

# Alaska Test Center Prepares for Busiest Winter in Memory

Mark Schauer

**F**or decades the Army has placed major emphasis on the realistic testing of military equipment and munitions in harsh natural environments. This type of testing ensures that the equipment will function reliably anywhere in the world, regardless of extreme climates. As U.S. forces have grown and evolved in recent years, this emphasis has also grown, with dramatic increases in the desert and cold weather workloads.

Collecting accurate data is important in every test, and summer is a prime time to recalibrate the U.S. Army Cold Regions Test Center's sophisticated equipment after a harsh winter of use. Here, Instrumentation Engineer Dan Fox calibrates a Doppler radar system used in missile tests. "This would be possible in winter, but much more difficult," Fox said. (U.S. Army photos by Mark Schauer.)





Heavy Equipment Operator Russell Hollembaek prepares a trench for an electrical conduit to one of the CRTC meteorology team's three new Sonic Detection and Ranging stations. Any type of construction is difficult or impossible to complete in winter, when the ground freezes to depths exceeding 10 feet.

Even a cursory examination of our Nation's history shows that extreme cold is a weather condition with which American troops have had to contend. From Korea to Afghanistan, the lives of U.S. Soldiers depend on functioning equipment in inhospitably frigid environments, and no other place in the world can provide extreme cold-weather testing like the U.S. Army's Cold Regions Test Center (CRTC) in Delta Junction, AK. CRTC is a subordinate command of Yuma Proving Ground, AZ, which is responsible for evaluating equipment in extreme desert, sub-Arctic, and tropical environments.

### Busier Than Ever

The range of conditions at CRTC is unimaginable to much of the world's population. The highest summer temperatures have been as much as 150 degrees warmer than the deepest cold of winter. The longest summer days have nearly 23 hours of daylight, while the winter solstice brings the sunlight for less than 5 hours. Close to the Arctic Circle, CRTC is the premier site for punishing tests of military equipment in severe cold.

**Extreme cold is a coveted commodity at CRTC. In the winter, CRTC test officers scrutinize weather conditions at several microclimates within the range to take advantage of the lowest temperatures, moving vehicles and test items from place to place as necessary.**

"We're going to have a busy season this year," said Greg Netardus, Chief of the Test Operations Division. "This is probably the busiest test season of the 5 years I've been here, and last year was very busy. Most test officers will be involved with more than one test, and some will run three or four."

The 2010–11 winter season's 16 scheduled tests cover a wide variety of military equipment, from a portable see-through-the-wall radar system to a long-term test on the environmental effects of spent ammunition in soil. Combat vehicles such as the Mine Resistant Ambush Protected All-Terrain Vehicle and the Stryker Mobile Gun System account for the most prominent of the evaluations.

As soon as the cold weather hits, each of the vehicles is put through its paces in more than 2,000 miles of mobility missions, pausing only in deep winter to conduct at least six evaluations per vehicle of heater performance and cold starts, in punishing 50-below-zero Fahrenheit weather—a full 25 degrees colder than many combat vehicles are currently rated for.

In summer, CRTC's crew prepares for the coming test season while the weather is still mild. "A lot of people think we're off in the summer," said LTC John Cavedo, CRTC's Commander. "That is far from the truth. Summertime is far from downtime at CRTC. We reset, refit, and prepare for the next winter."

## Preparation Poses Unique Challenges

Evaluating equipment in an extremely cold natural environment makes test preparation immensely challenging. Foremost among the tasks in summer is arranging the shipping of test items. Since Alaska cannot be reached by land without passing through another country, large items such as combat vehicles typically arrive by barge and can only make the journey using companies that are equipped to handle secure items. Receiving ordinary items can be difficult in winter, too. Fairbanks, the nearest major city to CRTC, is about 100 miles away, and most of the journey is over a winding 2-lane highway prone to heavy ice and snow.

As such, CRTC attempts to stock up on necessary supplies in advance of inclement weather whenever possible. That alone is a formidable task; aside from the difficulty of knowing which spare parts might be necessary on an item that has never been tested in extreme cold, testers don't want to hoard material that might be needed in theater.

Despite these hardships, CRTC personnel are prepared to negotiate the weather whenever necessary. When an axle on a test vehicle failed during a test last year, for example, the item's normal

supply chain was unable to provide a timely replacement. CRTC testers turned to their counterparts in Yuma, who expedited shipping of a replacement. The part arrived at CRTC in a relatively fast 9 days, and the vehicle maintenance team worked all night to install it. Since testers had altered the schedule to continue subtests that didn't require the vehicle to be mobile, the test resumed after the repair with a net loss of only 1 day.

CRTC test officers constantly apprise their customers of events that could impede testing, and they strive to have contingency plans in place to cope with such possibilities.

## Maintaining the Range

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Test officers are excited that this winter is expected to be even colder than usual. Yet any type of construction—be it berms or electrical conduits, culverts or roads—is difficult or impossible to complete when the ground freezes. “The ground is like concrete in winter,”

said Electronic Technician Wayne Robertson. “The freeze reaches down about 10 feet.”

Further, the long summer days routinely bring weeds that, if untended, can grow to 6 feet high. Spring 2010 had heavier-than-usual rainfall, which resulted in particularly heavy growth.

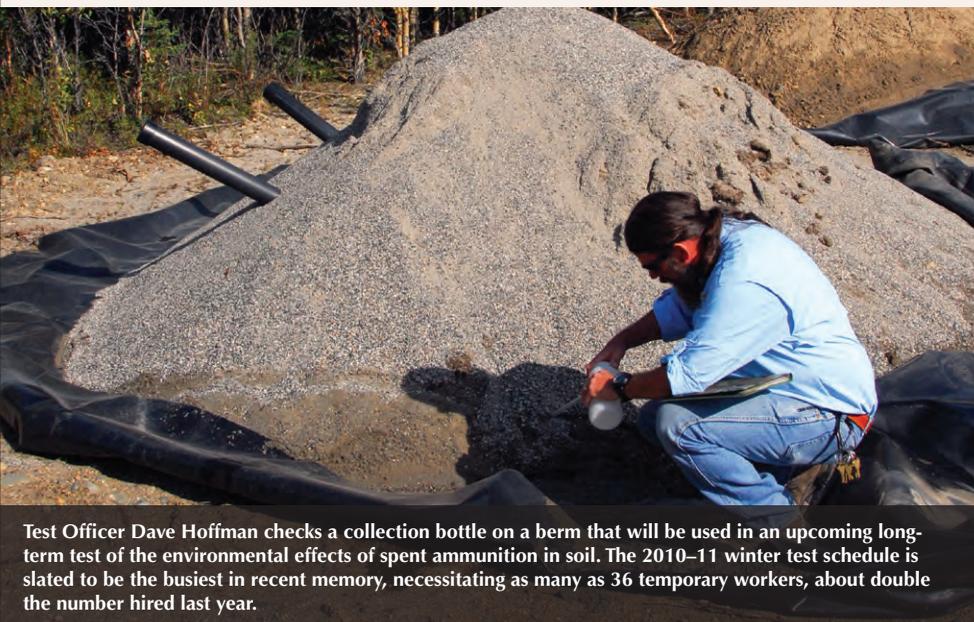
Another important summer project for the CRTC staff is sealing cracks and performing other maintenance work on the cold-weather test track. In winter, test officers intentionally put water on portions of the track, creating ice pads to test vehicle traction. If cracks are not fixed in summer, melting water will seep in and heave the asphalt when it refreezes.

## Sensitive Instruments

The sophisticated and sensitive instrumentation that CRTC personnel use to measure performance data is not immune to the effects of harsh cold, which makes recalibrating instruments another important summertime project.

CRTC's ranges are a veritable outdoor laboratory, and collecting weather data is critical to ensuring successful testing. This summer, the meteorology team completed the installation of three Sonic Detection and Ranging stations that can gather wind data at altitudes as high as 10,000 feet, replacing the need for weather balloons for these relatively low altitudes. The team also replaced infrastructure such as towers, outfitting them with new or recalibrated instruments.

Aside from CRTC's inventory of sophisticated equipment, the buildings that house its operations also need to be maintained in the summer. One small building had sunk significantly off plumb from repeated freezes and thaws of the ground beneath it. The problem was solved with some big equipment and several pairs of hands to lift the building onto steel support beams.



Test Officer Dave Hoffman checks a collection bottle on a berm that will be used in an upcoming long-term test of the environmental effects of spent ammunition in soil. The 2010–11 winter test schedule is slated to be the busiest in recent memory, necessitating as many as 36 temporary workers, about double the number hired last year.



CRTC employees use heavy machinery to lift a meteorology building onto steel support beams. Alaska's extreme freezes and subsequent thaws often cause structures like this to sink into the ground. "Because of our remoteness, and because of many competing demands from the many other U.S. Army Alaska tenant units, it is not always possible to get the necessary, timely support from the department of public works to work on these types of projects," said CRTC Commander LTC John Cavado.

"When we're doing tests in extreme cold, we can't run our equipment without a heated building," said Garry Garner, an Electronic Technician for the meteorology team. "This and the other locations need to be able to be occupied on a moment's notice."

### Vehicle Maintenance

CRTC's fleet of more than 40 wheeled vehicles and 20 tracked vehicles to support testing sees rigorous duty during Alaska's harsh winters. The workhorse of the fleet is the versatile Small Unit Support Vehicle (SUSV), an articulated, tracked vehicle that can negotiate deep snow and can even float.

"These vehicles are driven in nasty weather over rough terrain all winter," said Mechanic Rance Lentz. "In the spring and summer, we have an opportunity to fix them. Everything from changing undercarriages, tracks, drive trains, radiators, fuel systems, glass—you name it, we do it."

The extreme variations in summer and winter temperatures mean that the fleet and test vehicles' oil, lube, and antifreeze must be changed for

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seasonal use. Whenever possible, fiber hoses are used in lieu of their more common rubber counterparts, which become brittle in extreme cold. Rubber hoses need to be carefully monitored and replaced throughout the winter, as do wheels and tracks. During the 2009–10 winter, the crew did a limited installation of new composite rubber road wheels on the SUSVs and noticed dramatically extended tread life. Four of the most heavily used SUSVs received full complements of the new wheels, as well as new composite rubber tracks.

### Always Preparing

Summer ends quickly at CRTC; most years, the first snow is on the ground by the end of September. But preparation doesn't end there, or even when the test season begins. Test Planning Manager Joe Pierson is already doing preliminary

planning for test events in the winters of 2011–12 and 2012–13, all in support of Soldiers and the critical mission of ensuring that their equipment works in any feasible condition.

"We have a very well-trained and seasoned workforce," said Cavado. "It is absolutely phenomenal what these folks do to support the CRTC mission in every season of the year."

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