Addendum #1

MEARNG BASYS REPAIR Project, Various MEARNG locations throughout the State

Project No. 23SR19-426-D, Bid Number #19-020

Directorate of Facilities Engineering 13 December 2018

Note the following changes to the Bidding Documents for the: MEARNG BASYS Repair Project, at Various MEARNG locations throughout the state of Maine.

Specification Items:

Item #1: **Remove** Section 25 00 01-2, Integrated Automation System Description and **Insert** attached Revised Section 25 00 01-2, Integrated Automation System Description. Changes are on page 2 of this specification section, paragraphs 1.3 A and 1.3 C. Changes are in bold font and underlined.

Drawing Items: NONE

SECTION 25 00 01 – INTERGRATED AUTOMATION REQUIREMENTS FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. MEMORANDUM OF USE POLICY FOR All MEARNG Components, dated 10 August 2016 (Attached at the end of this Section).

1.2 SUMMARY

A. The intent of this specification is to provide instructions for the conversion the existing Building Automation Control System (BACS) used at various MEARNG facilities throughout the State from a Niagara AX platform to Niagara N4 version 4.6 platform. Included will be the replacement of outdated JACE 300, 600, and 700 controllers to JACE 8000 series controllers each with the required power supply as well as upgrading the existing Niagara AX Supervisor located at Camp Keyes in Augusta Maine to a Niagara N4 version 4.6 Supervisor. This repair work will take place in 20 buildings at 15 locations throughout the State. Approximately 700 devices will be controlled using the Niagara version 4.6 system. The Interoperable BACnet controllers shall be fully programmable via the embedded Niagara WorkBench tool requiring only a web browser to complete the programming process. Controllers that are not programmable or configurable directly within Niagara 4.6 are unacceptable.

B. Products requiring a licensed, non-embedded, off site programming tool are not acceptable with the exception of variable refrigerant volume system controls. Open source as referred to herein shall mean that the Niagara 4.6 Network Area Controller and the Interoperable Digital BACnet Controller (IDC) products are available from multiple contractor and vendor sources, affording the owner freedom of choice and competitive bidding for the initial installation of the BACS and future system expansions and modifications not limited by contractor, vendor or networking protocol. No territorially restricted OEM brands, single vendor or “branch only” products are acceptable. All products must be available for purchase by any qualified contractor that the owner chooses to do the installation and any further expansion or modifications.

C. All JACEs and Controllers shall be fully programmable or configurable from within any vendor’s version of the Niagara 4.6 Platform. Controllers that require a separate programming and or commissioning tool are not acceptable.

D. The BACS Installation shall include upgrading the existing Niagara AX Supervisor that is located on the Army's Main frame at Camp Keyes in Augusta, to Niagara N4 version 4.6. All existing AX series JACE controllers will be upgraded to JACE 8000 controllers running version 4.6. Existing JACE 8000 devices will remain but will get upgraded to version 4.6. All JACE’s will be integrated into the new supervisor in such a way as to minimize downtime. During the migration process, no site can be left unattended until it is fully functional and available on the new Supervisor.

E. Contractor must be an authorized and approved representative of the product which they propose to install.

F.

G. The successful bidder shall demonstrate to the owner via a product website dealer/contractor

locator that there are multiple contractors and vendors in the project geographic area to choose from. No exceptions to this requirement will be allowed.

H. Furnish all labor, materials, equipment, and service necessary for a complete and operating Building Automation Control System (BACS), utilizing Direct Digital Controls as shown on the drawings and as described herein. Drawings are diagrammatic only.

I. All labor, material, equipment and software not specifically referred to herein or on the plans, that is required to meet the functional intent of this specification, shall be provided without additional cost to the Owner.

J. The Owner shall be the named license holder of all software associated with any and all incremental work on the project(s).

1.3 SYSTEM DESCRIPTION

A. The entire BACS system shall be comprised of a Niagara AX Supervisor located on the Departments Main Frame, a network of interoperable, stand-alone digital controllers communicating via BACnet™ communication protocols to a Network Area Controller (NAC) through a Network Router.

B. The BACS must be comprised of Network Area Controller or Controllers (JACE) within each facility. From herein, NAC must refer to a JACE. The NAC must connect to the Owner's local or wide area network, depending on configuration. The controllers must be located adjacent to the equipment they monitor or control and must be sized for the task assigned to them. The system must utilize distributed processing architecture and one controller must be provided for each major piece of equipment or system controlled or monitored. Access to the system, either locally in each building, or remotely from a central site or sites, must be accomplished through standard Web browsers, via the local area network. Each NAC must communicate to Open Protocol controllers and other open protocol systems/devices provided under "Related Divisions".

C. The BACS Installation shall include upgrading the existing Niagara AX Supervisor that is located on the Army's Main frame at Camp Keyes in Augusta, to Niagara N4 version 4.6. All existing AX series JACE controllers will be upgraded to JACE 8000 controllers running version 4.6. Existing JACE 8000 devices will remain but will get upgraded to version 4.6. All JACE's will be integrated into the new supervisor in such a way as to minimize downtime. During the migration process, no site can be left unattended until it is fully functional and available on the new Supervisor.

D. The BACS as provided in this Division must be based on a hierarchical architecture incorporating Niagara 4.6. Systems not developed on the Niagara 4.6 platform are unacceptable.

E. JACE controllers shall be provided with a power supply, Network Router, a static Uninterruptable Power Supply (UPS) and surge protection devices. UPS shall provide power to the controllers to operate at full load for 2 hours. Further, all control panels shall be provided with a UPS with capacity to operate at full load for a minimum of 2 hours.

F. The BACS must monitor and control equipment as called for by the "Sequence of Operation" and points list.

G. The BACS must provide full graphic software capable of complete system operation for up to 34 simultaneous Thin-Client workstations.

H. The existing BACS shall continue to provide the existing full graphic operator interface at each location.

I. The BACS must continue to provide automated alarming software capable of sending messages to email compatible cellular telephones and pagers via the Owner's e-mail service. The email alarm paging system must be able to segregate users, time schedules, and equipment, and be capable of being programmed by the Owner. These features may not be currently active due to communications restrictions, but must be provided for possible future use.

J. The contractor must provide the appropriate quantity of legal copies of all software and utilities used during system commissioning and installation. The Owner must be named the license holder for all software associated with any and all incremental work in the project.

K. System performance:

1. Software requirements are Niagara 4.6 as previously specified in this document.

1.4 SUBMITTALS

A. Manufacturer's catalog data sheets and installation instructions for all controllers must be submitted to the Owner for review and acceptance.

B. Manufacturer's catalog data sheets and installation instructions for the universal power supply for the JACE 8000 as well as the UPS must be submitted to the Owner for review and acceptance.

C. Submittal must also include a complete point list of all points to be connected to the BACS per building.

1.5 SPECIFICATION NOMENCLATURE

A. Acronyms used in this specification are as follows:

1. Direct Digital Control System (DDC)
2. Building Automation Control System (BACS)
3. Graphical User Interface (GUI)
4. Interoperable BACnet Controller (IBC)
5. Interoperable Digital Controller (IDC)
6. Local Area Network (LAN)
7. Network Area Controller (NAC)
8. Object Oriented Technology (OOT)
9. Product Interoperability Compliance Statement (PICS)
10. Power Measurement Interface (PMI)
11. Portable Operator's Terminal (POT)
12. Temperature Control System (TCS)
13. Wide Area Network (WAN)
14. Web Browser Interface (WBI)

1.6 DIVISION OF WORK

A. The Division 23 and 26 (if applicable) contractors must be responsible for all open protocol controllers(OPC), control devices, control panels, controller programming, controller programming software, controller input/output and power wiring and controller network wiring.

B. The Division 23 contractor must be responsible for the Network Area Controller(s) (NAC), software and programming of the NAC, graphical user interface software (GUI), development of all graphical screens, Web browser pages, setup of schedules, logs and alarms, network management and connection of the NAC to the local or wide area network.

1.7 RELATED WORK SPECIFIED ELSEWHERE

A. Division 26, Electrical:

1. Power wiring and conduit (unless otherwise noted).

2. Other equipment and wiring as specified in Division 26.

1.8 AGENCY AND CODE APPROVALS

A. All products of the BACS shall be provided with the following agency approvals. Verification that the approvals exist for all submitted products shall be provided with the submittal package. Systems or products not currently offering the following approvals are not acceptable.

1. UL-916; Energy Management Systems
2. C-UL listed to Canadian Standards Association C22.2 No. 205-M1983 “signal Equipment”
3. CE
4. FCC, Part 15, Subpart J, Class A Computing Devices

1.9 SOFTWARE LICENSE AGREEMENT

A. The Owner shall agree to the manufacturer's standard software and firmware licensing agreement as a condition of this contract. Such license shall grant use of all programs and application software to Owner as defined by the manufacturer's license agreement, but shall protect manufacturer's rights to disclosure of trade secrets contained within such software.

B. The Owner, or his appointed agent, must receive ownership of all job specific software configuration documentation, data files, and application-level software developed for the project. This must include all custom, job specific software code and documentation for all configuration and programming that is generated for a given project and /or configured for use within Niagara 4.6 based controllers and/or servers and any related LAN / WAN / Intranet and all connected routers and devices.

1.10 DELIVERY, STORAGE AND HANDLING

A. Provide factory-shipping cartons for each piece of equipment and control device. Maintain cartons through shipping, storage, and handling as required to prevent equipment damage. Store equipment and materials inside and protected from weather.

1.11 QUALITY ASSURANCE

A. Proven Experience: Provide a list of no less than ten similar projects which utilize a Niagara 4x Platform. These projects must be on-line and functional such that the Owner's Representative would observe a direct digital control system in full operation. The Contractor must be a direct, wholly owned branch of a national control's manufacturer, or a representative not a wholesale distributor.

B. Quality of Compliance: Control systems shall be installed by trained control mechanics regularly employed in installation and calibration of BACS equipment by the manufacturer of the proposed equipment to be installed.

C. Contractor Requirements

1. Longevity: The BACS Contractor shall have a minimum of ten years’ experience installing, and servicing computerized building systems utilizing a Niagara 4x Platform. All subcontractors utilized by the BACS Contractor shall have a minimum of five-year experience within their appropriate trades.

2. Past Projects: The BACS Contractor shall have completed a minimum of five projects

which utilized the Niagara 4x Platform within the last three years that are at least equal in dollar value and scope to this project. A list of similar projects, dollar volume, scope, contact name and contact number shall be provided by the BACS Contractor if asked for by the Owner.

3. Personnel, Coverage and Response Capabilities: The BACS Contractor shall have a minimum of ten full time electronic service personnel and one factory trained DDC control technician within a 150 mile radius of the project location. One full time electronic service personnel and one DDC control technicians must work within a 150 mile radius of the project location.

4. The BACS Contractor shall have an established 24-hour emergency service organization. A dedicated telephone number shall be provided to the Owner for requesting emergency service. The BACS Contractor shall guarantee that within a maximum of four hours, the electronic service technicians shall be on site.

5. The Potential Low Bidder will submit with Bid Documents a qualification statement demonstrating how the above Contractor requirements shall be achieved. Any Potential Low Bidder that does not meet all of the criteria shall not be considered and shall be rejected for not complying with the specifications.

6. All Control Contractors must be pre-vetted by the Owner and the Consulting Engineer. This list will be provided as an amendment after the completion of the site visit. Any interested control contractor wanted to be included on the pre-vetted list of acceptable control contractors must be present at the site walkthrough, where they will receive instructions on how to be included on the pre-vetted control contractors list for this project.

7. Contractor and subcontractors performing work shall be required to fingerprinting and formal background checks sufficient to satisfy current Department of Defense security clearances for Contractor's or subcontractors performing work in secure areas.

1.12 JOB CONDITIONS

A. Cooperation with Other Trades: Coordinate the Work of this section with that of other sections to ensure that the Work will be carried out in an orderly fashion. It shall be this Contractor's responsibility to check the Contract Documents for possible conflicts between his Work and that of other crafts in equipment location, pipe, duct and conduit runs, electrical outlets and fixtures, air diffusers, and structural and architectural features.

PART 2 - PRODUCTS

2.1 GENERAL

A. The Building Automation Control System (BACS) shall be comprised of a network of interoperable, stand-alone digital controllers, a computer system, graphical user interface software, printers, network devices, valves, dampers, sensors, and other devices as specified herein.

B. The installed system shall provide secure password access to all features, functions and data contained in the overall BACS.

2.2 ACCEPTABLE MANUFACTURERS

A. Basis-of-Design: Niagara-4.6. Subject to compliance with requirements, provide the product named. System must operate on an open licensed JACE, no Appliance may be used. All

instances of Niagara 4.6 must operate with the compatibility modes set for "all". All instances of Niagara 4.6 must be capable of being programmed within any vendor's version of Niagara 4.6. All Unitary Controllers must be Programmable or Configurable directly within any vendor's version of the Niagara 4.6, no additionally required software is acceptable.

2.3 OPEN, INTEROPERABLE, INTEGRATED ARCHITECTURES

A. The intent of this specification is to provide a peer-to-peer networked, stand-alone, distributed control system with the capability to integrate ANSI/ASHRAE Standard 135-2001 BACnet™ technology, MODBUS™, OPC, and other open and non-proprietary communication protocols into one open, interoperable system.

B. The supplied computer software must employ object-oriented technology (OOT) for representation of all data and control devices within the system. In addition, adherence to industry standards including ANSI / ASHRAE™ Standard 135-2001 and Open Protocol to assure interoperability between all system components is required. For each Open Protocol device, the device supplier must provide a PICS document showing the installed device's compliance level. Minimum compliance is Level 3; with the ability to support data read and write functionality. Physical connection of Open Protocol devices must be via Ethernet, and/or RS-485, and/or RS-232.

C. All components and controllers supplied under this Division shall be true "peer-to-peer" communicating devices. Components or controllers requiring "polling" by a host to pass data shall not be acceptable.

D. The supplied system must incorporate the ability to access all data using standard Web browsers without requiring proprietary operator interface and configuration programs. Systems requiring proprietary database and user interface programs shall not be acceptable.

E. A hierarchical topology is required to assure reasonable system response times and to manage the flow and sharing of data without unduly burdening the customer's internal Intranet network. Systems employing a "flat" single tiered architecture shall not be acceptable.

1. Maximum acceptable response time from any alarm occurrence (at the point of origin) to the point of annunciation shall not exceed 5 seconds for local network connected user interfaces.

2. Maximum acceptable response time from any alarm occurrence (at the point of origin) to the point of annunciation shall not exceed 60 seconds for remote or dial-up connected user interfaces.

2.4 NETWORKS

A. The Local Area Network (LAN) shall be a 100 Megabit/sec Ethernet network supporting BACnet, Java, XML, HTTP, and SOAP for maximum flexibility for integration of building data with enterprise information systems and providing support for multiple Network Area Controllers (NACs), user workstations and, if specified, a local server.

B. Local area network minimum physical and media access requirements:

1. Ethernet; IEEE standard 802.3

2. Cable; 100 Base-T, UTP-8 wire, category 5

3. Minimum throughput; 100 Mbps.

C. Open Protocol Networks must each be a properly biased network, and capable of being converted to Open Protocol IP, via a converter.

2.5 NETWORK ACCESS

A. Remote Access, System must be capable of remote access that can be enabled at the Clients discretion.

2.6 NETWORK AREA CONTROLLER (NAC)

A. The contractor must supply one or more Network Area Controllers (NAC) as part of this contract. Number of area controllers required is dependent on the type and quantity of devices provided under Divisions 23 and 26. It is the responsibility of the contractor to coordinate with the Division 23 and 26 contractors to determine the quantity and type of devices.

B. The Network Area Controller (NAC) must provide the interface between the LAN or WAN and the field control devices, and provide global supervisory control functions over the control devices connected to the NAC. It must be capable of executing application control programs to provide:

1. Calendar functions
2. Scheduling
3. Trending
4. Alarm monitoring and routing
5. Time synchronization
6. Integration of Open Protocol controller data
7. Network Management functions for Open Protocol based devices

C. The Network Area Controller must provide the following hardware features as a minimum:

1. One Ethernet Port – 10/100 Mbps
2. One RS-232 port
3. One RS-485 port if Open Protocol controllers are used.
4. Battery Backup
5. Flash memory for long term data backup (If battery backup or flash memory is not supplied, the controller must contain a hard disk with at least 1 gigabyte storage capacity)
6. The NAC must be capable of operation over a temperature range of 32 to 122°F
7. The NAC must be capable of withstanding storage temperatures of between 0 and 158°F
8. The NAC must be capable of operation over a humidity range of 5 to 95% RH, non-condensing

D. The NAC must provide multiple user access to the system and support for ODBC or SQL. A database resident on the NAC must be an ODBC-compliant database or must provide an ODBC data access mechanism to read and write data stored within it.

E. The NAC must support standard Web browser access via the Intranet/Internet. It must support a minimum of 32 simultaneous users.

F. Event Alarm Notification and actions present prior to the conversion must remain.

G. Controller and network failures must be treated as alarms and annunciated.

H. Alarm annunciations present prior to the conversion must remain.

I. Alarm actions may be initiated by user defined programmable objects created for that purpose.

J. Defined users must continue to be given proper access to acknowledge any alarm, or specific types or classes of alarms defined by the user.

K. A log of all alarms must continue to be maintained by the NAC and/or a server (if configured in the system) and must be available for review by the user.

L. Continue to provide a “query” feature to allow review of specific alarms by user defined parameters.

M. A separate log for system alerts (controller failures, network failures, etc.) must continue to be provided and available for review by the user.

N. An Error Log to record invalid property changes or commands must continue to be provided and available for review by the user.

2.7 DATA COLLECTION AND STORAGE

A. The NAC must continue to have the ability to collect data for any property of any object and store this data for future use.

B. The data collection must be performed by log objects, resident in the NAC that must have, at a minimum, the following configurable properties:

1. Designating the log as interval or deviation.

1. For interval logs, the object must be configured for time of day, day of week and the sample collection interval.

2. For deviation logs, the object must be configured for the deviation of a variable to a fixed value. This value, when reached, will initiate logging of the object.

3. For all logs, provide the ability to set the maximum number of data stores for the log and to set whether the log will stop collecting when full, or rollover the data on a first-in, first-out basis.

4. Each log must have the ability to have its data cleared on a time-based event or by a user-defined event or action.

C. All log data must be stored in a relational database in the NAC and the data must be accessed from a server (if the system is so configured) or a standard Web browser.

D. All log data, when accessed from a server, must be capable of being manipulated using standard SQL statements.

E. All log data must be available to the user in the following data formats:

1. HTML
2. XML
3. Plain Text
4. Comma or tab separated values
5. PDF

F. Systems that do not provide log data in HTML and XML formats at a minimum must not be acceptable.

G. The NAC must have the ability to archive its log data either locally (to itself), or remotely to a server or other NAC on the network. Provide the ability to configure the following archiving properties, at a minimum:

1. Archive on time of day
2. Archive on user-defined number of data stores in the log (buffer size)
3. Archive when log has reached its user-defined capacity of data stores
4. Provide ability to clear logs once archived

2.8 AUDIT LOG

A. Provide and maintain an Audit Log that tracks all activities performed on the NAC. Provide the ability to specify a buffer size for the log and the ability to archive log based on time or when the log has reached its user-defined buffer size. Provide the ability to archive the log locally (to the NAC), to another NAC on the network, or to a server. For each log entry, provide the following data:

a. Time and date
b. User ID
c. Change or activity: i.e., Change set point, add or delete objects, commands, etc.

2.9 DATABASE BACKUP AND STORAGE

A. The NAC must continue to have the ability to automatically backup its database. The database must be backed up based on a user-defined time interval.

B. Copies of the current database and, at the most recently saved database must be stored in the NAC. The age of the most recently saved database is dependent on the user-defined database save interval.

C. The NAC database must be stored, at a minimum, in XML format to allow for user viewing and editing, if desired. Other formats are acceptable as well, as long as XML format is supported.

2.10 ADVANCED UNITARY CONTROLLER

A. The controller platform must be designed specifically to control HVAC – ventilation, filtration, heating, cooling, humidification, and distribution. Equipment includes: constant volume air handlers, VAV air handlers, packaged RTU, heat pumps, unit vents, fan coils, natural convection units, and radiant panels. The controller platform must provide options and advanced system functions and must be fully programmable and configurable using any vendors version of the Niagara 4.6 that allow standard and customizable control solutions.

B. Minimum Requirements:

1. The controller must be capable of either integrating with other devices or stand-alone operation.
2. The controller must have an FTT transformer-coupled communications port interface for common mode-noise rejection and DC isolation.
3. The controller must have an internal time clock with the ability to automatically revert from a master time clock on failure.
    a. Operating Range: 24 hour, 365 day, multi-year calendar including day of week and configuration for automatic day-light savings time adjustment to occur on configured start and stop dates.
    b. Accuracy: ±1 minute per month at 77° F (25° C).
    c. Power Failure Backup: 24 hours at 32° to 122° F (0° to 50° C).
4. The controller must have Significant Event Notification, Periodic Update capability, and Failure Detect when network inputs fail to be detected within their configurable time frame.
5. The controller must have an internal DC power supply to power external sensors.
6. Power Output: 20 VDC ±10% at 75 mA.
7. The controller must have a visual indication (LED) of the status of the devise:
    a. Controller operating normally.
    b. Controller in process of download.
    c. Controller in manual mode under control of software tool.
    d. Controller lost its configuration.
    e. No power to controller, low voltage, or controller damage.
    f. Processor and/or controller are not operating.
8. The minimum controller Environmental ratings
    a. Operating Temperature Ambient Rating: -40° to 150° F (-40° to 65.5° C).
    b. Storage Temperature Ambient Rating: -40° to 150° F (-40° to 65.5° C).
    c. Relative Humidity: 5% to 95% non-condensing.
9. The controller must have the additional approval requirements, listings, and approvals:
    a. UL/cUL (E87741) listed under UL916 (Standard for Open Energy Management Equipment) with plenum rating.
    b. CSA (LR95329-3) Listed
    c. Meets FCC Part 15, Subpart B, Class B (radiated emissions) requirements.
    d. Meets Canadian standard C108.8 (radiated emissions).
    e. Conforms to the following requirements per European Consortium standards:
        EN 61000-6-1; 2001 (EU Immunity)
        EN 61000-6-3; 2001 (EU Emissions)
10. The controller housing must be UL plenum rated mounting to either a panel or DIN rail

(standard EN50022; 7.5mm x 35mm).

11. The controller must have sufficient on-board inputs and outputs to support the application.
    a. Analog outputs (AO) must be capable of being configured to support 0-10 V, 2-10 V or 4-20 mA devices.
    b. Triac outputs must be capable of switching 30 Volts at 500 mA.
    c. Input and Output wiring terminal strips must be removable from the controller without disconnecting wiring. Input and Output wiring terminals must be designated with color coded labels.
    d. Universal inputs must be capable of being configured as binary inputs, resistive inputs, voltage inputs (0-10 VDC), or current inputs (4-20 mA).
12. The controller must provide for "user defined" Network Variables (NV) for customized configurations and naming using Niagara AX/N4 Framework™.
    a. The controller must support 62 Network Variables with a byte count of 31 per variable.
    b. The controller must support at least 1,922 separate data values.
13. The controller must provide "continuous" automated loop tuning with an Adaptive Integral Algorithm Control Loop.
14. The controller platform must have standard HVAC application programs that are modifiable to support both the traditional and specialized "sequence of operations" as outlined in Section 4.
    a. Discharge air control and low limit
    b. Pressure-dependent dual duct without flow mixing.
    c. Variable air volume with return flow tracking.
    d. Economizer with differential enthalpy.
    e. Minimum air flow coordinated with CO2.
    f. Unit ventilator cycle (1,2,3) 2-pipe.
    g. Unit ventilator cycle (1,2,3) 2-pipe with face/bypass.
    h. with EOC valve.

2.11 GRAPHICAL USER INTERFACE SOFTWARE

A. Operating System:
   1. The Workstation with the GUI must run on Microsoft Windows 7 Professional or higher.

B. The GUI must employ browser-like functionality for ease of navigation. It must include a tree view (similar to Windows Explorer) for quick viewing of, and access to, the hierarchical structure of the database. In addition, menu-pull downs, and toolbars must employ buttons, commands and navigation to permit the operator to perform tasks with a minimal knowledge of the HVAC Control System and basic computing skills. These must include, but are not limited to, forward/backward buttons, home button, and a context sensitive locator line (similar to a URL line), that displays the location and the selected object identification.

C. Real-Time Displays.

The GUI, must at a minimum, support the following graphical features and functions:

1. Graphic screens must be developed using any drawing package capable of generating a GIF, PNG, or JPG file format. Use of proprietary graphic file formats must not be acceptable. In addition to, or in lieu of, a graphic background the GUI must support the use of scanned pictures.

2. Graphic screens must have the capability to contain objects for text, real-time values, animation, color spectrum objects, logs, graphs, HTML or XML document links, schedule objects, hyperlinks to other URL's, and links to other graphic screens.

3. Graphics must support layering and each graphic object must be configurable for assignment to a layer. A minimum of six layers must be supported.

4. Modifying common application objects, such as schedules, calendars, and set points must be accomplished in a graphical manner.

   a. Schedule times will be adjusted using a graphical slider, without requiring any keyboard entry from the operator.

   b. Holidays must be set by using a graphical calendar without requiring any keyboard entry from the operator.

5. Commands to start and stop binary objects must be done by right-clicking the selected object and selecting the appropriate command from the pop-up menu. No text entry must be required.

6. Adjustments to analog objects, such as set points, must be done by right-clicking the selected object and using a graphical slider to adjust the value. No text entry must be required.

D. System Configuration. At a minimum, the GUI must permit the operator to perform the following tasks, with proper password access:

   a. Create, delete, or modify control strategies.

   b. Add or delete objects to the system.

   c. Tune control loops through the adjustment of control loop parameters.

   d. Enable or disable control strategies.

   e. Generate hard copy records or control strategies on a printer. f. Select points to be alarm-able and define the alarm state.

   f. Select points to be trended over a period of time and initiate the recording of values automatically.

E. On-Line Help. Provide a context sensitive on-line help system to assist the operator in operation and editing of the system. On-line help must be available for all applications and must provide the relevant data for the currently displayed screen. Additional help information must be available through the use of hypertext. All system documentation and help files must be in HTML format.

F. Security. Each operator must be required to log on to the system with a user name and password in order to view, edit, add, or delete data. System security must be selectable for each operator. The system administrator must have the ability to set passwords and security levels for all other operators. Each operator password must be able to restrict the operators' access for viewing and/or changing each system application, full screen editor, and object. Each operator must automatically be logged off the system if no keyboard or mouse activity is detected for a specified time. This auto log-off time must be set per operator password. All system security data must be stored in an encrypted format.

G. System Diagnostics. The system must automatically monitor the operation of all workstations, printers, modems, network connections, building management panels, and controllers. The failure of any device must be annunciated to the operator.

H. Alarm Console

1. The system must be provided with a dedicated alarm window or console. This window will notify the operator of an alarm condition and allow the operator to view details of the alarm and acknowledge the alarm. The use of the Alarm Console may be enabled or disabled by the system administrator.

2. When the Alarm Console is enabled, a separate alarm notification window will supersede all other windows on the desktop and must not be capable of being minimized or closed by the operator. This window will notify the operator of new alarms and unacknowledged alarms. Alarm notification windows or banners that can be minimized or closed by the operator must not be acceptable.

2.12 WEB BROWSER CLIENTS

A. The system must be capable of supporting an unlimited number of clients using a standard Web browser such as Internet Explorer™ or Netscape Navigator™. Systems requiring additional software (to enable a standard Web browser) to be resident on the client machine, or manufacture-specific browsers must not be acceptable.

B. The Web browser software must run on any operating system and system configuration that is supported by the Web browser. Systems that require specific machine requirements in terms of processor speed, memory, etc., in order to allow the Web browser to function with the BACS, must not be acceptable.

C. The Web browser must provide the same view of the system, in terms of graphics, schedules, calendars, logs, etc., and provide the same interface methodology as is provided by the Graphical User Interface (if used). Systems that require different graphic views, different means of graphic generation, or that require different means of interacting with objects such as schedules, or logs, must not be permitted.

D. The Web browser client must support at a minimum, the following functions:

1. User log-on identification and password must be required. If an unauthorized user attempts access, a blank web page must be displayed. Security using Java authentication and encryption techniques to prevent unauthorized access must be implemented.

2. Graphical screens developed for the GUI must be the same screens used for the Web browser client. Any animated graphical objects supported by the GUI must be supported by the Web browser interface.

3. HTML programming must not be required to display system graphics or data on a Web page. HTML editing of the Web page must be allowed if the user desires a specific look or format.

4. Storage of the graphical screens must be in the Network Area Controller (NAC), without requiring any graphics to be stored on the client machine. Systems that require graphics storage on each client are not acceptable.

5. Real-time values displayed on a Web page must update automatically without requiring a manual “refresh” of the Web page.

6. Users must have administrator-defined access privileges. Depending on the access privileges assigned, the user must be able to perform the following:

   a. Modify common application objects, such as schedules, calendars, and set points in a graphical manner.

      1) Schedule times will be adjusted using a graphical slider, without requiring any keyboard entry from the operator.

      2) Holidays must be set by using a graphical calendar, without requiring any keyboard entry from the operator.

      3) Commands to start and stop binary objects must be done by right-clicking the selected object and selecting the appropriate command from the pop-up menu. No text entry must be required.

      4) View logs and charts

      5) View and acknowledge alarms

      6) Setup and execute SQL queries on log and archive information

7. The system must provide the capability to specify a user’s (as determined by the log- on user identification) home page. Provide the ability to set a specific home page for each user. From the home page, links to other views, or pages in the system must be possible, if allowed by the system administrator.

8. Graphic screens on the Web Browser client must support hypertext links to other locations on the Internet or on Intranet sites, by specifying the Uniform Resource Locator (URL) for the desired link.

2.13 SYSTEM CONFIGURATION TOOL

A. The Workstation Graphical User Interface software (GUI) must provide the ability to perform system programming and graphic display engineering as part of a complete software package. Access to the programming functions and features of the GUI must be through password access as assigned by the system administrator.

B. A library of control, application, and graphic objects must be provided to enable the creation of all applications and user interface screens. Applications are to be created by selecting the desired control objects from the library, dragging or pasting them on the screen, and linking them together using a built in graphical connection tool. Completed applications may be stored in the library for future use. Graphical User Interface screens must be created in the same fashion. Data for the user displays is obtained by graphically linking the user display

objects to the application objects to provide "real-time" data updates. Any real-time data value or object property may be connected to display its current value on a user display. Systems requiring separate software tools or processes to create applications and user interface displays must not be acceptable.

C. Programming Methods

1. Provide the capability to copy objects from the supplied libraries, or from a user-defined library to the user's application. Objects must be linked by a graphical linking scheme by dragging a link from one object to another. Object links will support one-to-one, many-to-one, or one-to-many relationships. Linked objects must maintain their connections to other objects regardless of where they are positioned on the page and must show link identification for links to objects on other pages for easy identification. Links will vary in color depending on the type of link; i.e., internal, external, hardware, etc.

2. Configuration of each object will be done through the object's property sheet using fill-in the blank fields, list boxes, and selection buttons. Use of custom programming, scripting language, or a manufacturer-specific procedural language for configuration will not be accepted.

3. The software must provide the ability to view the logic in a monitor mode. When on-line, the monitor mode must provide the ability to view the logic in real time for easy diagnosis of the logic execution. When off-line (debug), the monitor mode must allow the user to set values to inputs and monitor the logic for diagnosing execution before it is applied to the system.

4. The system must support object duplication within a customer's database. An application, once configured, can be copied and pasted for easy re-use and duplication. All links, other than to the hardware, must be maintained during duplication.

2.14 LIBRARY

A. A standard library of objects must be included for development and setup of application logic, user interface displays, system services, and communication networks.

B. The objects in this library must be capable of being copied and pasted into the user's database and must be organized according to their function. In addition, the user must have the capability to group objects created in their application and store the new instances of these objects in a user-defined library.

C. In addition to the standard libraries specified here, the supplier of the system must maintain an on-line accessible (over the Internet) library, available to all registered users to provide new or updated objects and applications as they are developed.

D. All control objects must conform to the control objects specified in the Open Protocol specification.

E. The library must include applications or objects for the following functions, at a minimum:

1. Scheduling Object. The schedule must conform to the schedule object as defined in the Open Protocol specification, providing 7-day plus holiday & temporary scheduling features and a minimum of 10 on/off events per day. Data entry to be by graphical sliders to speed creation and selection of on-off events.

2. Calendar Object. The calendar must conform to the calendar object as defined in the Open Protocol specification, providing 12-month calendar features to allow for holiday or special event data entry. Data entry to be by graphical "point-and-click" selection. This object must be "linkable" to any or all scheduling objects for effective event control.

3. Duty Cycling Object. Provide a universal duty cycle object to allow repetitive on/off time control of equipment as an energy conserving measure. Any number of these objects may be created to control equipment at varying intervals

4. Temperature Override Object. Provide a temperature override object that is capable of overriding equipment turned off by other energy saving programs (scheduling, duty cycling etc.) to maintain occupant comfort or for equipment freeze protection.

5. Start-Stop Time Optimization Object. Provide a start-stop time optimization object to provide the capability of starting equipment just early enough to bring space conditions to desired conditions by the scheduled occupancy time. Also, allow equipment to be stopped before the scheduled un-occupancy time just far enough ahead to take advantage of the building's "flywheel" effect for energy savings. Provide automatic tuning of all start / stop time object properties based on the previous day's performance.

6. Demand Limiting Object. Provide a comprehensive demand-limiting object that is capable of controlling demand for any selected energy utility (electric, oil, and gas). The object must provide the capability of monitoring a demand value and predicting (by use of a sliding window prediction algorithm) the demand at the end of the user defined interval period (1-60 minutes). This object must also accommodate a utility meter time sync pulse for fixed interval demand control. Upon a prediction that will exceed the user defined demand limit (supply a minimum of 6 per day), the demand limiting object must issue shed commands to either turn off user specified loads or modify equipment set points to effect the desired energy reduction. If the list of sheddable equipment is not enough to reduce the demand to below the set point, a message must be displayed on the users screen (as an alarm) instructing the user to take manual actions to maintain the desired demand. The shed lists are specified by the user and must be selectable to be shed in either a fixed or rotating order to control which equipment is shed the most often. Upon suitable reductions in demand, the demand-limiting object must restore the equipment that was shed in the reverse order in which it was shed. Each sheddable object must have a minimum and maximum shed time property to effect both equipment protection and occupant comfort.

F. The library must include control objects for the following functions. All control objects must conform to the objects as specified in the Open Protocol specification.

1. Analog Input Object - Minimum requirement is to comply with the Open Protocol standard for data sharing. Allow high, low and failure limits to be assigned for alarming. Also, provide a time delay filter property to prevent nuisance alarms caused by temporary excursions above or below the user defined alarm limits.

2. Analog Output Object - Minimum requirement is to comply with the Open Protocol standard for data sharing.

3. Binary Input Object - Minimum requirement is to comply with the Open Protocol standard for data sharing. The user must be able to specify either input condition for alarming. This object must also include the capability to record equipment run-time by counting the amount of time the hardware input is in an "on" condition. The user must be able to specify either input condition as the "on" condition.

4. Binary Output Object - Minimum requirement is to comply with the Open Protocol standard for data sharing. Properties to enable minimum on and off times for equipment protection as well as interstart delay must be provided. The Open Protocol Command Prioritization priority scheme must be incorporated to allow multiple control applications to execute commands on this object with the highest priority command

being invoked. Provide sixteen levels of priority as a minimum. Systems not employing the Open Protocol method of contention resolution must not be acceptable.

5. PID Control Loop Object - Minimum requirement is to comply with the Open Protocol standard for data sharing. Each individual property must be adjustable as well as to be disabled to allow proportional control only, or proportional with integral control, as well as proportional, integral and derivative control.

6. Comparison Object - Allow a minimum of two analog objects to be compared to select either the highest, lowest, or equality between the two linked inputs. Also, allow limits to be applied to the output value for alarm generation.

7. Math Object - Allow a minimum of four analog objects to be tested for the minimum or maximum, or the sum, difference, or average of linked objects. Also, allow limits to be applied to the output value for alarm generation.

8. Custom Programming Objects - Provide a blank object template for the creation of new custom objects to meet specific user application requirements. This object must provide a simple BASIC-like programming language that is used to define object behavior. Provide a library of functions including math and logic functions, string manipulation, and e-mail as a minimum. Also, provide a comprehensive on-line debug tool to allow complete testing of the new object. Allow new objects to be stored in the library for re-use.

9. Interlock Object - Provide an interlock object that provides a means of coordination of objects within a piece of equipment such as an Air Handler or other similar types of equipment. An example is to link the return fan to the supply fan such that when the supply fan is started, the return fan object is also started automatically without the user having to issue separate commands or to link each object to a schedule object. In addition, the control loops, damper objects, and alarm monitoring (such as return air, supply air, and mixed air temperature objects) will be inhibited from alarming during a user-defined period after startup to allow for stabilization. When the air handler is stopped, the interlocked return fan is also stopped, the outside air damper is closed, and other related objects within the air handler unit are inhibited from alarming thereby eliminating nuisance alarms during the off period.

10. Temperature Override Object - Provide an object whose purpose is to provide the capability of overriding a binary output to an “On” state in the event a user specified high or low limit value is exceeded. This object is to be linked to the desired binary output object as well as to an analog object for temperature monitoring, to cause the override to be enabled. This object will execute a Start command at the Temperature Override level of start/stop command priority unless changed by the user.

11. Composite Object - Provide a container object that allows a collection of objects representing an application to be encapsulated to protect the application from tampering, or to more easily represent large applications. This object must have the ability to allow the user to select the appropriate parameters of the “contained” application that are represented on the graphical shell of this container.

G. The object library must include objects to support the integration of devices connected to the Network Area Controller (NAC). At a minimum, provide the following as part of the standard library included with the programming software:

1. For Open Protocol devices, provide the following objects at a minimum:
   a. Analog In
   b. Analog Out
   c. Analog Value
   d. Binary
   e. Binary In
   f. Binary Out
   g. Binary Value
   h. Multi-State In
   i. Multi-State Out
   j. Multi-State Value
   k. Schedule Export
   l. Calendar Export
   m. Trend Export
   n. Device

2. For each Open Protocol object, provide the ability to assign the object an Open Protocol device and object instance number.

3. For Open Protocol devices, provide the following support at a minimum
   a. Segmentation
   b. Segmented Request
   c. Segmented Response
   d. Application Services
   e. Read Property
   f. Read Property Multiple
   g. Write Property
   h. Who-has
   i. I-have
   j. Who-is
   k. I-am
   l. Media Types
   m. Ethernet
   n. Open Protocol IP Annex J
   o. MSTP
   p. Open Protocol Broadcast Management Device (BBMD) function
   q. Routing

2.15 DDE DEVICE INTEGRATION

A. The Network Area Controller must support the integration of device data via Dynamic Data Exchange (DDE), over the Ethernet Network. The Network Area Controller must act as a DDE client to another software application that functions as a DDE server.

B. Provide the required objects in the library, included with the Graphical User Interface programming software, to support the integration of these devices into the BACS. Objects provided must include at a minimum:

1. DDE Generic AI Object

2. DDE Generic AO Object

3. DDE Generic BO Object

4. DDE Generic BI Object

2.16 MODBUS SYSTEM INTEGRATION

A. The Network Area Controller must support the integration of device data from Modbus RTU, ASCII, or TCP control system devices. The connection to the Modbus system must be via an RS-232, RS485, or Ethernet IP as required by the device.

B. Provide the required objects in the library, included with the Graphical User Interface programming software, to support the integration of the Modbus system data into the FPMS. Objects provided must include at a minimum:

1. Read/Write Modbus AI Registers
2. Read/Write Modbus AO Registers
3. Read/Write Modbus BI Registers
4. Read/Write Modbus BO Registers

C. All scheduling, alarming, logging and global supervisory control functions, of the Modbus system devices, must be performed by the Network Area Controller.

D. The BACS supplier must provide a Modbus system communications driver. The equipment system vendor that provided the equipment utilizing Modbus must provide documentation of the system's Modbus interface and must provide factory support at no charge during system commissioning

2.17 OPC SYSTEM INTEGRATION

A. The Network Area Controller must act as an OPC client and must support the integration of device data from OPC servers. The connection to the OPC server must be Ethernet IP as required by the device. The OPC client must support third party OPC servers compatible with the Data Access 1.0 and 2.0 specifications.

B. Provide the required objects in the library, included with the Graphical User Interface programming software, to support the integration of the OPC system data into the BAS. Objects provided must include at a minimum:

1. Read/Write OPC AI Object
2. Read/Write OPC AO Object
3. Read/Write OPC BI Object
4. Read/Write OPC BO Object
5. Read/Write OPC Date/Time Input Object
6. Read/Write OPC Date/Time Output Object
7. Read/Write OPC String Input Object
8. Read/Write OPC String Output Object

C. All scheduling, alarming, logging and global supervisory control functions, of the OPC system devices, must be performed by the Network Area Controller.

D. The BACS supplier must provide an OPC client communications driver. The equipment system vendor that provided the equipment utilizing OPC must provide documentation of the system's OPC server interface and must provide factory support at no charge during system commissioning.

PART 3 - EXECUTION

3.1 EXECUTION

A. All work described in this section shall be performed by system integrators or contractors that have a successful history in the design and installation of integrated control systems. The BACS Contractor shall have a minimum of ten years' experience installing, and servicing computerized building systems utilizing the Niagara 4.6 Platform. All subcontractors utilized by the BACS Contractor shall have a minimum of five years' experience within their appropriate trades.

B. Install system and materials in accordance with manufacturer's instructions.

3.2 WIRING

A. All electrical control wiring and power wiring to the control panels, NAC, computers and network components shall be the responsibility of the this contractor.

B. The electrical contractor (Div. 26) shall furnish all power wiring to electrical starters and motors.

C. All wiring shall be in accordance with the Project Electrical Specifications (Division 26), the National Electrical Code and any applicable local codes. All power wiring and BACS wiring shall be installed in either conduit or cable tray as specified in the Project Electrical Specifications (Division 26 and 27) and installed in a neat and workmanlike manner. No exposed conductors or cabling are permitted.

3.3 WIRING CRITERIA

A. Run circuits operating at more than 100 volts in rigid or flexible conduit, metallic tubing, covered metal raceways, or armored cable.

B. Do not run binary control circuit wiring in the same conduit as power wiring over 100 volts. Where analog signal wiring requires conduit, do not run in the same conduit with AC power circuits or control circuits operating at more than 100 volts.

C. Provide circuit and wiring protection required by NFPA 70.

D. Run all wiring located inside mechanical rooms in conduit.

E. Do not bury aluminum-sheathed cable or aluminum conduit in concrete.

F. Input/output identification: Permanently label each field-installed wire at each end with descriptive text using a commercial wire marking system that fully encircles the wire, cable, or tube. Locate the markers within 2 inches of each termination. Match the names and I/O number to the project's point list. Similarly label all power wiring serving control devices, including the word "power" in the label. Label all terminal blocks with alpha/numeric labels. All wiring and the wiring methods must be in accordance with UL 508A.

G. For controller power, provide new 120 VAC circuits, with ground.

H. Provide each circuit with a dedicated breaker, and run wiring in its own conduit, separate from any control wiring. Connect the controller's ground wire to the electrical panel ground; conduit grounds are not acceptable.

I. Surge Protection: Install surge protection according to manufacturer's instructions. Multiple controllers fed from a common power supply may be protected by a common surge protector, properly sized for the total connected devices.

J. Grounding: Ground controllers and cabinets to a good earth ground as specified in

Division 26.

K. Conduit grounding is not acceptable; all grounding must have a direct path to the building earth ground. Ground sensor drain wire shields at the controller end.

L. The Contractor must be responsible for correcting all associated ground loop problems.

M. Run wiring in panel enclosures in covered wire track.

N. This is 100% conduit job. All Line Voltage and Control wiring must be run in EMT. Flexible Metallic Conduit can be used in short lengths at equipment or device connection points, or in situations where mechanical equipment vibration would warrant such an application. Properly sealed Rigid Metallic Conduit must be used in all explosion proof applications.

3.4 COMPONENT IDENTIFICATION LABELING

A. Using an electronic hand-held label maker with white tape and bold black block lettering, provide an identification label on the exterior of each new control panel, control device, actuator, and sensor. Also provide labels on the exterior of each new control actuator indicating the (full) open and (full) closed positions. For labels located outdoors, use exterior grade label tape, and provide labels on both the inside and outside of the panel door or device cover. Acceptable alternatives are white plastic labels with engraved bold black block lettering permanently attached to the control panel, control device, actuator, and sensor. Have the labels and wording approved by the BAS Owner prior to installation

3.5 WARRANTY

A. Equipment, materials and workmanship incorporated into the work shall be warranted for a period of one year from the time of system acceptance.

B. Within this period, upon notice by the Owner, any defects in the work provided under this section due to faulty materials, methods of installation or workmanship shall be promptly (within 48 hours after receipt of notice) repaired or replaced by this contractor at no expense to the Owner.

3.6 WARRANTY ACCESS

A. The Contractor shall meet the following requirements prior to the Owner allowing the Contractor to access the BACS from a remote location for the purpose of diagnostics and troubleshooting, via the Internet, during the warranty period:

1. Obtain Common Access Card (CAC) authorization from MEARNG using the State Employee System process and Army Knowledge Online (AKO).

2. The Contractor shall carry a minimum of 24 hours of costs for their employee/s to be education and trained to be able to become a CAC enabled employee. The location of the training and education to become a CAC enabled employee shall be held at Building #7, Camp Keyes, Augusta, Maine.

3. The Contractor shall carry a minimum of 8 hours of costs for their CAC enabled employee/s to load software here at Building #7, Camp Keyes, Augusta, Maine on the Government Furnished Computer. The Contractor shall only load software that is applicable to controlling or manipulate the Facility's BAC and HVAC system. The Software that is load to control or manipulate the Facility's BAC and HVAC system must be DOD certified. Non-DOD certified software will not be permitted on the Government Furnished Computer.

a. The specific employee/s for the Contractor will need a Federal employee sponsor provide by Directorate of Facility Engineering (DFE).

b. CAC authorization is for an individual not a company. Sharing of a CAC and the associated CAC PIN is forbidden and will result in termination of the CAC authorization.

1) Obtain a Contractor's CAC following the normal CAC issuing process at the DEERS/RAPIDS station.

a) Finger printing, and

b) Background check.

2) Complete the Deputy Chief of Staff Information Management (DCSIM) steps necessary to obtain an account on the MEARNG network:

a) Information Assurance (IA) Training

b) Acceptable Use Policy

c) Computer Equipment

B. The Owner shall provide a laptop w/operating system meeting DCSIM specifications. The laptop may remain in the Contractor's possession for the warranty period and will be returned to the Owner at the end of the warranty period or when requested by the Owner.

C. The computer equipment shall be configured to the following DCISM standards:

1. In accordance with AR25-2: Section 4-5(a)(6), installation of non-Government-owned computing systems or devices without prior authorization of the appointed Designated Approving Authority (DAA) including but not limited to USB devices, external media, personal or contractor-owned laptops, and Mobile Computer Devices (MCDs) is prohibited.

2. In accordance with AR25-2: Section 4-31(e), Contractor-owned and operated Information Systems (ISs) will meet all security requirements for Government-owned hardware and software when operating on the Army Enterprise Infrastructure (AEI), managing, storing, or processing Army or DOD data or information, or conducting official communications or business.

3. In accordance with AR25-2: Section 5-8(d), a DAA will be identified for each information system operating within or on behalf of the Department of the Army (DA), to include outsourced business processes supported by private sector IS and outsourced IT (for example, Government owned, Contractor Operated (GOCO) and Contractor Owned, Contractor Operated (COCO).

D. DCSIM will configure the laptop with software image to meet Army standards.

1. When all the above has been accomplished the contractor will be given remote access via a VPN connection or will have direct access when onsite at a MEARNG location. The CAC and user account privileges are granted on a per individual basis only, not a company. Sharing of a CAC and the associated CAC PIN is forbidden and will result in termination of the CAC authorization. The contractor will be responsible for complying with all DCSIM automated patch updates and will be subject to automated compliance scans upon connection to the network.

3.7 ACCEPTANCE TESTING

A. Upon completion of the installation, this contractor shall load all system software and start-up the system. This contractor shall perform all necessary calibration, testing and de-bugging and perform all required operational checks to insure that the system is functioning in full accordance with these specifications as well as the sequence of operation.

B. This contractor shall perform tests to verify proper performance of components, routines, and points. Repeat tests until proper performance results. This testing shall include a point-by-point log to validate 100% of the input and output points of the DDC system operation.

C. Controls testing shall also include operation verification of smoke control sequence, emergency shutdown sequence and emergency and normal power sequence.

D. Upon completion of the performance tests described above, repeat these tests, point by point as described in the validation log above in presence of Owner's Representative, as required. Properly schedule these tests so testing is complete at a time directed by the Owner or the Owner's Representative. Do not delay tests so as to prevent delay of occupancy permits or building occupancy.

E. System Acceptance: Satisfactory completion is when this contractor and the Division 26 contractor have performed successfully all the required testing to show performance compliance with the requirements of the Contract Documents to the satisfaction of the Owner and the Owner’s Representative. Final system acceptance shall be contingent upon completion and review of all corrected deficiencies.

3.8 OPERATOR INSTRUCTION, TRAINING

A. During system commissioning and at such time acceptable performance of the BACS hardware and software has been established this contractor shall provide on-site operator instruction to the owner's operating personnel. Operator instruction shall be done during normal working hours and shall be performed by a competent representative familiar with the system hardware, software and accessories.

B. This contractor shall provide 40 hours of instruction to the owner's designated personnel on the operation of the BACS and describe its intended use with respect to the programmed functions specified. Operator orientation of the systems shall include, but not be limited to; the overall operation program, equipment functions (both individually and as part of the total integrated system), commands, systems generation, advisories, and appropriate operator intervention required in responding to the System's operation.

C. The training shall be in three sessions as follows:

1. Initial Training: One day session (8 hours) after system is started up and at least one week before first acceptance test. Manual shall have been submitted at least two weeks prior to training so that the owners' personnel can start to familiarize themselves with the system before classroom instruction begins.

2. First Follow-Up Training: Two days (16 hours total) approximately two weeks after initial training, and before Formal Acceptance. These sessions will deal with more advanced topics and answer questions.

3. Warranty Follow Up: Two days (16 hours total) in no less than 4 hour increments, to be scheduled at the request of the owner during the one year warranty period. These sessions shall cover topics as requested by the owner such as; how to add additional points, create and gather data for trends, graphic screen generation or modification of control routines.

3.9 BUILDING FIRE ALARM INTERFACING

A. The fire-alarm system will send a signal to the DDC system to identify when the fire alarm system is in alarm.

B. Upon receipt of the fire alarm signal, the DDC system continues to operate HVAC equipment. It shall be automatically shut down only when activated by the smoke detector(s) located in the air handling unit. Both the supply fan and its related return fan shall be shut down by the same sensor.

3.10 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections. Report results in writing.

1. Operational Test. After electrical circuitry has been energized, start units to confirm proper unit operation. Remove malfunctioning units, replace with new units, and retest.

2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment, and retest.

3. Calibration test electronic controllers by disconnecting input sensors and stimulating operation with compatible signal generator.

B. Engage a factory-authorized service representative to perform startup service.

C. Replace damaged or malfunctioning controls and equipment.

1. Start, test, and adjust control systems.

2. Demonstrate compliance with requirements, including calibration and testing, and control sequences.

3. Adjust, calibrate, and fine tune circuits and equipment to achieve sequence of operation specified.

D. Verify DDC as follows:

1. Verify software including automatic restart, control sequences, scheduling, reset controls, and occupied/unoccupied cycles.

2. Verify operation of operator workstation.

3. Verify local control units including self-diagnostics.

3.11 SYSTEM ACCEPTANCE

A. The system installation shall be complete in all respects and tested for proper operation prior to acceptance testing for the Owner's authorized representative. A letter shall be submitted to the Engineer requesting system acceptance. This letter shall certify all controls are installed and the software programs have been completely exercised for proper equipment operation. Acceptance testing will commence at a mutually agreeable time within 30 calendar days of the request. When the system has been deemed satisfactory in whole or in part by the Owner's representative, the system will be accepted for beneficial use which will start the warranty period for the commissioned portion.

B. The building controls system subcontractor shall submit a proposed Acceptance Test Agreement for testing the system's functionality and the accuracy of all sensors and actuators."

DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT
JOINT FORCE HEADQUARTERS, MAINE NATIONAL GUARD
33 STATE HOUSE STATION
AUGUSTA, ME 04333-0033

MEMORANDUM FOR All MEARNG Components

SUBJECT: Contracting Companies requesting access to Maine Army National Guard (MEARNG) Domain or infrastructure

1. Reference:

a. AR 25-1, Army Knowledge Management and Information Technology.

b. AR 25-2, Information Assurance.

2. PURPOSE: To inform any company wishing to bid on contracts that require any type of access to the MEARNG Domain or computing infrastructure. Contracting Companies requesting access to MEARNG Domain or infrastructure must understand and comply with the security policies of the Maine Army National Guard (MEARNG),National Guard Bureau (NGB), Army, and Department of Defense (DoD).

3. Any company wishing to bid on contracts that require any type of access to the MEARNG Domain or infrastructure will comply with the following:

a. The Contracting Company will need to identify the Point of Contact's (POC's) who will require access and submit their names and any other information needed to perform a background check.

b. The Contracting Company for each POC identified who requires access to the MEARNG Domain or infrastructure must acquire an Army Knowledge On Line (AKO) account(s). The Directorate that is responsible for supervising the Contracting Company POC('s) is also responsible for sponsoring the Contracting Company POC('s) for the AKO account(s).

c. Each Contracting Company POC will get a Common Access Card (CAC) Identification to enable them to log into the MEARNG Domain. The Directorate that is responsible for supervising the Contracting Company POC's is also responsible for assisting the Contracting Company POC('s) in obtaining CAC Identification.

d. Each Contracting Company POC will complete the following before receiving a user account:

1. Complete the Army Information Assurance (IA) training.

2. Sign the MEARNG Acceptable Use Policy (AUP).

3. Sign a Memorandum of Understanding (MOU) with the MEARNG Deputy Chief of Staff Information Management (DCSIM) stating they understand this policy Memorandum.

4. Submit the above documents to the MEARNG Helpdesk for a user account.

e. A computer will be provided for the sole purpose of accessing the Contracting Companies system on the MEARNG Domain. The computer for the Contracting Company will be provided by the Directorate that is responsible for supervising the Contracting Company.

f. If the Contracting Company requires any special software not already loaded on the computer provided, then the Contracting Company will provide a Certificate of Net worthiness (CoN) issued by United States (US), Department of the Army (DA), General Level Signal (G6), Army.

g. The Contracting Company will only operate on approved Virtual Local Area Networks (VLANS) designated by the MEARNG Network Manager.

h. The Contracting Company will connect to their local system by connecting directly into the MEARNG infrastructure at a physical MEARNG facility. At no time will a Contracting Company be authorized to remote access or create a virtual private network (VPN) connection from outside the MEARNG Domain from any computer or electronic device. This includes, but is not limited to: Remote Desktop Connections, VPN clients etc…

i. The Contracting Company will be held responsible and liable for damages from any virus and vulnerabilities that they introduce to the MEARNG Domain. The Contracting Company will reimburse the MEARNG for all expenses associated with fixing any intrusions or damage caused by the intrusion.

DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT
JOINT FORCE HEADQUARTERS, MAINE NATIONAL GUARD
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4. POC is CW4 James P. Belanger, Plans and Policies for DCSIM, james.p.belanger.mil@mail.mil , Com (207) 430-5555.

JEFFREY M. BILODEAU
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AUGUSTA, ME 04333-0033

MEARNG-ARS-Z 10 August 2016

MEMORANDUM OF USE POLICY FOR All MEARNG Components

SUBJECT: MEMORANDUM of USE POLICE for Contracting Companies requesting access to Maine Army National Guard (MEARNG) Domain or infrastructure

1. Reference:

a. AR 25-1, Army Knowledge Management and Information Technology.

b. AR 25-2, Information Assurance.

2. PURPOSE: To establish a MEMORANDUM USE Policy (MOU) to any person wishing to bid on contracts that require any type of access to the MEARNG Domain or computing infrastructure. By signing this MOU I am requesting access to MEARNG Domain or infrastructure and I understand and will comply with the security policies of the Maine Army National Guard (MEARNG), National Guard Bureau (NGB), Army, and Department of Defense (DoD).

3. I will comply with the following:

k. I will identify all persons who will require access and submit their names and any other information needed to perform a background check.

l. I will acquire an Army Knowledge On-Line (AKO) account(s). I understand that the Directorate that is responsible for supervising me is also responsible for sponsoring my AKO account(s).

m. I will obtain a Common Access Card (CAC) Identification to enable me to log into the MEARNG Domain. I understand that he Directorate that is responsible for my supervision is also responsible for assisting me in obtaining my CAC Identification.

n. I will complete the following before receiving a user account:

5. I will complete the Army Information Assurance (IA) training.

6. I will sign the MEARNG Acceptable Use Policy (AUP).

7. I will sign this Memorandum of Understanding (MOU) with the MEARNG Deputy Chief of Staff Information Management (DCSIM) stating I understand this policy Memorandum.

8. I will submit the above documents to the MEARNG Helpdesk for a user account.

o. I understand that only the computer that was provided to me for this use will only be used for accessing my system, server, computer or IT device on the MEARNG Domain. I understand that the computer issued to me is my full responsibility.

p. I understand that I will not load any additional software not already loaded on the computer provided and all software on the computer will have a Certificate of Net worthiness (CoN) issued by United States (US), Department of the Army (DA), General Level Signal (G6), Army.

q. I understand that I will only operate on approved Virtual Local Area Networks (VLANS) designated by the MEARNG Network Manager.

r. I understand that I will only connect to my system by connecting directly into the MEARNG infrastructure at a physical MEARNG facility. At no time will I remote access or create a virtual private network (VPN) connection from outside the MEARNG Domain from any computer or electronic device. This includes, but is not limited to: Remote Desktop Connections, VPN clients etc…

s. I understand that I will be held financially and legally responsible for all damages from any virus and vulnerabilities that I introduce to the MEARNG Domain. I will reimburse the MEARNG for all expenses associated with fixing any intrusions or damage caused by the intrusion.

t. I understand that I will not attempt to access the MEARNG Domain or computing infrastructure without the Directorate Chief of Staff of Information Management (DCSIM) authorization and I understand that such activity is punishable under Public Law 99-474 (The Computer Fraud and Abuse Act of 1986).

4. POC is CW4 James P. Belanger, Plans and Policies for DCSIM, james.p.belanger.mil@mail.mil , Com (207) 430-5555.

DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT
JOINT FORCE HEADQUARTERS, MAINE NATIONAL GUARD
33 STATE HOUSE STATION
AUGUSTA, ME 04333-0033

I understand and will comply with this MEMORANDUM of USE POLICE.

Date: _____

Signature:_____

JEFFREY M. BILODEAU
LTC, SC, MEARNG
Deputy Chief of Staff
Information Management