PROJECT OVERVIEW: HYDRAULIC TEST SYSTEM UPGRADE FOR AIRCRAFT SEAT TEST RIGS

SAFRAN SEATS, CWMBRAN, WALES

Safran Seats is a global leader in aircraft seating solutions, with over one million seats in service across major airline fleets, providing seating for passengers and crew, across commercial aircraft and helicopters – tailored to the diverse needs of major airlines and manufacturers. To enhance test performance and reliability, Safran Seats collaborated with Moog and Savery Hydraulics to implement a major upgrade of its hydraulic test infrastructure.

MARKET

Test

Automation

OTHER APPLICATIONS

Simulation

CAPABILITY

Global Focus

Expertise

Modelling & Simulation

THE CHALLENGE

Safran's test facility in Cwmbran included two static test rigs used for static testing of aircraft seats. These rigs utilised manually operated valves to vary the force that the hydraulic cylinders produced. The legacy hydraulic systems were in need of modernisation, with improved documentation and functionality core to the requirement.

Safran required a solution that would:

- **Add a third test cell to expand testing capacity**
- **Introduce modern, flexible, and user-friendly testing technology**
- **Enable simultaneous operation of all rigs with dedicated hydraulic and control systems**
- **Integrate data acquisition and video monitoring for comprehensive test analysis**
- **Ensure compliance with current health and safety standards**
- **Improve energy efficiency and system control**
- **Allow safe and efficient changeover of test articles with minimal downtime**

THE SOLUTION

Moog proposed a comprehensive upgrade package, including the design, manufacture, installation, and commissioning of a modern closed-loop servo hydraulic system tailored to Safran's requirements.

KEY COMPONENTS INCLUDED:

+ **Hydraulic Power Unit:** A single energy efficient unit with a triple-outlet hydraulic service manifold, compliant with EN13849 safety standards. This allows independent operation and safe isolation of rigs during setup or maintenance. The system uses Moog RKP 19cc pumps.
+ **Safety Features:** Integrated low-flow, low-pressure mode for safe actuator positioning during setup, reducing risk of injury. Dual isolation system of the pressure supply to each test rig with functional monitoring.
+ **Actuators:** 280 Bar unequal area actuators with integral displacement transducers, servo valves, with low friction features for precise control. These are compatible with existing structures and enable real-time feedback and precise control of test parameters.
+ **Control System:** A Moog 6-channel closed-loop servo control system with three dual-screen operator workstations running Moog Test Suite software. This ensures precise control of actuator motion and force, critical for lifecycle and fatigue testing.
+ **Data Acquisition:** A 100-channel portable system with additional operator workstations and video camera substations for comprehensive test monitoring and analysis in each Test cell.

Moog and Savery delivered the system with full installation, commissioning, and operator training, ensuring a smooth transition and continued high-performance testing.

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THE RESULT

The Safran Test facility is now able to offer high performance precision structural testing with three independent test cells to address the needs of their customers.

Operators can configure, control, and monitor tests from dedicated workstations in each cell, improving usability and efficiency.

The facility is backed by a maintenance and support contract, including annual calibration, reinforcing the long-term partnership between Moog and Savery Hydraulics.

THE BENEFIT

Aran Taylor, Head of Test, at Safran Seats GB explains. "What truly stands out—and I can't thank you enough for this—is the evolution from what we called Proposal One or the initial proposal, to what became Proposal Two. Originally, we had limited the operation to a single test rig control, with a unified key system to transfer control. Now, we've progressed to a setup where each of the three test rigs can be controlled independently and most importantly, simultaneously. That's a significant leap forward. This flexibility is unmatched within Safran systems, impressing internal and external stakeholders, and laying a strong foundation for future developments."

Aran continues, "We've also improved our use of cost-effective IP bullet cameras connected to a Network Video Recorder (NVR) to monitor rig operations. Integration challenges were overcome using a new Ethernet-based system with software that enables automatic recording triggered by activity. The system now displays both video and data feeds. It was successfully tested during a key customer forward test with 7–8 attendees, yielding impressive results and valuable insights".

"While a neighbouring team conducts full-scale certification tests, we can continue setup, servicing, and calibration without interruption—thanks to the hydraulic service manifolds providing test rig isolation. Previously, this would have caused a two-day shutdown. This independence is a standout success."

The control room now features two active workstations supporting large and small rigs, with Rig 3 nearby. Safety manifolds introduced in Proposal Two eliminate hazardous manual hose transfers, and new junction boxes have improved organisation and functionality.

The investment has enabled flexible rig shutdowns for upgrades and budget optimisation. For example, installing new Savery actuators required structural modifications, during which manual lifting was replaced with assisted systems—reducing task time and significantly improving safety.

"The collaboration has felt like a true partnership, with Moog leading the second phase and introducing independent HSM units, far exceeding initial expectations. Issues have been resolved swiftly, reinforcing the strength of the relationship".

CONCLUSION

Using the latest technology to meet today's stringent requirements for testing precision, data capture, and safety, the upgraded facility satisfies all initial expectations and provides a future-proof, supportable test laboratory—enhancing Safran's business opportunities moving forward.

ABOUT ARAN TAYLOR - HEAD OF TEST AT SAFRAN SEATS GB

Aran's role involves coordinating and conducting static, cyclic, and acoustic testing for aircraft seating products. These include seat frames and cabin furniture. Aran leads a small team operating across multiple test rigs, with a focus on emergency crash testing. The goal is to evaluate whether seating products can withstand extreme conditions, ensuring they meet safety and performance standards required for aviation.

For further information, visit:
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