OMAO/AOC sUAS Operations

Overview of sUAS Operations
October 26, 2016

CDR Jon Neuhaus
NOAA Aircraft Operations Center

OMAO/AOC sUAS Operations

I. Structure of NOAA UAS

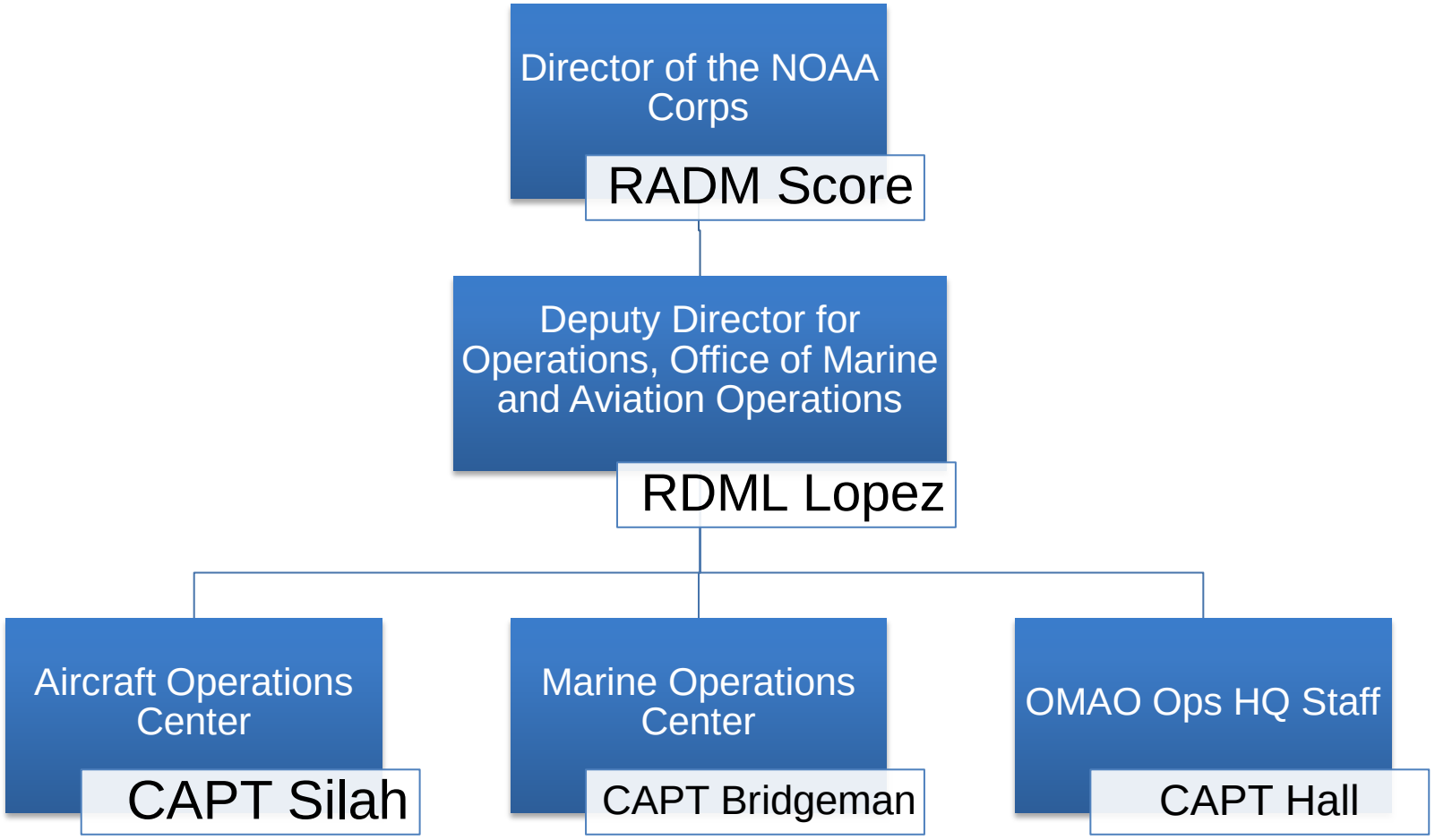
II. Governance and Policy of NOAA UAS

III. Where to Fly NOAA UAS

IV. How to Fly NOAA UAS

V. When to Fly NOAA UAS

Organizational Structure



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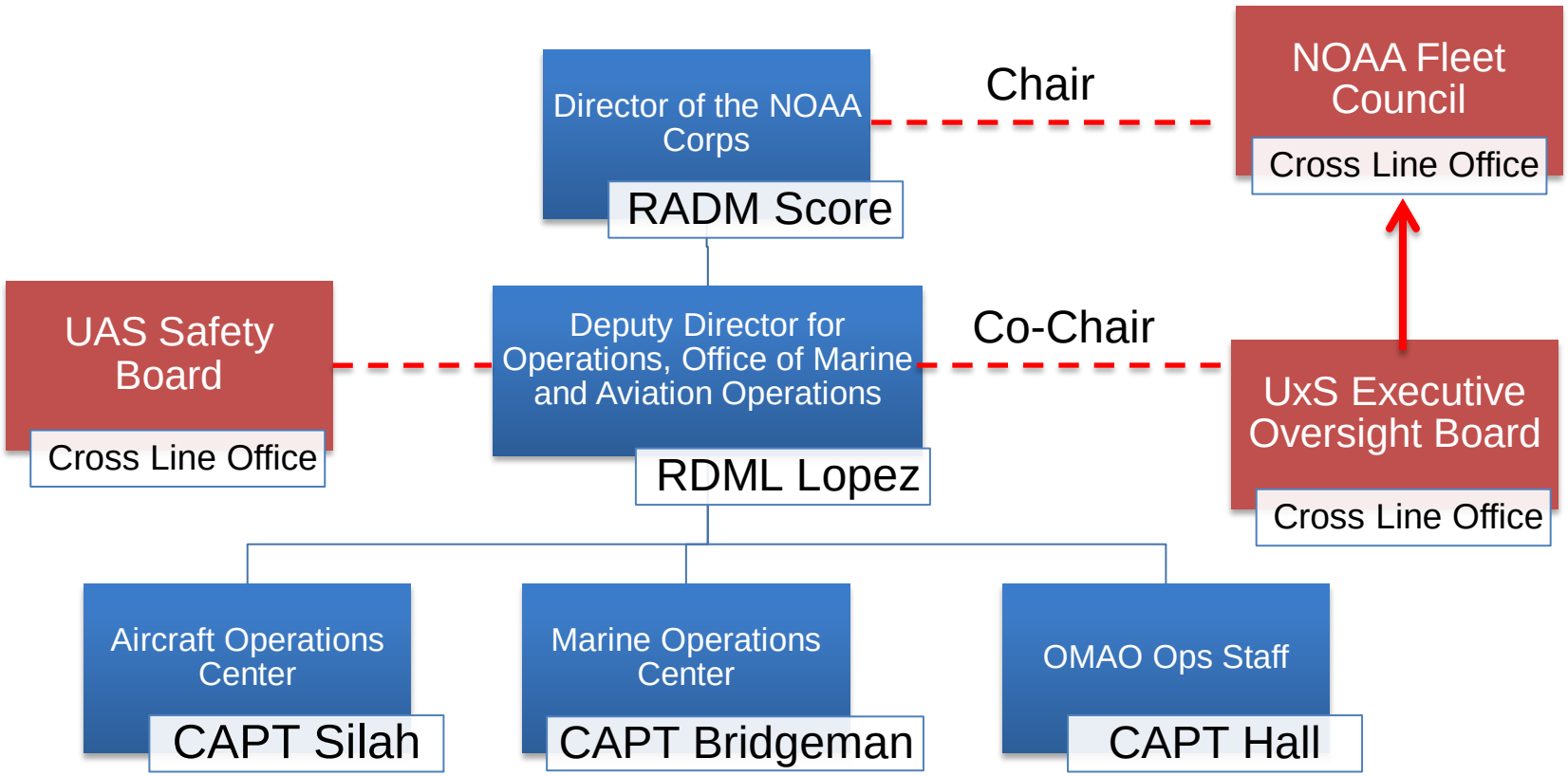


UxS Executive Oversight Board Membership

• RDML Anita Lopez (OMAO)	Co-Chair
• Dr. Gary Matlock (OAR)	Co-Chair
• Dave Detlor	NMFS
• David Holst	NOS
• Helmut Portmann	NWS
• Mark Paese	NESDIS
• Robbie Hood	OAR
• (vacant)	OMAO
• CAPT Phil Hall (OMAO)	Exec Sec

UxS Safety Board

- Composed of Line Office representatives
- CAPT Philip Hall (Chair)
- CDR Mike Ellis (OAR)
- Michael Gallagher (NMFS)
- CDR Mark Sweeney (NOS)
- Jim O'Sullivan (NWS)
- Ryan Wattam (NESDIS)
- CDR Jonathan Neuhaus (OMAO/AOC)

OMAO UAS Staff

• CAPT Phil Hall	OMAO UAS
• CDR Jon Neuhaus	AOC UAS Section Chief
• LT Mike Marino	AOC UAS Dep Chief
• LT Jesse Milton	AOC UAS Section
• Mr. Mark Rogers	AOC UAS Section
• LTJG Bill Carrier	AOC UAS Section
• LT Kyle Salling	NASA Global Hawk
• LTJG Casey Marwine	Point Mugu NAS

What is the FAA's Authority of UAS?

- U.S. airspace is public space
  - 49 U.S.C. §40102(a)(1)
- UAS are aircraft subject to regulation
  - 49 U.S.C. §40102(a)(6); 14 CFR 1.1; PL 112-95 §331, §336, 14 CFR 107
  - An aircraft is any device used for flight.
- UAS must comply with regulations that apply to all aircraft
  - Some state and local laws may impact UAS

Scope of UAS Oversight

- NOAA Administrative Order (NAO) 216-104A
- NOAA Aircraft Operations Policy 220-1-5 Unmanned Aircraft Systems Operations (UAS)
- NOAA Unmanned Aircraft System Handbook
  - Helps guide users through the process

NAO 216-104A / AOC Policy 220-1-5

- The NAO 216-104A mandates that all aircraft operated by NOAA are managed by the Aircraft Operations Center.

- The 220-1-5 is AOC's policy to the mandate.

NAO 216-104A / AOC Policy 220-1-5

- Establishes that the term ‘Aircraft’ refers to both manned and unmanned aircraft
  - NOAA Divides UAS into two main categories:
    - Corporate UAS: Assets Owned/Operated by AOC for all of NOAA and it will tracked in the Fleet Council.
    - Field UAS: Falls below the capital asset threshold ($200K) and meets the AOC criteria for being owned and operated by individual line offices in compliance with AOC.

* The majority of NOAA UAS Operations are Field UAS

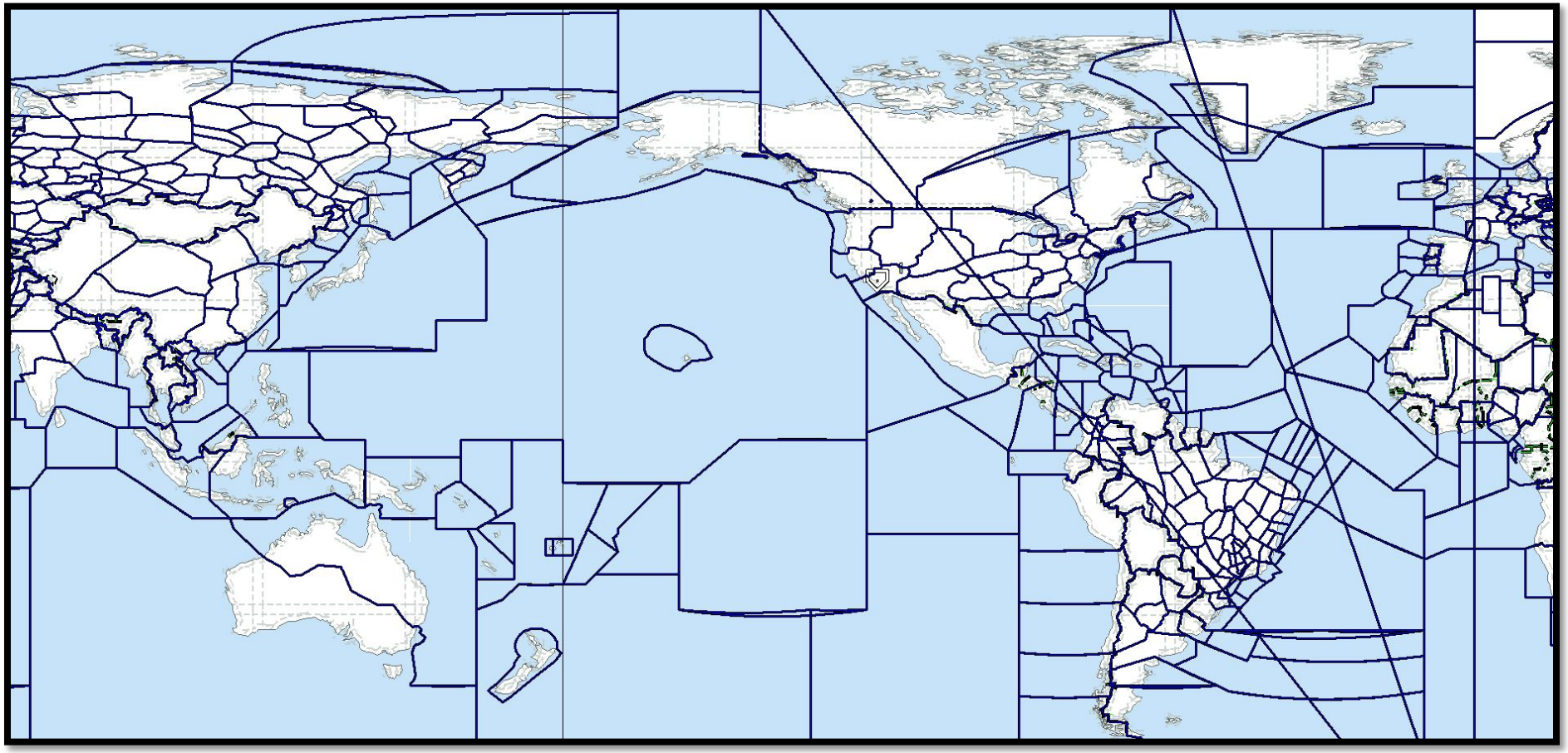
NAO 216-104A / AOC Policy 220-1-5

- All NOAA UAS Operations will be approved by OMAO to ensure safety and compliance with regulations and policy.
  - Airworthiness, Airspace Coordination, Risk Analysis, Crew Qualifications, etc.
- OMAO through AOC may delegate UAS Operations and Management to NOAA Line Offices that are Non-Capital, Field UAS, however AOC will provide oversight of all operations.

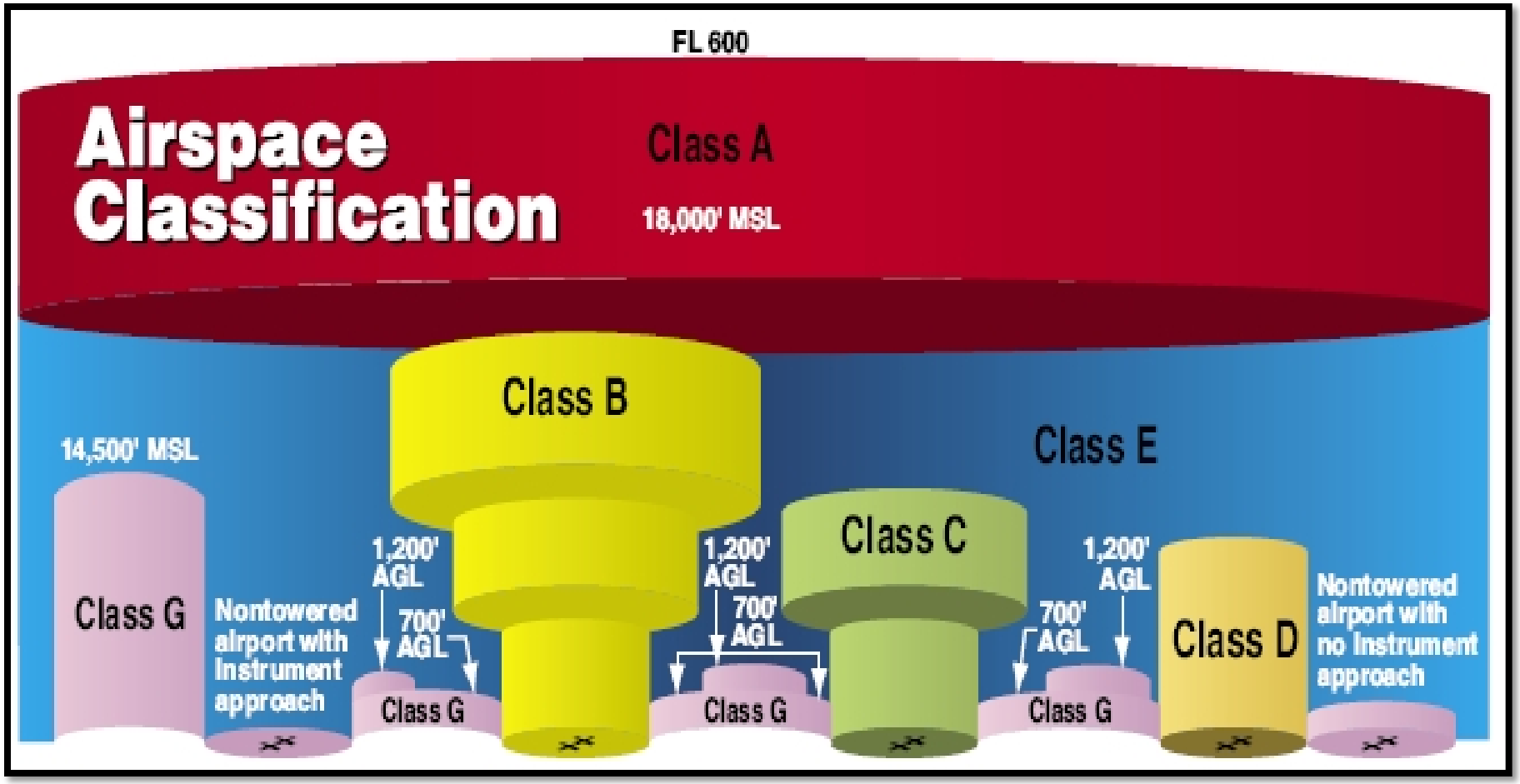
Airspace

- **National Airspace –** United States territorial airspace that exists above US territories and extends out 12nm from the coastline.
- **Special Use Airspace –** This airspace is controlled by an agency other than the FAA. The majority of Special Use Airspace (SUAS) is controlled by the military.
- **International Airspace –** International airspace refers to that airspace in the oceanic regions that are greater than 12nm offshore that is managed by the International Civil Aviation Organization (ICAO).
- **Foreign Airspace –** Airspace of another country. Operations in Foreign Airspace are required to comply with the respective country's laws.
- **Unclaimed Airspace –** Airspace that no country claims or controls. Rare. Part of Antarctica and Western Pacific off Mexico.

The World's Airspace



National Airspace



How to Fly

- **OMAO has several ways to conduct flight operations:**
  - **Formal COA from the FAA**
  - **Blanket COA from the FAA**
  - **Class G MOA with the FAA**
  - **Part 107 (transition, exemption)**

The Small UAS Rule (Part 107)

- First operational rules for routine operation of small UAS (<55 pounds)
- In effect for NOAA on October 20, 2016
- Recreational operators may fly under part 107 or Public Law 112-95 Section 336 criteria

The Basics

- UAS operators must obtain a Remote Pilot Airman Certificate
- Visual line-of-sight, daylight operations
- 400 feet or below in uncontrolled (Class G) airspace
- UAS must weigh less than 55 lbs. and be registered

Remote Pilot Certification

- Must be at least 16 years old
- Must read, write, and speak English
- Must pass an aeronautical knowledge exam at an FAA-approved Knowledge Testing Center
  - Part 61 certificate holders can take online training at faasafety.gov instead of the knowledge exam
- Must undergo TSA background security screening

Operating Rules

- Visual line-of-sight only
- Daylight or civil twilight only
- No operations over people
- Must yield right-of-way to manned aircraft
- One UAS per operator
- Max groundspeed of 100 mph
- External load operation only permitted if they do not affect flight operations or control

Waivable Provisions of Part 107

- Operation from a moving vehicle or aircraft (§ 107.25)
- Daylight operation (§ 107.29)
- Visual line of sight aircraft operation (§ 107.31)
- Visual observer (§ 107.33)
- Operation of multiple small UAS (§ 107.35)
- Yielding the right of way (§ 107.37(a))
- Operation over people (§ 107.39)
- Operation in certain airspace (§ 107.41)
- Operating limitations for small UAS (§ 107.51)

* A Part 107 exemption is expected to take 60 business days

Pilot Qualifications and Certification

MEDICAL REQUIREMENTS (Historic):

- FAA 2nd Class Medical

MEDICAL REQUIREMENTS (107 Transition):

- Medical is no longer required for operations below 400’ AGL.

- For flight operations above 400’ AGL (Part 107 exemptions or other flight authorizations) a FAA 3rd Class Medical will be required.

Pilot Qualifications and Certification

PIC PILOT REQUIREMENTS (Historic):

- FAA Private Pilot Written

PIC PILOT REQUIREMENTS (107 Transition):

- The PIC is required to have a Remote Pilot Airman Certificate with a sUAS rating issued from the FAA.

  * This is expected to accommodate the majority of UAS operations; however operations in airspace other than Class G may require further Certifications such as some variation of a Private Pilot's license.

Pilot Qualifications and Certification

AOC Requirements:

- The PIC is required to have a PIC Designation Letter in the platform being operated. The PIC Designation Letter consists of an AOC UAS office review of the pilot's platform training, FAA certifications and medical records, upon a successful review it is then signed by the CO of AOC.

Pilot Qualifications and Certification

Supplemental Pilot Requirements:

- The SP is only required to receive OEM training on the platform to be able to operate the UAS. This only applies when the SP is under the direct control of a qualified PIC. If at any point the PIC is not physically present or unable to provide direct oversight the SP must be a fully qualified PIC or cease operations.

Visual Observer (VO) Requirements:

- The VO must be able to maintain visual contact with the UAS at all times. For operations the extend beyond ½ mile the VO must have a verified vision test (tested to 20/20) within the past 24 months.

Contract Pilot Requirements:

- Certain UAS activities, as defined by AOC policy 220-1-5, are categorized as contracted services. These operations can include operations where NOAA has a reduced level of risk in operations, does not operate the airframe, does not provide operational support, and does not apply for any land owner or airspace clearances. In these operations that are funded by NOAA and entirely run by contracted services, an approval package with all operational planning information will be submitted to the AOC UAS section.

Other NOAA Crew Member Designations (cont)

NOAA Mission Commander (MC):

- **The MC has <u>final oversight and responsibility</u> to ensure all applicable statutory requirements are met <u>during all</u> UAS operations.**

- **This is to include compliance with FAA regulations, NOAA AOC 220-1- 5 policy, Flight reporting requirements (Sitreps, NOTAMS, Incident/Accident reporting) and any additional requirements within the Flight Authorization Memo. The MC <u>must</u> be a federal employee.**

When to Fly

- *RULE OF THUMB: The greater the complexity of an operation, the longer the lead time will need to be. Examples:*
- NOAA-FAA MOA, Blanket COA, or Part 107 ***EASY (1-3 Months)***
- Class G airspace outside the mode C veil
  - Below 1,200ft (Part 107 400ft Max)
  - Visual line of sight
  - Notice to airman (NOTAM) – Required unless operating under Part 107
  - Class G Notification required when operating under the Class G MOA (AOC Function)
- NOAA COA ***TAKES TIME (3 months once the COA submitted)***
  - Everything else
  - OMAO lead time requirement 120 days prior to start date
  - FAA requires 60 *business* days to process
- Special Cases ***HARDER (Case by Case)***
  - BLOS
  - Emergency COA

Questions?

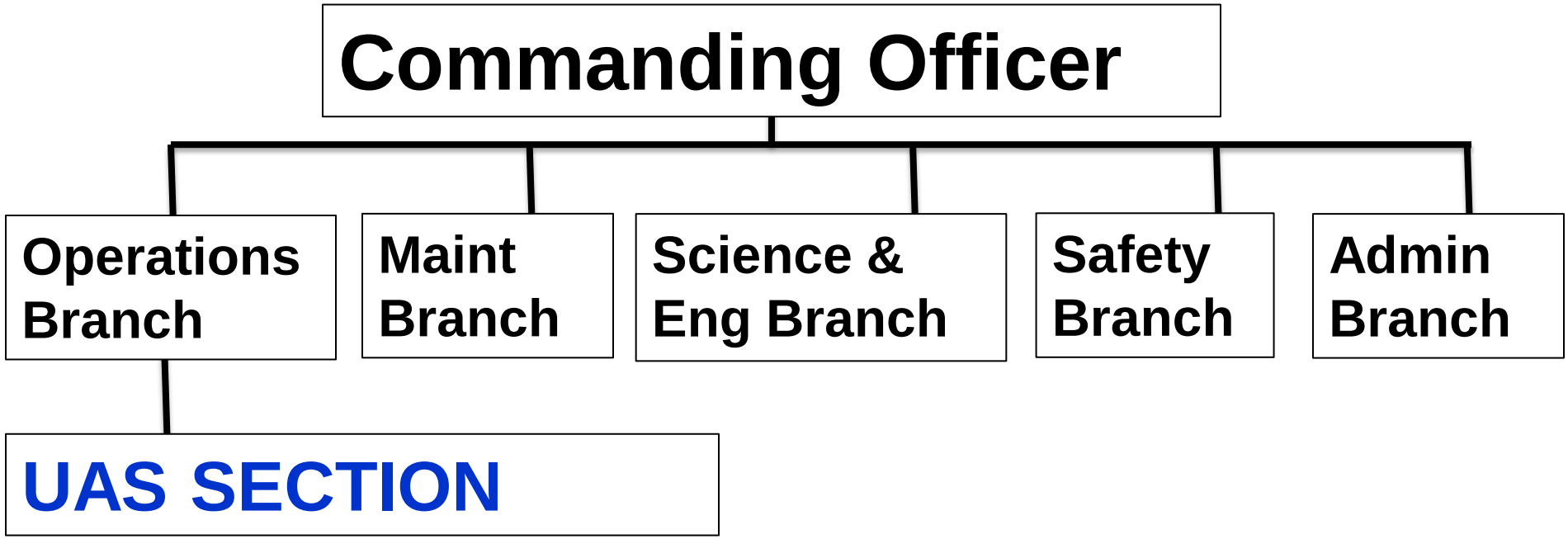
How to Get Your Drone Approved

Overview of AOC Approval Process
October 26, 2016

CDR Jon Neuhaus
NOAA Aircraft Operations Center

NOAA Aircraft Operations Center

AOC Structure



AOC UAS Section

• CDR Jon Neuhaus	AOC UAS Section Chief
• LT Mike Marino	AOC UAS Dep Chief
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• Mr. Mark Rogers	AOC UAS Section
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ALL NOAA UAS OPERATIONS

All NOAA UAS operations shall be approved by the Commanding Officer of the NOAA Aircraft Operations Center.

Approval Process

The Minimum Operational Requirements for Operations:

The following requirements must be met prior to any NOAA UAS flight operation commencing:

1. **Flight Authorization Memorandum** from CO, AOC.

2. For flights in the NAS, meet all requirements for the specific **FAA authorization** that the project is operating under. (COA, Blanket COA, Class G MOA, or Part 107)

3. For flights in **SUA**, an approval from the **controlling agency**.

4. For flights in **non-U.S. airspace, written approval** from the foreign aviation regulatory agency, diplomatic clearance through the U.S. State Department, and comply with all ITAR and foreign export requirements.

5. Meet AOC **Pilot in Command (PIC) requirements**.

6. Meet AOC **airworthiness and maintenance requirements**, as applicable.

The Start of the Process

- **SUBMIT A FLIGHT REQUEST FORM:**

- The PI should submit a complete NOAA UAS Flight Request Form and attachments to AOC at aoc.uas@noaa.gov at least 120 calendar days in advance of the proposed project start date if a COA will be required, or 90 calendar days in advance for projects not requiring a COA.

- *The request will also be routed through OMAO/MOC when shipboard operations are requested.

Operations Plan/Risk Assessment

- **SUBMIT PROPOSED OPERATION DESCRIPTION (EXAMPLES MAY INCLUDE, BUT NOT LIMITED TO:**

1. Concept of Operations (CONOPS) – When, where, why, and how.
2. Aircraft System Description
3. Sensor Package
4. Communication Links
5. Electromagnetic Interference Testing (EMI)
6. Aircrew Requirements and Responsibilities
7. Launch Procedures
8. Flight Operations

Operations Plan/Risk Assessment (cont)

- **SUBMIT PROPOSED OPERATION DESCRIPTION (EXAMPLES MAY INCLUDE, BUT NOT LIMITED TO:**

9. Recovery Procedures

10. Flight Restrictions

11. Operational Risk Management or Hazard Analysis

12. Emergency Procedures

13. Method of sense-and- avoid with other aircraft

14. Method of air traffic control (ATC) communications

15. UAS Airworthiness and previous testing/flights

AIRSPACE COORDINATION

- **WHAT FAA AUTHORIZATION WILL THE PROPOSED UAS OPERATION FLY UNDER:**
- **PART 107**
- **Class G Memorandum of Agreement (with FAA)**
- **Blanket COA**
- **Specific COA**

PILOT QUALIFICATIONS

- **Submit applicable pilot qualifications and medical certifications to AOC for review and records**

SPECTRUM MANAGMENT

- **DETERMINE IF THE PROPOSED FLIGHT OPERATION WILL REQUIRE FREQUENCY COORDINATION**

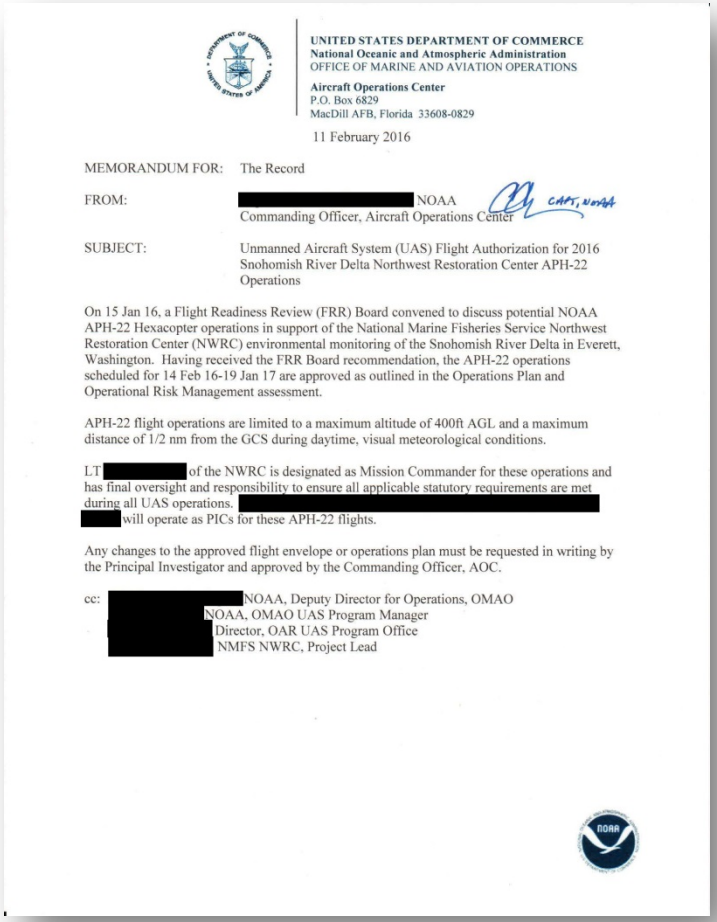
FINAL PROCESS

- **FLIGHT READINESS REVIEW:**

  -The project's PI will provide a briefing to the FRR Board (in person or via telephone conference).

  *Copies of the briefing material should be made available to the board three days prior to the scheduled Board date.

CO Approval Memo



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
OFFICE OF MARINE AND AVIATION OPERATIONS

Aircraft Operations Center
P.O. Box 6829
MacDill AFB, Florida 33608-0829

11 February 2016

MEMORANDUM FOR: The Record

FROM: [redacted] NOAA
Commanding Officer, Aircraft Operations Center

SUBJECT: Unmanned Aircraft System (UAS) Flight Authorization for 2016 Snohomish River Delta Northwest Restoration Center APH-22 Operations

On 15 Jan 16, a Flight Readiness Review (FRR) Board convened to discuss potential NOAA APH-22 Hexacopter operations in support of the National Marine Fisheries Service Northwest Restoration Center (NWRC) environmental monitoring of the Snohomish River Delta in Everett, Washington. Having received the FRR Board recommendation, the APH-22 operations scheduled for 14 Feb 16-19 Jan 17 are approved as outlined in the Operations Plan and Operational Risk Management assessment.

APH-22 flight operations are limited to a maximum altitude of 400ft AGL and a maximum distance of 1/2 nm from the GCS during daytime, visual meteorological conditions.

LT [redacted] of the NWRC is designated as Mission Commander for these operations and has final oversight and responsibility to ensure all applicable statutory requirements are met during all UAS operations. [redacted] will operate as PICs for these APH-22 flights.

Any changes to the approved flight envelope or operations plan must be requested in writing by the Principal Investigator and approved by the Commanding Officer, AOC.

cc: [redacted] NOAA, Deputy Director for Operations, OMAO
[redacted] NOAA, OMAO UAS Program Manager
[redacted] Director, OAR UAS Program Office
[redacted] NMFS NWRC, Project Lead

SUMMARY OF APPROVAL

- ✓ ORM Approval
- ✓ Airworthiness Approvals/Memo
- ✓ Airspace Clearance from FAA, Foreign Gov't, or Military
- ✓ Pilot in Command Qualifications
- ✓ Radio Spectrum Use Clearance
- ✓ Flight Readiness Review Memo
- ✓ CO Flight Authorization Memo

REPORTING REQUIREMENTS

- UAS shall follow AOC requirements for aviation asset reporting and utilization. This will include:

-NOTAMS
-SITREPS AND FLIGHT LOGS
-INCIDENT/ACCIDENT
-MAINTENANCE DISCREPENCIES

Questions?