

RESTRICTED

SECTION 142 – ARCTIC WORKING CONDITIONS

Climatic Conditions

3038. **Temperature:**

a. **Summer.** In most Arctic regions the mean daily temperature is several degrees above freezing. In the Subarctic the summer average is above 40°F, except in isolated places affected by local conditions. In certain localities in Alaska and Siberia short hot spells occur and maximum temperatures between 70°F and 100°F have been recorded.

b. **Winter.** Minimum temperatures vary greatly. In the coldest areas in the subarctic, the minimum may drop to -80°F. Coastal areas never fall below -60°F. In latitudes of 80°North, temperatures of -40°F may persist into April.

3039. **Snow.** In the Arctic all winter precipitation falls as snow, but the average amount is less than 50 ins a year. Snow cover persists for about eight months in the Arctic, and about six months in the Subarctic. The summer snow line varies between 1,600 feet and 5,000 feet.

3040. **Ice.** In both Arctic and Subarctic the ground is generally free of surface ice for between three and five months.

3041. **Rainfall.** Rainfall rarely exceeds 10-ins except in coastal areas of the Subarctic, but there is some precipitation on a large number of days.

3042. **Humidity.** Humidity is generally low, and men suffer from chapped skin and dryness of the breathing passages until they become acclimatized, but colds are almost unknown.

3043. **Wind.** Wind greatly increases the effect of cold on men. It is generally northerly in summer, and more or less southerly, and very cold in winter, but at very low temperatures its velocity is usually less than 5 mph.

RESTRICTED

A temperature of 15°F, with a surface wind of 2 mph, is reasonably comfortable for men who are suitably dressed but, at the same temperature with a wind of 27 mph, exposed flesh begins to freeze. This windchill effect does not apply to machinery.

3044. **Light.** In summer, sunlight and twilight are perpetual. Men can see to work for between 16 and 24 hours a day in June and July.

In winter it is never really dark on land, or on sea ice. Moonlight and starlight are reflected by snow cover, and some work can usually be done.

Objects are difficult to distinguish on snow without shadow from direct sunlight, and distance are hard to judge.

The glare of arctic snow produces quick and violent sunburn. Eye-strain and the risk of snow-blindness are greatest when the sun is well up and the sky lightly overcast.

3045. **Ice, fog.** Ice-fog peculiar to the Arctic, is caused by condensation and freezing of moisture particles in bright, calm, cold, and relatively humid weather. It can be formed by human breath, engines, and steam plant. It may limit visibility to as little as 10 ft and it often appears bright to the blinding point.

Work output

3046. The effect of climate must be taken into account when planning. men must be trained in the art of living and working in arctic conditions:

a. Winter weather may reduce an individual's working efficiency to as little as 5 or 10 per cent of normal.

b. At temperatures below about -40°F, heavy breathing may cause frost-bitten lungs. This fact limits strenuous work.

c. Some individuals are less affected than others by windchill. Individual endurance limits are most important in emergency work.

d. Plant operators and vehicle drivers gain some warmth from their engines but movement, even at 8 mph, may seriously increase windchill if the man is unprotected.

RESTRICTED

e. The temperature at which individual machines and tools are liable to failure must be appreciated.

f. At very low temperatures unheated metal must not be touched with bare hands, or the skin will freeze to it instantly, and will tear if pulled away without warming.

g. Sunshine is the vital source of warmth. Time of day and cloud cover should be considered when planning work