Advanced Ground Systems Maintenance Cryogenics Test Lab Control System Upgrade Project

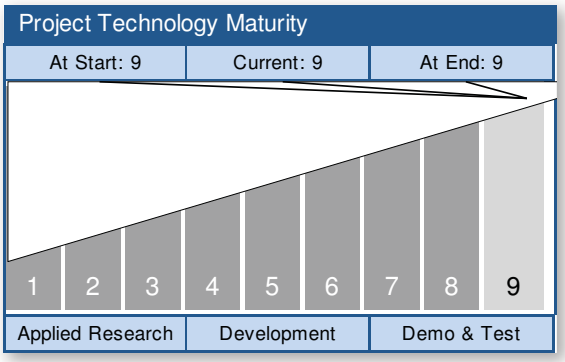
Ground Systems Development And Operations Program

Human Exploration And Operations Mission Directorate (HEOMD)

National Aeronautics and Space Administration

ABSTRACT

This project will outfit the Simulated Propellant Loading System (SPLS) at KSC's Cryogenics Test Laboratory with a new programmable logic control system. The control system upgrade enables the Advanced Ground Systems Maintenance Element Integration Team and other users of the SPLS to conduct testing in a controls environment similar to that used at the launch pad.



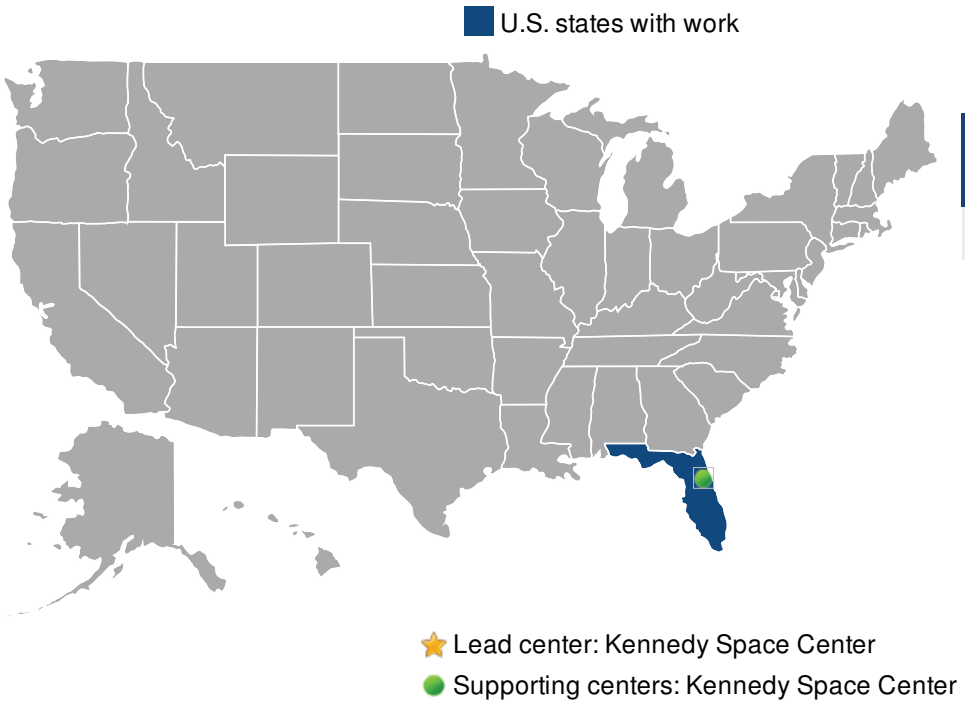
Technology Area: Ground & Launch Systems Processing TA13 (Primary)
Robotics, Tele-Robotics & Autonomous Systems TA04 (Secondary)

ANTICIPATED BENEFITS

To NASA funded missions:

The conversion will enable early integration, testing, evaluation and analysis for integrated health management capabilities prior to deployment as advisory application for ground systems. Utilizing the Cryo Testbed with “Pad-relevant” controls will “buy down” the risk of deploying advisory application for Pad operations without real-time testing. Helps focus development on concepts and applications with high potential for reducing operations and maintenance costs, improving system availability, and/or safety. Helps formulate a methodology for ...

Read more on the last page.



Other Organizations Performing Work
QinetiQ North America

DETAILED DESCRIPTION

Outfits the Simulated Propellant Loading System with four Allen Bradley programmable logic controllers for command, control and data acquistion.

MANAGEMENT

Program Executive:
Michael Bolger

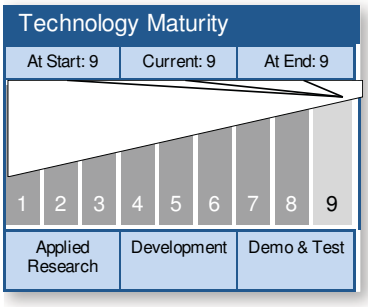
Program Manager:
Kirk Lougheed

Project Manager:
Barbara Brown

Principal Investigator:
Barbara Brown

TECHNOLOGY DETAILS

Advanced Ground Systems Maintenance Cryogenics Test Lab Control System Upgrade



TECHNOLOGY DESCRIPTION

The deliverable will be a compatible control infrastructure to match the present command and control approach use for ground operations.

This technology is categorized as a hardware system for other applications

- Technology Area
  - TA13 Ground & Launch Systems Processing (Primary)
  - TA04 Robotics, Tele-Robotics & Autonomous Systems (Secondary)

CAPABILITIES PROVIDED

Allen Bradley, PLC-based control system for the Simulated Propellant Loading System. This conversion provides a migration path for testing and evaluation of new technologies, components, concepts and approaches in a relevant Pad Environment with similar hardware and software controls. The capability will also be used for developing new command/control approaches cryogenic loading operations.

The capability can be used for developing new command/control approaches for automated and autonomous cryogenic loading operations.

IMAGE GALLERY

Upgraded control capability at the Cryogenics Test Laboratory's Simulated Propellant Loading System

ANTICIPATED BENEFITS

To NASA funded missions: (CONT'D)

quantifying/measuring return on investment.

To NASA unfunded & planned missions:

The capability can be used for developing new command/control approaches for automated and autonomous cryogenic loading operations.

To the commercial space industry:

The capability can be used for developing new command/control approaches for automated and autonomous cryogenic loading operations.