

CymSTAR Rebuilds 747-200 Sim To Train USAF Doomsday Crews

Brian Everstine April 15, 2022



Maj. Gen. Andrew Gebara, right, commander of 8th Air Force, demonstrates a new E-4B flight simulator near Offutt AFB, Nebraska.
Credit: U.S. Air Force

OMAHA, Nebraska—A four-decade-old [Boeing 747-200](#) simulator that was headed for disposal has been refurbished to train the [U.S. Air Force's](#) Doomsday plane pilots as part of an effort to increase the overall readiness of the four-plane E-4B Nightwatch fleet.

Officials at Offutt AFB, Nebraska, and CymSTAR unveiled the simulator at a new facility near the base, which will soon start training pilots and flight engineers as the Air Force begins its plan for the E-4B's replacement.

The simulator began its life in the early 1980s, originally for [KLM Royal Dutch Airlines](#) pilots to train and maintain currencies. After being used by [All Nippon Airways](#), the simulator made its way to Ypsilanti, Michigan, for Kalitta Air. As Kalitta planned to retire its 747-200s, the company planned to dismantle and dispose of the simulator.

About two years ago, Tulsa, Oklahoma-based CymSTAR got involved and obtained the simulator. Over about 14 months, the company refurbished the system's full-motion hydraulics, upgraded the software to include increased cybersecurity, modernized its visual display and programmed it to allow pilots to practice aerial refueling.

"As the 747-200 fleet draws down and is being retired at a rapid pace, that is becoming more difficult to get training in that platform, so it was an opportunity that we saw to take something that was becoming less in demand in the commercial sector and repurpose it for something that was very important," CymSTAR President and CEO Daniel Marticello says.

For years, Offutt-based E-4B aircrews had to fly to Miami to train on a system owned by Atlas Air that is also used by VC-25A aircrews. This required 16-18 visits per year for academic and simulator training before pilots could fly the E-4 or to maintain their currencies, says Col. Brian Golden, commander of the 595th Command and Control Group at Offutt.

This approach was costly and the simulator did not fully replicate the unique E-4B. When COVID-19 pandemic-related restrictions began, crews had to cancel visits or quarantine, further increasing the timeline.

About 80-90% of training is currently done on the E-4B aircraft itself, which flies at an hourly cost of about \$147,000, Golden says. With the simulator, which is expected to be fully operational this summer, he expects flight engineers to conduct 80-90% of their training in the new system, and pilots could meet 60-70% of their requirements in it.

The ability to practice aerial refueling in a simulator, for example, will largely decrease the amount of flying time needed in both the E-4B and for tankers. It currently takes between 12-18 sorties to be proficient in aerial refueling in the E-4B, and Golden expects the simulator could bring that down to six to eight. The savings from the reduction in training flying hours should pay for the simulator within about three months, he says.

The E-4B fleet is small, with just four of the [747s](#) at Offutt, though typically at least one is going through heavy maintenance at [Boeing's](#) San Antonio facility that can take it offline for about a year. The aircraft has more than 40 communications systems on board, which are constantly being updated. As an example, when Aviation Week visited the aircraft at Lincoln Airport on April 14, one E-4B was preparing to fly on a sortie to test a new trailing cable that is used for low-frequency radio transmission.

Whenever a new communications system is added, that aircraft needs to be checked out again and deemed safe to fly. Some upgrades require additional rewiring inside the aircraft, a process that can take that aircraft out of service for a longer period. [Air Force Materiel Command](#) has been developing new hardware, so communications upgrades can be done with software changes instead of firmware, Golden says.

One or two E-4Bs are typically in this upgrade scenario at a time, with one on alert or used for training. If the group is needed for a mission, such as the Defense Secretary leaving on a trip overseas, training will be canceled.

"This simulator is going to allow me to say yes a lot more than I can right now," Golden says.

For about two years the Offutt crew has also been operating at a temporary base about 1 hr. down the road in Lincoln. Because of a massive flood, Offutt is rebuilding its runway and undergoing other construction.

The change has shifted the group's operations, with the aircraft and personnel alert cycle going to two weeks instead of one. While aircrew still work out of Offutt, maintainers are now "deployed" to Lincoln on a temporary status for weeks at a time to keep the alert aircraft ready and conduct needed maintenance. Offutt has rented out an entire hotel near the Lincoln base for the maintainers and other crews who come in.

The flood has also showed a need to change how the E-4B's spare parts are organized. Instead of keeping them all in one location at Offutt, the parts are now dispersed between the Nebraska base and [Boeing's](#) San Antonio facility. Some parts also come in from [Boeing](#) in Seattle to avoid a scenario in which the location of needed parts could be hit by a storm. The E-4B also flies with enough parts and maintainers at all times in case the aircraft breaks down in an overseas location and needs to be fixed quickly. That parts package constantly grows as more breaks occur.

As the Offutt unit looks to overhaul its training and increase the jet's readiness, the Air Force is looking at its follow-on—the Survivable Airborne Operations Center, with its requirements still being determined. In the meantime, the aging E-4B is still in high demand and needs to be upgraded to continue to meet its mission for the next five to seven years, says Maj. Gen. Andrew Gebara, commander of Air Force Global Strike Command's Eighth Air Force.

"There's only a few aircraft. Every aircraft I take off the line to train with is a huge blow to operations," Gebara says. The E-4B is in a "transitory time" as it heads to retirement, and "that's when aircraft availability becomes really difficult. Having that ability to train without taking [aircraft] offline is very important."