

# RASA Software Development Environment and Automated Testing

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## OVERVIEW

### PROBLEMS OVERCOME:

- The RASA system requires constant testing of the software and hardware to support operations, maintenance, upgrades and sustainment.
- Active development to repair bugs, add features, and support a growing list of individual hardware components.
- RASA software and hardware also necessitates a trained RASA engineer to complete the testing which can take 2-3 days.
- Allocating testing time can create a significant strain on the program by consuming hardware and personnel.

### SUCCESSES ACHIEVED:

- Reduction in the utilization of customer hardware, freeing the units for operations and maintenance support
- Simulate field error conditions that can be difficult to replicate in a lab environment
- Investigation of critical situations without risk
- Improved testing time and reliability of software.

### LESSONS LEARNED:

- Automated testing is essential
- The process of writing and performing the test helps engineers learn, comprehend and support the system.
- Continuous testing is necessary to producing reliable software.

## SOFTWARE SIMULATIONS



- Software simulator that mimics RASA hardware components (System Instrumentation Units version 1 & 2, DSPEC 50 & Lynx MCAs, Ontrak & CP5 Coolers, Symmetra UPS systems, MetPac & Vaisala MET stations )
- Easily inject errors into simulator to test RASA software's behavior



Spin up many different virtual machines to test different permutations of RASA hardware

VM	SIU	DET	MCA	MET
VM 1	ONTRAK	CP5	DSPEC	MetPac
VM 2	ONTRAK	CP5	DSPEC PLUS	Vaisala
VM 3	ONTRAK	CP5	DSPEC 50	MetPac
VM 4	OPTO22	CP5	LYNX	Vaisala
VM 5	ONTRAK	XCOOLER	DSPEC	MetPac
VM 6	ONTRAK	XCOOLER	DSPEC PLUS	Vaisala
VM 7	ONTRAK	XCOOLER	DSPEC 50	MetPac
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VM n	OPTO22	XCOOLER	LYNX	MetPac

## HARDWARE TEST STANDS

### Detector Test Stand



- Supports testing of three detector assemblies simultaneously.
- Designed to support three RASA lead caves and RASA control equipment
- Custom software to control all MCA's on the system.

### SIU Testing Framework



- Test Multiple SIUs
- Reduce dependency on a Full RASA system.
- Expedite testing phase of SIU production to deploy SIU sooner to field stations.
- Quickly test failed components returning from field.

## AUTOMATED TESTING FRAMEWORK

