YPG Conducts Challenging and Rewarding Stryker Vehicle Testing in Suriname

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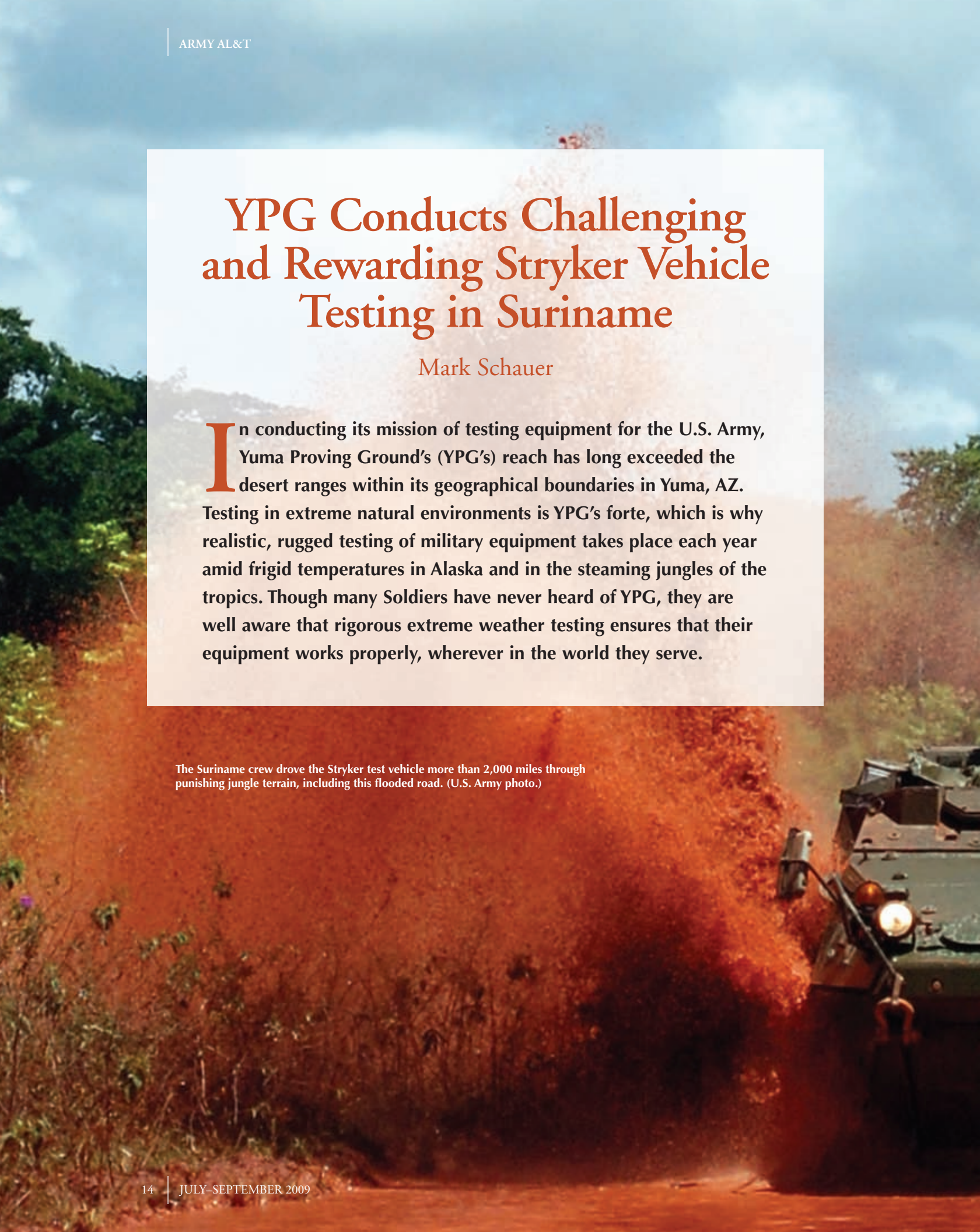
In conducting its mission of testing equipment for the U.S. Army, Yuma Proving Ground's (YPG's) reach has long exceeded the desert ranges within its geographical boundaries in Yuma, AZ. Testing in extreme natural environments is YPG's forte, which is why realistic, rugged testing of military equipment takes place each year amid frigid temperatures in Alaska and in the steaming jungles of the tropics. Though many Soldiers have never heard of YPG, they are well aware that rigorous extreme weather testing ensures that their equipment works properly, wherever in the world they serve.



The Suriname crew drove the Stryker test vehicle more than 2,000 miles through punishing jungle terrain, including this flooded road. (U.S. Army photo.)

Last year, nearly two dozen testers from YPG and its subsidiary test centers spent the better part of the year in the nation of Suriname, a former Dutch colony in South America, to test the Stryker combat vehicle. It was the first such test that YPG ever conducted in Suriname and the challenging effort took hundreds of people, including scores of local contractors, to accomplish.

The Stryker

The Stryker is the most versatile and technologically advanced armored vehicle in the military arsenal of the U.S. Particularly suited for transporting infantry in urban environments, the Stryker has become popular among Soldiers in the most dangerous areas overseas; they describe the vehicle as quiet, reliable, and relatively easy to maintain and repair. However, the Stryker is also one of the military's most complex platforms, with an operator's manual that encompasses 14 heavy volumes.

Prior to its deployment to Iraq, the Stryker underwent extensive testing at both YPG, in the deserts of southwestern Arizona, and the Cold Regions Test Center, the frigid Alaskan test facility over which YPG has jurisdiction. However, the platform had never undergone testing in a tropical environment. Although YPG also maintains test facilities in Hawaii, Honduras, and Panama, none of the three were suitable for the unique requirements of testing the several dozen-ton vehicle. After years of searching, an ideal testing site was identified in South America's smallest country: Suriname.

Suriname

Suriname has one of the most diverse populations in South America as a result of waves of foreign laborers from Asia coming to the country following the abolition of slavery in the mid-19th century. Since gaining its independence in 1975, Suriname has struggled to grow a stable economy and raise the standard of living. The per capita income of Suriname is less than 10 percent of that of the U.S.

However, the nation is developed enough to support the needs of Stryker testing. In addition to having sufficient roads, Moengo, a town of 7,000 residents located closest to the test site,

boasts a large bauxite mining presence and a familiarity with heavy equipment. Test planners knew that this knowledge would benefit the mission in the event of a catastrophic test vehicle failure. Through years of effort, senior YPG and Army officials negotiated and secured the required permissions and clearances to begin testing in Suriname on property owned by BHP Billiton, the world's largest mining company.

The challenges the testers faced were immense. Living quarters had to be procured for testers participating in the project. Upon the arrival of advance team members in spring 2008, the proposed test site had no infrastructure, requiring the rapid construction of a compound with security fencing, wiring, and communications networks. Test vehicle operator Jerry Pullen staked 30 miles of existing roads of various conditions for use in the test.

The lack of existing topographical maps required assistance from communications worker Tony Aultman, civil engineer Carlos Mora, and software/hardware engineer Jonathan Gonzalez, who together created a map by taking measurements of more than 1,000 points. "Their competence was very noteworthy," marveled Richard Reiser, lead test officer and second-in-command on the ground.

Local contractors assisted with all phases of construction. Although Suriname is a developing nation, all of the construction, from road and bridge upgrades to the compound's buildings, had to comply with local construction codes. Because of Suriname's history as a Dutch colony, these codes are European-based, and, thus, were unfamiliar to the American crew.

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Meanwhile, the test vehicle was trucked from Arizona to Ingleside, TX, where it was placed on a flat-bottom boat bound for Suriname. The trip was scheduled to last 10 days, but, because of a hurricane and other adverse weather, the Stryker didn't arrive until 4 weeks later. The Suriname crew was busy during the delay, though. "We had plenty to do while waiting," said Rolando Ayala, a tester usually based at the Tropic Regions Test Center facility in Panama. "We were starting from scratch."

Testing

The crew convoyed to the test site together each morning, using local drivers and aging vehicles that had been contracted to support the testers. The 10-mile commute took about 30 minutes over dirt roads. Once at work, the testing activities were similar to those that would be conducted on armored vehicles at YPG—namely, the meticulous performance data gathering of every possible facet of the Stryker's operation as it was used at a pace comparable to that of the tropical environment. The vehicle was driven in excess of 2,000 miles through punishing jungle terrain and was subjected to extensive stationary testing of its intricate electronic components. In addition to providing data for possible improvements in the test vehicle, the information gathered may influence the development of entirely new combat vehicle systems in the future.

The heavy vehicle often sank in the clay of the jungle test tracks when they were saturated by frequent tropical rains. According to the Stryker's multivolume operator's manual, lowering the tire pressure is the preferred method of gaining sufficient traction to negotiate muddy terrain. In practice, however, the testers found that deflating the tires could allow jungle biomass to compromise the space between the wheel and the tire. Keeping the tires inflated at highway pressures prevented this while

Muddy roads are typical in tropical environments. Although the Stryker's operating manual suggests deflating the tires to negotiate this type of terrain, the Suriname testers determined that the practice could allow biomass to compromise the space between the wheel and the tire. Insights like these are only generated in real-world test conditions. (U.S. Army photo.)

The Suriname crew, comprised of test personnel from three different test centers under the jurisdiction of YPG, poses in front of the Stryker test vehicle. The test compound was named in honor of Antonius "Foemi" Berika, a local contractor who was instrumental in the compound's construction and died in an off-duty accident during the test activities. (U.S. Army photo.)

still enabling the vehicle to extricate itself from the mud. These types of insights would not have been generated by testing the vehicle in a simulation chamber.

The ability to improvise was another priceless skill in the jungle. As an example, at one point the Stryker's air conditioning system, one of the many components being tested, malfunctioned. The crew had a complete replacement unit packed in a large crate inside a storage container. Removing the heavy box would have required a forklift and lifting out the unit would have necessitated a crane. Rather than spending 2 to 3 days unpacking and installing the entire unit, vehicle maintenance worker Mike Newbourn drilled a hole in the side of the box large enough to remove the necessary replacement component. "Mike had us back on the road in less than an hour," Reiser recalled. Considering the extreme humidity of the jungle climate, the air conditioning system is a critically important system as it dries out moisture that would otherwise corrode metallic components within the vehicle.

Unlike testing at YPG's established centers, the Suriname crew did not have ready access to spare parts. Ordering a replacement from the U.S. could take a month to arrive, and it was unlikely that any specialized equipment would be available on the open market in Suriname. All instrumentation had been trucked to Suriname in four storage trailers. Aside from this, the crew worked long hours following the same procedures they would follow while conducting vehicle tests at their typical duty stations.

Contributing to the General Welfare

In addition to testing, crew members found themselves contributing to the well-being of local society. The most striking example was the construction of a telemedicine link, a sophisticated audio and video system that remotely connects doctors in isolated Moengo with diagnosticians at the university hospital in the capital city of Paramaribo. The construction of this vital piece of infrastructure helped alleviate local concerns about the scope and duration of the test mission, as did a series of town hall meetings with the populace. Eusebio Lopez, a 27-year testing veteran who served as site manager, was the principal liaison between the test crew and the communities in and around Moengo. "He was able to insulate us from and address many minor local problems that had the potential to turn into major problems," said Reiser. "He went above and beyond on a daily basis."

Future

Despite the logistical challenges, delays, and culture shock, the Stryker testing was completed 5 weeks ahead of schedule. "I am very proud of the way our teams interacted and worked together to complete the test early under challenging circumstances," said Ayala. "That is a very satisfying feeling. I look forward to working with these professionals again."

Today, locals in Moengo anticipate that the mining conglomerate BHP Billiton, Moengo's largest employer, will cease local operations in 2010, a development that would significantly hurt the local economy. This prospect, combined with the good rapport the testers established with the local populace, make YPG's potential return eagerly anticipated.

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