

MOPP in the Cold*

— some special precautions needed

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Mission-oriented protective posture (MOPP) gear is used by soldiers around the world to protect themselves against nuclear, biological, and chemical (NBC) contamination.

The overgarment of the MOPP gear consists of an outer layer of nylon-cotton and an inner layer of charcoal-impregnated polyurethane foam. It is designed to "breathe" and to allow for escape of a certain amount of heat and moisture, but heat buildup can still be a problem.

Heat Stress

Commanders expect and are on the alert for heat problems when soldiers wear MOPP gear in hot climates. They know that the effort a soldier expends and the speed at which he works, along with the temperature and humidity, determine the chance of his overheating. They monitor their soldiers closely in moderate and hot climates to prevent heat stress.

It is just as critical that commanders and small-unit leaders monitor MOPP-clad soldiers in cold weather. Soldiers wearing MOPP gear in cold weather environments are also susceptible to overheating and excess perspiration, especially when they expend a lot of effort. The solution to overheating and excess sweating is prevention.

Commanders need a thorough understanding of the MOPP system's flexibility. MOPP levels are modified based on the commander's assessment of the situation and criticality of the mission. This flexible system allows commanders to

relax some of the standards to lessen heat. For example, a commander may allow soldiers to loosen the neck cord, undo the hood to form a partial vent, or unzip the jacket to the neck in order to vent. This stovepipe or chimney effect allows heat to escape and lowers the

body core temperature, reducing sweating, heat stress, and the possibility of cold injuries.

Cold Injuries

In cold weather, the potential for a cold injury exists alongside the potential for heat stress. When

Additional Notes

Editor's note: The following points from FM 3-4, NBC Protection, should also be noted.

- During extreme cold weather operations — lower than -20° F (-29° C) — soldiers should use either the M4 winterization kit for the M17-series protective mask and the M13 winterization kits for both the M25-series and M24 protective masks. These kits, when used, prevent frost accumulation on the inlet valve caps and upper intake hose. However, with the M4 winterization kit installed on the M17-series masks, soldiers wearing them will experience greater breathing resistance. This increases with workload and it becomes even more pronounced with fatigue.

- When using either M25-series protective mask or M24 protective mask,

soldiers should use the anti-fogging cloth, stored inside the mask carrier, to prevent fogging the facepiece and hampering vision.

- When wearing chemical protective overboots in cold weather, individuals must take extra precautions walking on surfaces covered by snow and ice because the small treads on the overboots tend to cake over with snow and lose traction. Since these chemical protective overboots are worn over the combat boot, the cold-weather injury factor does not increase. Normal cold weather injury preventive checks should be done in a clean environment during MOPP gear exchange.

FM 3-4 recommends the placement of tape on exposed internal rivets inside the facepiece of protective masks to prevent frostbite.

overheating and excess perspiration occur, soldiers should be allowed a rest period before making a MOPP gear exchange. Even with a rest period, perspiration can collect inside the facepiece and cause a cold injury.

Soldiers should take care when removing the mask to prevent perspiration from freezing on their faces. A cloth such as an extra glove, sock, or handkerchief can be used to wipe the face and inside the mask immediately after removing the mask. Arctic troops are issued the balaclava, a combination knit ski mask and ski cap, which they use to dry their faces immediately after the mask and hood are taken off. Troops in other cold regions might use the all-purpose wool scarf as a towel. But it must be used quickly to prevent the possibility of a cold injury.

Putting on a protective mask that is cold may cause some discomfort and difficulty in getting a tight seal. Wearing the mask carrier beneath outer garments allows a soldier's body heat to keep the mask flexible, but this lengthens masking time.

When fitting the mask, soldiers must adjust the head harness only tight enough to create a good seal. If the mask is too tight, it will restrict blood flow to certain areas of the face and make those areas more susceptible to cold injury.

The metal buckles on the protective mask become cold quickly; however, if the mask is worn properly, the metal buckles should have little or no contact with the skin. These metal buckles should not be wrapped with tape. Doing so could interfere with proper adjustment and fit of the mask and could lead

to problems in properly clearing and sealing the mask. Soldiers should, however, place a small piece of tape over the exposed metal rivets inside the facepiece to prevent cold injury. The tape should be just large enough to cover the metal and not so large that it interferes with putting on the mask.

Hands are susceptible to cold weather injuries while wearing the chemical protective gloves. One way of combating this is to wear the green wool liners from the black shell gloves instead of the white glove liners underneath the protective gloves. Soldiers may wear standard work gloves or black shells over the butyl-rubber gloves to protect them from damage or during cold weather. Also, the mittens issued as part of the cold weather gear are large enough to be worn over the rubber gloves and would provide protection against the cold.

Wearing the protective mask and hood doesn't give the ears much protection from the cold. Some soldiers in the Arctic wear the balaclava in order to have a layer of insulation between the hood and the skin. Troops not having the balaclava might consider using the sleeping cap issued with the cold weather sleeping bag. The cold weather parka is issued to all units operating in cold climates. It is large enough to be worn over the MOPP jacket, and its hood is large enough to fit over the head, the mask with hood, and the helmet with liner.

This could afford protection for the head and ears against extreme cold. Use of the pile cap is not a practical solution because it is difficult to wear either inside or outside the hood.

These are only interim solutions. A permanent solution is needed, and one is expected in the near future. Natick Research and Development Center is looking at attaching a hood, made of the same material, to the overgarment.

POL Operation in MOPP

Water and POL product spills on the chemical protective clothing can be a problem even at moderate temperatures. Spillage in cold weather presents the potential for cold injury, even hypothermia in dire instances. If the butyl-rubber apron is available in the supply system, wearing it could be a solution to the problem.

Currently under development is an item specifically for decontamination operations. It is an expendable, lightweight, and inexpensive suit called SCALP (suit, contamination avoidance, and liquid protection).

The suit is designed to provide a barrier to liquid chemical agents and prevent wetting during decontamination operations when worn over the protective overgarments.

In an actual contaminated environment, the potential hazards of cold weather may not warrant a commander's full concern. But, in a training environment, safety should not be sacrificed for realism. Realism in training will not be lost by adjusting the MOPP level to prevent overheating, by ensuring soldiers have a rest period before a MOPP exchange, or by allowing cold weather gear to be worn over the chemical protective suit. Commanders should modify training if necessary during extreme conditions to provide safety and protection for their soldiers. ■■■