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AIR FORCE MATERIEL COMMAND

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Maintenance

TEMPORARY 2 (T-2) MODIFICATION OF AEROSPACE VEHICLES

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This instruction establishes Air Force Materiel Command (AFMC) policy, implements the intent of AFI 21-101, *Aerospace Equipment Maintenance Management*, AFPD 62-6, *USAF Aircraft Airworthiness Certification* and AFPD 63-1, *Acquisition System*. The weapons System Program Manager (SPM) is the modification approval authority for all aerospace vehicles under their control. This instruction specifically prescribes procedures for managing, controlling, documenting, and processing Temporary 2 (T-2) modifications of aerospace vehicles. This instruction does not apply to the Air National Guard or US Air Force Reserve units and members. This AFMCI may be supplemented at any level. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*; route AF Forms 847 from the field through the appropriate functional chain of command. The authorities to waive wing/unit level requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. See AFI 33-360, *Publications and Forms Management*, Table 1.1 for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the Publication OPR for non-tiered compliance items. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with (IAW) Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of IAW the Air Force Records Information Management System (AFRIMS) Records Disposition Schedule

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SUMMARY OF CHANGES

This interim change revises AFMCI 21-126 by adding the implementing/supplementing publications statement and the waiver authority statement. A margin bar (|) indicates newly revised material.

1. Temporary 2 (T-2) Modifications Defined.

1.1. T-2 modifications are configuration changes that support research and development; design changes to existing T-2 modifications; and Developmental Test and Evaluation programs or in-service testing of systems or equipment. The T-2 modifications are temporary hardware or software changes or alterations to aerospace vehicles (aircraft, guided weapons, drones, Remotely Piloted Vehicles (RPV), Unmanned Aerial Vehicle (UAV), and their associated ground stations, and missiles other than strategic), airborne support equipment, external and internal stores, subsystems, components, or support equipment which is governed by Technical Orders (T.O.) that interface with an aerospace vehicle. T-2 modifications include instrumentation modifications, but can also be temporary changes to prove, develop, or characterize future permanent modifications.

1.2. T-2 modifications may be installed only for the duration of the flight test program unless stated in the demodification plan or an extension is approved by the Modification Engineering Authority (MEA) (reference **paragraph 12.2**).

1.3. Carrying of uncertified aircraft/stores combinations for other than certifying the store is considered a T-2 modification. AFI 63-104, *The Seek Eagle Program*, governs formal certification of external and internal stores through the US Air Force aircraft/stores certification program, and issuance of flight clearances for Initial Operational Test and Evaluation (IOT&E) purposes.

1.4. Hardware & Software Change Actions. Form, fit, and function exchanges of hardware or software offering negligible risk do not need to adhere to the strict requirements identified in this instruction. However, they do require approval of the T-2 Mod MEA, and will be accomplished In Accordance With (IAW) local procedures approved by the T-2 Mod Configuration Control Board (CCB) authority. Configuration control will be maintained at all times.

1.5. Aircraft Modifications for Ground Testing Only. The rigorous requirements identified in this instruction are not intended to be applied to modifications intended for ground testing only, and which are completely removed prior to flight. However, such modifications do require approval of the T-2 Mod MEA, and will be accomplished IAW local procedures approved by the T-2 Mod CCB authority. Verification must be made by either analysis or testing, indicating that after removal, no flight critical systems have been affected. No modifications shall be made under this provision for which T.O. repair provisions are insufficient to restore the test article to its pre-modified configuration. Configuration control will be maintained at all times.

2. Functional Manager for T-2 Modifications. HQ AFMC/LGMM is the functional manager for the T-2 modification instruction. The Instrumentation Division, 412 TW, Air Force Flight Test Center (AFFTC), Edwards AFB, California, is the Center of Expertise for T-2 modification procedures. HQ AFMC/LGMM performs staff surveillance over the AFMC T-2 modification process and staff assistance visits.

3. Acronyms and Terms Explained. Acronyms and terms are explained in **Attachment 1**.

4. Uncertified External and Internal Stores (General).

4.1. Although clearance of stores is part of the T-2 modification process, it involves highly specialized engineering disciplines and experience generally not available within modification activities. As a result, AFMC has set up a separate stores compatibility activity at the Air Force SEEK EAGLE Office (AFSEO), Eglin AFB, Florida. While each MEA is responsible for the successful conclusion of a T-2 modification, the MEA will contact the AFSEO to issue a flight clearance for all uncertified stores on all aircraft. For aircraft not assigned to a SPM, the modification activity will request a flight clearance for stores carried on those aircraft.

4.2. To be able to recommend a flight clearance, the stores compatibility activity often must conduct extensive analyses and tests, some of which may involve contracts. The modification activity or applicable store design activity is responsible for providing any necessary engineering data (physical, aerodynamic, structural, aero thermal, and electromagnetic) on the store and for providing funds to support compatibility studies and tests. To minimize program delays, it is recommended that the stores compatibility efforts be initiated early, usually well before the T-2 modification action itself is initiated.

4.3. The compatibility activity, after completing analyses and tests, can issue flight clearances to the modification activity. After MEA approval, the clearances will become part of the modification documentation. If a change is needed on a cleared store, aircraft configuration, or flight envelope, the modification activity will contact the issuing office for aircraft compatibility to determine if additional clearance is warranted.

5. Modification Classification. All T-2 modifications, to include hardware/software, will be classified as either Major or Minor.

5.1. A modification will be classified as Major if it involves a high degree of technical uncertainty, and it affects critical portions of one or more of the following areas: structure, propulsion sub-systems, avionics systems, software, aerodynamics, stability and control, etc. A high degree of technical uncertainty may exist if available technical data or analytical techniques are insufficient to provide an adequate basis for sound engineering design of the modification, and sufficient testing has not been accomplished to resolve the technical uncertainties. A reportable modification, as defined in MIL-HDBK-514, *Operational Safety, Suitability, And Effectiveness For The Aeronautical Enterprise* paragraph 11.10.1, would also be classified as Major. When determining classification, it is recommended that the MEA's technical staff review the proposed modification. All other modifications are classified as Minor.

5.2. The MEA is the classification approval authority (see **paragraph 7.1**).

5.3. The proposed T-2 modification will be reviewed by the MEA and the SPM to ensure technical data and/or analytical techniques are adequate to provide a basis for sound engineering and for resolution of technical uncertainties. If the MEA has any questions as to the technical uncertainty for a particular modification, they should contact the responsible SPM.

6. Independent Modification Review (IMR).

6.1. All Major T-2 aircraft modifications require an Independent Modification Review (IMR) by the responsible SPM. The comprehensiveness and extent of the IMR will be negotiated and agreed upon by the responsible program SPM and the MEA prior to approval of the preliminary modification package. Minor modifications and demodifications do not require an IMR. The IMR is a technical review of the modification from an airworthiness point of view. It will include a detailed review of the modification's engineering (including software and information security changes), impacted air vehicle characteristics, systems and flight safety, drawings, analyses, test plans, data, changes to related flight manuals, operating and maintenance instructions, and the demodification plan with its associated analyses and drawings. This detailed review will concentrate on those areas of the modification that are the basis for declaring the modification Major. The SPM should ensure that verification activities are in place to support any necessary subsequent airworthiness recertification efforts (MIL-HDBK-514, section 11.10).

6.2. The classification of the modification as either Major or Minor must be made as early as possible so the IMR requirements will be fulfilled. If the modification is classified as Major, the responsible program SPM will be contacted before formalizing any program schedules so all IMR required documentation can be identified.

6.3. As a part of the IMR, the responsible program SPM and the MEA may take part in the preliminary design review (PDR) and critical design review (CDR), the Physical Configuration Inspection (PCI), and the review of all test results. The MEA will recommend Safety of Flight approval or disapproval to the responsible program SPM unless delegated to the AFMC Test Center, test organization or laboratories IAW AFPD 62-6 para. 2.8.4.

7. Approval Authority.

7.1. Modification Engineering Authority (MEA).

7.1.1. The SPM is the approval authority for all T-2 modifications, including engineering and Safety of Flight approval, to aircraft unless delegated to AFMC Test Centers or Laboratory IAW AFPD 62-6. Normally, this responsibility is delegated to the MEA leader who then functions as the modification engineering approval authority for all aerospace vehicles under his/her control.

7.1.1.1. The authority to approve Minor modifications, including engineering and Safety of Flight approval, to aerospace vehicles is the responsibility of the SPM unless delegated to the Test Centers and Laboratory.

7.1.1.2. T-2 modifications are unique and only remain on a specific aerospace vehicle for the duration of the flight test program. An approved T-2 modification shall not be installed on a different aerospace vehicle without a CCB action.

7.1.1.3. Approval or disapproval recommendations for Major modifications to aerospace vehicles are assigned to the responsible program SPM. Engineering approval for Major T-2 modifications is the responsibility of the MEA if delegated by the SPM.

7.1.2. When Government Furnished Property (GFP) aircraft are assigned and/or possessed by a contractor (EB coded), the SPM functions as the MEA authority. When

the GFP aircraft are to be flight tested by an AFMC test organization, the test organization must take part in the CCB. The test organization will participate in other reviews as requested by the MEA authority.

7.1.3. For unaccepted aerospace vehicles, the MEA authority will be the SPM responsible for the program. If the aerospace vehicle is to be flown at an AFMC test facility, the AFMC test organization will be a member of the MEA.

7.1.4. For leased or loaned aerospace vehicles, or Laboratory-assigned and possessed (XY coded), the lease or loan agreement will specify which government agency, such as the FAA, SPM, or MEA has modification approval authority.

7.1.5. For non-AFMC aerospace vehicles not under lease or loan agreement, the MEA will be specified in the Memorandum of Agreement (MOA). Normally, this authority is delegated to the AFMC Test Centers or Laboratory. This approval will be coordinated with the appropriate SPM.

7.2. MEA Responsibilities.

7.2.1. Recommends approval/disapproval for all T-2 modifications and demodifications to the CCB.

7.2.2. Approves/disapproves the preliminary modification design and releases it for final design, and fabrication, and subject to CCB approval before installation.

7.2.3. Reviews all modification contracts and documents.

7.2.4. Utilizes appropriate airworthiness criteria (MIL-HDBK-516, *Airworthiness Certification Criteria* or FAA FARs) to accomplish preliminary Safety of Flight assessments (ref **para 8.2**) in order to evaluate if the technical approach to the modification will provide acceptable margins of safety.

7.2.5. Approves PDR and CDR for contracted T-2 modifications and design reviews for T-2 modifications conducted in-house.

7.2.6. Directs the development of local procedures to make sure that appropriate review and approval of subsequent changes to the design are assessed for their cost, schedule, safety, technical, and operational performance impacts.

7.2.7. Identifies areas of concern to the IMR in the case of Major modifications.

7.2.8. Safety Determination.

7.2.8.1. Ensures the accomplishment of design safety reviews and makes final Safety of Flight determination utilizing either MIL-HDBK-516 or FAA FAR criteria. The SPM may delegate Safety of Flight determination IAW AFPD 62-6. Normally, this is the delegated MEA leader.

7.2.8.2. Identifies aircraft flight test requirements for Safety of Flight determination as the result of modifications to aerospace vehicles.

7.2.8.3. Reviews results of laboratory, ground, or Safety of Flight tests.

7.2.9. Recommends assignment of status prefix symbol “N” (special test permanent) according to AFI 16-401, *Designating and Naming Defense Military Aerospace Vehicles*.

7.2.10. Approves tailoring and waivers to military standards and specifications that will be used to document and accomplish the modification.

7.2.11. Sends an information copy of the T-2 modification package to the appropriate AFMC item manager or weapons system SPM when requested.

7.2.12. The responsible MEA will ensure a PCI is conducted when modification, installation, design baseline changes, or demodifications are accomplished. The PCI is required before issuance of a flight release.

7.2.13. Addresses the following areas during revalidation:

7.2.13.1. Necessity of modification for current or future use.

7.2.13.2. Estimated demodification costs.

7.2.13.3. Increased Programmed Depot Maintenance (PDM) cost as the result of revalidated modifications.

7.3. CCB Concept.

7.3.1. The primary purpose of the CCB is to disposition proposed modification packages, waivers and deviations against established configuration baselines. The hardware and/or software authorized to be changed must represent the current configuration baseline. The purpose of the CCB is to control these baselines. They are documented in the form of weapon system specifications, drawings, software code listings, etc.. The CCB functions as an advisory body to the CCB Chairperson and meets at the discretion of the Chairperson. The weapon SPM has the CCB responsibility for his/her respective weapons systems. The CCB Chairperson is the modification process approval authority and may approve variances to normal procedures to accomplish modifications.

7.3.2. Configuration Control Board Delegation. The SPM may delegate CCB and MEA to AFMC Test Centers and Laboratory for the purpose of accomplishing T-2 modifications on test center or laboratory assigned, possessed, loaned, or leased aerospace vehicles. The CCB authority may not be delegated to other activities other than the AFMC Test Centers and Laboratory for the purposes of accomplishing T-2 modifications. Delegation from the SPM also may not bypass the established CCB authority at the AFMC Test Centers and Laboratory by going direct to subordinate organizations.

7.3.3. Major Modifications. The weapons SPM will approve all Major T-2 modifications.

7.3.4. For additional CCB guidance, see MIL-HDBK-61A, *Configuration Management Guidance* and AFMC Pamphlet 63-104, *IWSMConfiguration Management Implementation Guide*.

7.4. CCB Membership. The following minimum membership is recommended for the CCB to advise the Chairperson in the discharge of his/her responsibilities:

7.4.1. Safety.

7.4.2. Maintenance/Logistics.

7.4.3. Engineering.

7.4.4. Operations.

7.4.5. Quality Assurance/Control.

7.4.6. Responsible Test Organization (RTO) (if CCB authority is not the RTO).

7.4.7. Responsible SPM for Major modifications.

7.4.8. Contracting (When the modification effort requires contracting or involves a lease or loan agreement, identify contracting as part of the CCB membership).

7.4.9. Configuration management.

7.4.10. Information Security.

7.4.11. Others as identified by the CCB Authority.

8. Procedures and Control. Guidelines for a typical implementation of this instruction are provided within this section. This instruction may be supplemented according to **paragraph 17** to suit local requirements and capabilities.

8.1. Modification Phases. The modification process will be accomplished in the following phases: identification of modification requirements, preparation of the preliminary modification package, preliminary CCB approval, CCB approval, modification design, modification, Safety of Flight determination, and demodification.

8.1.1. Identification of Modification Requirements.

8.1.1.1. Initial Identification. Early identification of a T-2 aircraft modification requirement is vital. As soon as a program with modification requirements is initiated, the organization that has modification management responsibility will be contacted by the Program Manager (PM). This contact will be made before preparing the modification request to ensure smooth transition into the modification process (for more information, see T-2 Modification Lessons Learned, **Attachment 2**).

8.1.1.2. Formal Identification. As soon as funding and schedule parameters allow, a modification request will be sent to the MEA by the PM. The AFMC Test Centers, and Laboratory will use locally established funding processes.

8.1.2. Preparation of the Preliminary Modification Package.

8.1.2.1. Before initiating detailed design, a preliminary modification package will be prepared by the PM or his representative for MEA review and approval. The designated modification organization, with the assistance of the RTO and the organization initiating the modification, will prepare the package that will contain as a minimum the following:

8.1.2.1.1. An initial AFMC Form 244, **T-2 Modification Configuration Control Board Directive**.

8.1.2.1.2. Preliminary hazard analyses.

8.1.2.1.3. Justification and HQ AFMC program directives (where applicable).

8.1.2.1.4. Preliminary design information, profile, and support engineering data, as available.

8.1.2.1.5. Environmental, Safety & Occupational Health (ESOH Analysis).

8.1.2.1.6. Major Modifications: Identification of the airworthiness certification criteria to be considered during PDR, CDR, and Safety of Flight assessments.

8.1.2.2. For Major modifications, the responsible modification organization will send a copy of the package to the responsible SPM (if applicable) before MEA review and coordination.

8.1.3. Preliminary Modification Approval.

8.1.3.1. Preliminary modification approval is authority to proceed with detailed modification design, at which time the functional baseline for the modification is defined. The MEA is the approval authority.

8.1.4. Modification Design.

8.1.4.1. The final design must include all information necessary to fabricate, install, functionally check out, and verify Safety of Flight of the modification. The design must be accomplished with considerations for demodification. Approval from the SPM is required whenever standard T.O. repair procedures are insufficient to restore the test article to the pre-modified configuration. The requirements of MIL-STD-27733, Modification and Marking Requirements for Test and Aerospace Vehicles and Related Support Equipment, will be satisfied for all T-2 modifications to air vehicles and alternate mission equipment. Deviations to this engineering standard can be approved by either the Modification Engineering Authority (MEA), or the CCB Chairperson

8.1.4.2. If the modification is Major and with contracted engineering design, then the AFMC organization awarding the contract will conduct a PDR and a CDR. When aircraft with contracted modifications are to be flight tested by an AFMC test organization, that test organization must take part in the PDR and CDR. The test organization will participate in other reviews as requested by the MEA. If the modification is Minor and with contracted engineering design, the MEA will determine PDR and or CDR requirement.

8.1.4.3. For those modifications with in-house design, a design review will be established.

8.1.4.4. A PDR will normally address the following areas:

8.1.4.4.1. Preliminary design data, including preliminary drawings, diagrams, and sketches.

8.1.4.4.2. System safety.

8.1.4.4.3. Preliminary analyses and tests including Loads and Structural Analyses.

8.1.4.4.4. Mass properties.

8.1.4.4.5. External stores compatibility.

8.1.4.4.6. Power requirements, subsystems compatibility, and electrical loads analysis.

8.1.4.4.7. Electromagnetic compatibility.

8.1.4.4.8. Operating restrictions.

8.1.4.4.9. Changes to performance, stability, and control.

8.1.4.4.10. Preliminary flight test plan for Safety of Flight determination.

8.1.4.4.11. Group B Safety of Flight determination.

8.1.4.4.12. Demodification plan.

8.1.4.4.13. Schedule.

8.1.4.4.14. Thermal design and constraints.

8.1.4.4.15. Human factors.

8.1.4.4.16. Corrosion control.

8.1.4.4.17. Interface requirements.

8.1.4.4.18. Producibility (including the capabilities of manufacturing processes to meet design requirements).

8.1.4.4.19. Affordability.

8.1.4.4.20. Information security.

8.1.4.5. A CDR will normally address changes to scope, features and capabilities from those presented at the PDR. The CDR will also identify design and operating requirements or specifications not satisfied by the proposed design. In addition, the following areas should also be included:

8.1.4.5.1. Final design data, including detailed design drawings and diagrams.

8.1.4.5.2. System safety.

8.1.4.5.3. Final analyses and tests.

8.1.4.5.4. Detailed mass properties.

8.1.4.5.5. External stores compatibility.

8.1.4.5.6. Detailed power requirements, subsystems compatibility, and electrical loads analysis.

8.1.4.5.7. Updated electromagnetic compatibility.

8.1.4.5.8. Strength summary and operating restrictions.

8.1.4.5.9. Changes to performance, stability, and control.

8.1.4.5.10. Flight test program for Safety of Flight determination.

8.1.4.5.11. Operation, maintenance, and inspection instructions.

8.1.4.5.12. Project equipment list.

8.1.4.5.13. Drawing list.

8.1.4.5.14. Lists of engineering analyses, tests, and reports.

8.1.4.5.15. Flight test plan.

8.1.4.5.16. Updated demodification plan.

8.1.4.5.17. Thermal design and constraints.

8.1.4.5.18. Human factors.

8.1.4.5.19. Corrosion control.

8.1.4.5.20. Interface requirements.

8.1.4.5.21. Software detailed design.

8.1.4.5.22. Producibility (including the capabilities of manufacturing process to meet design requirements).

8.1.4.5.23. Affordability.

8.1.4.5.24. Information security.

8.1.4.5.25. Reliability, Maintainability, and Availability (RMA statistics/projections).

8.1.4.6. The CDR or the final in-house design review establishes the design baseline of the modification.

8.1.5. CCB Approval. CCB approval is authority to proceed with the modification installation. When time is critical and risk is determined by the MEA to be minimal, the CCB authority may provide interim approval to accomplish installation concurrent with engineering and fabrication. (Exercise of this provision does not relieve any final documentation requirements contained herein.) CCB approval is accomplished through the signing of the CCB directive by the CCB Chairperson. CCB approval establishes the configuration baseline for the modification; however, change is a normal part of the modification process, and it is important that local procedures clearly define CCB involvement in design baseline changes. The changes must not affect critical flight systems, such as, flight controls or cockpit instruments, nor can the function of the software go beyond the functional range envisioned when the original T-2 modification was approved. Any alteration to design that meets the Major modification criteria will cause the entire modification to be classified as Major. If that occurs, Major modification procedures apply.

8.1.6. Modification.

8.1.6.1. Normally, fabrication begins after the CDR for contracted modifications or after an internal design review for in-house modifications. Installation may only occur after CCB approval.

8.1.6.2. After the PCI, the responsible CCB authority ensures final documentation matches the current aircraft configuration.

8.1.7. Safety Determination. The SPM is responsible for ensuring design safety and Safety of Flight determination, unless delegated authority to MEA. By approving the modification, the CCB approves the requirements for laboratory, ground, and flight tests, as contained in the modification package.

8.1.8. Demodification. When flight testing is completed, the demodification plan (**paragraph 12**), certified during the MEA review and approval process (or as later amended), will be implemented, except as noted in **paragraph 14**.

8.2. Documentation Requirements. The T-2 modifications will be documented in a modification file that will be maintained by the organization possessing configuration control responsibility for the aerospace vehicles. Follow documentation and TCTO waiver procedures in AFI 21-101, *Air and Space Equipment Maintenance Management***,** AFI 21-101_ 21-101 AFMCSUP 1; and the 00-20 Series Technical Orders. For contracted T-2 modifications, the responsible organization will ensure the modification is properly documented according to this instruction by using appropriate tasking in the Statement Of Work (SOW)/Request for Proposal (RFP) while identifying the necessary data in the Contract Data Requirements List (CDRL). Portions of the file may be decentralized (e.g., drawings; Modification Flight Manuals; operation, maintenance, and inspection instructions; etc.); however, references to location of decentralized documents will be maintained in the modification file. A complete modification package will be provided to the gaining organization when an aircraft is transferred. When an aircraft is temporarily assigned to support test programs at other locations, a MOA between the affected organizations will address the transfer of T-2 modification packages. The modification file will contain all of the following data, if applicable to the modification:

8.2.1. Table of Contents for the entire modification package.

8.2.2. AFMC Form 243, **Temporary Release for Flight Certificate**.

8.2.3. AFMC Form 244, **T-2 Modification Configuration Control Board Directive.**

8.2.4. AFMC Form 272, **Physical Configuration Inspection (PCI) Report.**

8.2.5. AFMC Form 273, **Final Release for Flight Certificate.**

8.2.6. Preliminary hazards analysis.

8.2.7. Weight and balance data.

8.2.8. Inventory and disposition of equipment removed to facilitate the modification.

8.2.9. Stress and loads analysis.

8.2.10. Aerodynamic analysis.

8.2.11. Hydraulic load analysis.

8.2.12. Pneumatic load analysis.

8.2.13. Flutter analysis.

8.2.14. Ejection/jettison analysis.

8.2.15. Life support analysis.

8.2.16. Uncertified stores flight clearance.

8.2.17. Applicable airworthiness criteria and Safe for Flight determination.

8.2.18. Electrical loads analysis.

8.2.19. Ground support equipment analysis.

8.2.20. T-2 modification wire list.

8.2.21. On-board calibration procedures.

8.2.22. T-2 modification acceptance test plan.

8.2.23. System maintenance concept.

8.2.24. Group B components maintenance and calibration procedures.

8.2.25. Periodic inspection and maintenance requirements.

8.2.26. Ground crew preflight procedures.

8.2.27. Ground crew operation checklist.

8.2.28. Aircrew operation checklist.

8.2.29. Modification flight manuals.

8.2.30. Ground crew post-flight procedures.

8.2.31. Flight test plan.

8.2.32. Aircraft modification worksheets.

8.2.33. T-2 modification drawings list.

8.2.34. T-2 modification drawings.

8.2.35. Photographic records of T-2 modification installation.

8.2.36. Orange-bordered AFTO Form 781As, **Maintenance Discrepancy and Work Document**.

8.2.37. Design review meeting minutes.

8.2.38. CCB meeting minutes.

8.2.39. Orange-bordered AFTO Form 95, **Significant Historical Data.**

8.2.40. Variances and Request for Variances.

8.2.41. ASC/EN coordination for Major modifications.

8.2.42. Man-hours and cost documentation.

8.2.43. Project Equipment List

9. Post Modification Acceptance (PMA). A PMA will normally be completed prior to the PCI and before issuance of a flight release. The PMA consists of a ground-based checkout of the modification (when possible) to verify the following:

9.1. System operation.

9.2. Compliance with applicable airworthiness criteria Safety of Flight determination, to include, completion of electromagnetic interference and electromagnetic compatibility tests of the modification.

9.3. Modification satisfies the users" requirements as specified in the Program Introduction (PI) Document, Engineering Change Proposal (ECP), or AFMC Form 244.

9.4. Adequacy of the operation, maintenance, inspection instructions, and associated work cards. The PMA requirements will be recorded on an orange-bordered AFTO Form 781A. or a headquarters approved, locally developed form. All discrepancies will be reported to the CCB. The PMA findings will be considered before release for flight test or issuance of flight releases.

10. Physical Configuration Inspection (PCI). A PCI will be conducted for each modification, design baseline change, or demodification before it is released for operation. The PCI is a detailed inspection of the modification to ensure that the installation was done as prescribed by the approved modification package. It requires, as a minimum, an inspection of hardware and documentation to include engineering drawings, approved changes, maintenance instructions, work cards, and weight and balance mass properties. The PCI may be done in phases or when the work is completed, depending upon the magnitude of work. When a PCI is completed, the organization performing the inspection will certify its accomplishment. All discrepancies observed during a PCI will be recorded on an orange-bordered AFTO Form 781A and reported to the cognizant CCB. The PCI findings will be considered before Final Flight release for flight test or issuance of the final Safety of Flight determination. The PCIs will be documented on an AFMC Form 272.

11. Safety Requirements. As a minimum, T-2 aircraft modifications will incorporate the following requirements:

11.1. Group B Safety of Flight Determination. The government PM, initiating government organization, or the government organization providing the equipment will determine the Safety of Flight of the Group B components and identify associated hazards and limitations. The component's determination will be documented using the AFMC Form 3, *Component Safety of Flight Certificate.* Final determination of Safety of Flight will rest with the T-2 MEA lead if delegated by the SPM.

11.2. System Safety. The engineering design must include safety program requirements. These requirements will be determined by tailoring the current version of MIL-STD-882, *Department of Defense Standard for System Safety*, to the complexity of the modification and the degree of risk created by the modification. The SOWs/RFP will specify those safety program tasks required for the modification or equipment (Group B) development. Ensure the appropriate tasking is included for both modification and demodification when uses of known or potentially hazardous agents are being considered.

11.3. Safety Review Board (SRB). The MEA will ensure a SRB, or equivalent review, is conducted to provide formal safety reviews of ground and flight-test plans associated with the modification (references: AFMCI 99-103, *Test Management,* and AFI 91-202_AFMCSUP1, *The US Air Force Mishap Prevention Program*). The SRB will include representatives from safety, engineering, operations, project personnel, maintenance, cognizant test organization(s), and other disciplines as appropriate, including the SPM for Major modifications. Utilize appropriate airworthiness criteria (**paragraph 8.1.2.1.6**) as a checklist for Safety of Flight assessments.

12. Demodification Plan.

12.1. This plan details the procedures necessary for return of the test vehicle to its premodification configuration. The demodification plan must be as complete as possible and

should address such items as funding, disposition of removed Group A and Group B assets, location of basic aircraft equipment removed to accommodate the modification, and other areas which may not have been resolved during the modification. A demodification plan will contain enough detail to allow the MEA to approve the concept. The organization funding the modification is responsible for funding the demodification unless specific arrangements are formalized for other disposition.

12.2. The demodification plan must be reviewed, and approved by the MEA, as necessary, before the actual demodification. The demodification must be done after flight test is completed, unless the CCB determines that all or portions of the modification should be preserved to support known future test requirements or general support test programs (see **paragraph 14** for revalidation).

12.3. The IMR procedures do not apply to demodification unless specifically requested by the MEA.

12.4. The demodification plan will include estimates of man-hours and cost required to return the modified aerospace vehicle or support equipment to its premodified configuration.

12.5. The plan will address necessary action for parts that have been repaired or altered through demodification. These parts should be marked IAW the 00 series TOs and will not commingle with standard items.

13. Flight Releases.

13.1. Final Flight Releases. The responsible CCB authority will issue an AFMC Form 273 for the aircraft after a PCI and positive Safety of Flight determination has been accomplished.

13.2. Temporary Flight Releases. When a final flight release cannot be issued (e.g., an incomplete modification/demodification not affecting flight safety or a program requirement), then an AFMC Form 243 of up to 180 days may be issued by the responsible CCB authority. Subsequent temporary flight releases may be issued, as deemed necessary, by the responsible SPM or CCB authority if delegated. Temporary flight releases cannot be utilized to retain residual T-2 modifications after flight testing is completed. (see **paragraph 12.2**)

13.3. Major Modification Flight Releases. The MEA will provide recommendations for release or non-release to the responsible program SPM, unless the SPM has delegated Safety of Flight determination to the MEA.

14. Modification Revalidation.

14.1. The CCB authority may elect to retain all or portions of the modification through revalidation. Revalidation must be accomplished at least annually or at the completion of each test program:

14.1.1. To preserve some portion of the modification to be used on another program.

14.1.2. If portions of the modification cannot be removed without extensive damage and repair to the aerospace vehicle or system.

14.2. Revalidations can be made to either of the following:

14.2.1. An existing modification program.

14.2.2. A general test support program.

14.3. For revalidation due to paragraph **14.1.2**, the CCB authority will gain a one-time concurrence from the SPM prior to authorizing the revalidation. The CCB will ensure that analyses, tests, and installation actions necessary to qualify the residual modification comply with the current design criteria for permanent modifications and the airworthiness certification basis for the aircraft. In the event that the SPM does not concur, the test article will be fully demodified and the organization funding the modification will be responsible for funding the demodification.

14.4. Revalidation will be reviewed and approved by the responsible CCB authority who will ensure adequate management and technical controls exist to document the residual configuration. The responsible SPM (if applicable) will advise the CCB on the affected areas of a Major modification.

15. Contracted Modifications and Lease or Loan Agreements.

15.1. All organizations utilizing contractual support to accomplish T-2 modifications will comply with this instruction.

15.1.1. Purchase Request must be coordinated through the organization having test vehicle modification management responsibility during the modification installation to ensure the appropriate T-2 modification design standards, airworthiness criteria, and data are included. Instrumentation installed by contractors to support Test and Evaluation (T&E) is considered a T-2 modification regardless whether the aircraft has been accepted or rejected without a design baseline.

15.2. If a lease or loan agreement does not specifically require complete demodification upon lease or loan termination, or if the aerospace vehicle is to be returned in a modified configuration, a complete T-2 modification package will accompany the aerospace vehicle.

15.3. The responsible SPM will coordinate on all contracts, leases, and loan agreements involving aircraft requiring modification installation, flight test, or demodification for which the government has assumed the risk of loss, damage, or destruction. This includes aircraft that have not undergone final acceptance by the government and aircraft provided as government furnished property. The documentation of the responsible SPM coordination must comply with AFI 21-101 and AFI21-101_AFMCSUP1.

16. Funding Reimbursement. Modification and demodification costs of an aerospace vehicle will be reimbursed by the requesting activity using locally established funding processes or processes similar to AFMCI 65-602, *Uniform Reimbursement and Pricing Procedures*. When modifications are done for organizations outside of AFMC, the agreements will call for reimbursement similar to the procedures in AFMCI 65-602.

17. Local Supplements. AFMC field activities may prepare locally approved supplements and forms, as required, to detail procedures. These local supplements must be coordinated through HQ AFMC/LGM prior to unit Group-level approval. Once approved, send one copy of the official supplements and forms to HQ AFMC/LGMM for reference.

18. List of Prescribed Forms. DD Form 250, Orange-bordered AFTO Form 95, Orange-bordered AFTO Form 781A, AFMC Form 3, AFMC Form 243, AFMC Form 244, AFMC Form 272, and AFMC Form 273.

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Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFI 21-101, *Aerospace EquipmentMaintenance Management*

AFI 21-101_AFMCSUP1, *Air and Space EquipmentMaintenance Management*

AFI 63-104, *The Seek Eagle Program*

AFI 63-1101, *Modification Management*

AFI 91-202, *The US Air Force Mishap Prevention Program and AFMC Supplement 1*

AFI 16-401, *Designating and Naming Defense Military Aerospace Vehicles*

AFMCI 65-602, *Uniform Reimbursement and Pricing Procedures*

AFMCI 99-103, *Test management*

AFMC Pamphlet 63-104, *IWSM Configuration Management Implementation Guide*

AFPD 62-6, *USAF Aircraft Airworthiness Certification*

AFPD 63-1, *Acquisition System*

MIL-HDBK-61, *Configuration Management Guidance*

MIL-HDBK-514, *Operational Safety, Suitability, & Effectiveness for the Aeronautical Enterprise*

MIL-HDBK-516, *Airworthiness Certification Criteria*

MIL-STD-882, *Department of Defense Standard Practice for System Safety*

MIL-STD-27733, *Modification and Marking Requirements for Test Equipment in Aerospace Vehicles and Related Support Equipment*

Abbreviations and Acronyms

AFFTC—Air Force Flight Test Center (Edwards AFB CA)

AFI—Air Force Instruction

AFJI—Air Force Joint Instruction

AFMC—Air Force Materiel Command

AFMCI—Air Force Materiel Command Instruction

AFPD—Air Force Policy Directive

AFSEO—Air Force SEEK EAGLE Office (Eglin AFB FL)

AFTO—Air Force Technical Order

ASC/EN—Aeronautical Systems Center, Engineering Directorate (WPAFB OH)

CCB—Configuration Control Board

CDR—Critical Design Review

CDRL—Contract Data Requirements List

ECP—Engineering Change Proposal

FAA—Federal Aviation Administration

FAR—Federal Acquisition Regulation

GFE—Government Furnished Equipment

GFP—Government Furnished Property

HQ AFMC—Headquarters Air Force Materiel Command

HQ AFMC/LGMM—HQ AFMC Director of Logistics and Sustainment, Base-Level Maintenance Division

HQ USAF—Headquarters United States Air Force

IAW—In Accordance With

IMR—Independent Modification Review

IOT&E—Initial Operational Test and Evaluation

MEA—Modification Engineering Authority

MIL-STD—Military Standard

MOA—Memorandum of Agreement

PCI—Physical Configuration Inspection

PDM—Programmed Depot Maintenance

PDR—Preliminary Design Review

PHA—Preliminary Hazard Analysis

PI—Program Introduction Document

PM—Program Manager

PMA—Post Modification Acceptance

RPV—Remotely Piloted Vehicle

RTO—Responsible Test Organization

SC—Statement of Capability

SOW—Statement of Work

SPM—System Program Manager

SRB—Safety Review Board

T&E—Test and Evaluation

T-2—Temporary 2

T.O—Technical Order

UAV—Unmanned Aerial Vehicle

Terms

AFMC Test-Bed Aircraft—An aerospace vehicle that is assigned to AFMC for the purpose of providing long-term general test-bed capability in support of research and development testing, as well as operational testing and evaluation. This definition does not apply to an aerospace vehicle assigned to AFMC from another MAJCOM for a limited test period; that is, in support of a specific program for a specified duration.

Airworthiness Certification Basis—This is the subset of MIL-HDBK-516 airworthiness certification criteria and/or FAA type certifications that have been identified as applicable for the system being certified.

Component Safety of Flight Certificate (AFMC Form 3)—Verification that sufficient engineering or flight tests have been done to ensure safe flight of an aerospace vehicle or component within a specified envelope. This determination must also address the crashworthiness of the article.

Certification of Stores—The determination of a specific store or aircraft compatibility and the formal publication of all information necessary for appropriate employment of the store in the applicable technical and flight operations manuals.

Configuration Control Board (CCB)—A Board composed of representatives from program or project functional areas; such as, safety, maintenance and logistics, engineering, operations, quality assurance and control, RTO, ASC/EN (Major modifications), contracting, configuration management, and using or supporting organizations. The Board recommends approval or disapproval of proposed modifications to the CCB Chairperson. The Chairperson makes the final decision on all modifications, design baseline changes, revalidations, and demodifications unless otherwise directed by command policy. The CCB issues a directive to implement its decision (AFMC Form 244).

Contract Data Requirements List (CDRL)—The Contract Data Requirements List, DD Form 1423, **Contract Data Requirements List** is the standard format for identifying potential data requirements in a solicitation and deliverable data requirements in a contract. The CDRL is used to define data requirements, delivery requirements, approval criteria, references to tasking documents, and distribution statements. The compilations of specific CDRLs are exhibits to the contract. The CDRLs are specified as contract line items. With the exception of data specifically required by Federal Acquisition Regulation (FAR) or Defense Federal Acquisition Regulation (DFARS), the CDRL is the contractual instrument used to establish data requirements.

Critical Design Review (CDR)—A formal technical review of the detailed design of a modification. It will be conducted before fabrication or production design release so the detail design solutions satisfy performance requirements set by the PDR. Incremental reviews may be conducted instead of a single CDR.

Design Baseline—The baseline established by either the CDR (for contracted modifications) or the final in-house design review. This baseline delineates the necessary design interface requirements between the aerospace vehicle and the modification components (Group A and Group B).

Demodification—Removal of a modification (Group A and Group B components) related to a specific program/project.

EB-Coded Aircraft—Contractor test/test support: Aerospace vehicles provided to contractors as GFP in support of a prime Air Force contract. These aerospace vehicles will be utilized for complete system evaluation, testing to improve the capabilities of the designated aerospace vehicles, support of specific test programs, or production support. This code is for use as possession reporting identifiers only.

Final Flight Release—An AFMC Form 273 is issued to formally release an aerospace vehicle for mission use based upon sufficient engineering and flight tests to ensure safe flight within a specified envelope. Final flight release implies completion of the modification installation and documentation or demodification process.

Flight Clearance—An authorization for flight after appropriate engineering analyses have been made that an aircraft and store combination precludes an unacceptable risk for a specific, limited purpose of a munition or other external store. The flight clearance attests to the physical, mechanical, electrical, and aerodynamic compatibility of the aircraft-store configuration. The flight clearance will specify flight limits for the loading configuration desired and tolerances on store physical properties to include weight, center of gravity, moments of inertia, and employment.

Functional Baseline Configuration—The initial configuration of the modification as approved by the CCB. This configuration reflects the functional requirements associated with the modification as described in the program directive, PI, ECP, or other modification program requirement documents.

Group A—The items to be installed as part of a modification to support, secure, interconnect, or accommodate the Group B components. In general, anything that cannot be readily removed, provides support, or provisions for equipment installation is considered Group A. Examples of Group A items are: electrical wiring, power junction boxes, brackets, oxygen lines, signal wiring, interconnect cabling, waveguide, racks, beams, longerons, skins, spars, stringers, intercostals, plates, seats, mounts, trays/slides, fairings, lighting, and other structural support equipment for Group B items.

Group B—The equipment installed as part of a modification which is readily removable. Examples of Group B items: computers, printers, controllers, digital recorders, digital formatters, avionics encoders, antennas, radomes, and, in general, "black boxes."

Independent Modification Review (IMR)—A detailed technical review of Major modifications by ASC/EN personnel and the weapons system SPM of the modification engineering data, impacted air vehicle characteristics, drawings, analyses, test plans, and changes to related flight manuals and operating and maintenance instructions required to ensure safe operation. Personnel having no prior involvement in the modification will accomplish this review.

Initial Operational Test and Evaluation (IOT&E)—The first phase of operational test and evaluation conducted on preproduction items, prototypes, or pilot production items and normally completed prior to the first major production decision. It is conducted to provide a valid estimate of a system's operational effectiveness and operational suitability prior to the first major production decision.

Memorandum Of Agreement (MOA)—A document signed by authorized representatives of organizations which are working together such as a program office and a test and evaluation activity. The agreement establishes the organizational relationships and agreements.

Modification Engineering Authority (MEA)—The engineering activity responsible for the safe integration of the T-2 modification into the aerospace vehicle.

Physical Configuration Inspection (PCI)—A detailed inspection of the modification to ensure the modification has been installed as prescribed in the modification package.

Post Modification Acceptance (PMA)—A power up, ground test, and functional checkout of the equipment/modification to the maximum extent possible. During this system checkout, operation, maintenance, and inspection instructions will be evaluated for adequacy, and electromagnetic interference/electromagnetic compatibility test will be accomplished as required.

Preliminary Design Review (PDR)—A formal technical review of the basic approach for a modification design. It will be held after the preliminary design efforts are done, but before start of the detailed design.

Preliminary Hazard Analysis (PHA)—An analysis of hazardous conditions as an initial risk assessment of a concept or system identifying safety critical areas, evaluating hazards, and identifying the safety design criteria to be used.

Preliminary Hazard List—A list which identifies potential hazards associated with the modification (see AFMC Form 244).

Program Introduction (PI) Document—The PI document officially introduces the test program to the support agencies. The PI is a long-range planning document submitted by a potential user to the support agency immediately upon identification of the scope and duration of program activity. The potential user should submit the PI using best available information, enabling the support agency to initiate resource and technical planning. This information, while sometimes fragmentary and incomplete, is of substantial value to the support organization in determining the scope of the program. For minor or short lead-time programs, the PI is designed to eliminate further documentation except for conduct of specific tests. The PI is submitted by a user to a Range or Test Center to officially identify test support requirements. It should be initiated early enough to interface with test activity, fiscal, and planning cycles. The individual test activity should be consulted for assistance in preparation. When appropriate, the using command should assist in preparing the PI.

Program Manager (PM)—The designated individual assigned by an organization (i.e., the organization making the modification request in support of a project flight test) to oversee the project accomplishment.

Remotely Piloted Vehicle (RPV)—An aerospace vehicle that is remotely controlled. NOTE: For this instruction, an RPV is not considered a store and does not include guided bombs or missiles.

Responsible Test Organization (RTO)—The organization responsible for accomplishing the test program.

Revalidation—A method by which all, or portions, of a T-2 modification are retained after the project is completed. Documentation records are annotated to reflect the residual configuration as part of another modification program or a general test support program.

Request for Variance (RFV)—A request to determine the hazards and assess the risk of the proposed variance from or waiver of a requirement, or a specified method or process. The change in the risk involved in accepting the variance shall be identified when variance request, alter the requirement, method, or process will reduce the level of safety of the system.

Safety of Flight—The property of a particular air system configuration to safely attain, sustain, and terminate flight within prescribed and accepted limits for injury/death to personnel and damage to equipment, property, and/or environment. The intent of the Safety-of-Flight assessment is to show that appropriate risk management has been completed and the level of risk (hazards to system, personnel, property, equipment, and environment) has been appropriately identified and accepted by the managing activity prior to first flight of the air system. Component Safety of Flight is documented on AFMC Form 3.

Safety Review Board (SRB)—A board convened to review the project flight test plan and the Safety of Flight determination flight test plan (if applicable) to ensure all hazards have been identified and considered.

System Program Manager (SPM)—The designated individual with responsibility and authority to accomplish program objectives for development, production, and sustainment to meet the user's operational needs. Depending on the phase of the system (acquisition or sustainment), the SPM will normally reside at either a Product Center or Air Logistics Center (ALC). If a program is in acquisition, the SPM will be at the Product Center and will be supported by a System Support Manager (SSM) normally located at an ALC. If a program is in Sustainment, the SPM will normally reside at the appropriate ALC or other Sustainment location and will be supported by a Developmental System Manager (DSM) normally located at a Product Center. In all cases, except for Acquisition Category (ACAT) 1D programs, the SPM is the supported commander.

Software—A set of computer programs, procedures, and possible associated documentation concerned with the operation of a data processing system (compilers, library routines, manuals).

Statement of Capability (SC)—The SC is an activity's formal response to a request for test support listing capability and cost which, when signed, is a formal commitment of resources.

Stores—Any item suspended from a standard weapons station or in the bomb bays of an aerospace vehicle (e.g. bombs mounted on pylons, electronic countermeasure pods, missiles, external fuel tanks, and instrumentation pods and their suspension equipment).

Temporary Flight Release—AFMC Form 243 issued for no more than 180 days for an aerospace vehicle, due to incomplete installation or documentation of a T-2 modification.

Unaccepted Aerospace Vehicle—Aerospace vehicles being procured on an Air Force contract that are past final assembly, have not been accepted as completed per contract requirements, and a DD Form 250 has not been signed to accept the vehicle.

Uncertified Store—The particular aircraft-store configuration is not authorized in Section 5 of the Flight Manual (-1 T.O.) or wherever aircraft-store limitations are depicted for the aircraft.

Unmanned Aerial Vehicle (UAV)—An unmanned aerospace vehicle with autonomous guidance and control capability. NOTE: For this instruction, a UAV is not considered a store and does not include guided bombs or missiles. However, a UAV can carry stores as defined in this instruction.

XY-Coded ACFT—Leased, or loaned aerospace vehicles or trainers on lease to commercial agencies or loaned to other governmental agencies for accomplishment of test or other projects. This code is for use as possession reporting identifiers only.

Attachment 2

T-2 MODIFICATION LESSONS LEARNED

The following lessons learned have been identified to assist program managers involved in T-2 modifications in developing effective T-2 modification program plans. The listing provides questions that are presented in chronological sequence, which provides the user with an outline that follows the modification process. Since this listing is not necessarily exhaustive, the individual initiating the T-2 modification is encouraged to contact the activity performing the T-2 modification to learn more about local lessons learned.

A2.1. Initial Contact With RTO.

A2.1.1. Has the planning PI been accomplished? Not using a PI for planning normally results in higher cost due to confusion as to the job content.

A2.1.2. Has the test approach been agreed upon? A vague test approach often results in high cost due to out-of-scope changes for reconfiguration and additional instrumentation.

A2.1.3. Has aircraft availability and suitability been addressed? Aircraft that are not operationally suitable or supportable, especially at off-site locations, have increased program costs in the past.

A2.1.4. Have certification requirements been established and coordinated?

A2.1.5. Have the requirements for utilization of existing DoD ranges, facilities, or other resources to support the T-2 modification been addressed (e.g. waivers, etc.)?

A2.2. Group B.

A2.2.1. Has a Group B Safety of Flight determination been addressed? Rejection due to lack of analyses after design have, in the past, greatly increased program costs and stretched out modification schedules. Non-flight qualified hardware must be identified early in the program to ensure correct installation during the modification.

A2.2.2. Has AFSC DH l-X, Design Handbook, been used to design Group B components? In the past, non-use of this design handbook has resulted in high recertification and documentation costs.

A2.2.3. Have deliverable Group B components and data been addressed as items for delivery to the government under the Group B, CDRL?

A2.2.4. If Group B components cannot be delivered in time for use during modification, have arrangements been made for high fidelity (accurate size and mounting dimensions, electrical, waveguide, and cooling interfaces) Group B mockups? Failure of the mockup to accurately reflect Group B configuration has resulted in Group A rework with impact on program cost and schedule.

A2.2.5. Have spare components been identified and allowances been made for procurement?

A2.2.6. Have arrangements been made for the contractor to supply peculiar system equipment and components to the modification facility?

A2.2.7. Have substitutions for long-lead items been addressed?

A2.2.8. Have the modification and the Group B component delivery schedules been integrated?

A2.2.9. Has contractor peculiar instrumentation been identified? Lack of identification usually results in increased costs due to out-of-scope changes.

A2.2.10. Has the organization with aerospace vehicle T-2 modification CCB authority coordinated on all Group B contractual documents prior to contract award?

A2.3. Modification Planning.

A2.3.1. Have the modification requirements been clearly defined and conveyed to the activity performing the modification design? Failure to clearly define and convey the design requirements, coupled with requirement changes, are a significant source of rework. This will result in increases to modification program cost and schedule.

A2.3.2. Has complete funding for the modification been identified by source and fiscal year?

A2.3.3. Has demodification funding been identified by source and fiscal year?

A2.3.4. Is the modification a Major modification? If so, has consideration been given to independent modification review, ASC/EN requirements, SPM coordination, documentation, and contractor support for the modification?

A2.3.5. Has a decision been made to design the modification in-house or through a contractor?

A2.3.6. Has aircraft assignment by tail number been done?

A2.3.7. Is the flight testing of the modification considered hazardous? If so, has HQ AFMC/LGM been notified?

A2.3.8. Have modification marking, master power switch installation, and polyvinyl chloride (PVC) wiring (described in MIL-STD-27733, *Modification And Marking Requirements For Test Equipment In Aerospace Vehicles and Related Support Equipment*) been identified?

A2.3.9. Does the present modification schedule have any conflicts between Group B delivery, aircraft modification, and requirement for use of the vehicle for flight test? Have modification, post modification, maintenance interface, and checkout schedules been developed?

A2.3.10. Has the CCB authority been determined?

A2.3.11. Has the system safety preliminary hazard analysis been performed? Use of this technique often finds system deficiencies.

A2.3.12. Have the Safety of Flight determination flight test requirements been defined (pace, chase, photographic requirements, required test results, test technique, and schedule)?

A2.3.13. Have the responsibilities for Government Furnished Equipment (GFE) instrumentation been outlined (supply, format, calibration, and data reduction)?

A2.3.14. Has support GFE, such as, special aerospace ground equipment, including suitable substitutes and spares, been identified?

A2.3.15. Has an off-site support or range agreement been coordinated (special ramp and hangar facilities, safety zones, and power requirements)?

A2.3.16. Has an environmental assessment been done?

A2.3.17. Have radio and telemetry frequencies been coordinated with appropriate agencies?

A2.3.18. Have other support requirements, such as special construction, rehabilitation, new range facilities, or special use simulators, been identified?

A2.3.19. Have flight performance and operational systems impacts been carefully considered?

A2.3.20. Are there any known requirements for military specifications? Many military specifications have been deleted, therefore, a waiver may be required to invoke a military specification.

A2.3.21. Are there any known requirements for waiver of military specifications?

A2.3.22. Has consideration been given to Programmed Depot Maintenance impacts coming due during the modification installation duration? This issue can result in schedule and cost impacts if the modification Group B equipment must be removed and reinstalled to support aircraft maintenance. These costs are normally borne by the organization requesting the modification.

A2.3.23. Have fabrication and assembly processes been identified and their capabilities assessed and/or have constraints related to fabrication and assembly processes been communicated to the activity performing the design? Failure to consider manufacturing process capabilities during the design process often results in expensive rework of designs and/or manufacturing.

A2.4. Modification Phase.

A2.4.1. Have firm Group B delivery schedules been set up and have these schedules been checked for impact on the overall modification timetable?

A2.4.2. Have long-lead time items been delivered or reasonable substitutes found, or has a delivery schedule been agreed to that does not affect the modifications?

A2.4.3. Has design data for the modification been approved?

A2.4.4. Have mockups been delivered if it was agreed that the Group B items would not be available for the modification, fabrication, and installation phase?

A2.4.5. Have quality assurance inspections been scheduled and accomplished (in progress, blind area closeout, final, and functional)?

A2.4.6. Has the detailed fabrication and installation plan been coordinated?

A2.4.7. Has on-site contractor support been obtained?

A2.4.8. Have base support agreements at test operating locations been completed?

A2.4.9. Have maintenance support agreements at operating locations been completed?

A2.4.10. Has special maintenance support equipment been delivered and have special maintenance agreements been formalized?

A2.4.11. Have disposition instructions (storage, shipment, turn-in) been developed and implemented for basic aircraft equipment removed to accommodate the modification? Do these instructions address reinstallation requirements at demodification?

A2.4.12. Have control measures, such as, caution and warning notes identified in the PHA and failure mode, effects, and criticality analysis that affect operations and maintenance, been incorporated in modification flight manuals and maintenance instructions?

A2.4.13. Have deficient fabrication and assembly processes been improved, new processes developed, and/or designed robustness improved to ensure all such processes are capable?

A2.5. Demodification.

A2.5.1. Has a demodification schedule and funding profile been coordinated?

A2.5.2. Have requirements for functional check flights after completion of the demodification been identified?

A2.5.3. Has a disposition of the removed Group A and Group B components been coordinated?

A2.5.4. Has the possibility of revalidation been considered versus demodification?

A2.5.5. Have follow-on test requirements been identified?

A2.5.6. Has the impact of the demodification on other test programs been identified?

A2.5.7. Has a return agreement to other major commands (assumes aircraft not from AFMC inventory) been completed?

A2.5.8. Have transfer inspection requirements been identified?

A2.5.9. Has a requirement for revalidation of flight and technical manuals been addressed?

A2.5.10. Have residual special maintenance requirements been addressed?

A2.5.11. Has recertification of basic aircraft systems been addressed if those systems were affected by the modification?

A2.5.12. If the demodification requires the reinstallation of standard aircraft equipment (aircraft-21 equipment, such as an external tank), has re-procurement of the aircraft equipment been considered?