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| | | ASN | 2007-AHQ-8-COA |
| | | Case Status | EXP RED |
| | | Date Created | 02/13/2007 |
| | | Date Submitted | 03/23/2007 |
| Proponent Organization | | Sponsor | NASA ARC |
| | | Attn Of | (b) (6) |
| | | Address | Aviation Management Office |
| | | Address2 | Mail Stop 158-1 |
| | | City | Moffett Field |
| | | State | CA |
| | | Postal Code | 94035 |
| | | Telephone | (b) (6) |
| | | Email | (b) (6) |
| Declaration | | Declaration(a) | Yes |
| | | Declaration(b) | Yes |
| Point of Contact | | Representative | (b) (6) |
| | | Address | MS 248-3 |
| | | Address2 | NASA ARC |
| | | City | Moffett Field |
| | | State | CA |
| | | Postal Code | 94035 |
| | | Telephone | (b) (6) |
| | | Email | (b) (6) |
| Operational Description | Requested Effective Period | Beginning | |
| | | End | |
| | | Light out operation | No |
| | | VFR operation | Yes |
| | | FR operation | No |
| | | Day operation | Yes |
| | | Night operation | No |
| | | Program Executive Summary | <p>The Autonomous Rotorcraft Project (ARP) operates two Yamaha RMAX helicopters that have been retrofitted with the necessary avionics for autonomous flight. ARP has been operating the two RMAX helicopters and conducting autonomous flight research at Moffett Federal Airfield since 2001. Two prior COAs have been issued for this operation. The existing COA expires on 22 May 2007.</p> <p>Research topics for ARP include mission planning, autonomous landing, and obstacle field navigation. The results of this research have been published at numerous technical conferences and in technical journals.</p> |
| | | Operational Summary | The RMAX helicopters are flown approximately once per week for a period of approximately three (3) hours. During these operational periods the helicopters spend approximately half the time airborne. The helicopters are flown one at a time -- no multi-UAV operations are conducted. Over the past six years the aircraft have flown an average of 50 hours per year. |
| | Location | State | CA |
| | | County | Santa Clara |
| | | Nearest Airport | MOFFETT FEDERAL AFLD |
| | | AOR | California - Northern |
| | Class Of Airspace | Class-A | |
| | | Class-B | |
| | | Class-C | |
| | | Class-D | |
| | | Class-E | |
| | | Class-G | |
| System Description | | Aircraft Type | |
| | | Aircraft Type And Model Description Attachment | 1 |
| | | Control Station Attachment | 1 |
| | | Communications System Attachment | 1 |
| | | List Certified Components (TSO) Attachment | 1 |
| | | Other Attachment | 0 |
| Performance Characteristics | | Climb Rate (feet/Minute) | 400 |
| | | Descent Rate (feet/Minute) | 400 |
| | | Turn Rate (Degrees/Second) | 20 |
| | Cruise Speed | Maximum | 40 |
| | | Minimum | 0 |
| | | Approach Speed | 0 |
| | Operating Attributes | Maximum MSL | 1000 |
| | | Minimum MSL | 1 |
| | | Gross Takeoff Wt | 200 0 |
| | | Launch/Recovery Attachment | 1 |

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| Airworthiness | | FAA Type Certificate | |
| | | If No FAA Certificate (Public Aircraft Only) Attachment | 1 |
| Procedures | | Lost Link/Mission Procedures Attachment | 1 |
| | | Lost Communications Procedures Attachment | 1 |
| | | Emergency Procedures Attachment | 1 |
| Avionics/Equipment | | Equipment Suffix Type | X |
| | | GPS | Yes |
| | | Moving map indicator (Command Station) | Yes |
| | | Tracking capability | No |
| | | TCA/MCAS | No |
| | | ELT | No |
| | Transponder | Transponder | No |
| | | On | |
| | | Off | |
| | | Standby | |
| | | Ident | |
| | | Mode S | |
| | | Mode C | |
| | | Transponder Retuneable in Flight | |
| Lights | | Landing | No |
| | | Position/Navigation | No |
| | | Anti-collision | No |
| | | Infrared (IR) | No |
| Spectrum Analysis Approval | | Data Link | Yes |
| | | Data Link Attachment | 0 |
| | | Control Link(s) | Yes |
| | | Control Link Attachment | 0 |
| | | Operations utilizing Radio Control (R/C) frequencies as described in Title 47 CFR 95 | Yes |
| | | NTIA/FCC Authorization Attachment | 1 |
| ATC Communications | Transmitter VHF Band | VHF Band | No |
| | | Quantity | |
| | | In-Flight Retunable | No |
| | Transmitter UHF Band | UHF Band | Yes |
| | | Quantity | 3 |
| | | In-Flight Retunable | No |
| | Transmitter HF band | HF Band | No |
| | | Quantity | |
| | | In-Flight Retunable | No |
| | Receiver VHF Band | VHF Band | No |
| | | Quantity | |
| | | In-Flight Retunable | No |
| | Receiver UHF Band | UHF Band | Yes |
| | | Quantity | 3 |
| | | In-Flight Retunable | No |
| | Receiver HF band | HF Band | No |
| | | Quantity | |
| | | In-Flight Retunable | No |
| | Guard (Emergency) Frequencies VHF Band | VHF Band | No |
| | | Quantity | |
| | Guard (Emergency) Frequencies UHF Band | UHF Band | No |
| | | Quantity | |
| | Instantaneous Two-Way Voice | Direct to pilot | Yes |
| | | SATCOM | No |
| | | Relay via aircraft | No |

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| Electronic Surveillance/ Detection Capability | | EO/IR | No |
| | | Terrain detection | No |
| | | Weather/icing detection | No |
| | | Radar | No |
| | | Other Attachment | 0 |
| | | Electronic detection systems | No |
| | | Electronic detection systems attachment | 0 |
| | | Radar observation | Yes |
| | | NAS Operational Capability Attachment | 0 |
| Visual Surveillance/ Detection Capability | Maximum Distance from UA | Vertical | 1000 Feet |
| | | Horizontal | 0.2 Nautical Miles |
| | | Airborne based (Chase Aircraft) | No |
| | | Ground based | Yes |
| | | Visual observation from one or more ground sites | Yes |
| | | Forward or side looking cameras | No |
| | | Attachment for All | 0 |
| Aircraft Performance Recording | | Flight data recording | Yes |
| | | Control station recording | Yes |
| | | Voice Recording | Yes |
| Flight Aircrew Qualifications | Pilots | Private (Written) | Yes |
| | | Private (Certified) | No |
| | | Instrument | No |
| | | Commercial | No |
| | | Air Transport | No |
| | | Unique Trained Pilot | Yes |
| | | Unique Trained Pilot Description | Trained by Yamaha in the operation of the RMAX helicopter (see attached). |
| | | DOD certified/trained | No |
| | | Other Certified Training | Yes |
| | | Trained on FAR Part 91 Requirement | Yes |
| | | Medical Certification Class (FAA or DOD equivalent) | 1,2,3 |
| | | Currency Status | Current third class medical certification. Note bug on page, cannot uncheck box 1 and 2 above. |
| | | Duty Time Restrictions | None. |
| | | Single UAS Control | Yes |
| | | UAS Description | The External Pilot (EP) performs all pre-flight checks; flies the aircraft as required for each test sequence; and, has final responsibility for the safe operation of the aircraft. The EP is equipped with the flight control RC transmitter, the EP checklist, the Test Card, and a UHF trunking radio for communication with the ATC Tower and Ground Control Station. The EP is current, qualified, and approved to fly the RMAX by the FPO; is familiar with overall mission objectives and procedures; is familiar with prior practice of the prescribed flight maneuvers; familiar with the maneuver sequences prescribed for each flight; and familiar with crew coordination requirements. |
| | | Total Numbers of UAS Controlled | 1 |
| | Observers | Private (Written) | No |
| | | Private (Certified) | No |
| | | Instrument | No |
| | | Commercial | No |
| | | Air Transport | No |
| | | Unique Trained Pilot | No |
| | | Unique Trained Pilot Description | NA |
| | | DOD certified/trained | No |
| | | Other Certified Training | No |
| | | Trained on FAR Part 91 Requirement | Yes |
| | | DOD Certified Training Attachment | 1 |
| | | Medical Certification Class (FAA or DOD equivalent) | 2,3 |
| | | Currency Status | Pending. Observers shall obtain third class medical certification. Note bug on page, cannot uncheck box 2 above. |
| | | Duty Time Restrictions | None. |
| | | Single UAS Control | Yes |

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| | | | <p>The Safety Observer (SO) watches for potential hazards such as other operating aircraft, approaching vehicles, or birds, and advises the EP of such hazards; ensures that the test vehicle stays within the assigned airspace at all times; monitors ATC tower radio frequency at all times; conducts radio communications with the ATC tower using standard pilot to ATC procedures; remains physically alongside the EP and maintains communication with the EP; ensures that a handheld fire extinguisher is readily available during all operations.</p> <p>SO equipment includes a UHF trunking radio for communications with tower and a flight operations mobile phone.</p> |
| | | UAS Description | |
| | | Total Numbers of UAS Controlled | 1 |
| Special Circumstances | | Special Circumstances | |

Flight Operations Area/Plan

| Type | User Defin | Point | Loc ID | Degree | Distance | Latitude | Longitude | MSL Ceilin |
|-------------------|------------|-------|--------|--------|----------|----------|-----------|------------|
| USER DEFINED AREA | NUQ | | 1 | | | | | |

Total Map Attachment

| MSL Floor | Maximum | Minimum | Radius | SUA Description | |
|-----------|--------------|---------|--------|-----------------|------|
| | 37-24-58.11N | | | 122-02-56.91W | 1000 |

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2.0