



Photo courtesy of Airbus Military

## MTS Active Load Abort System

Enhanced protection for valuable aerospace test articles

### Benefits

- » Continuous test system monitoring to provide rapid, uniform unloading when needed
- » User-definable unloading schemes for both rate and unloading load profiles
- » Redundant primary and secondary FlexTest® control systems
- » Advanced active load abort manifolds
- » Mechanical fail-safe system
- » Load limiting

Aerospace structural tests involve many channels of load applied through dozens, sometimes hundreds, of hydraulic actuators. In the event of a power outage or mechanical malfunction, dangerous amounts of energy may remain within the test article, which can unload in unpredictable ways if left unmanaged.

In such an event, mechanisms exist at both the software and hardware levels to protect data and cease test activity – but these alone cannot fully safeguard valuable test articles from sustaining physical damage. At the point of system interlock it is essential to remove all loads from the test article evenly. While conventional mechanical, or passive, load

abort technology can effectively unload hydraulic pressure, it cannot achieve coordinated load levels for all actuators across the test article simultaneously.

The MTS Active Load Abort System is designed to ensure the safety of valuable aerospace test articles by providing complete control over both planned loading and unintended unloading of multi-channel structural test systems.

Combining advanced FlexTest® controls, AeroPro™ software and a unique hydraulic manifold design, these systems are capable of reducing all actuator loads to a neutral state at precisely the same time, regardless of varying pressures and positions of individual actuators.

The effectiveness of the MTS Active Load Abort System is derived from a redundant control scheme in which an independent unload control system runs in parallel to the test load control system. The loading and unloading of each actuator is implemented through advanced active load abort manifolds, which can be mounted directly to actuators, or stand free to avoid adding mass to the actuators; bracketing manifolds together on a frame is also an option.

Each manifold features both a primary and secondary control circuit. The primary circuit is driven by the load control system and is comprised of a standard MTS Series 252.2X servovalve, rated from 3.9 to 63 lpm. The secondary circuit is driven by an independent unload controller with one or two proportional valves capable of 50 to 200 lpm maximum unloading flow rates. Relief valves provide a tertiary mechanical fail safe, and are designed to meter the flow from the actuator to keep test specimen unloading under control - even if both the primary and secondary circuits fail.



Each MTS Active Load Abort Manifold features a primary and secondary control circuit, as well as a tertiary mechanical fail safe



**MTS Systems Corporation**  
 14000 Technology Drive  
 Eden Prairie, MN 55344-2290 USA  
 Telephone: 1.952.937.4000  
 Toll Free: 1.800.328.2255  
 E-mail: info@mts.com  
 www.mts.com  
 ISO 9001 Certified QMS



Developing the Active Load Abort System

Working in concert with the active load abort manifolds, the unload control system continuously monitors the state of the entire test. When it detects a failure or test interlock on the load control side it immediately prompts the uniform removal of all loads from the test article, protecting it from harm.

The unload control system employs versatile FlexTest controller technology and AeroPro software with easy to set up user-definable unloading schemes for both rate and unloading load profiles. Users have the flexibility to define what events trigger an automatic unloading sequence, including power loss, E-stop, overload and primary control failure. To provide the utmost in test article protection, the unload controller is backed up by Uninterruptible Power Supply (UPS).

Increasingly, test engineers are pushed to bring high-performance products to the marketplace sooner. They are working to perform faster, more complex cyclic and

static tests with expensive test articles. As a result, many manufacturers are requiring test labs to employ active abort load measures. Contact MTS today to learn how innovative MTS active load abort technology can be deployed to protect your staff, test articles and test data.

#### System Options:

- » Primary Flow Control – Select from MTS Series 252.2X servovalves, rated from 3.9 to 63 lpm
- » Secondary Flow Control – Select from 50 to 200 lpm maximum unloading flow rates
- » Multiple Triggers – FlexTest controllers offer the flexibility to initiate the unloading sequence through a variety of triggering events, including power loss, E-stop, overload and primary control failure
- » Flexible Mounting – MTS active load abort manifolds can be attached directly to an actuator, placed remotely on the floor, or mounted on an adjacent bracket.

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