

HEADQUARTERS,
HEADQUARTERS AND SERVICE BATTALION,
SECOND COMBAT SERVICE GROUP, (MEDIUM),
SERVICE COMMAND, FMF,
CAMP LEJEUNE, NORTH CAROLINA.

13 October, 1948.

MEMORANDUM FOR: The Commanding Officer, Second Combat Service Group, (Medium).

Reference: (a) 2dCombServGru(Med), (S-3) Memo dtd 2Jul48.

Enclosure: (A) Answers to questions listed in reference (a).

1. In compliance with reference (a), the information set forth in enclosure (A) is an attempt made by the undersigned to ascertain logical answers to questions listed in the reference. These answers are opinions only as no comprehensive experiments were made by Task Force 80.

2. All answers given in enclosure (A) are for average Arctic summer conditions only unless otherwise specified. No attempt to answer the questions from the viewpoint of what effect Arctic winter conditions would have on the various types of equipment, supplies, and materiel listed as it would only be my opinion or the opinion of others, whereas, I was informed by General Louis R. JONES that the Marine Corps Equipment Board, Quantico, Virginia, has available on file Army Reports and reports of Marine Corps experiments to answer most of the questions relative to sub-zero temperatures.

3. Very little information was gained from interviews with personnel at the weather stations visited either because of their lack of knowledge of the items concerned or because they didn't have the equipment or materiel on hand.

4. Considering the fact that we operated north of 75 degrees latitude most of the time, it was very surprising that the lowest temperature encountered was a plus 22 degrees Fahrenheit. The Marine Corps winter clothing (except gloves) and equipment as issued was most adequate for all temperatures encountered. It would be next to impossible, however, to use the sleeping bag without some type of air mattress, cot, or rough lumber underneath as most of the land is covered by large rock or muskeg. Vegetation is almost non-existent, therefore, no means of padding could be derived from that source.

5. As stated in the Marine Observers consolidated report a unit going into the area we visited would have to be totally independent of the locale with the exception of water. Fresh water can be found in most areas during the summer although it was reported that the water in many of these lakes was contaminated.

6. It is the opinion of the undersigned that the greatest task facing any sized unit going into the Arctic area even during the Arctic summer condition, is the problem of logistics. It is felt that the expense and time involved would not warrant sending a unit into this area for tactical maneuvers of a short duration, however, much experience could be gained logistically speaking during an encampment or maneuver lasting for a period of six to eight weeks.

7. The normal method of winterizing vehicles and equipment in the Camp Lejeune area, would be ample for arctic summer conditions in any of the Canadian Northwest Territory.

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Captain, U. S. Marine Corps.

Questions and Answers are based on SUMMER ARCTIC CONDITIONS
unless otherwise noted.

ORDNANCE

1. Q. What type of weapons can be employed in the area?
*A. All types of weapons organic to a Marine Division could be employed in most areas.
2. Q. What are the limitations offered by climate and terrain to coast artillery, field artillery and antiaircraft artillery?
*A. No limiting factor noted except that fog would limit observation.
3. Q. What type of recoil oil is satisfactory for heavy artillery pieces?
#A. No observation made.
4. Q. Are tanks practical in the area?
A. Tanks could be employed in limited areas. It would be preferable to use light tanks with track extensions.
5. Q. Does metal rust in the area?
A. Yes, this observation was actually noted.
6. Q. What types of ammunition storage magazines or dumps are most practical?
A. Due to the perma-frost, the above ground storage would be most practical.
7. Q. What is the action of the recoil mechanism of artillery pieces at low temperatures?
*A. No observation made.
8. Q. Which lubricants give the best results at the lower temperatures?
#A. No observation made.
9. Q. Do two adjacent metal surfaces free of paint (breech blocks, trail locks, hinge pins, trunnions, bearings) freeze together without the presence of moisture at low temperatures?
#A. No observation made.
10. Q. Is precision cutting of metal affected by the lower temperatures?
*A. No observation made.
11. Q. Is there any difference of RPM's for machines such as lathes?
*A. No observation made.
12. Q. What can be done to improve the traction of tanks on icy inclines? Can tracks such as those on LVT's be used?
*A. No observation made.
13. Q. How are ordnance optical instruments affected by extreme cold? Do lenses or mirrors become distorted or cracked?
#A. No observation made.
14. Q. Is the heating system of ordnance trucks and trailers adequate?
A. Ordinary heaters are adequate.
15. Q. Can LVT's be used to set up mobile machine shops or parts carriers?
A. They could be used in most areas, if not too heavily loaded.
16. Q. What sort of clothing, particularly gloves, is there available light enough to do small arms and instrument work, but warm enough at low temperatures?
A. None, it is best to have shelter to work in.
17. Q. What is the effect of cold weather on the operation of autoweapons? Are they sluggish? Is the spring action adequate?
#A. No observation made.

SUMMER ARCTIC CONDITIONS (Cont'd).

ENGINEER

1. Q. What types of electric generators are most practical in the area; i.e. gasoline, diesel, etc?
*A. Both diesel and gas types of electric generators used. Diesels seemed more predominate.
2. Q. Are any difficulties peculiar to the area encountered in the operation of diesel or gasoline motors?
*A. Preheat units needed. No other difficulties noticed.
3. Q. What type of camp is most feasible? How are the buildings heated?
A. The Weather Bureau uses timber structures Pre-fab houses for the weather station buildings. Insulated tents could be used for summer operations. Oil stoves are used for heating, and are adequate.
4. Q. What is the reaction in the compressor and evaporator? What steps are taken to prevent increased condensation in engine and fuel system after operation?
A. No observation made.
5. Q. What is the best lubricant? Fixed oils, compounded, blended or mineral?
#A. Ordinary lubricants adequate for use during summer.
6. Q. What effect does sub zero weather have on wire rope?
*A. No observation made.
7. Q. Is a special type carbon brush needed? Which would be most efficient A.C. or D.C.?
*A. No observation made.
8. Q. What protection is used for pumps and equipment on water supply units?
A. None. Water supply from streams and lakes.
9. Q. What grade and kind of gasoline is used for gas engines and tractors?
*A. Regular 72 octane gasoline used.
10. Q. What types of grease and gear oil is used in tractors and other heavy equipment?
*A. Same types as used in the states during winter.
11. Q. What type of track shoes are used for tractors in snow and ice?
*A. No observation made.
12. Q. What protection is needed for batteries?
#A. None. This was observed aboard ship.
13. Q. What type of diesel fuel is used?
#A. Regular diesel fuel used.
14. Q. How are tractor tracks kept from freezing?
#A. No observation made.
15. Q. What type of oil is used for hydraulic fluid?
#A. No observation made.
16. Q. What type shelters are needed for troops in the field?
*A. Insulated type tents with oil heaters adequate. Some types of heat is needed as cold is very penetrating even though temperature is above freezing most of the time.

SUMMER ARCTIC CONDITIONS (Cont'd).

MOTOR TRANSPORT

1. Q. What is the condition and extent of road system?
A. Roads are non-existent. At Godthead, Holstensborg, and Thule, Greenland, about three miles of gravel surfaced roads in use.
2. Q. In sand or tundra, what are the limitations on tire, chain, or track operation?
A. Weasel noted to operate all right over most terrain. Wheel vehicles (Jeeps) bog down in muskeg.
3. Q. What is the lowest temperatures encountered and with what attendant atmospheric phenomena?
A. The lowest temperature encountered was 22 degrees Fahrenheit on 12 September, 1948.
4. Q. What fuels and lubricants provide satisfactory performance?
*A. 72 octane gas and light weight lubricants were found to be satisfactory.
5. Q. What effect does the weather exert on batteries or electrical systems of motor vehicles? What specific gravity must be maintained in wet batteries?
*A. No observation made.
6. Q. What effect would outside storage have on motor vehicles, as regards starting, sustained operation, or maintenance?
*A. All vehicles have outside storage and preheat units were available if needed.
7. Q. Are motor heaters necessary for vehicles? Is a coolant required?
A. Anti-Freeze agent necessary year round. Motor heaters needed at times during summer, although their use not observed.
8. Q. What type lubricants are to be used in crankcase, differential, transmissions and grease fittings?
*A. Usual type for stateside winter operation.
9. Q. What type structures or tents could be used for cold weather maintenance, also type of heating installations for maintenance buildings?
*A. Quonsets, Pre-fabs, James Huts and tents could be used if heated.
10. Q. What type of pre-heating to use for starting vehicles?
*A. Flame primer on Grey Marine (LCVP) General Motors Engine 671, used to preheat LCVP for starting. Preheaters were not used on vehicles.
11. Q. What method is to be used to thaw out frozen brake shoes?
*A. No observation made.
12. Q. What type spark plugs are to be used?
*A. Regular type spark plugs used.
13. Q. What provisions are needed for starting motors after being idle for a period of 12 hours?
*A. No special provisions needed to start vehicles. Bell Helicopters used portable starter to save battery in plane.
14. Q. What type of break-down occurs most frequently due to weather conditions?
*A. I would say the track suspension system in tracked vehicles would break down most frequently due to the rocky terrain.
15. Q. Does gasolines and gasoline lines freeze? If not, what is used to prevent them from doing so?
*A. No observation made.

SUMMER ARCTIC CONDITIONS (Cont'd).

GENERAL SUPPLY

1. Q. Will the cover, protective, individual (stock No. 72-C-1000) listed in T/A Volume II be adequate in cold weather or will the cover, protective individual, cold climate, as listed in Army TM 3-290 be required in that area?
A. Neither covers needed during summer.
2. Q. Are the items of cold weather clothing issued by the Marine Corps adaptable to the area?
A. Yes, except gloves, mittens are much better.
3. Q. What type of storage is advisable for provisions?
A. Open storage above ground. Items which should not be exposed to freezing have to be placed in heated buildings or shelters. Most provisions can be left in open storage during summer.
4. Q. Is the fuel problem greatly magnified?
A. Yes.
5. Q. What is the effect of extreme cold on a heavy duty sewing machine such as the Goodyear outsole stitcher? This machine, though of rugged construction has many comparatively delicate machine parts which undergo quite a bit of stress during operation. Will extreme cold cause steel in needles and other finely machined parts to become brittle, thereby impairing efficiency of the machine and others of its kind such as textile and canvas sewing machines?
A. No observation made.
6. Q. What is the effect on sub-zero temperature on liquid rubber cement and liquid wax? Will they crystallize under normal storage conditions? Will ease of applications be affected by sub-zero weather. Recommendations for storage of rubber cement and liquid wax.
A. No observation made.
7. Q. The weight of a fully loaded Shoe and Textile repair trailer when completely stocked with expendable supplies in excess of seven ton. Will the traction of such a vehicle be impaired to any considerable extent by operation on the spongy tundra which I understand covers much of the terrain in arctic areas.
A. Yes, it would be difficult to negotiate across muskeg or tundra.
8. Q. What is the effect of frigid temperatures on the standard footwear issued by the Marine Corps? Will strength and pliability of leather and rubber soles be reduced by intense cold? By what percentage will wear on leather and rubber shoes be increased by contact with rugged geological formations encountered in frigid climates?
A. No observation made. Shoe pac tires feet but protects well from cold and dampness during summer.
9. Q. What is the effect of extremely cold weather on office machines? Is standard typewriter oil adequate for cold weather use? Will rubber on typewriter platens become brittle in extreme cold? Will liquid inks such as those used on mimeograph machines present a special problem through separating or becoming extremely gummy due to cold?
A. No observation made.

SUMMER ARCTIC CONDITIONS (Cont'd).

SIGNAL- (Below information received from Communications Officer Task Force 80).

1. Q. What difficulties are experienced in maintaining communications e.g.- frozen lines, failure of vacuum tubes, radio interference, etc?
A. No difficulties except a four hour radio silence blamed on a reaction from sun spots.
2. Q. How do hi-voltage mercury vapor rectifier react to cold weather and what can be done to overcome difficulties due to mercury not vaporizing properly?
A. None on board, no observation possible.
3. Q. Do insulating plastics and phenols used as insulators become brittle in cold weather?
A. Navy reports negative for summer season.
4. Q. Can present day field radio antenna wire support the weight of ice in extremely cold weather?
A. Yes, this however, was not experienced to a great degree.
5. Q. What effective means can be employed to prevent present co-axial cables from having water condensed internally and icing?, causing them to split or change electrical characteristics?
A. By using solid dual electric co-axial cable it does away with internal moisture.
6. Q. Does ice form a serious handicap to the rotating mechanism of present day radar? If so, what methods can be used to overcome this difficulty?
A. Yes, additional heaters should be installed in rotating mechanism (radar pedestal).

GENERAL

1. Q. What means of supply are available i.e. air, railway, road, water, etc?
A. Air and water are available to limited areas due to lack of airfields or because of ice conditions. Water best means for all areas. Good airfields are available at Thule and Resolute Bay.
2. Q. Is it feasible to "camp out" or are semibase installations advisable?
A. Semibase installations advisable.
3. Q. Are amphibious landings practical?
A. At Thule, Greenland and Resolute Bay, Cornwallis Island, yes.
4. Q. What are the limitations on land maneuvers?
A. Muskeg and Ice Glaciers main limitations.
5. Q. What are the normal housekeeping problems peculiar to the area?
A. Water heating and comfort of troops main problems. No, vegetation or natural cover for camp areas to augment supplies.
6. Q. What special equipment is required for the area; e.g. M290-weasel, sled, snow-mobile, stoves, etc.
*A. Weasel sleds for moving supplies heated showers and shops.
7. Q. What effect does the climate have on endurance of personnel? Are any special medical supplies or vitamins indicated?
*A. Not too much effect on endurance during summer.
8. Q. What special provisions must be made to protect personnel from insects?
A. None, very few flies or mosquitoes seen. This however depends on certain areas.

SUMMER ARCTIC CONDITIONS (Cont'd).

9. Q. Are there any special problems of a medical or sanitation nature?
*A. None noted. (Task force Medical Officer report).
10. Q. What kind of bedding is used for personnel?
*A. Sleeping bag very adequate. Needs something underneath to act as padding and insulation such as air mattress.
11. Q. What kind of bathing facilities are used?
A. Fuel drums cut in half - very poor method.
12. Q. What type stove is used for cooking?
A. Oil heaters and stoves used in all weather stations and camps.
13. Q. What means are employed for storing water?
A. None.
14. Q. What morale factors are considered in this type of weather?
A. Adequate eating and living facilities, showers, heads, movies, increased rations, etc.
15. Q. Are the present type field rations satisfactory for use in this area? If not, what type would be best and how should they be packed?
A. 5 in 1 and 10 in 1 used to supplement. A rations found to be very adequate.
16. Q. What type of vegetation and animal life is in the area?
A. Vegetation consisted of the Arctic willow tree, a few flowers, very little grass, muskeg, and tundra. Wild life seen was: Muskox, caribou, Polar Bears, Wolves, Rabbits, Seal, Walrus, Seagulls, Dove Kess, Ptarmigans, geese, and duck.

Footnote:

- * Army Reports available at Marine Corps Equipment Board, Quantico, Va. has this information.
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