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Abstract

“Climate is what you expect, but weather is what you get.” The scope of this paper will illustrate the complications of Arctic Warfare such as: Terrain, Potential Threats in Cold Weather Regions, The Conduct of Operations, and Experiences of Military Operations in Cold Weather Regions. The combination of weather conditions and the lack of proper training, and the proper equipment can cause cold weather conditions to drastically limit the military’s readiness and operational capabilities. History has proven that weather can have a major effect on mobility and greatly limits warfighting. A few examples of how weather affects the outcome of war (positive and negative) will be outlined throughout this paper.

Arctic Warfare Heats Up; Are we ready?

Arctic Warfare is a term used to describe armed conflict that takes place in exceptionally cold weather, usually in snow and ice terrain, sometimes on ice-covered bodies of water. Through out the United States political and military frame work there are talks that Arctic Warfare is heating up. The U. S. Military forces have not participated in an Arctic campaign in over 50 years. Most would agree that the U. S. Military forces are poorly trained and lack operational readiness to face a War in an Arctic Region at this point in time. This is largely due to the military having their primary focus and efforts being more concentrated on the contingency support for Operation Iraqi Freedom and Operation Endurance Freedom in the Middle Eastern region of the world. However, the U.S. Military does have a portion of the forces training and preparing for conflict in the Arctic regions of the world. As talks increase and the visibility on the possibility surrounding the U.S. Military forces operational readiness should they have to engage in any type of conflict in the part of the world that are cold regions. The question must be asked what the U.S. Military needs to do to be operational ready to face any type of conflict or issues in the cold regions of the world. There are a lot of elements to take in consideration and a need for the military to refocus there efforts and toward cold weather training and preparedness.

Weather is unpredictable. Units need to be operational ready to face War in an Arctic Region. Cold weather can occur anywhere; but understand in cold weather its guarantee. Lack of preparedness, for cold weather conditions will affect the units' capabilities to complete tasks. Units will find that tasks will be difficult if not impossible to achieve. Training crucial and essential; training for cold weather operations and adapting to the environment is part of the formula for units' success on and off the battlefield. Although, having accurate weather

conditions to provide effective cold weather training would be ideal, units must stay mindful there's a lot of training they can do and should do prior to deployment. Many of the fundamental elements of training are not always specifically military in nature. A commander, who encourages and places guidance for demanding adventure training, will find the preparations for cold weather operations will be easier. Another positive element is a high level of physical fitness to improve and increase stamina making soldiers more adaptable to harsh conditions. Some basic lessons can be taught in temperatures not so grueling; for example, proper fitting of clothing, tent drills, and familiarization with equipment. Naturally, the intent will be to develop these skills in the appropriate environment. Therefore, it's important that this pre-training is carefully coordinated with real conditions.

The combination of weather conditions and the lack of proper training, and the proper equipment can cause cold weather conditions to drastically limit the military's readiness and operational capabilities. Military forces not trained and equipped for these conditions will be unable to operate effectively. As a result, the tempo of operations slows down; causing time to become a critical factor. As you read some of the campaign experiences illustrated in this paper will talk more to how inclement weather such as snow can hurt the mission.

History has proven that weather can have a major effect on mobility and greatly limits war fighting. The history of warfare in cold weather conditions has illustrated that the weather generally causes far more casualties than any enemy forces. A few examples of how weather affects the outcomes of war (positive and negative) are: World War II, Korean War, and Finland Experience.

World War II (WWII), The Battle of Stalingrad was one of the most important battles of the war. The German leadership including Hitler underestimated the will of the Soviet people

and the affects of the environment to conduct military operations. During the Battle of Stalingrad temperature in the winter dropped to below -30 Fahrenheit. The German loses exceeded hundreds of thousands of Soldiers due to the weather and thousands of vehicles were lost when lubricants from vehicles froze.

The Korean War begins as a civil war between separate factions on June 25, 1950. North Korea had from support of Russia, and China while the United States and the United Nations supported South Korea. In Korea the standard issue equipment was being used for the cold weather. The condition of the equipment was not suitable for cold weather operations; many cases confirm there was not enough cold weather equipment available or issued. Soldiers constantly slept with their boots on; indicating a lack of training and leadership throughout the organization. This practice is highly dangerous, because moisture will form during the day and actually freeze during the night. Causing injuries if not deaths; during the Korean War, 5,300 Soldiers died are taken out of battle due to cold weather injuries.

At the beginning of WWII, Finland was a young country, having been given its independence from the Old Russian Imperial Empire following the Bolshevik Revolution of 1917. In March of 1940, the Finish government sent a group of people to Russia, and a few days later the Treaty of Moscow was a fact. This was the end of the war. The Finish Army counted their casualties; 24,923 were killed and 43,557 were wounded. On the other side the Russians counted about 200,000 people dead. They used in this war 26 divisions, comprising 1,200,000 men.

The Battle of Stalingrad was one of the most important battles of the war. The German leadership including Hitler underestimated the will of the Soviet people and the affects of the environment to conduct military operations. The German loses exceeded hundreds of thousands

of soldiers due to the incompetence of its top leadership. This was the first offensive in which the Germans encountered urban warfare.

General Zhukov devised a battle plan to fight the German forces in urban warfare and taking advantage of the enemy's failure to acknowledge the environment and what influences it has on morale, equipment and the ability to receive supplies. During the Battle of Stalingrad temperature in the winter dropped to -34 C (-29F) and lower, Zhukov took advantage of the extreme cold that congealed lubricants in German vehicles and weapon systems and counter-attacked. The Soviets plan encircled the German forces and put nine fronts in action from Leningrad to Crimea. The Soviets were able to control rail lines and thus sustain resupply for a 220 mile front. Zhukov forces defeated an offensive operation called Winter Storm to break through to the Caucasus pocket in the south. The German forces were malnourished, cold and far from home. After the Soviets defeated the German military machine at Stalingrad the tide of the war turned and the march to Berlin began.

The German Army Group A and his Sixth Army led by General Paulus was to take Stalingrad and cut off the Caucasus from the rest of the Soviet Army. On 12 September 1942, General Paulus and his Sixth Army entered the city of Stalingrad. Soviet troops and civilians battled the Germans fueled by fear of the atrocities committed by German forces upon the population. Paulus and his soldiers were enveloped east of the Don crossing at Kalach, he requested to retreat or break out of the trap. German Leadership issued orders to fight to the last soldier. General Paulus cut off from reinforcements and supplies were promised by air resupply by Field Marshall Goring. But because of German defeats key air fields were lost and aerial resupply was ineffective. The Sixth Army found themselves trapped in a destroyed city, with the front lines moving everyday communication and resupply almost became impossible. On

January 30th, 1942 Hitler promoted General Paulus to Field Marshal stating no German or Prussian of that rank had been taken alive before. Field Marshal Paulus surrendered to Soviet forces on February 2, 1942. Scores of German soldiers were taken prisoner and sent to labor camps and very few ever saw home again. This battle is a shining example of how the environment, especially harsh conditions of the cold. The German forces were poorly equipped due to the arrogance of Hitler in predicting a quick victory over Soviet forces. The German Lightning War didn't count on movement of forces, morale, and resupply of its Army. German Army defeats in Russia allowing Hitler to take over command.

After Operation Barbarossa in 1941, the offensive was stopped due to the Russian winter. Hitler becoming critical of his military leadership took command of German forces in the region and devised a plan to break the spirit of the Soviet resistance by cutting off their oil, grain and other natural commodities. Hitler lacked the military skills to plan and predict battles, and to understand the nature of environment on equipment and personnel. Hitler ignored military advice from his generals to stop the offensive until spring arrived. His thinking like a politician and not a soldier allowed him to make many mistakes in which the Soviets capitalized on. German military units were trained for sweeping across open terrain, not the infamous snipers they faced in the arctic weather as they fought from building to building. Hitler wanted to take Stalingrad at all cost because the city was Stalin's crown jewel and it provided most of the Soviet Union with its grain, oil and other commodities. Hitler ordered Paulus not to retreat from Stalingrad and wait for reinforcements and relief. Unlike Hitler, Stalin left the military planning to Zhukov and Vasilevsky who were very effective leaders who understood how to motivate through patriotism or fear to defend the Soviet Union from the Germans and their scorched earth policy. Many Soviet Jews knew of the harsh treatment at the hands of the German forces, this also helped motivate

Soviet citizens to fight harder. This important battle helped turn the tide of the war in favor of the Allies.

German leadership counted on superior forces that would quickly defeat the inferior Soviet military forces. Most of the previous battles to invade the Soviet Union was successful, but the Germans were poorly equipped for arctic warfare should the battle enter the winter months. The German resupply system also counted on seizing enemy natural resources to help their war effort. The Soviets were able to cut off the German resupplies and drag them into a prolonged urban warfare. This battle after 200 days inflicted over 600,000 casualties on the Axis side and over a million casualties on the Soviet side. It's argued by many that if Hitler would have taken the military advice of his generals and retreated to the main front, hundreds of thousand of men might have been able to force a stalemate on the eastern front.

The Korean War begins on June 25, 1950 as a civil war between separate factions; North Korea gathered the support of Russia and China while the United States along with the United Nations rendered support to South Korea. The war ended on July 27, 1953. During the Korean War winters, U.S. Military Forces experienced poorly trained troops and lacked operational readiness (e.g. suitable equipment, experience, availability and training) to face an Arctic War. Arctic conditions became a challenge, as equipment was not suitable or available. Limited training opportunities failed to get troops fully knowledgeable and adapted to arctic warfare and survival.

The equipment used in Korea was standard issue cold weather gear that included field jacket with hood, wool long johns, wool uniform shirt and trousers; two fatigue jackets, two fatigue trousers, sleeping bag and the "artic shoe-pac". The "shoe-pac" was the replacement for the conventional black boot; it was a rubberized and airtight cold weather shoe with moisture

collecting interchangeable sole. Even though the “shoe-pac” provided a vast improvement over the traditional boot, it did not prove to be suitable for infantry operations; foot conditions accounted for 95% of the severe frostbite cases.

The condition of the equipment was not suitable for cold weather operations; many cases confirm that cold weather issue was not available or issued such was the case with gloves; many men only had work gloves that did not offer the protection necessary. This caused the particular problem of cuts around where fingernails join the skin; this condition gave soldiers a severe risk of infection.

Every man was required to change his socks daily to guard against trench foot; in addition, the company aidmen inspected the feet of all members of the unit everyday. It is essential to point out that even though foot inspections were a norm in rear operations; this was not the case with the troops on the front, where most of the cold weather injuries occurred.

During the Korean War, the equipment was sub-standard; many recollections depict conventional clothing, boots and parkas without liners that would not withhold their effectiveness in temperatures not far below freezing; temperatures in Korea often ranged from 30 to 100 degrees below zero. Another adversary that soldiers encountered dealt with the warming tents. Warming tents were composed of a potbelly stove and coffee for temporary relief. Soldiers always had the weapon by their side in fear of an eminent attack and therefore, when a soldier entered the warming tent the equipment would collect moisture from the heat, when the soldier steps back out, literally in seconds the weapon to include the chamber are completely frozen. The weapon’s life and serviceability during the war was consistent with the amount of moisture and lubricant inside the chamber, one common problem with moisture is that the first

round would go off but the following round would fail to engage due to icy conditions. In terms of operational readiness, this caused a great challenge for the troops.

The following quotes depict the conditions that soldiers had to endure during the Korean War. “A check showed no errors in gun settings, however a shot landed on a ridge right in front of us, we quickly figured out that the powder’s composure was not right, powder thermometers carried by each gun section confirmed that our assumption was correct. The thermometer read thirty-two degrees below zero”.

David Hackworth, the most decorated soldier of the war with eight purple hearts said, “At one time we lost a guy a day and guys were losing fingers and toes”. “To this day I tend to have serious pain in the cold weather. These are some of the accounts that soldiers have left in the history books as lessons learned from Korean War operations.

Adaptability was a key issue that determined the fate of hundreds of thousands of soldiers during the Korean War. The issue of cold weather injuries became so great during 1950 that it prompted the initiation of a cold weather injury center at the Osaka Army Hospital. By 1951, the problem of cold weather injuries became worst and the center began to credit geographical belonging; soldiers from warmer states fared worst than the ones from colder states, race; blacks had less tolerance than whites and lower enlisted suffered more perhaps because of a lack of personal discipline.

One adaptation and technique that saved soldiers from frostbite were freeze-drying; a process by which soldiers would wait to have the moisture collected by the sock freeze so that later it could be shaken off, according to the soldiers, this process got rid of 90 % of the moisture.

The best training and adaptation scenario that the U.S. Army possesses is located at Ft. Wainwright, Alaska; here temperatures often fall below -50 degrees. With wind-chill factor, it is not uncommon for temperatures to reach -70 degrees. These extreme temperatures obviously present challenges for maintaining personnel and equipment. Here soldiers learn how to maneuver and operate in arctic conditions. One, good old fashioned, tactic against the cold, used in Korea and in today's operations is dressing in layers in order to minimize overheating and dehydration. However, today's training consists of several simple to do tasks that were not in place during the Korean War. Soldiers learn that it takes less energy to heat water from a canteen cup than to melt snow in their mouth. Soldiers also learn to keep canteens close to the body to keep the water from freezing. Students become aware of the importance and danger of fuel spills as they can produce frostbite instantly when in contact with skin.

Another training aspect that leaders continuously learn is identification, first aid and prevention of symptoms such as hypothermia, chilblain, immersion foot, frostbite and dehydration. Easy to remember acronyms such as C.O.L.D. E. R reminds soldiers to C: keep clothing clean, O: avoid overheating, L: wear clothing loose and in layers, D: keep clothing as dry as possible, E: examine clothing for holes, tears, and broken fasteners, R: Repair or replace damaged clothing.

A vast improvement from the Korean War days is that during training, soldiers receive vapor-barrier boots that are warm to 40 degrees below zero, polypropylene top and bottom arctic mittens with trigger fingers, triple layered sleeping bags, stoves with non-freezing fuels and insulated tents is the standard issue.

Through a combination of lessons learned, advanced technology and a broader sense of awareness, the Army has taken a proactive course of action in order not to have unnecessary

casualties due to cold weather operations. Even though Kosovo and Afghanistan have tested the Army's ability to respond to cold weather operations, U.S. Forces still have a test ahead if called upon to engage in arctic weather operations. U.S. Forces will be able to determine the success in the battlefield by employment of advanced technology, training and adaptation to a highly demanding climate.

Finland was a very young country when World War II started. After World War I they had the Bolshevik Revolution in 1917, and after that they had a civil war. This was between the Republics and the Socialists; the Socialist lost the battle. The Finish Army had ample time to complete the mobilization of their forces. A lot of volunteers were responsible field fortifications were being build during the summer months. As a result, Finland mobilized 175,000 men. They were all part of 9 divisions and some single companies or battalions. If there would have been enough weapons and equipment they might have called for 15 divisions. There were too many people who wanted to go to war. This was a little bit too ambitious. The Finish commander in chief, assembled on the Karelian Isthmus, 6 of his divisions, he stationed 2 divisions on a short line north of Lake Ladoga. He also held 1 division in reserve. In March of 1940, the Finish government sent a group of people to Russia, and a few days later the Treaty of Moscow was a fact. This was the end of the war. The Finish Army counted their casualties; 24,923 were killed and 43,557 were wounded. On the other side the Russians counted about 20,000 death people. They used in this war 26 divisions, comprising 1,200,000 men.

If we look at the experiences of Finland in the beginning of World War II I would like to emphases a few aspects. Gun areas will be unusually restricted and generally chosen for their accessibility. In wooded or mountainous country, suitable areas will be scarce, and particularly in the advance, a significant reconnaissance effort will be necessary. Not only should battery

commanders pay particular attention to this requirement but it is also a task for reconnaissance troops. Inadequate mapping could hinder the choosing of gun positions. Second aspect of consideration is camouflage. All defended locations will often have to be occupied in areas virtually devoid of natural camouflage. Concealment will require punctilious attention to track discipline, deception and intelligent use of snow and ground. Tracks can never be completely concealed in snow and thus the deception plan, which may include dummy positions, should take careful account of the track plan.

Also training to survive in cold weather conditions (individual factors) is very important. To survive cold conditions a soldier will need to have some knowledge of the weather conditions and how they can change, practical experience and the will to survive. These three factors may seem straightforward and simple, but in adverse field conditions the problems are magnified and often take much longer to overcome than anticipated. Surviving in these conditions can be crucial to any military operations. The Finish ski troops were in 1339 also able to sustain themselves in difficult winter conditions. They were equipped with warm clothing and were used to the cold. The human body can operate effectively only as long as its temperature is kept within fairly narrow limits. The food we eat is converted into energy with the purpose of maintaining this temperature and providing a surplus for work. Overlook one or more of these factors and an otherwise fit soldier is likely to become a casualty of the cold. Most of what we eat and drink goes towards maintaining our body heat while a relatively small proportion is expended on producing energy for physical work. A larger intake of calories (approx 5000) is therefore required in cold climates. Water should be available from streams or lakes but in cold conditions it will be frozen. Snow or ice can be melted, preferably the latter because it produces more water in less time and uses less fuel. Snow should never be eaten raw and the temptation to

scoop up a handful and melt it with body temperature should be resisted. The attention paid to self discipline and the embodiment of sensible standards of corporate discipline cannot be overrated. It is the glue which binds together the other aspects of morale and allows a commander to achieve the framework of trust and comradeship so essential for the conduct of successful operations.

Another aspect that needs some attention is equipment and materials. Weapon and shell characteristics are affected by low temperatures, particularly when these change quickly. The temperature of cold ammunition placed in a warm barrel rises rapidly, and a few seconds delay in firing may cause considerable variations in range. Radio's you can use at temperatures down to -25°C , no serious adverse effects are noticeable. Occasionally, mechanical components can stick but this can be quickly remedied by warming the equipment. All cables and leads also become brittle and break easily. The number of vehicles which can operate in cold weather conditions is limited, and even though cold running and the constant use of four wheel drive leads to high consumption, the call for POL for these will be relatively low. At last the clothing. The wide temperature range between summer and winter creates a demand for an unusual variety of clothing which must be stored, cleaned and distributed. Washing of winter clothing is essential to preserve its insulating properties, and this can seldom be done by men in the field: provision must also be made for dry cleaning those items of clothing which require it.

If we take a close look at the way battle we see that much of any cold weather operations will be fought at close quarters by dismounted infantry. The problems of meeting superior forces unexpectedly, the difficulties of rapid movement and the ease of constructing strong and concealed defenses indicate that a combined arms approach to operations in the cold weather conditions is absolutely essential. Operations in cold weather conditions invariably take much

longer to organize and coordinate than elsewhere; the conduct of operations may depend on factors not present in operations elsewhere, such as the movement of armored vehicles into precise positions for supporting fire or providing timely logistic support can become significant issues in cold weather operations. Any successful operation will depend to a large extent on the care and attention paid to the integration and harmonization of all combat arms. Also wheeled vehicles should be used for transport in rear areas where roads can more easily be kept clear; they should be used in forward areas only where the going is good, as the effort needed for recovery may well outweigh their usefulness.

If we look at the structure of Finish Army Units which were dedicated for Arctic Warfare we can see a few things. First we look at their equipment. The Finish Army is well trained and they have high tech equipment. If you look to their basis personnel equipment all Soldiers have individual clothing items especially for staying in cold weather conditions. Because they trained a lot in cold weather conditions, they were able to improve their equipment. The Finish Army gives extra attention on the training schedule and procedures for Leadership. Operating in cold weather conditions will present additional challenges and pressures for commanders at all levels. More importantly, Commanders must be aware of the problems that they are likely to face and mindful that they may easily be among the first to become victims to the cold. The commander who consumes all his mental and physical energy in self survival will be ill-equipped to lead his men. The commander who becomes a slave to the weather will lose the initiative. During wartime they have about 22,000 Soldiers for Border Guard. When required by defense readiness, all or part of the Border Troops can be incorporated into the Defense Forces by decree. The TRADOC organization takes care of training courses. Military training includes basic

training for all Soldiers, specialized training, for example in cold weather conditions and also leadership courses.

The Finnish Army has no special budget for training or equipment of their troops in cold weather conditions. The basic training of the Soldiers exists already items which they have to use during the rest of their Army life. Cold weather equipment is the basis they receive instead of other equipment soldiers receive in other countries who train in other weather circumstances.

The physical extremes of cold conditions which embrace snow and ice, slush, mud and the extremes of weather all restrict the mobility of a military force. To retain balance and cohesion a commander has to ensure that a combined arms approach to all climatic conditions is adopted by subordinate commanders and that his force can retain mobility, even if this is restricted at times to troops moving and operation on foot or skis.

Most cold weather operations will involve the deployment of all combat and combat support arms probably without any major change of their organizational status. In conditions of extremely low temperature or where significant layers of snow are present operating conditions will have to change to reflect these circumstances. In these situations the Infantry, with their inherent mobility, will be at a premium, together with the Engineers whose ability to enhance mobility (and counter mobility) will also be a much valued asset. Because the Finish Army and Border Patrol use the credo "Train as you Fight" they are always trained and prepared for a battle in cold weather circumstances.

Combat stamina is at a premium in any operations; it will quickly be expanded through careless planning and at the very time when a commander would normally expect his men to be for battle, they can be at the point of collapse. Commanders' battlefield procedures should take account of the conditions, allowing adequate time for feeding, rest and shelter from the cold.

Combat stamina is vital function of leadership. Leaders must take into consideration and be capable of seeing how change of weather can present and opportunity. The leaders see this as an opportunity to have the advantage. Times will arise when survival is an immediate problem verses the action of the enemy; but, leaders should remain calm and open minded. Because cold weather can be subject to change a situation and conditions quickly. The error in cold climates are narrow, deciding to take any risk, leaders must be careful and give as much thought before moving forward.

The environmental influences determine, in large measure, the outcome of combat in cold regions. The side that best adapts to and uses these influences will be victorious. Wars fought in cold regions have been among the most brutal in history and with incomprehensible suffering and deaths. Preparation, knowledge, and training are key elements for organizations success on the battlefield.

The weather affects our daily lives and our mobility. Even though, the U.S. Military seemingly lacks complete operational readiness to face an Arctic War; when and if they receive the call for duty, they will be ready. Additionally, the positive is the coalitions/alliances forces being able to provide interim and/or additional support if the need arise. Whether any military grouping would come under UN, NATO, WEU, Commonwealth or Coalition backing will be in place. Whatever circumstances, there would be integrated command and control arrangement along the lines. Any one presenting a threat to any of the United States Territories will be face with both Coalitions/Alliance Forces standing in proxy or beside the U.S. military forces; as brothers in arms.

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