U.S. Antarctic Program Interagency Air Operations Manual

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Office of Polar Programs
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Gary James

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GARY M. JAMES **Date**

Aviation Program Manager
Antarctic Infrastructure and Logistics
Office of Polar Programs
National Science Foundation

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INTER-AGENCY AIR OPERATIONS MANUAL (AOM)
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APPROVAL AUTHORITY	Gary M. James Aviation PM, Antarctic Infrastructure and Logistics (AIL), Office of Polar Programs, National Science Foundation
OPR	Mr. Jeremiah Clark Operations Manager, NIWC Atlantic Polar Programs (NPP)
OCR	Mr. Jeffrey Gehringer Air Traffic Manager, NIWC Atlantic Polar Programs (NPP)
Pages:78	

Supersedes USAP Air Operations Manual, dated 1 October 2021

In accordance with Presidential Memorandum 6646, the National Science Foundation (NSF) is responsiblefor the management of the USAP. Furthermore, the DoD will provide the logistics support requested by NSF to the program. The NSF/DoD MOA delineates agreed support that occurs on an annual basis. In accordance with this arrangement, the Deputy Commander, Joint Task Force-Support Forces Antarctica (DCJTF-SFA) is responsible for the safe operations of all DoD air assets. Civil aircraft under contract to NSF's Office of Polar Programs (NSF/OPP) are an integral component in the support of science on the continent and share the airspace with DoD aircraft. These civil aircraft are under the direct charge of NSF and operate in line with their respective Operations Specifications (OPSPEC) and their contract with NSF.

Oversight of the on-ice operations of the civil aircraft is NSF-delegated to the Department of the Interior/Office of Aviation Services (OAS) in accordance with the Interagency Agreement (IAA) betweenUnited States Department of the Interior (DOI) and NSF. Joint use of the USAP airspace in Antarctica requires close coordination between the DoD and NSF (and its delegations). This is achieved through dailymeetings between the Commander, 13th Air Expeditionary Group (13 AEG/CC) and the NSF Representative/Station Manager and via bi-weekly meetings of the Air Operations Planning Board (AOPB). USAP airspace is managed and controlled by the Naval Information Warfare Center Atlantic (NIWC). NSF delegates the publication and administration of the USAP Air Operations Manual to the DCJTF- SFA. The AIL Aviation Program Manager is single point of contact for NSF technical coordination.

This manual outlines responsibilities and major actions required on the part of all agencies that support and interact with the USAP. It shall not be construed to preclude the exercise of good judgment or compliancewith other aviation safety practices. The USAP AOM has been revised as requested by NSF/OPP to reflectthe most recent changes regarding Antarctic air operations, procedures, and participants and must be completely reviewed. It supersedes USAP AOM dated 1 October 2021.

The intent of this manual is to provide USAP Aviation Service Providers (ASPs) key information relating to the safe and efficient execution of their duties and to provide a common reference for those operations. Information in this manual will not supersede ICAO and/or FAA regulations; military flight regulations, civilian operations specifications, and/or National Science Foundation contracts.

The following publications contain key information to USAP ASPs: DoD/NOAA FLIP series, the AntarcticFlight Information Manual (AFIM), and the International Flight Information Manual. Refer to Attachment's 1 and 2 for a glossary of references and supporting documentation.

TABLE OF CONTENTS

CHAPTER 1 GENERAL INFORMATION 1
1.1 Aviation Service Providers (ASP's) 1
1.2 USAP Landing Locations 2
1.3 USAP Primary Airfields 2
1.4 Ramp Operations 3
1.5 Adverse Weather Landing Sites/Diverts 4
1.6 Airfield Construction, Markings and Lighting 6
1.7 Airfield Navigation Aids and Instrument Approaches 8
1.8 Airfield Status Reports 9
1.9 Runway Condition Reading (RCR) and Runway Surface Condition (RSC) 9
1.10 Airspace System 10
1.11 Air Traffic Control 11
1.12 Flight Following 13
1.13 Flight Reports 15
1.14 Aviation Meteorological Services 16
1.15 Antarctic Airfield Management 17
1.16 Austral Winter Flight Operations 19
CHAPTER 2 STANDARD OPERATING PROCEDURES (SOP) AND INSTRUCTIONS 20
2.1 Christchurch Operations 20
2.2 Christchurch Airport Ramp Operations 22
2.3 Flight Planning and Filing 23
2.4 Operating Minimums 24
2.5 Antarctic Operating Environment 24
2.6 ACL Coordination 26
2.7 Arrival and Departure Procedures 26
2.8 Uncontrolled Airfield Operations 27
2.9 Common Traffic Advisory Frequency (CTAF 129.7) 27
2.10 Over-flight Restrictions 28
2.11 Weather Balloon Launches 29
2.12 Degraded HF Communication Procedures 29
2.13 Ground Support and Servicing 30
2.14 Operational Risk Management (ORM) 30
2.15 Aviation Ground Safety 31
2.16 Explosive and Hazardous Cargo Areas Procedures 31

CHAPTER 3 ROTARY WING OPERATIONS 32
3.1 Local Flying Area 33
3.2 Local Operating Procedures 33
3.3 Heliport Traffic Patterns. 34
3.4 Helicopter Use at McMurdo Airfields 36
3.5 Helicopter Ship Operations 36
3.6 Communications 36
3.7 Upper Heliport Procedures. 44
3.8 Heliport Pad Locations. 44
3.9 Vehicle Traffic. 46
3.10 Passengers. 46
3.11 Fueling Operations. 46
3.12 External Load Procedures. 46
3.13 Hazardous Cargo. 47
3.14 Maintenance Parking. 48
3.15 Flight Following. 48
3.16 Over-flight Restrictions. 48
CHAPTER 4 UNMANNED AERIAL SYSTEM (UAS) OPERATIONS 49
4.1 General 49
4.2 Responsibilities 50
4.3 Operational Limits for UAS 51
ATTACHMENT 1: REFERENCES 53
ATTACHMENT 2: ABBREVIATIONS AND ACRONYMS 54
ATTACHMENT 3: GUIDELINES FOR THE OPERATION OF AIRCRAFT NEAR CONCENTRATIONS OF BIRDS IN ANTARCTICA 56
ATTACHMENT 4: SOUTH POLE CLEAN AIR SECTOR / NO FLY ZONE 58
ATTACHMENT 5: TYPICAL OPERATIONAL PERIODS AT THE MCMURDO AREA AIRFIELDS 61
ATTACHMENT 6: AIRFIELD STATUS REPORT (ASR) UPDATE EXAMPLE 62
ATTACHMENT 7: METEOROLOGICAL SERVICES 64
ATTACHMENT 8: UAS CONOPS TEMPLATE 70

Table of Figures

Figure 1 Surface/ Horizon Definitions and Terminology 26
Figure 2 McMurdo Helicopter Operations Area Map 38
Figure 3 McMurdo to Marble Point 39
Figure 4 New Williams Field location 40
Figure 5 Typical Helicopter Arrival and Departure Routing 41
Figure 6 McMurdo Heliport Gap Departure and Arrival Routes 42
Figure 7 Upper Heliport Procedures 43
Figure 8 Visitor's Helipad 45

Table of Tables

Table 1 USAP Recommended VHF-FM Helicopter Ops Radio Setup: 36

CHAPTER 1 GENERAL INFORMATION

1.1 Aviation Service Providers (ASP's)

1.1.1 Several US and New Zealand military organizations, US Government agencies, and civilian contractors provide aviation services to the USAP. ASP's must adhere to standard operating practices to ensure safe operations and efficient airlift utilization. The Naval Information Warfare Center (NIWC) in conjunction with the National Science Foundation (NSF) publishes the USAP Air Operations Manual. All ASP's should become familiar with the information in this manual. This is a joint, inter-agency manual; as such, DCJTF-SFA and 13AEG/CC are responsible for DoD air safety, as are civilian aircraft under contract to National Science Foundation that operate to FAA and contract requirements. Civilian operators report to NSF (via OAS) on the ice but will coordinate to the fullest extent possible with DoD to operate safely in the combined airspace environment.

1.1.2 NIWC Operations is responsible for revision oversight of this manual. DoD units will submit coordinated changes to the JTF-SFA, JTF-SFA to NIWC; other agencies will submit changes through the process designated by NSF/OPP/AIL or their designate. The Annual Planning Meeting (APM) presents an opportune time and location for coordination of all parties.

1.1.3 Intercontinental airlift is provided by various airframes to include, but not limited to, USAFC-17, RNZAF C-130s, RNZAF 757, an Australian and US contract A-319, SAFAIR L-100, Italian AF C-130Js and New York ANG LC-130s. NYANG LC-130 aircraft provide the majority of heavy airlift on continent and fly scientific research missions. NSF contracted ski-equipped Basler and Twin Otter aircraft and helicopters fly scientific research missions and provide medium and light airlift on continent.

1.1.3.1 Prior to first flight on-ice, all USAP and any non-transient pilots shall obtain a course rules brief from NPP either in Christchurch Base Operations or Mac Center (upon arrival at McMurdo Station).

1.1.4 USAF/ANG aircrews operate IAW governing Air Force Instructions (AFI's). RAAF, RNZAF, and Civilian ASP's will adhere to their respective Operations Specifications, company policies, and National Science Foundation contract language. Information contained within this manual is for informational purposes. If there is a conflict between the AOM and AFI's, OperationSpecifications, or contract language, ASP's will adhere to the latter. ASP's will:

1.1.4.1 Coordinate transportation support requirements with NSF Prime Contractor'sFixed/Rotary Wing Supervisors.

1.1.4.2 Coordinate mission requirements with the user, Fixed/Rotary Wing Supervisors,and support agencies the day prior to mission execution (usually accomplished at the dailyoperations meeting).

1.1.5 Rotary Wing Operations. See Chapter 3

1.2 USAP Landing Locations

1.2.1 Primary airfields for the USAP are located in the McMurdo Station area and at the South Pole Station (ski-equipped aircraft only). The primary heliport is located at McMurdo Station. Additional ice runways, skiways, and helicopter landing sites are established throughout the continent supporting the USAP science activities as planned by the NSF Prime Contractor's Fixed/ Rotary Wing Supervisors.

1.3 USAP Primary Airfields

1.3.1 Descriptions of USAP primary airfields can be found in the DoD/FLIP Enroute Supplement and the Antarctic Flight Information Manual (AFIM).

1.3.2 McMurdo airfields operate as prior-permission-required (PPR) through the USAP Airfield Manager to ensure safe operations on the airfields.

1.3.3 **Williams Field Skiway (NZWD)**. Williams Field is located on the Ross Ice Shelf approximately 7 NM from McMurdo. Williams Field is available for ski-equipped aircraft only. The main skiway is 220' X 10,000' and oriented 25/07G. The crosswind skiway is 220' X 10,000' and oriented 33/15G. The Ross Ice Shelf moves Grid east at the approximate rate of one foot per day and may require Williams Field complex to be infrequently relocated/rebuilt.

1.3.3.1 The Williams Field Skiway is limited to ski-equipped aircraft only.

1.3.3.2 Williams Field is serviced by TLS, TACAN, and RNAV (GPS) approaches.

1.3.3.3 Williams Field Operations and Restrictions.

1.3.3.3.1 180-degree turns on any portion of the skiways are not authorized. All turns should be at the ends of the skiway to prevent damage to the skiway surface.

1.3.3.4 Williams Field is maintained and operated IAW AFI 13-217, Drop Zone and Landing Zone Operations Chapter 4, LC-130 Skiway and Ski Landing Area Criteria.

1.3.4 **Phoenix Airfield (NZFX)**. Airfield is located approximately 10 NM Grid North of McMurdo Station. Phoenix runway is constructed of compacted snow for wheeled operations.

1.3.4.1 Phoenix Runway used primarily to support heavy airlift wheeled operations. U.S. Air Force certification for use by C-17 and C-130/LC-130 aircraft.

1.3.4.2 The Phoenix Runway is 11,000' x 200' feet and oriented Grid 15/33G. To the maximum extent possible, aircraft arrivals should be to runway 15 and departures to runway 33 to reduce the number of passes on the runway.

1.3.4.3 Phoenix Airfield is serviced by TLS, RNAV, and TACAN approaches.

1.3.4.4 Engine Running Operations will be approved by USAP Airfield Manager. All aircraft arriving or departing will be expected to shutdown to prevent damage to the airfield surfaces.

1.3.4.5 The Airfield Manager or designated representative will coordinate operational waivers through the 13 AEG/CC.

1.3.4.6 All LC-130 aircraft shall land/taxi on wheels when landing at Phoenix Airfield unless otherwise advised by NOTAM.

1.3.5 **McMurdo Heliport**. McMurdo heliports are located on the Grid northwest side of McMurdo Station and constructed on prepared gravel, populated with cement pads on the lower heliport.

1.3.5.1 There are two heliports, distinguished by levels, adjacent to one another. The lower level (elevation 60 feet MSL) has six helipads. The upper level (elevation 75 feet MSL) has two helipads. The McMurdo heliport is uncontrolled. All helicopters on the upper pads will avoid flying over helicopters on the lower pads.

1.3.5.2 Both NSF and Antarctica New Zealand (ANTNZ) contract aircraft provide support to field parties within 200 miles of McMurdo Station and Marble Point

1.3.6 **Marble Point Heliport**. Marble Point Heliport is approximately 45 NM Grid SSE from McMurdo Station and constructed on semi-prepared rock. It is uncontrolled and serves as a staging area and refueling station for helicopter support for numerous science parties in the Dry Valleys.

1.3.7 **South Pole Skiway (NZSP)**. The South Pole Skiway is located at the South Pole Station approximately 730 NM Grid North from McMurdo. The Skiway is 12,000’ x 220’ and oriented Grid 02/20G.

1.3.7.1 Clean Air Area – See Attachment 4.

1.3.7.2 Cargo drifting (Ski-combat offload) is authorized but must be pre-coordinated with the Assistant South Pole Area Manager a minimum of 45 minutes in advance of landing, thus ensuring cargo personnel can support ramp clearing operations.

1.4 Ramp Operations

NOTE
Skier Maintenance controls the ramp.

1.4.1 Phoenix Field Ramp information.

1.4.1.1 Phoenix Field is an uncontrolled airfield, and no tower services are available.

1.4.1.2 Pilots will operate under their own cognizance and provide their own separation.

1.4.2 Williams Field Skiway and ramp.

1.4.2.1 When the control tower is operational at Williams Field, ATC has sole authority to clear an aircraft onto the skiways. Taxiways at all airfields are non- movement areas.

1.4.2.2 Pilots will provide their own obstacle separation.

1.4.2.3 For operations on the Skier (LC-130) ramp, pilots will also notify "Skier Maintenance" (139 EAS Maintenance Control) on VHF 123.45 MHz prior to starting engines and prior to initiating any movement on the ramp as an advisory call only.

1.4.2.4 Skier Maintenance will provide aircraft marshalling for LC-130s. NSF Prime Contractor (AGE) personnel will provide other aircraft marshalling services.

1.4.2.5 Skier Maintenance controls sequencing at the fuel pits.

1.4.2.6 Loading or unloading in refueling pits with a sled (once adequate spacing is assured), or single loader, is authorized upon coordination with McMurdo Air Terminal Operations (ATO) through Skier Maintenance. Aircraft will contact "Skier Maintenance" (139 EAS Maintenance Control) if available on VHF 123.45 MHz.

NOTE

The use of sleds (specialized cargo loading sleds) in the fuel pits are standard operations.

The USAP Airfield Manager may discontinue this practice if fuel pit conditions become degraded.

1.4.2.7 LC-130 aircraft are approved to combat offload (drift cargo) on the backside of the ramp in front of the Cargo Yard. Prior coordination between the user and Skier Maintenance is required.

NOTE

The USAP Airfield Manager, if required due to snow conditions, can restrict combat offloads.

1.4.2.7.1 Aircraft Commander shall notify Skier Maintenance of intent to combat off-load cargo as soon as determined, but at least 30 minutes prior to arrival. Skier Maintenance shall in turn notify the USAP Airfield Manager, McMurdo ATO, and Williams Field Tower.

1.4.2.7.2 Skier Maintenance and the Aircraft Commander shall ensure the combat offload area is clear of personnel and equipment prior to commencing combat offload.

1.4.2.8 Skier Maintenance shall coordinate all engine runs with Tower and Aircraft Rescue and Fire Fighting (ARFF) prior to engine run. ARFF vehicles on standby shall not be parked closer than 500 feet from centerline of runway.

1.5 Adverse Weather Landing Sites/Diverts

1.5.1 When whiteout conditions occur, an aircraft may be unable to complete an instrument approach to the Williams Field or Phoenix Airfield.

1.5.2 Currently there are no adverse weather landing sites available for wheeled aircraft in Antarctica. Aircrew must ensure sufficient reserve fuel is carried to allow diverting to an alternate airfield off continent.

NOTE

As of Sept 2021, Mario Zucchelli Station had made substantial progress on a gravel runway to support their station. Prior to flight, it is advisable to check NOTAMS for status on this possible divert runway, available to wheeled aircraft.

1.5.3 **Mario Zucchelli Station (MZS) (Terra Nova Bay - NZTB)**. The Italian Antarctic Program builds Terra Nova Bay Ice Runway seasonally on "fast ice" in Terra Nova Bay. This seasonal sea ice runway is operational from late October through early December. However, it may not be operational every season or its operations may be terminated early due to adverse ice conditions. Its primary purpose is to support the Italian Antarctic Program airlift. When open and confirmed operational by the Italians, communicated through the 139EAS/CC, LC/C-130 Aircraft Commanders may use NZTB as an emergency divert.

1.5.3.1 Approximate location is 74 41.0'S, 164 06.7'E; 190 miles Grid South (True North) of McMurdo Station.

1.5.3.2 Ice Runway Alignment and Dimensions: 026T/206T, 10,000 feet x 250 feet.

NOTE

Runways are oriented to True North.

1.5.3.3 Due to high terrain (3400 feet 2 NM southwest of the runway) the designated runway for landing is 21T and for takeoff 03T. There is a non-directional beacon (NDB) servicing MZS – identifier NZTB, with an associated NDB/GPS approach.

NOTE

Headings are TRUE headings and may change from season to season.

1.5.3.4 Terra Nova Bay Handout can be referenced for runway layout and communications plan. Copies are available at Christchurch Base Operations and McMurdo Base Operations once Terra Nova Bay Seasonal Sea Ice Runway is operational. The Terra Nova Bay facilities and runway layout can also be found in the Antarctic Flight Information Manual (AFIM).

1.5.3.5 Terra Nova Bay Operations maintains a listening watch on HF 5.371 kHz during scheduled Italian flight operations.

NOTE

As of Sept 2021, Mario Zucchelli Station had made substantial progress on a gravel runway to support their station. Prior to flight, it is advisable to check NOTAMS for status on this possible divert runway, available to wheeled aircraft.

1.5.4 **Whiteout Landing Area**. A Whiteout Landing Area has been established on the Ross Ice Shelf, for ski-only landings, when landings are not possible on prepared surfaces due to weather or other factors.

1.5.4.1 The NSF Prime Contractor annually surveys and certifies the Whiteout Landing Area prior to the commencement of LC-130 operations to ensure the area is free of crevasses or obstructions.

1.5.4.2 NPP develops a Whiteout Area approach plates each season. The approach plate shall include navigational guidance from all McMurdo area airfields to the whiteout area.Two approaches are available: one from NZWD and one from NZFX.

1.5.5 New Zealand Emergency Airfields/ Diversion Procedures.

1.5.5.1 Primary recovery base will be Christchurch IAP, NZ; the secondary recovery base is Auckland IAP, NZ, for C-17, and Wellington IAP for LC-130 aircraft. Other NZ airfields are available as possible divert locations. Reference DoD FLIP Pacific Enroute Supplement for information on potential divert locations.

1.5.5.2 Aircrews should contact Christchurch operations as soon as possible with ETA to diversion base.

NOTE

Christchurch operations will notify diversion airfield base operations or airport control. Customs, agriculture, etc. will be requested as required.

1.5.5.3 Once on the ground at the alternate/diversion airfield, LC-130 Aircraft Commanders will contact 13 AEG Det 1 Representative by telephone. Collect calls are acceptable. C-17 Aircraft Commanders must notify CHC Base Operations and 304 EAS/CC or DO.

1.6 Airfield Construction, Markings and Lighting

1.6.1 USAP primary airfields and outlying camps that support fixed-wing aircraft operations are constructed and marked by the NSF Prime Contractor in accordance with the specifications contained in AFI 13-217, Drop Zone and Landing Zone Operations Chapter 4, LC-130 Skiway and Ski Landing Area Criteria and FC-3-260-06F. United States Navy is the TERPS certification authority for USAP Airfields. The Chief of Naval Operations has approved a permanent waiver for airfield lighting and marking allowing USAP airfields to be certified for IMC operations.

NOTE

Skiway and ice runway markings are installed as early in the season as practical.

1.6.2 Lighting

1.6.2.1 Airfield lighting systems are established at Phoenix and Williams Fields. The NSF Prime Contractor maintains airfield markings and lighting systems in accordance with AFMAN 32-1076, Design Standards for Visual Air Navigation Facilities.

1.6.2.2 International orange windsocks are installed on the approach ends (left side) of all skiways and ice runways.

1.6.2.3 Short Simplified Approach Lighting with Runway Alignment Indicator Lights (SSALR) lighting systems may be installed on active primary runways of Phoenix, and Williams Fields IAW Air Force Manuals.

1.6.2.3.1 Approach lighting intensity settings are consistent with AF requirements and follow FAAO 7110.65 regulations. ATC Tower personnel use those settings for setup and operations. For desired changes in intensity at Phoenix and Williams Fields, aircrews should notify ATC Tower personnel as soon as possible prior to expected landing.

NOTE

AFLC's (Airfield Lighting Computer) is installed and remotely controls airfield lighting.

1.6.2.4 Runway End Identifier Lighting System (REILS) is a portable lighting system that provides a rapid and positive identification of the end of the runway located in line with, and outboard of the threshold lighting of the primary instrument runway/skiway for Williams Field and Phoenix Runway.

1.6.2.4.1 The REILS system consists of synchronized flashing white lights.

NOTE

Approach lights and REILS are capable of being operational simultaneously at Phoenix and Williams Fields. REILS are serviced and maintained by NPP Ground Electronics Maintenance, and the Approach lights are maintained by the NSF Prime Contractor. The REILS are remote controlled and may be activated by selecting the appropriate VHF frequency (published annually by NPP) and keying the transmitter 5 times within a 10 second window.

1.6.2.4.2 Once activated, the REILS will remain in operation for approximately 15 minutes, deactivating automatically. The system may be deactivated manually by keying the transmitter 7 times .

1.6.2.4.3 The REILS operate with three programmable intensity settings which must be manually selected by NPP and are activated for an arriving aircraft 5 minutes prior to the aircraft's ETA when the ceiling and visibility is 3,000/5 or less, or upon pilot request.

1.6.2.5 Abbreviated Precision Approach Path Indicator (APAPI) is a two box system placed on the edge of the primary runway/skiway at the approach end. The touchdown and 2.5-degree glide slope are not coincident with the TLS.

1.6.2.5.1 APAPIs are located at Phoenix, and Williams Fields only. Phoenix runway is equipped with a 2 box LED/IR APAPI system. It offers Visibility Mode for daytime operations and NVG Mode for NVG landings at night. Williams Field is equipped with a 2 box LED APAPI system with Visibility Mode only.

1.6.2.6 Due to the lack of runway edge lighting and the minimal contrast between the runway edge and the surrounding ice, High Intensity Retro-Reflective Runway Identification Markers (HIRRRIM) are utilized to aid in runway identification during C- 17 austral winter flight operations.

1.6.2.6.1 The Mission Commander will coordinate with USAP Airfield Manager to ensure that HIRRRIM are installed properly and will brief the aircrew on the marker configuration.

1.6.2.7 The NSF Prime Contractor also manages a set of temporary runway edge and threshold lighting to be used by non-DOD aviation service providers as required outside of the austral summer.

1.6.2.7.1 The Mission Commander will coordinate with USAP Airfield Manager to ensure that temporary lighting are installed properly and will brief the aircrew on the marker configuration.

1.7 Airfield Navigation Aids and Instrument Approaches

1.7.1 Air Navigational Approach Aids.

NOTE:

All navigational and approach aids are intended strictly for use by USAP approved aircraft only.

The use of NAVAIDs by non-USAP aircraft are strictly at the pilot's own risk.

1.7.1.1 TACAN approaches may be available at Phoenix, and Williams Fields. These approaches are developed and normally certified annually to minimums of 300 feet and 1 mile. Minimums may change due to seasonal proximity of runway(s)/skiways to terrain. TACAN based departure procedures are available at Phoenix and Williams Fields.

1.7.1.2 TLS approaches: the TLS are operational at Phoenix, and Williams Fields. TLS approaches are developed and certified annually to minimums of 200 feet and ¾ mile.

1.7.1.3 RNAV (GPS) arrivals and approaches are available at Phoenix, and Williams Fields, and South Pole Station. All approaches are developed and certified annually.

1.7.2 Instrument fly-ability checks, as stated in AFMAN 11-230 Attachment 9, Instrument Procedures, are flown by FAA or equivalent aircrews to ensure procedures are safe, practical, and consistent with good operating procedures.

1.7.3 NPP ensures development, submission, review, approval, and use of instrument approach procedures in the Antarctic are consistent with DoD policies.

1.7.4 The DCJTF-SFA or designee, in accordance with the NSF-DoD MOA, authorizes interim IFR flight certification of instrument arrivals, approaches, and departures until FAA flight checks are completed in mid to late October and final instrument procedures are published.

1.7.5 Precision TLS instrument approaches are certified to minimums of 200 feet and ¾ mile. Non-precision TACAN and Airborne Radar Approaches (ARA) (LC-130 only) approaches are normally certified to 300 feet and 1 mile. Minimums may change due to seasonal proximity of runways/ skiways to terrain.

1.7.6 IFR ARAs are developed by NIWC, reviewed by the 109 OG/OGV (Stan/Eval), and approved by NAVFIG. These ARAs are approved for LC-130 aircrew use only.

Minimums for approved IFR ARAs are as published. Upon ARA clearance, pilot assumes responsibility for terrain and obstacle clearance. ATC retains responsibility for separation of IFR aircraft.

1.8 Airfield Status Reports

1.8.1 The USAP Airfield Manager:

1.8.1.1 Southbound flights: Provides to Charleston ROF and Mac Center, via email usingthe airfield status update form, the airfield information for Williams Field (NZWD), Phoenix Airfield (NZFX), and South Pole (NZSP), no later than 6 hours prior to a scheduled departure from Christchurch, for all southbound flights. Attachment 6 contains an example of the airfield status update.

1.8.1.2 On-Continent flights: Provides to Charleston ROF and Mac Center, via email using the airfield status update form, all Field Camp status reports and the airfield information for Williams Field (NZWD), Phoenix Airfield (NZFX), and South Pole (NZSP) no later than 3 hours prior to the first scheduled departure for all on-continent flights. All USAP aviation agencies will coordinate with the Fixed/Rotary Wing Supervisor to ensure accuracy of all field camp data.

1.8.2 MAC Center Air Traffic Control personnel:

1.8.2.1 Compile all McMurdo Airfield Status Reports, receive and review airfield status update forms from the airfield manager or his designated representative, review and update the status of NPP equipment (TACAN, TLS, PAPI, REILS, HF Communication, and SATCOM), and disseminate to the appropriate email distribution list. To be added to the Airfield Status report distribution list, please email atc.chs@usap.gov. Notify USAP Airfield Manager of discrepancies in the Airfield Status Report.

1.8.2.2 Post all status reports in Flight Planning area no later than 3 hours prior to the first scheduled departure for all on-continent flights. This information will be e-mailed to the 139 EAS Supervisor of Flying (SOF) in Raven Operations. Mac Center will post a copy of the current Airfield status report in Flight Planning.

1.9 Runway Condition Reading (RCR) and Runway Surface Condition (RSC)

1.9.1 RCR checks are conducted as required due to changing weather conditions, or as requested by aircrew for Phoenix Runway. RSC reports detail surface conditions and snow thickness. During RCR/RSC checks, the entire length of the runway is examined. If there are significant differences noted between sections of any runway, this difference is reported in the RSC report and passed to the USAP Airfield Manager. No RCR reports are provided for skiways, RSC only.

1.9.2 The USAP Airfield Manager or designated representative is responsible for forwarding the airfield information to all personnel on the MCM-Airfield-Reports list server. CHS

ROF will update the airfield status report and distribute via the USAP Airfield Status Report list server.

1.9.3 During the Austral Winter flights at Phoenix Airfield, the RCR and airfield status report for the airfields are accomplished by the NSF's Prime Contractor Fleet Operations personnel at the end of the duty day prior to a scheduled flight and called into Mac Center. If weather conditions change, which could affect the RCR, RSC or airfield status, the NSF Prime Contractor Fleet Operations will accomplish another RCR, RSC and airfield status report at the earliest opportunity.

1.10 Airspace System

1.10.1 By Letter of Agreement (LOA) with Airways Corporation of New Zealand Limited (AWC) and Civil Aviation Authority (CAA) of New Zealand, Mac Center has been delegated the following airspace from Auckland Oceanic Control Center, which is within the Auckland Flight Information Region (FIR). This airspace is known as the McMurdo Sector. It is all that airspace bounded by a line joining 60° S/163°E, 60° S /174°E, 73°30'S /131W, 90° S/131° W, and 60° S/163°E.

1.10.2 The McMurdo Sector is activated for USAP flight periods and will be depicted on DoD or other aviation charts and publications. The system includes airspace designated as Class A, D, E, and G.

1.10.3 **Class A**: Within the McMurdo Sector, applicable to all aircraft, includes the airspace beginning at Flight Level 245 up to and including Flight Level 600.

1.10.4 **Class D**: The area around the operating control tower at Williams Field is designated Class D airspace. The area is a 4.3 NM (5 SM) radius from the center of the airport surface up to and including 2500 AGL. Two-way radio contact with the control tower is mandatory prior to entering Class D airspace.

1.10.5 **Class E**: Class E airspace is controlled airspace within 100 NM of Williams Field, or Phoenix Field TACANs (excluding Class D airspace) extending from the surface up to, but not including, FL 245.

NOTE:

Aircraft may operate under VFR within Class E airspace from the surface up to the floor of Class A airspace.

1.10.6 **Class G**: All other airspace is considered class G or uncontrolled. All USAP support aircraft operating in this airspace comply with ICAO Standard Airfield Reporting Procedures and command or company policies for air operations.

NOTE:

For USAP participating aircraft, Class A airspace extends over the entire continent of Antarctica. Additionally, Class D and E airspace is applicable to USAP participating aircraft. All other aircraft are encouraged to recognize established airspace categories to ensure flight safety.

1.11 Air Traffic Control

1.11.1 NIWC Atlantic's Polar Programs (NPP) is responsible for providing air traffic control and flight advisory services for all aircraft operating in the McMurdo sector of the Auckland FIR.

1.11.2 Services: McMurdo ATC provides Enroute/Oceanic Air Traffic Control, flight following, Non-Radar Approach Control, VFR Control Tower services and Search and Rescue coordination. These services are provided for aircraft operating south of 60° South latitude in the McMurdo Sector and USAP flights operating over the Antarctic Continent. Other Antarctic ATC agencies may assist Mac Center in providing these services.

1.11.2.1 Mac Center coordinates with Auckland Center for flights between Antarctica and New Zealand, and Melbourne Center for flights between Antarctica and Australia. The transfer of control and responsibility between Mac Center and Auckland Center is 60° South latitude. The transfer of control point between Mac Center and Melbourne is the FIR boundary along 163° East Longitude.

1.11.3 NPP, 62d/446th and 109th Air Wings develop approach plates, standard route and GPS RNAV STARS annually. ATC may descend IFR inbound aircraft via the published routing. Aircrews shall comply with published minimum enroute altitudes (MEA) unless restricted by ATC.

1.11.4 ATC-provided services for McMurdo Station Area:

NOTE

To be added to a distribution list for any of these products, please email: atc.chs@usap.gov.

1.11.4.1 Mac Center provides enroute/oceanic air traffic control, flight following, and search and rescue coordination services to all USAP participants operating within the McMurdo Sector and/or over the Antarctic continent. In addition, Mac Center provides non-radar Approach/Control Services in Class E airspace within 100 NM of Phoenix and Williams Fields below FL245 when there is no operating control tower.

1.11.4.2 Remote Operating Facility (ROF): ROF is a functional mirror facility of Mac Center, physically located in Charleston SC, capable of remotely providing all Mac Center services. Specific products prepared or maintained by the ROF are listed below.

- Movement report notifications for all USAP aircraft to include arrival, departure, delay, and turnaround aircraft
- Pre-flight Briefing Services
- Flight Planning Services
- Enroute Flight Advisory Service (EFAS)
- Emergency activation/deactivation
- SAR callout or secure
- Aircraft movement report notifications
- Airfield status report dissemination

1.11.4.3 Tower is responsible for providing:

- Air traffic control services to aircraft within Class D airspace.
- Non-radar arrival and departure services in Class E airspace.
- Traffic advisories and Air Traffic Control service for VFR and IFR aircraft within Class D and E airspace.
- Air traffic control service to aircraft transitioning through Class D airspace.

1.11.4.4 Mac Center provides traffic advisory service for VFR and IFR aircraft outside Class D airspace.

1.11.5 Visual Separation.

1.11.5.1 Aircraft cleared to maintain visual separation must remain in VMC until other approved IFR separation can be applied.

1.11.5.2 Visual separation clearances will be applied in accordance with procedures set forth in FAAO 7110.65 rules and regulations.

1.11.5.3 Visual separation is authorized up to the base of Class A airspace.

1.11.6 Emergency Procedures.

1.11.6.1 The emergency procedures section of the DoD FLIP Flight Information Handbook and or applicable ICAO documents apply to all USAP aircraft.

1.11.7 Aircraft Emergency/Mishap Alert Procedure.

1.11.7.1 ATC (Mac Center or Tower) alerts required personnel in the event of an aircraft emergency or mishap. The control tower alerts Station II (airfield fire station) and Mac Center via CH-2 with the following information:

- Aircraft identification,
- Aircraft position,
- Nature of emergency,
- Fuel on-board in pounds,
- Number of persons on-board,
- Pilot intentions
- Any other pertinent information.

1.11.7.2 Station II ensures that an ambulance is dispatched to the appropriate location and positions all emergency vehicles.

1.11.7.3 Mac Center/Tower notifies Raven Operations or the aviation activity involved in an emergency. Mac Center notifies the Mac Center Manager/Air Traffic Manager (ATM) of all incidents, mishaps, or emergencies on or near the airfields of McMurdo.

1.11.7.4 All concerned agencies are alerted via email by Charleston ROF. To be added to the Emergency distribution list please email atc.chs@usap.gov.

1.11.7.5 The ATM collects controller statements and ensures the tapes are safeguarded IAW FAAO 7210.3 Facility Operation and Administration and FAAO 8020.11 Aircraft Accident and Notification, Investigation and Reporting.

1.11.7.6 In the event of DoD involved assets, the 13 AEG/CC, in coordination with the NSF Representative/Station Manager, designates the appropriate military representative who has received aviation safety officer training to initiate the safety/mishap investigation procedures, to include the collection and preservation of evidence, IAW AFI 91-204, Safety Investigation and Reports.

1.12 Flight Following

1.12.1 Flights north of 60° South latitude and operating between McMurdo Station and New Zealand are under the control of Auckland Center or Melbourne Flight Service Center.

1.12.2 Mac Center or Charleston ROF provides enroute flight guard, air traffic control and advisory service for all USAP sponsored aircraft operating over the continent of Antarctica and South of a line joining 60° S/163°E, 60° S /174°E, 73°30'S /131W, 90° S/131° W, and 60° S/163°E at all altitudes above the surface.

1.12.3 Mac Center also provides the above services to all known aircraft operating in the McMurdo Sector that includes the area noted above and within a sector defined by longitudes 163°E and 131°W to the geographic South Pole. Exceptions are:

1.12.3.1 Independent support missions at outlying stations.

1.12.3.2 Aircraft remaining under shipboard control and operating more than 15 miles from the Williams Field TACAN below 500 feet altitude.

1.12.3.3 Aircraft under the control of the Williams Field tower.

1.12.3.4 All non-USAP aircraft that are operating outside the boundaries of McMurdo Sector.

1.12.4 Mac Center Provides Helicopter Flight Following (HFF) to helicopter traffic in the local flying area and may operate in the deep field providing localized services to deep field camps.

1.12.4.1 HFF Responsibilities. General HFF duties and responsibilities include but are not limited to the following:

- Provide flight following for the safety of flight.
- If in the field, Call Mac Center on Iridium phone at the commencement and discontinuance of helicopter operations each day.
- Conduct communications search for overdue helicopters.
- Advise MCWS of overdue aircraft.
- When requested, provide Visual Flight Rules (VFR) advisories and flight assistance.
- Neatly maintain and retain daily helicopter flight following form and position log.
- Return forms and logs to Mac Center for retention (if in field camp)

1.12.4.2 Flight Following Procedures.

1.12.4.2.1 Contractually, all USAP helicopters will maintain flight following by communicating each take off, landing, and every 30 minutes enroute to the HFF.

1.12.4.2.2 During helicopter operations, the HFF position shall be manned at all times. If a break is needed another HFF must log in. The HFF must control any and all distractions to performing HFF in the flight following area of camp if in the field.

1.12.4.2.3 Flight Plan. A departure flight plan shall include: departure point, destination, estimated time enroute, people on board (including the pilot and helitech), and fuel on board.

1.12.4.2.4 Enroute/Position Report. An enroute call may include: operations status (i.e. normal) and position report. The pilot may elect to amend the enroute time to destination during this call but if that does not occur, the original enroute time will remain.

1.12.4.2.5 Arrival. An arrival transmission may include: location where landing and duration of time planned on the ground.

1.12.4.2.6 Flight Follow Local. A "flight follow local" flight plan means the pilot is flying the helicopter in a general area conducting multiple landings and departures with different numbers of people on board. The pilot should file a local flight plan and advise the HFF where their local flying will take place, their enroute time, and their fuel on board. The maximum amount of time available for a local flight plan is 30 minutes. The pilot may extend local flying time in 30-minute increments.

1.12.4.2.7 Ground Time/Ground Delay. Ground time/delay time means the helicopter has landed and will be on the ground for a specified amount of time.

1.12.4.2.8 The pilot will call landing at location and the amount of time needed on the ground. The maximum amount of time available for a ground time/delay is 30 minutes. The pilot must contact HFF to amend this time in up to 30-minute intervals.

1.12.4.2.9 Automated Flight Following (AFF). Radio and telephone communications between the helicopter pilot and the HFF are the primary flight following tools. AFF is a secondary flight following tool. Contractually, all USAP helicopters must have an AFF unit and SATCOM installed in the aircraft. Mac Center will ensure the helicopters are visible on the AFF during initial commencement radio (or Iridium phone if in the field) call.

1.12.4.2.10 Navigation. All references regarding direction/headings to/from helicopters shall be in TRUE unless otherwise stated.

1.12.4.2.11 Weather Minimums. Contractually, USAP helicopters will operate under Visual Flight Rules (VFR) only.

1.12.5 Automated Flight Following (AFF). All USAP contractor operated aircraft are equipped with a combined satellite communications and automated flight following system (Sky-Trac System ISAT-1000 or equivalent). The systems report at a minimum of 2- minute intervals and are registered with the U.S. GOV's aff.gov site (Managed by NIFC/USFS in Boise, ID).

1.12.5.1 Automated Flight Following (AFF) is an online government application that automatically tracks the location and velocity of specially-equipped aircraft and mobile assets and provides this information in near-real-time to dispatchers, aviation managers, and other authorized users.

1.12.5.2 Utilizing geolocation and data communications devices installed in government-registered aircraft. AFF tracks position speed, altitude, heading, and transmits the data via satellite to a ground-based flight-monitoring system. AFF tracks contract aircraft around the globe.

1.12.5.3 AFF benefits include improved detection and response to emergencies; reduced workload in aircraft and dispatch centers; reduced radio traffic and pilot "heads down time"; enhanced situational awareness for all users.

1.12.5.4 It is the goal of USAP to maximize the number of registered users of AFF compatible systems beyond contracted aircraft to include DoD, partner nations, commercial NGO users and more in order to better present a "fused" air picture across the continent for safety and emergency SAR response.

1.13 Flight Reports

1.13.1 Pilots shall provide Auckland Center/Mac Center and Christchurch Base Operations with a departure report as soon as practical after establishing initial HF or VHF radio contact. KBA VFR aircraft departing Williams Field will give their departure report to the tower when the airfield is controlled. During periods Williams Field is uncontrolled, KBA VFR aircraft will make their departure reports to CHS ROF via Iridium.

1.13.2 Departure reports shall include:

- departure station,
- actual time of departure (ATD),
- destination,
- estimated time of arrival (ETA),
- enroute altitude,
- ETA at first reporting point,
- ETA at 60 South (if required),
- ETA at PSR (for Southbound intercontinental flights only), and
- any applicable remarks.

1.13.3 IFR fixed-wing aircraft shall make position reports at compulsory reporting points along the route of flight in standard ICAO format. This must include spot winds and temperature.

1.13.4 Pilots landing at locations not having flight guard capability will advise Mac Center of their point of intended landing, estimated landing time, and estimated time of departure.

1.13.5 Aircrew shall attempt contact with Mac Center after landing and prior to take off. Hourly "ops normal" radio calls will be made to Mac Center while on the ground unless other arrangements are coordinated between the Aircraft Commander and Mac Center.

1.13.6 VFR fixed-wing aircraft will report flight position at hourly intervals.

NOTE
Aircraft separation services are not provided for VFR aircraft.

1.14 Aviation Meteorological Services

1.14.1 NPP Meteorology provides meteorological services to USAP participants and partners' aviation service providers from the McMurdo Weather Office at McMurdo Station and the NPP Remote Operations Facility (ROF) in Charleston, South Carolina. Aviation meteorological forecasting services for Antarctic continental sites are primarily provided remotely by the NPP ROF.

1.14.1.1 The McMurdo Weather Office provides aviation meteorological services for USAP aircraft missions originating at McMurdo and routinely issues METAR and SPECI observations. The weather office coordinates over-the-counter flight weather briefings and can provide weather updates by Iridium telephone or UHF broadcast when patched through by Central Comms.

1.14.1.2 The NPP ROF routinely issues TAFs (Terminal Area Forecasts) for the McMurdo active airfields, for selected USAP field camps, and for the South Pole station skiway. It also hosts the flight weather briefings for USAP aircrews of southbound missions originating at Christchurch, New Zealand via web-conference with Christchurch USAP Base Operations, as well as northbound and continental missions originating in McMurdo Station via web-conference with McMurdo Weather Office. The NPP ROF can provide voice weather updates for continental and intercontinental missions via Iridium or other telephone systems.

1.14.1.3 A flight weather packet will be provided for all scheduled flights. The continental flight weather packet will contain a Flight Weather Briefing (DD Form 175-1) or VFR Briefing sheet and Flight Level Winds. The intercontinental flight weather packet will contain, at a minimum, a Flight Weather Briefing (DD Form 175-1), Flight Level Wind Charts, and a Significant Weather (SIGWX) Prognosis (FL100-FL450).

1.14.2 The delineation of the Met services NPP provides to its customers and their expectations can be found in attachment 7.

1.15 Antarctic Airfield Management

1.15.1 General.

1.15.1.1 Airfield Management of the McMurdo Station area airfields provides safe, efficient, and effective aircraft operations for all USAP participants.

1.15.1.2 Airfield management responsibility for the McMurdo airfields and South Pole Station resides with the NSF Prime Contractor's USAP Airfield Manager.

1.15.1.3 Airfield management responsibility for outlying camps resides with the NSF Prime Contractor through the camp manager/supervisor.

1.15.1.4 All exercises, traverses or training taking place on or near McMurdo or South Pole airfields and Whiteout Area are prior coordinated with the NSF Representative/Station Manager, 13 AEG/CC, USAP Airfield Manager and NPP Site Manager a minimum seven (7) working days in advance.

1.15.1.4.1 Failure to coordinate in advance could result in hazardous conditions requiring the USAP Airfield Manager to suspend airfield operations until the hazard(s) is (are) terminated. The coordination is to ensure events or exercises shall not impact the safe, continuous operations of airfields.

1.15.2 Airfield Preparation and Maintenance.

1.15.2.1 Preparation and maintenance generally include grading, chaining, and rolling to obtain the desired surface conditions. The NSF Prime contractor should ensure that Skiway surfaces are groomed in a timely manner following surface disturbance/damage by weather, to minimize impact on scheduled flight operations. This is especially important during the operating season to eliminate snowdrifts, windrows (caused by vehicle traffic), and ruts created by aircraft skis.

1.15.2.1.1 **SKIWAYS**: Williams Field and South Pole Skiways and associated ramp and taxiway areas will be prepared and maintained by the NSF Prime Contractor to ensure a smooth and compact surface for use by ski-equipped aircraft.

1.15.2.1.2 **RUNWAYS**: The Phoenix Runway and associated taxiway areas are graded smooth and may have a firmly compacted snow pavement, and up to one-inch depth of loose snow; ramps are graded and may have surface covers similar to the runways.

1.15.3 Airfield Standards.

1.15.3.1 The criteria outlined in FC 3-260-06F, Air Force Design, Construction, Maintenance, and Evaluation of Snow and Ice Airfields in Antarctica, set the standards for the design, construction, maintenance, and operation of Phoenix Runway. AFI 13- 217, Drop Zone and Landing Zone Operations Chapter 4, LC-130 Skiway and Ski Landing Area Criteria set the standard for USAP skiways.

1.15.3.2 To ensure flight safety, the USAP Airfield Manager, NPP Manager and Airlift management personnel are advised on all construction activities on or near the airfields during periods of flight operations. Airfield waiver requests to the published clear zone criteria must be received a minimum of 90 days prior to the construction. Justification for non-compliance must be included in the request.

1.15.3.3 The Runway Lateral Clear Zones at the Williams Field Skiway and Phoenix Airfield are established at 500 feet, measured from the centerline of the runway. No objects, including aircraft or structures, shall be sited within the Runway Lateral Clear Zones. Exception: Navigational aids and lighting.

1.15.3.4 The Compacted Snow Runway and Skiway maintenance crews and inspection personnel utilize the following standards:

1.15.3.4.1 Airport markings will be in accordance with Air Force Manual 32- 1076, AFI 13-217, and FC-3-260-06F and free from snow accumulation and other obstructions. These markings apply to:

- approach lights,
- distance, threshold, and low visibility markers,
- taxiway/ramp lights, and /or flags

1.15.3.4.2 All runway lights and markers must be visible from an inspecting vehicle when located at the center point of runway.

1.15.4 Skiway and Compacted Snow Runway Standards:

1.15.4.1 Normally, an additional 100 feet of prepared surface is added to the width of the last 300 feet of each runway (skiway) to provide for a turnaround area.

1.15.4.2 Runways will be groomed frequently - often daily. Skiways are graded and groomed often daily and always immediately after new snow accumulation.

1.15.4.3 Both Skiway and Ice Runway ramps and taxiways will be graded smooth. Additionally, Ice Runway ramps and taxiways can have up to two inches of loose snow cover.

1.15.5 NSF Prime Contractor's USAP Airfield Manager Responsibilities

NOTE:

The USAP Airfield Manager has the authority to close/suspend and resume airfield, runway/skiway or taxiway operations. Time permitting; this will be done with the concurrence of the NSF Representative/Station Manager and 13AEG/CC.

1.15.5.1 Maintenance of Phoenix Runway, Williams Field Skiway, and South Pole Skiway to ensure safe conditions for flight operations.

1.15.5.2 Maintenance of Access roads between McMurdo Station and the airfields to ensure safe conditions for flight operations.

1.15.5.3 Assurance that airfield checks and inspections are performed on a daily basis and after any event (heavy snowfall, numerous aircraft operations, high winds, etc.) that may affect the condition of the runway/skiway or ramp area.

1.15.6 South Pole Station/Outlying Camp Supervisor Responsibilities.

1.15.6.1 Station/Camp Supervisors of outlying camps shall designate a representative or personally make daily inspections (more frequently if conditions warrant) of skiways, taxiways and ramp facilities.

1.15.6.2 All Station/Camp Supervisors shall report daily, no later than 0600L, the current airfield status, to include Material Handling Equipment (MHE) and fuel availability, through Central Comms who, in turn, phone or radio-patch the individual to the Aviation Operations Manager. Changes to airfield status are reported daily in the same manner.

1.15.6.3 Station/Camp Supervisors are required to communicate with the USAP Airfield Manager regarding questionable issues that may impact aviation operations. Station/Camp Supervisors shall ensure weather observations are taken with sufficient frequency to support fixed wing flight operations.

1.16 Austral Winter Flight Operations

1.16.1 The utilization of NVGs (DoD) and temporary runway edge/threshold lights (non- DoD service providers) provides year-round capability to McMurdo offering a valuable means to evacuate personnel or deliver emergency supplies during the Austral Winter. C- 17 NVG Operations will be conducted IAW AFMAN 11-2C-17V3 Addenda-C.

CHAPTER 2 STANDARD OPERATING PROCEDURES (SOP) AND INSTRUCTIONS

2.1 Christchurch Operations

2.1.1 Each mission's success is the product of several agencies working together efficiently.

2.1.1.1 The National Science Foundation (NSF) is the airlift user and has engaged its Prime Contractor to manage intercontinental operations.

2.1.1.2 As the lead agency for the USAP, the National Science Foundation is ultimately responsible for the prioritization of passengers and cargo.

2.1.1.3 Command and Control (C2) of DoD airlift remains the responsibility of the 13 AEG/CC for Operation DEEP FREEZE.

2.1.1.4 In addition, there are many other agencies involved in the planning and execution of USAP missions. Early recognition of problem areas or conflicts allows sufficient intervention time to ensure successful mission accomplishment.

2.1.2 NSF Prime Contractor, Christchurch:

2.1.2.1 Provides air terminal support at Christchurch NZ in cooperation with AMC detachment.

2.1.3 Aircrew Transportation. Transportation to/from work from hotels for 139th EAS crews, if not within walking distance, may be attained by taking the aircrew van or requesting complimentary shuttle service by the hotel.

2.1.4 The Christchurch SFA/PERSCO/First Sergeant will be provided a van for his/her mission duties.

2.1.5 Meals. Pre-flight meals are available in the hotel restaurant or near the airport at the "60 South" Restaurant or Spitfire Square, or as coordinated otherwise for off hours.

2.1.5.1 In-flight meals will be provided for all aircrew and passengers on intercontinental flights.

2.1.6 Passenger and Cargo Requirements.

2.1.6.1 Once operational requirements are determined, every attempt will be made to maximize allowable cargo loads (ACL) for each aircraft. This requires very close coordination among the aircrew and NSF Prime Contractor (Christchurch) / NZDF Terminal Operations.

2.1.7 Passenger Safety Briefings.

2.1.7.1 Passenger briefings will be accomplished on the aircraft or at the Antarctic Passenger Terminal (APT) by a qualified aircrew member for all flights.

2.1.8 Anti-Hijacking Passenger Processing and Awareness.

2.1.8.1 A passenger without a current passport and/or a valid DoD identification card will not be allowed on flights to Antarctica.

2.1.8.2 False statements about hijacking, bombing, or carrying concealed weapons are violations of Federal and International law.

2.1.8.3 Federal and International laws forbid, except for items authorized in governing regulations, the carriage of hazardous materials aboard aircraft in a passenger's checked or carry-on baggage/packages.

2.1.8.4 If a passenger has questions and is unable to ascertain if the item is unauthorized, the suspected item shall be called to the attention of APT security and physically inspected. In this case, the passenger will open the baggage/package and remove the suspected item for inspection by an authorized agent (Aviation Security personnel). If the item is unauthorized, the passenger must follow locally established rules for disposition of the item.

2.1.8.5 NSF Prime Contractor (Christchurch) has developed controls to screen and maintain passengers and hand-carried items in a sterile environment from the time they have been screened until they are loaded on-board the aircraft.

2.1.8.6 Baggage/Passenger Matching.

2.1.8.6.1 No aircraft shall depart a station until terminal personnel are certain there is a positive match between passengers on-board the aircraft and the baggage on- board the aircraft. If a passenger is manifested on a flight and does not show for the flight, the baggage belonging to the passenger will be removed from the aircraft. Baggage can be processed via the cargo system and manifested as such.

2.1.8.6.2 Passenger baggage, except for hand carry, will be palletized unless the quantity does not justify the use of a pallet

2.1.8.7 Extreme Cold Weather Gear (ECW).

2.1.8.7.1 Extreme cold weather (ECW) gear is required for all personnel traveling to Antarctica.

2.1.8.7.2 Life Support personnel may arrange with NSF Prime Contractor personnel for issue of compatible ECW equipment from NSF supplies in Christchurch, if needed.

2.1.8.7.3 Passenger ECW gear will be worn/available.

2.1.9 New Zealand Arrivals.

2.1.9.1 Aircraft crew and passengers are cleared as follows.

2.1.9.1.1 The Ministry for Primary Industries (MPI) first clears the aircraft ensuring its contents are free of bio-security risk items.

NOTE:

This clearance does not authorize personnel to leave the aircraft.

2.1.9.1.2 The MPI Officer or Terminal Operations APT Rep (if a Discretionary Clearance has been given) release the crew and passengers from the aircraft to process through the border at the international arrival terminal.

2.1.9.1.3 The Customs and MPI Duty Officers may give the crew a Discretionary Clearance that exempts them from processing through the international arrival terminal.

2.1.9.2 A maximum of 11 crewmembers for C-17 and 12 for LC/C-130 (+1 if a Flight Surgeon is part of the crew) are allowed to be manifested on the General Declaration. The list may include mission essential personnel (MEP) as authorized.

2.1.9.2.1 When completing the General Declaration, the crew constituency includes the Aircraft Commander and the remaining crew, inclusive of MEPs. All other personnel must be manifested and processed as passengers.

2.1.9.2.2 All passengers and their baggage will be transported promptly to the international arrival area for processing by Border agents.

2.1.9.2.3 All passengers are required to complete arrival documentation and have in their possession a valid passport or military identification with valid orders, or other approved means of identification.

2.1.10 Smoking is prohibited in the secured area of the airfield and ramp. Smoking or alcohol consumption is not permitted on any USAP related flight.

2.2 Christchurch Airport Ramp Operations

2.2.1 The Antarctic Apron is part of the Christchurch International Airport and as such, a Christchurch International Airport Ltd. (CIAL) Airside Operations Agreement governs ramp operations. All USAP aircrews and support personnel are required to adhere to this agreement.

2.2.2 Military personnel operating vehicles on CIAL ramps must comply with licensing and/or training requirements outlined in Operation Deep Freeze reporting instructions and Operations Order, if any.

2.2.3 Personnel will don reflective vests when on the ramp and flight line. They will also wear hearing protection when on/near the ramp area and in the vicinity of operating equipment or aircraft generating noise.

2.2.4 Smoking on the flight line or ramp area is prohibited at all times.

2.2.5 In any emergency, notify the Airport Fire Service by the fastest means possible, either by apron phone or dialing 1-111 on any phone.

2.2.6 Security is a significant aspect of USAP operations. All individuals must be always security conscious and report any security incident or suspicious activities to the 13 AEG Det 1 Supervisor or First Sergeant and/or local police or airfield security.

2.2.6.1 CIAL Aviation Security provides airport and ramp security at all times. USAF Security personnel may be temporarily assigned to patrol the Deep Freeze ramp while USAF aircraft are deployed to support Operation DEEP FREEZE.

2.2.7 Engine runs will be conducted IAW the Airside Operations Agreement. A copy of this is available from the NSF Prime Contractor Christchurch Terminal Operations Manager.

2.3 Flight Planning and Filing

2.3.1 "ATC Course Rules" briefings will be provided in both Christchurch and McMurdo for USAP Flight Crews. Twin Otter and Helicopter crews will be briefed as soon as possible after arrival at McMurdo Station.

2.3.2 USAP aircraft shall be on an approved flight plan appropriate for intended operation, filed through Base Operations.

2.3.3 The local flying area for fixed-wing aircraft includes the entire continent of Antarctica.

2.3.4 Intercontinental flights between New Zealand and Antarctica will require USAP aircrew to file a DD Form 1801 (International Flight Plan) in Christchurch Base Operations to Christchurch Clearance Delivery. Flights utilizing the Macquarie route will require a FIR estimate for Melbourne and Auckland boundaries.

2.3.5 Flights within the Antarctic continent will file a DD Form 1801, International Flight Plan with McMurdo Center unless on Standardized Routing.

NOTE:

PSR time will be included on all DD Form 1801's.

2.3.6 IFR flights will be cleared via filed flight plan routing, stereo route prescribed Departure Procedure (DP), and/or Standard Terminal Arrival Routing (STAR) to their destination.

2.3.7 Pilots flying VFR will notify ATC of their departure and individual flight legs for flight following. The VFR flight information must include:

- Aircraft identification,
- Type aircraft,
- Departure point,
- Destination,
- Time enroute,
- Endurance and
- Souls on-board.

2.3.8 NOTAMS will be posted daily in Christchurch Base Operations and Mac Center by ATC. NOTAMS will include information such as runway and NAVAID status, version numbers with effective dates (DD Month YYYY to DD Month YYYY) of current approved approach plates, and other pertinent information.

2.3.9 In addition to NOTAMS, the USAP Airfield Manager will provide daily airfield status reports for McMurdo airfields.

2.3.10 Crew list (including MEPs) and passenger manifests may be filed separately with Raven Operations. The NSF Prime Contractor will maintain a file copy of all passenger manifests until the cessation of season flying operations.

2.3.11 Once ACL is determined, the Mission Commander / Aircraft Commander / DO will ensure final coordination of ACL and fuel load with Terminal Operations.

2.3.11.1 All operators make their own arrangements with the aviation fuel provider, including ordering it.

2.4 Operating Minimums

2.4.1 ASP's will operate IAW their established flying regulations (OPSPECS) and contract language.

2.4.2 Consideration will be given to weather trends, i.e., surface/horizon definitions, and winds. If, at any time prior to reaching PSR, the weather trend creates doubt as to the suitability of McMurdo airfield arrival conditions, then the Aircraft Commander will consider reversing course.

2.4.3 Each operator should also consider other operational issues such as: NAVAIDs, communications, airfield conditions as well as potential divert locations.

2.5 Antarctic Operating Environment

2.5.1 Polar Grid System

2.5.1.1 The Polar Grid System (grid) will be used and/or referenced for all fixed-wing aircraft navigation true south of 60 degrees south latitude. Directional information given to or received from pilots and references to directions published in this manual will be based on grid direction unless otherwise stated.

NOTE:

USAP Helicopter operators use TRUE headings for all references to direction unless otherwise stated.

2.5.2 Antarctic Pressure Altitude

2.5.2.1 Due to nonstandard pressure altitude and extremely cold temperatures, aircraft will make appropriate altitude corrections per the FAA Airmen's Information Manual and the DoD Flight Information Handbook or applicable ICAO regulations.

2.5.3 Altitude Reference

2.5.3.1 The lowest usable flight level over the Antarctica continent will be FL 200 (the floor of controlled airspace is FL 245). Transition altitude is 18,000' MSL and the transition level is FL 200. Refer to AIM 7-2-1 (USAF aircrew also refer to AFI 11-202v3) for more information and cold weather altitude correction tables.

NOTE:

When using an altimeter setting of 29.92 in areas of low pressure, actual altitude may be lower than indicated altitude. The lack of reported altimeter settings combined with extremely low pressures over the Antarctic continent might require an adjustment to the minimum usable altitudes in the FLIP Enroute Supplement.

2.5.3.2 To ensure altitude separation between aircraft flying at 18,000 feet on a local altimeter setting and those aircraft flying at FL 200, the following procedure is evoked:

2.5.3.2.1 When climbing, pilots will set altimeters to QNE (29.92) upon reaching 18,000 feet MSL. When descending, pilots will set reported or forecast QNH passing through FL 200. When operating in uncontrolled airspace outside 100nm from a reported or forecast altimeter-setting aircraft, crew will set QNE (29.92).

2.5.4 Surface/Horizon Definitions and White-Out Conditions.

2.5.4.1 Surface definition is the ease with which features on a snow–covered surface can be distinguished, either from the air or by a surface observer. Horizon definition is the ease with which the boundary between the ground and the sky can be determined. It is a parameter most appropriate over ice or areas where there are no mountains or nunataks visible, which provide visual references on the horizon. Surface and horizon definitions are reported as good, fair, poor, or nil, although there are no internationally agreed-upon definitions for either of these categories.

2.5.4.2 A whiteout condition is an optical phenomenon that occurs in uniformly overcast sky conditions over a snow–covered surface. It is associated with diffuse (uniform), shadow less illumination that causes a complete lack of surface and horizon definitions.

2.5.4.2.1 A person's ability to perceive snow covered orographic features depends on the shadows that they cast. Such features become indistinguishable under whiteout conditions. Without any visual stimulation, it is common to incorrectly evaluate an incline. Judgments of the distance and orientation of objects in the field of view are severely handicapped. Such spatial disorientation is exacerbated while airborne. Whiteout conditions can occur while visibility (i.e. transparency of the air) remains good.

2.5.4.2.2 While total whiteout results from nil surface and horizon definitions, there are degrees of this effect. For example, partially degraded horizon and surface definitions can occur under a broken cloud layer, snow, or blowing snow. Figure 1.1 describes the NPP’s terminology of surface and horizon definitions.

Qualitative Term	Surface definition	Horizon definition
Good	Snow surface features such as sastrugi, drifts, and gullies are easily identified by shadow. The sun is usually unobscured. Surface features are clearly defined for as far as the eye can see.	The horizon is sharply defined by shadow or contrast. The horizon isdistinct with an obvious difference between land (snow) and sky.
Fair	Snow features can be identified by contrast. No definite shadows exist. The sun is usually totally obscured. Surface features become indistinct at distances of more than a few kilometers.	The horizon may be identified, although the contrast between sky and snow is not sharply defined.
Poor	Snow surface features (e.g. skidoo tracks)cannot readily be identified except from close-up (within 50 meters). The sun is usually totally obscured.	The horizon is barely discernable: inother words, the sky can be discriminated from land but no distinct horizon is visible.
Nil	Snow features cannot be identified. No shadows or contrast exist. Dark colored objects appear to float in the sky. The sun is totally obscured, although the overcast sky may exhibit considerable glare. The glare appears equally bright from surface reflection and from all directions.	Total loss of horizon: the snow surface merges with the whiteness of the sky.

Figure 1 Surface/ Horizon Definitions and Terminology

2.6 ACL Coordination

2.6.1 LC-130 Mission Commander / Aircraft Commander / DO will pass the required fuel load and ACL to NSF Prime Contractor Flight Operations not later than 2 ½ hours prior to scheduled takeoff. C-17 crews will pass information as coordinated.

2.6.2 Approximately 2 hours prior to takeoff, the Air Cargo Yard supervisor should have the initial load plan completed. An aircrew loadmaster will go to the Air Cargo Yard to verify the cargo and load plan paperwork.

2.6.3 ACL may be adjusted at the Aircraft Commander's discretion. This decision should consider safety, mission objectives, and aircraft limitations. New ACLs must be passed onto NSF Prime Contractor Movement Control Center (MCC) as soon as practical.

2.7 Arrival and Departure Procedures

2.7.1 Enroute Procedures.

2.7.1.1 The Aircraft Commander (AC) will maintain a listening watch on an appropriate ATC frequency at all times.

2.7.1.2 As the aircraft approaches PSR, the Aircraft Commander will advise Mac Center and/or Auckland Center of their decision to proceed or turn around.

2.7.1.3 The Aircraft Commander will obtain ATC approval prior to executing a turn-around to ensure separation from other known IFR aircraft.

2.7.2 McMurdo Station Arrival Procedures.

2.7.2.1 IFR. McMurdo ATC retains responsibility for all IFR aircraft. Aircraft will be instructed to contact Tower prior to entering Class E airspace.

2.7.2.2 VFR. Aircraft are normally instructed to contact tower no closer than 10 miles from the airport for landing instructions.

2.7.2.3 Aircraft operating in Class D airspace will be in radio contact with the tower and should remain at 1,000 feet AGL or higher (500 feet for helicopters) until commencing final descent.

2.7.3 McMurdo Station Departure Procedures.

2.7.3.1 IFR aircraft will call for IFR clearance. Tower will relay IFR clearances and issue departure instructions to aircraft departing on an IFR flight plan.

2.7.3.2 VFR aircraft will be given appropriate VFR departure information.

NOTE:

Heavy aircraft, such as the C-17 should start their takeoff roll at the 9000 feet runway remaining marker to protect low visibility markers at the approach end from blast damage.

2.8 Uncontrolled Airfield Operations

2.8.1 For operations at uncontrolled McMurdo area airfields, fixed/rotary wing aircraft pilots will follow uncontrolled field procedures.

2.8.1.1 Flight plans will be filed with Mac Center and advisory service provided.

2.8.1.2 Fifteen (15) minutes prior to departure from an uncontrolled airfield, the pilot will notify Mac Center/Tower of planned activity via landline or radio.

2.8.1.3 Mac Center/Tower will notify Aircraft Rescue and Fire Fighting (ARFF) (who notifies the USAP Airfield Manager) on FM Channel 2 of intended uncontrolled airfield operations.

2.8.1.4 Pilots will announce their intentions on the Common Traffic Advisory Frequency (CTAF) VHF 122.8 MHz.

2.9 Common Traffic Advisory Frequency (CTAF 129.7)

2.9.1 Traffic information broadcasts by aircraft are to be used within the traffic information coverage (VHF radio range) of South Pole Station and outlying camps. They are intended to be advisory reports transmitted on a Common Traffic Advisory Frequency (CTAF) providing information to other aircraft in the vicinity. When procedures are not otherwise specified, attempt to comply with US Federal Aviation Regulations / Airman's Information Manual (FAR/AIM) guidance.

2.9.1.1 The CTAF may be a UNICOM or MULTICOM frequency identified in appropriate aeronautical publications.

2.9.1.2 CTAF frequencies are designated in the USAP Communications Plan.

2.9.1.3 The form of the broadcast should start and end with the airfield name, such as: (Airfield) Traffic this is (call sign) appropriate movement advisory information (i.e. starting engines, taxiing, departing, arriving, climbing or descending to altitude), (Airfield) Traffic.

2.9.1.4 Broadcasts are not normally acknowledged except when another aircraft or ground station is aware of the potential for close proximity or conflict with another aircraft or the need for mutual support, communications relay, or contingency back-up exists.

2.9.1.5 CTAF procedures will be used at all outlying USAP camps/stations, continent- wide. Pilots will use the CTAF frequency to broadcast pertinent UNICOM information.

2.9.1.6 Mac Center will instruct arriving aircraft to change to advisory frequency upon entering Class G or when advised by ATC in Class E airspace.

2.9.1.7 All inbound traffic should monitor and communicate as appropriate on the designated CTAF from 10 miles out to landing.

2.9.1.8 Aircraft should maintain a listening watch on the primary HF frequency for further advisories from Mac Center or relay of ATC information.

2.9.1.9 Departing aircraft will monitor CTAF frequency while on the snow and will relay UNICOM information as required.

2.9.1.10 Departure aircraft should monitor and communicate on the appropriate frequency from engine start-up, during taxi, and until 10 miles from the station or camp.

2.10 Over-flight Restrictions

2.10.1 Direct over-flight of McMurdo Station/Scott Base shall be avoided.

2.10.1.1 If necessary, fixed-wing aircraft over-flying McMurdo Station or Scott Base will maintain an altitude at or above 1500 feet AGL.

2.10.1.2 Over-flight within one nautical mile of the McMurdo Heliport is restricted to an altitude at or above 1500 feet AGL.

2.10.2 ASPAs: Antarctic Special Protected Areas (ASPAs) were created to protect areas of special environmental, scientific, historic, aesthetic, and wilderness value. Certain flight restrictions are associated with these areas. All airlift service providers should be familiar with the Antarctic Conservation Act of 1978, as amended by the Antarctic Science, Tourism, and Conservation Act of 1996 (ACA).

2.10.3 As a general rule, aircraft will avoid disturbing concentrations of birds and animals. Flights shall not approach within 500 feet lateral and no lower than 3,000 feet AGL of these concentrations.

2.10.4 Information regarding flight restrictions of ASPAs is available from the National Science Foundation Representative at McMurdo Station, or the Antarctic Treaty Secretariat. The Antarctic Treaty Secretariat publishes an interactive map of all ASPAs, which can be located at:

https://antarctictreaty.maps.arcgis.com/home/group.html?id=1739b7169a2f4d88849364c8cb764778&focus=applications&view=list#content

Click on the "Antarctic Treat Protected Areas" link. This link can be used to display all ASPAs in/around the McMurdo station. Maps of ASPA areas can be found at: http://www.mcmurdodryvalleys.aq/management/aspas

2.10.5 Information on these areas may be included in the local flying area brief provided by Mac Center, if applicable.

2.10.6 Resolution 2 of the XXVII Antarctic Treaty Consultative Meeting recommends that the "Guidelines for the Operation of Aircraft near Concentrations of Birds in Antarctica" be used by those engaged in the operation of aircraft in Antarctica. (See attachment 3)

2.10.7 Aircraft approaching camps will fly no lower than 1000AGL unless there is a specific operational necessity for a lower altitude.

2.11 Weather Balloon Launches

2.11.1 McMurdo Weather regularly launches weather balloons between 2100Z and 0000Z and between 0900Z and 1200Z from a point ¼ mile grid south of McMurdo Heliport. 2.11.2.

2.11.2 Mac Center and the tower will broadcast additional pertinent balloon launch information when required.

2.11.3 Notification of upper atmosphere balloon launches, including NASA's Long Duration Balloons (LDB) and Crary Lab, will be by NOTAM.

2.11.3.1 LDB launches have priority over aircraft operations. The LDB Camp Manager shall coordinate 48 hours in advance with the USAP Airfield Manager of intent to launch.

2.11.3.2 LDB and Crary Lab balloon launches will be coordinated through the ROF in Charleston. Coordination process is as follows: Camp Manager shall notify USAP Airfield Manager, NPP Site Manager, Mac Center, ROF Charleston, and 13 AEG/CC, providing all known details, to include launch date and time.

2.11.3.3 ROF Charleston shall initiate and disseminate NOTAMs, which are posted in Mac Center Flight Planning and CHC Base Operations.

2.11.3.4 LDB will communicate a termination request to the NSF Representative for termination coordination between Mac Center and planned operational aircraft. This request will be at least 24-hours prior for NOTAM purposes.

2.12 Degraded HF Communication Procedures

2.12.1 In the event of loss of communications, a listening watch will be maintained on the primary HF frequency 9.032 kHz. MAC Center will also maintain a watch on HF 11.256 kHz.

2.12.2 On a secondary radio, proceed with HF radio checks on the secondary frequency 5.726 kHz and tertiary HF frequencies of 13.251 kHz, 11.256 kHz, or 6.708 kHz.

2.12.3 Garmin InReach, Iridium phones and text messaging will be used as a backup to HF communications.

2.12.4 See the USAP Communications Plan for current seasonal frequency assignments. Aircraft operators should refer to current seasonal manuals for specific lost communications procedures.

2.13 Ground Support and Servicing

2.13.1 Fueling: Aviation fuel is provided for USAP aircraft through the NSF Prime Contractor. AN-8 fuel (JP-8 with anti-gelling additive) is normally the only aviation fuel available at Williams Field, Phoenix Field and South Pole Station.

2.13.1.1 NSF Prime Contractor Fuels personnel are required to be present during all refueling operations with the exception of the MCM Heliport.

2.13.2 The NSF Prime Contractor provides Aerospace Ground Equipment (AGE) for all DoD aircraft operating at the McMurdo airfields.

2.13.2.1 Transient aircrews should request AGE support services through Mac Center one hour prior to their arrival.

2.13.2.2 During LC-130 operations at Williams Field, Skier Maintenance will provide radio and telephone coordination of AGE assets. Transient aircrews should contact Skier Maintenance on VHF 123.45 MHz or UHF 251.25 MHz prior to arrival.

NOTE

Aircraft heaters shall not be used on LC-130 or C-17 aircraft when winds exceed 25 knots.

WARNING

WHEN HEATERS OR OTHER POWERED AGE EQUIPMENT ARE OPERATIONAL AND CONNECTED TO AIRCRAFT, THEY SHALL BE CLOSELY MONITORED AT ALL TIMES EITHER BY THE USER OR AGE PERSONNEL. HEATERS AND OTHER EQUIPMENT SHALL NOT BE LEFT UNATTENDED WHEN OPERATIONAL.

2.13.3 USAP contract aviation service providers (ASPs) will provide their own ground support, maintenance, and spare parts. 139 EAS Maintenance personnel, within their capability, may provide transient alert support for aircraft other than LC-130.

2.14 Operational Risk Management (ORM)

2.14.1 The goal of ORM is to identify and eliminate unnecessary risks. ASPs are expected to utilize ORM practices in the conduct of flight operations, within the bounds of their applicable operation specifications or contracts. For 139 EAS aircrew, ORM worksheets

are available in the MCM flight planning area and should be turned in to the 139 EAS Supervisor of Flying (SOF) prior to flight.

2.15 Aviation Ground Safety

2.15.1 Support personnel must be aware of the hazards involved in working and moving around aircraft, including propeller and jet engine danger zones.

2.15.2 Support personnel are instructed not to approach an aircraft until directed to do so by the aircrew.

2.15.3 Vehicles not directly involved in loading, maintenance or servicing of aircraft will avoid approaching the aircraft and will remain outside the "circle of safety."

2.15.3.1 A "circle of safety" is defined as a circular area with a 25-foot radius, from wingtip to wingtip, around parked aircraft. If an engine is running or propellers are turning, this area is increased to 50 feet, from wingtip to wingtip, towards the rear of the parked aircraft.

2.15.4 The McMurdo USAP Airfield Manager or outlying camp Station Supervisor is responsible for training and certifying their ground support personnel for flight line operations.

2.16 Explosive and Hazardous Cargo Areas Procedures

2.16.1 All hazardous cargo will be handled and transported IAW appropriate Defense Transportation Regulations listed in DTR 4500.9-R.

2.16.2 The USAP Airfield Manager and the Terminal Manager will designate the Hazardous Cargo storage area seasonally.

2.16.3 The USAP Airfield Manager, in coordination with the Explosives Manager and flight operations personnel, will designate the Explosive Cargo storage area seasonally.

2.16.4 Areas will be designated at the airfields for loading/unloading explosive material and for loading/unloading hazardous cargo.

2.16.5 All hazardous and explosive cargo will be unloaded or loaded with the aircraft engines shutdown in the designated location. Exception: C-17 aircraft may conduct engine running on/offloads (ERO) with prior coordination.

2.16.6 USAP passengers are considered 'Duty Passengers', so applicable regulatory guidance will be in effect when transporting hazardous cargo on USAP aircraft with passengers.

2.16.7 Upon notification of hazardous cargo movement, the NSF's Prime Contractor Aviation Operations Manager will notify the following positions/stations no later than 24 hours prior to scheduled movement:

- NSF Representative/Station Manager
- 13th AEG Commander
- USAP Airfield Manager
- McMurdo Station Explosives Manager
- McMurdo Station ARFF

- McMurdo Station ATC
- McMurdo Station Medical

CHAPTER 3 ROTARY WING OPERATIONS

NOTE

Rotary wing operations are conducted by NSF's Helicopter contractor and are bound operationally by their approved OPSPEC / GOM, locally approved procedures and contractual terms.

3.1 Local Flying Area

3.1.1 The local flying area for rotary aircraft is a 60 NM radius of McMurdo Station and Marble point (when operational). USAP Flight operations conducted beyond the local area, without specific approval of the helicopter vendor site manager, require two aircraft separated by a distance of not greater than 100 NM. The NSF Station Manager may approve single aircraft operations up to a maximum distance of 200 NM from McMurdo, with additional restrictions.

3.1.2 It is highly recommended that Helicopters have transponders turned on to provide visibility to TCAS equipped aircraft. McMurdo is a Non-Radar Environment.

3.1.3 Helicopters use TRUE headings for information given to or received from pilots, and all references to direction are in TRUE unless otherwise stated.

3.1.4 Contractually, helicopters operate under VFR only, although all contractor pilots are IFR rated and trained.

3.1.5 Operations overwater beyond power off glide distances are not authorized.

3.2 Local Operating Procedures

3.2.1 All departures and arrivals will be at pilot discretion with due consideration of safety.

3.2.2 When Winter Quarters Bay and the sea around Observation Hill are covered by fast ice, normal procedures will apply (see Figure 3.2. Typical Helicopter Arrival and Departure Routing). This will consist of departing and arriving over the sea ice west of the Heliport area.

3.2.3 All aircraft will operate with transponders on and ADS-B out enabled.

3.2.4 Arrival.

3.2.4.1 Helicopters will make appropriate outbound/inbound radio calls to Mac Center, who's Helo Flight Following call sign is "Mac Radio".

3.2.4.2 Recommended altitude is 500 feet or below within 10 NM of McMurdo Station. Be aware other helicopters may be operating around McMurdo Station at varying altitudes.

3.2.4.3 Make approaches to Heliport from over the sea ice to assigned landing spot whenever possible.

3.2.4.4 Avoid over-flying other aircraft, buildings, or people. The prevailing wind at the Heliport is from the true southeast, so over-ice departures are often downwind.

3.2.4.5 With a strong westerly wind, an approach paralleling the shoreline from the ice wharf or around Observation Hill is recommended.

3.2.4.6 A direct approach through the "gap" (known as the area between Observation Hill and Crater Hill) and down the steep slope is strongly discouraged.

3.2.4.7 When twenty (20) minutes out from McMurdo, advise Helo Hangar on Helo Ops frequency that you are inbound and if you will need fuel, transportation, or special assistance. Advise Operations if carrying a sling load.

3.2.4.8 If unable to use Helo Ops, ask Mac Radio to relay this information to the Helicopter Hangar.

3.2.4.9 At 10 NM out, contact Mac Radio on 118.5 MHz and report intentions.

3.2.4.10 If Williams Field Tower is open, request clearance into Class D airspace if arrival path is through Class D airspace. Helicopters need not contact Williams Field tower for Class D airspace transitions when arriving McMurdo helipad when they will remain within ¼ mile True South of Cape Armitage and remain True North of a True 030˚ bearing clockwise through a True 060˚ bearing from Cape Armitage. (See Figure 3.1 Williams Field Class D Helicopter Transition).

NOTE

Runway numbering is relative to Grid North, Grid North = True + 167 degrees.

3.2.5 Departure.

3.2.5.1 Prior to lift-off, contact Mac Radio on 118.5 MHz and pass flight plan and intended departure route.

3.2.5.2 Mac Radio will provide information on conflicting traffic and the operational control tower.

3.2.5.3 If possible, broadcast intentions on Helo Ops frequency prior to liftoff.

3.2.5.4 Contact Williams Field Tower on 126.2 MHz as soon as possible after takeoff if departure path is through Class D airspace. Helicopters need not contact Williams Field tower for Class D airspace transitions when departing McMurdo helipad when they will remain within ¼ mile True south of Cape Armitage and remain ¼ mile True South of Cape Armitage and remain True North of a True 030˚ bearing clockwise through a True 060˚ bearing from Cape Armitage. (See Figure 3.1 Williams Field Class D Helicopter Transition).

3.2.5.5 Remain 500' AGL or below while in Class D airspace and monitor 126.2 MHz until clear. Report clear to Williams Field Tower if doing a normal transition and change to 118.2 MHz beyond 10 NM radius of McMurdo Station.

3.3 Heliport Traffic Patterns.

3.3.1 Standard Pattern.

3.3.1.1 The prevailing wind at McMurdo Station is from true southeast. This wind passing through the "gap" is normally stronger and has more gusts than other locations in the area.

3.3.1.2 Due to the winds in the "gap," helicopters should approach the heliport from the true northeast, over McMurdo Sound, for a straight-in approach. Departures should also be made to the true northeast and may require an immediate turn downwind. Pilots should avoid over-flying power lines, buildings, and transmission towers.

3.3.1.3 During an approach under average conditions with winds of 10 to 20 knots, updrafts can be expected approximately ¼ mile on final approach followed by a down draft at approximately 1/8-mile. Pilots should be aware of these conditions.

3.3.2 Ice-Out or Wind-Driven Alternate (Gap) Pattern Procedures.

3.3.2.1 If there is open water in Winter Quarters Bay and/or the sea area around Observation Hill, all helicopters should use a shoreline approach and departure or the "gap" procedures (see Figure 3.3. McMurdo Heliport Gap Departure and Arrival Routes). Note: USAP helicopters are not float equipped.

3.3.2.2 When water and/or prevailing winds preclude approaches and departures true northeast of Observation Hill, the following procedures are recommended:

3.3.2.3 Departure.

3.3.2.3.1 After making the appropriate radio calls, takeoff and departure should be accomplished by flying directly up slope toward the "gap" to the right of the pipes and power lines.

3.3.2.3.2 Avoid over-flying the fuel tanks located in the "gap" and avoid the antenna farm on top of the ridge on the east side of the "gap". Avoid over-flying aircraft, buildings, or people.

3.3.2.3.3 Be prepared for turbulence and wind shear when flying this route.

3.3.2.3.4 Contact Mac Center ("Mac Radio" for local operators) prior to departure while stating intention to make a "gap" departure. Aircraft would proceed along the grid eastside of the main station, then through the pass, climbing to a minimum altitude of 500 feet MSL and remaining to the right side of the pass. Contact Tower when advised by Mac Radio.

3.3.2.4 Arrival.

3.3.2.4.1 After making the appropriate radio calls and advising Mac Radio that you will be making a "gap" arrival, proceed to the "gap".

3.3.2.4.2 Entry (see Figure 3.3. McMurdo Heliport Gap Departure and Arrival Routes) will be along the east or right side of the "gap". The arrival path will be a slow left circle around the outside of McMurdo Station proper over-flying the roads, across the inland end of Winter Quarters Bay and then along the shoreline to the Heliport.

3.3.2.4.3 Avoid over-flying buildings, fuel tanks, people, or aircraft.

3.3.2.5 Approach Routing.

3.3.2.5.1 If required, contact tower on frequency 126.2 MHz prior to entry into Class D airspace. Approach McMurdo Station from the Northeast through the pass between Observation Hill and Crater Hill, at a minimum altitude of 500 feet MSL, remaining to the right side of the pass.

3.3.2.5.2 The aircraft should continue southwest across the station area and make a descending left turn to the heliport, remaining over the outskirts of the main station as much as possible. Pilots should anticipate turbulence in the pass and throughout the approach.

3.4 Helicopter Use at McMurdo Airfields

3.4.1 McMurdo airfields operate as prior-permission-required (PPR) through the USAP Airfield Manager to ensure safe operations on the airfields.

3.4.2 Landing sites and ramp operations/marshalling should be coordinated in advance with the USAP Airfield Manager who will provide the most up-to-date guidance based on the airfield and time of year.

3.5 Helicopter Ship Operations

3.5.1 Tourist Ship helicopters will establish communications with Mac Radio prior to commencing “ship to shore” flight operations in the McMurdo Station vicinity.

3.6 Communications

3.6.1 Communications will be made with McMurdo Radio prior to departure or arrival.

3.6.2 All communications with Mac Radio within 10 NM of McMurdo Station should be on the Common frequency, 118.5 MHz.

3.6.3 Flight Following (135.5 MHz (Transmit) and 143.975 MHz (Receive)) and Helo Ops (143.4 MHz) on VHF-FM should also be monitored, if possible, when operating into or out of McMurdo Heliport.

3.6.4 When Ice Tower is open, contact them on 126.2 MHz prior to arrival or departure if anticipating being more than ½ mile from the Ross Island landmass.

3.6.5 Beyond 10 NM radius from McMurdo Station:

3.6.5.1 Use Flight-following frequencies 118.5 MHz, or HF 4.718 kHz to communicate with Mac Radio and monitor Area Common frequency 129.7 MHz and/or Helo Ops frequency if possible.

Table 1 USAP Recommended VHF-FM Helicopter Ops Radio Setup:

CH	Tx	Rx	Tone	Name
1	143.4	143.4	107.2 Tx	Helo Ops (CH 11 on Kiwi radios)
2	139.1	139.1	79.7 Tx	Pad
3	138.5	143.975	186.2 Tx / 173.8 Rx	Flight Following Cones

4	138.5	143.975	156.7 Tx / 173.8 Rx	Flight Following Coates
5	138.5	143.975	173.8 Tx / 173.8 Rx	Flight Following Newell
6	138.5	143.975	192.8 Tx / 173.8 Rx	Flight Following Minna Bluff/Mt Aztec
7	139.5	139.5	100.0 Tx	Science
8	139.3	143.8	131.8 Tx	NZ Crater Hill (CH 4 on Kiwi radios)
9	143.1	140.0 -	NZ Mt Newell Rptr/AntNZ	Field Party Freq (CH 5 on AntNZ radios)
10	156.8	156.8 -		Marine 16
11	138.6	143.225	85.4 Tx	Taylor Valley Field Party Rptr
12	138.6	143.225	123.0 Tx	Mt Terror/Bird Field Party Rptr
13	138.6	143.225	110.9 Tx	Wright Valley/Newell Field Party Rptr
14	138.6	143.225	74.4 Tx	Mt Aurora Field Party Rptr
15	138.6	143.225	141.3 Tx	Mt Brooke/Kimball Pt Field Party Rptr
GD 1	143.4	143.4	107.2 Tx	Helo Ops (CH 11 on Kiwi radios)
GD 2	138.5	143.975	186.2 Tx / 173.8 Rx	Flight Following Cones Z

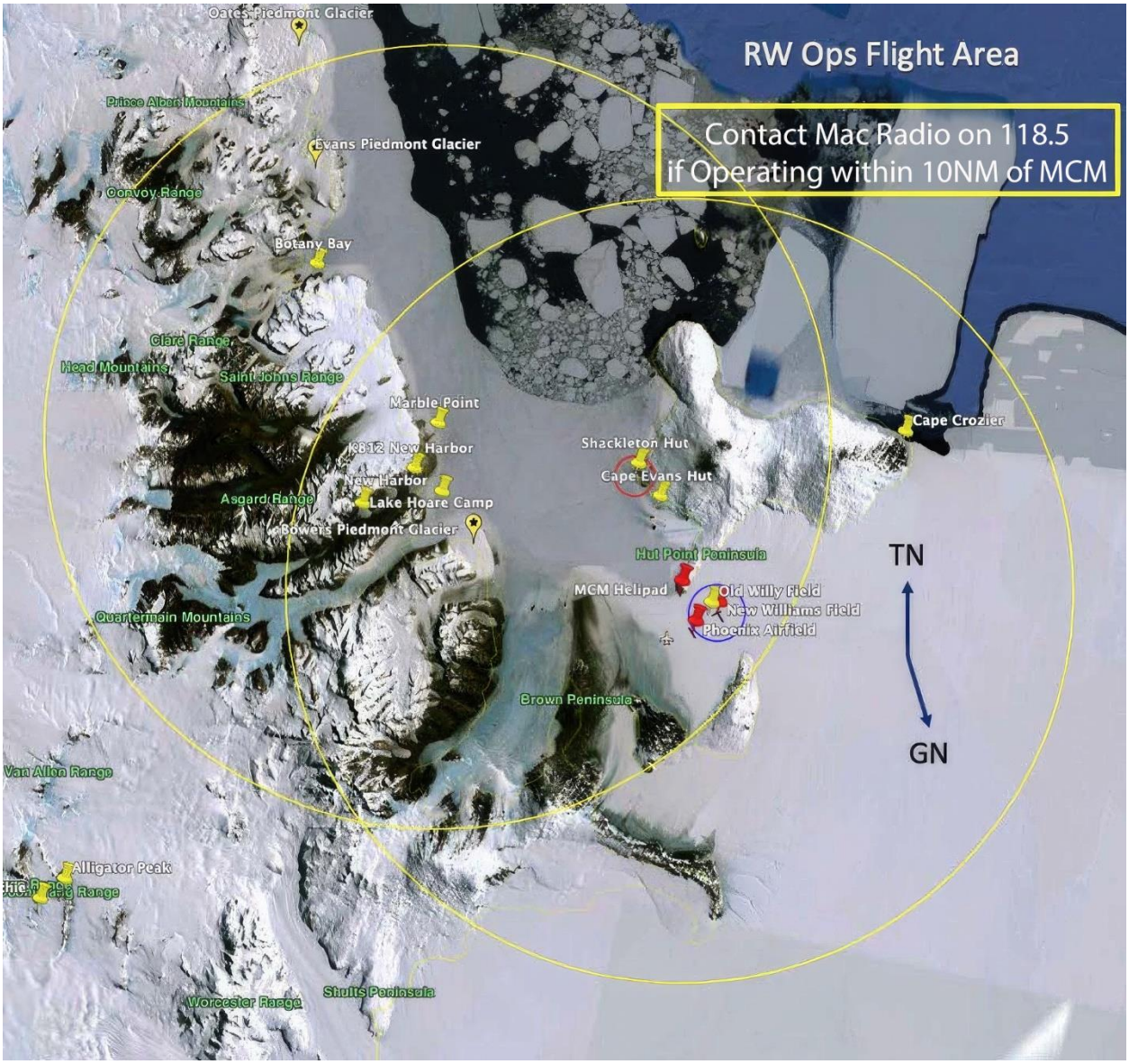

Figure 2 McMurdo Helicopter Operations Area Map

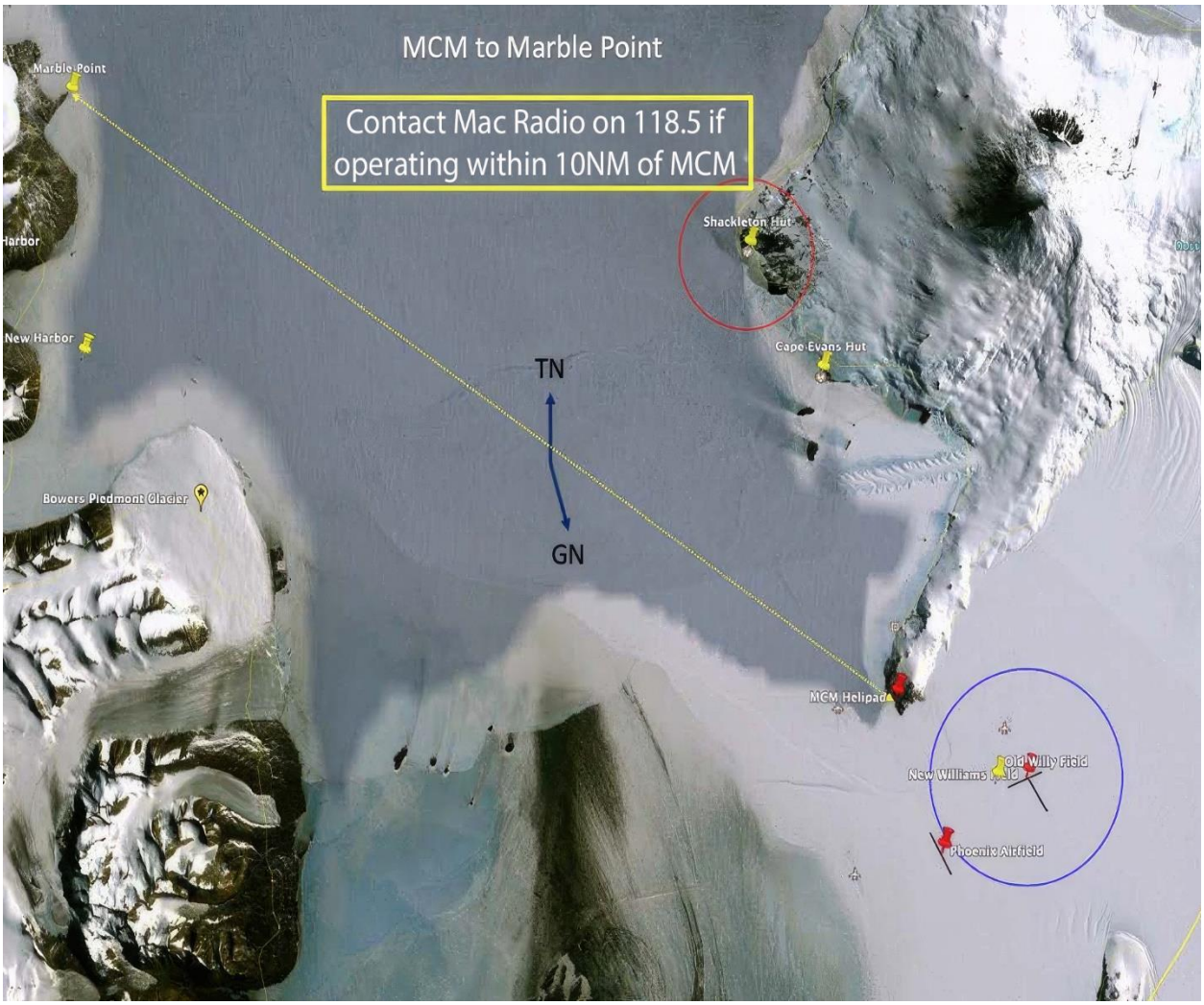

Figure 3 McMurdo to Marble Point

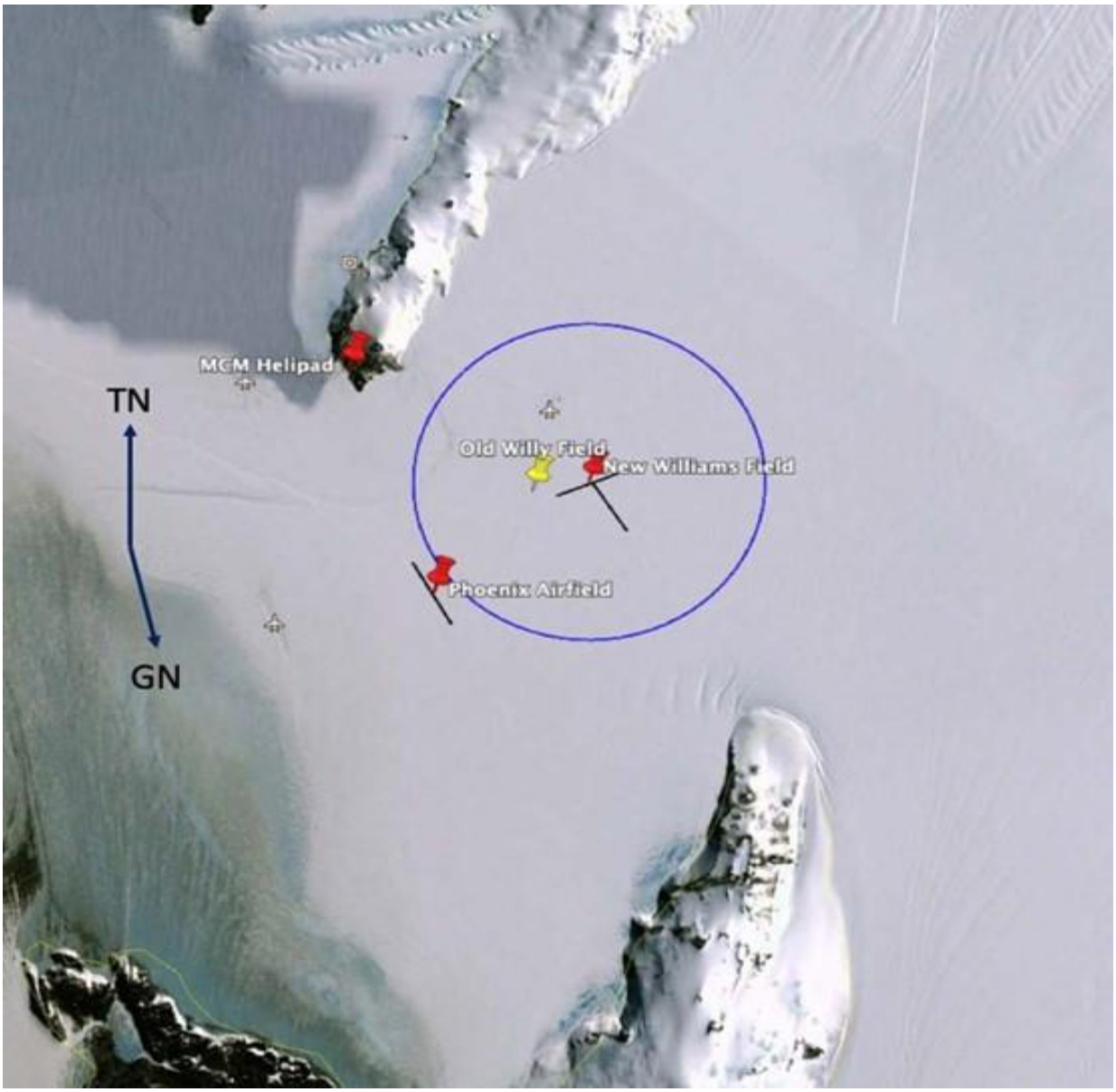

Figure 4 New Williams Field location

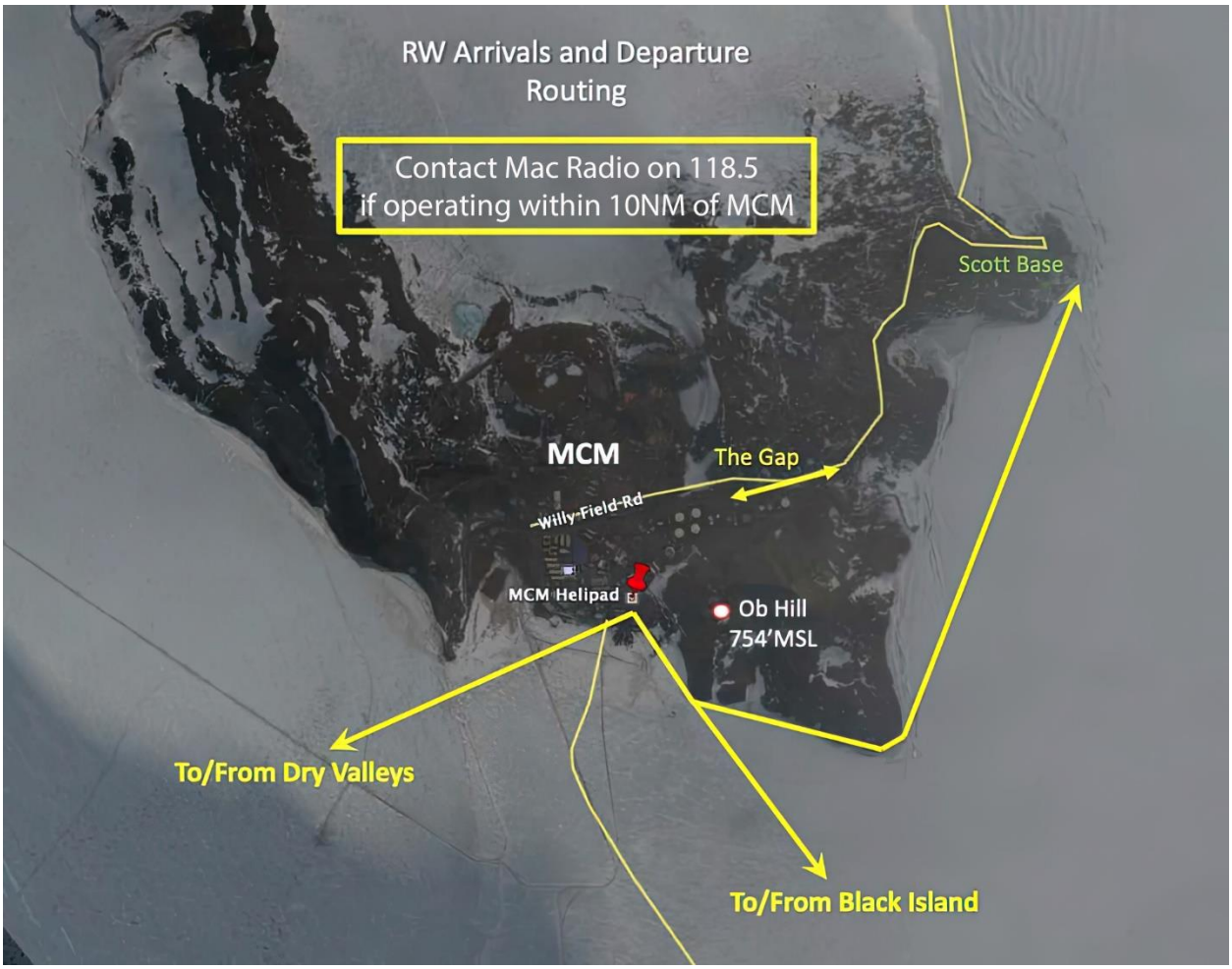

Figure 5 Typical Helicopter Arrival and Departure Routing

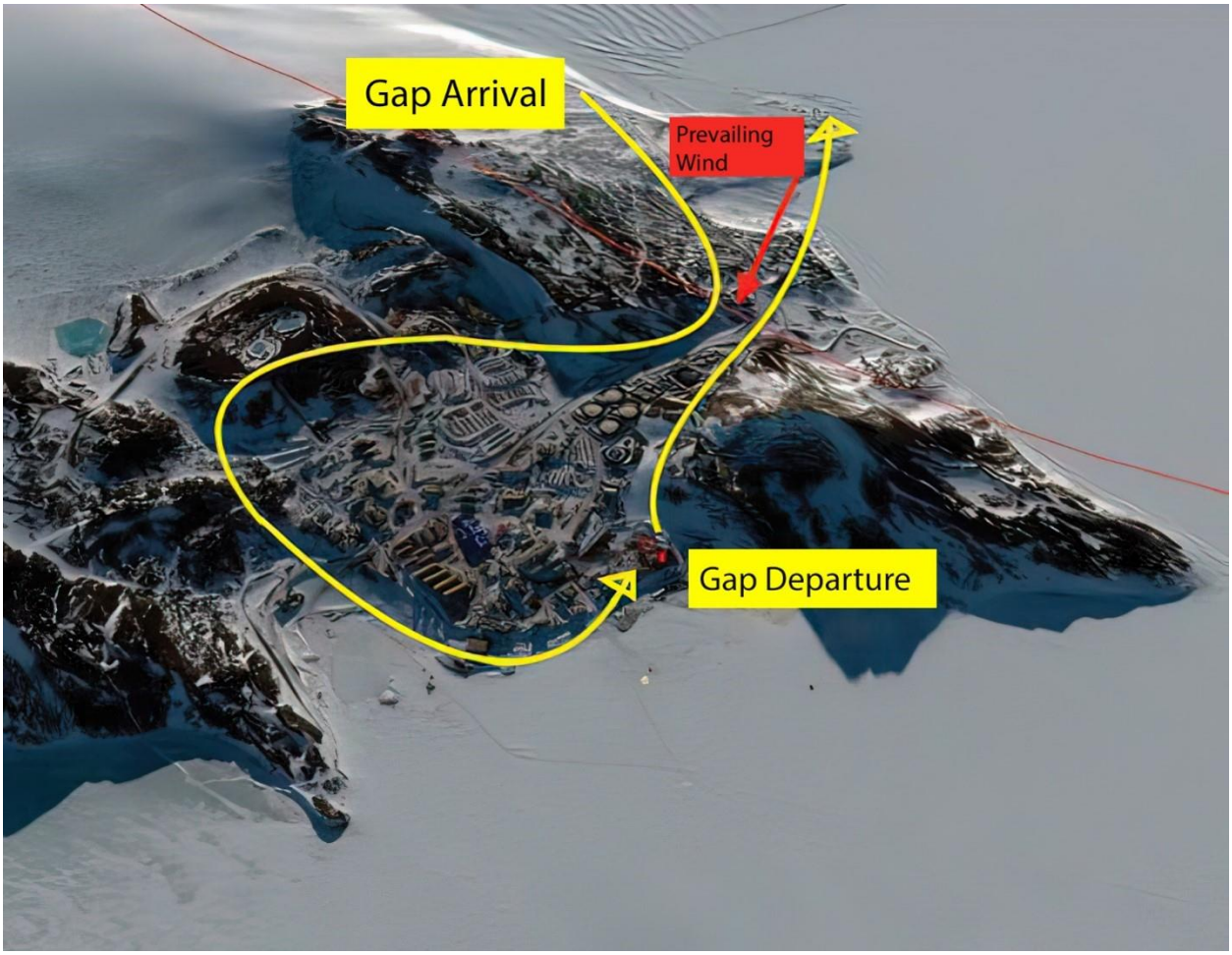

Figure 6 McMurdo Heliport Gap Departure and Arrival Routes

Figure 7 Upper Heliport Procedures

3.7 Upper Heliport Procedures.

3.7.1 Departure. (See Figure 3.4. Upper Heliport Procedures).

3.7.1.1 Make appropriate radio calls prior to takeoff.

3.7.1.2 Fly one of the following takeoff paths:

3.7.1.2.1 Around the outside boundary of the lower heliport and outside of the lower buildings to over the sea ice or shoreline; through the "gap".

3.7.1.2.2 Along the road on the North side of the Helo Hangar to over the sea ice or shoreline.

3.7.1.3 Avoid over-flying the Helo Hangar, buildings, aircraft, or people.

NOTE

Be aware that the dust and rocks kicked up by the departing aircraft can cause injury to personnel and damage to the aircraft on the lower Heliport.

3.7.2 Arrival.

3.7.2.1 Approach path to the upper heliport should be made along the road north of the Helo Hangar or around the outside boundary of the lower heliport.

NOTE

If no helicopter is parked on A-1 pad (closest to the Helo Hangar) and there are no personnel on the lower heliport, an approach straight in from the sea ice/shoreline may be made close along the south side of the hangar.

3.7.2.2 A direct approach from a "gap" arrival is not recommended due to the steepness of the slope onto the heliport and the rapid rates of descent that could develop.

3.7.2.3 Avoid over-flying any buildings, aircraft, or people.

3.8 Heliport Pad Locations.

3.8.1 There are seven landing pads on the lower heliport and two on the upper heliport, (see Figure 3-6 Upper Heliport Procedures).

3.8.2 The upper helipads (designated Upper Heliport Pads D1 & E1) are typically used only for overflow. If use is desired, these spots must be visually inspected and approved by ASC Facilities personnel prior to use and after extended periods of no use.

3.8.3 The lower heliport consists of three rows, Alpha (4 pads), Bravo (3 pads).

3.8.4 Alpha 1 (A-1) is the maintenance pad and should be kept clear except for maintenance, movement into or out of the Helo Hangar, or hot loading or unloading of cargo/passengers.

3.8.5 Fuel will be available at all lower helipads except A-4. This spot is designated for aircraft with metric fuel gage use.

Figure 8 Visitor's Helipad

NOTE

Contact Mac Radio when within 60 miles of McMurdo on VHF 118.5Mhz to state intentions and for flight following. All heading and wind information are given in True. Remain clear of Williams Field Class D airspace. Williams Field Tower frequency is VHF 126.2Mhz.

Arrivals:

1. Helicopters will make appropriate outbound/inbound radio calls.
2. Recommended altitude is 500 feet or below when within 10 NM of McMurdo Station. Be aware other helicopters may be operating around McMurdo Station at varying altitudes.
3. Make approaches to Heliport from over the sea ice so as to land at the designated Visitor's Helipad (see Figure 3-7).
4. Avoid over-flying other aircraft, buildings, or people. The prevailing wind at the Heliport is from the true southeast, so over-ice departures are often downwind.

Departures:

1. Prior to lift-off, contact Mac Radio on 118.5 MHz and pass intended departure route.
2. Mac Radio will provide information on conflicting traffic and the operational control tower.

NOTE

All visiting helicopters will land at the Visitor's Heliport (location noted by the red circle), UNLESS prior permission is granted by the NSF Station Manager (24-hours prior notice is required, 48 to 72-hours prior notice is preferred). The NSF Station Manager can be contacted at: mcm- nsfstmgr@usap.gov or by calling the MCM Operator at (US number) 1-720-568-1000 and asking for the NSF Station Manager.

3.9 Vehicle Traffic.

3.9.1 Do not over-fly vehicles at very low altitude or when making an approach or takeoff. Be aware of vehicle traffic around or on the Heliport.

3.9.2 Vehicles entering either the upper or lower heliport shall contact the Helo Hangar on the Helo Ops Frequency (VHF-FM) prior to driving onto or across the heliport.

3.10 Passengers.

3.10.1 All passengers must have successfully completed the USAP's Antarctic Field Safety (AFS) course including the Helicopter Safety Video component during the current season in order to board a USAP helicopter. NSF Representative/Station Manager has the ability to waive this requirement for specific Distinguished Visitors or others approved in writing. For passengers with waivers, the Helicopter Safety Video will be shown before the aircraft briefing when possible.

3.10.2 Passengers shall be escorted to and from the helicopter by a helitech or pilot. NEVER APPROACH THE HELICOPTER FROM THE REAR.

3.10.3 All passengers should be briefed by pertinent aircrew immediately before going out to the helicopter.

3.10.4 The pilot shall ensure that a safety briefing is given to **all passengers** prior to takeoff in accordance with the governing procedures of the pilot's respective organization and the NSF's contract language.

3.10.5 Passengers may disembark from the helicopter prior to shut down when operationally essential and only if escorted by qualified personnel, normally a helitech or pilot.

3.10.6 Escorts should ensure they have the pilot's permission to approach or depart an aircraft that is running and that all ground personnel and passengers stay well clear of the tail rotor.

3.11 Fueling Operations.

3.11.1 Initial helicopter fueling time is after 0700 each morning, following the NSF Prime Contractor fuels personnel daily system inspection conducted no later than 6:45 am daily.

3.11.2 Non-local transiting helicopters requiring refueling should call the Helo Hangar or have Mac Radio relay that they will require fuel at least 15 minutes prior to arrival.

3.11.3 Fueling with the helicopter running (hot refueling) is not authorized.

3.11.4 Only trained personnel should operate the fueling system.

3.12 External Load Procedures.

NOTE

External (sling) load operations: all aircraft in the vicinity should "give way" to the sling-load aircraft due to its reduced maneuverability.

3.12.1 Pick Up.

3.12.1.1 External loads shall be picked up from the area along the west side of the Lower Heliport. Generally, outgoing loads will be set up closest to the hangar.

3.12.1.2 Aircraft picking up an external load shall advise the Helo Hangar on Helo Ops frequency.

3.12.1.3 When possible, pilot[s] will maintain radio communications with ground personnel.

3.12.1.4 When departing, DO NOT OVERFLY aircraft or people and avoid over flying buildings, vehicles, or fuel tanks.

3.12.1.5 Ensure adequate clearance from all ground obstructions.

3.12.2 Drop Off.

3.12.2.1 It is recommended, when making the call to Mac Radio (for non-local operators) or Helo Ops (local USAF/AntNZ) inbound; advise them of an external load. This is to make other aircraft operating in the vicinity aware that the helicopter has an external load and is less maneuverable.

3.12.2.2 Use 118.5 MHz to contact Mac Radio inbound.

3.12.2.3 If possible, advise the Helo Hangar on Helo Ops frequency 20 minutes out that the helicopter is inbound with an external load. All external loads will be put in on the west side of the Lower Heliport.

3.12.2.4 Use the first 15 feet of the helipad along the west edge.

3.12.2.5 Generally, all incoming loads should be placed progressively further away from the Helo Hangar (see Figure 3.4. Upper Heliport Procedures).

3.12.2.6 When putting in an external load, DO NOT over-fly aircraft or people and avoid over-flying buildings, vehicles, other loads, or fuel tanks.

3.12.2.7 Drop off external loads along the west edge of the Heliport, away from the Helo Hangar (see Figure 3.3. McMurdo Heliport Gap Departure and Arrival Routes). After releasing the external load, proceed to the assigned parking spot or maintenance pad (A-1) if maintenance is scheduled.

3.12.2.8 Be aware that the Lower Heliport is approximately 40 feet above sea level.

3.12.2.9 If ground advisories or ground handling personnel are desired, please advise the Helo Hangar either on Helo Ops frequency or through Mac Radio.

3.13 Hazardous Cargo.

3.13.1 For local operators, all operations shall be conducted IAW approved USAP HAZMAT/DG procedures.

3.13.2 For non-local operators, contact Mac Radio and advise them on initial flight plan call when departing and returning to McMurdo Station of any Hazardous Cargo on-board.

3.14 Maintenance Parking.

3.14.1 Aircraft scheduled for maintenance may be parked in front of the Helo Hangar on A-1 pad at Maintenance's request.

3.14.2 The aircraft should be parked with the tail facing the hangar.

3.14.3 Inbound aircraft should advise the Helo Hangar prior to arrival that they would be parking on A-1 maintenance pad 1, generally when the '20 minutes out' report is made.

3.15 Flight Following.

3.15.1 Helicopters shall report "operations normal" every 30 minutes to Mac Radio.

3.16 Over-flight Restrictions.

3.16.1 Fixed-Wing aircraft over-flying McMurdo Station or Scott Base will maintain an altitude at or above 1500 feet AGL. Over-flight within one nautical mile of the McMurdo Heliport is restricted to an altitude at or above 1500 feet AGL.

3.16.2 Antarctic Special Protected Areas (ASPAs) were created to protect areas of special environmental, scientific, historic, aesthetic, and wilderness value. Certain flight restrictions are associated with these areas. All airlift service providers should be familiar with the Antarctic Conservation Act of 1978.

3.16.3 As a general rule, aircraft will avoid disturbing concentrations of birds and animals. Helicopter flights shall not approach within ¼ mile lateral and no lower than 1000 feet AGL of these concentrations.

3.16.4 Information regarding flight restrictions of ASPAs is available from the NSF Representative/Station Manager at McMurdo Station or in Antarctic Science, Tourism, and Conservation Act of 1996 (ACA).

CHAPTER 4 UNMANNED AERIAL SYSTEM (UAS) OPERATIONS

NOTE:

UAS operations are **NOT** permitted without prior approval via the USAP UAS Working Group. UAS flight approval is a Conditional Letter to Operate (CLO), which specifies restrictions to your UAS use while deployed under the USAP. If you do not have a CLO, you are **NOT** cleared to fly.

4.1 General

4.1.1 Approved groups operating small UAS (sUAS) (less than 55 pounds) shall conduct operations in accordance with 14 CFR Part 107. Pilots are required to list sUAS certification (FAA or equivalent) and attach flight logs disclosing 10 hours of operation (minimum) on proposed UAS aircraft in the last 30–90-day period. Any authorized deviations will be specified in the approval process by the UAS- WG.

4.1.2 UAS Pilot Currency Requirements:

4.1.2.1 Inexperienced pilots (those with less than 100 total hours on a drone): must show 10 hours primary pilot time within 30 days of deployment.

4.1.2.2 Pilots with more than 100, but less than 200 total flight hours: can submit logs with 10 hours primary pilot time within 60 days of deployment.

4.1.2.3 Pilots with more than 200 total flight hours or possess a private pilot's license: can submit logs with 10 hours primary pilot time up to 90 days before deployment.

4.1.2.4 Flight requirements include:

4.1.2.4.1 At least 2 hours of the flight time on the type of vehicle to be deployed.

4.1.2.4.2 At least 1 hour operating the UAS in attitude stabilized/manual modes (that do not rely on autonomous navigation other than low level stabilization i.e., attitude/altitude hold).

4.1.3 Once certification and logs are submitted and time is verified, NSF will issue a **Conditional Letter to Operate** (CLO). Pilots require a CLO to fly and must present it to deployed authorities. For McMurdo based groups, they should expect to present the CLO to Mac Center as part of their Course Rules Brief.

4.1.4 Operations of vehicles outside this category will have a specific authorization containing procedures, constraints that will be published separately.

WARNING: POLAR OPERATIONS

OPERATING CERTAIN UAS RELYING ON GNSS/GPS IN ANTARCTICA CAN POSE A SIGNIFICANT RISK INCLUDING FLY-AWAY OR LOSS OF CONTROL. THIS CAN BE ATTRIBUTED TO THE FACT THAT THEIR MAGNETOMETER CALIBRATION ROUTINES AND GPS AVAILABILITY ASSUMPTIONS ARE BASED ON NON-POLAR CONDITIONS.

4.1.5 Because of these limitations with GNSS/GPS, the CONOPs must address the following:

- PIC must demonstrate competency by logging a minimum of 1-hour time operating the UAS in Attitude stabilized / Manual modes that do not rely on autonomous navigation other than low level stabilization i.e., attitude/ altitude hold.
- CONOPS must indicate that visual line of sight and orientation awareness will be maintained at all times.
- CONOPS must address the limitations of autopilot modes including the inability to use fail-safes (e.g., return-to-launch) given they rely on nominal autonomous navigation routines.

4.2 Responsibilities

4.2.1 UAS groups shall:

4.2.1.1 Utilize the USAP UAS CONOPs Template, or equivalent (see Attachment 8) to provide a full description of planned UAS activities, submitted to the NSF Aviation Program Manager and NPP UAS Coordinator by July of deployment year.

4.2.1.2 At McMurdo or South Pole, schedule mission in-brief with NPP ATM UAS Coordinator upon arrival. Outside McMurdo, schedule an in-brief with Ship or Palmer Station Authorities (SA).

4.2.1.3 Provide proposed flight schedule and areas to be flown to the ship or SA. At McMurdo and South Pole, NPP ATM UAS Coordinator and the ASC Aviation Operations Manager will act as your gateway. NPP ATC will de-conflict UAS activity with manned fixed and rotary wing flights to the maximum extent possible via coordination and the development of project specific special use airspace.

4.2.1.4 Coordinate with ship or SA no later than 24 hours prior to any UAS mission. For McMurdo and South Pole, coordinate directly with the ASC Aviation Operations Manager.

4.2.1.5 Provide a qualified pilot to communicate with NPP ATC/SA.

4.2.1.6 Maintain constant two-way radio communications with NPP ATC/SA during all missions.

4.2.1.7 Coordinate with NPP ATMUAS Coordinator/SA for special use airspace and special use airspace NOTAMs. If necessary, SA will coordinate with NPP AUAS Coordinator TC.

4.2.1.8 Establish and publish lost communication and lost data link procedures.

4.2.1.9 Prior to departing theater, schedule a mission out-brief with station authorities NPP UAS Coordinator (or NPP ATC station authorities) to capture lessons learned and report any injuries.

4.2.2 (McMurdo/South Pole only) The ASC Aviation Operations Manager shall:

4.2.2.1 Add the scheduled UAS mission(s) to the daily flying schedule.

4.2.2.2 Identify any potential conflicts on the schedule and notify NPP ATMUAS Coordinator

4.2.3 NPP US Coordinator ATM/Ship/SA shall:

4.2.3.1 Coordinate the UAS Group in-brief to include a review of planned CONOPS, discuss local course rules, issue radios to group lead PIC/Remote Pilot.

4.2.3.2 Develop special use airspace as required by the UAS groups, ATC, and the USAP flying community, drafting an appropriate NOTAM for publishing.

4.2.3.3 Provide traffic advisories as required to UAS groups via direct communications and broadcast advisories on appropriate frequencies.

4.2.3.4 Provide broadcast notifications to the appropriate email distribution list of key events on a daily event basis.

4.2.3.5 Ensure that UAS aircraft operating within the local area, are either on deck or established within the NOTAM'd special use airspace, prior to a fixed wing arrival reaching 100NM from the airport or departing fixed wing aircraft starting takeoff roll.

4.2.3.6 Advise all fixed and rotary wing aircraft of the position and intentions of all UASs operating within the local area (via direct communications or broadcast).

4.2.4 UAS PIC/Remote Pilot shall:

4.2.4.1 Request weather forecast support with MET 24-hours in advance.

4.2.4.2 Prior to engine start:

4.2.4.2.1 Establish communication via best means available with appropriate ATC for location (Mac Radio, Tower, etc.)

4.2.4.3 Prior to taxi/takeoff:

4.2.4.3.1 Verify positive AFF with Mac Radio (if installed)

4.2.4.3.2 Verify airspace status, traffic, with Mac Radio, include planned duration, estimate land time, planned area to operate.

4.2.4.3.3 VHF CTAF / UNICOM Calls commence for all events within 10 nm of an existing airfield and continue throughout flight operations.

4.2.4.4 Off-deck call to Mac Radio, "Ops Normal"

4.2.4.5 On-deck call to Mac Radio, estimate time of next takeoff or secure for the day.

4.2.4.6 Notify ATC immediately of any lost link, fly away or other emergency situation.

4.3 Operational Limits for UAS

4.3.1 Unless otherwise specified within each UAS groups approval the following limits apply:

4.3.1.1 All flight operations are to be conducted under daylight (to include civil twilight if equipped with anti-collision lighting) and visual meteorological conditions (VMC), following Visual Flight Rules (VFR) and cloud clearances for the appropriate ICAO airspace that operations are being conducted in.

4.3.1.2 Visual Line of Sight (VLOS) operations only (unaided visual, binoculars are not approved means to extend the operating range). “Daisy chained” qualified observers in direct communication with the PIC/Remote Pilot may be utilized to extend the operating area.

4.3.1.3 All flights conducted at or below 400’ AGL unless otherwise authorized.

4.3.1.4 Comply with all conditions as directed in your Conditional Letter to Operate

ATTACHMENT 1: REFERENCES

Number	Title
AFI 11-202 Vol 3	*General Flight Rules*
AFI 11-218	*Aircraft Operation and Movement on the Ground*
AFI 11-230	*Instrument Procedures*
AFI 11-2C-130 Vol 1	*C-130 Aircrew Training*
AFI 11-2C-130 Vol 3	*C-130 Operations Procedures*
AFMAN 11-2C-17 Vol 1	*C-17 Aircrew Training*
AFI 11-2C-17 Vol 3	*C-17 Operations Procedures*
AFI 13-217	*Drop Zone and Landing Zone Operations*
AFI 91-204	*Safety Investigations and Reports*
AFIM	*Antarctic Flight Information Manual*
AFMAN 11-226	*FAAO 8260.3 Terminal Instrument Procedures*
AFMAN 32-1076	*Design Standards for Visual Air Navigation Facilities*
AMC 24-101 Vol 15	*Transportation, Military Airlift Passenger Service*
FAAO 7110.65	*Air Traffic Control*
FAAO 7210.3	*Facility Operation and Administration*
FAAO 8020.11	*Aircraft Accident and Incident Notification, Investigationand Reporting*
FC 3-260-06F	*Design, Construction, Maintenance and Evaluation of Snowand Ice Airfields in Antarctica*
FLIP	*DoD Flight Information Publication*
ICAO DOC 7030/4	*Regional Supplementary Procedures*
Public Law 104-227	*Antarctic Science, Tourism, and Conservation Act of 1996*
TERPS MOU	*Terminal Instrument Procedures Memorandum ofUnderstanding*
T.O. 00-25-172	*Ground servicing of Aircraft and Static Grounding/Bonding*

ATTACHMENT 2: ABBREVIATIONS AND ACRONYMS

Acronym	Definition
ACHI	Air Center Helicopters, Inc
AGL	Above Ground Level
AMC	Air Mobility Command
ANG	Air National Guard
ANTNZ	Antarctic New Zealand Program
ARA	Airborne Radar Approach
ARFF	Aircraft Rescue and Fire Fighting
ASC	Antarctic Support Contract
ATC	Air Traffic Control
ATM	Air Traffic Manager
CTAF	Common Traffic Advisory Frequency
DP	Departure Procedures
ETP	Equal Time Point
FAAO	Federal Aviation Administration Order
FIR	Flight Information Region
FMC	Full Mission Capable
HF	High Frequency
IAP	International Airport
IAP	Instrument Approach Procedure
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Condition
KBA	Kenn Borek Air
KIAS	Knots Indicated Airspeed
LDB	Long Duration Balloon
Mainbody	Main Deployment Phase for Operation DEEP FREEZE
Mac Center	McMurdo Air Traffic Control Center
MC	Mission Commander
MCWS	Mac Center Watch Supervisor
MDA	Minimum Descent Altitude
MEA	Minimum Enroute Altitude
MOU	Memorandum of Understanding
MPH	Miles Per Hour
MZS	Mario Zucchelli Station
NDB	Non-directional beacon
NM	Nautical Mile
NOTAM	Notice to Airmen
NSF	National Science Foundation
OAS	Office of Aviation Services (of the Dept. of Interior)
ODF	Operation DEEP FREEZE

Acronym	Definition
OPORD	Operations Order
ORM	Operation Risk Management
PSR	Point of Safe Return
Redeployment	Main Redeployment Phase for Operation DEEP FREEZE
ROF	Remote Operations Facility at NIWC, Charleston SC
RSC	Runway Surface Condition
SAR	Search and Rescue
SATCOM	Satellite Communication
SITREP	Situation Report
SOAR	Support Office for Aerogeophysical Research
SOE	Sequence of Events
NPP	Polar Programs
NIWC	Naval Information Warfare Center Atlantic
TERP	Terminal Instrument Procedures
USAP	United States Antarctic Program
VFR	Visual Flight Rules
VMC	Visual Meteorological Condition
WINFLY	Winter Flight Period

ATTACHMENT 3: GUIDELINES FOR THE OPERATION OF AIRCRAFT NEAR CONCENTRATIONS OF BIRDS IN ANTARCTICA

A.3.1. Working Paper on Guidelines for the Operation of Aircraft near Concentrations of Birds in Antarctica

A.3.1.1. Fixed-wing aircraft and helicopter operations are now integral to most national Antarctic research programs, as well as being used by a small number of commercial tourist and air transport companies. The potential for harmful disturbance to concentrations of birds makes it important to provide pilots with guidelines that would prevent or minimize damaging impacts during over flights. Unfortunately, there is a lack of definitive scientific data on which to base firm guidelines for pilots. Moreover, most of the available research relates to penguins and different species of birds are likely to react in different ways or to different degrees to over flights.

A.3.1.2. United Kingdom introduced Working Paper ATCM XXV / WP-26 at ATCM XXV in Warsaw (2002) to bring the issue to the attention of Treaty Parties and to propose a particular set of guidelines. The CEP invited COMNAP, in consultation with SCAR, to review the guidelines, and to report back to the CEP. The present paper presents conclusions and a recommended set of guidelines. Pending further scientific evidence, these guidelines are considered to constitute a reasonable basis for voluntary implementation. They are based on the practical experience of researchers, including input from SCAR, and on experience derived from the national operators' provision of logistics support to researchers. These guidelines are designed to help aircraft operations in Antarctica to be undertaken safely with the minimal environmental impact. COMNAP recommends that aircraft operations in Antarctica should be planned and carried out in accordance with these guidelines to the maximum extent practicable.

A.3.2. Guidelines on Minimum Distances for Aircraft Operations Close to Concentrations of Birds

A.3.2.1. There are many variables in noise levels received on the ground during aircraft operations. Determining factors on noise levels include flight height, the type of aircraft and engine, the flight profile, the weather and the location. Pilots will need to make their own judgements based on the aircraft type, task and operational safety considerations.

A.3.2.2. Unless otherwise specified, for example by an ASPA management plan or ASMA guidelines, recommended distances are set out below. It is recognized however that whilst these represent preferred distances, which should be adhered to the extent possible, operators may already have developed guidelines to suit their own particular needs and circumstances.

A.3.2.2.1. Penguin, albatross and other bird colonies are not to be over flown below 2000ft (~ 610 m) Above Ground Level (AGL), except when operationally necessary.

A.3.2.2.2. Landings within ½ nautical mile (~ 930 m) of penguin, albatross or other bird colonies should be avoided wherever possible.

A.3.2.2.3. Never hover or make repeated passes over wildlife concentrations or fly lower than necessary.

A.3.2.2.4. Maintain a vertical separation distance of 2000 ft (~ 610 m) AGL, and ahorizontal separation of 1/4 nautical mile (~ 460 m), from the coastline where possible.

A.3.2.2.5. Cross coasts at right angles and above 2000ft (~610 m) AGL where possible.

A.3.3. Location of Aircraft Operations (Other Considerations)

A.3.3.1. Be aware that concentrations of birds are most often found in coastal areas.

A.3.3.2. Be aware that when operating aircraft in inland areas, snow and Antarctic petrel colonies are frequently found on nunataks. Minimum over-flight distance should be maintained in such areas.

A.3.3.3. Where practical, landings near to concentrations of birds should be downwind and/or behind a prominent physical barrier (e.g. hill) to minimize disturbance.

A.3.3.4. Avoid Antarctic Specially Protected Areas, unless authorized to over-fly and/or land via permit issued by an appropriate national authority. For many ASPAs there are specific controls onaircraft operations, which are set out in the relevant Management Plans.

A.3.3.5. Follow aircraft flight heights, preferred flight paths and approach paths contained in the Antarctic Flight Information Manual (AFIM), in station aircraft operation manuals and on relevant charts and maps. Once the guidelines have been adopted, COMNAP envisages the preparation of Wild Life and Low Flying Avoidance Maps for the major airstrips in the Antarctic (e.g. Marsh, Marambio, Rothera, McMurdo).

A.3.3.6. Particularly avoid flying toward concentrations of birds immediately after take-off and avoid steep banking turns in flight as these significantly increase the amount of noise generated.

A.3.4. Timing of Aircraft Operations

A.3.4.1. Most native bird species breed at coastal locations in Antarctica between October and Aprileach season. During the planning of aircraft operations near to concentrations of birds, consideration should be given to undertaking flying activities outside of the main breeding and/or molting periods.

A.3.4.2. Where aircraft operations are necessary to be close to concentrations of birds, the durationof flights should be the minimum necessary.

A.3.4.3. To minimize bird strikes, especially in coastal areas, avoid flying after dark between October and April. At this time of year, prions and petrels are active. These birds are nocturnal when breeding and are attracted by lights.

A.3.4.4. Aircraft operations should be delayed or cancelled if weather conditions (e.g. cloud base,winds) are such that the suggested minimum vertical and horizontal separation distances given in these guidelines cannot be maintained.

ATTACHMENT 4: SOUTH POLE CLEAN AIR SECTOR / NO FLY ZONE

NOTE

Geographic coordinates for the No-Fly Zone (2) do not change, but the Clean Air Sector (1) and the De-Motorized Zone (3) "float" with the ARO building as the polar ice cap moves (grid) NW, approximately 10 meters (33 feet) per year.

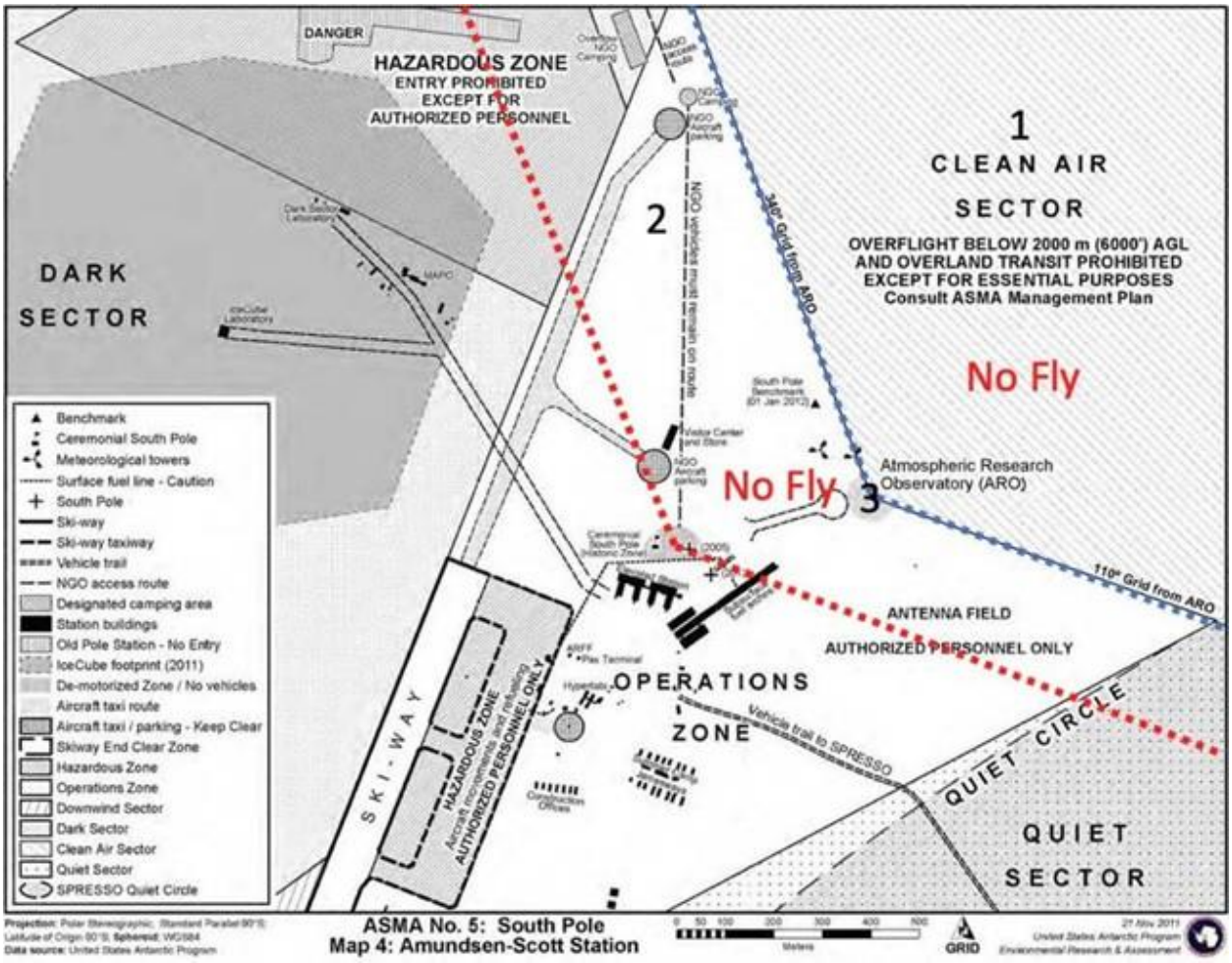

Figure A.4.1: SOUTH POLE CLEAN AIR SECTOR / NO FLY ZONE

NOTE

All flights should approach Pole from the Downwind Sector

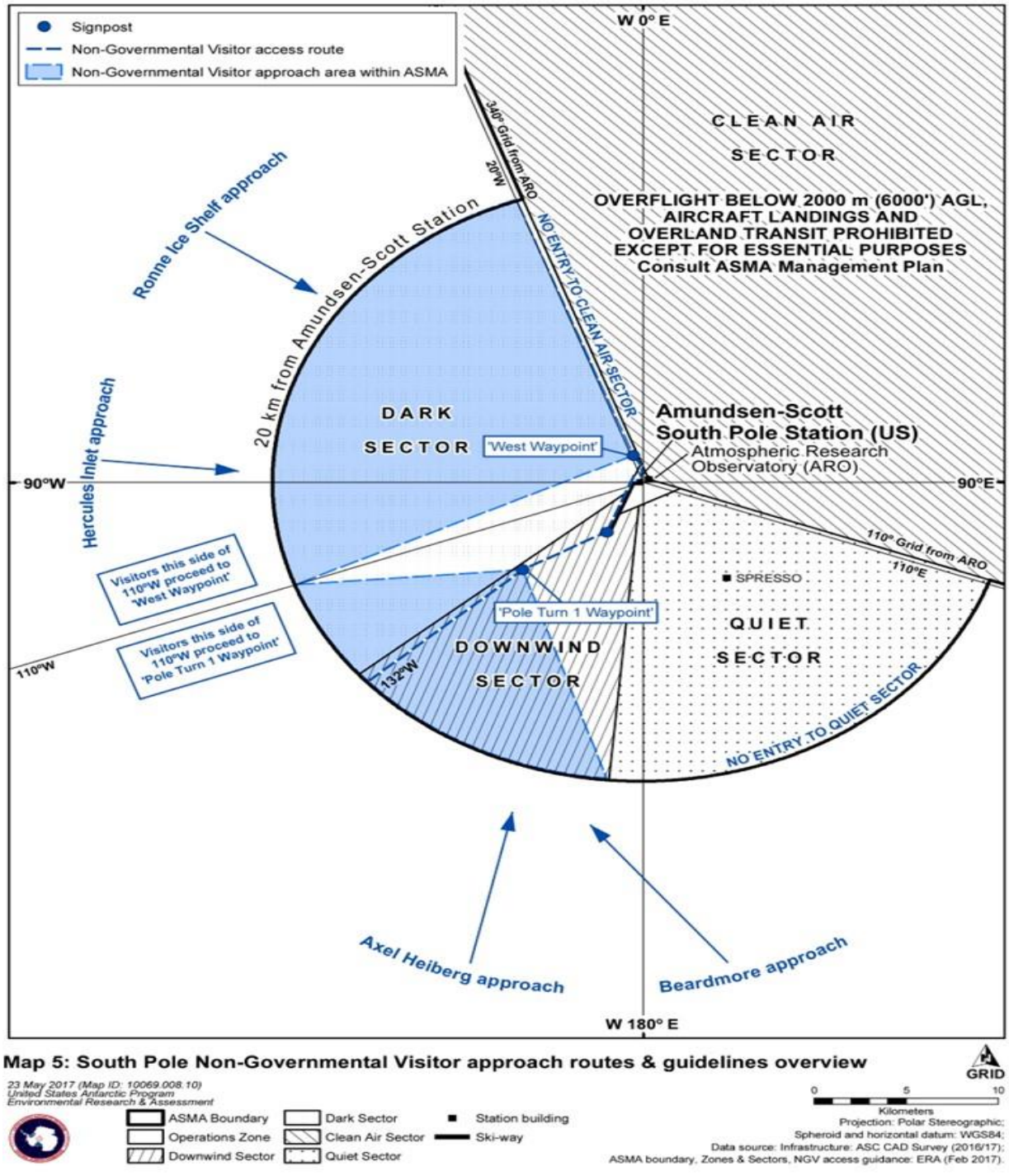

Figure A.4.2 Shows sector boundaries out to 20NMs.

NOTE

Although the South Pole Skiway extends into the NFZ, use of the Skiway is exempt from these NFZ guidelines. Additionally, USAP aircraft are permitted to enter the No-Fly Zone as necessary for official business (approaches / takeoffs / landings, NSF-directed missions, FAA checks, etc.) In all cases, pilots are asked to minimize potential contamination of the CAS.

A.4.1. Clean Air Sector (CAS)

A.4.1.1. The Clean Air Sector is a wedge-shaped area upwind (grid northeast) of the main station complex, defined by the following boundaries, measured from the Atmospheric Research Observatory (ARO).

A.4.1.1.1. A line extending grid 340 degrees from the SW corner of ARO - A lineextending grid 110 degrees from the SW corner of ARO - 88° 40’ South Latitude (150 kilometers/80 nautical miles NE of the station).

A.4.2. No-Fly Zone (NFZ)

A.4.2.1 To facilitate navigation around the Clean Air Sector, the National Science Foundation has established an additional “No-Fly Zone” extending 2 kilometers (6,000 feet) above the snow surface and defined by the following boundaries, measured from the Geographic South Pole.

A.4.2.2 20° West Longitude (Grid 340°) - 110° East Longitude (Grid 110°) - 88° 40’ South Latitude (150 kilometers/80 nautical miles NE of the station)

ATTACHMENT 5: TYPICAL OPERATIONAL PERIODS AT THE MCMURDO AREA AIRFIELDS

Table A.5.1 Normal Operational Periods – For current periods, check NOTAMs

NAME	OPEN	CLOSE
Williams Field Skiway	16 OCT	28 FEB
Phoenix Runway (***pre-gap***)	1 OCT	15 DEC
Phoenix Runway (***post-gap***)	1 FEB	15 MAR

ATTACHMENT 6: AIRFIELD STATUS REPORT (ASR) UPDATE EXAMPLE

AIRFIELD STATUS INFORMATION

26 AUG 0400L

PHOENIX FIELD

Aerodrome Status	OPERATIONAL
Phoenix Runway 33/15	OPERATIONAL
Phoenix Runway 33/15 Dimensions	150' X 10,000'
Overrun Departure End RWY 33 Dimensions	150' X 1,000'
Runway Surface Conditions (RSC)	3/10" – 5/10" Loose snow (Last updated 1730L 25 Aug)
Runway Condition Reading (RCR)	10 (Last updated 0320L 26 Aug)
Anomalies	NONE
Ramp One	OPERATIONAL
Ramp One Fueling Pit	OPERATIONAL
Lighting Aids	
Approach Lights (SSALR) RWY 33	OPERATIONAL
Sequenced Flashing Lights (SFL) RWY 33	OPERATIONAL
Threshold Lights RWY 33	OPERATIONAL
Temporary Runway Edge Lights RWY 33/15	
Temporary Threshold lights RWY 15	
Temporary HIRRRIM Cones RWY 33/15	NOT INSTALLED
Runway Markers RWY 33/15	INSTALLED
Distance Remaining Markers RWY 33/15	INSTALLED
Precision Approach Path Indicator (PAPI) RWY 33	OPERATIONAL
Runway End Identifier Lights (REIL) RWY 33	OPERATIONAL
Navigational Aids	
TACAN-ZFX-CHANNEL 85	OPERATIONAL
Transponder Landing System (TLS) RWY 33	OPERATIONAL
Weather Aids (AWS)	
FMQ-19	OPERATIONAL
Aerospace Ground Equipment Available When Operational	
Hobart Power Carts	2 OPERATIONAL
-95 (Huffer)	1 OPERATIONAL
Heaters	7 OPERATIONAL
Nitrogen Cart	1 OPERATIONAL
B-5 Maintenance Stand	1 OPERATIONAL
Air Stairs	1 OPERATIONAL

PHOENIX AIRFIELD FLIGHT PLANNING INFORMATION

- AIRCREW CONDUCTING IN THE DARK MISSIONS: THE APPROACH LIGHTS CAN BE ADJUSTED FROM LEVELS 1-5 AND STROBES CAN BE L-M-H.
- AMC PHOENIX AIRFIELD CERTIFICATION VALID THROUGH 30 NOV 2023.
- RWY 33/15 EDGE LGT NON STD LED RUNWAY EDGE LIGHTS MIGHT NOT BE COMPATIBLE WITH ALL NVGS OR ENHANCED FLIGHT VISION SYSTEMS.
- UNLIT OVERRUN DEPARTURE END OF RUNWAY 33 IS OPEN.
- STRESSED RUNWAY SHOULDERS ARE 25' WIDE (BOTH SIDES OF RUNWAY). ALL RUNWAY MARKERS ARE LOCATED ON OUTSIDE EDGE OF THE SHOULDERS.
- ALL AIRCRAFT SHALL TRANSMIT ON CTAF VHF 122.8 FOR DEPARTURE/ARRIVAL AND WHEN ENTERING or DEPARTING THE APRON FOR THE RUNWAY. THIS ALLOWS FIRE HOUSE TIME TO CHECK RUNWAY TO MAKE SURE VEHICLE TRAFFIC IS OFF THE RUNWAY FOR YOUR DEPARTURE OR ARRIVAL.
- TO THE MAXIMUN EXTENT POSSIBLE, ALL ARRIVALS SHOULD BE TO RUNWAY 15 AND DEPARTURES SHOULD BE TO RUNWAY 33.
- ALL 180 DEGREE TURNS ARE ACCOMPLISHED AT THE DEPARTURE END OF RUNWAY 33 IN THE OVERRUN IN THE FIRST 500' (JUST PAST THE RED THRESHOLD MARKERS). DO NOT TURNAROUND IN THE GRADED AREA (NON-STRESSED) WHERE ALL THE BOUNDRY FLAGS/MARKERS DELINEATE THE NON-STRESSED AREA OF THE RUNWAY.
- ALL AIRCRAFT: WHEN DEPARTING RUNWAY 33 ENSURE AIRCRAFT ARE 500' FROM THE THRESHOLD LIGHTS TO PREVENT DAMAGE TO LIGHTS.
- AIRCREWS ARE RESPONSIBLE TO SIGNAL GROUND PERSONNEL WHEN GROUND PERSONNEL CAN APPROACH THE AIRCRAFT TO START OFFLOAD.
- PASSENGERS WILL REMAIN ONBOARD ALL AIRCRAFT UNTIL ATO REP ARRIVES AT THE AIRCRAFT FOR THE PASSENGERS.
- PAPI OPERATIONAL, CAPABLE OF CHANGING INTENSITY UPON REQUEST, REILS ARE REMOTE CONTROLLED AND ARE TURNED ON/OFF BY AIRCRAFT
- TEMPORARY LIGHTS AND HIRRRIM CONES LISTED ARE INSTALLED ONLY FOR WINTER NIGHT OPERATIONS – REQUIRES 24 HOURS NOTICE FOR INSTALLATION THROUGH OPERATIONS -720-568-1017 IN MCMURDO OR EMAIL USAP AIRFIELD MANAGER: mcm-airfield-manager@usap.gov
- FOLLOW MARSHALLER DIRECTIONS TO PARKING LOCATION.
- TAKE ALL PRACTICAL MEASURES TO MINIMIZE EXHAUST AND THERMAL DAMAGE TO THE AIRFIELD SURFACES. GROUND OPERATIONS OF ENGINES SHOULD BE KEPT TO MINIMUM PRACTICAL FOR SAFE OPERATIONS. MINIMIZE TAXI TIMES AND BRAKING, TAXI WITH FLAPS UP, MINIMIZE AMOUNT OF TIME STATIONARY ON RUNWAY.
- MAINTENANCE ENGINE RUNS SHALL BE IN AREAS WITH EXHAUST DIRECTED OFF OF AIRFIELD AREAS.
- GPU AND LOADERS ARE STANDARD EQUIPMENT FOR AIRCRAFT SERVICING. NOTIFY MAC CENTER OF REQUIREMENT FOR HEATERS, OTHER GROUND EQUIPMENT AND FUEL TWO HOURS PRIOR TO ARRIVAL.

ATTACHMENT 7: METEOROLOGICAL SERVICES

A.7.1. The delineation of NPP Met services provided to its customers and their expectations are:

A.7.1.1. Joint Task Force – Support Forces Antarctica (JTF-SFA)

A.7.1.1.1. NPP-provided Met Services

A.7.1.1.1.1. Provide weather support for Operation DEEP FREEZE airlift missions between Christchurch and Antarctica and within Antarctica

A.7.1.1.1.2. Provide weather impacts on scheduled airlift via daily briefings of SFA and staff.

A.7.1.1.1.3. Notification of significant degradation of weather observing or weather forecasting capabilities

A.7.1.1.2. NPP expects that SFA will:

A.7.1.1.2.1. Provide NPP with a current listing of SFA's meteorological service requirements.

A.7.1.2. Commander, 304th Expeditionary Airlift Squadron (304 EAS)

A.7.1.2.1. NPP-provided Met Services.

A.7.1.2.1.1. Provide Mission Commander weather briefing electronically five hours prior to ETD for Go/No-Go decision.

A.7.1.2.1.2. Issue TAFs for the McMurdo active runway and provide pertinent observations.

A.7.1.2.2. NPP expects that the 304th will:

A.7.1.2.2.1. Provide NPP Remote Operations Facility and the Aviation Operations Manager with the sequence of events (SOE) for each mission.

A.7.1.2.2.2. Notify the Aviation Service Providers of any changes to flight schedule.

A.7.1.3. Aircraft Commander, 304th Expeditionary Airlift Squadron (304 EAS)

A.7.1.3.1. NPP-provided Met Services

A.7.1.3.1.1. Issue flight weather packet

A.7.1.3.1.2. Conduct flight weather briefing at Christchurch USAP Base Operations via a web-based conference

A.7.1.3.1.3. Issue TAFs for the McMurdo area active runway

A.7.1.3.1.4. Take, record, and disseminate aviation weather observations for the McMurdo area active runway

A.7.1.3.1.5. Take, record, and disseminate Aviation Selected Special Weather Report (SPECI) for the McMurdo active runway every half hour beginning two hours prior to Point-of-Safe Return

until arrival at the McMurdo area active runway

A.7.1.3.1.6. Issue Point-of-Safe Return forecast and updated Christchurch (NZCH) TAF for southbound leg of mission

A.7.1.3.2. NPP's expectations of the 304th Aircraft Commander:

A.7.1.3.2.1. Provide PIREPS and AIREPS to Auckland Control and Mac Center when in their respective FIR/s.

A.7.1.4. Operations Officer, 139th Expeditionary Airlift Squadron (139 EAS)

A.7.1.4.1. NPP-provided Met Services:

A.7.1.4.1.1. Issue TAF/s for the McMurdo area active runway

A.7.1.4.1.2. Issue TAF/s for pertinent field camp landing sites

A.7.1.4.1.3. Take, record, and disseminate aviation weather observations for the McMurdo area active runway.

A.7.1.4.1.4. Disseminate weather observations from field camp landing sites.

A.7.1.4.1.5. Provide significant changes to observed/forecast weather at LC-130 departure or arrival sites.

A.7.1.4.2. NPP's expectations of the 139th Operations Officer:

A.7.1.4.2.1. Inform McMurdo Weather Office of any changes to continental and intercontinental flight schedule.

A.7.1.4.2.2. Inform impacted aircraft of significant changes to forecasted weather at destination(s)

A.7.1.5. Aircraft Commander, 139th Expeditionary Airlift Squadron (139 EAS)

A.7.1.5.1. NPP-provided Met Services:

A.7.1.5.1.1. Issue flight weather packet

A.7.1.5.1.2. Provide timely flight weather briefings.

A.7.1.5.1.3. Conduct flight weather briefing at Christchurch USAP Base Operations via a web-based conference.

A.7.1.5.1.4. Issue TAF/s for the McMurdo area active runway

A.7.1.5.1.5. Issue TAF/s for pertinent field camp landing sites

A.7.1.5.1.6. Take, record, and disseminate aviation weather observations for the McMurdo area active runway.

A.7.1.5.1.7. Disseminate Auto weather observations from equipped alternate landing sites where manned observations are not allotted (i.e., William's Field).

A.7.1.5.1.8. Take, record, and disseminate Aviation Selected Special Weather Report (SPECI) for the McMurdo active runway

every half hour beginning two hours prior to Point-of-Safe Return until arrival at the McMurdo area active runway

A.7.1.5.1.9. Issue Point-of-Safe Return forecast and updated Christchurch (NZCH) TAF for southbound leg of mission

A.7.1.5.2. NPP's expectations of the 139th Aircraft Commander:

A.7.1.5.2.1. Provide PIREPS and AIREPS to Auckland Control and Mac Center when in their respective FIR/s

A.7.1.6. Aircraft Commander, 40th Squadron Royal New Zealand Air Force

A.7.1.6.1. NPP-provided Met Services:

A.7.1.6.1.1. Issue flight weather packet

A.7.1.6.1.2. Conduct flight weather briefing at Christchurch USAP Base Operations via a web-based conference.

A.7.1.6.1.3. Conduct flight weather briefing when departing McMurdo.

A.7.1.6.1.4. Issue TAF/s for the McMurdo area active runway

A.7.1.6.1.5. Take, record, and disseminate aviation weather observations for the McMurdo area active runway.

A.7.1.6.1.6. Take, record, and disseminate Aviation Selected Special Weather Report (SPECI) for the McMurdo active runway every half hour beginning two hours prior to Point-of-Safe Return until arrival at the McMurdo area active runway.

A.7.1.6.1.7. Issue Point-of-Safe Return forecast and updated Christchurch (NZCH) TAF for southbound leg of mission.

A.7.1.6.2. Expectations

A.7.1.6.2.1. 40th Squadron shall inform aviation service providers of changes to flight schedule and briefing times.

A.7.1.7. Aviation Specialist, US Department of the Interior/Office of Aviation services (OAS)

A.7.1.7.1. NPP-provided Met Services

A.7.1.7.1.1. Provide weather support for National Science Foundation contract aircraft within Antarctica.

A.7.1.7.1.2. Notification of significant degradation of weather observing or weather forecasting capabilities

A.7.1.7.2. Expectations

A.7.1.7.2.1. Provide NPP with meteorological service requirements.

A.7.1.8. Contract fixed-wing service provider.

A.7.1.8.1. Aviation Meteorological Services

A.7.1.8.1.1. Issue TAFs for the McMurdo area active runway.

A.7.1.8.1.2. Issue VFR Briefing with modified VFR TAF for primary and backup landing site, as identified in the Fixed Wing Schedule, no later than 1700 UTC.

A.7.1.8.1.3. Conduct timely flight weather briefings for aircraft departing from McMurdo.

A.7.1.8.1.4. Discuss VFR Briefing, via Iridium telephone, with those aircraft pilots operating from field camps.

A.7.1.8.1.5. Take, record, and disseminate aviation weather observations for the McMurdo area active runway.

A.7.1.8.1.6. Disseminate weather observations from field camp landing sites.

A.7.1.8.1.7. Monitor Automated Flight Following (AFF) along route and destinations. Inform, via Iridium telephone, of any significant changes to observed/forecast weather at McMurdo airfield or field camp where aircraft are destined.

A.7.1.8.2. NPP's expectations of the NSF's fixed-wing service provider:

A.7.1.8.2.1. Inform Aviation Service Providers of changes to flight schedule.

A.7.1.8.2.2. Provide PIREPS and feedback regarding observed weather enroute and/or arrival weather.

A.7.1.8.2.3. Contact NPP Remote Operations Facility prior to or upon departure from any field camp for updates to enroute and destination weather.

A.7.1.9. NSF's contract Helicopter services provider:

A.7.1.9.1. Aviation Meteorological Services

A.7.1.9.1.1. Issue the Daily Helo Briefing

A.7.1.9.1.2. Conduct flight weather briefings twice-daily

A.7.1.9.1.3. Monitor weather in the helicopter operating areas and notify Helo Operations of impending hazardous weather

A.7.1.9.2. Expectations

A.7.1.9.2.1. Contact McMurdo Weather Office for updates to weather in the helicopter operating area.

A.7.1.9.2.2. Notify McMurdo Weather immediately of significant weather in the helicopter operating area.

A.7.1.10. USAP Airfield Manager

A.7.1.10.1. Aviation Meteorological Services

A.7.1.10.1.1. Notification of expected Severe Weather Conditions for the airfields.

A.7.1.10.2. Expectations

A.7.1.10.2.1.Provide McMurdo Weather Office with intentions or plans regarding closing/opening of airfields and associated roads.

A.7.1.11. NSF Prime Contractor's Aviation Operations Manager (McMurdo Station)

A.7.1.11.1. Aviation Meteorological Services

A.7.1.11.1.1. Provide VFR Briefing of the day no later than 1700 UTC.

A.7.1.11.1.2. Provide updated VFR Briefing, allowing 30 minutes for each change in landing site, upon receipt of an updated Fixed Wing Schedule.

A.7.1.11.1.3. Attend the twice weekly Air Operations Planning Board (AOPB) chaired by the NSF Prime Contractor's Aviation Operations leadership and provide weather impacts on scheduled airlift missions.

A.7.1.11.1.4. Provide weather situational awareness briefings to the day and night shift Aviation Operations Staff.

A.7.1.11.2. Expectations

A.7.1.11.2.1. Include McMurdo Weather Office and NPP Remote Operations Facility on distribution of all Fixed Wing Schedules

A.7.1.11.2.2. Fixed Wing Flight Schedule should contain all fixed-wing missions, including Unmanned Aerial Systems (UAS) flights, flights of our USAP Participating Partners, and flights of Non-Governmental Activities (NGA's) for which NSF has made prior agreements to provide aviation meteorological services support.

A.7.1.12. NSF Prime Contractor's Science Support

A.7.1.12.1. Aviation Meteorological Services

A.7.1.12.1.1. Provide aviation weather forecasts for helicopter detachment when embarked on USAP research vessels.

A.7.1.12.1.2. Provide quality control for the outlying field camp weather observations prior to dissemination.

A.7.1.12.1.3. Provide Portable Polar Meteorological Kit (PPMK) operator training to outlying field camp observers.

A.7.1.12.1.4. Issue PPMK/s, from GEM Building 159 at McMurdo Station, to outlying field Camp Managers for selected field camps.

A.7.1.12.2. Expectations

A.7.1.12.2.1. Ensure McMurdo Fixed Wing Supervisor is informed of NSF agreements with non-USAP Participating Partners that require fixed-wing aviation meteorological services.

A.7.1.12.2.2. Include the NPP Meteorology Manager for representation at mission planning meetings for upcoming Antarctic research projects requiring aviation meteorological services support.

A.7.1.12.2.3. Provide the NPP Meteorology Manager all meteorological support requests contained in submitted Support Information Packages (SIP)

A.7.1.13. Properly trained NSF Prime Contractor personnel or grantees provide aviation METAR weather observations at the South Pole Station and outlying field camps. These observations are required and taken a minimum of three times a day at 0000Z, 0600Z, and 1800Z. Observation frequency increases to hourly, commencing six hours prior to aircraft departure for the camp, and continues through the duration of flight operations. SPECI observations are provided as required. Field camps designated for back-up missions increase frequency of observations to every three hours, commencing six hours prior to aircraft departure for primary camp, and continues through the duration of flight operations.

ATTACHMENT 8: UAS CONOPS TEMPLATE

UAS Group Proposal: Please fill out A.8.1 through A.8.8

A.8.1. Overview

A.8.1.1. Executive Summary

A.8.1.2. Project Participants

A.8.2. Implementation Plan

A.8.2.1. Mission Planning

A.8.2.2. UAS Platforms – ID make and manufacturer

A.8.2.3. UAS Specifications – ID operational specifications material:

Overall dimensions:

Max TOGW:

Ground clearance:

Service ceiling:

Max cruise speed:

Max endurance:

Rate of climb:

Rate of descent:

Radio transmission frequencies:

A.8.2.4. Study Site(s)

A.8.2.4.1. Area A – include:

Proposed flight paths/patterns/altitudes/distances to accomplish goals. These include latitude/longitudes, mission number (if any), call sign, pilot, visual observer, flight plan activation window (dates), altitudes, distances

A.8.2.4.2. Area B, etc.

A.8.3. Launch and Recovery

Prior to each mission a preflight procedure is defined to assure safe and reliable mission execution. These procedures include crew briefing, aircraft testing and calibration, communication tests and weather checks. The sUAS launch zone is selected and prepared for operations by the PIC. The aircraft will be launched from (describe proposed area). The PIC will establish communication with ATC (Mac Center).

A.8.3.1. Pre-flight Protocol - Before the mission is initiated, the preflight protocol is validated by the PIC and VO.

A.8.3.1.1. Team Briefing

1. Briefing items to include:
    a. Operating Conditions
    b. Emergency procedures

c. Contingency procedures
d. Roles and responsibilities of each person involved in operations
e. Potential hazards
f. Expected duration of flight

A.8.3.1.2. Environment Check

1. Conduct area assessment:
   a. Local weather conditions and forecast check
   b. Local airspace. Will also ID any flight restrictions
   c. ID locations of persons and property on the surface
   d. ID other ground or flight hazards

A.8.3.1.3. Aircraft Check – a aircraft preflight inspection is required prior to every mission:

1. Equipment check:
   a. Airframe
   b. Flight Controller
   c. Imaging Camera/gimbal

A.8.3.1.4. Pre-flight Operation Check – to be accomplished prior to every flight to verify aircraft is in good working order:

1. Aircraft check
2. Flight controller check
3. Aircraft compass calibration
4. GPS position acquisition check
5. Geo fence function test

A.8.3.2. Launch Procedure – describe launch procedures.

A.8.3.3. Landing Procedure – describe landing procedures.

WARNING

MOST UAS INJURIES OCCUR WHEN RECOVERING AN AIRBORNE UAS BY HAND. ANY PLAN TO RECOVER A UAS IN THIS MANNER WILL BE SPECIFICALLY APPROVED BY THE UAS-WG AND ONLY BY EXPERIENCED OPERATORS USING PROTECTIVE GEAR.

A.8.3.4. Airspace Management – describes how you will interface with ATC or ship authorities.

Table A.8.1 Example Communications Card

WHO	WHAT	WHEN
ATC	ATC issues standing NOTAM for the project and geographic footprint utilizing a latitude/longitude center point with radius covering the affected area with ceiling based on vehicle's maximum service ceiling +2000ft.	Prior to commencement of season operation
ATC	Issue airfield CTAF VHF frequency and include in NOTAM	Prior to commencement of season operation
Event Planner	Source air band radios	On arrival to MCM
PI (or designated representative	Confirms planned events with times for next day with FW ops for inclusion to daily flight schedule	NLT 24 hrs prior to planned mission
FW Operations / ATC	Deconflict daily flight schedule based on planned events. Clarify priorities with MCM NSF Rep as required.	Prior to daily flight schedule release
Remote Pilot / Pilot Operator / ATC	Radio call to Mac Center / Send notification to advise appropriate users of planned commencement for UAS flight operations. Mac Center email: macctr@usap.gov	30 mins prior to first takeoff of the day
Remote Pilot / Pilot Operator / ATC	Establish communication via best means available with appropriate ATC location (Mac Center, Tower, etc.)	Prior to powering up systems
Remote Pilot / Pilot Operator / ATC	Verify positive AFF with Mac Center (if installed)	Prior to taxi / takeoff
Remote Pilot / Pilot Operator / ATC	Verify airspace status, traffic with Mac Center. Include planned duration, estimated land time, planned area to operate.	Prior to taxi / takeoff
Remote Pilot / Pilot Operator / ATC	VHF CTAF / UNICOM calls commence for all events within 10NM of an existing airfield.	Prior to takeoff through landing
Remote Pilot / Pilot Operator / ATC	"Off-deck" call to Mac Center	When airborne
Remote Pilot / Pilot Operator / ATC	"Ops normal" calls to Mac Center	Every 30 mins while airborne
Remote Pilot / Pilot Operator / ATC	"On-deck" call to Mac Center, with estimated time for next take-off or relay intention to terminate flight ops for the day.	At completion of single flight or when flight operations for day are concluded.

A.8.4. Pilot Certifications: the CONOPs should provide FAA (or equivalent) pilot certifications and logbooks that clearly show pilot competency. Prior to CONOPs approval and issuance of Conditional Letter of Approval, pilots are required to submit logs that show 10 hours flight time in the prior 30-90 days from deployment date.

A.8.4.1. Pilot A

A.8.4.2. Pilot B, etc.

A.8.5. References:

A.8.6. Additional Information – please add any additional information needed for the UAS-WG to consider your work.