

**A** carpet was rolled out when the C-17 Globemaster III touched down at JB Andrews, Md., the morning of Aug. 16. The extra measure wasn't for the comfort of VIPs who frequently pass through the base located near Washington, D.C. It was for protection.

Within minutes, Col. Nicholas Conger, an infectious disease consultant, and Maj. Joel M. Villavert, a flight nurse evaluator, assisted Maj. Stephanie LaPierre in exiting an air-tight containment pod to walk down the carpet-covered loading ramp and into an awaiting ambulance.

The ambulance promptly headed to Walter Reed National Military Medical Center in Bethesda, Md. LaPierre and anyone who went near her was covered in protective gear from head to toe.

Fortunately for LaPierre, the whole scenario was an exercise to validate Air Mobility Command's concept of operations for transporting a patient, suspected of having Ebola, using the Transport Isolation System.

When 2,800 DOD personnel deployed to West Africa to counter the Ebola outbreak in late 2014, the military did not have the ability to safely evacuate contagious patients back to the United States for care. A commercial carrier was available to transport a single patient, but there would have been no way to move a high number of casualties if an outbreak occurred among troops who required US care.

Seeing an immediate problem, US Transportation Command initiated a joint urgent operational need request in September 2014. TRANSCOM sought a system that could evacuate multiple US personnel if necessary.

"So our approach was: If we're going to put military members in harm's way, the capacity to move a single patient at a time was insufficient to the mission

# Ebola Flight

By Will Skowronski, Senior Editor



that we are asking our team to do,” Air Force Gen. Paul J. Selva, TRANSCOM commander at the time, told reporters in December 2014. Selva is now vice chairman of the Joint Chiefs of Staff.

Within a matter of months of the request, in January 2015, the TIS became mission capable.

### **AN ISOLATION ROOM**

Each TIS—a pod enclosed by plastic sheeting secured over a metal frame built on modified pallets that can be loaded into a C-130 or C-17—consists of at least one isolation chamber that can carry up to four patients and a separate antechamber used for decontamination. A maintained negative pressure and air filtration system prevent contaminants from leaving the chamber.

“It’s an isolation room, but it’s just sitting on an airplane,” Conger said.

Because the system is scalable, a second isolation module can be added. Standard C-130s can only carry the single isolation-module configuration, but the stretched C-130J-30 and C-17s can carry the larger, two-module configuration. In fact, the C-17 can hold up to two units.

Maj. Erika Smith, branch chief of AMC’s aeromedical operations and training, said the number of patients that can be transported at once will differ, depending on the condition of the patients.

AMC now has 25 units, which are stored at JB Charleston, S.C., Scott AFB, Ill., Wright-Patterson AFB, Ohio, and JBSA-Lackland’s Kelly Field Annex in Texas. Built by Production Products in St. Louis, which had already made smaller units for commercial use, the development and purchase of the TIS units only cost \$7 million.

“Before that, there was no system in place,” said Maj. Melissa Buzbee Stiles, branch chief of the Clinical Operations Division within AMC’s Office



**AMC proves it can move an infectious patient forward for advanced treatment.**

*AC-17 on the flight line at JB Charleston, S.C., equipped with a Transport Isolation System, during Exercise Mobility Solace in August.*



*/1/ Medical and support personnel aboard a C-17 prepare for takeoff during Mobility Solace. The exercise allowed Air Mobility Command and joint partners to evaluate how they would move multiple patients exposed to or infected with the highly contagious Ebola virus. /2/ Capt. Thomas Jones (l) dons protective gear before entering the TIS during Mobility Solace. Col. Nick Conger (r), an infectious disease consultant, helps him. /3/ Conger (l) and Maj. Joel Villavert, a flight nurse evaluator, prepare to transfer a simulated Ebola patient from the TIS to an awaiting ambulance at JB Andrews, Md. /4/ Maj. Stephanie LaPierre, a simulated Ebola patient, is transferred in a containment unit from an ambulance to Walter Reed National Military Medical Center in Bethesda, Md.*

USAF photo by TSgt. Gegory Brook



Staff photo by Will Skowronski



of the Command Surgeon. “This is an entirely new concept.”

A designated support team, responsible for storing, configuring, loading, and decontaminating the TIS, is located at JB Charleston, Stiles said in an email. The 43rd Aeromedical Evacuation Squadron at Pope Army Airfield, N.C., and 375th AES at Scott will execute any TIS mission.

Infectious disease specialists and critical care teams that would also be part of any TIS flight are tasked from their local units of assignment.

August’s Exercise Mobility Solace was the first time the entire evacuation process, including transferring the pa-

tient to a medical facility, was practiced, AMC Command Surgeon Brig. Gen. Lee Payne said. But the C-17, assigned to the 436th Airlift Wing at Dover AFB, Del., picked up LaPierre in Charleston, rather than from the simulated outbreak area in Africa.

Smith said the exercise was to validate procedures and timelines, including a 72-hour deadline to get the patient back to the US once the transfer request is received. Conger said the idea is to get the patient Stateside before overt symptoms appear because that is when Ebola is most contagious.

During the flight, an aeromedical evacuation crew practiced caring for

LaPierre, a process complicated by the need to carefully don and remove substantial amounts of personal protective equipment in the anteroom section of the TIS to avoid contaminating crew members and the aircraft.

SMSgt. Kristen Smith, superintendent of the 43rd AES, said the enclosed space made communication tricky. During the flight, LaPierre used a small whiteboard to write messages that could be read through the clear plastic lining when a team member wasn’t inside the TIS with her.

“It takes a lot more effort to care for the patient” in these intense conditions, Smith said.

But the flight was also to test the TIS itself. Payne said prior practice uses showed a stronger frame and solid doors, rather than the original flaps with zippers, were needed to support the structure.

“Any time you write something down on paper, it sounds really good. But any time you walk through it, you find holes,” Payne told *Air Force Magazine* while en route to Andrews. “We’re going to learn a lot out of this exercise.”

During the flight, an actual hole was found in the TIS’ plastic lining. Smith said that while it was unexpected, the negative pressure would have prevented a contamination. Crew members are taught how to repair any openings.

“We’ll use the after-action reports

## GETTING IT RIGHT

Capt. Richard Elliot, the mission pilot, said the training is important for aircrews because loading the isolation system and addressing the patients’ needs require a lot of coordination between the pilots, loadmasters, and medical personnel.

“It’s definitely a mission you don’t want to get wrong,” he said.

After landing at Andrews, LaPierre was loaded into a specialized ambulance, with a portable isolation pod, and driven to Walter Reed, where a medical team practiced transferring her to a contained treatment room.

Chris Gillette, command emergency manager for Walter Reed, said the exercise was an opportunity for the numer-

gust the military will likely play a larger role in future outbreak responses. This is because of the capabilities, including the TIS, the services developed during the USAID-headed relief effort.

“Putting together those isolation systems was really a great lesson on how we could rapidly develop capability if that were to become required, depending on the environment that we were in,” said West. She also heads US Army Medical Command.

Smith noted that because the TIS was developed to handle the 2014 Ebola outbreak, the knowledge gained by health care providers, including some who were infected due to breaches, informed AMC’s concept of operations.



Staff photo by Will Skowronski



Staff photo by Will Skowronski

and the results of this exercise to continually improve our ability to respond to Ebola-type situations,” Stiles said. Further evaluation of the lining will be done in light of the exercise’s findings “to ensure the highest quality product with the greatest level of protection is produced,” she added in an email.

Conger said practice is “invaluable” for the medical teams and that the run-throughs revealed potential procedure tweaks, such as making wash buckets available in the anteroom to help maintain a clean zone. He said the aeromedical crews, which receive a week of specialized TIS training, would also practice on their way to pick up a patient.

ous parties involved to run through the procedures developed during tabletop exercises and “see what we can do better,” even including figuring out the best way for the ambulance and support vehicles to pull into the hospital.

Though lessons are still being learned, Conger said, there wouldn’t have been any contamination breaches during the evacuation if the patient had actually been infected. “So from that perspective, it went very well,” he said.

Army Surgeon General Lt. Gen. Nadja Y. West, who served as the Joint Staff surgeon during 2014’s Operation United Assistance and was nicknamed “Queen Ebola” at the time, told reporters this Au-

“We are hopeful that we have taken all of those lessons learned, put that into our plans, [so] we can keep our crew members and health care providers as protected as possible—and also our military airframes, so they can continue to be used throughout to support the mobility operation,” she said.

Payne acknowledged that the thought of having a contagious person transported to the United States is disconcerting for some.

“We want everyone to know that we can do it safely,” he said.

While no one hopes the TIS is put to the test soon, if AMC were called tomorrow, Payne said, “we could execute this mission.”