



# Modernizing NASA's High Capability Centrifuge

NASA's Goddard High-Capacity Centrifuge (HCC) in Greenbelt, MD stands as a one-of-a-kind national monument built in the 1960s to support the Apollo space program. This facility simulates extreme launch and landing loads for spacecraft testing.

## Case Study

### INDUSTRY

Aerospace

### RESULTS

- Restored Reliability
- Improved Safety
- Operational Insight
- Reduced Costs and Risks
- Preserved National Asset

**120ft**

Centrifuge Arm Diameter

**30 g**

Maximum Acceleration

**5K**

Payload Capacity  
(lbs)

**60 +**

Years of Service

## The Problem

Due to the antiquated legacy systems of the HCC, NASA faced increasing difficulty sourcing replacement parts, and the outdated controls lacked modern diagnostic tools or the ability to update software. The long-term reliability, maintainability, and safety of the HCC were at risk if NASA did not act quickly.

## Our Solution



### PLC Upgrade

Replaced the Automax system with a Siemens S7-1500 PLC, providing modern, flexible, and easily supported controls.



### Operator Interface

Integrated a Siemens WINCC HMI that gives operators real-time visibility, intuitive controls, and details of fault diagnostics.



### Motor Control Modernization

Installed Siemens DC drives to replace the antiquated DC field control system.



### Safety Enhancements

Implemented automatic shutdown protocols and advanced alarming to monitor safety and performance.

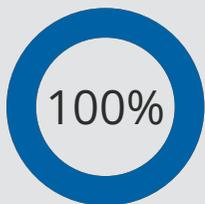


**PREMIER AUTOMATION**  
POWERING INDUSTRIAL AUTOMATION

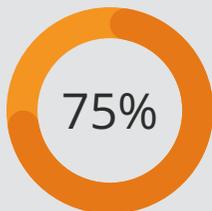
## TECHNOLOGY STACK

- **Siemens S7-1500 PLC:** Industrial-grade programmable logic controller
- **WINCC HMI:** Advanced human machine interface
- **Siemens DC Drives:** Precision motor control systems
- **Safety Monitoring:** Automated protection protocols

## Case Study



System Uptime  
Improvement



Diagnostic Time  
Reduction



Maintenance Cost  
Savings

## Results & Impact



### Restored Reliability

Fully supported, modernized system eliminates uncertainty of obsolete hardware and ensures mission readiness



### Enhanced Safety

Automated shutdowns and advanced monitoring protect personnel and valuable test payloads during operations



### Operational Excellence

Detailed diagnostic information enables efficient troubleshooting and preventative maintenance strategies



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