Attachment E

Definition: Climate Modeling and Research System Acceptance Test

Solicitation Number 6400009257

1. CMRS Acceptance Test

The CMRS Acceptance Test shall comprise multiple components where the overall goal is to ensure that the system as a whole is capable of delivering the scientific output required by the NOAA project. The Acceptance Test shall be divided into 5 phases that shall test the system infrastructure with a combination of applications and synthetic benchmarks. This section provides an overview of the acceptance test process, where final details shall be negotiated as part of the contract award and prior to delivery of the system. The five phases are Hardware, Functionality, Performance, Stability, and Throughput.

Any requirement described in the Technical Specification may generate a specific test within the negotiated Acceptance Test procedure.

The Acceptance Test must be successfully executed for each delivered subsystem, and for any substantive upgrade.

1.1. Hardware

The system shall boot and run Offeror diagnostics. All Offeror diagnostics must pass and details of the diagnostic runs shall be delineated to the Acceptance Test team.

1.2. Entry Criteria for Functionality Test

Prior to entering the final four phases of the acceptance test the Offeror shall demonstrate the system capabilities by running the HPCC benchmark where the HPL component shall achieve at least 70% of peak performance.

1.3. Functionality Test

The Functionality Test shall contain but not be limited to system administration tests (reboots, infrastructure connectivity, compiler and library capabilities (C/C++, Fortran, MPI, OpenMP, optimized math libraries), the I/O subsystem and the generation of correct results from test cases from the benchmark applications outlined with this Solicitation.

1.4. Performance Test

The performance capabilities shall be tested for the performance requirements in the Technical Specification (such as the MPI performance requirements in the Technical Specification) as well as the applications and I/O tests in the benchmark suite. All metrics to be applied to the system acceptance shall be determined during contract award negotiation and prior to delivery.

1.5. Stability Test

The stability test shall be a synthetic workload along with an optional (at the discretion of ORNL) workload from friendly users to the system. The synthetic workload shall contain components from both the functionality and performance tests. All application or systems errors during the stability test shall be tracked and a root cause shall be determined. At least 95% of the jobs submitted must complete and all completed jobs must give correct answers. There shall be a time limit for the stability test with an available uptime metric to be applied. The time limit shall be at least 2 weeks. Downtimes for reboots do not count toward the stability time clock but do count toward the overall availability of the system.

1.6. Throughput Test

The throughput test shall determine the job throughput including computation and data movement capability between the FS and LTFS file systems. Success requires demonstrating the proposed throughput segment runtimes, the proposed overall job times (which includes data setup within the FS filesystem and completion of all data movement between the FS and LTFS filesystems) as well as verifying that the multiple instances of the benchmark reproduce each other at the bit level.

The proposed computational system shall demonstrate runtime variability consistent with the Solicitation Technical Specification for all benchmarks and job load during the acceptance time period. The Offeror shall explain any variability outside this limit to the satisfaction of ORNL.