*INDEPENDENT SPECULATIVE PROJECT - FOR PORTFOLIO PURPOSES ONLY*

## INSIGHTS: DEFENSE & SECURITY - WHY DOES SIMULATION MATTER?

***Military transport crews for the C-390 Millennium must be prepared for a wide range of missions and not every scenario can be practiced easily in an actual aircraft. This is where simulators come in.***

A military transport pilot must be prepared to respond to an aircraft malfunction during adverse weather conditions. A loadmaster must be able to assess cargo weight, distribution and securement during a time-sensitive resupply mission. Simulators are used to train and prepare C-390 aircraft crews and ground personnel for situations they may face in the field.

Through two training systems, C-390 crews will be able to interact within simulated environments that reproduce aspects of real-world flight and cargo operations. The first simulator is designed for pilots and the second is for loadmasters and cargo personnel. A loadmaster is a crewmember who specializes in managing, calculating and securing cargo along with equipment and passengers.



The C-390 Millennium cockpit. Simulation-based training prepares pilots to manage aircraft systems and respond to challenging flight conditions. (Photo Credit: Fernando Xavier / Wikimedia Commons. Licensed under CC BY-SA 4.0.)

### Preparing pilots for the unexpected

First, the Full Flight Simulator (FFS), designed to achieve Level D qualification, provides pilots with highly immersive training under simulated normal, abnormal and emergency conditions. Level D is the highest of full-flight simulator qualification levels under established civilian aviation standards, with stringent requirements for realism and simulator performance. The FFS allows for the safe practice of a range of military mission scenarios, including more than 350 simulated malfunctions, with reduced costs and risks to the operation. The C-390 can perform a wide range of missions including cargo and troop transport, medical evacuation, search and rescue, firefighting and humanitarian operations. It can also operate from temporary or unpaved runways. Pilots are able to rehearse flight procedures, emergency responses and military mission scenarios.

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**Training the crew behind the cargo**

Second, the Cargo Handling Station Trainer (CHST), developed in partnership with Rheinmetall, enables comprehensive training for loadmasters and cargo personnel during their operations. It uses advanced visual display technology, which provides interior cargo hold views along with the exterior view of the entire aircraft. This allows loadmasters to practice key responsibilities including planning loading arrangements, understanding weight distribution and securing equipment while following operational procedures. The C-390 can accommodate a wide range of cargo, from military pallets to vehicles and airdrop bundles, requiring loadmasters to prepare for different loading configurations and handling procedures. The CHST helps prepare loadmasters to manage cargo operations on an aircraft capable of carrying up to 26 metric tonnes of payload.

These technologies support different but complementary aspects of the C-390's military transport operations and together support operational readiness and mission effectiveness across the future and existing C-390 fleet.



Military personnel prepare for an operational parachute jump aboard a C-390 Millennium.
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**Why bring these capabilities closer to European operators?**

The new training facility in Bremen is intended to improve access for European air forces by bringing these capabilities closer to operators' home bases. A new facility will bolster long-term training support as existing and future C-390 operators will require initial and ongoing crew training as the fleet develops. Expanding the multinational training network could also reduce reliance on a single training hub while complementing existing national arrangements.

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