COE) until the use of Global Information Grid Enterprise Services-Core Enterprise Services (GIG ES-CES) standards are mandated. All such COE applications shall be at least COE Level 5 compliant as measured against the latest version of the Integration and Run Time Specification (I&RTS) specification. The Contractor shall modify existing software in a manner approved by the Government.
- 2.24. Geospatial Information and Services. For new development and reengineering of mapping and geospatial functions, the system shall utilize the government's enterprise solution, currently Commercial Joint Mapping Toolkit (C/JMTK). The system shall use products and access data from USSTRATCOM's geospatial servers or geospatial databases in formats supported by the National Geospatial-Intelligence Agency (NGA). If the Contractor wishes to deviate from this guidance, the Contractor shall provide justification to the Government for consideration and approval.
3. Options. This section is for information on possible future tasks. (Note: Offerors need not provide a technical or price proposal for these tasks prior to award.) The Contractor may be assigned optional taskings, some of which are listed here. During the life of the Contract, Rough Order of Magnitudes (ROMs) may be requested as needed.
 - 3.1. Clip Phase 5 Enhancement of MGPS Accessibility modules. M115 (Force Application and Timing Program) may require modification to maintain the interface between MGPS and the Accessibility programs. MGPS will need to integrate a new RHMI Display Builder to display the enhanced graphics, retrieve data for the displays, and manipulate the enhanced graphics images. DARTS development should make these capabilities inherent in the software.
 - 3.2. Evolutionary Programs (EP) and Artificial Neural Network (ANN). It may be required to develop and incorporate biological based algorithms and procedures, including EP and ANN technology, into MGPS/DARTS with a concentration on optimizing Government objectives.
4. Reference Documents. The following ISPAN documents shall be provided to the Contractor. The objectives of this contract should adhere to the information provided by these references. The Contractor will discuss any proposed deviations with the Government to determine the direction in which to proceed.
 - Software Engineering Master Plan (SEMP)
 - Testing and Evaluation Master Plan (TEMP)
 - STRATCOM Technology Profile (STP)

- OPLAN 8044 Production Schedule

5. Travel. The Contractor shall be responsible for making arrangements for all airfare, car rental, lodging, and subsistence required. The contractor shall be responsible for tracking travel expenditures. The Joint Travel Regulations (JTR) (Current Volume) shall be used for guidance.

6. Government Support. The following support will be Government-provided to the Contractor:

6.1. Program Support within USSTRATCOM Headquarters. Support is primarily furnished for secure access to the ISPAN computing environment that is not authorized outside the Curtis E. LeMay building and Building 501. This support is wholly dedicated to one project or contract and is not permanently fixed within one or more offices.

6.2. Work Space Within USSTRATCOM Headquarters. Reasonable working space, on a non-permanent basis, for the Contractor to accomplish those technical tasks requiring access to the ISPAN computing environment, Top Secret data, and computing facilities not authorized for Contractor access outside USSTRATCOM Headquarters.

6.3. Government Furnished Equipment (GFE). The Government will provide GFE as listed in Attachment 5. The Contractor shall be responsible for providing maintenance for the GFE items included on the list at Attachment 5.

7. Contractor/Government Communication. The Contractor's Program Manager for MASS may directly contact the respective Government Program Manager on technical and programmatic issues. The Contractor can contact Government Functional Managers directly on issues concerning requirements and technical issues. The Contractor shall keep the respective Government Program Manager apprised of relevant issues.

8. Contractor Use of Proprietary Software. The Contractor shall establish a process to ensure the Government approves the use of any proprietary software to include commercial products (including operating systems, graphical user interfaces, patches, and compilers).

9. Minimum Staff Qualifications. The Contractor shall provide a staff with the following minimum qualifications:

9.1. Location. A complete technical team located within the local office within one year of contract award, if not in place at contract start.

9.2. Technology. A staff capable of complying with all current and projected standards for maintainability and upgradeability, employing object-oriented and component-based technology.

- 9.3. Software Engineering, Development, and Maintenance. The staff shall have experience in object-oriented design and programming, distributed programming, rules-based systems, GUI programming, quality assurance, configuration management, systems and software development process standards such as CMMI SW, DoD software engineering standards, and DoD software documentation methodologies. The staff will have personnel experienced and completely familiar with client-server computer architectures, N-tier architectures, web services, database servers, and distributed database concepts.
- 9.4. Computer Languages. The staff shall have demonstrated expertise in Ada 83, Ada 95, multi-threaded C++, C, X-windows/Motif, FORTRAN, and SQL. The staff shall include computer programmers and other specialists totally proficient in creating, modifying, and testing assembler, C, C++, FORTRAN, Java, and Ada software code, and totally proficient in Solaris Operation Systems. The staff shall be capable of reengineering and implementing a new software product for follow-on implementation as DARTS. The staff shall have expertise in the computer programming languages, architectures, and technologies necessary to implement the DARTS system. These include modern languages such as Java and C#, n-tier architectures, and web services.
- 9.5. Networks. The staff shall have experience with Unix networking, distributed processing, and Solaris.
- 9.6. On-site Support. On-site support shall be provided by a domain expert who possesses a Top Secret clearance based on a Special Background Investigation and is eligible for SIOP-ESI and Special Access Program access. This expert must have the ability to provide same-day on-site technical support to analyze, identify and resolve problems for aspects of software maintained under this program. This expert must have a thorough understanding of the various inputs to, and outputs from, the ballistic missile planning system to ensure fully integrated and coordinated problem resolution. This expert must be prepared to provide software maintenance during routine, emergency, and USSTRATCOM exercise periods. The Contractor must also be prepared to provide 24-hour, seven day a week (24/7) support for services when deemed essential by the Government.
- 9.7. Management Team. The Program Manager shall also be a domain expert. Key management and supervisory personnel must be experienced and completely familiar with strategic weapon planning, targeting concepts, ballistic missile weapon system performance, aircraft weapon system relationships to ballistic missile planning and flight simulation concepts, weapon system fratricide modeling techniques, interactive software graphics, and OPLAN 8044 production and processes. The Program Manager will provide resumes of key management and supervisory personnel who will be closely associated with the project; resumes must include names, qualifications in the context of this TRD, and security clearances held.

- 9.8. Security Clearances. All contract employees in technical and management positions shall possess a Top Secret clearance based on a Special Background Investigation and eligible for SIOP-ESI access. An interim Top Secret clearance does not satisfy this requirement. Administrative and contract support personnel shall possess a Secret clearance.
10. Mission Essential Services. All tasks in this document associated with sustainment and modifications to support the warfighter are identified as mission essential.

the *USS Nevada* are receiving an *extra* 2-year visit to the shipyard to be backfitted with D-5 missiles -- the *USS Alaska* began backfit early in 2000 and the backfit has now been completed. The *USS Nevada* entered the shipyard in February 2001. Both submarines are now back in service carrying D-5 missiles. Their actual refueling overhaul will take place a few years later. Meanwhile, the *USS Henry M. Jackson* and the *USS Alabama* are actually scheduled for backfit during their refueling overhauls. This is depicted below.

	Fiscal Year 2000	Fiscal Year 2001	Fiscal Year 2002	Fiscal Year 2003	Fiscal Year 2004	Fiscal Year 2005	Fiscal Year 2006	Fiscal Year 2007	Fiscal Year 2008	Fiscal Year 2009	Fiscal Year 2010
<i>USS Henry M. Jackson</i>											
<i>USS Alabama</i>											
<i>USS Alaska</i>											
<i>USS Nevada</i>											

Trident SSBN Overhaul/Backfit Schedule

(Source: Final Report, p. 1-2)

Fiscal Years begin on October 1st

Legend:

	D-5 Backfit only (2 years)
	Engineering Refueling Overhaul only (2 years)
	Engineering Refueling Overhaul and D-5 Backfit simultaneously (2 years)
	Recertification after refueling (6 months)

COST SAVINGS IN CANCELING D-5 BACKFIT AND SCRAPPING THE SUBMARINES.

The planned START-2 level of 1728 SLBM warheads could be carried on nine Trident submarines. The ten SSBNs based at Kings Bay are more than necessary. All eight Trident-1 subs, rather than just four, could be safely decommissioned. With the George W. Bush administration's negotiations to drastically reduce the nuclear weapons inventory, decommissioning the eight oldest Trident subs should be high on the agenda.

There are still unknowns and uncertainties in cost estimates, at least as far as the public is concerned. However, from what we know at present the total savings from stopping the D-5 backfit and retiring the two remaining candidate submarines would be at least the following (In millions of fiscal year 2002 dollars):

-- Subs not converted to carry D-5 missiles ¹⁸	\$ 269.2
-- Eliminating shipyard costs for two 2-year overhauls. ¹⁹	209.5(estimated)

¹⁸\$257 million would be the cost of backfitting 2 subs based on the \$513 million for 4 subs given in "Assumed in the FY 2000 Budget Submission." The money for backfitting the *USS Alaska* and *USS Nevada* has already been appropriated. \$257 million converted to 2002 dollars is \$269.2 million.

¹⁹This involves work other than the D-5 upgrade.