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NAVAL AIR SYSTEMS COMMAND
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NAVAIRINST 13050.6
AIR-5.0
27 Dec 02

NAVAIR INSTRUCTION 13050.6

From: Commander, Naval Air Systems Command

Subj: POLICY, PROCEDURES AND RESPONSIBILITIES FOR MODIFICATION AND CONFIGURATION CONTROL OF AIR VEHICLES, AIR VEHICLE STORES AND AIR VEHICLE INSTALLED SYSTEMS FOR RESEARCH DEVELOPMENT TEST AND EVALUATION

Ref: (a) OPNAVINST 4790.2H
(b) NAVAIRINST 4130.1C
(c) NAVAIRINST 3960.4A
(d) NAVAIRINST 13034.1B
(e) NAVAIR 00-25-300
(f) NAVAIRINST 7040.11C

Encl: (1) NAVAIR Aircraft Modification Process Flow NAVAIR Modification Data Packages
(2) NAVAIR Modification Data Packages

1. **Purpose.** To establish policy, responsibilities, definitions and procedures to approve, control, and document the modification and reconfiguration of air vehicles, air vehicle stores and air vehicle installed systems (hereafter referred to as air vehicles) by Naval Air Systems Command (NAVAIR) in support of Research, Development, Test and Evaluation (RDT&E) efforts.

2. **Scope.** This instruction applies to all air vehicles assigned to or in the temporary custody of NAVAIR as well as all air vehicles on which NAVAIR personnel perform modifications in support of RDT&E effort.

3. **Background**

a. Reference (a) specifies that the Commander Naval Air Systems Command (COMNAVAIRSYSCOM) has the only authority to approve modification, or withhold modification approval of aeronautical equipment. Also, COMNAVAIRSYSCOM approval is required to modify more than one aircraft within any Aircraft Controlling Custodian's control. COMNAVAIRSYSCOM is also the Aircraft Control Custodian (ACC) for all aircraft assigned to NAVAIR and its component commands. Reference (b) establishes policy, procedures, and responsibilities governing configuration management for configuration items managed by the naval aviation Program Executive Officer (PEO) organizations and NAVAIR.

b. Neither reference (a) or (b) specifically addresses modifications in support of the unique nature of NAVAIR's RDT&E mission. Historically, the Naval Air Warfare Center Aircraft Division (NAVAIRWARCENACDIV) and Naval Air Warfare Center Weapons Division (NAVAIRWARCENWPNDIV) have implemented separate configuration control processes to

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support of their RDT&E missions. Today's RDT&E efforts require maximum utilization of all of the facilities available at the NAVAIR sites. It is important that a common configuration control process be instituted to support both timely response to requirements and a seamless transfer of air vehicles between sites to better accomplish all required tests. Prior to the start of flight testing with a modified air vehicle three independent approvals are required, they are:

- (1) air vehicle modification approval/acceptance, (as defined by this instruction);
- (2) test plan approval (defined by reference (c)); and
- (3) flight clearance approval (defined by reference (d)).

4. **Policy.** In order to facilitate the accomplishment of the NAVAIR RDT&E mission:

a. COMNAVAIRSYSCOM hereby delegates reference (a), Type Commander (TYCOM) Prototype Modification Authority (TPMA) to the NAVAIR Aircraft Reporting Custodian (ARC) to authorize modification of their assigned air vehicles (to include temporary custody). This delegation includes authority to approve multiple installations of prototype configurations, only when required for RDT&E purposes. The ARC may further exercise this authority by establishing individuals to sign "By Direction" for the ARC.

b. Delegation of modification authority does not supercede or take precedence over the existing authority specified in references (a), (b), and (e) (e.g. Engineering Change Proposals (ECPs), Technical Directives (TDs), Rapid Action Minor Engineering Change (RAMECs) and other NAVAIR approved modifications) for aeronautical equipment.

c. Configuration management for ECPs, TDs, RAMECs and other NAVAIR approved modifications shall be processed following applicable instructions.

d. The modification configuration control procedures in this instruction shall apply:

(1) When a NAVAIR assigned air vehicle is modified or reconfigured to a non-production/fleet configuration, irrespective of the performing agent (i.e., Naval Air Depot (NAVAIRDEPOT), contractor, or NAVAIR personnel) or where the work is performed.

(2) In all instances where RDT&E projects require the configuration of the air vehicle or installed system to be changed (i.e., install, move, remove, and/or modify items).

(3) To all air vehicles modified or reconfigured by NAVAIR personnel and/or under NAVAIR direction for RDT&E projects, regardless of location or air vehicle owner/custodian (i.e., Department of Defense (DoD), United States Coast Guard (USCG), public use, Federal Aviation Administration (FAA) registered, and/or foreign aircraft. Compliance with this instruction does not constitute relief from the air vehicle owner/custodians maintenance and operational requirements.

e. Aircraft modifications shall be subject to the following guidelines:

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(1) RDT&E aircraft (except those in the Y (Prototype) or N (Permanent Test Bed Category) shall be returned to the standard configuration for the bureau number prior to transfer unless authority to transfer aircraft in a modified state has been obtained by NAVAIR ACC and the receiving ACC. Expenses incurred in returning an aircraft to its standard configuration will be borne by the Program Manager Air (PMA)/customer). Costs to reconfigure the articles for test and subsequently for restoration are financed by RDT&E following reference (f).

(2) Prior to beginning modifications to any temporarily assigned air vehicle, concurrence must be obtained from the permanent controlling custodian (or applicable air vehicle owner). This will include air vehicles for which the ARCs have only Accident and Incident (A&I) reporting responsibility. Temporarily assigned air vehicles will be returned to an "as received" configuration before return to the lending activity, unless prior concurrence is obtained from both the transferring and receiving ACC and NAVAIR Configuration Control Board (CCB) following reference (a). Expenses incurred in returning an aircraft to its "as received" configuration will be borne by the PMA/customer following reference (f).

(3) Adequate funding, manpower, and technical data shall be available to produce and maintain the NAVAIR Modification Data Packages. A complete data package, following enclosure (2), shall:

- (a) be maintained for each RDT&E project modification;
- (b) accompany the air vehicle upon transfer to a new ARC; and
- (c) be maintained for at least 5 years after transfer of aircraft or removal of the modifications, whichever occurs first.

5. Definitions

a. ACC. An administrative function within major commands exercising administrative control of assignment, employment, and logistic support of Navy aircraft and engines, as assigned by the Chief of Naval Operations (CNO).

b. ARC. An administrative function, assigned by the ACC, at the lowest organizational level to account for and provide information about assigned aircraft or support equipment. This does not imply or require physical custody.

c. Air Vehicle. For the purpose of this instruction air vehicle includes the following: fixed-wing aircraft, rotary-wing aircraft, tilt rotor aircraft, Vertical/Short Take off and Landing (VTOL) Aircraft Unmanned Aerial Vehicles (UAV), Unmanned Combat Aerial Vehicles (UCAV), targets flown as manned aircraft (e.g, QF-4), air vehicle stores and air vehicle installed systems. Aerial targets/decoys and weapons that are not carried on aircraft are exempt from this instruction.

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Note: Any modification to vehicle stores, aerial targets, decoys or weapons that result in a change to the aircraft interface (i.e., electrical loads, mass properties, etc.) will fall under this instruction.

d. **Airworthiness Process**. For the purpose of this instruction, it is the process by which an engineering analysis is performed to determine that an aviation system and/or its component parts meets minimum design criteria, standards, and configuration for conduct of safe flight operations.

e. **Configuration**. The functional and physical attributes that define existing or planned products, or a combination of products at a given time.

f. **Configuration Control**. The systematic evaluation, coordination, approval or disapproval of proposed Configuration Item changes, and the implementation of all approved changes to the new configuration of a configurable item after its formal establishment.

g. **Configuration Documentation**. Technical documentation having the primary purposes of identifying and defining a products configuration.

h. **Configurable Item**. Any hardware, software or combination of both that satisfies an end use function and is designated for separate configuration management by existing instructions or further determined by the Modification Proposal Approval Authority.

i. **Flight Clearance**. Temporary approval for flight of an aviation system in a non-standard configuration or operation outside the envelopes defined in Naval Air Training and Operating Procedures Standard (NATOPS) and Tactical Manuals (TACMANs). The flight clearance is evidence that an independent engineering assessment of airworthiness has been performed, and the assessment indicates the aviation system can be operated with an acceptable level of risk.

j. **Modification Acceptance**. Process to ensure all required modification procedures have been completed. To include (but not limited to):

- (1) verification of proper installation;
- (2) quality assurance inspections completed;
- (3) configuration changes completed;
- (4) weight and balance updated;
- (5) aircraft log books updated as required; and
- (6) NAVAIR Modification Data Package for flight completed.

k. **Modification Acceptance Approval Authority.** Person or persons authorized to approve acceptance of the air vehicle after completion of the modification acceptance process.

l. **Modification Authority.** Person or persons authorized to exercise reference (a), TYCOM Prototype Modification Authority, to approve modifications of an air vehicle for RDT&E. COMNAVAIRSYSCOM, or as further delegated to the NAVAIR Aircraft Controlling Custodian (AIR-5.0D), and/or the ARC.

m. **Modification Coordinator.** Person responsible for the oversight, management, and coordination of the RDT&E modification process.

n. **Modification Induction.** Process to initiate a configuration change to an air vehicle.

o. **Modification Induction Approval Authority.** Person or persons authorized to approve the modification induction.

p. **Modification Proposal.** A defined plan describing changes to an approved baseline configuration.

q. **Modification Proposal Approval Authority.** Person or persons authorized to approve the modification proposal.

r. **NAVAIR Modification Data Package.** Documentation describing the modification of an air vehicle intended for flight test.

s. **Store.** Any device carried internally or externally and mounted on suspension and release equipment (or air vehicle structure), whether or not the device is capable of being separated in flight from the aircraft or air vehicle. Examples of air vehicle stores are as follows: UAV carried/launched from a manned aircraft, missile, bomb, mine, torpedo, pyrotechnic device, sonoboy, fuel tank, pod (aerial/antenna, gun, electronic countermeasures, etc.), aerial tow target reel or similar item(s).

7. **Responsibilities**

a. **PMA/Customer.** The PMA/customer responsibilities as related to modifying aircraft are to plan, program, budget, and fund the costs associated with installing, maintaining and removing air vehicle modifications. The PMA shall ensure that funding is in place for a comprehensive NAVAIR Modification Data Package.

b. **NAVAIRWARCENACDIV/WPNDIV.** Develop an implementation proposal for NAVAIR addressing policy and procedures governing the required planning and coordination of engineering reviews to be addressed by all modification proposal approval authorities. Additionally, provide tailored policies and procedures based upon this instruction for modifications performed by NAVAIR personnel on non-Navy owned and operated air vehicles.

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c. Naval Test Wing Atlantic/Pacific. Wing Commanders shall be responsible for administering the RDT&E modification process following in this instruction. Wing commanders shall issue instructions and guidance as required to implement a modification process that ensures sound configuration management practices for RDT&E air vehicles within their commands and/or that are being modified by personnel within their commands. The Test Wings shall jointly develop and maintain a web based tool designed to capture required data and documentation for RDT&E modifications.

d. ARC

(1) ARCs shall establish formal written procedures for implementing this instruction. The ARCs shall be responsible and accountable for implementing a sound and robust configuration control process to manage, control, and document all RDT&E modifications incorporated on air vehicles for which they have reporting custodian responsibilities. To include:

- (a) verification of proper installation;
- (b) quality assurance inspections completed;
- (c) configuration changes completed;
- (d) weight and balance updated;
- (e) aircraft log books updated as required; and
- (f) NAVAIR Modification Data Package for flight completed.

(2) ARCs shall also be responsible and accountable for implementing sound configuration control processes on air vehicles for which they are not the ARC but for which they have been authorized by the ACC/owner to modify for NAVAIR's RDT&E mission or in support of the parent command's/owner's mission.

(3) ARCs shall designate in writing those personnel who possess "By Direction" authority for modification proposal approval, modification induction approval, and modification acceptance approval. This delegation shall specify each individual's level of empowerment.

(4) Ensure all configuration equipment removed from temporarily assigned aircraft is properly tagged, preserved, packaged and stored in a limited access store room under the control of the material control officer (or equivalent), for reinstallation prior to transfer or upon completion of the project.

(5) Verify that the air vehicle has been properly deconfigured, as required.

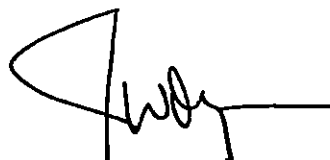
8. Process. The RDT&E modification process is a multi-step process that is graphically depicted in enclosure (1). The RDT&E modification process follows a structured configuration control process that includes analysis, approval, and documentation. The process is closely tied

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with both the test planning (reference (c)) and flight clearance (reference (d)) processes used in support of RDT&E projects. The test planning and flight clearance processes are performed in parallel but are both dependent on information from the modification process. To facilitate the analysis, approval and documentation of RDT&E modifications the NAVAIR Modification Data Packages are provided in enclosure (2). Access to a common web based tool will be provided to capture required data and documentation for RDT&E modifications to facilitate better communication across divisions, provide access to information in support of the flight clearance and test planning processes and to serve as a data repository to improve archival records.

9. Review. AIR-5.0 shall annually review this instruction and provide recommendations for changes and deletions to the commander.

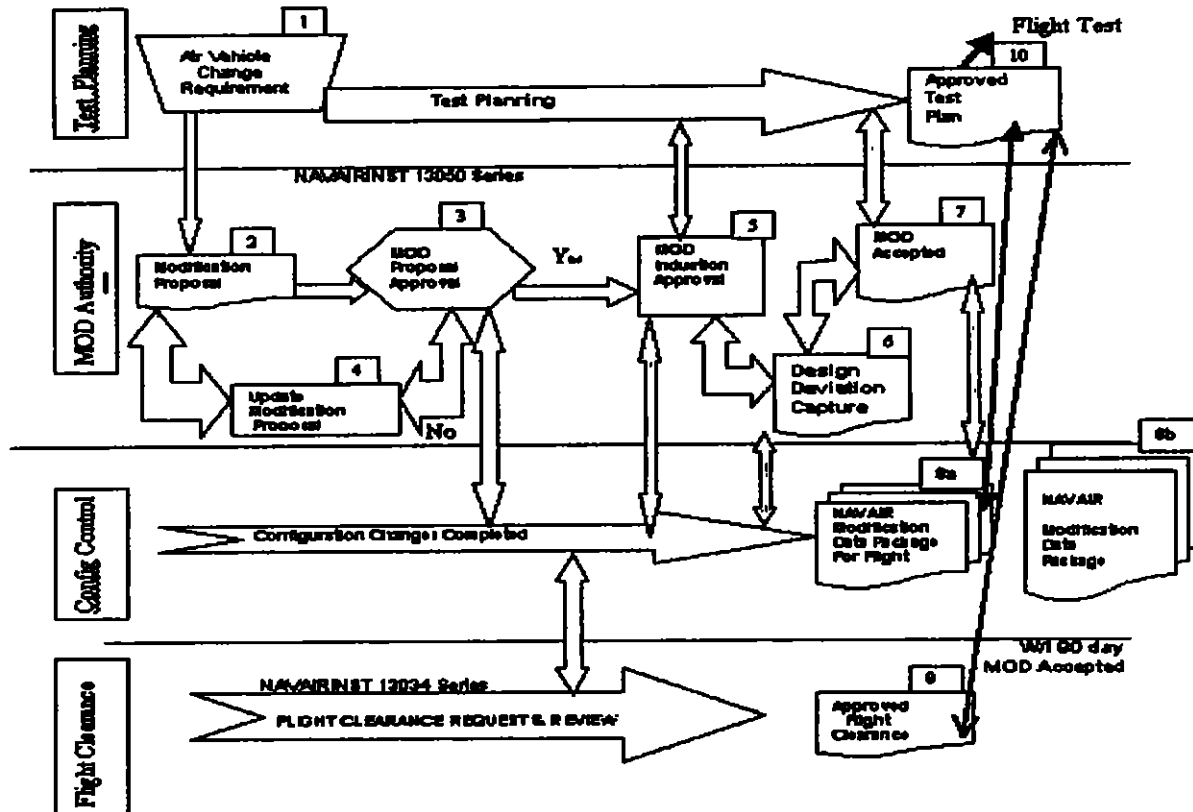


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NAVAIRHQ Directives Web sites: www.directives.nalda.navy.mil/instructions/default.cfm or locally <http://wingspan.navair.navy.mil>

NAVAIR Level Aircraft Modification Process Flow

NAVAIR Level Common Process



Block 1 - Air Vehicle Change Requirement. Requirement generated to change an air vehicle configuration. Sources of requirement generation include:

1. NAVAIR Program Sponsor, e.g., PMA-265;
2. United States Navy (USN)/DoD Research Sponsor, e.g., Naval Research Laboratory (NRL) or Defense Advanced Research Projects Agency (DARPA);
3. U.S. Government Agency, e.g., Federal Aviation Administration (FAA) or USCG;
4. Private Corporations, e.g., Boeing Aircraft Company; and
5. Foreign Military Sales (FMS) Agreements

Block 2 - Modification Proposal. Based upon modification requirements an initial proposal for configuration change is proposed. Change proposals must provide the following minimum information:

1. sponsoring activity;
2. air vehicle intended for modification;

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3. organization(s) proposed to make the modification; and
4. key points of contact
5. modification description.

Block 3 - Modification Proposal Approval

1. NAVAIR Controlled Air Vehicle. The Modification Proposal Approval Authority shall:

a. Ensure the modification proposal falls within their scope of empowerment, if not, forward those proposals to the appropriate approval authority.

b. Ensure the modification proposal is in compliance with all applicable NAVAIR, NAVAIRWARCENACDIV/WPNDIV, Test Wing, and Test Squadron modification instructions.

2. Non-NAVAIR Assets. The aircraft or item controlling custodian shall designate in writing, with the written agreement of the modifying activity, all personnel authorized to approve modifications to their equipment, and what portion(s) of the NAVAIR modification approval and documentation process that will be performed by NAVAIR support. Any modification that involves known hazards to personnel or equipment during modification or checkout shall require written approval to commence from the commanding officer responsible for the activity in direct support of the modification.

Note: This could involve either a squadron or station commander depending upon the facilities, personnel or support involved.

Block 4 - Update Modification Proposal. If the modification proposal approval authority determines that critical elements of the modification proposal are insufficient to induct the air vehicle, they shall notify the modification sponsor and state in writing what action needs to be completed prior to approval to begin modification.

Block 5 - Modification Induction Approval. Modification Induction approval authority shall:

1. verify the modification proposal has been properly approved;
2. verify all required resources are in place to commence;
3. direct initiation of the mod of the air vehicle; and
4. execute modification.

Block 6 - Design Deviation Captured. If a modification was approved to begin based upon specific installation and/or design, any deviations from that design should be documented to assist in

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flight clearance and final modification approval/acceptance and archiving to assist in any subsequent future modification Proposals interfacing with the current modification.

Block 7 - Modification Acceptance Approval. The modification acceptance approval authority shall ensure all required modification procedures involving the modified air vehicle have been completed to include (but not limited to):

1. verification of proper installation;
2. quality assurance inspections completed;
3. configuration changes completed;
4. weight and balance updated;
5. aircraft log books updated as required; and
6. NAVAIR modification data package for flight completed in accordance with Block 8A.

Block 8A - NAVAIR Modification Data Package for Flight. The NAVAIR standard data package (required prior to flight) is provided in enclosure (2).

Block 8B - NAVAIR Modification Final Data Package. The NAVAIR standard data package required within 90 days of modification acceptance is provided in enclosure (2).

Block 9 - Approved Flight Clearance. Every effort shall be made to minimize redundant reviews, while keeping both the ARC and flight clearance authority informed of changes made during the modification and their impact on airworthiness. The modification coordinator shall liaison closely with the Flight Clearance Control Officer (FCCO) to maintain awareness of changes and associated implications for all modifications leading to a flight clearance or flight clearance recommendation.

Block 10 - Approved Test Plan. Development and review of test plans are conducted following the NAVAIRINST 3960 series. The modification coordinator shall ensure open communication exists with each test team to ensure early identification of design shortfalls, provide timely engineering assessment of modification proposals and installations, and seek rapid and effective resolution of installation issues while keeping flight safety as the overarching requirement. The modification coordinator is also charged with clearly conveying all hazards discovered during the modification proposal development, installation and approval process to members of the Test Team and Test Coordination Team (TCT). Test plan approval will generally follow initial flight clearance approval, however, final approval of test plans depends upon the approval criteria established by the TCT.

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NAVAIR Modification Data Package for Flight

1. Documentation requirements for the NAVAIR Modification Data Package ***required prior to flight*** include:

- a. modification description;
- b. applicable air worthiness engineering data or location, to include name, code, phone of the cognizant Point(s) of Contact (POC);
- c. applicable Quality Assurance (QA) inspection procedures;
- d. installation Operation and Maintenance Instructions, or location of same. Ensure that modifications that result in changes to maintenance procedures are adequately communicated/briefed to maintenance personnel;
- e. EEE SOFT results, if required;
- f. summary of known hazards and associated risk mitigation steps, if any exist;
- g. identify applicable flight restrictions;
- h. engineering drawings, schematics, graphics, checklists, photographs, etc. of sufficient quality to show location and installed configuration of all components; or the POCs name, phone and code who possesses the drawings, schematics, graphics, checklists, or photographs; and
- i. accurate weight and balance data sufficient to support an update of an aircraft Form F.

Enclosure (2)

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NAVAIR Modification Final Data Package

1. Documentation in addition to the flight data package shall be required within 90 days from modification acceptance approval. Additional data shall include:

- a. detailed modification description (scope, purpose, e.g. schedule, cost, issues encountered during installation, recommendations);
- b. additional installation Operation and Maintenance Instructions, if generated or changed from initial submission. Ensure that modifications that result in changes to maintenance procedures are adequately communicated/ briefed to maintenance personnel;
- c. completed set of drawings, graphics or photographs that thoroughly document (electrically and mechanically) the entire installation;
- d. summary of known hazards and associated risk mitigation steps, if any exist;
- e. summary of engineering analyses conducted outside of the NAVAIR airworthiness reviews, to include POC name, code, and the date of review;
- f. summary of all installation deviations and a record of the approving authority for each deviation unless already captured in final drawing set;
- g. component list;
- h. if required TEMPEST or HERO analysis results/reports, or location;
- i. reconfiguration plan if future subsets of the modification are expected to be installed or removed to support various configurations/operations; and
- j. material properties and dimensions of all instrumentation and/or NAVAIR fabricated load-bearing components.