**SCHEDULE G**

**PROJECT MANAGEMENT REQUIREMENTS**

# Project Management

The assembly, pre-shipment testing, delivery, installation and acceptance testing of the NWSC-2 systems, along with the subsequent support and maintenance of the systems to exceed system reliability thresholds, requires close cooperation between the Subcontractor and UCAR. Therefore, this document sets forth clear and comprehensive project management as a critical element of a successful system deployment, transition to production, and effective use during the system’s lifetime. Additionally, since the NCAR-Wyoming Supercomputer Center (NWSC) is located in Cheyenne, Wyoming, this addresses important logistics and transportation issues.

**Project Planning Workshop**

UCAR and the Subcontractor shall schedule and complete a workshop to mutually establish and agree upon project management goals, techniques, and processes. The initial workshop shall take place within 45 days after the Subcontract’s Effective Date. Additional project planning workshops shall take place as needed thereafter.

**Project Plan**

Subcontractor shall provide UCAR with a detailed Project Plan that includes a Work Breakdown Structure (WBS) and milestone schedule. The Project Plan shall contain all aspects of the proposed Subcontractor’s solution and associated engineering (hardware and software) and support activities. The initial project plan shall be submitted within 60 days of the Subcontract’s Effective Date and the project plan shall be updated, as needed, thereafter. The Project Plan shall include, but not be limited, to the following items:

* Project Management approach and process
* WBS
* Facilities planning (e.g., floor, power & cooling, cabling)
* Transportation and delivery of equipment
* Installation & Testing (including pre-delivery factory tests and acceptance tests)
* Shipping, delivery, deployment and integration
* System Stability Planning
* Software Plan
* Development that may be associated with technical options, or other innovative hardware or software components
* Interdependencies, such as those with 3rd party suppliers or vendors
* Risk assessment & mitigation
* Staffing throughout the life of the Subcontract
* Remote and on-site support and services, through the life of the Subcontract
* Training & education of systems, application, and operations staff

**Project Management Team**

The Subcontractor shall assign a Project Manager (PM) for the purposes of executing the Project Management Plan on behalf of the Subcontractor.

The Project Manager shall be assigned for the duration of the Subcontract and be based at the NWSC-2 site in Cheyenne, Wyoming during the delivery, installation and acceptance test period of the System. When the PM is unavailable due to vacation, sick leave, or other absence, the Subcontractor shall provide a backup who is knowledgeable of the NWSC-2 project and has the authority to make decisions in the absence of the PM. The PM or backup shall be available for emergency situations via phone or pager on a 24x7 basis through the delivery, installation and acceptance of the delivered system.

**Subcontractor Management Contacts**

The following positions in the Subcontractor organization are responsible for performance under this Subcontract:

* Project Manager
* Technical Representative
* Contract Representative
* Service Manager

The names and contact information for the individuals holding these positions and responsibilities are provided in Schedule C.

**Roles and Responsibilities**

The **Project Manager** has responsibility for overall customer satisfaction and Subcontract performance. It is anticipated that he/she shall be an experienced Subcontractor employee with extensive working knowledge of the products and services proposed. The Subcontractor’s PM shall:

* Act as conduit and single point of contact for information and issues between UCAR and the Subcontractor
* Delegate program authority and responsibility to Subcontractor personnel
* Quickly and effectively resolve conflicts or disagreements between Subcontractor staff and UCAR staff, or provide escalation for matters that require it
* Establish internal schedules consistent with the Subcontract schedule and respond appropriately to schedule redirection from the designated UCAR authority
* Establish team communication procedures
* Conduct regularly scheduled review meetings with Subcontractor and UCAR staff
* Approve, or obtain approval for, Subcontract deliverables for submittal to UCAR
* Obtain required resources from the extensive capabilities available from within the Subcontractor and from outside sources
* Provide for timely resolution of problems
* Apprise UCAR of new hardware and software releases and patches before release, or no later than one week of release, to the general market place and provide UCAR with said software within two weeks of request

The PM shall serve as the primary interface for UCAR into the Subcontractor, managing all aspects of the Subcontractor in response to the program requirements, and ultimately responsible for ensuring the performance of Subcontractor obligations.

The **Technical Representative** shall be responsible for:

* Developing system configurations to technical design requirements
* Updating UCAR on the Subcontractor’s products and directions
* Working with the PM to review the Subcontractor’s adherence to the Subcontract
* Working with UCAR staff to resolve technical issues that arise in the course of delivering Subcontract services

The **Contract Representative** is:

* The Subcontractor’s primary interface for Subcontract matters
* Is authorized to sign Subcontract documents committing the Subcontractor
* Supports the Project Manager by submitting formal proposals and accepting Subcontract modifications
* Liaise with Subcontractor contracts, procurement, and legal staff when required

The **Service Manager** has the responsibility for:

* Compliance with the Subcontractor’s hardware maintenance and software service requirements
* Determining workload requirements and assigning services personnel to support UCAR
* Managing the Subcontractor’s overall service delivery to UCAR
* Provide feedback on status of open service requests, or other matters that impact, or have the potential to impact, Subcontractor service level obligations to UCAR
* Meeting with UCAR personnel regularly to review whether the Subcontractor’s service is filling UCAR’s requirements

# Status and Meetings

The Subcontractor shall communicate periodically with UCAR as described below.

**Daily Progress Reviews**

The Subcontractor’s PM shall communicate daily with UCAR’s Project Manager, Technical Representative or designate, and appropriate UCAR staff. These daily communications shall commence shortly after the Subcontract’s Effective Date and continue until both parties agree they are no longer needed. The communication may be via email, teleconference or a meeting - whichever is appropriate for the agenda. Target duration for this meeting is one-half hour. Both Subcontractor and UCAR may submit agenda items for this meeting. The topics covered in this meeting include, but are not limited to:

* Project status, including schedule of deliverables, testing or other Subcontractor commitments
* System problems status, including escalation, that impact schedule and deliverables
* Non-system problems, such as contractual issues, staffing or other matters that impact schedule and deliverables
* Impending deliveries
* Other topics as appropriate

**Weekly Status Meeting**

The Subcontractor’s PM shall schedule this meeting. Target duration is one hour. Weekly meetings shall commence shortly after the Subcontract’s Effective Date and continue until both parties agree they are no longer needed. Frequency of these meetings will be adjusted as needed. Attendees typically include the Subcontractor’s PM, Service Manager, UCAR’s Project Manager, Contract Representative, Technical Representative, and System Administrator(s) as well as other invitees.

Topics covered in this meeting include:

* Review of the past seven days and the next seven days with a focus on problems, resolutions, and impending milestones
* Review of UCAR’s “top-10” list of problems and issues
* System reliability, availability and utilization
* System configuration changes
* Open issues (hardware/software) shall be presented by the Subcontractor’s PM. Open issues that are not closed at this meeting shall have an action plan defined and agreed upon by both parties by close of this meeting
* Other topics as appropriate

**Extended Status Review Meeting**

Periodically, but no more than once per month and no less than once per quarter, an Extended Status Review Meeting will be conducted in lieu of the Weekly Status Meeting. The Subcontractor’s PM shall schedule this meeting with the agreement of UCAR’s Project Manager. Target duration is one to three hours. Attendees normally include: Subcontractor’s PM, Technical Representative, UCAR’s PM, Contract Representative, Technical Representative, NWSC Facility Management, and other invitees as appropriate. Topics covered in this meeting include:

* Review of the past 30 days and the next 30 days with a focus on problems, resolutions and impending milestones (Subcontractor PM to present)
* Implementation schedule status (Subcontractor PM to present)
* High priority issues (issue owners to present)
* Facilities issues (e.g., changes in product power, cooling, and space estimates for the to-be-installed products)
* All topics that are normally covered in the Weekly Status Meeting
* Other topics as appropriate

**Quarterly Executive Meeting**

Subcontractor’s PM shall schedule this meeting. Target duration is three hours. Attendees normally include: Subcontractor’s PM, Subcontractor’s Senior Management, UCAR’s Project Manager, Contract Representative, Technical Representative, selected Management, selected Technical Staff and other invitees as appropriate. Topics covered in this meeting include:

* Program status (Subcontractor to present)
* UCAR’s satisfaction (UCAR to present)
* Contract issues
* Partnership issues and opportunities (joint discussion)
* Future hardware and software product plans and potential impacts for UCAR
* Participation by Subcontractor’s suppliers as appropriate
* Other topics as appropriate
* Both Subcontractor and UCAR may submit agenda items for this meeting.

# Hardware and Software Support

Severity Classification

* The Subcontractor shall have documented problem severity classifications. These severity classifications shall be provided to UCAR along with descriptions defining each classification.

Severity Response

* The Subcontractor shall have a documented response for each severity classification. The guidelines for how the Subcontractor will respond to each severity classification shall be provided to UCAR

These documents shall be provided to UCAR’s Project Manager within 90 days of the Subcontract’s Effective Date and updated, as needed, thereafter.

**Problem Search Capabilities**

The Subcontractor shall provide the capability of searching the Subcontractor’s problem database via a web page interface. Searchable problems should not be limited solely to those identified by UCAR. This capability shall be made available to all individual CISL staff members designated by UCAR.

**Problem Escalation**

The Subcontractor shall utilize a problem escalation system that initiates escalation based either on time or the need for more technical support. Problem escalation procedures are the same for hardware and software problems. A problem is closed when all commitments have been met, the problem is resolved and UCAR is in agreement. UCAR initiates problem notification to Subcontractor personnel, or designated Subcontractor on-call staff.

Hardware and Software support definitions will become part of the Subcontractor Statement of Work.

# Risk Management

The Subcontractor shall continuously monitor and assess risks affecting the successful completion of the NWSC-2 Subcontract, and provide UCAR with documentation to facilitate project management, and to assist UCAR in its risk management obligations to the NSF.

The Subcontractor shall provide UCAR with a Risk Management Plan (RMP) for the technological, schedule and business risks of the NWSC-2 project. The RMP describes the Subcontractor’s approach to managing NWSC-2 project risks by identifying, analyzing, making contingency plans for, mitigating, tracking, and ultimately retiring project risks. The initial plan is due 30 days after the Subcontract’s Effective Date. Once approved by UCAR, UCAR shall review the Subcontractor’s RMP at least annually, but no less than is required based on the severity of the risks under consideration.

The Subcontractor shall also maintain a formal Risk Register (RR) documenting all individual risk elements that may affect the successful completion of the NWSC-2 project. The RR is a data-base managed using an application and format approved by UCAR. The initial RR is due 30 days after the Subcontract’s Effective Date. The RR shall be updated at least monthly. After acceptance, the RR shall be reviewed and updated no less than quarterly.

Along with each required update to the RR, the Subcontractor shall provide a Risk Assessment Report (RAR) summarizing the history and status of all risks and any material changes. The initial report and subsequent updates will be reviewed and approved by UCAR’s Project Manager or his/her designee.

**Risk Management Plan**

The purpose of the RMP, as detailed below, is to document, assess and manage Subcontract’s risks affecting the NWSC-2 Subcontract:

* Document procedures and methodology for identifying and analyzing known risks to the NWSC-2 project along with tactics and strategies to mitigate those risks.
* Serve as a basis for identifying alternatives to achieving cost, schedule, and performance goals.
* Assist in making informed decisions by providing risk-related information.

The RMP shall include, but is not limited to: logistics, assembly, shipping, delivery, installation, management, hardware, software, maintenance and support services delivery, risk assessment, mitigation and contingency plan(s).

**Risk Register**

The RR shall include an assessment of each likely risk element that may impact the NWSC-2 Subcontract. For each identified risk, the report shall include:

* Root cause of identified risk
* Probability of occurrence (low, medium, or high)
* Impact to the project if the risk occurs (low, medium, or high)
* Identifies the consequence of a risk event affecting cost, schedule, performance, and/or scope
* Risk mitigation steps to be taken to reduce likelihood of risk occurrence and/or steps to reduce impact of risk

Execution of mitigation plans are subject to UCAR approval and may include:

* Technology substitution: subject to the condition that substituted technologies shall not have aggregate performance, capability, or capacity less than originally proposed
* 3rd party assistance: for example in areas of critical software or technology development
* Performance compensation: possibility of compensating for performance shortfalls via additional deliveries
* Dates for risk mitigation decision points
* Contingency plans to be executed should risk occur; subject to UCAR approval
* Owner of the risk

**Risk Assessment Report**

The RAR shall include the following:

* Total number of risks grouped by severity
* Summary of newly identified risks from last reporting period
* Summary of any risks retired since the last report
* Identification and discussion of the status of the Top 10 (watch list) risks
* List of all prior retired risks