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NAVAL AIR SYSTEMS COMMAND
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IN REPLY REFER TO
NAVAIRINST 13034.1D
AIR-4.0P
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NAVAIR INSTRUCTION 13034.1D

From: Commander, Naval Air Systems Command

Subj: FLIGHT CLEARANCE POLICY FOR AIR VEHICLES AND AIRCRAFT SYSTEMS

Ref: (a) OPNAVINST 3710.7U of 23 Nov 2009
(b) OPNAVINST 3510.15A of 12 Nov 2008
(c) NA 00-25-300 of 28 Jan 2009
(d) OPNAVINST 4790.2J of 01 Feb 2005
(e) COMNAVAIRFORINST 4790.2B of 15 Feb 2009
(f) NAVAIRINST 5000.21B of 22 Jan 2008
(g) MIL-STD-882D of 10 Feb 2000
(h) OPNAVINST 3750.6R 01 Mar 2001
(i) NAVAIRINST 5100.11A of 28 Nov 2005
(j) NAVAIRINST 13100.15 of 30 Mar 2002

Encl: (1) References continued
(2) UAS Flight Clearance Policy Notes and Examples
(3) Flight Clearance General Process
(4) Flight Clearance Process Flow Diagram
(5) Sample EDRAP format
(6) Sample Interim Flight Clearance Request
(7) Sample Interim Flight Clearance Message Format
(8) Configuration and Envelope Changes Requiring a Flight Clearance
(9) Flight Clearance Key Players Requirements
(10) Information Required for Determination of Flight Operating Limitations
(11) Acronyms

1. Purpose. To establish policy, responsibilities, and procedures for executing airworthiness reviews resulting in Naval Air Systems Command (NAVAIR) flight clearances for all Department of Navy (DON) air vehicles and aircraft systems.

2. Cancellation. The NAVAIR Instruction (NAVAIRINST) 13034.1C of 28 Sept 2004, NAVAIRINST 13030.2 of 26 Mar 01 and NAVAIRINST 5600.5B of 20 Mar 1990. Since this is a major revision, changes are not indicated and should be reviewed in its entirety.

3. Authority. This instruction delegates authority to NAVAIR, Airworthiness Office (Air-4.0P) to issue flight clearances per references (a) through (r) for all DON aircraft. The following legal authorities provide for this delegation:

- Title 49 United States Code (U.S.C.), Section (§) 40103;
- Title 10 U.S.C., § 5013;
- Secretary of Navy Instruction(SECNAVINST) 5400.15C;
- Chief of Naval Operations Instruction (OPNAVINST) 3710.7U (reference(a));
- OPNAVINST 3710.7U, Chapter 7 (for Interim Flight Clearance (IFC) and Naval Air Training and Operating Procedures (NATOPS)); and,
- OPNAVINST 3510.15A (for Naval Aviation Technical Information Product (NATIP)/Tactical Manual (TACMAN) (reference (b)).

4. Scope

a. Application. This policy applies to all air vehicles and aircraft systems owned or leased by any DON entity or component, whether or not they are reflected in the official Navy/United States Marine Corps (USMC) inventory. A flight clearance shall be issued only for an aircraft system owned or leased by the DON. Only by exception will a flight clearance be issued for a non-DON aircraft system. Examples of exceptions are listed in paragraph 7, Policy Exceptions. This instruction applies to:

(1) All Manned and Unmanned Aircraft Systems (UAS), including pre-accepted aircraft and DON public aircraft. This includes, but is not limited to, all aircraft systems in-service and under development, including Joint Program Office (JPO) systems being developed for DON use. It also applies to all Assistant Secretary of the Navy for Research, Development and Acquisition (ASN(RDA)) designated aviation acquisition programs being developed or acquired for DON use, and to Fleet units that own, operate, or manage DON aircraft;

(2) Standard and new/modified aircraft system configurations, including hardware, firmware, and software; flight envelopes; and operation. This includes, but is not limited to, stores and store suspension equipment, Aviation Life

Support Systems (ALSS) utilization, and airborne and surface based components for UAS;

(3) Developmental Testing (DT), Operational Testing (OT), Follow-on Operational Test and Evaluation (FOT&E), and Fleet operations. This instruction does not supersede or take precedence over the process for formal certification of readiness for DT, OT, or recertification for FOT&E required by applicable acquisition directives;

(4) Any DON owned or leased air vehicle operated at a DON or non-DON-owned range; and,

(5) Commercial Air Services (CAS) operated as a public use aircraft, under DON contract and in direct support to the DON.

b. The airworthiness process relies on sound configuration management and control processes, which are key tenets of managing and maintaining a flight clearance. A Flight Clearance authorizes flight in a specific configuration to specified limits. Configuration management (CM) is the responsibility of AIR-1.0. Sound CM planning, audits, control, status accounting and data management are essential to form the baseline of the configuration that will be authorized in a flight clearance. Engineering Change Proposals (ECPs) are used to assess proposed aircraft modifications and, when approved, results in aircraft design changes. Authority to modify an aircraft is managed by AIR-6.0. A Technical Directive (TD) authorizes these aircraft modifications (IAW reference (c)). AIR-4.0P coordinates with AIR-1.0 and AIR-6.0 to ensure that the integrity of these critical tenets of airworthiness are maintained. Examples of exclusions are listed in paragraph 8.

c. NAVAIR flight clearances are only valid when aircraft are maintained in accordance with OPNAVINST 4790.2J (references (d) and (e)) and/or NAVAIR accepted/approved maintenance and structural life management plans.

d. The airworthiness process addresses only a small part of the overall risk management process. The process ensures that technical risk has been evaluated for a given aircraft configuration/flight envelope to ensure that deployment of the system meets accepted standards for loss of life, damage to non-

program property, and potential damage to the environment. After the technical risks are identified, they must be acceptable to the approver at the appropriate level and coordinated with the Fleet user. Programmatic, operational, and flight test risks are all managed separately from the airworthiness process, and are discussed in more detail in references (f), (g), and (h).

5. Background

a. Public vs. Civil Aircraft. Aircraft in the United States (U.S.) are divided into two categories:

(1) Department of Defense (DoD) Public Aircraft, defined by 49 U.S.C. §40102 (a)(41) as an aircraft that is not used for commercial purposes and is (a) owned or operated by the armed forces, or chartered by the armed forces, including CAS, when the operation being conducted is a military or otherwise governmental function; (b) used only for the U.S. Government; or (c) owned by the Government and operated by any person for purposes related to crew training, equipment development, or demonstration of government aircraft. (Normal commercial air transportation of armed forces personnel or cargo does not constitute a public aircraft, unless the Secretary of Defense designates that transportation, as required for national interests, constitutes public aircraft).

(2) Civil Aircraft is defined as any aircraft, other than public aircraft, per 49 U.S.C. § 44101. The Federal Aviation Administration (FAA) is the airworthiness authority for all civil aircraft licensing pilots/mechanics; approving design; approving procedures; and, approving flight envelopes. Public aircraft fall under 49 U.S.C. § 40125(b). Military aircraft are normally exempt from FAA airworthiness procedures because these aircraft are classified as "public aircraft."

b. The NATOPS program originated in 1960 as an effort to improve the safety and readiness of Naval Aviation. The Chief of Naval Operations, Air Warfare Division (OPNAV N88), is the overall NATOPS program sponsor. Management of all NATOPS publications was delegated from OPNAV to AIR-4.0P in 2003. The NATOPS program is further defined in reference (a), chapter 2.

c. In 2002, the Aircraft TACMAN program was restructured into the Aircraft Naval Tactics, Techniques, and Procedures (AIR NTTP) and NATIP programs. OPNAVINST 3510.15A (reference (b)) designates AIR-4.0P as the NATIP program manager and Naval Strike and Air Warfare Center (NSAWC) as the AIR NTTP program manager. Reference (b) further specifies the management of the AIR NTTP and NATIP programs and that NATIP is the technical foundation, limitations, and safety of flight information on which AIR NTTPs are developed.

6. Policy

a. General Airworthiness Policy. The Program Executive Officer (PEO) for Tactical Aircraft Programs (PEO(T)), PEO for Air Anti-Submarine Warfare, Assault and Special Mission Programs (PEO(A)), PEO for Joint Strike Fighter (PEO(JSF)), PEO for Strike Weapons and Unmanned Aviation (PEO(U&W)), PEO for Integrated Warfare Systems (PEO (IWS)), and others as designated by the Office of the Secretary Defense (OSD), are responsible for the acquisition, integration, support, and development of naval aircraft systems. As systems develop and mature, they undergo configuration changes and/or expansions of the operational flight envelope. At each step, from first flight through retirement of the platform, airworthiness must be assured and certified by a NAVAIR Flight Clearance.

(1) Flight Clearance. A flight clearance is a formal document that provides assurance of airworthiness/safety of flight and ensures risk has been identified and accepted at the appropriate level, within acceptable bounds for the intended mission. These clearances provide flight/operating limitations for specific configurations and store loadings. A NAVAIR flight clearance can either be interim or permanent.

(a) Interim Flight Clearance (IFC) Definition. The IFCs provide temporary flight authorizations for aircraft systems operating in non-standard configurations, envelopes, or conditions. The IFCs are valid until the specific expiration date or other conditions specified in the IFC are met, or until promulgation of a change to either the NATOPS or NATIP, as applicable. The IFCs are commonly used in the Research, Development, Test and Evaluation (RDT&E) community, but can also be used on a temporary basis for Fleet operations. They are also the authoritative document that permits the use of a Draft NATOPS

manual set or NATIP by DT units and for a Preliminary NATOPS manual set or NATIP by OT units.

(b) Permanent Flight Clearance (PFC). The PFCs come in two forms: NATOPS and NATIP (or legacy TACMAN, if applicable). The NATOPS provides standardized aircraft operating procedures, limitations, technical data, and training requirements necessary for safe and effective operation of the aircraft model or aviation support activity. The NATIP provides critical technical data and limitations for all weapons, weapon systems, avionics and mission systems required for the operator to safely and effectively employ the aircraft weapon and mission systems. Not all IFCs will generate changes to the PFC.

(2) Flight Clearance Concepts. The flight clearance process involves an independent engineering assessment of airworthiness, safety of flight, and unusual risk.

(a) Airworthiness. Airworthiness determines the property of an air system configuration to safely attain, sustain and terminate ("complete" in case of UAS) flight in accordance with approved usage limits. All manned aircraft must be airworthy. The UAS may have a lower level of inherent airworthiness and a higher probability of loss than manned aircraft. As such, UAS have been classified into three major categories, per paragraph 6e(2) of this instruction so that the appropriate level of airworthiness criteria, engineering standards, and data requirements can be established.

(b) Safety of Flight (SOF). SOF determines the property of an air system configuration to safely attain, sustain and terminate "complete" in case of UAS) flight (to include in-flight or post-flight aircrew survivability), within prescribed and accepted limits for injury/death to personnel and damage to equipment, property and/or environment. The intent of assessing SOF is to show that the level of risk (hazard to the system, personnel, property, equipment and environment) has been appropriately identified by the Technical Area Experts (TAE), and accepted by the appropriate authority. All DON manned and unmanned aircraft systems must be safe for flight within acceptable levels of risk defined in references (f) and (g).

(c) Unusual Risk. In some cases where risk is determined to be above normal, as determined by engineering or

the National Airworthiness Team (NAT) for the intended mission (e.g., flight test, air show, Fleet use), a Hazard Risk Analysis (HRA) may be required and a Hazard Risk Index (HRI) may be included in the flight clearance. Prior to issuance of the flight clearance, those risks (including loss of aircraft) that exceed the acceptance threshold of the Technical Area Expert (TAE) will be briefed to, and accepted by, the appropriate risk acceptance authorities per reference (i). The TAEs will work with System Safety to include applicable Hazard Risk Statements, limitations, warnings, cautions, and notes in the flight clearance.

(3) Flight Clearance Applicability. A flight clearance is valid only for the specific configurations and flight envelopes/operations specified in the clearance. There are cases when multiple flight clearances apply to the same Type/Model/Series (T/M/S) or bureau number aircraft. Care must be taken to ensure that when multiple flight clearances are applicable, the most restrictive set of limits are observed to ensure airworthiness standards are not compromised. Any change to the specified configuration or flight operation requires issuance of a separate or amended flight clearance.

(4) Thresholds for Flight Clearance. For manned or unmanned fixed wing aircraft, the threshold for the requirement for a flight clearance is when there is intent for flight or the potential for flight, as in the case of high-speed taxi. For manned and unmanned rotary wing or tilt-rotor aircraft, the threshold for the requirement of a flight clearance is engagement/turning of rotors.

(5) Authority to Modify. Per references (d) and (e), the NAVAIR Change Control Board is the only authority to approve, modify or withhold modification of U.S. Navy aeronautical equipment. In accordance with references (d) and (e), the Aircraft Controlling Custodian (ACC)/Type Commander (TYCOM) has the authority to modify one aircraft under their command; however, a flight clearance must be obtained to fly an aircraft system in that non-standard configuration.

(6) Airworthiness Qualification Plan. Aircraft programs with new and/or modified aircraft should develop a Flight Certification Plan (FCP) that details how all required flight certifications will be obtained. An Airworthiness Qualification

Plan (AQP) should be a subset of this FCP, and is an overarching document to outline the strategy to achieve flight clearance. The AQPs are highly recommended for all programs, but are required for programs that deviate from this instruction (For example, Joint Programs or Commercial Derivative programs that intend to accept non-DON airworthiness certification and/or the use of non-DON TAEs to assure airworthiness). In these cases the AQP shall delineate agreements between the agencies involved, specifically related to which organizations are conducting engineering reviews, and how the program will ensure all configurations, limitations, and operations are analyzed without gaps in the review. The use of MIL-HDBK-516, reference (m), is highly recommended in these cases.

(7) IFC Flight Restrictions. The responsible office for issuing Flight Restrictions is AIR-4.0P, but it does not issue Grounding Bulletins or Red Stripes, which must follow the guidelines of reference (i). An IFC Flight Restriction message, issued by AIR-4.0P, can be used as a quick tool for restricting operations (other then full grounding) for safety issues. Alternatively, Flight Restriction Bulletins may be issued by the Assistant Program Manager for Systems Engineering (APMSE). These Bulletins are more thorough, requiring coordination with logistics, corrective action planning, and periodic follow-ups/communication.

(8) Other Supporting Certification Data. To minimize duplicative effort, the flight clearance process shall utilize data from the Original Equipment Manufacturer (OEM) and other airworthiness certification agencies, such as the FAA, U.S. Air Force (USAF), U.S. Army (USA), U.S. Coast Guard (USCG), National Aeronautics and Space Administration (NASA), the Department of Homeland Security (DHS), and foreign military and civil agencies, to the maximum extent possible in establishing airworthiness and equipment limitations for commercially-derived or public aircraft purchased/leased/contracted by the DON.

(a) Commercial Derivative Aircraft (CDA) Certification Data. Some CDA leased/owned/contracted by the DON will be operated in exactly the same operating envelope and usage spectrum as exists in the commercial environment, while others will have DON-unique requirements. Issuance of DON flight clearances for CDA may be based on an FAA-issued Type Inspection Authorization (TIA), Type Certificate (TC), Supplemental Type

Certificate (STC), supporting certification data, and a NAVAIR engineering assessment of risk against DON-unique usage, per reference (j). It is imperative that DON-unique usage and support requirements are clearly stated in the CDA Program's contractual documentation. This utilization includes, but is not limited to, training philosophy, maintenance plan, operational envelope, flight profiles, flight manuals and environmental factors. The Armed Services maintain a Memorandum of Agreement (MOA) with the FAA for airworthiness support of CDA aircraft (reference (k)).

1. The APMSE class desk/Integrated Product Team (IPT) lead will determine if the configuration, limitations, and usage spectrum are the same as that certified by the original airworthiness authority, and document this in writing to AIR-4.0P.

2. If there are no DON unique requirements, appropriate engineers (as determined by AIR-4.0P) are informed of this action, but are not asked to provide engineering assessment of the aircraft.

(b) Other DoD Service Certification Data. The Commander, NAVAIR maintains an agreement with the USAF and USA to allow a mutual acceptance of airworthiness certification data from the USAF and USA for air vehicle systems, subsystems, and allied equipment to the configuration, flight envelope, environment, service life, maintenance plan, and usage spectrum authorized by the originating service per reference (l). Reference (m) will be used for public aircraft basis of airworthiness certification data acceptance. New programs must show compliance with reference (m).

1. The originating service will provide a data package that includes: an airworthiness certificate; airworthiness data that includes operating instructions, manuals, and limitations necessary for safe operation and flight of the aircraft system; continued airworthiness data that includes maintenance plans and inspection criteria; and any unusual technical risk accepted in the certification/operation of the system, per paragraph 6a(2)(c).

2. The receiving Service is responsible for assuring airworthiness for modifications to the original configuration, flight envelope, or usage spectrum.

(c) DON-Unique Requirements. If there are DON-unique requirements, appropriate engineers (as determined by AIR-4.0P) will be required to review only the DON-unique requirements to demonstrate that adequate risk mitigation has been accomplished. The FAA, USAF, or USA certification will be used to the maximum extent possible.

(d) Acceptance of Data. It is at the discretion of AIR-4.0P to accept or not accept another Service's or FAA/OEM airworthiness certification data to partially or fully meet the DON airworthiness requirements, unless directed otherwise by Assistant Commander, Research and Engineering (AIR-4.0) or Commander, NAVAIR (AIR-00).

b. IFC Specific Policy. The IFCs are primarily used to support the RDT&E, DT, and OT processes where configurations are not standardized and may change, frequently requiring recurring airworthiness/risk assessments. The IFCs may also be used to support Fleet-deployed forces when rapid assurance of airworthiness and safety of flight is critical. The IFCs are issued for new and/or modified aircraft system configurations, including hardware, firmware, and software changes; expansion of flight envelopes; and nonstandard operations.

(1) An IFC is required when the air system configuration will:

(a) Commence its first test flight, and/or subsequent developmental test flights in a non-standard configuration or operating envelope;

(b) Undergo developmental testing with a draft NATOPS and/or NATIP;

(c) Undergo operational testing, FOT&E or Fleet operations with a preliminary NATOPS and/or NATIP;

(d) Operate outside of envelopes or limits approved by the promulgated NATOPS, NATIP/legacy TACMAN, or NAVAIR-approved OEM flight manuals;

(e) Operate in a configuration or loading not approved via formally-released NAVAIR technical publications, TDs, and NATOPS/NATIP/legacy TACMAN, when applicable. Interim TDs require an IFC until the following have been formally released: The NAVAIR technical publications, TDs, and NATOPS/NATIP/legacy TACMAN, when applicable.

(2) The IFCs are required until the applicable PFCs (NATOPS, NATIP/legacy TACMAN, and/or NAVAIR-approved OEM flight manuals) have been updated. If flight limitations and/or warnings, cautions, and notes are affected, an IFC is required, despite a configuration becoming standard (e.g., production-line ECP, TD, etc.) until the PFC update is released.

(3) IFC extensions shall be granted only after an assessment of implementing the change into a PFC.

(4) Tailored Technical Standards for Test Applications. Special purpose configurations of DON aircraft and weapons systems not intended for Fleet introduction, but intended for limited operation in a controlled test and evaluation environment, may use tailored application of technical standards. In this case, the IFC provides an airworthiness assessment and ensures that technical risk has been appropriately identified by the TAE, and accepted by appropriate authorities for that specific limited environment, test location, and/or limited test duration.

(5) Rapid Warfighting Response (RWR) Support. During wartime, combat forces may have urgent needs for delivery of capabilities that have no pre-planning and little or no data to support flight clearance decisions.

(a) Projects that result follow a non-traditional acquisition path and are supported by a NAVAIR Rapid Response Cell (RRC) that engages the Warfighter and senior NAVAIR Level 1 Leadership. The RRC is responsible for fully understanding the requirements and implementing a deployment strategy consistent with NAVAIR roles and responsibilities. Additionally, the RRC ensures compliance with contracting law, legal restrictions, flight clearance integrity and technical authority, security and other Command responsibilities. These projects will generally exhibit the following characteristics:

1. Operational impact justifies accepting higher risk than usual and appropriate level decision makers have formally accepted those risks;

2. Current combat losses or threats to Warfighters justify higher level of system safety hazard acceptance, once again formally accepted at an appropriate level; and,

3. Highly pressurized schedules and limited (if any) substantiating data are available to support informed engineering recommendations.

(b) Flight clearances needed to support RWR projects will be identified by the PEO/Program Management Air (PMA), Class Desk, and/or the RRC to AIR-4.0P and NAVAIR Level 1 Leadership. Due to the inherent risks, these projects will always be "exceptions to the rule," and will be engaged in sparingly and only when explicitly directed by AIR-00.

(c) The AIR-00 or his designated representative will direct AIR-4.0P to begin an RWR IFC effort only after fully understanding the risks involved and judging that the need is sufficiently urgent to tailor the normal engineering practices. When so directed, the RRC and/or AIR-4.0P will appoint a senior engineering review team for the subject RWR IFC. From the start of the flight clearance process for an RWR IFC, the appointed senior engineering reviewers will be expected to identify, characterize, and provide possible mitigations for risks based on their best engineering judgment, using all available data that may be obtained within the timelines identified by the RRC and PEO/PMA. The senior engineering review team will provide IFC approval/disapproval via "epower". The team will also ensure final flight clearances fully convey the risk areas still present, and include appropriate procedures/measures to follow when operating in regimes affected by these risks. AIR-00, his designated representative, or the PEO/PMA, may request a final risk acceptance review presentation by the PEO/PMA to understand how residual risks have been characterized by the senior engineers.

c. NATOPS-Specific Policy. The NATOPS primarily support standardized aircraft operating procedures, limitations, technical data, and training requirements necessary for safe and

effective operation of the aircraft model or aviation support activity.

(1) NAVAIR is responsible for providing and maintaining accurate and up-to-date NATOPS products to the Fleet.

(2) The NATOPS publications are published for all Navy and USMC aircraft T/M/S. Depending on its maturity, a set of NATOPS products may be categorized as draft, preliminary, or promulgated. The technical content, style, and format for both paper and digital NATOPS publications shall be in accordance with the applicable military specifications, including the MIL-DTL-85025B(AS).

(3) A NATOPS product is updated via an interim change (IC), change, or revision.

(a) A NATOPS Interim Change (IC) is initiated by an urgent or priority change recommendation, and issued by rapid means, normally via Naval Message with accompanying replacement pages, if appropriate.

(b) A NATOPS Change is typically a printed update to a NATOPS product, limited to only those pages containing revised information.

(c) A NATOPS Revision is a second or subsequent edition of a complete publication, superseding the preceding edition and incorporating all previously issued changes. Revisions to NATOPS publications are indicated by a revised date on the title page.

(4) Further NATOPS-specific policy is delineated in reference (a).

d. NATIP-Specific Policy. NATIP primarily support standardized aircraft weapon and mission systems configurations operated within standard limits or operating envelopes. However, NATIP may include combinations of standard or non-standard configurations and limits/operating envelopes.

(1) Legacy TACMANs. Per reference (b), NAVAIR is responsible for the sustainment of technical data and information contained in the legacy TACMANs and will promulgate

changes to appropriate sections, per this flight clearance instruction. Legacy TACMANs shall be converted to AIR NTTP and NATIP, per reference (b). During conversion, technical content in legacy TACMANs will be updated via an Interim Change or Change.

(a) A TACMAN IC is initiated by a flight clearance request and is normally issued via Naval Message with content replacement pages made available to the user electronically.

(b) A TACMAN Change is typically a sizable update, in support of the addition of new systems or capabilities. Changes are usually prompted by OEM contract deliverables. A Change is initiated by a flight clearance request and is normally issued via Naval Message with content replacement pages made available to the user electronically.

(2) NATIP Program Management. Per reference (b), AIR-4.0P is responsible for the management of the NATIP program. The NATIP is the primary technical reference upon which tactics are developed. As such, NATIPs are issued primarily for aircraft systems that have corresponding AIR NTTP. The technical content, style, and format shall be in accordance with the NATIP Program Management Guide (PMG) (reference (n)). The NATIP PMG shall serve as the primary NATIP working document for programmatics. All NATIP users should consult the PMG on a periodic basis.

(3) NATIP Development. Depending on its maturity, a specific T/M/S NATIP may be categorized as draft, preliminary, or approved (promulgated).

(a) Draft NATIP. New acquisition or major system upgrade programs should begin developing a Draft NATIP in support of RDT&E. Draft NATIP shall contain approved engineering data and limits, and its distribution is restricted to the test community. An IFC is the authoritative document that permits the RDT&E community to use a Draft NATIP during DT.

(b) Preliminary NATIP. New acquisition or major system upgrade programs shall have a Preliminary NATIP in support of Operational Test Readiness Review (OTRR) and to facilitate the development of the post-OT AIR NTTP. Draft NATIP typically are matured via the DT process and updated to become a

Preliminary NATIP. Preliminary NATIP shall contain mature engineering data, configurations, limits, interfaces, and operating steps for use by the OT community. An IFC is the authoritative document that permits the OT&E community to use a Preliminary NATIP during OT.

(c) Approved NATIP have a NAVAIR-endorsed letter of approval that is authorized for Fleet use and shall have an accompanying AIR-4.0P release message that specifies the current NATIP by calendar date. Approved NATIP shall be accessed by Fleet users via an AIR-4.0P-approved web-based electronic library (e.g., airworthiness website).

(d) Approved NATIP are changed via a NATIP Update. Updates are initiated via a flight clearance request and are normally issued by a Naval Message that specifies the current NATIP by calendar date. Immediately upon approval, updated content will be incorporated into the appropriate NATIP and promulgated to the Fleet via an AIR-4.0P approved web-based electronic library.

e. UAS-Specific Policy

(1) Background. The UAS vary widely in unmanned aircraft (UA) size, weight, complexity, mission, autonomy, and cost. Flight clearance policy for UAS must accommodate a wide range of aircraft size and usage. The UAS-specific flight clearance policy takes into account that the UA carries no people onboard, and hence may have a lower level of reliability than a manned aircraft. In order to mitigate the consequences of UA mishaps to people and/or property on the ground, and/or uncontrolled flight outside of pre-planned or contingency flight profiles, appropriate restrictions on UAS operations may be placed in the flight clearance to ensure an overall acceptable level of flight safety. In addition to airworthiness, UAS flight clearance policy is primarily a function of the area of operation of the UA, with secondary considerations of mass, kinetic energy, cost, usage, and reliability. Consistent with UAS flight clearance category definitions, flight clearances may define areas of operation for flight (for instance, authorized to fly only over sparsely populated areas), but should not limit operation to specific ranges or specific restricted areas. Examples of unique flight clearance engineering considerations for UAS are included in enclosure (2). AIR-4.0P issues flight clearances for UAS,

however, this is not a substitute for formal aircraft reporting requirements defined in reference (o).

(2) UAS Flight Clearance Categories. Three categories of UAS flight clearance exist to accommodate the wide spectrum of UAS and the inherent level of airworthiness that each system may exhibit. The general flight clearance process for all three categories remains the same as for manned aircraft; the engineering design standards, supplied data, and associated system analysis are used to define three categories of clearance. The APMSE is responsible for identifying the flight clearance category for the UAS based on the design, supplied data, safety analysis, system analysis and recommendations of the TAEs. The flight clearance category and associated language in the flight clearance will provide guidance to the end user's choice of operating areas. So that the TAEs can appropriately tailor their airworthiness criteria, engineering standards, and data requirements for a UAS, the APMSE may be asked to identify a "target" system-level mishap rate for the UAS; however, the TAE's determination of airworthiness (in their functional area) will be based on compliance with criteria and standards chosen by the TAE, rather than adherence to a system-level mishap rate target. This does not preclude the APMSE from prescribing a system-level mishap rate in the specification; however, that number, in and of itself, will not determine the airworthiness or airworthiness category.

(a) Category 1, or "Standard." Category 1 flight clearances are issued to UAS that intend to regularly operate in all classes of airspace, including those outside of Restricted Warning Areas and combat zones. Category 1 flight clearances will be based on airworthiness criteria, engineering standards, and data requirements similar to those of manned aircraft, while also taking into account UAS-unique design considerations (e.g., reference (p)). Category 1 flight clearances are intended primarily for UA with a maximum take-off weight of 1,320 pounds (lbs.) and above, but may be issued to UA of any weight. The TAEs will choose appropriate airworthiness criteria, engineering standards, and data requirements for a Category 1 flight clearance such that the level of airworthiness correlates to a system-level mishap rate of no more than 1 loss of UA per 100,000 flight hours (1E-05 per flight hour); however, determination of airworthiness should be primarily based on compliance with

criteria and standards chosen by the TAEs, rather than verification of a system-level mishap rate.

(b) Category 2, or "Restricted." Category 2 flight clearances are issued to UAS that intend to regularly operate over areas of low population density, and/or in Restricted and Warning Areas, and/or in a maritime environment, and/or in combat zones. They do not require the same engineering and data requirements as Category 1 flight clearances, but do require a tailored set of airworthiness criteria, engineering standards, and data requirements to ensure the TAEs can determine that the integrity of design and the inherent airworthiness of the system is suitable for flight in the above restricted environments. Because engineering standards and data requirements are less stringent than Category 1 flight clearances, additional operating limitations and operating rules may be used to maintain acceptable levels of safety to people and property on the ground. Category 2 flight clearances are intended for UA with maximum take-off weight heavier than 55 lbs. and less than 1,320 lbs, but may be issued for a UA of any weight. The TAEs will choose appropriate airworthiness criteria, engineering standards, and data requirements for a Category 2 flight clearance such that the level of airworthiness correlates to a system-level mishap rate of no more than 1 loss of UA per 10,000 flight hours (1E-04 per flight hour); however, determination of airworthiness should be primarily based on compliance with criteria and standards chosen by the TAEs, rather than verification of a system-level mishap rate. Examples of areas where engineering and data requirements can be tailored for UAS flight clearances are listed in enclosure (2).

(c) Category 3, or "Developmental." Category 3 flight clearances are issued for UAS that are not designed to accepted engineering standards and/or do not possess adequate engineering data to determine their compliance with accepted standards. As such, Category 3 flight clearances are issued with owner/sponsor acknowledgement of a higher probability of loss of the UA. Category 3 flight clearances commonly include stringent operational restrictions to ensure safety to people, environment, and property on the ground. The data requirements for a Category 3 flight clearance directly correlate to the proposed operational restrictions, area of operation, and usage of the UA. Category 3 flight clearances are intended primarily for UA with a maximum take-off weight of 55 lbs. or less, but may be issued to UA of

any weight. Enclosure (2) provides examples of how Category 3 flight clearance data requirements may vary based on the proposed usage of the UA.

(3) Category 3 Flight Clearance Unique Responsibilities. Because Category 3 flight clearances are issued for UAS that are not designed to accepted standards and/or do not possess data to verify compliance to standards, the following unique responsibilities exist:

(a) Prior to initiation of a flight clearance request, the APMSE is responsible for ensuring completion of risk assessment questionnaire, such as those in the Range Safety Criteria for Unmanned Air Vehicles Supplement, reference (p).

(b) A TAE approval on a Category 3 flight clearance signifies that, for the TAE's area of responsibility, the TAE has conducted the following:

(1) The responses to risk assessment review questions have been reviewed;

(2) The inherent level of airworthiness of the UAS is consistent with the proposed operational restrictions and the limits, warnings, cautions, and notes placed in the flight clearance by the TAE;

(3) Technical and/or operational risks have been identified and communicated to APMSE, System Safety, and operational user, based on available data and operational restrictions. In some cases, the absence of data in a particular technical area may be identified as a risk; and,

(4) The OEM-issued flight manuals have been reviewed and any discrepancies in the manuals and associated residual risks have been identified to System Safety and APMSE. For Category 3 flight clearances, it is presumed that data and procedures in the OEM flight manuals will not be independently verified by the TAEs.

(c) The APMSE is responsible for obtaining a statement from the UAS owner/sponsor acknowledging higher probability of loss of the UA (in previous versions of this instruction, referred to as "expendability") and indicating

owner/sponsor concurrence with issuance of a Category 3 flight clearance for the UAS.

(d) Category 3 flight clearances do not alleviate the responsibility for operational risk management, mishap reporting, or reference (o) aircraft inventory requirements.

(4) Accelerated Deployment of UAS. A UAS designed to Category 1 or Category 2 flight clearance requirements may be issued a lower category flight clearance as part of a comprehensive airworthiness strategy. A UAS that requires a Category 1 flight clearance for full operational capability may be issued a Category 2 or 3 flight clearance to allow deployment with airspace/operational restrictions, while additional data is generated in support of the Category 1 flight clearance. For accelerated UAS deployment, a safety case may be used to supplement the engineering review to support issuance of Category 3 flight clearances, provided the safety case shows that risks are sufficiently mitigated to acceptable levels defined in reference (f).

(5) FAA Certificates of Authorization. In order to fly in the U.S. National Airspace System (NAS) outside of Restricted or Warning Areas, reference (r) requires military UAS to obtain a Certificate of Authorization (COA). One of the FAA requirements to obtain a COA is an airworthiness statement from the sponsoring military Service. For UAS subject to this flight clearance instruction, an interim flight clearance shall serve as the statement of airworthiness to the FAA. The APMSE shall indicate in the flight clearance request whether the requested flight clearance is intended to be used as a statement of airworthiness in support of a COA. UAS possessing a Category 1 flight clearance are generally considered airworthy for all COA applications. For UAS with Category 2 and Category 3 flight clearances, the flight clearance provided to the FAA must be consistent with the intended operation proposed in the COA application (e.g., a flight clearance containing a restriction for flight over sparsely populated areas only may not accompany a COA application to fly over a densely populated area). Enclosure (2) provides example statements of airworthiness that are inserted in IFCs supporting COA applications.

(6) UAS Acquired through NAVAIR by Non-DON Third Parties. The UAS acquired through NAVAIR by non-DON third party under a

contractual instrument and then transferred to the non-DON third party will require an AIR-4.0P flight clearance for flight of the UA until such time that proof of transfer of ownership and/or custodial responsibility to the non-DON third party is officially documented and such documentation is provided to, and accepted by, AIR-4.0P.

(7) UAS Ship Integration Considerations. Flight clearances for UAS intending to operate to, from, or near a ship shall consider unique requirements such as structural integrity, propulsion system dynamic response and tolerance to hot gas or vapor ingestion, control systems response to approach and landings in high sea states and turbulence, electromagnetic environmental effects (e.g., effect on data links), shipboard integration of the UAS control station, and unique launch and recovery equipment. Additionally, the potential for the UAS to damage critical equipment on the ship shall be taken into account.

(8) Weaponized UAS. The UAS that carry/deploy live ordnance require a minimum of a Category 2 flight clearance. Only by exception (explicitly approved by AIR-4.0) will a UAS be authorized to carry/deploy live ordnance under a Category 3 flight clearance.

7. Policy Exceptions

a. Non-DON Aircraft Flight Clearances. AIR-4.0P will issue a flight clearance for a non-DON aircraft system only by exception. Exceptions include, but are not limited to:

(1) AIR-00 has entered into a formal written agreement that establishes NAVAIR as the flight clearance authority for the subject vehicle;

(2) Navy Ship/Facility Involvement. If a non-DON air vehicle is to be operated from/near a DON ship/facility, the ship/facility may require a NAVAIR flight clearance; and,

(3) If a non-DON air vehicle is being operated for DON purposes, it may be considered a "Public Aircraft" if the operation being conducted is inherently military and the FAA has no regulations for that operation. If there are questions regarding the airworthiness review conducted by the FAA for that

configuration or operation, AIR-4.0P will coordinate with the FAA to evaluate if additional DON certification requirements exist or if the FAA certification is sufficient for our purposes. A NAVAIR flight clearance may be required, as determined by AIR-4.0P, as a result of that coordination.

b. Flight Clearance Recommendations. A flight clearance recommendation may be issued for non-DON aircraft system customers if a formal written agreement has been reached between the customer, AIR-00 and the PEO/PMA. In this case, the airworthiness review will be handled in the same manner as for a flight clearance. A flight clearance recommendation will be issued in lieu of a flight clearance to the requesting agency for acceptance and use at their discretion.

c. IFC Exemption for Radio-Controlled UA Under 55 lbs. DON Radio-Controlled UA with a maximum takeoff weight of less than 55 lbs. that are flown within line-of-sight and below an altitude 400 ft Above Ground Level (AGL) do not require a flight clearance if UA operations are conducted in Restricted airspace or Warning areas, in accordance with reference (s). DON UAS normally require a COA, per reference (r), prior to operation outside of Restricted Airspace or Warning Areas.

8. Exclusions. A flight clearance does not:

a. Authorize operation of the aircraft system;
b. Assign aircraft or authorize aircrews/operators;
c. Authorize modification of the aircraft system;
d. Authorize installation of equipment;
e. Grant exemption from the formal NAVAIR Configuration Management Process (CMP), defined in reference (t);
f. Constitute a safety review, to the level of those performed by the Naval Safety Center, or imply that such a review has been performed;
g. Preclude the need for a range clearance;
h. Indicate adequate sponsorship/funding;
i. Guarantee the modification or aircraft system will perform its intended function;
j. Indicate adequate logistics support;
k. Preclude the need for coordination with the facility, range, ship, or airspace controlling authority to conduct operations;
l. Authorize ground or flight testing;

m. Authorize changes to OEM documentation; or,
n. Authorize the use of a laser system.

9. Flight Clearance Process

a. General Process. The general process is the same for all manned and unmanned flight clearances, both interim and permanent, and is described in enclosure (3) and depicted in enclosure (4). Each type of flight clearance - Interim, NATOPS, and NATIP - have different focus areas within this general process; each will be described in detail later in this section. The fundamental flight clearance process phases are:

1. Planning;
2. Request;
3. Scope of review;
4. Review;
5. Finalize flight clearance; and,
6. Release flight clearance.

(1) Planning. Sound planning and communication are critical to the successful execution of the flight clearance process. Planning activities should be initiated as soon as possible after a requirement/issue has been identified (blocks 0 and 1 of enclosure (4)) and shall include both the interim and permanent flight clearance solutions. Upon notification of a requirement/issue (block 2 of enclosure 4)), the NAT will determine if a flight clearance is required (block 3). Planning is an iterative phase and may recur as the program matures.

(a) Stakeholders. The APMSE and/or IPT/Externally Directed Team (EDT) leadership are responsible for initiating planning, negotiating with technical area leadership to determine the specific individuals that will review the flight clearance, and documenting the outcome. The NAT determines the required TAE reviewers (block 4) and is empowered to adjudicate APMSE and TAE data requirement disagreements with the applicable technical leadership. The TAE reviewers, as well as applicable flight testers and project engineers should be included in the planning phase (block 5).

(b) Objectives. A flight clearance strategy, initial engineering assessment and data requirements must be determined between the appropriate stakeholders. The TAEs or their

designated representatives must attend the planning meeting or provide data. Flight Clearance planning should also identify what analyses, ground testing, and/or flight testing may be required. Test plans and associated test requirements are the responsibility of the test organization; however, test personnel should coordinate with the APMSE during flight clearance planning to ensure the flight clearance will meet test requirements. Flight Clearance planning is the responsibility of the APMSE or IPT/EDT lead and may be accomplished through meetings, telecons, emails, etc. (block 7). The TAEs or a delegated representative must participate in the planning event. Resulting documentation may include stakeholder list, Engineering/Data Requirements Agreement Plan (EDRAP), planning chop sheet, etc.

(1) Data Requirements. Data required to support a flight clearance shall be determined by the APMSE and TAEs, and shall be provided prior to the flight clearance request (blocks 8-12). The engineering data requirements may be incorporated into a contractual Statement of Work (e.g., Contract Data Requirements List (CDRL)) or in-house work agreement (e.g., EDRAP) when concurrence is reached (block 9).

(2) Cost and Schedule. The APMSE should present to stakeholders all aspects of the program, including program cost, schedule, risk, existing data, review cycles, final deliverables, and flight clearance need date.

(3) EDRAP. The EDRAP represents the negotiated written agreement established during the flight clearance planning process between the IPT/EDT leader and the TAEs. An EDRAP is required for any project required to conduct a Flight Readiness Review, in accordance with reference (u), and recommended for all other programs (block 10 of enclosure (4)). A sample EDRAP format is provided in enclosure (5).

(2) Request. All flight clearance requests shall be submitted to AIR-4.0P (block 13). The flight clearance request specifies the new configuration and/or usage limits or the desired changes to the existing flight clearances. Requests should specify a clearance need date that permits sufficient review time, dependent on the complexity of the modification. A flight clearance request should be tailored to the requirements of the specific type of flight clearance desired.

(a) For the RDT&E community aircraft and changes, an IFC will typically be requested. For Fleet assets and/or operations, a PFC (NATOPS and NATIP (or legacy TACMAN, if applicable)) should be requested. The PFCs provide standardized aircraft and weapon system operating procedures, limitations, technical data, and training requirements. The IFCs may be requested and issued on a temporary basis for Fleet use if a PFC solution is not appropriate.

(b) If any request is submitted in improper format or with no supporting data, the NAT may accept or deny the request, at their discretion. Upon data availability or request correction, the request may be resubmitted. If a program desires to cancel a flight clearance request, the cancellation must be in writing and be from the requestor or reference concurrence from the requestor.

(c) A flight clearance draft must be derivable from each request. The APMSE or IPT/EDT lead or their designated flight clearance facilitator will compose the draft flight clearance (block 15). The TAEs are responsible for providing technical input/content to the draft clearance to ensure that engineering requirements are properly and accurately communicated.

(3) Scope of Review. When the NAT receives a flight clearance request, they review it for thoroughness, check that all required engineering data has been referenced, check for any potential configuration problems, and log it into the NAVAIR flight clearance database (block 14). A chop sheet is created by AIR-4.0P to specify which technical areas are required to review the draft flight clearance. The chop sheet should reflect the pre-determined technical areas named in the planning phase unless the program details have changed. The NAT assigns the request to an appropriate flight clearance facilitator for action. The assigned flight clearance facilitator uses the chop sheet to determine the appropriate staffing of the draft flight clearance. The APMSE may provide additional input on the chops required, based on their knowledge of the flight clearance action being requested. AIR-4.0P shall make the final determination of required chops. AIR-4.0P may elect to issue a permanent or interim flight clearance, as appropriate, in lieu of what was requested.

(4) Review. AIR-4.0P provides direction and assigns competencies to execute the airworthiness review process in accordance with priorities communicated to AIR-4.0P by PMAs and senior NAVAIR leadership. Appropriate personnel, including TAEs, Fleet representatives, and program representatives execute a thorough review of the proposed flight clearance content and provide their comments and/or concurrence to AIR-4.0P.

(a) Engineering Review. The TAEs will review the draft clearance and supporting data, recommend changes, and will either concur, disapprove, or indicate Discipline not required (block 16). Each TAE will execute the process delineated by their technical area for flight clearance approval, tailored to that specific flight clearance. Engineers will work to support requested need dates and inform AIR-4.0P and the APMSE if there are issues with completing the review in that time period. Engineers may have many clearances in work and should work with appropriate APMSEs to prioritize their flight clearance workload.

(b) APMSE Review. The APMSE ensures the proper engineering has been accomplished, and decides if the outcome of the engineering review and changes made to the draft clearance meet the programmatic requirements (block 17). If not, the APMSE must work with the TAE who made the changes or the appropriate NAVAIR chain of command until an acceptable compromise is reached (block 19). If a compromise cannot be reached because either the data available does not support the flight clearance request or the desired changes to the draft flight clearance do not meet customer/program requirements, the APMSE either pursues resolution of the issue(s), which may include a risk assessment, or cancels the flight clearance request (block 22).

(5) Finalize Flight Clearance. The empowered Flight Clearance Releaser (FCR) verifies that the proper technical area TAEs have reviewed and concurred with the proposed flight clearance, including changes that were made during the review process (block 18). The FCR reviews the flight clearance for cross-competency coherence and executability. The format and content will also be reviewed by the FCR for completeness. If the draft flight clearance has the required maturity and fidelity, the document is approved by an empowered FCR. If the FCR determines that additional engineering review is required, the draft flight clearance will be routed through the additional necessary personnel. If technical modifications are made to the

proposed flight clearance, it will be routed back to the APMSE for concurrence.

(6) Release Flight Clearance. The final flight clearance is issued to the recipients detailed in the request. The flight clearance is posted to the Airworthiness website for archival purposes (block 20). If required, flight clearances addressed to a TYCOM may be readdressed to subordinate commands, at their discretion (block 21).

b. IFC-Specific Process. The approval and release of an IFC for both manned and unmanned aircraft follows the general airworthiness process defined above. The following paragraphs describe, in greater detail, specific steps/actions followed to yield an approved and issued IFC.

(1) IFC Planning

(a) Non-platform Requestors. If the request does not originate from a platform IPT leader, the platform IPT(s) must be notified to provide consensus prior to proceeding. The IPT/EDT leader should always coordinate with other platform/product IPT/EDT leaders as required (e.g., Weapons or Aircrew Systems class desks). If concurrence is not granted by the platform IPT leader, the ACC/Aircraft Reporting Custodian (ARC)/aircraft owner or requirements generator will be informed by the IPT/EDT leader and the flight clearance process will not be undertaken.

(2) IFC Request

(a) Create Request. The Fleet or IPT/EDT lead shall generate the IFC request in a seven-part or other NAT-approved format via Naval Message, airworthiness website flight clearance request tool, or a formal serialized signed memo(only when web-based request submittal is not feasible). Oral and email requests are generally not accepted. The request must be sent to the NAT for tracking and action. The content of the request is further detailed in the sample request provided in enclosure (6).

(b) Owner Concurrence. When the IPT/EDT drafts an IFC request, prior to an IFC request being forwarded to the NAT, the aircraft owner (i.e. TYCOM/ACC) must be contacted and must be in agreement with the use of their aircraft, as well any proposed

changes from prior IFCs. Documentation of this concurrence must appear as a reference in the flight clearance request.

(c) Test Aircraft Requests. For RDT&E programs using NAVAIR Aircraft Controlling Custodian (AIR-5.0D) aircraft or fleet aircraft that are under the control of the test wing, the IFC request shall be released by the appropriate Test Wing, AIR-5.0D, or their delegated authority. For Fleet aircraft under test, the Test Wing shall obtain TYCOM concurrence prior to submitting the request. OEM requests (for Defense Contract Management Agency (DCMA)) may be submitted directly to the appropriate Naval Test Wing Atlantic (NTWL)/Naval Test Wing Pacific (NTWP) Test Flight Clearance Officer (TFCO), after prior coordination with Class Desk and Platform Coordinator/Government Flight Test Director (GFTD).

(d) Request Exceptions. Requests sent to a Flight Clearance Releasing Authority (FCRA) may be in an approved non-standard format at the discretion of the approving FCRA. Formal IFC requests are required for re-issuance of expired clearances, changes/revisions to existing flight clearances (including issuing a test clearance to the Fleet), and cancellations of existing IFCs.

(1) Request Not Required. Cases when formal requests are not required include: readdressals, extension of time period for current IFCs, and flight clearance restrictions. These requests must be in writing, but the format may deviate from standard IFC requests. Extension requests must be from authorized individuals only and must have aircraft owner concurrence. Flight clearance restrictions requests may be submitted by other sources, but must have IPT concurrence.

(2) Status Message. If a fleet request is received that NAVAIR cannot currently support due to lack of data or funding, a Status message will be sent back to the requestor informing them who may help them resolve the issue.

(3) IFC Scope of Review. No deviations from the General Process Scope of Review.

(4) IFC Review.

a. Draft Clearance. The IPT/EDT leader or their designated flight clearance facilitator will compose a draft flight clearance document. This initial draft IFC will be the document that is routed to TAEs via a paperless flight clearance system for editing.

b. Risk Assessment. The NAT, APMSE, and TAE may also assess the technical risk this flight clearance may incur onto the program or the intended mission. Safety of flight, risk to personnel or non-program property, and probability of aircraft loss (due to questions regarding the airworthiness of the system) may all be assessed and a clearance may be issued stating these unusual factors/considerations. If analysis indicates that the system is safe with respect to personnel and non-program property, but based on the available data, there are questions regarding the airworthiness of the system, the clearance will be issued stating these concerns. When this type of clearance is issued, the decision to fly or not then becomes a programmatic and/or operational decision. In most cases, this type of IFC will be limited to RDT&E operations or Category 3 UAS IFCs.

(5) IFC Finalize Flight Clearance. No deviations from the General Process Finalize Flight Clearance.

(6) IFC Release Flight Clearance.

(a) IFC Release. The IFCs are issued by a FCR via Naval Message or official correspondence to the appropriate TYCOM/ACC/ARC/aircraft owner or test squadron. The IFC messages or memos are generally provided in a seven-part format; however other formats such as Excel spreadsheet, compatibility matrix, etc., are authorized when there is a more effective way to convey equal content (e.g. tables, graphs, pictures, etc.). A sample flight clearance is provided in enclosure (7). An electronically-approved copy may be faxed or emailed (if urgent) to addressees, and this is considered to be a valid flight clearance document.

(b) IFC Denial. An IFC request can be denied based on insufficient program support, execution, data, or other technical considerations. If a Fleet asset was to be used, the APMSE should inform the ACC/ARC/aircraft owner of program impact. If the program can be restructured, the APMSE must repeat the

process, commencing with the planning phase of the flight clearance process.

(c) IFC Flight Restriction. While AIR-4.0P does not issue grounding bulletins, it may issue restrictions to existing flight clearances (configuration, flight envelope). An IFC Flight Restriction is typically issued by AIR-4.0P via Naval Message or other approved distribution method and should specify the restriction to the current IFC or PFC, an explanation of the restriction, and conditions that would allow the restriction to be lifted.

c. NATOPS-Specific Process. The approval and release of NATOPS modifications follows the general airworthiness process defined above. The following sections describe in greater detail specific steps/actions to an approved NATOPS update. Additional details are found in Chapter 2 of reference (a).

(1) NATOPS Planning

(a) The effectiveness of the NATOPS program is dependent on the currency and accuracy of NATOPS publications. Any NATOPS publication user who notes a deficiency or an error is obligated to submit a change recommendation. The NAVAIR engineering competencies have an obligation to engage in the NATOPS change process to ensure the continued accuracy and currency of NATOPS publications.

(b) The AIR-4.0P and NAVAIR TAEs monitor the Naval Message traffic, IFCs, flight test report results, and other approved technical data sources, such as ECPs, for proposed changes to the current manuals.

(2) NATOPS Request

(a) General. NATOPS change recommendations are either Routine or Interim, depending on the urgency of the recommendation. Interim change recommendations are additionally categorized as either Priority or Urgent based on the consequence of the content of the change.

(1) Routine Change Recommendations. Routine change recommendations are those that do not require immediate issuance to the Fleet. Routine change recommendations are

submitted to AIR-4.0P and held within the database until addressed at the next NATOPS conference for that publication. If approved, the Routine change recommendations are promulgated to the user via a change or revision to the NATOPS product.

(2) Interim Change (IC) Recommendations. The IC recommendations are those that require near-term issuance to the fleet. Approved IC recommendations are promulgated to the fleet user via IC Naval Message and replacement pages. IC recommendations are divided into two categories, Urgent and Priority, based on the nature of the recommendation.

(a) Urgent change recommendations are changes that immediately affect safety of flight. Urgent change recommendations shall be generated any time a hazard has been identified and classified as high risk with respect to personal injury, property damage, or mission degradation, or if the situation involves the fundamental airworthiness of the aircraft or operating procedures likely to place flight personnel in immediate danger. Turnaround time goal for Urgent change recommendation release as an IC is three days from receipt of the recommendation.

(b) Priority change recommendations are changes that cannot be allowed to wait for implementation until after the next review conference. Priority change recommendations shall be generated any time a hazard has been identified that must be addressed in the short-term, but does not immediately impact safety of flight. Turnaround time goal for priority change recommendation release as an IC is 30 days from receipt of the recommendation.

(b) Change Recommendation. A change recommendation should be submitted to the web-based, interactive Airworthiness issues resolution and tracking system. The recommendation should be given an initial category of Routine, Priority, or Urgent based on the consequence of the change. If a recommendation is safety of flight related and needs to be defined as Urgent, additionally state so in the subject line and in the justification section.

(c) Initial NATOPS Model Manager Approval. Once a change recommendation is submitted, the NATOPS Program Manager reviews the change recommendation for appropriateness and

completeness. Incomplete change recommendations are returned to the originator for staffing to meet the required standards. The NATOPS Program Manager gives initial approval to execute the review process for the particular change. This initial approval is not concurrence for release of the change recommendation, but is instead approval for the recommendation to proceed into review. For Urgent change recommendations, this initial review shall be completed and forwarded within 24 hours of receipt of the notification email; for Priority change recommendations, this initial review shall be completed and forwarded within three days of receipt of the notification email.

(3) NATOPS Scope of Review. The Fleet Advisory Group is a required reviewer. There are no other deviations from the General Process Scope of Review.

(4) NATOPS Review

(a) Draft Development. Once initial approval to proceed is received from the NATOPS Program Manager, AIR-4.0P develops the draft change package for advisory group and technical review. If NATOPS source data is available, draft replacement pages may be generated as part of this package. Pen and ink changes may also be utilized. The review package is forwarded to the advisory group members for review, comment, and concurrence. Cognizant TAEs are included in the draft development and shall provide approved technical information and any recommended procedures.

(b) Approval of Technical Information. AIR-4.0P has cognizance over the content and layout specifications, all aircraft equipment limitations, flight envelopes, and technical data in NATOPS publications. The Fleet Model Manager has cognizance over all operating procedures, but must operate within the constraints of the technical limitations. Following receipt of a change recommendation that involves technical information, NAVAIR may issue an IC without further Fleet review, provided no operating procedures are involved.

(c) Cognizant Command Request for Release. The Cognizant Command (COG) shall review comments from the members of the advisory group and the Model Manager Unit (MMU) and then recommend final action to AIR-4.0P.

(5) NATOPS Finalize Flight Clearance

(a) All validated Fleet, TAE, and APMSE comments received during review are incorporated into the NATOPS update. A final quality assurance review of the content changes, as they would appear in the published NATOPS, is performed by the NATOPS Program Manager and APMSE.

(b) Upon receipt of the COG Command's recommendation for issuance, AIR-4.0P shall assemble the final NATOPS interim change package.

(6) NATOPS Release Flight Clearance

(a) Upon approval, NATOPS updates are promulgated via Naval Message release notification and posting of the changes to an AIR-4.0P-approved website-based electronic library. The release notification is addressed to the effected activities, summarizes the changed NATOPS content, and provides instructions for NATOPS modification and access to the released change in electronic format.

d. NATIP-Specific Process. The approval and publishing (release to the Fleet) of a change to a NATIP follows the general airworthiness process defined above. The following sections describe, in greater detail, specific steps/actions followed to yield an approved and published NATIP update.

(1) NATIP Planning. The effectiveness of the NATIP program is dependent on the currency and accuracy of specific T/M/S products. Any NATIP user who notes a deficiency or an error is obligated to submit an update recommendation. NAVAIR engineering competencies have an obligation to engage in the NATIP update process to ensure the continued accuracy and currency of NATIP. AIR-4.0P and NAVAIR technical areas will monitor the Naval Message traffic, IFCs, flight test report results, and other approved technical data sources such as ECPs for proposed changes to the current products. All NATIP update recommendations should be submitted via the web-based, interactive airworthiness issues resolution and tracking system at (https://airworthiness.navair.navy.mil). All NATIP update recommendations are prioritized by the T/M/S APMSE according to urgency, criticality or consequence of the content of the change, and availability of resources.

(2) NATIP Request. Update recommendations should be submitted via the web-based Airworthiness issue resolution system on the Airworthiness website. The recommending individual shall: provide a descriptive subject, specify the defect or update requirements, provide justification for the change and submit any supporting data or documentation. Once an update recommendation (issue) is submitted, the NATIP Program Engineer reviews the issue for appropriateness and completeness. Incomplete update recommendations will be returned to the originator for clarification and correction to meet the required standards. The NATIP Program Engineer will forward the issue to the affected NATIP Product Lead and APMSE for action (including prioritization and processing) of the particular issue. This initial action does not constitute concurrence with the issue or generate a flight clearance request, but is instead approval for the recommendation to proceed into planning and development. If the program does not originate from a platform APMSE, the platform APMSE must be notified to provide concurrence prior to proceeding. The platform APMSE should always coordinate with other product APMSE, as required (e.g., weapon APMSE). If concurrence is not granted, the requirement generator will be informed and the flight clearance process will not be initiated.

(3) NATIP Scope of Review. No deviations from the General Process Scope of Review.

(4) NATIP Review. The APMSE and TAEs develop the recommended update draft content for technical review. Cognizant TAEs are included in the draft development and shall provide approved technical information. The draft content is forwarded to the NATIP Production staff for incorporation into the NATIP format/web-based publishing tool in preparation for engineering review.

(5) NATIP Finalize Flight Clearance. All validated Fleet, TAE, and APMSE comments received during review are incorporated into the NATIP update by the NATIP production staff. Depending on the complexity of comments received, the APMSE may elect to perform a quality assurance review of the content changes as they would appear in the published NATIP, prior to release.

(6) NATIP Release Flight Clearance. Immediately upon approval, NATIP updates are promulgated via a release notification (normally Naval Message) and posting of the updated NATIP to an AIR-4.0P approved web-based electronic library. The release notification is addressed to the affected activities, summarizes the changed NATIP content, indicates the current product date, and provides instructions for accessing the product.

10. Responsibilities

a. AIR-00. AIR-00 is the DON Airworthiness Authority, in accordance with references (a) and (b).

b. AIR-4.0. AIR-4.0 is designated as the Technical Authority for all DON aircraft.

c. AIR-4.0P. AIR-4.0P Directorate is the single authority for the issuance of interim and permanent flight clearances for all DON aircraft systems and provides direction and tasking to NAVAIR competencies to execute the airworthiness process on behalf of AIR-00. The Directorate approves and oversees the processes used to issue flight clearances and empowers all NAT personnel using AIR-4.0P established standards and selection criteria. The level of empowerment and authorization to manage the flight clearance process is specified in the individual "Empowerment Letter" signed by the Director/Deputy/Flight Clearance Officer (FCO). These empowerment levels are defined below.

d. NAT. The NAT is the cross-competency group of AIR-4.0P empowered personnel dedicated to the processing, tracking, and issuance of NAVAIR Flight Clearances. Responsibilities of the NAT include:

(1) Ensuring that all applicable processes have been followed prior to issuing a flight clearance;

(2) Establishing the requested flight clearance need date as the work to date for issuing the final flight clearance;

(3) Maintaining a record of flight clearance actions (requests, issued clearances, denials, etc.);

(4) Managing the routing of draft flight clearances and distribution of issued flight clearance actions;

(5) Educating all participants on the flight clearance process;

(6) Informing leadership of airworthiness and safety of flight issues;

(7) Providing guidance and support to the aircraft system IPT / APMSE in the development of flight clearance strategy including planning meetings, EDRAP development, and/or an AQP development; and,

(8) Specific empowerment levels and/or responsibilities for NAT personnel are as follows:

(a) Airworthiness Authorities (AA). The Director/Deputy/Military FCOs are empowered as the AIR-4.0P AA and are responsible for all operations of AIR-4.0P and Airworthiness support for the DON. The AAs are authorized to release all DON flight clearances.

(b) Designated Airworthiness Authorities (DAA). The AIR-4.0P Chief Engineers and other designated personnel are empowered as DAAs to manage the interim and permanent flight clearance processes, ensure appropriate engineering reviews of all clearances, and are authorized to release all DON flight clearances.

(c) Test Airworthiness Agent (TAA). Test Flight Clearance Officers (TFCOs) are empowered as TAAs to manage the Test Wing flight clearance process, submit flight test clearance requests, ensure appropriate engineering reviews of flight test clearances, and are authorized to release all test flight clearances.

(d) Limited Airworthiness Agents (LAA). Flight Clearance Releasing Authorities (FCRAs) have limited empowerment as LAAs to manage and facilitate the flight clearance process, ensure appropriate engineering reviews, and release limited scope flight clearances.

(e) Flight Clearance Facilitators. Facilitators shall coordinate planning meetings, distribute data to TAEs,

create and route draft flight clearances, ensure all required TAEs and APMSE sign off on flight clearance actions, and prepare final flight clearance into appropriate format.

(f) NATIP Product Leads. The NATIP Product Leads serve as liaison between AIR-4.0P and the platform APMSE, maintain a report of all content requirements and defects against the product, and ensure comprehensive and timely development of NATIP updates.

(g) NATIP Program Engineers. The NATIP Program Engineers are Senior Airworthiness Engineers (SAE) and serve as liaison between AIR-4.0P, Platform APMSE and the NAVAIR cognizant technical areas on all NATIP product activity.

(h) NATOPS Program Engineers. The NATOPS Program Engineers are SAEs and serve as liaison between AIR-4.0P, Fleet NATOPS advisory group members, and the NAVAIR cognizant technical areas on all NATOPS conference activity.

(i) NATOPS IC Coordinator. The NATOPS IC Coordinator coordinates all NATOPS IC and Advance Change activity, including engineering and Fleet review and editorial support. The IC Coordinator also reviews ECPs for NATOPS effectiveness.

e. Program Manager, APMSE/IPT Lead, and/or EDT leader or delegate shall:

(1) Take ownership of flight clearance actions and priorities;

(2) Integrate flight clearance planning milestones to adequately prepare for major program evolutions such as first flight of a new weapon system or Fleet introduction, and provide funding for IFC, NATOPS, and NATIP actions;

(3) Implement the flight clearance process described herein for all configuration/envelope changes as defined in enclosure (8). The IPT leaders shall allocate budget and define the schedule for airworthiness assessments. IPT/EDT leaders shall manage the execution of the process and establish flight clearance priorities within the programs;

(4) Establish and maintain lines of communication to the customers and stakeholders during the execution of the flight clearance process and establish cross-competency consensus in the airworthiness assessment. The PMAs, PEOs, ACCs, NAT, contractors, TAEs, designers, testers, other APMSEs (including weapons, human systems, etc.) and the engineering team are all contributors to the success of this process;

(5) Develop, fund, acquire, maintain, and coordinate delivery of required technical data to the TAEs in support of airworthiness assessment for the flight clearance;

(6) Validate and track flight clearance requests;

(7) Assist AIR-4.0P in determining required set of TAEs;

(8) Conduct a planning meeting with AIR-4.0P and appropriate TAEs and develop an EDRAP. A sample EDRAP format can be found in enclosure (5);

(9) Coordinate a systems engineering review;

(10) De-conflicting engineering competency issues;

(11) Submit flight clearance requests when needed (with concurrence from the aircraft owner);

(12) Provide a flight clearance facilitator if workload requires; and,

(13) Be certified and attend training, in accordance with AIR-4.0P policy, to maintain certification. Refer to enclosure (9) for training requirements.

f. NAVAIR Competency Managers (Deputy Warrant Officers) and Division Heads (Technical Warrant Holders) shall:

(1) Establish and document certification requirements for personnel to perform airworthiness assessments as TAEs. The competency managers shall identify NAVAIR-certified personnel to support the IPT and staff the flight clearance engineering review team. All TAEs must be Airworthiness TAE certificate holders. Obtaining certification is contingent upon thorough knowledge and

understanding of the flight clearance process, including attendance at AIR-4.0P flight clearance training;

(2) Maintain accurate information in TAE database;

(3) Resolve prioritization conflicts for TAEs assigned to multiple programs;

(4) Ensure attendance at planning meetings;

(5) Assist APMSE and AIR-4.0P to resolve engineering conflicts;

(6) Budget for and manage program funding adequately to provide needed technical competency for all required tasks. If funding or other contingencies limit completion, manager shall personally intervene and resolve the issue with the APMSE or Program Manager. No fleet support-related flight clearance action shall be delayed or refused due to lack of funds, and work priorities will be worked aggressively to attempt to satisfy all customer needs;

(7) Be certified and attend training, in accordance with AIR-4.0P policy, to maintain certification. Refer to enclosure (9) for training requirements.

g. Airworthiness TAE Certificate Holder. This TAE (also called Performance Monitor, competency engineer, or Subject Matter Expert (SME)) shall:

(1) Be certified by the competency manager, and attend training, in accordance with AIR-4.0P policy, to maintain certification. Refer to enclosure (9) for training requirements;

(2) Attend planning meetings and integrate MIL-HDBK-516 into airworthiness requirements and decision making;

(3) Ensure compliance with all airworthiness-related instructions, processes and procedures;

(4) Establish and communicate the technical data requirements to determine the operating envelopes, limitations, cautions and special inspections required, based upon a specified configuration in an interim and/or permanent flight clearance.

Enclosure (10) contains examples of types of data typically required for each flight clearance application;

(5) Provide maximum airworthiness limitations possible with respect to safety of flight for a given configuration;

(6) Respond in a timely manner to all flight clearance actions. Open all flight clearance actions upon receipt and triage for criticality, scope, availability of required supporting data, and availability of support funding. If funding, work priorities or any other contingency prevention action in accordance with requested timeline; notify competency manager, APMSE, and AIR-4.0P. Work will continue while issues are being resolved;

(7) Document and record the airworthiness basis for their chop on each flight clearance. This basis defines what data and assumptions were used to assess the airworthiness of the aircraft configuration; and,

(8) Attend NATOPS conferences when requested by APMSE/AIR-4.0P.

h. Aircraft Owner (TYCOM/AIR 5.0D/EDT) shall: collect and prioritize requirements, submit accurate requests to AIR-4.0P for all configuration/envelope changes as defined in enclosure (8) and, participate in review process when appropriate.

i. Test Teams shall: scope IFC requests commensurate with planned tests; work with TAEs to define test requirements and identify test data/reports as necessary to support flight clearances and coordinate with APMSE for test data/report provisions to the TAEs.

j. OEMs. Submit requests when applicable, assist with data requirements as required. OEM shall provide appropriate flight manual content, at the request of the APMSE, and shall follow OPNAV procedures for interim and permanent flight clearance process execution. The OEMs shall use MIL-HDBK-516 to determine certification requirements in support of aircraft certification.

k. AIR NTTP Model Managers shall: Develop and maintain platform level tactics, techniques, and procedures for platforms assigned by NSAWC.

l. NATOPS Model Managers shall: Thoroughly review their assigned NATOPS products to ensure they contain the latest approved operating procedures and make appropriate recommendations on matters concerning the NATOPS manuals; and host NATOPS review conferences for their assigned NATOPS products.

m. NATOPS Program Managers shall: be responsible to the NATOPS Model Manager for specific duties in the maintenance of the assigned NATOPS products and acts as the Model Manager's single point of contact for NATOPS related issues; and coordinate with the appropriate AIR NTTP Model Manager when appropriate.

11. Definitions

a. Airworthiness Authorities (AA). AIR-4.0P Director/Deputy/Military FCO are responsible for all operations of AIR-4.0P and Airworthiness support for the DON. The AAs are empowered by AIR-00 and authorized to release all DON flight clearances.

b. Aircraft Controlling Custodian (ACC). A Naval administrative function within major commands exercising administrative control of assignment, employment, and logistic support of DON aircraft and engines, as assigned by the CNO.

c. Aircraft Owner. As used throughout this instruction, this term applies to the appropriate TYCOM, ACC, or ARC that is officially designated to represent DON ownership. In the case of UA/UAS procured, tested and/or managed outside of the established ACC/ARC structure, the term "UAS owner/sponsor" is defined as the head of the agency responsible for procuring and managing the system. Examples include the Marine Corps Warfighting Laboratory and the Naval Research Laboratory.

d. Aircraft Reporting Custodian (ARC). A Naval 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 necessarily imply or require physical custody.

e. Aircrew. Personnel located within the air vehicle with duties assigned to operate or assist in the aircraft system operation.

f. Aviation Life Support System (ALSS). Equipment required for aircrew to operate aircraft and for aircrew flight safety including aircraft escape system, special environmental protective system, personal parachute system, aviator's personal protective and survival equipment, aircrew mounted mission systems (e.g., night vision goggles), search and rescue gear, and aircraft fixed seat system. The man-mounted ALSS standard Configuration is identified in the Aviation Crew Systems Technical Manual for Aircrew Protective Equipment, NAVAIR Document 13-1-6.7-1.

g. Aircraft System. A manned or unmanned fixed wing, rotary wing, tilt rotor craft, vertical/short takeoff and landing air vehicle, or aerial target, including onboard hardware, firmware, and software, equipped with or without stores. Store loading is considered to be part of the aircraft system. The remote control station, UA launch and recovery, and data link systems for unmanned aircraft are also part of the aircraft system.

h. Commerical-Derivitive Aircraft (CDA)/Aircraft System. Any aircraft system of commercial origin having a basic design which can be adapted to perform specific DON operational or non-operational missions and which has been previously certified for commercial use by the FAA or other equivalent foreign agencies.

i. Designated Airworthiness Authorities (DAA). The AIR-4.0P Chief Engineers and other designated personnel who are empowered by AIR-00 and authorized to release all DON flight clearances.

j. Engineering Data Requirements Agreement Plan (EDRAP). The EDRAP represents the negotiated written agreement established during the flight clearance planning process between the IPT/EDT leader and the TAEs. The written plan shall contain a detailed description of the engineering data that the competencies require to establish the system airworthiness with confidence. It should be understood that not all characteristics of a system or planned test can be known well ahead of the system development or test plan development. Therefore some deviation from the original

EDRAP agreement should be expected as detailed knowledge of the system or test becomes available. A sample EDRAP format is provided in enclosure (5).

k. Firmware. Firmware is the programmable content of a hardware device, which can consist of machine language instructions for a processor, or configuration settings for a fixed-function device, gate array or programmable logic device. A common feature of firmware is that it can be updated post-manufacturing by electronic means (reprogramming).

l. Flight Clearance Facilitator. Individual tasked to assist in development and progression of the draft flight clearance as the document advances through the engineering review of airworthiness. Facilitators are generally aircraft platform specific and funded by the respective program office.

m. Flight Clearance Process. The process by which an independent engineering analysis is performed to provide assessment of airworthiness and safety of flight, and ensure that risk has been managed within acceptable bounds for the intended mission, resulting in issuance of a flight clearance.

n. IFC Flight Restriction. A type of message issued by AIR-4.0P as a quick tool for restricting operations (other then full grounding) for safety issues. It should specify the restriction to the current IFC or PFC, an explanation of the restriction, and conditions that would allow the restriction to be lifted.

o. Limited Airworthiness Agents (LAA). The FCRAs empowered by the AAs to release interim flight clearances at diverse levels of authority according to their experience and abilities. These empowered LAAs exist at various sites as required for convenience and operational efficiency.

p. Mission Equipment. Any piece of equipment (electrical or otherwise) on an aircraft that is used to fulfill an aircraft's particular mission or task during takeoff, flight and landing. Mission equipment may be carry-on/carry-off.

q. National Airworthiness Team (NAT). Represents the cross competency group of empowered personnel dedicated to the processing, tracking, and issuance of NAVAIR Flight Clearances.

Heading this group is the civilian Airworthiness Director. The empowered personnel at various sites, including AAs, DAAs, TAAs, and LAAs, in conjunction with the NAVAIR Airworthiness Office, AIR-4.0P support staff and facilitators constitute the NAT.

r. Nonstandard Configuration. Any aircraft system configuration, including stores, onboard avionics, and software not approved via published NAVAIR technical publications (maintenance manuals), TDs, NATIP/legacy TACMAN, or NATOPS. Published TDs include Formal Changes, Interim Changes, Rapid Action Minor Engineering Changes (RAMECs), and Bulletins in accordance with NAVAIR 00-25-300. Nonstandard configurations include but are not limited to changes in external configuration, changes to hardware, firmware, and/or software, modification/change in personal flight equipment, modification to an external store, or modification to payload, and changes to Ground Control Station hardware or software for an unmanned aircraft system.

s. Nonstandard Operating Envelope/Limits. Any operating envelope or limit not authorized by the NATOPS, NATIP (or legacy TACMAN), or NAVAIR-approved OEM operator's manual.

t. Operator. Personnel not located within the air vehicle with duties assigned to operate or assist in the aircraft system operation. Typically remote control station staff for UA/UAS.

u. Pre-accepted Aircraft. Any aircraft for which the final DD250, which accepts individual aircraft into the DON inventory under the guidelines of a specific contract, has not been executed by the Government, but for which the Government has assumed some of the risk of loss, destruction, or damage; or,

v. Software Levels. Changes to software and/or firmware are divided into levels according to type of change and what systems in the aircraft systems are affected.

(1) Direct Critical Software (Level I): Software and/or firmware products that:

(a) Directly control the flight dynamics of the aircraft. Examples are flight control computer software and engine control software;

(b) Directly control a flight critical system, provided there is not a backup system that is immediately available if the primary fails. Example is software within the Heads Up Display that controls how and where flight critical information is displayed when no backup attitude display is available;

(c) Provide flight critical data to a flight critical system provided there is not a backup system, that is immediately available if the primary fails. Examples are attitude and airspeed data provided by the inertial navigation system, and air data computer without secondary sources; or,

(d) Control the release timing of stores and/or the flight dynamics of stores within the stores separation region. Example is release timing software within the Stores Management Set.

(2) Indirect Critical Software (Level II). Software and/or firmware that provide critical data to flight critical systems and in-flight management systems that control primary warning or caution systems, fire suppression, stores release systems, essential attitude, and navigation instruments that have independent backup systems immediately available.

(a) Software and/or firmware that provide non-critical data to flight critical systems and in-flight management systems that control aircrew or operator advisories, stores release systems, and navigation instruments. Examples of indirect critical software and/or firmware include:

(b) F/A-18 Mission Computer, and Cockpit Display Software that is not flight critical (e.g., fuel displays or engine instruments that have an independent backup);

(c) Inertial Navigation Systems that have independent backup attitude systems immediately available; and,

(d) Environmental control systems with independent warning or caution systems.

(3) Non-Critical Software (Level III). Software and/or firmware that controls and/or provides data to perform non-flight

critical functions. Examples include radar warning receiver and fire control radar.

w. Store. Any device intended for internal or external carriage or mounted on aircraft suspension and release equipment, whether or not the item is intended to be separated in flight from the aircraft. Stores include missiles, rockets, bombs, mines, torpedoes, fuel tanks, and all types of pods and dispensers(e.g. before refueling, gun, electronic, cargo, bomblet, chaff, flare, chemical spray, aerial target). Items dispensed from pods and dispensers are part of the store and are subject to the applicable portions of the requirements herein. Aircraft thrust augmentation devices such as Jet Assisted Takeoff units or auxiliary engines, are not included. Specific equipment items mounted outside aircraft mold lines may be defined as a store by the procuring activity; for example, the PAVE PENNY and LANTIRN pods were considered stores even though they are mounted to special pylons not incorporating store suspension equipment.

x. Suspension Equipment. A device such as a rack, adapter, missile launcher or pylon, used for store carriage, employment and/or jettison.

y. Test Airworthiness Agents (TAA). The TFCOs manage the test flight clearance process and are empowered by the AAs to release all RDT&E interim flight clearances.

z. Termination of Flight. The point at which the air system is no longer under power at the completion of a mission, or the mission is concluded as a result of a crash landing or ejection.

aa. Type Commands (TYCOM). A Naval administrative organization that provides the Tactical Commands with the means to conduct tactical operations.

bb. Unmanned Aircraft (UA). A remotely piloted or autonomous air vehicle designed for purposes other than as a direct-to-target weapon of destruction. Targets, long-loiter weapons, and weapons originally designed to be aircraft are considered to be UA. Conventional missiles, cruise missiles, and guided bombs are not considered UA.

cc. Unmanned Aircraft System (UAS). A UA and its remote operating system. The operating system can be built into the vehicle or be part of the support equipment for remotely piloted vehicles. This "system" includes the remote control station, data links, flight control system, communications systems/links, UA-unique launch and recovery equipment, etc., as well as the air vehicle. The remote control station may be located on the ground (stationary or mobile), on a ship, submarine, aircraft, etc.

12. Acronyms. Enclosure (11) contains a list of acronyms used throughout this instruction and its enclosures.

13. Review. This instruction will be reviewed by AIR-4.0P annually to provide recommendations or cancellation to the Commander.

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References continued (from page 1)

(k) FAA/Armed Forces MOA for FAA Airworthiness Support for military Commercial Derivative Aircraft (CDA) of 05 Feb 2007
(l) Joint Service MOA for Mutual Acceptance of Airworthiness Data of 09 Oct 2007
(m) MIL-HDBK-516 of 01 Oct 2002
(n) NATIP Program Management Guide of 23 May 2006
(o) NAVAIRINST 5442.4 of 20 Jul 2007
(p) STANAG 4671 Unmanned Aerial Vehicles Systems Airworthiness Requirements of 2003 Sep 2009
(q) RCC 323-99 Range Safety Criteria for Unmanned Air Vehicles of Apr 2004
(r) FAA Order 7610.4N of 27 Aug 2009
(s) Academy of Model Aeronautics Safety Code of 2001 Jan 2006
(t) NAVAIRINST 4130.1D of 19 Dec 2006
(u) NAVAIRINST 4355.19D of 17 Apr 2009
(v) NAVAIRINST 13034.3 of 28 Jul 2006
(w) NAVAIRINST 5400.158A of 01 Jan 2007

UAS Flight Clearance Policy Notes and Examples

1. Unique UAS Flight Clearance Engineering Considerations. There are airworthiness considerations unique to UAS that must be considered in all three categories of flight clearance. Areas of consideration include, but are not limited to:

-Unique launch and recovery methods and equipment such as pneumatic launch, parachute, and net recovery;

-Datalink and/or GPS availability and reliability;

-UA operator workload and situational awareness of UA status and position relative to other aircraft within the airspace;

-Control of multiple UA from a single remote control station, including handoff of UA control between remote control stations;

-Environmental considerations such as robustness to icing and/or lightning; and

-Lost link contingencies including autonomous "return home" and flight termination.

2. Engineering and Data Requirement Tailoring Considerations for UAS. The level and amount of engineering and data requirements necessary for determining UAS airworthiness and/or safety of flight, as determined by the TAEs, may be affected by, but not limited to:

-Intended use, including the area of operation and airspace requirements (e.g., densely populated areas in civil airspace vice sparsely populated areas in a controlled test range);

-Airframe life for which the UA is designed (e.g., whether proof testing can be used in lieu of dedicated static testing);

-UAS owner/sponsor acknowledgement of a higher probability of loss of the UA (sometimes referred to as "expendability" of the UA);

-Risks associated with operating the UA in close proximity to the remote control station, personnel, property or other equipment;

-Requirement of the UA to recover from stall, spins or departures;

-Weapons carriage and/or release;

-Operations to, from, or near ships;

-Whether direct overflight of densely populated areas is required vice conducting operations at a slant range;

-Guidance, navigation, and control accuracy requirements (e.g., requirement for the UA to stay contained in a specified area);

-Landing precision requirement (e.g., whether differential Global Positioning System (GPS) or beam-following systems will be used to improve landing accuracy for shipboard or land-based operations);

-Requirement to operate in certain weather conditions (e.g., lightning, gusts, icing, etc.); and,

-Requirement to operate in proximity of various radio frequency (RF) emitters.

3. Data Requirements for Category 3 UAS Flight Clearance

a. The data requirements for a Category 3 flight clearance will vary significantly, based on the proposed location for UA flight. For example, the data requirements to fly a UA in Active Restricted airspace (or in a Warning Area) over an unpopulated or sparsely populated area monitored by range safety personnel may be limited to a completed reference (q), Range Commander's Council RCC 323-99 Range Safety Questionnaire, and assessment of risks to people and property on the ground as well as detrimental effects to the environment and potential for the UA to stay within the approved area of operation. Because a higher probability of loss of the UA is acknowledged and because the UA will be flown in a controlled environment, a reduced number of engineering disciplines may be required to review the data and

concur with the flight clearance. For example, a review of this nature could consist of System Safety certifying that risks to people, property and the environment are acceptable; Electromagnetic Environmental Effects, certifying that external RF does not create an unsafe situation; Flight Controls, certifying that the UA will not fly outside of the approved area; and Human Systems and/or Avionics System Engineering will certify that loss of link procedures are adequate.

b. In comparison, for a proposed Category 3 flight clearance where UA flight occurs over populated areas or in a shipboard environment, the data requirements will be closer to that of a Category 2 Flight Clearance, and a larger complement of engineering disciplines will be required to review the data and concur with the flight clearance.

4. Statements of Airworthiness in Support of a COA

a. Within the U.S., a COA is usually required for flight outside of Restricted and/or Warning areas. Flight clearances normally state that flight outside of Restricted and/or Warning areas is prohibited. To ensure adequate TAE review, the APMSE must indicate in the flight clearance request if the flight clearance is intended to support a COA application. The following statements are typically used to fulfill the FAA's requirement for an airworthiness statement for a COA:

-For Category 1 UAS flight clearances, the following statement should appear in paragraph 7:
"PER NAVAIRINST 13034.1D, THIS IFC PROVIDES NAVAIR CATEGORY 1 AIRWORTHINESS CERTIFICATION SUBSEQUENT TO A DESIGN ENGINEERING REVIEW."

-For Category 2 UAS flight clearances, the following statement should appear in paragraph 7:
"PER NAVAIRINST 13034.1D, THIS IFC PROVIDES NAVAIR CATEGORY 2 AIRWORTHINESS CERTIFICATION SUBSEQUENT TO A DESIGN ENGINEERING REVIEW."

-For Category 3 UAS flight clearances, the following statement should appear in paragraph 7:
"PER NAVAIRINST 13034.1D, THIS IFC PROVIDES NAVAIR CATEGORY 3 AIRWORTHINESS CERTIFICATION SUBSEQUENT TO AN ENGINEERING REVIEW."

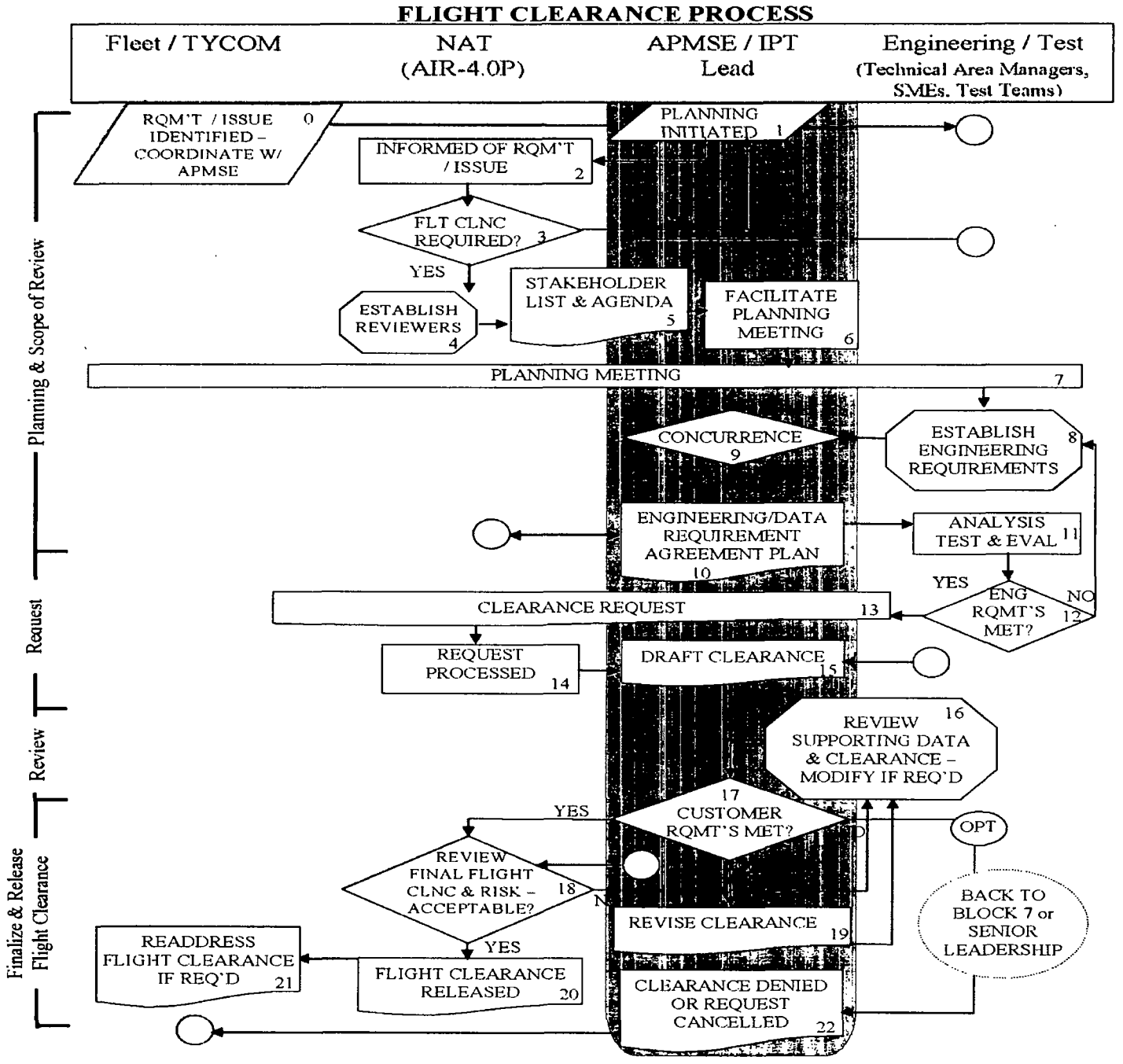
b. Any operational and/or airspace restrictions in the Category 2 or 3 UAS flight clearances must be consistent with the operations proposed in the COA application.

FLIGHT CLEARANCE GENERAL PROCESS

Process Phase	Responsible Party	Process Duties
Planning	APMSE / IPT Lead	Initiate planning; provide info about proposed FC to all stakeholders; determine flight clearance strategy (IFC, PFC); advise on existing data; come to consensus with TAEs on data requirements; document planning agreements (including EDRAP); obtain supporting data prior to request; reinitiate additional planning as needed.
	Fleet/TYCOM	Coordinate with APMSE; specify requirements.
	NAT (AIR-4.0P)	Provide planning chop sheet; attend and provide strategy and assessment guidance at planning meeting; update planning chop sheet as needed.
	TAEs	Assess proposed flight clearance; provide necessary testing/data requirements; participate in planning
	Deputy Warrant Officers	Empower TAEs for subject technical areas.
	Test Team	Participate in planning activities. Provide data/input.
Request	APMSE / IPT	Submits or cancels requests (with TYCOM concurrence for IFC); determines need date; provides input for Test requests.
	Fleet/TYCOM	Submits requests or provides concurrence; provides need date; cancel requests if no longer needed.
	NAT (AIR-4.0P)	Receives all flight clearance requests; denies if content not acceptable.
	TAEs	Submits recommendations for change to existing FCs.
	Test Wing	Submits requests and/or cancels requests for AIR-5.0D aircraft.
Scope of Review	APMSE / IPT	Recommend required reviewers
	Facilitator	Determine specific TAEs based on approved chop sheet
	NAT (AIR-4.0P)	Review request; determine required reviewers; create chop sheet
Review	APMSE/IPT	First to review; develop draft clearance content; assess program and technical risk; work disagreements up applicable NAVAIR chain of command; last to review before Finalize Flight

Process Phase	Responsible Party	Process Duties
		Clearance phase.
	Facilitator	Format draft clearance.
	Fleet/TYCOM	Review, ensure flight clearance is usable.
	NAT (AIR-4.0P)	Assist in reconciling review conflicts.
	TAE	Review draft clearance; provide timely input; approve, disapprove, or determine chop not required; identify risk for delegated technical area.
	Deputy Warrant Officers	Prioritize workloads for TAEs; reconcile TAE-IPT flight clearance content disagreements.
Finalize Flight Clearance	NAT (AIR-4.0P)	Provide comprehensive engineering review of final clearance; assess risk; ensure all required chops complete and all inputs are in agreement; ensure clearance is coherent, executable, and any abnormal risks are clearly documented.
Release Flight Clearance	Fleet/TYCOM	Readdress flight clearance as required to subordinate activities.
	NAT (AIR-4.0P)	Issue or deny flight clearance; post to website.

MAR 15 2010


FLIGHT CLEARANCE PROCESS
Fleet / TYCOM
NAT (AIR-4.0P)
APMSE / IPT Lead
Engineering / Test (Technical Area Managers, SMEs, Test Teams)
Planning & Scope of Review
Request
Review
Finalize & Release Flight Clearance
RQM'T / ISSUE IDENTIFIED – COORDINATE W/ APMSE 0
PLANNING INITIATED 1
INFORMED OF RQM'T / ISSUE 2
FLT CLNC REQUIRED? 3
YES
ESTABLISH REVIEWERS 4
STAKEHOLDER LIST & AGENDA 5
FACILITATE PLANNING MEETING 6
PLANNING MEETING 7
CONCURRENCE 9
ESTABLISH ENGINEERING REQUIREMENTS 8
ENGINEERING/DATA REQUIREMENT AGREEMENT PLAN 10
ANALYSIS TEST & EVAL 11
YES
ENG RQMT'S MET? 12
NO
CLEARANCE REQUEST 13
REQUEST PROCESSED 14
DRAFT CLEARANCE 15
REVIEW SUPPORTING DATA & CLEARANCE – MODIFY IF REQ'D 16
CUSTOMER RQMT'S MET? 17
YES
OPT
REVIEW FINAL FLIGHT CLNC & RISK – ACCEPTABLE? 18
REVISE CLEARANCE 19
BACK TO BLOCK 7 or SENIOR LEADERSHIP
YES
READDRESS FLIGHT CLEARANCE IF REQ'D 21
FLIGHT CLEARANCE RELEASED 20
CLEARANCE DENIED OR REQUEST CANCELLED 22

SAMPLE EDRAP FORMAT

At a minimum, the plan shall contain:

(1) Program description;

(2) Names of the IPT/EDT engineering members and point of contact for each subject element (structures, Flying Qualities and Performance, etc.);

(3) Names of the TAEs as determined by IPT/EDT/competency management;

(4) Platform Point of Contact;

(5) Engineering program schedule;

(6) Proposed need dates for flight clearances;

(7) Proposed air vehicle configuration for flight clearances;

(8) Proposed operating limitations/envelopes for flight clearances;

(9) Anticipated Impact to Permanent Flight Clearance (NATOPS and/or NATIP);

(10) Identification of flight clearance facilitator;

(11) Identification of IPT personnel responsible for the draft flight clearance request;

(12) Data element list required for each technical specialty;

(13) Technical issues of concern, unknowns and risk items and their potential schedule impacts;

(14) Signature page with the IPT/EDT leadership, the NAT representative and the TAEs; and,

(15) Date of issue (to include a revision numeral, if a revision occurred).

MAR 15 2010

SAMPLE INTERIM FLIGHT CLEARANCE REQUEST

FROM: IPT, TYCOM/ACC/ARC, or Test Wing
TO: COMNAVAIR PATUXENT RIVER MD//AIR-4.0P//
INFO: COMNAVAIRFOR, COMNAVAIR, or others as appropriate
SUBJ/FLIGHT CLEARANCE REQUEST FOR (aircraft T/M/S, with X mod)
REFERENCES: as needed TYCOM Concurrence (name and date), drawings, data, flight manuals, previous flight clearance

RMKS/1. REQUEST FLIGHT CLEARANCE FOR (aircraft T/M/S, store nomenclature, modification identification, scope and purpose, test program, squadron, TYCOM Designated or BUNO as applicable).

2. REQUESTED TAKEOFF CONFIGURATION: In accordance with (IAW) X (list documents on which you are basing the aircraft configuration such as NATOPS, NATIP, etc.) with the addition of X modification (per reference). Must identify the configuration change with drawings, draft ECP packages, part numbers, dated references, etc, to ensure that specific configuration is reviewed for airworthiness.

3. REQUESTED LIMITS/FLIGHT ENVELOPE: IAW X (list documents on which you are basing the aircraft limits such as NATOPS, NATIP, etc.) and X (can be a reference). Limitations can include: airspeed, altitude, mach number, acceleration, dive angle, store carriage/release, non-standard limits, and aircraft carrier testing.

4. REQUESTED WARNINGS/CAUTIONS/NOTES: Any specific Warnings, Cautions, or Notes, as defined in 3710.7U that should be included in the final flight clearance for aircrew awareness.

5. NEED AND EXPIRATION DATES: Need date for clearance, and recommended expiration date, or valid until incorporation into NATOPS/NATIP if system testing is complete and going to fleet.

6. Point of Contact: Name, organization, phone number, and email for requester, technical, and program points of contact.

7. SUPPORTING DATA/OTHER REMARKS: Title, location, and availability of engineering/test/simulation data, ECPs, test plan/reason for flight test, etc. Reference to EDRAP and/or list of chops recommended or determined at planning stage. Other remarks: whatever else will help get the clearance approved,

b. Any operational and/or airspace restrictions in the Category 2 or 3 UAS flight clearances must be consistent with the operations proposed in the COA application.

SAMPLE INTERIM FLIGHT CLEARANCE MESSAGE FORMAT

PTTUZYUW RULSABU1234 XXXXXXX-UUUU-RHMCSUU.
ZNR UUUUU
P DATE-TIME-GROUP ZYB
FM COMNAVAIR PATUXENT RIVER MD//4.0P//
TO COMNAVAIRFOR SAN DIEGO CA//N421G//
INFO PEOTACAIR PATUXENT RIVER MD//PMAXXX//
COMNAVAIR PATUXENT RIVER MD//5.0D/4.0P//
BT
UNCLAS //N13034//
MSGID/GENADMIN/COMNAVAIR/4.0P//
SUBJ/INTERIM FLIGHT CLEARANCE FOR AIRCRAFT T/M/S WITH MODIFIED /XXXX INSTALLED//
REF/A/MSG/COMNAVAIR/DTG//
REF/B/MSG/COMNAVAIR/DTG//
REF/C/DOC/CONTRACTOR/DATE//
REF/D/DOC/NAVAIR/DDMMMYYYY//
REF/OTHERS AS APPLICABLE.
NARR/REF A IS FLIGHT CLEARANCE REQUEST. REF B IS PREVIOUS FLIGHT CLEARANCE FOR MODIFICATION XXX. REF C IS DATA PACKAGE FOR MODIFICATION XXX. REF D IS NAVAIRINST 13034.1D, NAVAIR FLIGHT CLEARANCE POLICY FOR AIR VEHICLES AND AIRCRAFT SYSTEMS. REF OTHERS AS APPLICABLE.//
RMKS/1. IRT REF A, THIS FLIGHT CLEARANCE CANCELS REF B AND IS GRANTED FOR AIRCRAFT T/M/S WITH MODIFICATION XXX, SUBJECT TO NATOPS AND NATIP AND THE FOLLOWING LIMITS AND CONDITIONS.
2. TAKEOFF CONFIGURATION: IAW NATOPS/NATIP, APPLICABLE REFERENCES, OTHER APPLICABLE NAVAIR FLIGHT CLEARANCES, AND THE FOLLOWING EXCEPTIONS: MODIFICATION XXX AS DEFINED IN REF C.
3. LIMITS: IAW NATOPS, APPLICABLE REFERENCES, OTHER APPLICABLE NAVAIR FLIGHT CLEARANCES, AND AS FOLLOWS: LIMITS XXX
4. WARNINGS, CAUTIONS, AND NOTES: AS NEEDED
5. TIME PERIOD: THIS FLIGHT CLEARANCE EXPIRES DD MMM YYYY.
6. POINTS OF CONTACT:
A. NAVAIR: CLASS DESK, NAME, PHONE NUMBER, EMAIL
B. CNAF: NAME, PHONE NUMBER, EMAIL
C. FLIGHT CLEARANCE FACILITATOR: NAME, PHONE NUMBER, EMAIL
7. OTHER REMARKS:
A. REQUEST TYCOMS READ FLIGHT CLEARANCE AS APPROPRIATE.
B. PER REF C, THIS FLIGHT CLEARANCE PROVIDES NAVAIR AIRWORTHINESS CERTIFICATION SUBSEQUENT TO A DESIGN ENGINEERING REVIEW. IT DOES NOT AUTHORIZE AIRCRAFT/SYSTEM MODIFICATION, NOR DOES IT SATISFY NAVAIR REQUIREMENTS FOR CONFIGURATION MANAGEMENT.

REFER TO OPNAVINST 4790.2J FOR POLICY GUIDANCE ON CONFIGU ON MANAGEMENT AND MOD AUTHORITY.

C. EPOWER FOLDER 123456, TRACKING NUMBER 12345// BT

CONFIGURATION AND ENVELOPE CHANGES REQUIRING A NEW FLIGHT CLEARANCE

(A) New/Modified Configuration. Examples of configuration changes requiring a flight clearance include, but are not limited to:

(1) Structural and material changes.

(2) Modification to the exterior contour/mold line of the air vehicle (addition/removal of antenna, wing fence, ventral fin, vortex generator, air induction system, auxiliary inlets, etc.).

(3) Carriage and release of stores, mixed loads, out of sequence release, or expanded limitations not specifically authorized by NATIP/legacy TACMAN or NATOPS. This shall include:

(a) deviations in store mass properties that exceed limits by the following; weight +/- 5%, center of gravity (CG) +/- 0.5 inches, and mass moments of inertia +/- 10%;

(b) changes in autopilot software affecting separation characteristics;

(c) changes in structural properties affecting load paths; and,

(d) modification to weapons release/firing system, including stores management system and associated weapon software.

(4) Any changes in software. Software changes are divided into different levels (as defined in paragraph 11 of the instruction).

(a) Subsystem modifications that do not interface or affect flight operations, propulsion, or weapons control, such as User Data Files changes generally do not require a flight clearance, however, in this case the aircraft platform class desk shall have written certification from the subsystem development lead, or weapon and/or store software IPT lead stating that there is no aircraft interface or airworthiness concern.

(b) Flight clearances can be issued to allow undefined changes in software versions without the need to obtain a new flight clearance, referred to as 'green box' clearances. These will be considered on a case by case basis and are generally only authorized for flight testing of a software system that does not interface with the primary systems of the aircraft and/or due to the software architecture changes to that system can not affect the airworthiness of the aircraft. Flight clearances can also be granted to allow several defined versions of software to be interchanged or to allow defined changes in software gains or parameters.

(c) Fleet software releases are issued by OPNAV rather then AIR-4.0P.

(5) Modification to the flight control system, including software revisions within the flight control system or within systems that provide data to the flight control system.

(6) New or modified propulsion system or its control system, including software.

(7) Modification of the displays, annunciation or critical information presented to the aircrew or operator which may affect situational awareness, aircraft control, weapon/store release and weapon system employment.

(8) Installation of equipment, including Non-Developmental Items (NDI) or Commercial-Off-The-Shelf (COTS) systems, mounted to the air vehicle (whether interior or exterior) that is not part of the configuration authorized by NATOPS.

(9) Any change to a UAS or target system. This "system" includes the remote control station, data links, flight control system, communications systems/links, UA-unique launch and recovery equipment, etc., as well as the air vehicle. Changes include both hardware, firmware and/or software. A flight clearance is only required under these circumstances when the UA or target air vehicle is DON owned or leased regardless of the ownership of any other part of the "system". A flight clearance is not required when a change is made to any part of the "system" (DON owned or not) unless the air vehicle is also DON owned/leased.

(10) Modification of the ALSS.

(11) Modification of any aircraft subsystem interfacing with and affecting flight operations, propulsion, or weapons control, e.g., mission computer, radar, and navigation, warning systems.

(a) With regard to mission planning systems: When required, flight clearances for mission planning systems shall be requested by the platform making use of the system. If a mission planning system produces an artifact that, when loaded into the aircraft computer, affects flight controls, autopilot, automatic weapons release, etc. that is not already covered in NATOPS/NATIP or another flight clearance document, then a flight clearance is required. When no airworthiness or safety of flight impact is present, no flight clearance is required. For mission planning systems the platform class desk officer shall determine the need for a flight clearance with input from the weapons and/or mission planning system class desk. If the platform class desk has any doubt, the class desk should request advice from AIR-4.0P. AIR-4.0P will provide advice according to prevailing policy and best engineering practices.

(12) Carry-on, carry-off, Roll-on, Roll-off equipment that either interfaces directly with aircraft systems and/or has potential to interfere with aircraft systems, including mission related electronic and/or battery powered devices of any kind. Additionally, crew/passengers shall not operate non-mission related electronic equipment/battery powered devices such as radios, tape players, razors, calculators, etc, without approval of the pilot in command while the aircraft is in flight. Cellular telephones shall not be operated in Naval aircraft while airborne IAW FCC regulations.

(13) Flight test instrumentation, including, but not limited to wingbooms, nosebooms, sensitive gauges and camera pods. For a new/modified Envelope, examples of flight envelope changes requiring a flight clearance include, but are not limited to:

(a) Envelope expansion, evaluation of crosswind landing or wet runway landing limits, IMC flight (reference (v)), emergency procedures, structural or flight control limits, wind envelopes, dynamic interface limits, air show procedures, or helicopter external lift/cargo hook system/tow limits.

(b) Use of flight test techniques and/or procedures that are non-standard. Non-standard techniques/procedures are those that are planned for flight test and are not generally accepted by the aviation community in a formal publication such as the United States Naval Test Pilot School or USAF Flight Test Manuals, equivalent Non-DoD Government Agency Manuals (such as NASA), published Industry Standards, or DON program unique flight test practices and guidelines agreed to between the appropriate technical area and the test team such as those delineated in the F/A-18E/F Maneuver Test Library. Examples of "standard" techniques include pitch/roll/yaw doublets at constant frequency or amplitude. Example of "non-standard" technique would include a pitch/roll/yaw doublet at increasing frequency and amplitude.

(c) Intentional operation in degraded mode for test purpose not covered by NATOPS (e.g., simulation of partial loss or malfunction of flight control system, engine, avionics, etc.), this includes testing of the failure mode and establishing limits and envelopes for this mode.

FLIGHT CLEARANCE KEY PLAYERS REQUIREMENTS

APMSE

MINIMUM

- AIR-4.1 empowerment
- AIR-4.0P Airworthiness Process and Procedures course (8hr) (every 3 years)
- Instruction on the web-based NAVAIR flight clearance tool

RECOMMENDED

- Instruction on chop sheet input
- Instruction on flight clearance request generation

COMPETENCY MANAGERS

MINIMUM

- AIR-4.0 empowerment
- AIR-4.0P Airworthiness Process and Procedures course (8hr) (every 3 years)
- Instruction on the web-based NAVAIR flight clearance tool
- Instruction on airworthiness website POC maintenance.

TAES

MINIMUM

- Competency empowerment with APMSE and AIR-4.0P concurrence
- AIR-4.0P Airworthiness Process and Procedures course (8hr) (every 3 years)

RECOMMENDED

- Instruction on web-based Airworthiness issue resolution system

FLIGHT CLEARANCE FACILITATORS

MINIMUM

- Supporting Platform APMSE empowerment with AIR-4.0P concurrence (unless a AIR-4.0P facilitator, in which case they will be empowered by AIR-4.0P.)
- AIR-4.0P Airworthiness Process and Procedures course (8hr) (every 3 years)
- Instruction on the web-based NAVAIR flight clearance tool
- Instruction on the web-based Airworthiness issue resolution system
- Monthly attendance at AIR-4.0P Facilitator Training session.

OEM, AND/OR INTEGRATED TEST TEAM MEMBERS

RECOMMENDED

- AIR-4.0P Airworthiness Process and Procedures course (8hr)

- Instruction on the web-based NAVAIR flight clearance tool
- Instruction on web-based Airworthiness issue resolution system

INFORMATION REQUIRED FOR DETERMINATION OF FLIGHT OPERATING LIMITATIONS

1. Introduction. The following is a compilation of the data typically required for the determination of flight operating limits for non-standard aircraft system configurations, including proposed store loadings, and expansions to the operating envelope. (This list does not include all possible data requirements for all flight clearance applications, nor are all data listed required for each application. The NAT, in cooperation with cognizant engineers, will determine the applicability and tailor the data requirements for each specific application.) The MIL-HDBK-516, reference (m), provides a more detailed list of typical data requirements for DON, USAF, and USA approvals.

a. Descriptive:

(1) A complete description of proposed modification or operation, including aircraft configuration, store loadings, flight envelope, and store carriage/employment/jettison envelope;

(2) Three-view drawings, including all dimensions, materials, and physical/geometric/kinematics clearances;

(3) Air vehicle and stores weight and balance data, and appropriate mass moments of inertia;

(4) Air vehicle electrical wiring diagrams;

(5) Description of store arming/tail banding wiring configuration;

(6) Software architecture and version description documents and a listing of associated computer software configuration items;

(7) Assembly drawings of ALSS equipment;

(8) Drawings detailing installation of test instrumentation;

(9) Store release/launch event timelines, delays, and activation;

(10) The largest center of gravity shift during a store drop/launch, fuel jettison/burn, or airborne refueling; and,

(11) The location of onboard instruments, e.g., angle-of-attack, mach, airspeed, etc.

b. Analysis (reports that detail the following):

(1) Design criteria;

(2) Air vehicle loads, store loads, and strength;

(3) Vibrations, flutter, and divergence;

(4) Vibration, thermal, and acoustic fatigue;

(5) Electrical loads;

(6) Effects on aircraft performance;

(7) Effects on air vehicle stability and control, including flight control system failure or degraded mode effects;

(8) Stores separation characteristics, including miss distances;

(9) Store autopilot or aircraft stability augmentation system function changes;

(10) Aircraft or store control system mechanism dynamic effects;

(11) Effects on air vehicle spin and stall recoveries;

(12) Effects on air vehicle ALSS;

(13) Software change hazard analysis; and,

(14) Effects of normal operation and failures of test instrumentation on air vehicle systems, stores and stores employment, and ALSS operation, including:

a. Electromagnetic interference;

(10) The largest center of gravity shift during a store drop/launch, fuel jettison/burn, or airborne refueling; and,

(11) The location of onboard instruments, e.g., angle-of-attack, mach, airspeed, etc.

b. Analysis (reports that detail the following):

(1) Design criteria;

(2) Air vehicle loads, store loads, and strength;

(3) Vibrations, flutter, and divergence;

(4) Vibration, thermal, and acoustic fatigue;

(5) Electrical loads;

(6) Effects on aircraft performance;

(7) Effects on air vehicle stability and control, including flight control system failure or degraded mode effects;

(8) Stores separation characteristics, including miss distances;

(9) Store autopilot or aircraft stability augmentation system function changes;

(10) Aircraft or store control system mechanism dynamic effects;

(11) Effects on air vehicle spin and stall recoveries;

(12) Effects on air vehicle ALSS;

(13) Software change hazard analysis; and,

(14) Effects of normal operation and failures of test instrumentation on air vehicle systems, stores and stores employment, and ALSS operation, including:

a. Electromagnetic interference;

b. Integrity of structures modified for instrumentation installation; and,

c. Physical interference/clearance.

(15) System safety hazard analysis;

(16) Hazards of Electromagnetic Radiation to Ordnance (HERO) Analysis, including restrictions, safe separation distances, and HERO Emission Control bill (per NAVSEA OP 3565);

(17) Powerplant effects;

(18) Data links; and,

(19) Flight termination system vulnerability.

c. Testing (reports that detail the following):

(1) Laboratory and ground testing;

(2) Air vehicle/stores compatibility (fit check, electrical interface, arming wire/clip/tail band, etc.);

(3) Static ejection and gun/rocket/missile firing;

(4) Store separation and jettison (wind tunnel);

(5) Ground vibration frequency (including ground resonance for rotary wing and rotorcraft) and modal survey;

(6) Electromagnetic effects, including HERO (per NAVSEA OP 3565);

(7) Stability and control, flying qualities, and performance (wind tunnel);

(8) Thermal, vibration, and acoustic fatigue;

(9) Environmental;

(10) Structures static and fatigue;

(11) Aircrew restrictive code effects (per NAVAIRINST 3710.9A, Anthropomorphic Accommodation in Naval Aircraft);

(12) Man-mounted ALSS equipment compatibility/tolerance tests;

(13) Escape system compatibility;

(14) Cockpit lighting/instrument lighting and readability;

(15) Aircrew or operator displays, including software change effects;

(16) Software formal qualification and regression testing;

(17) Flight control integration testing (lab and ground);

(18) Test instrumentation compatibility;

(19) Powerplant effects; and,

(20) Cockpit transparencies and transmissivity.

d. In-Flight Testing (reports that detail the following):

(1) Stores captive carriage;

(2) Store carriage loads;

(3) Stores separation and jettison;

(4) Weapon delivery data (ballistics, safe escape, etc.);

(5) Carrier suitability (catapults and arrestments);

(6) Flutter and divergence;

(7) Acoustic and vibration environment;

(8) Loads and stress survey;

(9) Electromagnetic compatibility/electromagnetic interference;

(10) Flying qualities, and stability and control;

(11) Aircraft performance;

(12) Engine, transmission, auxiliary power unit, and cross shaft performance;

(13) Escape/egress system compatibility;

(14) Aircrew or operator displays;

(15) Flight controls, including software change effects;

(16) Effects of forward firing ordnance on engine operation, including surge and restart envelope;

(17) Software, including effects on aircrew or operator displays; and,

(18) Air vehicle subsystems performance.

ACRONYMS

AA - Airworthiness Authority
ACC - Aircraft Controlling Custodian
AGL - Above Ground Level
ALSS - Aviation Life Support Systems
AMA - Academy of Model Aeronautics
APMSE - Assistant Program Manager for Systems Engineering
AQP - Airworthiness Qualification Plan
ARC - Aircraft Reporting Custodian
ASN(RDA) - Assistant Secretary of the Navy for Research, Development and Acquisition
CAS - Commercial Air Services
CDA - Commercial Derivative Aircraft
CDRL - Contract Data Requirements List
CNAF - Commander Naval Air Forces
CNO - Chief of Naval Operations
COA - Certificate of Authorization
COG - Cognizant Command
DAA - Designated Airworthiness Authority
DCMA - Defense Contract Management Agency
DHS - Department of Homeland Security
DON - Department of Navy
DT - Developmental Testing
EDRAP - Engineering Data Requirements Agreement Plan
ECP - Engineering Change Proposals
EDT - Externally Directed Team
FAA - Federal Aviation Administration
FCC - Federal Communications Commission
FCO - Flight Clearance Officer
FCP - Flight Certification Plan
FCR - Flight Clearance Releaser
FCRA - Flight Clearance Releasing Authority
FOT&E - Follow-on Operational Test and Evaluation
HERO - Hazards of Electromagnetic Radiation to Ordnance
HRA - Hazard Risk Analysis
HRI - Hazard Risk Index
IC - Interim Change
IPT - Integrated Product Team
IFC - Interim Flight Clearance
IMC - Instrument Meteorological Conditions
ITT - Integrated Test Team
JPO - Joint Program Office
LAA - Limited Airworthiness Agent

MAR 15 2010

LTE - Lead Test Engineer
MIL-HDBK - Military Handbook
MMU - Model Manager Unit
NAMP - Naval Aviation Maintenance Program
NAS - National Airspace System
NASA - National Aeronautics and Space Administration
NAT - National Airworthiness Team
NATIP - Naval Aviation Technical Information Product
NATOPS - Naval Air Training and Operating Procedures Standardization
NAVAIR - Naval Air Systems Command
NAVAIRINST - NAVAIR Instruction
NSAWC - Naval Strike and Air Warfare Center
NTTP - Naval Tactics, Techniques, and Procedures
OEM - Original Equipment Manufacturer
OPNAV - Office of the Chief of Naval Operations
OPNAVINST - OPNAV Instruction
OT - Operational Testing
PEO - Program Executive Officer
PEO(A) - PEO for Air Anti-Submarine Warfare, Assault and Special Mission Programs
PEO(JSF) - PEO for Joint Strike Fighter Programs
PEO(T) - PEO for Tactical Aircraft Programs
PEO(UW) - PEO for Strike Weapons and Unmanned Aviation
PEO(IWS) - PEO for Integrated Warfare Systems
PFC - Permanent Flight Clearance
PMA - Program Manager Air
PMG - Program Management Guide
RAMEC - Rapid Action Minor Engineering Change
RCC - Range Commander's Council
RDT&E - Research, Development, Test and Evaluation
SECNAVINST - Secretary of Navy Instruction
SOF - Safety of Flight
STC - Supplemental Type Certificates
TAA - Test Airworthiness Agent
TACMAN - Tactical Manual
TAE - Technical Area Expert
TC - Type Certificates
TD - Technical Directive
TFCO - Test Flight Clearance Officer
TIA - Type Inspection Authorizations
T/M/S - Type/Model/Series
TYCOM - Type Commander
UA - Unmanned Aircraft

MAR 15 2010

UAS - Unmanned Aircraft System
U.S. - United States
USA - United States Army
USAF - United States Air Force
USC - United States Congress
USCG - United States Coast Guard
USMC - United States Marine Corps