**SCHEDULE G**

**PROJECT MANAGEMENT REQUIREMENTS**

# Project Management

The assembly, pre-shipment testing, delivery, installation and acceptance testing of the subcontracted system(s), along with the provision of subsequent support and maintenance services for the systems to exceed system performance and reliability thresholds, requires close cooperation between the Subcontractor and UCAR. Therefore, project management is an essential element of the successful system deployment, transition to production, maintenance, and effective end-user utilization.

This document sets expectations for project management practices and procedures as part of the NWSC-3 Subcontract.

**Subcontractor Project Management Team**

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

* Project Manager
* Technical Representative(s)
* Contract Representative
* Service Manager

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

**Subcontractor Project Management Team Roles and Responsibilities**

The Subcontractor shall assign a Project Manager (PM) for the purposes of creating and executing a Project Management Plan (PMP) on behalf of the Subcontractor. The PM shall serve as the primary interface for UCAR into the Subcontractor’s organization, managing all aspects of the Subcontractor’s response to the Subcontract requirements, and is ultimately responsible for ensuring the performance of Subcontractor obligations.

The Subcontractor’s PM shall be assigned for the duration of the Subcontract. When the PM is unavailable due to vacation, sick leave, or other absence, the Subcontractor shall provide a backup PM who is knowledgeable of the project and has the authority to make decisions in the absence of the primary PM.

During the delivery, installation and acceptance testing of the subcontracted system(s), the PM is expected to be present at the NWSC site in Cheyenne, WY, and to be available via mobile communications device(s) on a 24x7 basis to manage and coordinate Subcontractor response to critical situations.

The Subcontractor’s **Project Manager** has responsibility for coordinating and effecting Subcontractor performance and assuring UCAR’s overall satisfaction therewith. It is anticipated that he/she is an experienced Subcontractor employee with project management certification and experience, and an extensive working knowledge of the subcontracted products and services. The responsibilities of the Subcontractor’s PM include:

* Provide project and risk management plans and documents, and conduct associated project activities, as outlined below.
* Conduct regularly scheduled meetings with UCAR and Subcontractor staff, as outlined below.
* Act as conduit and single point of contact for information exchange between UCAR and the Subcontractor.
* Delegate project/task responsibility and authority to Subcontractor personnel.
* Establish internal schedules consistent with the Subcontract schedule and respond appropriately to schedule redirection from the designated UCAR authority.
* Establish team communication procedures and coordinate project-related Subcontractor communications.
* Approve, or obtain approval for, Subcontract deliverables for submittal to UCAR.
* Obtain required resources from within the Subcontractor organization and from its outside sources.
* Apprise UCAR of new software releases and patches, no later than one (1) week before release to the general marketplace, and provide UCAR with said software within two (2) weeks of request.
* Provide for timely communication, management, and resolution of issues.
* In cooperation with UCAR’s Project Director, quickly and effectively resolve conflicts or disagreements between Subcontractor staff and UCAR staff, and provide escalation for matters that require it.

The responsibilities of the Subcontractor’s **Technical Representative(s)** include:

* Develop system configurations to comply with technical design requirements.
* Provide technical updates to UCAR on the Subcontractor’s products and product roadmaps.
* Provide technical guidance to UCAR on system delivery, hardware and software installation, configuration, administration, and operation.
* Work with the PM to review the Subcontractor’s technical adherence to the Subcontract.
* Work with the UCAR Project Director and Technical Representative(s), and designate(s), to resolve technical issues that arise in the course of delivering Subcontractor goods and services.

The responsibilities of the Subcontractor’s **Contract Representative** include:

* All Subcontract matters on behalf of the Subcontractor.
* The authority to execute Subcontract documents, and the execution thereof, which commit the Subcontractor and its organization to Subcontract requirements.
* Support the Subcontractor’s Project Manager by submitting formal proposals, negotiating, and accepting Subcontract modifications.
* Liaise with the Subcontractor’s and UCAR’s contracts, procurement, and legal staff when required.

The responsibilities of the Subcontractor’s **Service Manager** include:

* Assure compliance with the Subcontract’s hardware maintenance and software service requirements.
* Determine service workload requirements and assignment of services personnel to support UCAR.
* Manage the Subcontractor’s overall service delivery to UCAR.
* Provide feedback on the status of open service requests, or other matters that impact, or have the potential to impact, Subcontractor service-level obligations to UCAR.
* Meet with UCAR personnel regularly to review whether the Subcontractor’s service is fulfilling the Subcontract’s requirements.

# Project Planning

**Project Planning Workshop**

UCAR and the Subcontractor shall schedule and complete one or more workshop(s) to mutually establish and agree upon project management goals, techniques, timelines, processes, and procedures. The initial workshop shall take place within forty-five (45) days after the Subcontract’s Effective Date. Additional project planning workshops shall take place as needed thereafter.

**Project Management Plan**

The Subcontractor shall provide UCAR with a detailed Project Management Plan that includes a Work Breakdown Structure (WBS) and milestone schedule. The Project Management 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 to UCAR within sixty (60) days of the Subcontract’s Effective Date and the Project Management Plan shall be updated, as needed, thereafter.

The Project Management Plan shall include, but not be limited to, the following items:

* Project Management approach and process
* Work Breakdown Structure (WBS), complete project schedule with milestones in Gantt chart format, and a milestone summary schedule
* Risk assessment and mitigation
* Facilities planning (e.g., equipment layout, power, cooling, cabling, etc.)
* Shipping, transportation, delivery, installation, and integration
* System stability and reliability planning
* Testing (including pre-delivery factory tests and post-installation acceptance tests)
* Software installation and upgrade plan
* Subcontractor development that may be associated with technical options, or other innovative hardware or software components
* Support and maintenance plan
* Remote and on-site staffing, support, and services during delivery, installation, acceptance, and throughout the life of the Subcontract
* Training and education of UCAR systems, applications, and operations staff
* Interdependencies, such as those with third party suppliers or vendors

# Risk Management

The Subcontractor shall continuously monitor and assess risks affecting the successful delivery of Subcontracted products and services, and provide UCAR with documentation to facilitate its own project management and to assist UCAR in its risk management obligations to its sponsor, the National Science Foundation (NSF).

The Subcontractor shall provide UCAR’s Project Director with a **Risk Management Plan** (RMP) for the technological, schedule, and business risks of the project. Such risks shall not only include risks to the timely manufacturing, shipping, delivery, installation, testing, and acceptance of systems, but risks to Subcontractor-provided software, support, and services over the life of the Subcontract, and the achievement of the system’s lifetime reliability goals. The RMP should describe the Subcontractor’s approach to managing project risks by identifying, analyzing, tracking, mitigating, making contingency plans for, and ultimately retiring project risks.

* The initial RMP is due forty-five (45) days after the Subcontract’s Effective Date.
* Until production system acceptance, the Subcontractor’s RMP shall be updated at least monthly.
* After production system acceptance, the RMP shall be reviewed and approved by UCAR’s Project Director or his/her designee and shall be updated at least annually, but no less than is required based upon the Subcontract deliverables and 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 execution and completion of the project. Along with each 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 RR and RAR are due sixty (60) days after the Subcontract’s Effective Date.
* Until production system acceptance, the Subcontractor’s RR and RAR shall be updated at least monthly.
* After production system acceptance, the RR and RAR shall be reviewed and approved by UCAR’s Project Director or his/her designee and shall be updated at least annually, but no less than is required based upon the Subcontract deliverables and the severity of the risks under consideration.

**Risk Management Plan**

The purpose of the Risk Management Plan (RMP) is to assess, communicate, document, and manage any risks which may affect the Subcontractor’s ability to satisfactorily perform the Subcontract’s requirements; specifically:

* Document the methodology and procedures for identifying and analyzing known risks to the project along with strategies and tactics to mitigate those risks.
* Serve as a basis for identifying alternatives to achieving technological, 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 plans.

**Risk Mitigation**

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

* Owner of the risk
* Dates for risk mitigation decision points
* Contingency plans, subject to UCAR approval, to be executed should the risk occur, which include, but are not limited to:
	+ Technology substitution: subject to the condition that substituted technologies shall not have aggregate performance, capability, or capacity less than Subcontract commitments
	+ Third party assistance: such as in areas of critical software or technology development and/or troubleshooting
	+ Performance compensation: possibility of compensating for performance shortfalls via additional deliveries
	+ Other items per Schedules B, D, E, F, and H

**Risk Register**

The Risk Register (RR) shall include an assessment of each likely risk element that may impact the Subcontract. For each identified risk, the register shall include:

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

**Risk Assessment Report**

The Risk Assessment Report (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 to date

# Status and Meetings

The Subcontractor shall communicate periodically with UCAR as described below.

**Daily Progress Review**

The Subcontractor’s PM shall communicate daily with UCAR’s Project Director, Technical Representative(s), or their designate(s). These daily communications shall commence shortly after the Subcontract’s Effective Date and continue until both parties agree they can be reduced in frequency or are no longer needed. The communication may be via telephone, email, instant messaging, electronic conference, or a physical meeting—whichever is appropriate for the agenda. Both the Subcontractor and UCAR may submit agenda items for the Daily Progress Review. The topics covered by the Daily Progress Review include, but are not limited to:

* Project status, including schedule of deliverables, testing, or other Subcontractor commitments
* System problem 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 or less. 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, Technical Representative(s), and Service Manager, and UCAR’s Project Director and Technical Representative(s), as well as other invitees.

Topics covered in this meeting include:

* Review of the past seven (7) days and the next seven (7) days with a focus on problems, resolutions, and impending milestones
* Review of UCAR’s list of problems and issues
* System reliability, availability, utilization, usability, and workload resiliency
* System software and configuration changes
* Open issues (pertaining to hardware and 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 the close of this meeting
* Other topics as appropriate

**Extended Status Review Meeting**

Periodically, as deemed necessary by the PM and UCAR Project Director, but no less than once per quarter, an Extended Status Review Meeting shall be conducted in lieu of the Weekly Status Meeting. The Subcontractor’s PM shall schedule this meeting with the concurrence of UCAR’s Project Director. Target duration is one and a half hours. Attendees normally include: the Subcontractor’s PM, Technical Representative(s) and Service Manager, UCAR’s Project Director and Technical Representative(s), NWSC Facility Management, and other invitees as appropriate. Topics covered in this meeting include:

* Review of the past thirty (30) days and the next thirty (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., power, cooling status, stability, and trends and logistics for the to-be-installed products)
* All topics that are normally covered in the Weekly Status Meeting
* Other topics as appropriate

**Executive Meeting**

Whenever deemed mutually advantageous, the Subcontractor’s PM and UCAR’s Project Director may schedule an Executive Meeting. Target duration is two hours. Attendees normally include: the Subcontractor’s PM, Subcontractor’s senior management, UCAR’s Project Director, Contract Representative, Technical Representative(s), selected CISL and UCAR management, and other invitees as appropriate. Both the Subcontractor and UCAR may submit agenda items for this meeting. Topics typically covered in this meeting include:

* Program status (Subcontractor presents)
* Deliverable and Subcontract issues
* UCAR’s satisfaction (UCAR presents)
* Partnership issues and opportunities (joint discussion)
* Future hardware and software product plans and potential impacts for UCAR
* Other topics as appropriate

# Hardware and Software Support Services

Critical to successful large project management is the ability to communicate technical issues as they arise, and the ability to track issue status and the progress made toward addressing those issues. Thus, the Subcontractor shall provide **Support Services** document(s) describing the Subcontractor’s support services and structure, procedures for UCAR staff to report problems and otherwise request support services, and/or engage support services staff. These document(s) shall also describe the Subcontractor’s problem severity classifications, their descriptions and the Subcontractor’s response, and the anticipated timeliness of response, for each severity classification.

These document(s) shall be provided to UCAR’s Project Director within sixty (60) days of the Subcontract’s Effective Date and shall be updated as needed thereafter.

**Problem Search Capabilities**

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

**Problem Escalation**

The Subcontractor shall utilize a problem escalation system that initiates escalation based either on time thresholds or the need for engaging additional technical support. Problem escalation procedures shall be 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.