



Infantry Company Operations In an Extreme Cold Environment

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During the winter of 1939-1940, the Soviet Army invaded Finland. In spite of early gains due to the element of surprise along the Finnish border, the attacks soon slowed, especially in the heavily forested, less developed regions of central Finland. The Russian soldiers were neither prepared nor equipped to fight in extreme cold temperatures and deep snow. The Finns were.

In late December and early January, the Finnish 9th Infantry Division stopped the advances of the Soviet 163d Infantry Division and the force sent to rescue it, the 44th Motorized Rifle Division, at the Battle of Suomussalmi. Although outnumbered by as much as two or three to one and equipped mostly with small arms and mortars, the Finns destroyed the two divisions. They knew how to shoot, move, communicate, and ultimately win in the extremely cold, sub-arctic environment.

While most of our recent military operations have been in far warmer areas, we cannot ignore the possibility of cold-weather operations. If our soldiers were to deploy to Bosnia or Korea, for example, they could well encounter deep snow and potentially debilitating cold. Like the Russians, if we could not first conquer the cold, we would not be able to defeat the enemy.

Certainly, severe cold and deep snow pose a challenge for a company commander and his unit, because these condi-

tions affect everything they try to do on the battlefield. Even simple tasks take longer, movement of any kind is slower, and equipment breaks more readily. With proper training and leadership, however, cold-weather operations can succeed.

During my assignment as a training officer at the Army's Northern Warfare Training Center (NWTC) at Fort Greely, Alaska, I have trained and observed many different companies in cold-weather operations. These companies came from the lower 48 states as well as the Alaska National Guard. Although they underwent different types of training, they all experienced similar effects from the cold.

Because a unit may suddenly deploy to a cold-weather theater, a commander needs to know what he can expect to face and how he can overcome the cold to accomplish his mission. From my observations at the NWTC, I have developed some cold-weather considerations that will help a commander prepare for and conduct tactical operations in extreme cold.

Entering the Theater

Some units deploying to a cold-weather theater may have enough warning to conduct some training at home station, while others may have very little warning. In either case, a commander must know how he can acclimatize his soldiers

to the cold and make them combat effective as quickly as possible.

Training at home station and initial training in theater should include setting up and operating the 10-man arctic tent and stove group. At the NWTC, we use M1950 Yukon stoves inside these tents. In temperatures below zero, this shelter may mean the difference between a non-battle cold-weather casualty and a ready-to-fight soldier. But a commander cannot just issue this equipment and expect his soldiers to use it properly; the soldiers must drill on erecting the tent and stove if they are to do it quickly, safely, and properly when it counts the most. Because of the long hours of darkness in the northern regions, units must also train on this task during periods of limited visibility. A well-drilled squad can set the tent up and have the stove operating in less than 15 minutes.

Moving over the snow should be a training priority, because a unit's success or failure may depend on it. Snowshoes and skis are the two primary ways for dismounted soldiers to avoid walking or "post-holing" through deep snow. Both methods require training before soldiers can use them effectively.

Snowshoes are the most likely method for most units, and soldiers can learn all they need to know in about an hour. In fact, if training time is short, a commander may prefer snowshoes to skis, but moving on snowshoes requires more physical effort than skiing and the unit's rate of movement will be slower. Soldiers must also know how to fit snowshoes and make quick repairs.

By contrast, skiing requires intensive training and experienced instructors, but good skiers move faster and more easily cross country than soldiers on snowshoes. Obviously, soldiers who have skied before have an advantage and can form a training cadre for the rest of the unit. Well-conditioned soldiers acquire the skills more easily than less fit soldiers. Because northern areas have many mountainous or hilly regions, ski training should include uphill, downhill, and cross-country movement.

Ideally, the battalion scout platoon is an excellent unit to learn skiing first. For a rifle company, the commander might

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focus his efforts on one squad per platoon or even one platoon. He can then use these trained soldiers for a quick-reaction or reserve mission, a reconnaissance patrol, or any task that requires fast or long movement. Of course, if there is sufficient time for the entire company to train to proficiency, this will greatly improve the commander's flexibility in accomplishing any mission.

A unit that has snowshoes available can learn the basics anywhere, even without snow, but ski training obviously requires snow. Units in cold areas such as Alaska or Fort

Drum, New York, should include ski training in their normal training programs during winter months.

Before deploying or shortly afterward, a unit should cover two other vital areas—cold-weather medical considerations and cold-weather clothing. Soldiers of all ranks need to know how to identify, treat, and—most important—*prevent* cold-weather injuries.

Leaders should ensure that their soldiers have serviceable clothing that fits properly, and that they know how to fit and wear it. Soldiers who wear clothing that is too tight or restrictive have a difficult time staying warm. The vapor barrier

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boots, either the black or white models, protect the feet if soldiers know how to wear them correctly. When a unit is already occupying an assembly area, it is too late to find out that a soldier is getting cold because his mittens are too large or the zipper on his sleeping bag is broken.

A unit must spend time acclimatizing to the environment upon arrival in a cold-weather theater. This is important because a unit that has had no experience in the cold is more likely to suffer cold-weather casualties. Soldiers can acclimatize while training on the tent and stove drill and basic snowshoeing skills. Battle drill practice and other collective tasks can also be incorporated into this training. Leaders need to monitor soldiers for cold problems. If time is available, a unit can increase the soldiers' exposure to the elements as they prepare for military missions.

Offensive Considerations

As the company moves from the initial entry point to its area of operations, the soldiers begin using their winter skills. Clearly, if most of the soldiers cannot ski, they have to move on snowshoes for any dismounted marches, and this is slower than skiing.

A relatively fast way for a unit to move forward is skijoring, in which soldiers on skis are pulled behind a vehicle, normally a small-unit support vehicle (SUSV). A SUSV can pull up to two squads at a time at safe speeds of up to 10 miles per hour. These soldiers do not have to be expert skiers, but they do have to bundle up to protect themselves from the additional windchill of being pulled behind a vehicle.

Eventually, the company will start moving cross country, and to do this effectively the commander must assess his unit's mobility skills. He must also look for a route that will best protect his unit from both the enemy and nature.

As the soldiers begin to move through the snow, they have to make a trail, and this slows movement. In deep snow and dense forests, progress is even slower. Trailbreaking is therefore a major planning consideration for a commander.

Trailbreaking requires a fairly large element because it quickly tires soldiers. The commander should designate one-

fourth to one-third of the company as a trailbreaking element. If the company is moving along a single direction of attack, this element should be a platoon; if the platoons are moving along different routes, the element would be one squad per platoon. Even with skis or snowshoes, soldiers find movement difficult in deep snow. They cut down small trees or bushes and trample down the deep snow. Leaders should have a rotation plan to keep fresh troops making the trail. Also, since the trailbreaking party is moving slowly, it needs to go out earlier than the main body. A general rule is one hour earlier for every five kilometers of planned movement.

In addition to cutting a trail, the trailbreaking party navigates for the main body. In the large forests of the north, terrain features are not really evident, and a unit has to use dead reckoning to maintain its azimuth. (Soldiers need to be careful that the fluids in their compasses do not thicken in extreme cold temperatures.) While trying to stay on azimuth, trailbreaking elements must also be concerned about concealing their movement.

In addition, the commander must decide what the soldier's load will be. Soldiers need to carry their rucksacks with basic survival gear (sleeping bag, mittens, warm



clothing, food). But when the unit is traveling with rucksacks or pulling an ahkio sled, movement becomes more difficult.

The multi-purpose ahkio sled can hold up to 200 pounds of cargo. Normally, a unit uses the ahkio to carry tents and stoves, but it can also carry ammunition, mortars, and supplies. Pulling an ahkio in temperatures below zero does allow a unit to have the tent and stove readily available to set up for a warming shelter when it is needed. But pulling ahkios also requires the soldiers to break wider trails and cut more trees and bushes. Understandably, this requires even more physical effort, and the commander must have a rotation plan to keep fresh trailbreakers on the job.

Another consideration in hilly or mountainous terrain is the danger of avalanche. Avalanche awareness requires detailed training and skill. The different snow layers, slope angles, and weather all play a role, and units themselves add the human factor. Often, a commander plans a route that is well concealed from the enemy but does not consider that the route may take his unit directly into an avalanche-prone area.

If a unit is caught in an avalanche, soldiers may be buried alive and the route blocked, which forces the unit to organize a rescue party, try to find any missing soldiers, and find an alternate route *if* it is still able to continue the mission.

If avoiding an area is not possible, a unit should have key individuals trained to know the conditions that might lead to avalanches and then use caution moving across the area. Finally, the unit should also know and practice search and rescue techniques that will save critical time if a rescue becomes necessary.

Another consideration when moving across a snowfield is track discipline. First, a unit needs to limit the number of tracks, because the more the soldiers make, the more likely it is that the enemy will pick up at least one of them. Ideally, there should be one track per direction of attack or axis of advance.

Even with only one track, that track should be kept well hidden. At Suomussalmi, Russian aerial reconnaissance planes tried in vain to find the Finnish forces. The Finns kept their routes concealed by trees and thus protected themselves from identification and subsequent air strikes.

The physical fitness of the soldiers is also important. Moving cross country is only a means of reaching an objective. The soldiers must still be able to fight once the unit has completed its movement.

Another planning decision is whether the soldiers will assault the objective wearing snowshoes or skis or neither. With skis is probably the least preferred method, especially if the commander expects close-in fighting, because skis are too unwieldy and a soldier has difficulty planting his feet. Soldiers find snowshoes easier, but individual movement techniques are more difficult. When deep snow covers the objective, they may prefer using snowshoes to keep from sinking in when speed is critical. On shallow or hard-packed snow, they can assault without either skis or snowshoes and move with relative ease and speed.

The primary fire support systems available to the company may be its own 60mm mortars, because the company mortar section can move the weapons fairly easily on an ahkio sled. Other systems moved by vehicles, such as direct-support field artillery or battalion mortars, will have limited mobility, especially if they are transported by wheeled vehicles. Because deep snow will reduce the effects of point-detonated rounds, the mortar crew should set the fuses for proximity (height of burst three to 13 feet) or near-surface burst (height zero to three feet). This provides the greatest spread of shrapnel over the target area.

Generally, cold weather may favor offensive operations because soldiers stay warmer on-the-move. Soldiers in the defense may be as concerned with staying warm as with fighting the enemy. Still, movement and other tasks take longer, movement takes a physical toll on the unit, and fewer soldiers are available for the final assault.

Defensive Considerations

Despite a preference for offensive operations in cold weather, a unit will receive a defensive mission at some time

or other—occupying an assembly area or manning a battle position—and will face some challenges unique to the more static environment.

Because units are not moving, soldiers are not producing as much body heat and need external warming shelters, especially when temperatures are extreme. This means units have a greater chance of suffering cold-weather casualties, and leaders need to be alert to this. Fortunately, it is easier to inspect soldiers in a defensive situation.

A unit may initially establish stationary observation posts (OPs). These should always be two-man OPs and should not be kept out for long periods of time. A commander who needs to keep them out should rotate the soldiers about every half hour.

Local security patrols are better, because they are more active. But patrols may be limited, depending on the temperature, so soldiers can warm up as required. The patrols also have to be careful about making tracks that identify them to the enemy in front of the positions.

Soldiers in fighting positions have their own challenges. First, it is unwise to set the tent up immediately behind the front lines, because it is unprotected and provides a thermal signature. Normally, tents should be erected 300 meters or

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more behind the lines; however, soldiers still need to stay warm while maintaining an alert defense. One technique is to construct a snow shelter immediately behind the fighting position. A field expedient thermal shelter constructed of a log frame covered with ponchos and then snow provides a quick shelter with a limited thermal signature. Temperatures inside the shelter may be 50 degrees higher than outside. If a unit organizes its defense around fire-team positions instead of two-man positions, two men from each fire team can be in the shelter while the other two man the weapons. Instead of going back 300 meters to the tent when they need to warm up, they can move back only a short distance.

Regardless of the type of shelter, reaction to enemy contact may be slower, especially when the commander reduces security posture from 100 percent. Soldiers in the shelter or tent will take longer to put on their cold-weather clothing and get to their positions. The commander should rehearse enemy contact drills during both daylight and darkness. The organization of equipment and weapons in or around the tent will make this drill run more smoothly.

The construction of fighting positions is another challenge for soldiers in the defense. Soldiers trying to dig into frozen ground with entrenching tools will probably break the tools before they have dug anything that will protect them. They need pioneer tools even to make a dent, and engineer support from a small emplacement excavator

or explosives is even better. Even with this assistance, digging in takes more time and effort.

Fields of fire are another concern. If the defense is in three feet of snow, soldiers must remove the snow before they reach the ground. As they bore into the earth, the snow will still be above their holes. They must clear fields of fire while protecting themselves from indirect fire. As they clear fields of fire, they also need to watch the concealment of their positions from the enemy side.

A unit will find that “building up” is much easier than digging in, but this provides only limited protection against indirect fire. When building up, soldiers use existing materials such as snow, ice, and frozen ground to provide protection against direct fires. “Ice-crete”—a mixture of snow, ice, sand, and gravel—provides good frontal protection, but it requires water as well as sand or gravel, and these substances may not be available in large amounts.

As in the offense, track discipline is important in the defense. Because soldiers will be in the same general areas for longer periods, they may create more tracks. Each trail is potentially an arrow pointing the enemy to the defense. Leaders need to be alert to this and strictly enforce track discipline.

Such passive areas as track discipline and concealment of tents and positions are the unit’s best protection from air attack.

Both defensive and offensive operations are difficult in an extreme cold environment, because soldiers are fighting both the cold and the enemy. They also rely more on logisticians to provide them the supplies to keep them combat effective. And in a cold-weather region, combat service support (CSS) can be the decisive factor.

Combat Service Support

CSS is critical to any military operation. A unit cannot fight without bullets and food. Inadequate CSS operations probably have a faster detrimental effect on tactical operations in cold weather than in any other environment. Because of the nature of surviving and fighting in the cold, units consume more Class I, II, III, VII, VIII, and IX, and moving these supplies forward is far more difficult.

First, a soldier requires more food and water. In extreme cold, he needs around 4,500 calories per day for tasks that require only moderate exertion and up to 6,000 calories with heavy exertion. Three MREs (meals, ready to eat) provide less than 4,000 calories, and a soldier needs food supplements. The cold-weather rations in the inventory provide enough calories and are less bulky than MREs. Any of these rations that are available should go to the soldiers on the front lines.

Hot meals are still best for soldiers: The body does not have to use additional energy to warm the food during digestion, and hot food is a morale booster for soldiers out in the cold for extended periods. The drawback is that hot meals are harder to prepare and move to the front lines. Still, a unit should make every effort to get hot food to the soldiers whenever possible.

Water is another critical item, because dehydration is a leading contributor to cold-weather injuries. Soldiers need four to six liters or quarts of water per day in cold weather. Unfortunately, the available drinking water (as opposed to ice) may be limited. When a unit cannot transport water, soldiers must melt snow to replenish their canteens. They still need to protect their canteens from freezing. The current arctic canteen will freeze quickly in intense cold. A soldier should keep at least one canteen next to his body and the other wrapped in a scarf or other heavy article and inside his rucksack. This will help keep it insulated and liquid for a few hours. Also, filling it with hot water will keep it from freezing for a longer time.

Having enough water available will do no good, however, if soldiers don't drink it, and they may not feel the same need to drink that they feel in a warmer environment. Leaders therefore need to monitor their soldiers. One good way to

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monitor intake is to check urine output. Dark-colored urine indicates a soldier is not drinking enough liquids. Consuming soups and other hot liquids can help maintain the proper fluid level, but large amounts of coffee and tea will cause a soldier to urinate more often, which also leads to dehydration.

Maintenance is also a challenge. In extremely cold temperatures such as -30 degrees Fahrenheit and below, plastic, rubber, and metal all become more brittle and subject to breaking. The normal lubricants for weapons and vehicles thicken and will not perform as required. This, in turn, causes lower operational readiness rates for just about everything. Also, a soldier's desire to perform proper preventive maintenance checks and services may decrease.

More important for a light infantry unit is the care and maintenance of small arms. Leaders need to ensure that soldiers are taking care of their weapons properly. Weapons sweat, and this moisture condenses on cold weapons brought into a warm tent. Keeping weapons outside the tent is preferred, but any weapon brought in should be allowed to sweat for about an hour and then wiped dry. Otherwise, the condensation will freeze and lock the weapon up when it is taken back outside.

Machinegunners and automatic riflemen should warm their weapons with a slow rate of fire. If they fire too fast, the buffer assemblies and firing pins may break. Soldiers should use LAW (lubricant, arctic, weapon) instead of "Breakfree" lubricant on weapons. If LAW is not available, soldiers should keep their weapons dry.

Any battery-powered device has less output under cold conditions, and the batteries die much quicker. Magnesium batteries for radios are not effective at -40 degrees. Even lithium batteries have less output at those temperatures.

Furthermore, soldiers need to handle communication equipment carefully in the cold, because cords and wires become brittle and break easily.

Company medics have a harder task in the cold and must actively check soldiers for cold-weather problems. Integral to this is having leaders physically checking their soldiers as well. If medics and the chain of command do not inspect, it is only a matter of time before cold-weather problems and then casualties appear.

Medics also need to make sure their supplies do not freeze. Such fluids as intravenous solutions are especially susceptible. In 1939-1940, Finnish medics kept fluids from freezing by keeping them next to their bodies. Medics attached to infantry companies will have the same problems today and will need to take similar precautions.

As for clothing, the extended cold-weather clothing system (ECWCS) uses modern materials to protect soldiers from the cold. This system is effective as long as soldiers size it and wear it correctly. Since ECWCS uses several layers for insulation, soldiers need to make sure the outer layer garments (parka and trousers) are large enough to fit over the inner and intermediate areas and still allow freedom of movement.

With the layered design of the ECWCS, soldiers need to wear just enough layers to keep them warm while stationary and avoid overheating while moving. The ECWCS has different zippers and layers that soldiers can use to ventilate the clothing and regulate the amount of heat lost or trapped.

Without proper CSS operations such as resupply and medical evacuation, a unit becomes more of a liability than an asset for its higher commander. Commanders and their CSS operators and planners need to pay extra attention to this critical area of military operations. If soldiers do not have food, clothing, heat, and shelter, they will suffer cold-weather injuries and possibly death.

There is no big secret to fighting in an extreme cold environment. Tactics that work in a temperate environment will work as well in the cold. The only differences will be the conditions under which they are executed. Commanders and small-unit leaders need to know that while the cold will adversely affect what they do, it will not make what they do impossible.

Leaders must work extra hard to ensure that their soldiers remain a healthy combat force. At all levels, leaders need to be confident in their own ability to survive, fight, and win in the cold. If leaders have a problem with the cold, or show pessimistic, defeatist attitudes, so will their soldiers.

During the Russo-Finnish war, the Finns proved that small, well-trained forces could defeat much larger but less-trained forces in a harsh environment. With proper training, equipment, knowledge, and attitude, our soldiers can also be victorious in some of the harshest conditions on earth.

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