DEPARTMENT OF THE NAVY

NAVAL POSTGRADUATE SCHOOL
1 UNIVERSITY CIR
MONTEREY CA 93943-5000

IN REPLY REFER TO:

NAVPGSCOLINST 3700.1
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12 Oct 07

NAVPGSCOLINST 3700.1

Subj: FLIGHT CLEARANCE AND OPERATIONS POLICY FOR NAVAL POSTGRADUATE SCHOOL AIR VEHICLES AND AIRCRAFT SYSTEMS

Ref: (a) NAVAIRINST 13034.1C, Flight Clearance Policy for Air Vehicles and Aircraft Systems
     (b) OPNAVINST 3710.7T, NATOPS General Flight and Operating Instructions
     (c) MIL-STD-2161A(AS), Paint Schemes and Exterior Markings for US Navy and Marine Corps Aircraft
     (d) NAVAIRINST 3710.1F, Contractor's Flight and Ground Operations
     (e) Academy of Model Aeronautics National Model Aircraft Safety Code, Effective January 1, 2006.
     (f) FAA 14 CFR Part 91, Docket No FAA-2006-25714, Notice 07-01, Unmanned Aircraft Operations in the National Airspace
     (g) NAVAIRINST 3710.8C, Authority for Personnel to Pilot or Fly In Aircraft Under the Controlling Custody of Naval Air Systems Command or Other Aircraft Used by Naval Air Systems Command Activities and Pre-Accepted Aircraft
     (h) NAVAIRINST 3710.6F, Static Display and Flight Demonstration of Naval Air Systems Command Aircraft

Encl: (1) NPS Flight Clearance, Authorization and Approval Sources
      (2) Acronyms

1. <u>Purpose</u>. To establish policy, responsibilities, and Procedures Naval Postgraduate School (NPS) for acquiring flight clearances for air vehicles and aircraft systems, and for the authorization and approval of operations of such vehicles and systems.

2. <u>Cancellation</u>. This is a new NPS Instruction.

3. <u>Scope</u>. This instruction applies to all manned and unmanned air vehicles and aircraft systems owned, leased or operated by the NPS, including public use aircraft

modified by/for the Navy.. This includes, but is not limited to all systems in-service and under development.

4. <u>Background</u>. Safe and legal operation of Naval aircraft requires both clearance and authorization for flight. In addition, operation of Naval aircraft by a contractor requires flight approval. All NPS aircraft must receive an NPS Flight Release prior to their first flight. Changes in the configuration, equipment or operation of the aircraft system, including Ground Control Station(s) (if any), may require revisions to or reissue of some or all of these documents.

   a. <u>Flight Clearance</u>. Paragraph 7.1.1 of reference (b) stipulates that "Naval aircraft, both manned and unmanned, including pre-accepted aircraft and public use aircraft modified by/for the Navy, shall not be operated in a nonstandard configuration or outside the limits of NATOPS without airworthiness approval in the form of a flight clearance document (per NAVAIRINST 13034.1) from NAVAIRSYSCOM." Paragraph 2.2.2.e(3) of reference (b) further states that, "Because of their systems test and evaluation mission, COMNAVAIRSYSCOM has cognizance over all aircraft equipment limitations and technical data in NATOPS publications and is responsible for ensuring the airworthiness of all Naval aircraft, including Preaccepted Aircraft and Public Use Aircraft operated by or for the Navy." Due to the research and/or instructional nature of their missions, NPS aircraft, both manned and unmanned, will almost always be involved in nonstandard operations. Thus, NPS aircraft will require flight clearances and operating limitations issued under the provisions of reference (a).

      (1) The flight clearance process involves an independent engineering assessment of an aircraft's airworthiness, safety of flight, and unusual risk.

      (2) Airworthiness determines the property of an air system configuration to safely attain, sustain and terminate flight in accordance with approved usage limits.

      (3) Safety of flight determines the property of an air system configuration to safely attain, sustain and terminate flight within prescribed and accepted limits for injury/death to personnel and damage to equipment, property and/or environment.

(4) In some cases where risk is determined to be above normal as determined by engineering or the Flight Clearance Officer (FCO) for the intended mission, a **Hazard Risk Analysis (HRA)** may be required and a **Hazard Risk Index (HRI)** will be included in the flight clearance.

(5) Flight clearances are issued under the authority of the Commander, NAVAIRSYSCOM, through the Flight Clearance Officer (FCO), the military head (AIR-4.0P) of the National Airworthiness Team (NAT) at NAVAIR, acting in accordance with the provisions of reference (a).

b. <u>Flight Release.</u> A Flight Release is an acceptance by the NPS President of an aircraft into his inventory, and an authorization for NPS personnel to seek Flight Authorizations for proposed missions. The requirement for all aircraft to receive Flight Release prior to their first NPS flight, and to maintain a current NPS Flight Release while in NPS custody, is intended to insure that all other requirements have been satisfied, especially including that:

(1) The aircraft has been appropriately cleared for flight in accordance with the provisions of reference (a), or in the case of small Unmanned Aeriel Vehicle (UAV) system operation, meets the requirements of reference (e).

(2) The aircraft has been appropriately marked, in accordance with the provisions of reference (c).

c. <u>Flight Authorization.</u> Flight Authorization is permission to operate a Naval aircraft system, flying a specific mission or series of missions.

(1) Flight Authorizations for NPS, aircraft are issued under the authority of the President of the Naval Postgraduate School, acting through the NPS Director of the Center for Interdisciplinary Remotely Piloted Aircraft Studies (CIRPAS/NAVPGSCOL) and the CIRPAS Government Flight Representative (GFR).

(2) Flight Authorizations are issued for a specified number of flights and/or a specified time duration, flying a

specified mission with a specified crew. Additional flights or extended duration require modification or reissue of the authorization.

(3) Since requests for NPS Flight Authorization are subject to the same process and conditions as requests for NPS Flight Approval, NPS Flight Approval will include Flight Authorization. A separate request is not required. [Note: Flight Authorization does **NOT** include Flight Approval.]

d. Flight Approval. Flight Approval is permission for a contractor to maintain and fly a government aircraft, with the Government assuming some of the risk of loss or damage in accordance with the provisions of reference (d) and the contract.

(1) Flight Approvals for NPS aircraft are granted under the authority of an Approving Authority, acting through a properly designated GFR, to whom authority has been delegated in writing. The Approving Authority for NPS aircraft is the Commander, Naval Air Systems Command.

(2) Reference (d) states in enclosure 2, paragraph 1.3, "The Government does not assume any risk of loss under the G&FRC or AFRC for any flight which has not received prior written approval by the GFR."

(3) Flight Approvals are issued for a specified number of flights and/or a specified time duration, flying a specified mission with a specified crew. Additional flights or extended duration require modification or reissue of the Approval.

(4) Since requests for NPS Flight Approval are subject to the same process and conditions as requests for NPS Flight Authorization, NPS Flight Approval will include Flight Authorization. A separate request is not required.

5. Policy. **All** NPS aircraft systems must receive an **NPS Flight Release** prior to first flight, and must maintain a current NPS Flight Release while in NPS custody. In addition, NPS aircraft systems shall not be operated without **both** a current **flight clearance** and an appropriate **flight authorization**. Where contractors are

involved in flight or ground operations, **flight approval** is also required.

    a. For manned or unmanned fixed wing aircraft, the threshold for the requirement for a **flight clearance** is crossed 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. For NPS ornithopters, the threshold for the requirement for an **NPS Flight Release** is operation of the wing-motion system under power.

    b. Reference (a) states that NAVAIR flight clearances are only valid when aircraft are maintained in accordance with approved maintenance and structural life management plans. All NPS aircraft, whether manned or unmanned, are required to meet this requirement.

    c. Reference (a), paragraph 5.g, states that "A flight clearance is not required for UAV aircraft designed and operated in compliance with the Academy of Model Aeronautics Model Aircraft Safety Code."

    (1) Note: As stated in reference (f), The Federal Aviation Administration (FAA) interprets its "Model Aircraft Exemption" as applying only to hobbyists flying small model aircraft for pleasure. It does not apply to aircraft of any size which belong to the government or any commercial enterprise.

    (2) For UAVs which are to be flown under the provisions of reference (a) without a Flight Clearance, an NPS Flight Release must be obtained from CIRPAS/NPS prior to first flight and maintained current thereafter (as for any NPS aircraft).

    (3) Such flights must be flown in strict compliance with the provisions of the Academy of Model Aeronautics Model Aircraft Safety Code, reference (e). Autonomous flight is not permitted by reference (e).

    d. Enclosure (1) NPS Flight Clearance and Authorization Sources further delineates the specific disciplines, roles, and responsibilities addressed by each of the clearance

products (i.e. the flight clearance, flight approval, and flight authorization). Enclosure (1) also addresses the level of signature authorization required for each of the "Unmanned Aircraft Systems" (UAS) categories and manned aircraft systems.

6. <u>Definitions</u>. The terminology used in this instruction corresponds to that defined in reference (a). Some of the definitions used there are quoted (and shown enclosed in quotation marks), and some definitions are added or expanded for NPS purposes, as follows:

   a. "Aircraft Controlling Custodian (ACC). A Naval administrative function within major commands exercising administrative control of assignment, employment, and logistic support of Navy aircraft and engines, as assigned by the CNO." Commander, Naval Air Systems Command, is the ACC for NPS Aircraft, with the President, NPS, serving as the ACC for mishap reporting purposes.

   b. "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." The ARC for NPS aircraft is the Director of the NPS Center for Interdisciplinary Remotely-Piloted Aircraft Studies (CIRPAS/NPS).

   c. "Aircraft Owner. This term usually applies to the appropriate TYCOM, ACC, or ARC, but in the case of UAV/UAS some systems are procured, tested and managed outside of the established ACC/ARC structure. In this case, the owner shall be defined as the head of the agency responsible for procuring and managing the system." For the purposes of this instruction, the Chairman of the Department or Academic Group of which the Principal Investigator or Primary Teaching Faculty Member is a member shall be considered to be the aircraft owner.

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

e. "Operator. Personnel not located within the air vehicle with duties assigned to operate or assist in the aircraft system operation." Ground station controllers, internal and/or external pilots for remotely piloted vehicles or unmanned air vehicles are examples of "operators" under this instruction.

7. Flight Clearance Process

a. NAVAIR Airworthiness Office (AIR-4.0P), supported by the National Airworthiness Team (NAT), is the only source for flight clearances for Naval aircraft systems. Enclosure (1) to reference (a) describes the NAVAIR interim flight clearance process and the actions leading to interim flight clearance approval for manned and unmanned aircraft systems. The process requires the IPT/EDT to establish an engineering review team, execute an engineering review to establish airworthiness, and manage the interim flight clearance development. The process can be lengthy and coincides with the non-recurring engineering activities of most development programs. IPT/EDT program plans must account for cost and schedule associated with the process at the outset.

(1) Although the flight clearance process for UAS is the same as that for manned aircraft, engineering and data requirements for UAS clearances depend on both the intended use of the UAS and the size of the Unmanned Aircraft (UA).

(2) Category 1 flight clearances are issued to UAS intended to operate in all classes of airspace including those outside of Restricted and Warning Areas, and combat zones. Category 1 flight clearances will be based on airworthiness criteria, engineering standards, and data requirements consistent with those of manned aircraft. Category 1 flight clearances are intended primarily for UA with a maximum take-off weight of 1320 lbs and above, but may be issued to UA of any weight.

(3) Category 2 flight clearances are issued to UAS intended to operate primarily in Restricted and Warning Areas, 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. Because 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 1320 lbs, but may be issued for a UA of any weight.

(4) Category 3 flight clearances are issued for UAS that are not designed to any accepted engineering standard and/or do not possess adequate engineering data to determine their compliance with accepted standards. Category 3 flight clearances are only issued for the UA that are deemed as expendable by the aircraft owner and contain a statement that the owner of the aircraft accepts the programmatic probability of loss of the UA. Category 3 flight clearances ensure safety to people and property on the ground through stringent operational restrictions. The data requirements for a Category 3 flight clearance directly correlate to the proposed 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.

b. Any NPS activity which intends to operate any air vehicle system, manned or unmanned, must contact the CIRPAS Configuration and Airworthiness Manager (CAM) at the outset of program planning for assistance in initiating the NAVAIR Airworthiness and NPS Flight Release processes. Enclosure (1) indicates the sources for Flight Clearance, Authorization and Approval for NPS air vehicle systems. Where necessary, the CAM will contact the appropriate Class Desk at NAVAIR for assistance in generating an Interim Flight Clearance (IFC) request, and will serve as NPS liaison with NAVAIR through the IFC process. This process must be initiated early. Once the data required for the IFC have been determined, they must be sent to NAVAIR at least 21 days prior to the IFC need date. Note also that the requesting activity must be ready to meet the costs involved in acquiring an IFC.

c. For mini and micro UAVs which have been exempted from the NAVAIR flight clearance process by paragraph 5.g of reference (a), although no flight clearance is required, an NPS Flight Release must be obtained prior to flight.

d. Formal interim flight clearance requests are required for extension of time periods for existing interim

Clearances, re-issuance of expired interim clearances, and changes/amendments to existing flight clearances.

8. Flight Release, Authorization, and Approval Processes

a. The President, NPS, has designated the Director of CIRPAS/NPS as his representative for the issuance of NPS Flight Releases and Flight Authorizations.

b. Requests for an NPS Flight Release should be submitted to CIRPAS on NPS Form 3700-1 as early as practicable, so that the user can be certain that all requirements have been met prior to final scheduling of first flight. If a Flight Clearance is required, no NPS Flight Release can be granted without completion of the process described in paragraph (7), above.

c. Requests for Flight Authorization must be submitted to CIRPAS on NPS Form 3700-2 at least five working days prior to flight. Authorizations may be granted for individual flights or for a specified or unspecified number of flights during a specified period of time, not to exceed thirty days.

d. Pilots/operators of NPS aircraft must have been approved as meeting the following qualification and currency prior to listing them as flight crew members on the authorization request.

(1) Contractor pilots of NPS manned aircraft must be qualified and current IAW contractor training and currency programs approved by the GFR under OPNAVINST 3710.1F, or if government pilots, IAW OPNAVINST 3710.7T.

(2) Contractor operators of NPS UAS must be qualified and current IAW contractor training and currency programs approved by the GFR under OPNAVINST 3710.1F.

(3) Government operators of NPS Category 1 or 2 UAS must be qualified and current IAW appropriate approved government or manufacturer training programs.

(4) Contractor operators of NPS Category 3 UAS must be qualified and current IAW contractor training and currency programs approved by the GFR under OPNAVINST 3710.1F, or if government operators, by the Director of CIRPAS, under authority delegated by the President, NPS.

e. Requests for Flight Approval must be submitted through CIRPAS to the CIRPAS GFR on DCMA Form 644 at least five working days prior to flight. Approvals may be granted for individual flights or for a specified or unspecified number of flights during a specified period of time, not to exceed thirty days. Note that prior to any Flight Approval the GFR must approve Contractor Procedures and flight crews, in accordance with reference (d).

f. NPS UAVs will not be flown in the National Air Space (NAS) without an FAA Certificate of Authorization (COA). For all practical purposes this means that all flight operations of NPS UAs must be:

(1) Conducted indoors at NPS, or

(2) Conducted entirely within military restricted airspace (e.g., from NPS' McMillan Field at Camp Roberts, CA, and remaining within R-2504), or

(3) Conducted in accordance with the FAA COA (if flown in the NAS).

g. For identification, all NPS aircraft will be marked in accordance with reference (c). The Director of CIRPAS will assist those owning NPS aircraft in acquiring proper marking materials.

9. <u>Authorization to Pilot or Fly in NPS Aircraft. Static Display and Flight Demonstration of NPS Aircraft.</u> NPS aircraft, whether manned or unmanned, are under the controlling custody of the Commander, Naval Air Systems Command. As such, NAVAIR policies and procedures relating to authorization of personnel to pilot or fly in NPS aircraft, as prescribed in reference (g), and policies and restrictions regarding static displays and flight demonstrations of NPS aircraft, as prescribed in reference (h), must be followed.

10. <u>Acronyms</u>. Enclosure (2) contains a list of acronyms used throughout this instruction and its enclosures.

11. <u>Review</u>. CIRPAS/NPS shall annually review this instruction and provide recommendations for changes to the President.

DAVID A. SMARSH
Chief of Staff

NAVAL POSTGRADUATE SCHOOL FLIGHT CLEARANCE AND AUTHORIZATION SOURCES (Excel Document)

NAVAL POSTGRADUATE SCHOOL FLIGHT CLEARANCE AND AUTHORIZATION SOURCES:

Legend:
- P = NAVAIRSYSCOM AIR-4.0P
- L = LOCAL (CIRPAS/NAV4/PGSCOL)*
- TECT = TEST & EXPERIMENTATION COORDINATION TEAM
- G = GOVERNMENT FLIGHT REPRESENTATIVE

	FLIGHT CLEARANCE														FLIGHT APPROVAL & AUTHORIZATION							Type of Flight	Physical Req'd
	Baseline IFC	Radio-controlled Flight Clearance	Autonomous Flight Clearance	Flight Control Hardware Clearance	Flight Control System Modification	Flight Control Software Clearance	Flight Control Software Modification	GCS Software or Hardware Change	UA Powerplant Change	Aircraft Mold Line Change	Antenna Configuration Change	Instrument Rack Approval	Pyrotechnics, Squibs, etc.	Test Flight Planning Approval	Approve Mission Flight Planning	Add or Remove IFC Items "With/Without"	Change Payload in Approved Racks	Authorize &/or Approve Flights	Approve Crews	Approve Flight & Ground Procedures	Approve Flt Crew and Operator Trng		
Manned a/c	P	NA	NA	P	P	NA	NA	NA	NA	P	P	P	P	TECT	L	L	L	G	G	G	G	FAA II	
UA/UAS:																							
CAT 1	P	P	P	P	P	P	P	NA	NA	P	P	P	P	TECT	L	L	L	G	G	G	G	FAA III	
CAT 2	P	P	P	P	P	P	P	NA	P	P	P	P	P	TECT	L	L	L	G	G	G	G	FAA III	
CAT 3	L	L	P	L	L	P	P	P	L	L	L	L	P	TECT	L	L	L	G	G	G	G	None	

REMARKS:

Coordinate w/ CIRPAS: Cat 3 UAS do not require clearance if flown as "model a/c", larger a/c require NAVAIR IFC. All require NPS Flt Release.

Coordinate data package with CIRPAS, autonomous flight requires NAVAIR IFC.

Coordinate w/ CIRPAS: Changes to GCS may require revision to the NAVAIR IFC.

Coordinate data package with CIRPAS, any use of pyrotechnics or squibs of any size requires NAVAIR clearance.

Coordinate w/ CIRPAS: Test flights must be planned and approved IAW NAVAIRINST 3960.4B.

Submit flight plans to CIRPAS for review.

Where AIR-4.0P IFC shows items as "With or Without", they may be added or removed with CIRPAS approval.

Instrumentation carried in approved racks may be changed, subject to weight and balance and electrical power limitations.

Submit "Form 8.4-1" to CIRPAS for GFR approval. Authority is delegated to CIRPAS GFR by NPS President to authorize flights of NPS aircraft.

Submit DD Form 2628 with appropriate certification of training and qualifications to CIRPAS for GFR approval of crew members.

Contractor Procedures must be IAW NAVAIRINST 3710.1E; NPS Gov't Personnel discuss required Procedures w/ GFR.

...as specified in GFR-approved Procedures.

UA CLEARANCE CATEGORIES:

Category	Category Name	Gross Vehicle Weight (GVW)	NPS EXAMPLES
CAT 1	"STANDARD"	1320 lb < GVW	RQ-1A Predator
CAT 2	"RESTRICTED"	55 lb** < GVW < 1320 lb	Dakota, Tern
CAT 3	"EXPERIMENTAL"	GVW < 55 lb***	Rascal, Scan Eagle, Sr Telemaster,

* Must meet requirements of reference (e) to NPSINST 3700.1; else "P" applies.

** Corresponds to Academy of Model Aeronautics' maximum "model aircraft" weight.

ACRONYMS

ACC	Aircraft Controlling Custodian
AFRC	Aircraft Flight Risk Clause (DFARS 252.228-7002)
ARC	Aircraft Reporting Custodian
CIRPAS or CIRPAS/NPS	Center for Inter-disciplinary Remotely Piloted Aircraft Studies, at NPS
CAM	Configuration and Airworthiness Manager
CNO	Chief of Naval Operations
COA	Certificate of Authorization
FAA	Federal Aviation Administration
FCO	Flight Clearance Officer
FCRA	Flight Clearance Release Authority
FRC	Flight Risk Clause (DFARS 252.228-7002)
GFR	Government Flight Representative
G&FRC (also GFRC)	Ground and Flight Risk Clause (DFARS 252.228-7001)
HALE	High Altitude, Long Endurance, a UAV class
HRA	Hazard Risk Analysis
HRI	Hazard Risk Index
IFC	Interim Flight Clearance
IPT/EDT	Integrated Product Team/Externally Directed Team
MAE	Medium Altitude & Endurance, a UAV class
NAS	National Airspace System
NAT	National Airworthiness Team
NAVAIR	Naval Air Systems Command
NPS	Naval Postgraduate School, Monterey, CA
PI	Principal Investigator
SOF	Safety of Flight

TYCOM	Type Commander
UA	Unmanned Aircraft
UAS	Unmanned Aircraft System
UAV	Unmanned Aerial Vehicle