BY ORDER OF THE COMMANDER

AIR FORCE SPACE COMMAND
INSTRUCTION 61-101

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Scientific/Research and Development

SPACE SCIENCE AND TECHNOLOGY (S&T) AND INNOVATION

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction implements Air Force Policy Directive (AFPD) 61-1 ***Management of Science and Technology***, AFPD 10-23 ***Operational Innovation Program*** and AFI 10-1202 ***Space Test Program (STP) Management.*** This includes space aspects of the Air Force Science and Technology (S&T) and operational innovation programs to include: critical experiments, Advanced Technology Demonstrations (ATD), Developmental Roadmaps, Advanced Concept Technology Demonstrations (ACTD), the AF Scientific Experiment Review Board (SERB), Tactical Exploitation of National Capabilities (TENCAP), Space Battlelab initiatives and other innovative solutions. This instruction provides guidance for the oversight of Space S&T and Innovation as it pertains to the development of AFSPC concepts, long-range plans, capabilities and fiscal products such as the Air Force Space Command (AFSPC) Program Objective Memorandum (POM) and budget. It includes the interactions of AFSPC with Air Force Materiel Command (AFMC) and external agencies concerning space aspects of S&T and Innovation activities. It applies to all AFSPC organizations, subordinate units and contractors. It does not apply to Air Force Reserve Command or Air National Guard units. Subordinate units should supplement this instruction. All supplements to this instruction will be coordinated with Headquarters (HQ) AFSPC/XP before publication.

SUMMARY OF REVISIONS

This document is substantially revised and must be completely reviewed.

1. Introduction:

1.1. **AF Management of S&T.** The Air Force manages AF S&T as an integrated set of programs that invest in the future while strengthening current capabilities. The AF S&T program carefully balances the investment portfolio in basic research, applied research and advanced technology development to produce both evolutionary and revolutionary capability increases. AFMC is the major command (MAJCOM) responsible for managing and executing a comprehensive AF S&T program to support the overall Air Force, ensuring S&T resources are applied to the highest priority Air Force technology needs. Air Force Research Laboratory (AFRL) is the agency within AFMC that executes the S&T effort. The S&T portion of the AF POM is submitted through AFMC in the Air Force resource allocation process. AFSPC, as an S&T customer, provides guidance, prioritization, and oversight to ensure its technology needs are met.

1.2. **AFSPC Role in S&T.** AFSPC has a unique role in USAF S&T:

1.2.1. It is the center of space operations and acquisition expertise for the USAF.

1.2.2. It is an operational command as well as an acquisition command. Space and Missile Systems Center's (SMC) transition from AFMC to AFSPC aligns acquisition and operational space expertise for increased efficiency and responsiveness.

1.2.3. Space acquisition is different enough to have its own guidance in ***National Security Space Acquisition Policy 03-01*** (NSS 03-01). These differences are driven by high technology, small quantity programs.

1.2.4. AFSPC also has the unique responsibility of bringing space to the USAF and joint warfighters through AF TENCAP and Space Battlelab initiatives.

1.3. **AFSPC S&T Responsibilities.** AFSPC identifies concepts, requirements and priorities for space research, enabling future AF capabilities. AFSPC collects space technology needs from USAF MAJCOMs and provides investment strategies for the USAF Space S&T program. AFSPC also solicits Combatant Commander space capability requirements and translates them into future S&T needs through the Integrated Planning and Programming (IPP) process. Finally, AFSPC provides information and recommendations on USAF Space S&T priorities, programs and funding, in coordination with AFMC, to the Under Secretary of the Air Force (USECAF). See AFPD 61-1 for additional details.

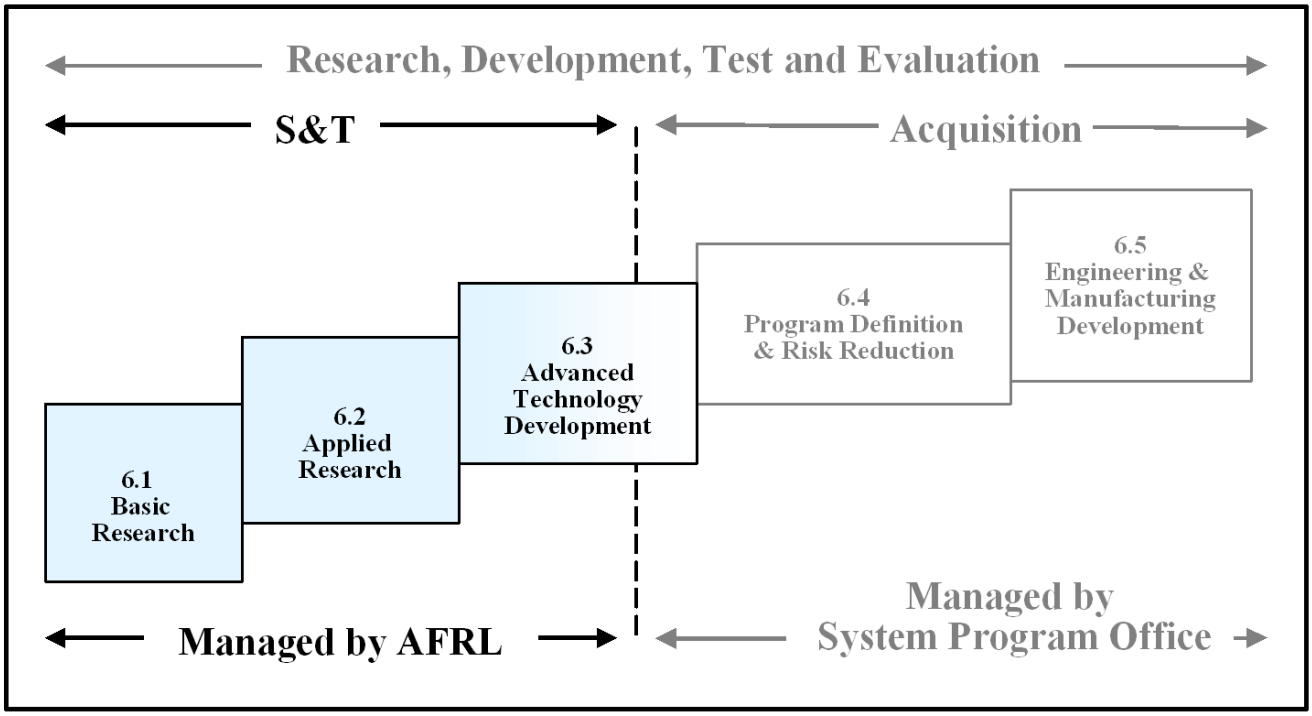
1.4. **The S&T and Innovation Portfolio.** USAF S&T is part of a larger research and development picture. There are potential synergies among critical experiments, ATDs, ACTDs, the AF SERB candidates, AF TENCAP and Space Battlelab initiatives. ACTDs leverage maturing technologies and are one means of transitioning technology to the warfighter. STP hosts critical experiments, ATDs and ACTDs as well as other activities that require space launch. AF TENCAP and Space Battlelab initiatives bring technology and new ways of fighting to the warfighter. Because of the interrelationships of these programs, they are reviewed together.

2. Purpose. This instruction defines AFSPC roles and responsibilities with respect to S&T and Innovation; establishes processes for providing priorities, guidance, oversight and integration using the AFSPC S&T corporate process; and establishes AFSPC/XPX as the command lead for S&T and Innovation.

3. Background:

3.1. **Elements of S&T.** S&T consists of basic research efforts, applied research efforts and advanced technology development as defined in AFPD 61-1. (**See Attachment 1, Terms**). **Figure 1.** provides an overview of S&T phases.

Figure 1. Science & Technology.



3.2. **S&T and Innovation Processes.** AFPD 61-1 guides S&T. AFPD 10-23 guides operational innovation programs such as Battlelabs and others. Different higher headquarters organizations dictate many of these processes. **See Figure 2.**

Figure 2. Synopsis of Various Space S&T and Innovation Activities:

Activity	Process Owner	Timeframe	Process	Funding Source	Council Product and Recipient
Critical Experiment	PEO/TEO	1 – 2 years	Developmental Roadmap Process	AFRL	TBD
Advanced Technology Demonstration (**ATD**)	SAF/AQ	1 – 4 years	ATC	AFRL	AFSPC Prioritization List to AFRL/CC
Developmental Roadmap	PEO/TEO	N/A	Developmental Roadmap Process	N/A	AFSPC Reviewed Roadmaps
Advanced Concept Technology Demonstration (**ACTD**)	DUSD(AS&C) HQ AF/XI	2 – 4 years	Breakfast Club JROC	Strategy: DUSD(AS&C) AFRL AFSPC	AFSPC Prioritized List to HQ AF/XI
AF SERB	SMC/TD	< 5 years	DoD SERB	AFSPC & Experiment Sponsors	AFSPC Prioritized List to SAF/USAL for SERB
AF Tactical Exploitation of National Capabilities (**TENCAP**)	SAF/USA	6 months – 3 years	TENCAP Initiative Process	AFSPC & Others	AFSPC Review
Battlelab Initiative	HQ AF/XI	< 18 months	Battlelab Initiative Process	AFSPC & Others	AFSPC Review
Operationally Responsive Innovative Solutions	Varies	6 months – 3 years	Varies	Varies	Prioritization List to Sponsor(s)

3.2.1. The Applied Technology Council (ATC) is an Air Force process for managing AF ATDs. The ATC provides a senior-level forum facilitating transition of technology from the Air Force Research Laboratory (AFRL) to AF product centers, improving USAF warfighting capabilities. Several ATCs exist. The Space ATC includes AFMC, AFRL, AFSPC and SMC and when needed may also include Electronic Systems Command (ESC) and Air Armament Command (AAC).

3.2.2. The Developmental Roadmap process is directed by SMC/TD and AFRL/XPS in coordination with the System Program Offices (SPOs), AFRL technology directorates and HQ AFSPC/XP/DR/XO. The process identifies technology requirements and shortfalls within the space portfolio. The roadmaps are generated through a technical analysis of program technology needs, linked to Initial Capabilities Documents (ICD)/ Capability Development Documents (CDD) or Functional Solutions Analysis (FSA). The Developmental Roadmaps graphically link relevant S&T activities, such as critical experiments, ATDs and ACTDs. The Developmental Roadmap products are reviewed semi-annually during the Program Executive Officer (PEO)/Technology Executive

Officer (TEO) review, and are inputs to the Space S&T Council, the Annual National Security Space Program Assessment and other forums. SMC/CC is the Space PEO and AFRL/CC is the TEO.

3.2.3. The Deputy Undersecretary of Defense for Advanced Systems and Concepts (DUSD(AS&C)) assesses ACTD technology maturity and costing accuracy with assistance from senior members of the S&T community, known as the Breakfast Club. The Breakfast Club is a DoD process to review candidate ACTDs. The Joint Requirements Oversight Council (JROC) validates mission needs and establishes the priority of the ACTD candidates by military need.

3.2.4. The AF SERB prioritizes AF STP candidates, funded and unfunded, for review and approval by the AFSPC S&T Corporate Process. In providing for the Corporate Review, the AF SERB will also present the criteria used for ranking of the AF SERB candidates. The approved, prioritized AF SERB candidate list is then submitted to the DoD SERB. The DoD SERB is a DoD process, organized and chaired by SAF/USA, to review all requests for STP spaceflight. The SERB process creates an experiment priority list for execution by SMC Detachment 12.

3.2.5. The AF TENCAP Decision Authority is the Space Warfare Center Commander (SWC/CC), who approves and directs AF TENCAP Program execution.

3.2.6. The Space Battlelab (SB) conducts its own screening process to prioritize initiatives.

3.2.7. Other operationally responsive innovations are addressed on a case by case basis and reviewed by the AFSPC S&T Corporate Process for approval.

3.3. **S&T Relationship to Other Processes.** S&T and Innovation are closely related to the Joint Capabilities Integration and Development System (JCIDS), Acquisition Management System (AMS) and Planning, Programming, Budgeting and Execution (PPBE) system. As changes in capabilities, performance, schedule or cost occur within these systems, they must be reported back to the S&T and Innovation oversight process. HQ AFSPC/DR organizations and HQ AFSPC/XPP provide visibility into key changes that affect the IPP or S&T and Innovation portfolio.

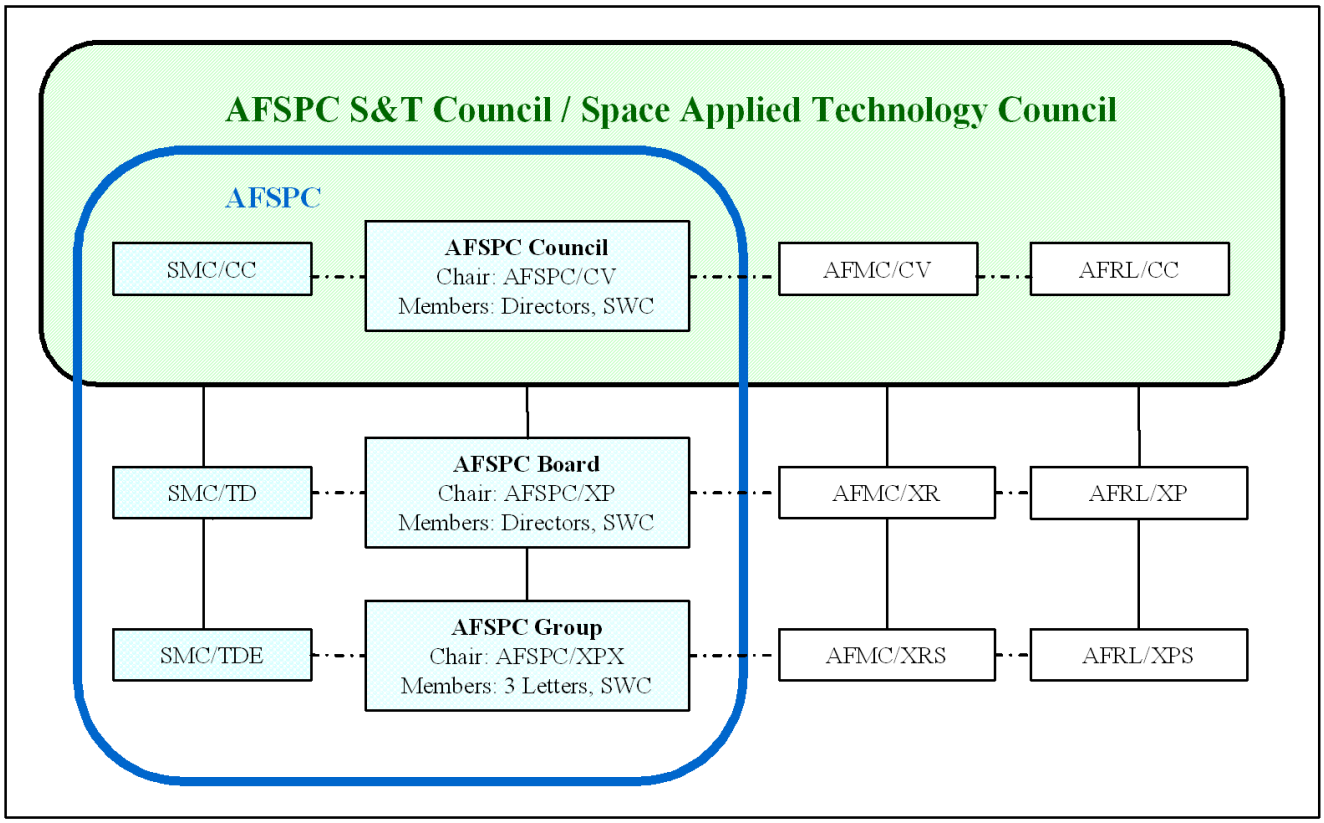
4. General Guidance & Authority:

4.1. **Guidance:**

4.1.1. The AFSPC Corporate Structure defines the process for vetting Space S&T and Innovation related issues through AFSPC and incorporates the Space ATC. **See Figure 3.** below. It includes three levels of review: the AFSPC Group, conducted at the HQ AFSPC 3-letter level; the AFSPC Board, conducted at the HQ AFSPC 2-letter level; and the AFSPC Council, chaired by the AFSPC/CV. The members of the Group, Board and Council are listed in **Attachment 2**. Each activity vetted through the Corporate Structure has a process owner. (***EXAMPLES*:** Planning (HQ AFSPC/XPX), Programming (HQ AFSPC/XPP) and Budgeting (HQ AFSPC/FMA)).

4.1.1.1. ATCs review proposed ATD candidates, including their acquisition funding streams for technology insertion/transition; commission ATDs from the ATD candidate list; and plan for technology transition of commissioned ATD programs. The AFSPC S&T Corporate Structure meets the Space ATC obligations for review of emerging technology. It provides a “standing body” for other space-related S&T and Innovation processes. AFSPC complies with AFMC formats and procedures for the ATC and its products. (***NOTE***: The Space ATC is chaired by AFSPC/CV with SMC/CC, AFMC/CV, and AFRL/CC as members).

Figure 3. AFSPC S&T Corporate Structure.



4.1.1.2. **Figure 3.** illustrates the AFSPC S&T Corporate Structure. The roles of key organizations as they pertain to the AFSPC S&T Corporate Structure are amplified below.

4.1.1.2.1. AFSPC performs two important and distinct roles. As an operational command, it represents the warfighter in the AFSPC S&T Corporate Process. AFSPC develops the Strategic Master Plan (SMP), writes capabilities documents and programs for S&T transition funds. As an acquisition command, AFSPC acquires space systems and identifies acquisition program needs to S&T providers.

4.1.1.2.2. As AFSPC's acquisition agency, SMC transforms warfighter needs into system requirements, defines needed technologies, generates Developmental Roadmaps in coordination with AFRL, transitions technology into its programs (including ATDs and ACTDs) and delivers materiel solutions to operators.

4.1.1.2.3. AFMC develops investment strategies and programming for Space S&T. AFMC also represents their SPOs, such as ESC and Aeronautical Systems Center (ASC) program offices, which may have space related acquisitions or use space related technologies.

4.1.1.3. **See Attachment 2** for detailed information on both the AFSPC S&T Corporate Structure and members.

4.1.1.4. The AFSPC S&T Corporate Structure provides guidance, prioritization and review of space related S&T, and provides information about technology transition and innovation activities underway in the command to include:

4.1.1.4.1. Critical experiments.

4.1.1.4.2. ATDs.

4.1.1.4.3. Developmental Roadmaps.

4.1.1.4.4. ACTDs.

4.1.1.4.5. AF SERB candidates (both funded and unfunded).

4.1.1.4.6. AF TENCAP Initiatives.

4.1.1.4.7. Battlelab Initiatives.

4.1.1.4.8. Operationally Responsive Innovative Solutions.

4.1.1.4.9. Prioritized AFSPC S&T List.

4.2. **Prioritization:**

4.2.1. The AFSPC IPP provides a rigorous methodology for prioritizing AFSPC needs. IPP analysis produces two major products defining USAF Space S&T priorities: the Functional Needs Analysis (FNA) and Functional Solutions Analysis (FSA). FNA and FSA replace the terms Mission Needs Analysis and Mission Solutions Analysis. The IPP produces the AFSPC SMP. The AFSPC SMP S&T Appendix highlights work conducted in support of the IPP and provides AFSPC guidance for S&T. HQ AFSPC/XPXT, with input from the S&T and Innovation community, determines the content and format of the Space S&T Guidance Appendix and provides a prioritized S&T needs list based upon the FNA.

4.2.1.1. Functional Area Analysis (FAA) is the first major phase of the IPP. It examines high-level strategies such as the National Security Strategy, National Military Strategy, AF Concepts, Master Capability Library (MCL) and Combatant Commander's Integrated Priority Lists (IPLs). FAA develops a strategy-to-task hierarchy as the analytical framework (or value model) to assess AFSPC current and programmed forces. FAA replaces the term Mission Area Analysis.

4.2.1.1.1. FAA is not guidance to the Space S&T and Innovation community because it focuses on operational capabilities, not capability shortfalls or functional needs. However, it provides AFSPC broad areas of interest.

4.2.1.2. FNA assesses AFSPC current and programmed force abilities to fulfill FAA required capabilities. Functional needs represent shortfalls in the AFSPC ability to attain those capabilities over the strategic planning horizon. The focus is a strategic look at the Command's future needs. Functional needs are categorized into three timeframes: near-term, mid-term and far-term. The result of FNA is a prioritized list of time-phased needs, detailing capability shortfalls and providing the basis for prioritizing AFSPC S&T needs.

4.2.1.3. FSA identifies potential materiel and non-materiel solutions to fulfill the needs identified during FNA. Modifications to existing systems and new concepts, along with enabling technologies, are identified as potential solutions to meet the functional needs. This may also offer an avenue for input of new S&T ideas and development programs. FSA produces a prioritized list of probable solutions to meet the FNA identified deficiencies. A derivative product is a prioritized list of S&T needs. The S&T community should focus on those concepts requiring S&T development to satisfy functional needs. The mid-term often is the optimum

timeframe for balancing new technologies and new concepts with a clear vision meaningful to the S&T and Innovation communities because near term needs usually have funded acquisition programs that are using existing S&T while far term needs have a tendency to change over time based upon constantly evolving S&T.

4.2.1.4. Integrated Investment Analysis (IIA) considers warfighter needs in a fiscally constrained model. It looks at proposed solutions, optimizing warfighter capabilities within total obligation authority. IIA uses many parameters to analyze the optimal investment strategy. One parameter is time. If the model can't "afford" a given solution at the specified operational date, it will move the date to fit within the funding constraints. Those dates are then fed back to the functional experts for review. The result of IIA is an integrated investment roadmap that optimizes AFSPC capabilities. Use caution with these dates. They may change with a major reprogramming of AFSPC funds or a technology breakthrough.

4.2.2. Developmental Roadmaps describe how and when technology transitions to acquisition programs or warfighter capabilities. The AFSPC S&T Corporate Structure reviews the Developmental Roadmaps, ensuring activities are integrated and meet cost, schedule and performance parameters. The following elements are reviewed during the process:

4.2.2.1. Links to AF Concepts and Master Capabilities Library (MCL) to aid in integrating the activity into the AF Capabilities Review and Risk Assessment (CRRA) process.

4.2.2.2. Technology support to developmental or fielded systems. This includes cost, schedule and performance attributes meeting system requirements. The Roadmaps include milestones for increased technology readiness levels (TRLs) meeting system development requirements (**See Attachment 3**).

4.2.3. The AFSPC S&T Corporate Process accomplishes the following:

4.2.3.1. Approves AFSPC prioritization of ATDs, ACTDs, AF SERB candidates, the AFSPC S&T List and Operationally Responsive Innovations.

4.2.3.1.1. By ensuring traceability to:

4.2.3.1.1.1. AF Concepts; the MCL or capabilities documented in ICDs, CDDs and Capability Production Documents (CPD).

4.2.3.1.1.2. AFSPC concepts.

4.2.3.1.1.3. The AFSPC IPP.

4.2.3.1.2. By ensuring transition plans are adequately considered.

4.2.3.2. Ensures consistency of priorities among the various programs (***EXAMPLE*:** A #1 priority ATD needing spaceflight should be a high priority on the AF SERB list).

4.2.3.3. Reviews Developmental Roadmaps to ensure they meet cost, schedule and performance requirements, technology insertion points and determines their impacts on "combat effects".

4.2.3.4. Reviews AFSPC and AFMC funding for space S&T investment strategies, programming and budget activities.

4.2.3.5. Prioritizes Space ATDs.

4.2.3.5.1. Reviews, commissions, graduates and categorizes ATDs in accordance with AFMCI 61-102, ***Advanced Technology Demonstration Technology Transition Planning.***

4.2.3.5.2. All approved ATD programs require a transition plan. This plan names the transition organization, identifies the transition schedule, cites funding requirements and highlights interdependencies with the transition organization's program. It also ties ATDs to required warfighter capabilities.

4.2.3.6. Prioritizes Space ACTDs.

4.2.3.6.1. Guidelines for ACTD selection criteria are established on the DUSD(AS&C) website at **http://www.acq.osd.mil/actd/guidelns.htm**. Tie ACTDs to the following when possible: Joint Operations Concepts, Joint Operating Concepts, or Joint Functional Concepts.

4.2.3.6.2. ACTD transition planning is accomplished through ACTD Implementation Directives and ACTD Management Plans. Funding must be sufficient to complete the planned assessment of military utility and provide technical support for the first two years of fielding. If the utility assessment results in a decision to acquire more production units, the S&T Corporate Process must ensure that transition planning for a formal acquisition is accomplished.

4.2.3.6.3. HQ AFSPC/XPXT coordinates ACTDs among HQ AFSPC agencies, ensuring support of successful ACTDs and advocacy for transition actions. HQ AFSPC/XPY supports analysis of ACTDs through participation in the analytical team, usually involving the SWC and the Air Force Operational Test and Evaluation Center (AFOTEC).

4.2.3.7. Prioritizes AF SERB candidates, both funded and unfunded, ensuring that the highest priority candidates are evaluated and approved. AFI 10-1202 establishes STP experiment eligibility criteria. This is based upon an explanation of the potential significance to satisfying DoD requirements, justifying the need for spaceflight in meeting program objectives, and meeting funding criteria constraints. HQ AFSPC advocates for the STP program with Air Staff and user agencies to ensure continuing support.

4.2.3.8. Reviews, advocates and assists in the transition of AFSPC focused AF TENCAP initiatives.

4.2.3.9. Reviews, advocates, and assists in the transition of Space Battlelab (SB) initiatives.

4.2.3.10. Provides AFRL and AFMC with a prioritized AFSPC S&T needs list.

4.2.3.11. Reviews, advocates, and assists in the transition of Operationally Responsive Innovative Solutions.

4.2.3.11.1. Identifies other innovative solutions supported by AFSPC, but not identified in the above process discussions. (***EXAMPLE***: An innovative solution may include a higher headquarters directed project providing space capabilities direct to a theater that are not provided by the above processes).

4.2.3.11.2. Links these innovative solutions with the appropriate capabilities/needs to provide for funding review and transition planning by the corporate process.

4.2.4. The POM and budget processes may inherently impact S&T and Innovation priorities. The appropriate process owner will notify HQ AFSPC/XPXT if changes are required.

4.3. **Oversight.** Oversight allows two-way communications providing clarification, advocacy and direction to Space S&T efforts throughout AFSPC and AFMC. These interactions generate feedback captured in the IPP and documented in the SMP, as appropriate. The AFSPC S&T Corporate Structure will:

4.3.1. Review the Space S&T POM.

4.3.1.1. AFRL Space S&T POM Strategy.

4.3.1.2. AFRL Space S&T POM Submission to AFMC.

4.3.1.3. AFMC POM Review (Space S&T).

4.3.1.4. AFSPC POM (S&T related, STP, and when needed, space innovations needing POM funding).

4.3.2. Review the AF Space S&T portfolio. This review includes the following: 1) Appropriate information from the PEO/TEO review, 2) Status reviews of space related S&T activities, 3) Reviews of individual S&T and Innovation programs (***EXAMPLE*:** Space ATDs), and 4) Workshop reviews for specific sub-functional area oversight (***EXAMPLE*:** Common Aero-Vehicle, Operationally Responsive Space, etc.).

4.3.3. Provide an AFSPC position for significant S&T and Innovation related issues and taskers from Air Staff and USECAF.

4.3.4. Add/remove elements of oversight.

5. Responsibilities:

5.1. **HQ AFSPC/CV.** The AFSPC/CV chairs the AFSPC S&T Council and provides guidance and direction to the AFSPC S&T process.

5.2. **HQ AFSPC/XP:**

5.2.1. HQ AFSPC/XP is the process owner for the AFSPC S&T Corporate Process.

5.2.1.1. Manages Space S&T oversight.

5.2.1.2. Resolves conflicts within the AFSPC S&T process.

5.2.1.3. Represents AFSPC in the AFMC corporate process, advocating for Space S&T activities.

5.2.1.4. Manages the AFSPC ACTD program.

5.2.1.5. Manages the AF SERB through the AFSPC S&T Corporate Process.

5.2.2. HQ AFSPC/XPX manages the IPP and S&T integration planning and develops priorities for space S&T guidance for unclassified and classified (up to and including Special Compartmented Information (SCI) and Special Access Program (SAP)) subject matter.

5.2.2.1. Ensures Space S&T prioritization and guidance are captured in the AFSPC SMP S&T Appendix.

5.2.2.2. Produces a prioritized AFSPC S&T needs list.

5.2.2.3. Ensures key guidance products are provided to AFMC/AFRL, as necessary.

5.2.2.4. Administers the AFSPC S&T Corporate Process.

5.2.2.5. Conducts Space S&T planning workshops.

5.2.2.6. Provides the Space S&T planning interface with National Aeronautics and Space Administration (NASA), National Reconnaissance Office (NRO), Defense Advanced Research Projects Agency (DARPA), National Oceanic and Atmospheric Administration (NOAA), National Geospatial-Intelligence Agency (NGA) and other external government agencies, as appropriate.

5.2.2.7. Manages the Space Partnership Council and authors the Space Collaborative Plan.

5.2.3. HQ AFSPC/XPP ensures execution of the SMP within the bounds of the PPBE construct, ensuring programming decisions are based upon the SMP as appropriate.

5.2.3.1. XPP provides feedback from the AFSPC POM to XPX for incorporation into the IPP and to AFRL and other government agencies as appropriate to plan S&T activities.

5.2.3.2. XPP reviews S&T activities (including SCI and SAP subject matter) that may impact AFSPC total obligation authority.

5.2.4. HQ AFSPC/XPY provides technical expertise, analysis, assessment and recommendations supporting the IPP and SMP to include basic research, applied research and advanced technology development linkages.

5.2.4.1. Provides independent, timely advice on current and future space technology capabilities to AFSPC senior leaders.

5.2.4.2. Conducts technical analysis supporting Analysis of Alternatives (AoA) and enabling concept, previously known as system concept, development.

5.2.4.3. Conducts modeling, simulation, analysis, and military utility assessments for S&T and Innovation activities.

5.2.4.4. Organizes and conducts S&T scientific analysis workshops.

5.2.4.5. Provides technical analysis interface with NASA, NRO, DARPA, NOAA and NGA, as appropriate.

5.2.4.6. Provides technical review, comment and recommendations supporting AFSPC S&T Corporate Process as appropriate.

5.2.4.7. Provides analytical assistance supporting HQ AFSPC/DR development of requirements.

5.3. **HQ AFSPC/DR:**

5.3.1. Recommends modifications to existing weapon systems and support infrastructure to achieve validated requirements through technology insertion.

5.3.2. Provides input to HQ AFSPC/XP on cost, schedule or performance changes regarding space systems/concepts that could affect future SMPs (***EXAMPLE***: AoA Results).

5.3.3. Identifies the need to develop concepts for emergent space technologies to HQ AFSPC/XO.

5.3.4. Presents AoA analysis results to AFRL as needed to support future S&T planning.

5.3.5. Assists SMC/TD with updating Developmental Roadmaps and linking them to AF Concepts and MCL to aid S&T integration into the CRRA.

5.3.6. Assists HQ AFSPC/XPX in incorporating Developmental Roadmaps into the appropriate sections of the SMP.

5.3.7. In coordination with HQ AFSPC/XP, provides SMP guidance to technology providers.

5.3.8. Ensures SMP prioritization and S&T guidance are incorporated into HQ AFSPC/DR, Command Lead and Program Element Monitor (PEM) activities.

5.3.9. Supports HQ AFSPC/XP in the management of the ACTD program. Develops implementation directives and management plans for ACTDs. This includes identifying funding sources and entering program transition funds into the AFSPC POM process as necessary.

5.3.10. HQ AFSPC/DR-SEIO is the HQ AFSPC/DR S&T programs point of contact.

5.3.10.1. Identifies HQ AFSPC/DR Command Lead and/or PEM for transition of successful S&T programs.

5.3.10.2. Advocates for transition and future funding for transition of S&T into space acquisition programs.

5.3.10.3. Reviews Developmental Roadmaps for S&T availability dates to meet developmental system needs.

5.3.10.4. Supports development of transition plans for space ATDs in accordance with (IAW) AFMCI 61-102, ***Advanced Technology Demonstration Technology Transition Planning*** as appropriate.

5.4. **HQ AFSPC/XO:**

5.4.1. Develops Enabling Concepts (formerly system concepts) for emergent space technologies. Refer to AFSPCI 10-102, ***Air Force Space Command Concept Development*** for additional information on this new term.

5.4.2. Ensures SMP prioritization and S&T guidance are incorporated into HQ AFSPC/XO and PEM activities.

5.5. **HQ AFSPC/IN:**

5.5.1. HQ AFSPC/INX conducts threat analysis supporting AoAs and Enabling Concepts development.

5.5.2. HQ AFSPC/INX conducts Threat Analysis Workshops in support of emerging space technologies.

5.6. **HQ AFSPC/LC:**

5.6.1. HQ AFSPC/LCX supports HQ AFSPC/XPX in future planning and HQ AFSPC/DR in recommending modifications to existing weapon systems and support infrastructure to achieve validated requirements through technology insertion.

5.6.2. HQ AFSPC/LCA ensures architectures are considered for transitioning S&T and Innovations.

5.7. **Space Warfare Center (SWC):**

5.7.1. Rapidly identifies and proves worthy, innovative ideas that improve USAF execution of core capabilities and joint warfighting.

5.7.2. Draws upon expertise and resources of AFMC, AFRL, SMC, HQ AFSPC/XPXT and other government organizations, industry, and academia to rapidly generate, lend or lease technical capabilities needed to demonstrate and measure the worth of promising concepts.

5.7.3. Leads non-materiel solution portion of FSA.

5.7.4. Supports the execution of military utility assessments for AFSPC-sponsored ACTDs.

5.7.5. Presents Space Battlelab, AF TENCAP and Operationally Responsive Innovations to the AFSPC S&T Corporate Structure for information.

5.7.6. Implements AFSPC/CC guidance and direction on Space S&T and Innovation investment.

5.8. **SMC:**

5.8.1. Implements AFSPC/CC guidance and direction on Space S&T and Innovation investment.

5.8.2. SMC SPOs.

5.8.2.1. Update Developmental Roadmaps with S&T and Innovation efforts with assistance from AFRL and HQ AFSPC/DR.

5.8.2.2. Support AFSPC-sponsored ACTDs.

5.8.2.3. Support SMC/TD in conducting S&T and Innovation portfolio reviews.

5.8.2.4. Support development of transition plans for ATDs that will be used by the SPO IAW AFMCI 61-102.

5.8.3. SMC/TD.

5.8.3.1. Leads materiel solution portion of FSA.

5.8.3.2. Leads the Developmental Roadmap process for SMC in coordination with AFRL/XPS. Creates Developmental Roadmaps for high priority mid and far-term concepts. Supports identification of needed technologies.

5.8.3.3. Leads SMC PEO S&T portfolio reviews.

5.8.3.4. Reviews Space Battlelab initiatives, AFSPC focused AF TENCAP initiatives, and ACTDs for transition to operational system acquisition baselines. Determines disconnects between these programs and possible acquisition programs. Recommends creative solutions to close disconnects. May serve as the technical and/or transition manager for ACTDs.

5.8.3.5. Chairs the AF SERB to include review and prioritization of all funded and unfunded candidates. In coordination with other AF SERB members, develops criteria for ranking of AF SERB candidates and presents the criteria and ranking recommendations to the AFSPC Corporate Structure for review and approval. With AFRL, ensures proper execution of AF SERB process and linkage to DoD SERB process.

5.8.3.6. Supports all S&T POM review processes through the AFSPC Corporate process. Assists in identifying disconnects between AFSPC and AFMC/AFRL POM allocations.

5.8.3.7. Supports the ATC and any ATD without SPO sponsorship. Supports the creation of transition plans for any ATD not owned by a SPO IAW AFMCI 61-102.

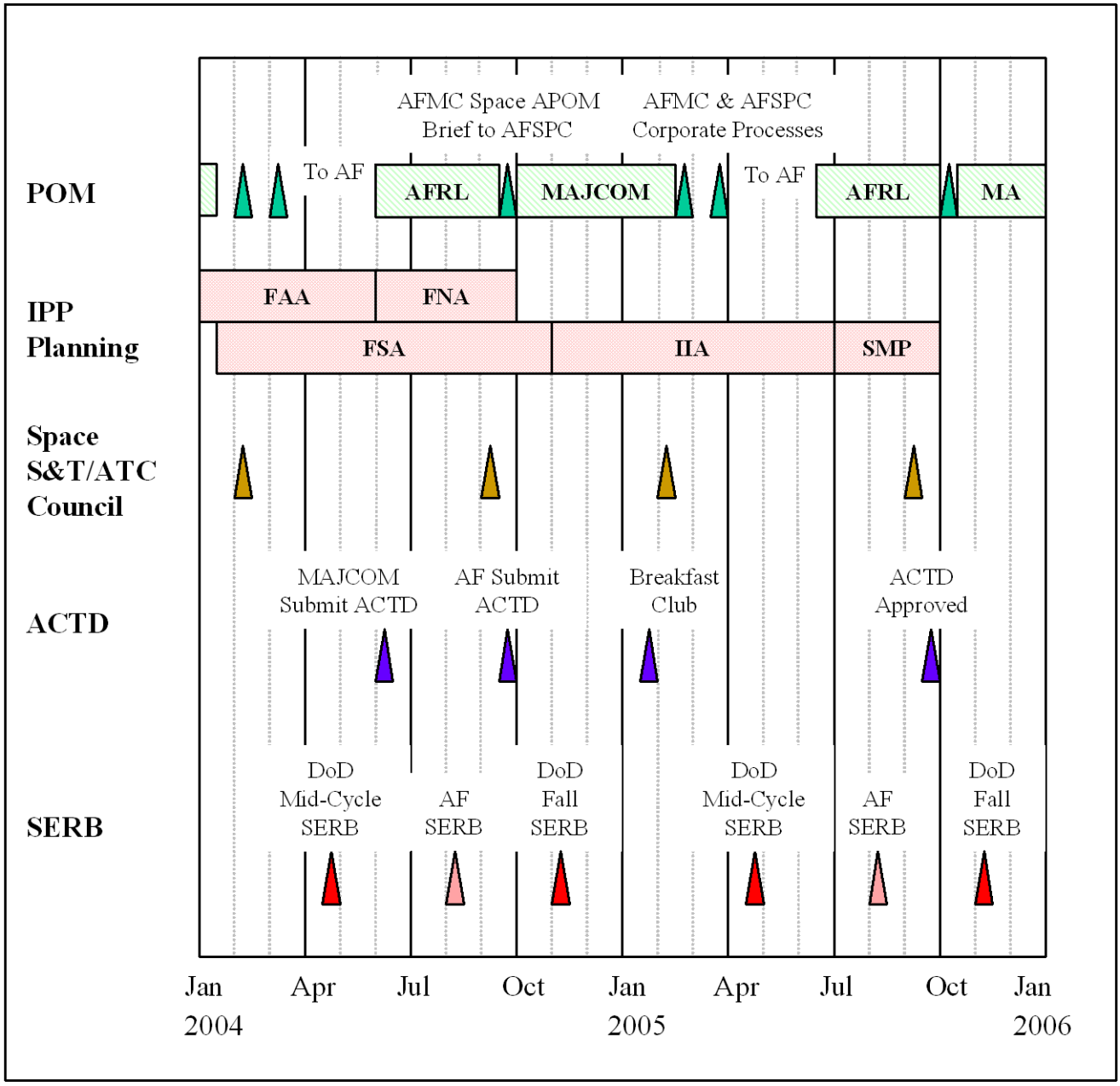
5.8.3.8. Coordinates the SMC component of the Small Business Innovation Research process under DoD direction.

6. Timelines and Schedules:

6.1. Timelines.

6.1.1. **Figure 4.** depicts timelines and activities associated with S&T. POM development is the key schedule driver. MAJCOMs start their POM development in the fall, submitting their inputs to the Air Staff in the March timeframe. AFMC requires subordinate unit input during POM development. As a result, AFRL develops their POM inputs four or five months in advance of AFMC. This is a key point in terms of S&T development.

Figure 4. Nominal S&T and Operationally Responsive Innovation Timelines.



6.1.2. The AFSPC IPP is a two-year planning process that supports an upcoming POM. In **Figure 4.**, the IPP produces the SMP by 1 Oct 05 to support the FY08 POM development. At the same time, AFRL needs the products from the IPP to guide their technology development. They need this guidance in time to build their technology development plans and determine their POM input for the AF S&T program. Therefore, products from the IPP are provided to AFMC and AFRL upon completion. These products include:

6.1.2.1. FAA – Prioritized capabilities, tasks and subtasks.

6.1.2.2. FNA – Prioritized needs.

6.1.2.3. FSA – Potential concept solutions.

6.1.2.4. IIA – The best balance of systems/concepts required to fulfill AFSPC's needed capabilities.

6.1.2.5. AFSPC SMP S&T Appendix– Guidance for S&T space development.

6.1.2.6. A prioritized AFSPC S&T needs list.

6.1.3. AFRL uses AFMC and AFSPC guidance to develop technology plans for Space S&T. AFRL works closely with SMC to ensure technology efforts meet acquisition goals and timelines.

6.1.4. ACTDs have their own timelines as dictated by DUSD(AS&C) and the budget year. These timelines show their relationship to the POM, AFSPC IPP and technology development. ACTDs are geared towards receiving start approval at the beginning of a new fiscal year.

6.1.5. SAF/USA holds a yearly DoD SERB (normally in November) to review requests for spaceflight forwarded by the DoD components or departmental approval authorities. Critical experiments, ATDs and ACTDs requiring spaceflight must meet those timelines.

6.1.6. AF TENCAP and Space Battlelab Initiatives provide needed capabilities to the warfighter rapidly. While both programs may play in the POM process, individual initiatives are shorter term and come from the SWC budget and warfighting customers.

6.1.7. The AFSPC S&T Corporate Structure provides guidance, prioritization and oversight to the Space S&T community. Meetings are currently scheduled in early February and early September of each year. This optimizes guidance to AFRL in the spring and oversight for the POM in the fall. (***NOTE***: The Space ATC schedule is the same as the AFSPC S&T Council schedule in **Figure 4.**).

6.1.8. Finally, most schedules change slightly each year. Therefore, it is imperative to get the current year's schedule to track events properly.

6.2. **Schedules.** The following schedules are available on the AFSPC S&T website and updated yearly:

6.2.1. POM development.

6.2.1.1. AFMC S&T activities.

6.2.1.2. AFRL S&T activities.

6.2.1.3. AFSPC S&T activities.

6.2.2. Critical Experiment/ATD/Developmental Roadmap schedule.

6.2.3. ACTD link on the DUSD(AS&C) website.

6.2.4. AF SERB candidate link.

6.2.5. SWC link to AF TENCAP and Space Battlelab activities.

6.2.6. AFSPC IPP activities.

7. General Procedures:

7.1. **The AFSPC S&T Corporate Process.** This process provides the foundation for the AFSPC S&T and Innovation program. **Figure 2.** provides an overview of external S&T and innovation processes. The following are procedural attributes of the process:

7.1.1. Chair: AFSPC/CV; Voting members: SMC/CC, AFRL/CC, AFMC/CV.

7.1.2. Scheduling: The Group meets every two months, as a minimum. The Board and Council meet a minimum of twice a year, in early February and early September.

7.1.3. Executive agent for the AFSPC S&T Corporate Process: HQ AFSPC/XPXT.

7.1.4. All announcements concerning meetings, agendas, minutes, or products are provided to Group, Board and Council members (**See Attachment 2**). For the website address, contact HQ AFSPC/XPXT.

7.2. **HQ AFSPC/XP.** Manages the AFSPC S&T Corporate Process:

7.2.1. Conducts a semi-annual review of the AFSPC S&T and Innovation portfolio of space-related S&T and Innovation activities through the AFSPC S&T Corporate Process.

7.2.2. Reviews cost, schedule and performance impacts on AFSPC developmental and fielded systems.

7.2.3. Reviews for compliance with the AFSPC SMP.

7.3. **HQ AFSPC/XPXT.** Serves as the AFSPC Corporate Process single point of entry and exit for all S&T activities.

7.3.1. Administers the AFSPC S&T Corporate Process:

7.3.1.1. Advises process package owners on appropriate offices for coordination prior to submission to the AFSPC S&T Corporate Structure.

7.3.1.2. Provides evaluation criteria, based upon governing directives, for Council use and review.

7.3.1.3. Leads action officers from AFSPC, SMC, AFMC, AFRL and SWC in reviewing initial prioritization of programs where multiple proposals have been received from diverse organizations (***EXAMPLE*:** Multiple innovative ideas).

7.3.1.4. Schedules time, place, and resources and designates standardized formats for both regularly scheduled and time sensitive AFSPC S&T Corporate meetings.

7.3.1.5. Prepares implementing documents for signature by the Council Chair upon conclusion of corporate processes. Transmits documents to execution agencies:

7.3.1.5.1. Space ATD priority list to AFRL/CC.

7.3.1.5.2. Space ACTD priority list to HQ AF/XI.

7.3.1.5.3. AF SERB candidate priority list and packages to SAF/USAL for presentation to SERB.

7.3.1.5.4. Prioritized AFSPC S&T needs list to AFRL and AFMC.

7.3.1.6. Coordinates a semi-annual S&T and Innovation portfolio look at all ATDs, ACTDs, Developmental Roadmaps, AF SERB candidates, AF TENCAP initiatives, Space Battlelab initiatives and Operationally Responsive Innovations. This provides an integrated look at program linkages to the AFSPC SMP S&T Appendix, system development roadmaps and functional plans. In addition, a view of each activity's integration into Air Force Concepts, effects and capabilities is presented. Organizations who propose/execute the above activities should

include an analysis of these links as part of their package submission.

7.3.2. Conducts S&T Planning Workshops. These workshops support development and execution of the SMP. They provide:

7.3.2.1. Insight into technologies and projects, enhancing AFSPC oversight and guidance of Space S&T activities.

7.3.2.2. An introduction to new technologies and technical solutions meeting AFSPC needs.

7.3.2.3. Support to AFSPC concept development.

7.3.2.4. Assurance that the Space S&T portfolio meets AFSPC needs and timelines.

7.3.2.5. Identification of S&T and Innovation issues for insertion into the AFSPC corporate process, providing advocacy, resolution and information.

7.3.2.6. Enhanced collaboration between S&T, Innovation, acquisition, and warfighter communities.

7.3.2.7. Linkage among S&T and Innovation activities, tying them to the technology transition strategy and roadmaps, as appropriate.

8. AFSPC ATD Procedures:

8.1. **Guidance.** AFSPC uses ATD guidance in AFMC Instructions for review of space ATDs.

8.2. **Purpose.** ATDs demonstrate an integrated set of technologies enabling:

8.2.1. Development of superior warfighting capabilities.

8.2.2. Readiness to transition before the end of the Future Years Defense Program (FYDP).

8.3. **AFSPC OPR.** HQ AFSPC/XPX.

8.4. **Execution OPR.** AFRL/XPS.

8.5. **Process Owner.** Space Applied Technology Council and AFRL/XPS.

8.6. **Process Introduction.** HQ AFSPC/XPXT serves as the entry and exit point for AFSPC supported ATDs. The AFSPC S&T Corporate Structure produces a prioritized list of AFSPC supported ATDs for submission to AFRL. (**See Paragraph 4.2.3.5.**). The AFSPC Corporate Process includes a semi-annual review of candidate ATDs for execution and transition planning.

8.7. **ATD Categories.** See AFMCI 61-102 for ATD category definitions.

8.8. **ATD Development and Review Process.**

8.8.1. Proposed ATD candidate owners contact AFRL/XPS to review their ATD packages (prepared IAW AFMCI 61-102) and ensure they are included in the AFSPC S&T Corporate Structure review prior to submission to the AFMC ATC process. For SMC sponsored ATDs, SMC/TD is the lead for compiling and forwarding the ATD candidates to AFRL/XPS for AFSPC S&T Corporate Structure review and approval.

8.8.2. AFSPC Review Guidance. HQ AFSPC/XPXT coordinates review of candidate ATDs among AFSPC PEMs and staff, to include inputs from the applicable SMC SPOs, and prepares a list of ATDs based upon the following criteria:

8.8.2.1. The ATD addresses a need generated in response to a MAJCOM deficiency or other documented requirement.

8.8.2.2. A draft transition plan (as a minimum, a tri-panel chart) is available for review during the corporate process. A finalized transition plan is available for review prior to the second ATC after commissioning.

8.8.2.3. The ATD has received engineering validation, ensuring maximized payoffs from AFRL technology developments and incorporating a systems engineering approach with supporting methodology.

8.8.2.4. Value to development of a new system or increased capability to a fielded system should be couched in the language of "combat effects" as much as possible.

8.8.2.5. Cost tradeoffs among ATDs.

8.8.2.6. ATD meets system developmental timelines and operational needs.

8.8.2.7. Expected performance increase or confidence from successful completion of the ATD.

8.9. **Decision Memorandum.** HQ AFSPC/XPXT prepares a decision memorandum for the AFSPC S&T Council Chair. This document is used for Space S&T advocacy during the AFMC POM process.

9. AFSPC ACTD Procedures:

9.1. **Guidance.** The primary reference for the ACTD process is the DUSD(AS&C) website at http://www.acq.osd.mil/actd/. This website provides the most current authority and direction for preparation of ACTD candidate packages. Prospective ACTD developers should visit this website as a beginning step.

9.2. **Purpose.** ACTDs permit the early and relatively inexpensive evaluation of mature advanced technology to meet the needs of the warfighter. They allow performance of a military utility evaluation and assessment before the commitment to proceed with formal acquisition.

9.3. **AFSPC OPR.** HQ AFSPC/XPXT.

9.4. **Execution OPR.** HQ AFSPC/DR/XO, SMC or SWC.

9.5. **Process Owner.** DUSD(AS&C).

9.6. **Process Introduction.** HQ AFSPC/XPXT serves as the entry and exit point for all AFSPC supported ACTDs, to include those sponsored or supported by subordinate units. The AFSPC S&T Corporate Structure produces a prioritized list of AFSPC supported ACTDs for submission to HQ AF/XI (**see Paragraph 4.2.3.6.**). HQ AF/XI then prioritizes all AF sponsored ACTDs for submission to DUSD(AS&C).

9.7. **AFSPC Executive Agent.** HQ AFSPC/XPXT is the executive agent for ACTDs. It performs the following activities:

9.7.1. Solicits proposals for ACTDs through the AFSPC S&T website throughout the year.

9.7.2. Acts as the focal point and facilitator for moving ACTDs through the AFSPC S&T Corporate Process. Successful ACTD packages require specific actions prior to submission. HQ AFSPC/XPXT provides:

9.7.2.1. Advice on preparation and review of the DUSD(AS&C) package and the AFSPC attachments.

9.7.2.2. Review to ensure ACTDs have full funding for the execution years, and POM inputs, or solid intent to include POM inputs, for ACTD transition. Written confirmation of support from a senior member of the sponsoring warfighter organization is especially important.

9.7.2.3. Advises HQ AFSPC 2-letters of the ACTD and assists in determination of PEM assignment if required to the ACTD. The affected PEMs will:

9.7.2.3.1. Ensure programmatics and funding are aligned and executable.

9.7.2.3.2. Advocate for the ACTD during all funding and budgeting exercises.

9.7.2.3.3. Coordinate all actions with AFMC/XR and the appropriate AFRL and SMC PEMs.

9.7.3. Ensures a technical manager, operational manager and transition manager are identified in the package along with a user sponsor.

9.7.4. Includes additional ACTD sponsor-provided information during ACTD preparation, to aid the AFSPC S&T Corporate Process and increase the quality and probability of success for Space ACTDs. Provides the format for submission of the following material as attachments to the ACTD:

9.7.4.1. ACTD contribution to a current or developmental AFSPC system or capability. This attachment should address when and how the ACTD product would transition to the AFSPC system or capability as well as how the ACTD meets the timeline requirements in the Developmental Roadmap or SMP.

9.7.4.2. Draft Operational View 1 and 2 (OV-1 and OV-2) architectures showing integration of the ACTD into current or planned AFSPC, AF or Joint architectures.

9.7.5. Assists in identification of coordinating organizations for the ACTD package prior to submission to the AFSPC Group. As a minimum, coordination by the following entities is required: HQ AFSPC/XPX/XPP/LCA/LCX/DR-SEIO/XOO/FM, SMC/TDE, AFMC/XR, AFRL/XPS, and SWC/XI. Additional coordination will be ACTD specific.

9.7.6. Provides ACTD packages to the S&T Group prior to the beginning of the FY in the September timeframe. Group actions include:

9.7.6.1. Review of the initial ACTD package to ensure it meets all ACTD criteria.

9.7.6.2. Review of AFSPC specific information as described above.

9.7.7. Schedules the AFSPC S&T Board, for review, and the Council, for approval of the ACTD prior to submission to HQ AF/XI in time for the “Breakfast Club” meeting (January timeframe).

9.7.8. Coordinates any changes with AF/XI and other affected organizations.

9.8. **ACTD Operational Manager.** HQ AFSPC/XO/DR, SMC, or SWC are normally the operational managers for ACTDs.

9.9. **ACTD Analysis Agent.** HQ AFSPC/XPY participates in the ACTD analytical team as identified in the ACTD Management Plan leveraging previous AoA and requirements analysis.

10. AF SERB Procedures:

10.1. **Guidance.** STP is described in AFI 10-1202.

10.2. **Purpose.** The AF SERB functions as a review process for submission of candidates to the DOD SERB and entry into the STP. The STP is an activity under Air Force executive management, providing spacelift for research and development. AFSPC is responsible for funding the program.

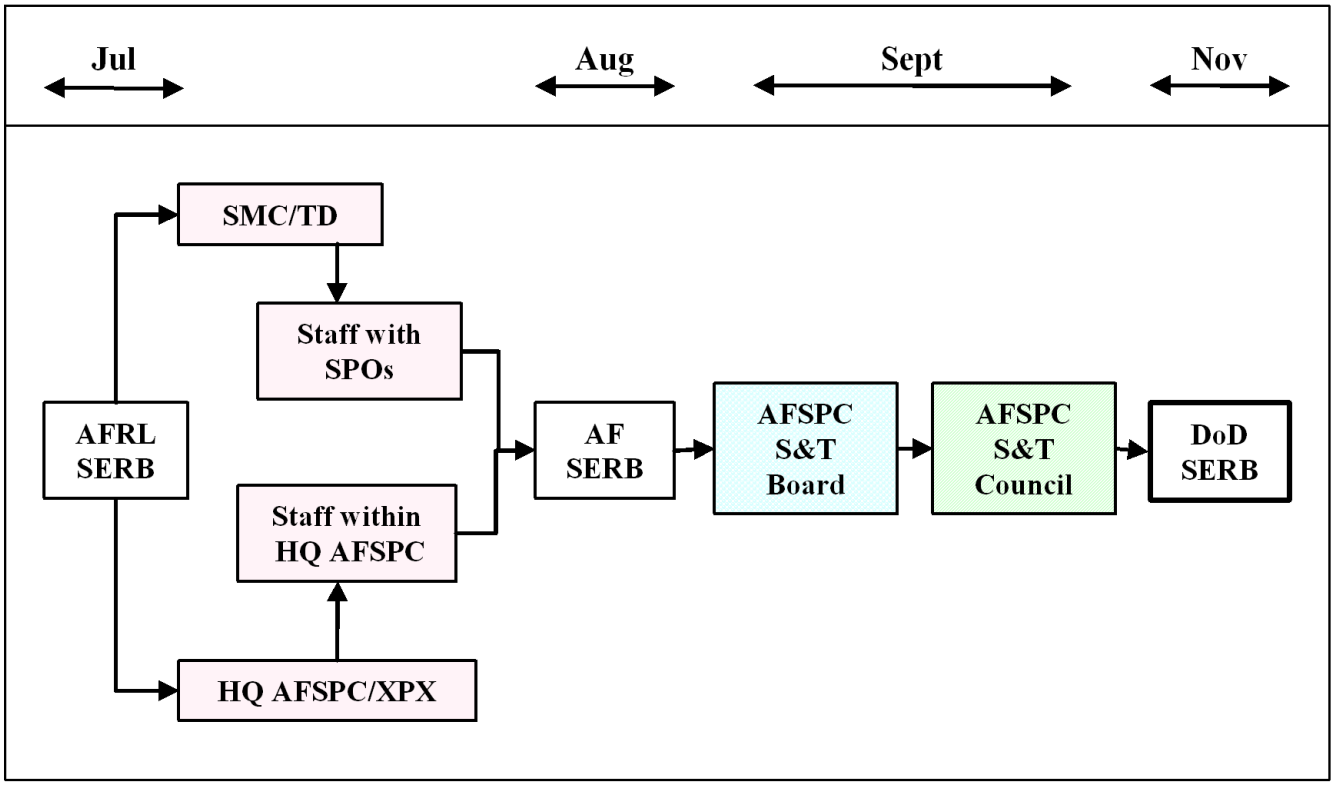
10.3. **AFSPC OPR.** HQ AFSPC/XPXT.

10.4. **Execution OPR.** SMC Detachment 12.

10.5. **Process Owner.** SMC/TD is the process owner and chair of the AF SERB. AF SERB voting members are representatives from SMC/TD, AFSPC/XPX, AFSPC/DRX, and AFRL/VSE.

10.6. **Process Introduction.** HQ AFSPC/XPXT is the entry/exit point for AFSPC supported SERB candidates. AFSPC uses the S&T Corporate Process to approve the AF SERB candidate list developed by the AF SERB for submission to the DOD SERB. **Figure 5.** illustrates the AF SERB process.

Figure 5. AF SERB Process.



10.7. **SMC/TDE.** This AFSPC organization collects, formats and staffs SERB candidates prior to convening the AF SERB. AFSPC/XPXT assists in staffing these candidates through HQ AFSPC, which results in an initial priority list of SERB candidates. SMC/TDE provides the list to the AF SERB for prioritization. Results of the AF SERB, with ranking criteria, are submitted to the AFSPC S&T Corporate Board and Council for approval. SMC/TDE then submits the AFSPC S&T Council approved AF SERB candidate list, in accordance with AFI 10-1202, to SAF/USAL for entry into the DoD SERB.

10.8. **HQ AFSPC/XPXT.** HQ AFSPC/XPXT serves as the focal point for staffing the AF SERB candidates through the AFSPC S&T Corporate Process for approval and submission to the SERB. A key driver of AFSPC involvement in the program will be the AFRL, SMC and SWC prioritized requests for spacelift supporting system development, to include AFRL critical experiments and ATDs. Criteria for evaluation of AF SERB candidate requests will include AFI 10-1202 criteria and AFSPC specific criteria. Meeting these criteria enhances effectiveness of the AFSPC prioritization process. Included in that criteria are the following:

10.8.1. Value to new system development or increased capability to a fielded system. Couch this value in terms of "combat effects," providing traceability from AF Concepts to effects and capabilities with linkage to AFSPC programs.

10.8.2. Description of expected launch date versus system development timeline or operational need.

10.9. **AF SERB Semi-Annual Review.** HQ AFSPC/XPXT will ensure an AFSPC S&T Group mid-term review to support the SERB mid-term review. The Group will review the spaceflight manifest provided by SMC Detachment 12 against the priority list approved by the DoD SERB to ensure AFSPC priorities are being addressed.

11. AF TENCAP Procedures:

11.1. **Guidance.** This AFSPCI provides guidance for briefing TENCAP initiatives to the AFSPC S&T Corporate Structure.

11.2. **Purpose.** TENCAP develops innovative solutions to a diverse set of warfighting requirements from AFSPC, MAJCOMs, and joint warfighters. It provides rapid prototyping and transition of emerging space and space-related technologies and concepts. It fills a unique and critical role in supporting the Combat Air Forces (CAF), providing integrated air and space combat effects, bringing "space to the warfighter." The goal of AFSPC S&T and Innovation support to TENCAP is ensuring TENCAP efforts are integrated into developmental and fielded systems where appropriate as well as input into the AFSPC IPP for future systems and concepts. Conversely, consolidated S&T community technology inputs to TENCAP programs can improve SWC efficiencies.

11.3. **AFSPC OPR.** HQ AFSPC/DRC.

11.4. **Execution OPR.** SWC/TC.

11.5. **Process Owner.** SWC/CC.

11.6. **Process Introduction:**

11.6.1. SWC/CC provides a briefing of AFSPC focused TENCAP initiatives to the AFSPC S&T Corporate Structure. TENCAP includes links to other warfighter needs, highlighting the cross command and mission value of space combat effects.

11.6.2. Post execution, SWC/TC presents initiative results to the AFSPC S&T Corporate Structure for further action, including transition assistance as needed.

11.7. **TENCAP Initiative Review Process.** SWC/CC submits information briefings about TENCAP initiatives to the AFSPC S&T Corporate Structure twice a year, in early February and early September. TENCAP provides information to ensure the MAJCOM is aware of TENCAP efforts and can:

11.7.1. Assist TENCAP in garnering assistance from the AFSPC S&T Corporate Structure when needed.

11.7.2. Ensure a cross-flow of ideas and insight among organizations (SMC, AFRL, SWC) into various types of technology and innovation under development.

11.7.3. Address when and how the TENCAP initiative would transition to an AFSPC capability or system, and identify any timeline requirements in the Developmental Roadmap or SMP.

11.7.4. Receive a summary of completed TENCAP initiatives. The outbrief should include the value to the warfighter and results of the initiative.

11.8. **AFSPC Transition Support.** HQ AFSPC/XPXT facilitates transition planning and advises HQ AFSPC 2-letters of TENCAP initiatives and assists in determination of PEM assignment if required for AFSPC focused initiatives (this may be in addition to the TENCAP PEM). PEMs plan for transition and advocate AFSPC focused initiatives. Transition planning support from HQ AFSPC/XPXT ensures seamless integration of successful initiatives into AFSPC programs, where appropriate.

12. AFSPC Space Battlelab (SB) Procedures:

12.1. **Guidance.** AFI 10-2303, ***Battlelabs*** provides guidance on Battlelab procedures.

12.2. **Purpose.** "Rapidly identify and prove the worth of innovative ideas that improve the ability of the Air Force to execute the core capabilities and joint warfighting."

12.3. **AFSPC OPR.** Varies by project.

12.4. **Execution OPR.** SWC/SB.

12.5. **Process Owner.** HQ AF/XI and SB/CC.

12.6. **Process Introduction.** SB/CC provides information briefings on Battlelab initiatives to the AFSPC Corporate Structure twice per year, in early February and early September.

12.7. **SB Initiatives Process:**

12.7.1. The SB staff begins the process with a Warfighter Outreach Program, soliciting warfighting needs from HQ AFSPC, NAFs, MAJCOMs, and COCOMs. This outreach effort goes beyond the AFSPC SMP to reach space related needs of a diverse group of warfighters resulting in creation of a Battlelab initiatives "top 10" priority list.

12.7.2. SB staff researches formal warfighting requirements and the current level of technology, ensuring cross talk with SMC and AFRL. Using the SB value model, potential candidates are prioritized.

12.7.3. Upon SWC/CC review, the initiative list is briefed to the AFSPC S&T Corporate Structure to:

12.7.3.1. Ensure a cross-flow of ideas and insight among organizations (SMC, AFRL, SWC) into various types of technology and innovation under development.

12.7.3.2. Develop transition planning. This planning may/may not provide for a formal transition plan but can identify contributions to AFSPC and Combat Air Forces programs. HQ AFSPC/XPXT assists in making recommendations to HQ AFSPC 2-letters for assignment of PEM where appropriate for transition planning and advocacy.

12.7.3.3. Outbrief summary of the After Initiative Report on completed initiatives at the next AFSPC S&T Corporate meeting. The Outbrief should include the value to the warfighter and the results of the initiative.

12.8. **AFSPC Transition Support.** HQ AFSPC/XPXT supports the SB/CC by assisting the SB in integrating their efforts into developmental and fielded systems, and inserting appropriate items into planning for the future in the SMP.

13. Operationally Responsive Innovation Procedures:

13.1. **Purpose.** Provide for rapid incorporation and execution of operationally responsive innovative solutions through the AFSPC S&T Corporate Process.

13.2. **AFSPC OPR.** Determined during preparation of package for Group review. In most cases, the OPR will be an office in HQ AFSPC/DR responsible for a development program that the innovative solution supports and advances.

13.3. **Execution OPR.** Determined during preparation of package for Group review. (***EXAMPLE***: HQ AFSPC/DR may pursue technologies encompassing operationally responsive lift vehicles and payloads, SWC/XI may develop an innovative intelligence solution for presentation to a theater warfighter).

13.4. **Process Owner.** Determined during package preparation. This will usually be the organization presenting the innovation.

13.5. **Process Introduction.** HQ AFSPC/XPXT will guide the innovation through the AFSPC S&T and Innovation process. It will follow the model for other technology and innovation submissions providing a common, recognizable format for review and comment, highlighting Operationally Responsive Innovations to the AFSPC staff. HQ AFSPC/XPXT:

13.5.1. Ensures cross-flow of ideas and provides insight among organizations (SMC, AFRL, SWC) into technology and innovations under development.

13.5.2. Assists in transition plan development and makes recommendations to AFSPC 2- letters for assignment of PEMs for transition planning and advocacy.

13.6. **Execution.** This is determined on a case-by-case basis during the AFSPC S&T Corporate Process.

13.7. **Conclusion and Transition.** Upon innovation conclusion, the results, transition plan and recommendations are briefed to the AFSPC S&T Corporate Structure and provide the value and results of the initiative as well as transition recommendations.

14. Entry Point for New S&T Ideas. Within HQ AFSPC, the HQ AFSPC/XPX Functional Area Team Lead (formerly Mission Area Team Lead) will be the single entry point for new S&T ideas. New ideas are programs, concepts, etc. that have not yet been entered into the IPP or received advocacy from AFSPC. HQ AFSPC/XPX will determine if the new S&T idea meets a defined AFSPC need and forward the new idea to the appropriate organization(s).

15. Changes To This Document:

15.1. **Recommendations.** Forward recommended changes to HQ AFSPC/XPXT**.**

15.2. **Approval.** Changes to this document will be approved by AFSPC/CV**.**

ROOSEVELT MERCER, JR., Brig Gen, USAF
Director of Plans and Programs

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

DODD 5101.2, ***DoD Executive Agent for Space***

DEPSECDEF Memorandum, ***Space Test Program Management and Funding Policy***

CJCSM 3170.01A***, Operation of the Joint Capabilities Integration and Development System***

CJCSI 3170.01D, ***Joint Capabilities Integration and Development System***

NSS Acquisition Policy 03-01, ***Guidance for DoD Space System Acquisition Process***

AF PAD 01-04, ***Implementation of Secretary of Defense Direction Regarding Recommendations Made By Commission To Assess United States National Security Space Management and Organization***

AFPD10-12, ***Space***

AFPD10-23, ***Operational Innovation Program***

AFSPCI 10-102, ***Air Force Space Command Concept Development***

AFI 10-601, ***Interim Guidance, Capabilities Based Operational Requirements***

AFI 10-1202, ***Space Test Program (STP) Management***

AFI 10-2303, ***Battlelabs***

AFPD 16-5, ***Planning, Programming, And Budgeting System***

AFPD 61-1, ***Management of Science and Technology***

AFMCI 61-102, ***Advanced Technology Demonstration Technology Transition Planning***

AFI 61-105, ***Planning for Science and Technology***

AFSPC HOI 65-603, ***Command Financial Management Procedures***

Memorandum of Agreement between AFSPC and AFMC For Supported-Supporting Relationships

Interim Defense Acquisition Guidebook

Technology Readiness Assessment (TRA) Deskbook

Web Sites

DOD/ACTD - **http://www.acq.osd.mil/actd/index.htm**

DOD/STP - **http://www.safus.hq.af.mil/usa/usal/serb/index.htm**

AFSPC Science and Technology - **https://afkm.wpafb.af.mil/ASPs/CoP/EntryCoP.asp?Filter=OO-ST-AF-SP**

Abbreviations and Acronyms

AAC—Air Armament Center

ACTD—Advanced Concept Technology Demonstration

AF—Air Force

AFI—Air Force Instruction

AFMC—Air Force Materiel Command

AFOTEC—Air Force Operational Test and Evaluation Center

AFPD—Air Force Policy Directive

AFRL—Air Force Research Laboratory

AFROCC—Air Force Requirements for Operational Capabilities Council

AFSPC—Air Force Space Command

AOA—Analysis of Alternatives

AMS—Acquisition Management System

ASC—Aeronautical Systems Center

ATC—Applied Technology Council

ATD—Applied Technology Demonstration

CAF—Combat Air Forces

CDD—Capability Development Document

CPD—Capability Production Document

CRRA—Capabilities Review and Risk Assessment

DARPA—Defense Advanced Research Projects Agency

DOD—Department of Defense

DUSD(AS&C)—Deputy Undersecretary of Defense, Advanced Systems and Concepts

ESC—Electronic Systems Center

FAA—Functional Area Analysis

FNA—Functional Needs Analysis

FSA—Functional Solutions Analysis

FYDP—Future Years Defense Plan

HQ—Headquarters

IAW—In Accordance With

ICD—Initial Capabilities Document

IIA—Integrated Investment Analysis

IPL—Integrated Priority List

IPP—Integrated Planning Process

JCIDS—Joint Capabilities Integration and Development System

JROC—Joint Requirements Oversight Council

MAJCOM—Major Command

MCL—Master Capabilities Library

MOA—Memorandum of Agreement

NASA—National Aeronautics and Space Administration

NGA—National Geospatial-Intelligence Agency

NOAA—National Oceanic and Atmospheric Administration

NRO—National Reconnaissance Office

NSSA—National Security Space Architect

NSSO—National Security Space Office

PEM—Program Element Monitor

PEO—Program Executive Officer

POM—Program Objective Memorandum

PPBE—Planning, Programming, Budgeting and Execution

PPBS—Planning, Programming and Budgeting System

S&T—Science and Technology

SAP—Special Access Program

SB—Space Battlelab

SERB—Space Experiment Review Board

SCI—Special Compartmented Information

SMC—Space and Missile Systems Center

SMP—Strategic Master Plan

SPO—System Program Office

STP—Space Test Program

SWC—Space Warfare Center

TENCAP—Tactical Exploitation of National Capabilities

TEO—Technology Executive Officer

TRL—Technology Readiness Level

USECAF—Under Secretary of the Air Force

Terms

Advanced Concept Technology Demonstration (ACTD)—exploits mature and maturing technologies to solve important military problems. Provides the warfighter an opportunity: to develop and refine his concept of operations to fully exploit the capability under evaluation, to evolve his operational

requirements as he gains experience and understanding of the capability, and to operate militarily useful quantities of prototype systems in realistic military demonstrations, and on that basis, make an assessment of the military utility of the proposed capability. (DoD ACTD Web Site)

Advanced Technology Demonstration (ATD)—is an Air Force S&T technology program with the objective of demonstrating an integrated set of technologies that will enable (a) superior warfighting capabilities and (b) be ready to transition before the end of the FYDP. (AFMCI 61-102)

Advanced Technology Development (6.3)—is conducted on technologies that have matured past applied research to demonstrate performance improvements, increased sustainment abilities, or cost reduction potential of militarily relevant technologies. (AFPD 61-1)

Air Force Concepts—describe the ways (sequenced actions) in which we employ military means (capabilities) to accomplish desired ends (effects). Air Force concepts consist of four basic types: Institutional, Operating Functional and Enabling. (AFPD 10-28)

Air Force S&T Program—contains all basic and applied research efforts, and advanced technology development efforts that are executed by AFRL. (AFPD 61-1)

AFSPC Corporate Process—is a formal process for coordinating and developing an AFSPC position. Consists of meetings of a 3-letter body known as a Group, a 2-letter body known as a Board, and the culminating body consisting of the board chaired by the AFSPC/CV, known as a Council.

AF Space S&T Program—Space aspects of the AF S&T (AFPD 61-1). This AFSPCI addresses ballistic missiles as part of the Space S&T Program.

Applied Research (6.2)—translates promising basic research into solutions for broadly defined military needs, short of major development projects. (AFPD 61-1)

Basic Research (6.1)—is the scientific study and experimentation directed toward increasing knowledge and understanding in the fields of physical, engineering, environmental, and life sciences. (AFPD 61-1)

Battlelab Initiative—is a funded result of the screening process that explores and assesses the potential worth of an innovative concept. Initiative execution involves courses of action ranging from modeling and simulation to actual employment of forces in actual or exercise environments. (AFI 10-2301)

Board—See AFSPC Corporate Process.

Collaborative Planning—is a joint planning effort between AFSPC and external agencies.

Council—See AFSPC Corporate Process.

Critical Experiment—is an advanced development 6.3 program that may become an ATD in the future. It attempts to advance a concept or technology beyond the exploratory development phase into component testing in a laboratory environment. (AFI 61-105)

Critical Technology—is the technology required during a system development to meet capability thresholds, with acceptable development cost and schedule and with acceptable production and operation costs and if the technology or its application is either new or novel. (DoD Technology Readiness Assessment Deskbook)

Developmental Roadmap—is a visual representation of the acquisition baseline, enabling technologies, and technical transition linkage for an approved acquisition program or high priority concept.

Enabling Concepts—developed by AFSPC/XO, the enabling concepts represent the employment

method of a given weapon system or family of weapon systems. (See AFSPCI 10-102 for more detail)

Far-Term—is the planning period that follows the first 12 years of the SMP extending to 25 years. (Actual dates are defined in the AFSPC SMP)

Functional Area Analysis—is the first phase of the IPP. This phase analyzes doctrine and higher headquarters guidance to determine mission capabilities that AFSPC must provide. It is fiscally unconstrained.

Functional Needs Analysis—is the second phase of the IPP. This phase analyzes AFSPC's ability to meet the capabilities defined by FAA. Capability shortfalls are referred to as needs. It is fiscally unconstrained.

Functional Solution Analysis—is the third phase of the IPP. Probable materiel and non-materiel solutions are analyzed for their ability to meet the needs identified in FNA. It is fiscally unconstrained.

Group—See AFSPC Corporate Process.

Innovation—The introduction of something new or a new idea, method, or device (Webster's). The process of identifying/inventing and incorporating changes to improve effectiveness and efficiency. (AFPD 10-23)

Integrated Investment Analysis—is the fourth and final phase of the IPP. This phase analyzes the fiscal constraints against the output of FSA to optimize cost vs. required capabilities. It produces a list of concepts that will satisfy the capabilities requirements set forth in MAA. It provides fiscally constrained modeling.

Integrated Planning Process—is the AFSPC corporate process for modernization planning.

Materiel Solution—is a defense acquisition program that satisfies, or is a primary basis for satisfying identified warfighter capabilities. This is opposed to a non-materiel solution. (CJCSI 3170.01D)

Mid-Term—is the planning period consisting of the second six years of the SMP (actual dates defined in the SMP).

Militarily Useful Capability—is a capability that achieves military objectives through operational effectiveness, suitability and availability, which is interoperable with related systems and processes, transportable and sustainable when and where needed, and at costs known to be affordable over the long term. (CJCSI 3170.01D)

Military Utility Assessment—is an assessment of the militarily useful capability of a system.

Near-Term—is the planning period consisting of the first six years of the SMP (actual dates defined in SMP).

Non-Materiel Solution—is a change in doctrine, organization, training, leadership and education, personnel or facilities to satisfy identified functional capabilities. (CJCSI 3170.01D)

Planning, Programming, Budgeting and Execution (PPBE)—is based upon PPBS, but adds an emphasis on program execution and feedback information.

Planning, Programming, and Budgeting System (PPBS)—is a cyclical process containing three distinct but interrelated phases: Planning, which produces a fiscal forecast, planning guidance, and program guidance; Programming, which creates the Air Force portion of the DoD's Future Years Defense Program (FYDP) by defining and examining alternative forces and weapons and support systems; and

Budgeting, which formulates, executes, and controls resource requirements, allocation and use. (AFPD 16-5)

Space Test Program—is a DoD activity under Air Force executive management that provides spaceflight for DoD research and development experiments. (AFI 10-1202)

Attachment 2

AFSPC GROUP/BOARD/COUNCIL COMPOSITION

AFSPC S&T COUNCIL COMPOSITION

AFSPC/CV – CHAIR

AFSPC/XP	SMC/CC	AFMC/CV
AFSPC/DR	SWC/CC	AFRL/CC
AFSPC/XO	ESC/CC	SAF/AQR
AFSPC/IN	AAC/CC	SAF/USA
AFSPC/FM	ASC/CC	AF/XII
AFSPC/LC		NSSO
AFSPC/SE		

AFSPC S&T BOARD COMPOSITION

AFSPC/XP – CHAIR

AFSPC/DR	SMC/CV	AFMC/XP
AFSPC/XO	SWC/CC	AFMC/DR
AFSPC/IN	ESC/CXP	AFRL/CV
AFSPCE/FM	AAC/EN	SAF/AQR
AFSPC/LC	ASC/AAP	SAF/USA
AFSPC/SE		AF/XII
		NSSO

AFSPC S&T GROUP COMPOSITION

AFSPC/XPX – CHAIR

AFSPC/XPP	SMC/TD	AFMC/XPP
AFSPC/XPY	SMC DET 12	AFMC/DRX
AFSPC/DR-SEIO	SWC/XI	AFRL/XPS
AFSPC/DR_	SWC/SB	AFRL/__
AFSPC/XO_	SWC/TC	SAF/AQRT
AFSPC/INX	ESC/CXP	SAF/USAC
AFSPC/FMA	ESC/ND	SAF/USAL

AFSPC/LCA	AAC/EN	AF/XIIV
AFSPC/LCX	ASC/AAP	
AFSPC/SEC		
AFSPC/SEW		

NOTE: A "_" means any office in that division or any of the AFRL technology directorates.

Attachment 3

TECHNOLOGY READINESS LEVELS

Table A3.1. Technology Readiness Levels.

Technology Readiness Level	Description
1. Basic principles observed and reported.	Lowest level of technology readiness. Scientific research begins to be translated into applied research and development. Examples might include paper studies of a technology's basic properties.
2. Technology concept and/or application formulated.	Invention begins. Once basic principles are observed, practical applications can be invented. Applications are speculative and there may be no proof or detailed analysis to support the assumptions. Examples are limited to analytic studies.
3. Analytical and experimental critical function and/or characteristic proof of concept.	Active research and development is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative.
4. Component and/or breadboard validation in laboratory environment.	Basic technological components are integrated to establish that they will work together. This is relatively "low fidelity" compared to the eventual system. Examples include integration of "ad hoc" hardware in the laboratory.
5. Component and/or breadboard validation in relevant environment.	Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements so it can be tested in a simulated environment. Examples include "high fidelity" laboratory integration of components.
6. System/subsystem model or prototype demonstration in a relevant environment.	Representative model or prototype system, which is well beyond that of TRL 5, is tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness. Examples include testing a prototype in a high-fidelity laboratory environment or in simulated operational environment.

Technology Readiness Level	Description
7. System prototype demonstration in an operational environment.	Prototype near, or at, planned operational system. Represents a major step up from TRL 6, requiring demonstration of an actual system prototype in an operational environment such as an aircraft, vehicle, or space. Examples include testing the prototype in a test bed aircraft.
8. Actual system completed and qualified through test and demonstration.	Technology has been proven to work in its final form and under expected conditions. In almost all cases, this TRL represents the end of true system development. Examples include developmental test and evaluation of the system in its intended weapon system to determine if it meets design specifications.
9. Actual system proven through successful mission operations.	Actual application of the technology in its final form and under mission conditions, such as those encountered in operational test and evaluation. Examples include using the system under operational mission conditions.

Technology Readiness Level	Description

NOTES:

1. BREADBOARD: Integrated components that provide a representation of a system/subsystem and which can be used to determine concept feasibility and to develop technical data. Typically configured for laboratory use to demonstrate the technical principles of immediate interest. May resemble final system/subsystem in function only.

2. “HIGH FIDELITY”: Addresses form, fit and function. High-fidelity laboratory environment would involve testing with equipment that can simulate and validate all system specifications within a laboratory setting.

3. “LOW FIDELITY”: A representative of the component or system that has limited ability to provide anything but first order information about the end product. Low-fidelity assessments are used to provide trend analysis.

4. MODEL: A functional form of a system, generally reduced in scale, near or at operational specification. Models will be sufficiently hardened to allow demonstration of the technical and operational capabilities required of the final system.

5. OPERATIONAL ENVIRONMENT: Environment that addresses all of the operational requirements and specifications required of the final system to include platform/packaging.

6. PROTOTYPE: A physical or virtual model used to evaluate the technical or manufacturing feasibility or military utility of a particular technology or process, concept, end item or system.

7. RELEVANT ENVIRONMENT: Testing environment that simulates the key aspects of the operational environment.

8. SIMULATED OPERATIONAL ENVIRONMENTAL: Either 1) a real environment that can simulate all of the operational requirements and specifications required of the final system, or 2) a simulated environment that allows for testing of a virtual prototype; used in either case to determine whether a developmental system meets the operational requirements and specifications of the final system.