BY ORDER OF THE SECRETARY OF THE AIR FORCE

AIR FORCE MANUAL 11-2C-17V3 ADDENDA-C

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Flying Operations

C-17 ANTARCTIC OPERATIONS

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This publication implements Air Force Policy Directive (AFPD) 11-2, *Aircrew Operations*, and is incomplete without AFMAN 11-2C-17V3, *C-17 Operations Procedures*. This is a specialized publication intended for the operation C-17 aircraft in Antarctica. This publication applies to the Regular Air Force and the Air Force Reserve. This publication does not apply to the United States Space Force and the Air National Guard. Ensure all records generated as a result of processes prescribed in this publication adhere to Air Force Instruction 33-322, *Records Management and Information Governance Program*, and are disposed in accordance with the Air Force Records Disposition Schedule, which is located in the Air Force Records Information Management System. This publication may be supplemented at any level, but all direct Supplements must be routed to the office of primary responsibility (OPR) of this publication for coordination prior to certification and approval. Refer recommended changes and questions to the publication OPR using the Department of the Air Force (DAF) Form 847, *Recommendation for Change of Publication*; route DAF Forms 847 from the field through the appropriate chain of command. The authorities to waive wing/unit level requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. See DAFMAN 90-161, *Publishing Processes and Procedures*, for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the Publication OPR for non-tiered compliance items.

SUMMARY OF CHANGES

This document has been substantially revised and should be completely reviewed. Changes include codified Aircraft Rescue and Fire Fighting requirements, clarification on weather minimums, and Transponder Landing System procedures. The Naval Information Warfare Center Atlantic is also included as the Operation Deep Freeze military service weather provider.

Chapter 1

GENERAL

1.1. Overview. These procedures provide guidance to plan and execute C-17 airlift and airdrop operations on the continent and surrounding waters of Antarctica. Use these procedures in conjunction with the flight manual and mission operating directives. Training should be planned and executed to meet joint tasks, conditions, and standards when applicable.

1.2. Mission Description. Operation DEEP FREEZE (ODF) is the Department of Defense (DoD) inter/intra-theater air and surface logistical support of the United States Antarctic Program (USAP). It involves the deployment and redeployment of scientific and support personnel, resupply of South Pole Station, McMurdo Station, and numerous deep field research camps established by the National Science Foundation (NSF) Office of Polar Programs (OPP).

1.2.1. Joint Task Force-Support Forces Antarctica (JTF-SFA) is the standing JTF that is tasked with managing the DoD operational and logistical support to the USAP.

1.2.2. C-17 aircraft, aircrews, Aircrew Flight Equipment (AFE), maintenance, and support personnel are tasked to perform airland and airdrop operations on the Antarctic continent in support of USAP programs on an annual basis.

1.2.3. C-17A crews from the 62d Operations Group (62 OG) and the 446th Operations Group (446 OG) at Joint Base Lewis-McChord are responsible for filling ODF taskings and managing the C-17 Aircrew Antarctic Training Program in accordance with (IAW) AFMAN 11-2C-17V1, *C-17 Aircrew Training*. If another wing is tasked to conduct the ODF mission, the aircrew must be trained and certified IAW AFMAN 11-2C-17V1 Aircrew Antarctic Training Program.

1.2.4. Deployed aircraft and personnel are assigned to the 304th Expeditionary Airlift Squadron (304 EAS). The 304 EAS is based at Christchurch, New Zealand and is subordinate to the 13th Air Expeditionary Group (13 AEG), JTF-SFA.

1.2.5. ODF operations are divided into three time periods: Mid-Winter, Winter Flying (WINFLY), and Main Season/Redeploy.

1.2.6. On behalf of U.S. Transportation Command (USTRANSCOM), the Air Mobility Command (AMC) Director of Operations, Strategic Deterrence, and Nuclear Integration (AMC/A3/10) provides aircraft approval for initial ice runway operations based on command pavement engineer certification. Utilizing data provided by the USAP McMurdo-area airfield manager, the AMC pavement engineer provides certification for C-17 operations prior to initial seasonal mission execution for the McMurdo Annual Sea Ice runway (NZIR), and/or Phoenix Field (NZFX).

1.3. ODF Specific Terms.

1.3.1. Ice Certification. The certification of an ODF crewmember is conducted in accordance with the 62/446 OG ODF C-17 Antarctic Training and Certification Guide and syllabus. Crew members will be certified by the ODF Commander and will be referred to as “Ice Certified”. Additional certifications exist for WINFLY, South Pole Airdrop, and night vision goggle (NVG) operations. These certifications will be tracked in the Graduate Training Integration

Management Systems (GTIMS), the C-17 Training Management System, and ice certifications will be recorded on the letter of X's. **(T-3)**

1.3.2. WINFLY. The period of ODF operations that occur during late Austral Winter, usually in August, which brings in the advance team of personnel to prepare the airfields and McMurdo Station for main season operations. WINFLY requires a separate aircrew certification.

1.3.3. Main Season. The period of ODF operations that occur during the main operating season, usually from early October through early March. The majority of cargo and personnel airlift occur during this period.

1.3.4. Mid-Winter. The period between the end of the Main Season and the beginning of WINFLY. In addition to regularly scheduled missions during this timeframe, WINFLY CertifiedC-17 crews may be called upon to conduct emergency operations during this period.

1.3.5. Point of Safe Return (PSR). An en route point between Christchurch, NZ and McMurdo Station where the pilot in command (PIC) makes the decision to proceed to McMurdo Station or return to Christchurch, NZ based on weather conditions at McMurdo Station. Continuing past the PSR commits the aircrew to land at McMurdo Station regardless of weather conditions.

1.3.6. Phoenix Ice Runway. The compacted hard surfaced white ice runway built on the permanent Ross Sea Ice Shelf approximately 8 miles from McMurdo Station. This runway can be made available year-round.

1.3.7. Annual Sea Ice Runway. The temporary runway built on the annual sea ice in McMurdo Sound. This runway is constructed each season on a new site over frozen sea water and is approximately 2 miles from McMurdo Station. This runway is only available when the sea ice is thick enough to support aircraft operations, usually from early October through early December.

1.4. Command, Control, and Communications.

1.4.1. Command relationships are detailed in AFMAN 11-2C-17V3, Chapter 2, the JTF-SFA Operations Order for ODF, and the AMC ODF Execute Order (EXORD).

1.4.2. Operational control (OPCON) of deployed C-17 aircraft in support of ODF will be retained by USTRANSCOM. Tactical control (TACON) is transferred to U.S. Indo-Pacific Command upon arriving in the joint operations area (JOA) and will be relinquished when departing the JOA.

1.4.3. Plain (non-secure) communications are used for in-flight operations. High frequency (HF), satellite communication (SATCOM), and Iridium text capability are utilized for ODF communications when out of very high frequency (VHF) range.

1.4.4. C-17 crewmembers are not required to carry communications security (COMSEC) materials on missions between Christchurch, NZ and Antarctica.

1.4.5. All landing locations must be entered into the Global Decision Support System (GDSS) with adequate information to support major command (MAJCOM) command and control processes and enhance supervisory situational awareness at all levels.

1.5. Mission Planning, Briefings, and Guides.

1.5.1. A formal training day will be conducted at the beginning of each deployment rotation. Crews will be trained IAW the 62 OG and 446 OG ODF C-17 Antarctic Training and Certification guide and syllabus. **(T-3)** Support personnel will utilize established continuity guides for operations. **(T-3)** The 62 OG and 446 OG DEEP FREEZE Program office may produce ODF-specific inflight guides or training products to aid members in mission accomplishment. These guides will be approved by the 62 or 446 OG commanders. **(T-3)**

1.5.2. Pre-mission aircrew, weather, and mission commander briefings will be conducted prior to each ODF mission. **(T-3)** Briefings will be conducted IAW current AMC briefing guides and may be augmented with the 304 EAS briefing guides. **(T-3)**

1.5.3. ODF aircrew flight planning, flight management, and weather support will be provided by Naval Information Warfare Center (NIWC) Atlantic located in Charleston, South Carolina. NIWC Atlantic is the designated ODF military weather service provider.

1.6. Aircrew Management. Guidance on crew management is provided in AFMAN 11-2C-17V3, AFMAN 11-202V3_AMC Sup, *Flight Operations*, and the following:

1.6.1. Aircrew Certification. The PIC and primary loadmaster for all missions to Antarctica will be Ice Certified. **(T-3)** Ice certified instructors will be provided for upgrading pilots and loadmasters.

1.6.1.1. During WINFLY and Mid-Winter flights, the PIC and primary loadmaster will be WINFLY Certified. **(T-2)** If Antarctic operations will be conducted during period of darkness, the PIC must also be NVG certified. **(T-3)**

1.6.1.2. Polar Airdrop. Pilots must complete the Ice Airdrop Certification training prior to dropping on or near the South Pole (below 85°S latitude). **(T-3)** This training includes a sortie that conducts an actual or dry pass over one of the South Pole Drop Zones. All South Pole airdrops must be conducted with a visual back up to verify aircraft position and mission computer alignment prior to the release point. **(T-3)**

1.6.2. Crew Complement. An Ice crew normally consists of 4 pilots, 4 loadmasters, and 2 flying crew chiefs. The mission commander may adjust the crew size based on scheduling and mission requirements.

1.6.3. Alerting Procedures. Ice crews are alerted by the mission commander 3+45 hours prior to scheduled takeoff time to allow 1 hour for reporting and 2+45 hours for mission preparation. 304 EAS personnel will use the DEEP FREEZE C-17A Sequence of Events (SOE) (**Attachment 2**) for the Alert sequence. **(T-3)**

1.6.4. Flight Duty Period (FDP). Aircrews should assume all days are augmented unless specifically told otherwise by the mission commander prior to entering pre-mission crew rest. The mission commander may approve flights with basic crews based on mission and scheduling requirements.

1.6.5. Training FDP. Comply with AFMAN 11-202-V3, *Flight Operations* and MAJCOM guidance. ODF training missions normally include an annual NVG and airdrop Off Station Trainer. Any additional crew duty day extensions not listed in **paragraph 1.8.8** must be requested and approved by the appropriate waiver authority. **(T-3)**

1.7. ODF Aircraft Operating Restrictions. Aircraft operating restrictions will be IAW AFMAN 11-2C-17V3, Chapter 4. ODF missions launching to Antarctica will have the following additions:

1.7.1. Christchurch, NZ is considered Column A for missions departing for Antarctica. **Exception:** The mission commander (with PIC concurrence) may allow exceptions based on operational need, but no less than Column B requirements. Aircraft returning to Christchurch, NZ is considered Column B. Departures from Christchurch, NZ to other locations will revert to Column B. **(T-3)**

1.7.2. Ignition channels A and B will be fully operational. **(T-3)** **Exception:** The mission commander (with PIC concurrence) may allow exceptions based on operational need.

1.7.3. All non-mission essential equipment will be removed from the aircraft. **(T-3)** **Exception:** The mission commander (with PIC concurrence) may allow exceptions based on operational need.

1.7.4. The Auxiliary Power Unit (APU) will be operational. **(T-3)** **Exception:** The mission commander (with PIC concurrence) may allow exceptions based on operational need.

1.7.5. Oxygen on board for takeoff must be sufficient to accomplish the planned flight from the PSR to a suitable recovery base, should oxygen be required. **(T-3)** Calculate crew requirements using the 100 percent Oxygen Duration Chart in T.O. 1C-17A-1, *Flight Manual*. Calculate crew and passenger requirements based on flight level 250 from the PSR to the nearest suitable recovery base.

1.7.6. Emergency Passenger Oxygen System (EPOS) is the primary emergency oxygen source for palletized seats. Calculate EPOS oxygen supply at 60 minutes for seated passengers. Passengers in palletized seats will be provided one EPOS for every hour of flight from the PSR to a suitable recovery base. **(T-3)** One EPOS is stowed under each seat. The additional EPOS may be kept in the Survival Equipment Locker and distributed to passengers as required.

1.8. ODF Specific Procedures. The following exceptions are granted for AMC C-17 aircraft supporting Operation DEEP FREEZE missions or training sorties.

1.8.1. Parachutes. To maximize available allowable cabin load (ACL) and fuel load, C-17 missions supporting ODF are authorized to operate without parachutes and associated survival kits on board the aircraft. The additional space generated will be used to store specialized cold weather gear and anti-exposure suits required for the mission. Parachutes will be removed and stored at home station. **(T-3)** Restraint harnesses must be utilized for ODF airdrop operations. **(T-3)**

1.8.2. Life Raft Overflow. C-17 missions supporting ODF are authorized to operate over water utilizing the overload capacity of 69 personnel per life raft versus the standard 46 personnel per life raft restriction on active legs.

1.8.3. Approval for operations on unlit runways. AFMAN 11-202V3, paragraph 3.23 requires MAJCOM/A3 approval to operate on runways that do not have lighting but are equipped with reflective markers. ODF NVG-certified aircrews are authorized to operate on Phoenix Runway utilizing NVGs and High Intensity Retro-Reflective Runway Identification Markers (HIRRRIM) with the restrictions published in **Chapter 4** of this document.

1.8.4. Aircraft Rescue and Firefighting (ARFF) Operations.

1.8.4.1. Aircrew supporting ODF missions to McMurdo Station are advised that NZFX operates at a Reduced Level of Service (RLS) capacity for AF Vehicle Set 4 (e.g., C-17) aircraft IAW AMCI 11-208, *Mobility Air Forces Management* Table 10.3. If ARFF capability falls below the RLS category, missions will require a waiver IAW AMCI 11-208 paragraph 10.4.

1.8.4.2. C-17 aircraft supporting ODF Special Assignment Airlift Missions (SAAMs) via the Australian channel are authorized more than two takeoffs and landings within a seven-day period at RAAF Richmond, Australia (YSRI) with an aircraft rescue and firefighting (ARFF) level less than seven.

1.8.5. Door Bundles. Due to the high mean sea level (MSL) drop altitudes (10,000-12,000 feet) and estimated aircraft weight, minimum aircraft maneuvering speeds for the C-17 are estimated to be between 142-147 knots calibrated airspeed (KCAS) for airdrop configuration. This exception to AFMAN 11-231, *Computed Air Release Point Procedures,* allows door bundle aerial delivery from a C-17 using high altitude personnel configurations with airspeeds up to but not greater than 150 KCAS with bundle weights not to exceed 350 pounds.

1.8.6. Non-Breakaway Static Lines. Airdrop loads dropped at 10,000 feet MSL or above are normally rigged with breakaway static lines. Antarctic Operations at high MSL drop altitudes (10,000-12,000 feet) supporting ODF are authorized to airdrop loads rigged with non-breakaway static lines up to 2,000 feet above ground level (AGL). Loadmasters need to be aware of the human factors involved with oxygen lines and equipment to ensure airdrop equipment does not become entangled. If available, High Pressure Oxygen System (HPOS) should be used.

1.8.7. Approval to Conduct Multiple Approaches with Passengers on Board. WINFLY/NVG missions are authorized to conduct multiple approaches with passengers on board to assess the status of the runway and marker layout or as required to facilitate aircrew training for NVG certification. Any planned low approach will be terminated no lower than 500 feet AGL. **(T-3)**

1.8.8. Extension of Basic FDP for Austral Winter Flights. When a Mid-Winter SAAM is flown from the Australian channel mission, the channel-SAAM transition day (YSRI-YBAS-YSRI-NZCH) may be flown using an 18-hour FDP even though it only meets the leg requirements of a basic FDP.

1.8.9. Approval to use an Out-of-Cycle Worldwide Navigation Database (WWNDB). C-17 aircraft supporting Antarctic Operations are authorized to fly with a special pre-cycle WWNDB provided it includes current (not pre-cycle) New Zealand data. The special WWNDB will be replaced with the normal database prior to the aircraft departing New Zealand for any airfield not in New Zealand or Antarctica. **(T-3)**

1.8.10. Extension of Training FDP and Tactical Event Period. During the South Pole Airdrop Training/Certification all flights will be considered missions, thus a 24-hour augmented FDP is authorized IAW AFMAN11-202V3_AMCSUP guidance. **(T-2)**

1.9. Roles and Responsibilities.

1.9.1. MAJCOMs will provide guidance and approve waivers (as required), where specified throughout this instruction.

1.9.2. Pilot in Command (PIC). The pilot in command PIC is the aircrew member designated by Competent authority, regardless of rank, as being responsible for, and is the final authority for the operation of the aircraft. The PIC will ensure the aircraft is not operated in a careless, reckless, or irresponsible manner that could endanger life or property. **(T-3)** The PIC will ensure compliance with this publication and the following: **(T-3)**

1.9.2.1. HAF, MAJCOM, and Mission Design Series specific guidance.

1.9.2.2. Flight Information Publications and Foreign Clearance Guide.

1.9.2.3. Air Traffic Control clearances.

1.9.2.4. Notices to Airmen.

1.9.2.5. Aircraft Technical Orders.

1.9.2.6. Combatant Commander's instructions and other associated directives.

1.9.3. Aircrew. Individuals designated on the flight authorization are responsible to fulfill specific aeronautical tasks regarding operating USAF aircraft as specified in this AFMAN or by other competent, supplemental authority.

Chapter 2

AIRLAND OPERATIONS

2.1. Mission Commander Launch Decision. The mission commander makes the mission launch decision based on weather, aircraft status, runway status, aerospace ground equipment status, and user requirements. The mission commander will utilize the Airfield, Services, and Aircraft Go/No-Go Decision Matrix (**Attachment 3**) and the Weather Go/No-Go Decision Matrix (**Attachment 4**) to aid in this decision. **(T-3)** At any time during the launch sequence or after the aircraft has launched, the mission commander may cancel, delay, or recall the mission as conditions warrant.

2.2. Christchurch Launch Weather Minimums. Specific minimums have been developed for ODF missions to mitigate risk and prevent unsafe operations in an inhospitable environment.

2.2.1. Minimum weather to launch routine ODF missions from Christchurch, NZ to McMurdo Station are 1,000-foot ceiling and 3 statute miles (SM) visibility for estimated time of arrival (ETA) plus 3 hours at McMurdo Station. If the weather does not support these minimums, the mission will be delayed or cancelled until weather conditions improve. **(T-3)**

2.2.2. If an emergency condition exists requiring weather conditions below those outlined in **paragraph 2.2.1**, ceiling and visibility may be lowered by the mission commander (with PIC concurrence). With an overhead PSR, minimum weather to launch emergency ODF missions is 1,000-foot ceiling and 2 SM visibility at ETA plus 2 hours. If mission requirements require even lower weather minimums, the 304th Expeditionary Airlift Squadron Commander (304 EAS/CC) (or designated mission commander) will determine if and what lower minimums are acceptable after accomplishing a thorough Operational Risk Management (ORM) review and will obtain approval from the appropriate waiver authority. **(T-2)**

2.2.3. The 304 EAS/CC (or designated mission commander) will consider weather trends, recent observations at origin and destination, and forecast temporary weather conditions when making launch decisions. **(T-2)** Primary concern is preventing PSR turn around due to weather as well as ensuring departure weather capability out of McMurdo Station.

2.3. Point of Safe Return Fuel Planning. The PSR is the farthest point along the flight path from Christchurch, NZ to McMurdo Station where the aircraft has enough fuel to turn around and divert to Christchurch, NZ if the weather at McMurdo Station is below minimums. The PSR can be overhead McMurdo Station or up to a maximum of 60 minutes from landing depending on cargo and fuel load. Upon arriving at the PSR, the PIC must decide to either proceed to McMurdo Station or return to Christchurch, NZ. **(T-3)** This decision is based on several factors to include current and forecast weather, aircraft condition, airfield status, and reliable communications.

2.3.1. C-17 missions will be planned utilizing a maximum fuel load with an ACL of 100,000 pounds on all missions. **(T-3)** Depending on mission needs, an ACL greater than 100,000, but less than 120,000 pounds, requires mission commander approval. An ACL greater than 120,000 pounds significantly affects PSR and requires 618 Air Operations Center approval.

2.3.2. The PSR is based on a point determined by the mission computer. The PSR allows the aircraft to return to Christchurch, NZ (or other designated alternate) with minimum required fuel. If in the view of the PIC more fuel is required when returning from PSR, the PSR will be adjusted farther from McMurdo Station. **(T-3)**

2.3.3. Once past PSR, the crew is committed to land at McMurdo Station regardless of conditions because insufficient fuel exists to return to a recovery/alternate airfield.

2.4. Point of Safe Return Weather Minimums.

2.4.1. To proceed beyond the PSR, the PIC must have the following:

2.4.1.1. The forecast McMurdo Station weather at or above 1,000-foot ceiling and 3 SM visibility at ETA plus 1 hour. **(T-3)** **Note:** If the aircraft has a PSR overhead the landing airfield, sufficient fuel to fly a straight-in instrument approach procedure (IAP), execute a missed approach, climb to en route altitude, and return to Christchurch, NZ with holding and divert fuel. **(T-3)** The PIC may elect to continue to McMurdo Station with forecast weather of 600 foot ceiling and 2 SM visibility or circling minimums (whichever is higher) at ETA plus 1 hour.

2.4.1.2. A PSR forecast will be obtained no earlier than 60 minutes prior to PSR. **(T-3)** The PSR forecast provides specific weather conditions expected at ETA. **(T-3)**

2.4.1.3. The PSR forecast will contain sky condition, visibility, weather, (i.e., surface wind (Grid)), runway air temperature, runway dew point, and altimeter setting. **(T-3)** Communication with McMurdo Weather may be direct, relayed through other aircraft, Auckland Center, Airline Operational Control message, or any other means available.

2.4.2. C-17 aircraft will reverse course at PSR if any of the following conditions exists at the McMurdo Station airfields.

2.4.2.1. Observed weather below 1,000-foot ceiling and 3 SM visibility (or 600-foot ceiling and 2 SM visibility if meeting overhead PSR criteria in the note in **paragraph 2.4.1.1**). **(T-3)**

2.4.2.2. Surface winds (including gusts) and/or Runway Condition Reading (RCR) corrected crosswind component exceed operating limits (observed or forecast). **(T-3)**

2.4.2.3. Mooring chart wind limitations are exceeded (observed or forecast). **(T-3)**

2.4.2.4. NIL surface definition. **(T-3)** **Note:** If a POOR surface definition is observed; runway approach lighting system, Precision Approach Path Indicator (PAPI), and navigation aid for the instrument approach must be operational. A circling maneuver should not be attempted. **Exception**: Crews conducting NVG approaches to a runway marked with HIRRRIM may operate with a NIL surface definition.

2.4.2.5. Tactical Air Navigation (TACAN) not in service. **(T-3)** **Note:** If observed weather at McMurdo Station exceeds 5,500-foot ceiling and 5 SM visibility and forecasted to remain so for at least 2 hours after ETA, and if dual Global Positioning System (GPS) with Receiver Autonomous Integrity Monitoring (RAIM) are available and operational, the mission may continue past PSR on the published Area Navigation (RNAV) arrival to a visual approach to the field. If a certified RNAV approach is available (dual GPS with RAIM), aircraft may continue past PSR with weather minimums of 1000-foot ceiling and 3 SM visibility with the TACAN not in service. **(T-3)**

2.4.2.6. Negative communications, direct or relay, with McMurdo Center. **(T-3)**

2.4.2.7. More than one inch depth of loose snow reported on the primary runway. **(T-3)** **Note:** The Phoenix "White Ice" Runway is constructed by compacting snow to the

approximate consistency of concrete. This loose snow layer does not restrict aircraft operations to the runway. Do not input a Runway Surface Condition into the mission computer. Use the reported RCR only.

2.4.2.8. Two sources of air for engine start are not available (APU and air cart) unless an engine running offload/onload (ERO) is planned. **(T-3)**

2.5. McMurdo Station Arrivals and Instrument Approach Procedures. McMurdo Station airfields are certified for Instrument Meteorological Condition (IMC) operations; however, they lack normal instrument runway markings and lighting. Aircrews flying into these airfields must have at least one current Ice certified pilot at a set of controls to operate safely in this environment. **(T-3)**

2.5.1. The Federal Aviation Administration (FAA) produces and flight-checks instrument arrival and approach procedures each season. ODF aircrews are responsible for reviewing FAA updates. **(T-3)**

2.5.2. Due to operational necessity, C-17 aircrews may need to perform flyability checks on new IAPs at the beginning of the ODF season, prior to the arrival of FAA flight check personnel. These flight checks will be conducted in Visual Meteorological Conditions (VMC). **(T-3)** See AFMAN 11-230, *Instrument Procedures* for additional guidance. An AF Form 3992, *Instrument Procedure Flyability Check Instrument Approach Procedure (IAP)*, will be submitted to the 13th Air Expeditionary Group Commander (13 AEG/CC) for validation and approval. **(T-3)**

2.5.3. The Transponder Landing System (TLS) at Phoenix Airfield is authorized for use by trained aircrew only. Ice certification training for pilots includes required TLS training.

2.6. Ground Operations. C-17 aircrew will be trained and certified on all non-standard ground equipment at McMurdo Station and cargo loading operations. **(T-3)** The unit will issue Extreme Cold Weather (ECW) gear which aircrew must wear. **(T-3)** For additional requirements, see JTF-SFA and 304 EAS/CC guidance.

2.7. McMurdo Area Airfield Departure Weather Minimums. There are no departure alternates meeting AFMAN 11-2C-17V3 requirements for C-17 aircraft at McMurdo Station. Aircrew must plan to use the McMurdo Station departure airfield as the only emergency return option. **(T-3)** Aircrew will plan to depart McMurdo Station airfields with weather minima of 1,000-foot ceiling and 3 SM visibility to the maximum extent possible. **(T-3)**

2.7.1. Aircrew will thoroughly analyze current and trend weather data when departure weather is observed or forecasted to be below 1,000-foot ceiling and 3 SM visibility. **(T-3)** If departure weather below 1,000-foot ceiling and 3 SM visibility is caused by a temporary event, the crew should delay until conditions improve before departing.

2.7.2. If, after thorough analysis of weather conditions, the PIC determines that waiting to obtain 1,000-foot ceiling and 3 SM visibility for departure is impractical, a departure is authorized with weather minimums of 600-foot ceiling and 2 SM visibility or circling minimums, whichever is higher.

2.7.3. If circling minimums or 600-foot ceiling (whichever is higher) and 2 SM visibility for departure is not attainable and the crew does not have enough FDP remaining to wait for improved weather conditions, the PIC will contact the mission commander to determine lowest

weather departure minimums for safe operations. **(T-3)** The mission commander may approve departure minimums no lower than the lowest compatible approach minimums. The approval is considered situationally dependent based on a mission commander thorough ORM review to include, as a minimum: aircrew experience, actual weather conditions and weather trends, crew duty day, and assessment of risk associated with departing McMurdo Station under IMC versus keeping a C-17 on the surface for an extended period.

Chapter 3

AIRDROP OPERATIONS

3.1. General. This chapter outlines specific procedures unique to performing airdrop operations on the Antarctic continent and the surrounding waters. Airdrop is the only means of reaching the South Pole Station or other parts of the Antarctic interior during the Austral Winter period. The PIC must be an Ice instructor and Ice airdrop certified when performing airdrops at or near the South Pole. **(T-3)** Pilots performing airdrops in other areas of the continent, or in the surrounding waters, must meet ODF crew complement and C-17 Airdrop qualification. **(T-3)**

3.2. Christchurch Airdrop Launch Weather Minima. All weather minima listed in **Chapter 2** for airland operations apply to ODF airdrop missions. However, the mission commander will also consider the following when making the Go/No-Go decision:

3.2.1. Due to the distance between Christchurch, NZ and the South Pole, McMurdo Station must be utilized for refueling prior to conducting the airdrop unless an air refueling is planned. **(T-3)** The mission commander will ensure weather at McMurdo Station is suitable to allow the refueling stop and departure, as well as providing emergency divert capability before and after the drop. **(T-3)**

3.2.2. McMurdo Station weather must be 1,000-foot ceiling and 3 SM visibility for ETA plus 4 hours for fuel stop return time. **(T-3)**

3.2.3. Drop Zone weather must be 1,500-foot ceiling and 3 SM visibility for ETA plus 1 hour. **(T-3)**

3.2.4. Weather at McMurdo Station must be 1,000-foot ceiling and 3 SM visibility during the time frame when an emergency divert to McMurdo Station from the drop zone might be needed. **(T-3)**

3.3. Mission Computer Anomalies. Due to the rapid convergence of lines of longitude near the South Pole, the aircraft mission computer may give a false representation of aircraft location in relation to the ground position. Additionally, there may be divergence between the pilot and copilot's multifunction displays (MFDs) in relation to the run in course.

3.4. Drop Zone Surveys and Markings. The JTF-SFA is responsible for providing drop zone surveys, if available. If a survey is not available, drop zone coordinates and terrain data for the surrounding area is be provided. A communications plan and drop zone markings will be relayed to the mission commander and provided to the crew prior to mission execution. **(T-3)** The mission commander will ensure a safety of flight review is conducted for the drop zone. **(T-3)** See DAFMAN 13-217, *Drop Zone, Landing Zone, and Helicopter Landing Zone Operations* for guidance.

3.5. Airdrop Configurations. The nature of the airdrop varies based on customer requirements. Configurations for airdrop cargo may include Heavy Equipment, Container Delivery System, or Door Bundles. In most emergency situations, only a small amount of cargo is required to be airdropped as a Door Bundle. Depending on conditions, it may be necessary to fly Door Bundle airdrops above AFMAN 11-231 speeds. Refer to **paragraph 1.8.5** of this document for a description of the approved Door Bundle airdrop airspeed exception.

3.6. Emergency Airdrop Operations. If an emergency condition exists requiring airdrop operations in the JOA with weather conditions below those outlined in **paragraph 3.2.3**, ceiling and visibility may be lowered and the wind component may be increased IAW AFMAN 11-2C-17V3 and DAFMAN 13-217. The 304 EAS/CC or designated mission commander will determine if lower minimums or increased wind component are acceptable after accomplishing an applicable ORM review and obtaining approval from the appropriate waiver authority. **(T-2)**

Chapter 4

NIGHT VISION GOGGLE (NVG) OPERATIONS

4.1. General. This chapter provides guidance for C-17 NVG operations on the Phoenix runway in support of the NSF mission on the Antarctic continent during periods of darkness. The utilization of NVGs provides year-round capability to McMurdo Station offering a valuable means to evacuate personnel or deliver emergency supplies during the Austral Winter.

4.1.1. Runway markings. Due to the lack of runway edge lighting and the minimal contrast between the runway edge and the surrounding ice, HIRRRIM are utilized to aid in runway identification. These markers reflect the light from the aircraft's landing lights to aid in runway edge identification. The aircraft must be aligned within 8° of centerline to ensure reflectivity. **(T-3)** Other suitable markings, pre-coordinated and approved by the Mission Commander (MC), are acceptable. Overt LED runway markings at the field negate the requirement for NVGs and HIRRRIM cones in order to land in periods of darkness with a NIL surface condition.

4.1.2. The mission commander will coordinate with Phoenix Airfield Manager to ensure that HIRRRIM are installed properly and brief the aircrew on the marker configuration. **(T-3)**

4.2. Mission Planning. The mission commander will notify aircrews if NVG operations are required. **(T-3)** Aircrews will deploy with an appropriate number of NVGs, to include spares, as determined by the mission commander. **(T-3)** Aircrew Flight Equipment personnel will deploy with necessary maintenance equipment, Hoffman testers, and an eye lane. **(T-3)**

4.3. Christchurch NVG Launch Weather Minima. Minimum weather to launch ODF NVG missions from Christchurch, NZ to McMurdo Station are 1,500-foot ceiling and 3 SM visibility for estimated time of arrival (ETA) plus 4 hours at McMurdo Station. The mission commander will also consider airfield instrument approach procedure availability, airfield lighting, and crosswind component for the launch determination. **(T-3)**

4.4. NVG Operating Restrictions.

4.4.1. Pilots performing a takeoff or landing at McMurdo Station on NVGs must be current and qualified as an Ice NVG pilot or be under the direct supervision of an Ice NVG Instructor Pilot. **(T-3)**

4.4.2. NVG flight training will be conducted IAW the 62/446 OG ODF C-17 Antarctic Training and Certification guide and syllabus and AFMAN 11-2C-17V3. **(T-3)**

4.4.3. All airland PSR weather and minima guidance from **Chapter 2** of this document apply to NVG operations. In addition to minimum requirements of 1,500-foot ceiling and 3 SM visibility for ETA plus 1 hour, the airfield must have a fully functioning straight in IAP, and runway end identifier lights or similar lead-in lighting. **(T-3)**

4.4.4. Maximum crosswind component limitation for landing is 15 knots.

4.4.5. Due to the inherent degradation of NVG effectiveness in areas of precipitation, continuation past PSR is not permitted if observed or forecasted weather includes continuous or heavy snow showers. **(T-3)** Operations are permitted during periods of light snow (-SN).

4.5. Emergency NVG Operations. If an emergency condition exists requiring NVG operations at McMurdo Station with weather conditions below those outlined in **paragraph 4.3**, ceiling and visibility may be lowered, and the crosswind component may be increased IAW AFMAN 11-2C-17V3. The 304 EAS/CC (or designated mission commander) will determine if lower minimums and/or increased crosswind component are acceptable after accomplishing a thorough ORM review and obtain approval from the appropriate waiver authority. **(T-2)**

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Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

TO 1C-17A-1, *Flight Manual,* 1 May 2023

AFPD 11-2, *Aircrew Operations,* 31 Jan 2019

AFMAN 11-202V3, *Flight Operations,* 10 January 2022

AFI 11-202V3_AMC Sup, *Flight Operations,* 14 June 2021

AMCI 11-208, *Mobility Air Forces Management*, 08 February 2017

AFMAN 11-230, *Instrument Procedures,* 24 July 2019

AFMAN 11-231, *Computed Air Release Point Procedures,* 18 November 2020

AFMAN 11-2C-17V1, *C-17 Aircrew Training,* 12 February 2020

AFMAN 11-2C-17V3, *C-17 Operations Procedures,* 30 July 2019

DAFMAN 13-217, *Drop Zone, Landing Zone, and Helicopter Landing Zone Operations,* 22 April 2021

AFMAN 33-322, *Records Management and Information Governance Program*, 23 March 2020

DAFMAN 90-161, *Publishing Processes and Procedures,* 18 October 2023

JTF-SFA Operations Order, Operation DEEP FREEZE (revised and reissued annually)

AMC ODF EXORD (revised and reissued annually)

Adopted Forms

DAF Form 847, *Recommendation for Change of Publication*

AF Form 3992, *Instrument Procedure Flyability Check Instrument Approach Procedure*

Abbreviations and Acronyms

ACL—Allowable Cabin Load

AEG—Air Expeditionary Group

AFE—Aircrew Flight Equipment

AFPD—Air Force Policy Directives

AGL—Above Ground Level

AMC—Air Mobility Command

APT—Airport Passenger Terminal

APU—Auxiliary Power Unit

ARFF—Aircraft Rescue and Firefighting

CFP—Computer Flight Plan

COMSEC—Communications Security

DAF—Department of the Air Force

DoD—Department of Defense

EAS—Expeditionary Airlift Squadron

ECW—Extreme Cold Weather

EPOS—Emergency Passenger Oxygen System

ERO—Engine Running Onload/Offload

ETA—Estimated Time of Arrival

EXORD—Executive Order

FAA—Federal Aviation Administration

FDP—Flight Duty Period

GDSS—Global Decision Support System

GPS—Global Positioning System

GTIMS—Graduate Training Integration Management System

HF—High Frequency

HIRRRIM—High Intensity Retro-Reflective Runway Identification Marker

HPOS—High Pressure Oxygen System

IAP—Instrument Approach Procedure

IAW—In Accordance With

IMC—Instrument Meteorological Condition

JOA—Joint Operations Area

JTF-SFA—Joint Task Force Support Forces Antarctica

KCAS—Knots Calibrated Airspeed

MAJCOM—Major Command

MC—Mission Commander

MEP—Mission Essential Personnel

MFD—Multifunction Display

MSL—Mean Sea Level

NAVAID—Navigational Aid

NIL—name, image, and likeness

NIWC—Naval Information Warfare Center

NSF—National Science Foundation

NVG—Night Vision Goggle

ODF—Operation DEEP FREEZE

OG—Operations Group

OPCON—Operational Control

OPP—Office of Polar Program

OPR—Office of Primary Responsibility

ORM—Operational Risk Management

PAPI—Precision Approach Path Indicator

PIC—Pilot in Command

PSR—Point of Safe Return

RAIM—Receiver Autonomous Integrity Monitoring

RCR—Runway Condition Reading

RLS—Required Level of Service

RNAV—Area Navigation

SAAM—Special Assignment Airlift Mission

SATCOM—Satellite Communication

SM—Statute Miles

TACAN—Tactical Air Navigation

TACON—Tactical Control

TLS—Transponder Landing System

USAP—United States Antarctic Program

USTRANSCOM—United States Transportation Command

VHF—Very High Frequency

VMC—Visual Meteorological Condition

WINFLY—Winter Flying

WWNDB—Worldwide Navigation Database

Office Symbols

AMC/A3V—Air Mobility Command Aircrew Standardization and Evaluation Division

AF/A3T—Air Force Aircrew Tactics and Training Division

AMC/A3/10—Directorate of Operations, Strategic Deterrence, and Nuclear Integration

304 EAS/CC—304th Expeditionary Airlift Squadron Commander

13 AEG/CC—13th Air Expeditionary Group Commander

Terms

JTF-SFA JOA—JTF-SFA primary area of operations is below 60°S latitude and within the country of New Zealand.

Mission Commander—An Ice Certified field grade officer responsible for executing C-17 ODF missions. Duties are normally performed by the 304th EAS/CC but may be delegated as required.

Operational Control (OPCON)—The command authority to perform those functions of command over subordinate forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission.

Tactical Control (TACON)—The command authority over assigned or attached forces or commands, or military capability or forces made available for tasking, that is limited to the detailed direction and control of movements or maneuvers necessary to accomplish missions or tasks assigned within the area of operations.

Attachment 2

ODF C-17A SEQUENCE OF EVENTS

Table A2.1. ODF C-17A Sequence of Events.

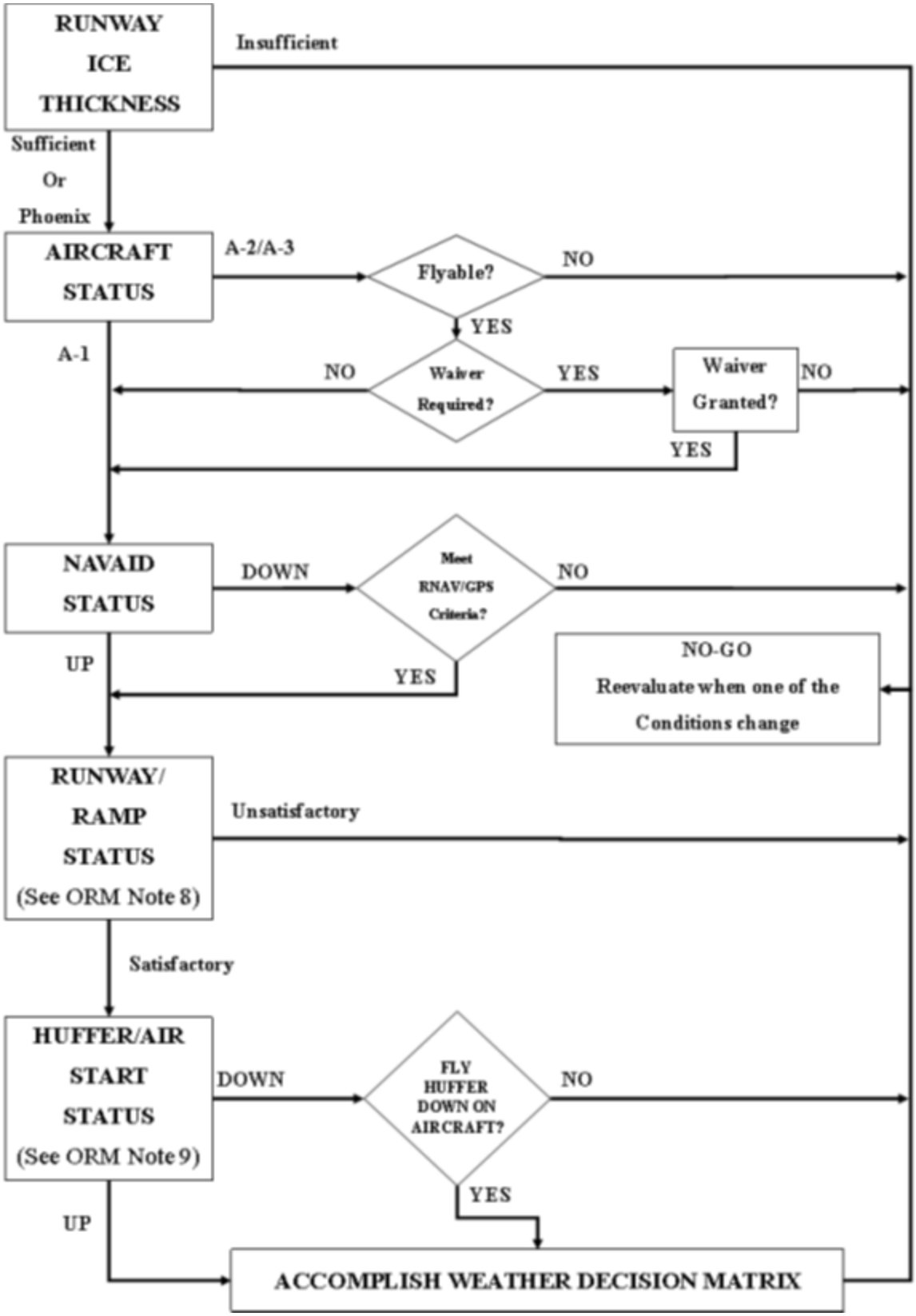
ACTIVITY	TIME TO TAKEOFF
Enter Crew Rest	16+00
Weather Call to MC for Go/No-Go	4+40
Weather Decision / APT Notified /ORM Complete	4+30
Crew Alert	3+45
Maintenance at Aircraft	3+00
Aircrew Show	2+45
Load Team and AFE at Workstations	2+45
Pilot Weather Briefing Ready / Airfield Brief Ready	2+30
Cold Weather Gear Available for Crew	2+30
Pilots Show at Base Ops / Initial Weather / CFPs	2+30
Loadmasters Check Load and Load Plan at Cargo Yard	2+30
MEP Show for Crew Briefing	2+15
Crew Briefing	2+15
Maintenance Begins Refuel	2+00
Pilots Complete Weather Briefing/Flight Planning	2+00
Loadmasters/Copilots at Aircraft	2+00
Final Fuel to Maintenance	2+00
PIC at Aircraft	1+30
Refueling Complete	1+00
Cargo Loading Complete	1+00
Start Passenger Loading	1+00
Passenger Onload Complete	0+45
Aircrew at Stations	0+40
Engine Start	0+30
Block out from Parking	0+15
Takeoff from Christchurch New Zealand	0+00

Note: SOE may be modified at the direction of the 304 EAS/CC (or designated mission commander) based on operational necessity.

Attachment 3

AIRFIELD, SERVICES, AND AIRCRAFT GO/NO-GO DECISION MATRIX

Figure A3.1. Airfield, Service, and Aircraft Go/No-Go Decision Matrix.



Note: Reference ORM for decision matrix.

Attachment 4

MISSION COMMANDER WEATHER GO/NO-GO DECISION MATRIX

Figure A4.1. Mission Commander Weather Go/No-Go Decision Matrix.