HEADQUARTERS, JOINT TASK FORCE
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ANNEX H TO JTF-SFA OPORD DEEP FREEZE
METEOROLOGICAL AND OCEANOGRAPHIC (METOC) OPERATIONS
OPR: JTF-SFA/J3

REFERENCES:
(a) Joint Pub 3-59, Joint Doctrine, Tactics and Procedures for METOC Operations, Mar 99
(b) AFI 15-128, Aerospace Weather Operations – Roles and Responsibilities, 26 July 04
(c) PACAFI 15-101, PACAF Weather Operations, Feb 04
(d) HQ AMC/DOW Memo dtd 4 Mar 03
(e) USAFETAC DS 90/038, 90
(f) International Station Meteorological Climate Summary
(g) NAVMETOCCOMINST 3140.1L, Sep 00

1. Situation.

a. Purpose. This Meteorological and Oceanographic (METOC) annex provides planning guidance to USPACOM component commands and outlines interagency responsibilities between the DoD and the National Science Foundation (NSF) in support of Operation DEEP FREEZE (ODF). ODF requires coordinated and joint METOC support operations due to the extreme environmental conditions in Antarctica as well as the diverse organization and forces involved.

b. Friendly.

1) SPAWAR Systems Center (SPAWARSYSCEN), Charleston is designated as the lead METOC forecast unit for weather support to ODF through a MOA with the NSF. Reference (d) designates SPAWAR Office of Polar Programs (SOPP) as a military weather service provider at Christchurch, NZ and McMurdo Station, Antarctica. SOPP will provide weather support to ODF airlift missions between Christchurch and Antarctica, and within Antarctica. In addition to forecast support, SOPP provides aviation weather observations for McMurdo Station airfields. The NSF Prime Contractor provides aviation weather observations at South Pole Station and all Deep Field Camps. SPAWARSYSCEN, Charleston also provides weather services to USCG, MSC, and USAP sponsored vessels operating south of 60 degrees South latitude, between 120 degrees West to 150 degrees East longitude. SPAWARSYSCEN, Charleston will coordinate weather support issues and provide functional oversight for weather service in support of Antarctic continental and intercontinental airlift missions, and ship support when vessels are operating within the DEEP FREEZE designated area of responsibility.

2) The 15th Operational Weather Squadron/Global Mobility Weather Flight (15 OWS/WXM) is the lead weather unit (LWU) for Operation DEEP FREEZE missions deploying to or redeploying from the AOR, will monitor weather conditions impacting ODF missions and provide en route weather updates for those missions as required. As LWU, 15 OWS/WXM will coordinate with the appropriate OWS to provide aerial refueling track forecasts or other data as required.

3) Combat Weather Teams (CWTs) will update takeoff data as required to 15 OWS/WXM Mission Execution Forecasts (MEFs) for ODF missions originating from their home station. If departing or transiting a location without a collocated CWT or transiting elsewhere, 15 OWS/WXM or the appropriate OWS for the region will provide the MEF updates under the reengineered weather operations concept.

4) Commander, Naval Meteorology and Oceanography Command will provide Optimum Track Ship Routing (OTSR) support through the Naval Pacific Meteorology and Oceanography Center (NPMOC Pearl Harbor) and satellite iceberg reconnaissance support through the Naval Ice Center (NAVICE).

5) Air Force Weather Agency (AFWA) and Fleet Numerical Meteorology and Oceanography Center (FNMOC) will provide operational numerical modeling support for Antarctica. Space Weather products for Antarctica will be provided by AFWA. Each agency will coordinate with SPAWARSYSCEN for product improvement and quality control. AFWA will disseminate their products through the Joint Army/Air Force Weather Information Network (JAAWIN) and FNMOC through METCAST. AFWA will also provide climatological support and products to any agency supporting ODF through the Air Force Combat Climatology Center (AFCCC) as requested.

c. Assumptions.

1) See Basic Order.

2) Friendly countries under World Meteorological Organization agreements will continue to make environmental data of all types available.

3) Environmental satellite products will continue to be available, however due to the high latitude of Antarctica, only polar orbiting satellites are available for operational purposes on continent, and are limited to the times and areas covered by each satellite pass. Thus the temporal availability of usable satellite imagery is reduced compared to lower latitudes (geostationary satellites) and gaps in coverage exist throughout the day.

4) Allied nations (New Zealand) indigenous weather facilities and services are available.

5) The university/research community participating in the USAP will provide additional observation, modeling, satellite, or other appropriate METOC data applicable to ODF operations within their present capabilities.

6) Initial METOC Command Structure. AFWA and NAVMETOCCOM provide routine and special products in support of operational commanders. USAF theater weather support is under the operational control of Commander, U.S. Pacific Air Forces (PACAF). USN regional METOC centers, facilities, and detachments provide operational support to Commander, U.S. Pacific Fleet (COMPACFLT).

d. Planning Factors.

1) Initial METOC Command Structure. AFWA and NAVMETOCCOM provide routine and special products in support of operational commanders. USAF theater weather support is under the operational control of Commander, U.S. Pacific Air Forces (PACAF). USN regional METOC centers, facilities, and detachments provide operational support to Commander, U.S. Pacific Fleet (COMPACFLT).

2) Reference A governs joint METOC operations required in the execution of this OPORD for Meteorological and Oceanographic Operations (23 March 1999).

2. Mission. ODF is the DoD mission to provide air and sealift of personnel and supplies required for the USAP. As with any air and sealift operation, METOC conditions create significant challenges for the mission and this is especially true in the extreme environment of Antarctica. High quality weather products, including Terminal Aerodrome Forecasts (TAFs), MEFs, weather warnings, sea/ice data and a host of other products and services are required for successful mission accomplishment of ODF.

3. Execution.

a. Concept of Operations.

1) Phase I. CWTs collocated with supporting airlift and tanker units or other appropriate OWSs will provide MEFs for missions deploying to Christchurch unless already provided by 15 OWS/WXM. Aircrews may supplement MEFs with updates provided by en route base weather personnel. SPAWARSYSCEN personnel at Christchurch and McMurdo will provide weather support to missions to/from Antarctica.

2) Phase II. Weather support will be provided by elements of SPAWARSYSCEN at Charleston, Christchurch, and McMurdo for all aircraft operating between Christchurch and McMurdo Station. The McMurdo weather facility will provide all required weather support for northbound flights to Christchurch. The Christchurch weather facility will provide all support to southbound flights from Christchurch to Antarctica. Weather support will be provided by the SPAWARSYSCEN facility at McMurdo for all aircraft operating within Antarctica.

3) Phase III. NPMOC Pearl Harbor will provide OTSR services to USCG and MSC vessels participating in ODF when requested. SPAWARSYSCEN will provide enroute weather services (WEAX) to USCG and MSC vessels operating south of 60 degrees south latitude, between 120 degrees west to 150 degrees east longitude.

4) Phase IV. SPAWARSYSCEN, Charleston facility at McMurdo will provide all weather support for airlift operating between McMurdo and Christchurch and for redeploying LC-130 operations between outlying field camps, South Pole Station, McMurdo and Christchurch. SPAWARSYSCEN, Charleston will provide forecast services for up to one week in Christchurch after season closure. 15 OWS/WXM will provide en route weather information for all aircraft redeploying from Christchurch back to CONUS. As a last resort, the New Zealand Meteorological Service at Christchurch International Airport is also available to provide required weather briefings.

b. Tasks and Responsibilities.

1) COMPACAF: 17th Operational Weather Squadron (17 OWS).

(a) Provide MEFs and aerial refueling track forecasts to aircraft supporting ODF transiting their AOR upon request.

(b) Monitor weather conditions for CJTF-SFA in coordination with JTF-SFA/J35W maintaining situational awareness of mission impacting weather for all ODF operations.

2) CJTF-SFA.

(a) JTF-SFA/J3W will coordinate weather support issues and provide functional oversight for weather service supporting airlift missions.

(b) JTF-SFA/JAOC/J35W will monitor weather conditions for JTF-SFA/JAOC maintaining situational awareness of mission impacting weather for all ODF operations.

3) COMPACFLT. Oversee weather support issues and provide functional oversight for weather service supporting maritime vessel movement. Coordinate with Commander, Naval Meteorology and Oceanography Command to provide OTSR and satellite iceberg reconnaissance support through the Naval Pacific Meteorology and Oceanography Center and NAVICE.

c. Coordinating Instructions.

1) The USPACOM Senior METOC Officer (J3319) will coordinate all cross agency weather support for ODF operations.

2) Weather forecast/warning products provided by SPAWARSYSCEN at McMurdo and Christchurch will be considered the official forecast (MEF) for all airlift missions operating between Christchurch and Antarctica and within Antarctica. Deviation from these products is not authorized without prior coordination except when safety of flight is jeopardized.

4. Administration and Logistics. See Basic Order.

5. Command and Control Communications. See Basic Order.

Appendixes:
1. Terminal Climatology
2. Climatological Wind Factors

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APPENDIX 1 TO ANNEX H TO JTF-SFA OPORD DEEP FREEZE
TERMINAL CLIMATOLOGY OPR: SPAWARSYSCEN

PAGO PAGO, AMERICAN SAMOA

	SEP	OCT	NOV	DEC	JAN	FEB	MAR
Extreme Maximum Temp (F)	89	92	92	92	94	92	92
Average Maximum Temp (F)	85	85	85	86	87	87	87
Average Minimum Temp (F)	75	75	76	75	75	75	76
Extreme Minimum Temp (F)	63	67	67	67	67	67	67
Measurable Precipitation (# days)	19	22	21	23	25	22	25
Thunderstorms (# days)	1	4	3	4	5	3	3
Prevailing Wind Direction/Speed	E12	ESE 12	ESE 11	E 11	E 10	E 10	E 10
Extreme Wind Speed	43	45	51	60	63	93	50
Ceiling/Visibility, percent of time equal to or greater than:							
1500'/3 mi	94	95	95	96	99	94	99
1000'/2 mi	99	99	99	99	99	98	99
200'/ ½ mi	100	100	100	100	100	100	100
99.95% Highest Pressure Altitude (ft)	1100	1100	1200	900	1000	900	900

MCMURDO STATION

	SEP	OCT	NOV	DEC	JAN	FEB	MAR
Extreme Maximum Temp (F)	24	33	37	49	47	39	28
Average Maximum Temp (F)	-5	4	20	30	31	21	6
Average Minimum Temp (F)	-20	-9	9	21	22	11	-4
Extreme Minimum Temp (F)	-47	-40	-19	2	4	-13	-46
Measurable Precipitation (# days)	6	5	4	4	3	6	5
Thunderstorms (# days)	0	0	0	0	0	0	0
Prevailing Wind Direction/Speed	E14	E13	E11	E11	E12	E13	E15
Extreme Wind Speed	92	85	77	67	54	65	70
Ceiling/Visibility, percent of time equal to or greater than:							
1500'/3 mi	81	87	96	94	95	94	84
1000'/2 mi	84	90	97	96	97	96	88
200'/ ½ mi	91	96	99	99	99	99	95
99.95% Highest Pressure Altitude (ft)	1950	1800	1550	1400	1300	1350	1550

APPENDIX 2 TO ANNEX H TO JTF-SFA OPORD DEEP FREEZE
CLIMATOLOGICAL WIND FACTORS OPR: SPAWARSYSCEN

1. This Appendix contains climatological wind factors and temperatures at 35,000 feet along the route from Pt Mugu NAWS CA (KNTD) to McMurdo Station (NZCM) via Hickam AFB HI (PHNL), Pago Pago, American Samoa (NSTU), and Christchurch NZ (NZCH). Wind factors designated "90% Worst" indicate a wind factor less favorable can be expected 10 percent of the time and more favorable 90 percent of the time. Similarly, "90% Warm" indicates a warmer temperature would occur only 10 percent of the time.

2. Wind factors:

	SEP	OCT	NOV	DEC	JAN	FEB	MAR
KNTD-PHNL Mean	-21	-24	-32	-37	-40	-39	-40
90% Worst	-40	-43	-53	-61	-64	-63	-62
Mean Temp	-46	-45	-46	-44	-44	-45	-46
90% Warm	-43	-45	-46	-44	-44	-45	-46
PHNL-NSTU Mean	-5	-4	-4	-4	-3	-4	-6
90% Worst	-15	-17	-19	-20	-21	-21	-24
Mean Temp	-44	-44	-44	-44	-45	-45	-45
90% Warm	-43	-43	-43	-42	-42	-42	-42
NSTU-NZCH Mean	-26	-24	-22	-20	-17	-14	-18
90% Worst	-48	-46	-44	-40	-37	-34	-41
Mean Temp	-48	-46	-47	-46	-46	-46	-46
90% Warm	-42	-43	-43	-42	-42	-42	-42
NZCH-NZCM Mean	-5	-5	-4	-2	-1	-2	-1
90% Worst	-27	-28	-26	-23	-24	-24	-20
Mean Temp	-58	-56	-52	-49	-47	-48	-49
90% Warm	-52	-50	-47	-43	-41	-42	-43
NZCM-NZCH Mean	0	+1	+1	-2	-1	-2	-3
90% Worst	-22	-22	-21	-24	-24	-24	-24
NZCH-NSTU Mean	+12	+12	+11	+10	+8	+7	+10
90% Worst	+8	-7	-7	-7	-4	-7	-6
NSTU-PHNL Mean	+2	-3	+2	+3	0	-3	-1
90% Worst	-5	-10	0	-14	-5	-11	-5
PHNL-KNTD Mean	+21	+24	+32	+37	+39	+37	+39
90% Worst	+3	+5	+15	+13	+15	+13	+18