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**USACE / NAVFAC / AFCEC / NASA UFGS-25 08 10 (April 2006)**

**--------------------------**

**Preparing Activity: USACE**

**UNIFIED FACILITIES GUIDE SPECIFICATIONS**

**References are in agreement with UMRL dated July 2019**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

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**USACE / NAVFAC / AFCEC / NASA UFGS-25 08 10 (April 2006)**

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**Preparing Activity: USACE**

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**References are in agreement with UMRL dated July 2019**

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SECTION 25 08 10

UTILITY MONITORING AND CONTROL SYSTEM TESTING

**04/06**

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**NOTE: This guide specification covers the**

**requirements for factory, performance verification,**

**and endurance test of UMCS and HVAC controls.**

**Adhere to** UFC 1-300-02 **Unified Facilities Guide**

**Specifications (UFGS) Format Standard when editing**

**this guide specification or preparing new project**

**specification sections. Edit this guide**

**specification for project specific requirements by**

**adding, deleting, or revising text. For bracketed**

**items, choose applicable item(s) or insert**

**appropriate information.**

**Remove information and requirements not required in**

**respective project, whether or not brackets are**

**present.**

**Comments, suggestions and recommended changes for**

**this guide specification are welcome and should be**

**submitted as a** Criteria Change Request (CCR)**.**

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PART 1 GENERAL

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

**NOTE: The designer will need to edit this**

**specification if only a portion of the testing is**

**required on the project. The engineer must keep in**

**mind there can be testing of 1) new UMCS, 2)**

**building level controls, and/or 3) combined building**

**level controls and UMCS.**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

1.1 REFERENCES

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

**NOTE: This paragraph is used to list the**

**publications cited in the text of the guide**

**specification. The publications are referred to in**

**the text by basic designation only and listed in**

**this paragraph by organization, designation, date,**

SECTION 25 08 10 Page 3

**and title.**

**Use the Reference Wizard's Check Reference feature**

**when you add a Reference Identifier (RID) outside of**

**the Section's Reference Article to automatically**

**place the reference in the Reference Article. Also**

**use the Reference Wizard's Check Reference feature**

**to update the issue dates.**

**References not used in the text will automatically**

**be deleted from this section of the project**

**specification when you choose to reconcile**

**references in the publish print process.**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

The publications listed below form a part of this specification to the

extent referenced. The publications are referred to within the text by

the basic designation only.

CONSUMER TECHNOLOGY ASSOCIATION (CTA)

CTA CTA-709.1-D (2014) Control Network Protocol

Specification

CTA CTA-709.3 (1999; R 2015) Free-Topology Twisted-Pair

Channel Specification

CTA CTA-852-C (2014) Tunneling Device Area Network

Protocols Over Internet Protocol Channels

1.2 DEFINITIONS

1.2.1 Algorithm

A set of well-defined rules or procedures for solving a problem or

providing an output from a specific set of inputs.

1.2.2 Analog

A continuously varying signal value (temperature current, velocity, etc.).

1.2.3 Analog to Digital (A/D) Converter

An A/D converter is a circuit or device whose input is information in

analog form and whose output is the same information in digital form.

1.2.4 CTA CTA-709.1-D

"Control Network Protocol Specification", Standard communication protocol

for networked control systems that provides peer-to-peer communications.

1.2.5 Application Specific Controller

A device that is furnished with a pre-established built in application

that is configurable but not re-programmable.

1.2.6 Architecture

Architecture is the general organization and structure of hardware and

SECTION 25 08 10 Page 4

software.

1.2.7 Binary

A two-state system where an "ON" condition is represented by a high signal

level and an "OFF" condition is represented by a low signal level.

1.2.8 Building Point of Connection (BPOC)

The point of connection between the UMCS network backbone and the building

network backbone. The hardware at this location, which performs/provides

the connection is referred to as the BPOC Hardware.

1.2.9 Control Wiring

This includes conduit, wire, and wiring devices to install complete HVAC

control systems, including motor control circuits, interlocks, sensors, PE

and EP switches, and like devices. This also includes all wiring from

node to node, and nodes to all sensors and points defined in the I/O

summary shown on drawings or specified herein, and required to execute the

sequence of operation. Does not include line voltage power wiring.

1.2.10 Demand

The maximum rate of use of electrical energy averaged over a specific

interval of time usually expressed in kW.

1.2.11 Diagnostic Program

Machine-executable instructions used to detect and isolate system and

component malfunctions.

1.2.12 Distributed Control

A system whereby all control processing is decentralized and independent

of a central computer. In regards to a LonWorks based system, it also

means where the control logic for a single piece of building level control

resides in more than one controller (node).

1.2.13 Graphical User Interface (GUI)

Human-machine interfacing allows the operator to manage, command, monitor,

and program the system.

1.2.14 Integration

Establishing communication between two or more systems to create a single

system.

1.2.15 Interoperable

Two devices are interoperable if installed into the same system and they

communicate with each other without the use of another device (such as a

gateway).

1.2.16 LonTalk(r)

Open communication protocol developed by the Echelon(r) Corporation.

SECTION 25 08 10 Page 5

1.2.17 LONWORKS(r)

The communication technology developed by Echelon(r) Corporation for

control systems developed. The technology is based on the CTA CTA-709.1-D

protocol and employs interoperable devices along with the capability to

openly manage these devices using a network configuration tool.

1.2.18 LONMARK(r) International (LONMARK(r) Interoperability Assoc.)

Standards committee consisting of numerous independent product developers

and systems integrators dedicated to determining and maintaining the

interoperability guidelines for the LONWORKS(r) industry.

1.2.19 LonMarked(r)

A device that has been certified for compliance with LonMark(r) standards

by the LonMark(r) International.

1.2.20 LONWORKS(r) Application Specific Controller (ASC)

A networked device or node that contains a complete, configurable

application that is specific to a particular task.

1.2.21 LONWORKS(r) General Purpose Programmable Controller

A programmable control product, that unlike an ASC, is not installed with

a fixed factory-installed application program. The application in the

controller is custom software produced by the integrator specifically for

the project.

1.2.22 LONWORKS(r) Network Services (LNS)

The database format for addressing nodes and variable bindings

node-to-node.

1.2.23 Network

A system of distributed control units that are linked together on a

communication bus. A network allows sharing of point information between

all control units. Additionally, a network provides central monitoring

and control of the entire system from any distributed control unit

location.

1.2.24 Network Configuration Tool

Software used to create and modify the control network database and

configure controllers.

1.2.25 Node ID

A unique 48-bit node identification (ID) tag given to each node by Echelon

Corporation.

1.2.26 Node

An intelligent LONWORKS(r) device with a node ID and communicates via

CTA CTA-709.1-D and is connected to an CTA CTA-709.1-D network.

SECTION 25 08 10 Page 6

1.2.27 Operating System (OS)

Software which controls the execution of computer programs and which

provides scheduling, debugging, input/output controls, accounting,

compilation, storage assignment, data management, and related services.

1.2.28 Operator Workstation (OWS)

The OWS consists of a high-level processing desktop or laptop computer

that provides a graphic user interface to network.

1.2.29 Peripheral

Input/Output (I/O) equipment used to communicate to and from the computer

and make hard copies of system outputs and magnetic files.

1.2.30 Router

A device which routes messages destined for a node on another segment

subnet or domain of the control network. The device controls message

traffic based on node address and priority. Routers may also serve as

communication links between powerline, twisted pair, fiber, coax, and RF

media.

1.2.31 Standard Network Variable Type (SNVT)

A network variable of a standard format type used to define data

information transmitted and receive by the individual nodes.

1.2.32 UMCS Network Media

Transmission equipment including cables and interface modules (excluding

MODEMs) permitting transmission of digital information.

1.2.33 XIF

"External Interface File" contains the contents of the manufacturer's

product documentation.

1.2.34 Gateway

A device that translates from one protocol to another. Gateways are also

called Communications Bridges or Protocol Translators.

1.3 SYSTEM DESCRIPTION

a. The purpose of this Specification is to define generic Factory,

Performance Verification, and Endurance Test procedures for Utility

Monitoring and Control Systems (UMCS) and building level DDC. These

tests are to be used to assure that the physical and performance

requirements of UMCS and building level DDC are tested, and that the

test results are adequately documented. The Government will base

certain contractual decisions on the results of these tests.

b. This document covers the factory, performance verification, and

endurance test procedures for the Utility Monitoring and Control

System (UMCS) and Direct Digital Control for HVAC. It has been

written for a host based system where the LONWORKS(r) LNS database

resides on the main computer (server) and communicates over the

SECTION 25 08 10 Page 7

Ethernet (TCP/IP) connection to the field level controller nodes. The

system shall be comprised of the server hardware and software, IP

network hardware and software, and building point of connection (BPOC)

hardware and software.

c. The contractor who provided building level DDC under Section 23 09 00

INSTRUMENTATION AND CONTROL FOR HVAC is responsible for testing the

building level DDC. All control testing and controller tuning

required under Section 23 09 00 shall be completed and approved before

performing Performance Verification and Endurance Tests under this

section.

d. The following UFGS: Section 25 10 10 UTILITY MONITORING AND CONTROL

SYSTEM (UMCS) FRONT END AND INTEGRATION and Section 23 09 00

INSTRUMENTATION AND CONTROL FOR HVAC shall be part of the contract

documents.

1.3.1 Factory Test

Conduct a factory test at a company site. Perform some of the basic

functions of the UMCS and building level DDC, to assure that the

performance requirements of the specifications are met.

1.3.2 Performance Verification and Endurance Test

a. Shall be conducted on hardware and software installed at the jobsite

to assure that the physical and performance requirements of

specifications are met. Tests on network media shall include all

contractor furnished media and shall include at least one type of each

device installed.

b. Shall be conducted under normal mode operation, unless otherwise

indicated in the initial conditions description for each test. System

normal mode describes a condition in which the system is performing

its assigned tasks in accordance with the contract requirements.

c. Shall utilize the operator workstation (OWS) to issue commands or

verify status data.

1.3.3 Test Equipment and Setup

All test equipment calibrations shall be traceable to NIST. The accuracy

of the test equipment and overall test method shall be at least twice the

maximum accuracy required for the test. For example, if a temperature

sensor has an accuracy of +0.5 degree C +1 degree F over the executed

range, the test instrument used shall have an accuracy of at least +0.25

degree C +0.5 degree F or better. Provide all test equipment unless

otherwise noted in the contract documents.

1.4 SUBMITTALS

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

**NOTE: Review submittal description (SD) definitions**

**in Section 01 33 00 SUBMITTAL PROCEDURES and edit**

**the following list to reflect only the submittals**

**required for the project.**

**The Guide Specification technical editors have**

**designated those items that require Government**

SECTION 25 08 10 Page 8

**approval, due to their complexity or criticality,**

**with a "G." Generally, other submittal items can be**

**reviewed by the Contractor's Quality Control**

**System. Only add a “G” to an item, if the submittal**

**is sufficiently important or complex in context of**

**the project.**

**For submittals requiring Government approval on Army**

**projects, a code of up to three characters within**

**the submittal tags may be used following the "G"**

**designation to indicate the approving authority.**

**Codes for Army projects using the Resident**

**Management System (RMS) are: "AE" for**

**Architect-Engineer; "DO" for District Office**

**(Engineering Division or other organization in the**

**District Office); "AO" for Area Office; "RO" for**

**Resident Office; and "PO" for Project Office. Codes**

**following the "G" typically are not used for Navy,**

**Air Force, and NASA projects.**

**The "S" following a submittal item indicates that**

**the submittal is required for the Sustainability**

**eNotebook to fulfill federally mandated sustainable**

**requirements in accordance with Section 01 33 29**

**SUSTAINABILITY REPORTING. Locate the "S" submittal**

**under the SD number that best describes the**

**submittal item.**

**Choose the first bracketed item for Navy, Air Force**

**and NASA projects, or choose the second bracketed**

**item for Army projects.**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

Government approval is required for submittals with a "G" designation;

submittals not having a "G" designation are for [Contractor Quality

Control approval.] [information only. When used, a designation following

the "G" designation identifies the office that will review the submittal

for the Government.] Submittals with an "S" are for inclusion in the

Sustainability eNotebook, in conformance to Section 01 33 29

SUSTAINABILITY REPORTING. Submit the following in accordance with Section

01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Factory Test; G[, [\_\_\_\_\_]]

SD-06 Test Reports

UMCS and Building Level DDC Testing Sequence

Performance Verification Test; G[, [\_\_\_\_\_]]

Endurance Testing

PART 2 PRODUCTS

Not Used

SECTION 25 08 10 Page 9

PART 3 EXECUTION

3.1 UMCS AND BUILDING LEVEL DDC TESTING SEQUENCE

Perform a successful factory test prior to start of installation work, as

described in this section. During the installation phase, perform all

required field testing requirements on the UMCS and building level DDC as

specified in Sections 25 10 10 UTILITY MONITORING AND CONTROL SYSTEM

(UMCS) FRONT END AND INTEGRATION and 23 09 00 INSTRUMENTATION AND CONTROL

FOR HVAC, to verify that systems are functioning and installed in

accordance with specifications. Submit field test report prior to start

of PVT and endurance testing. After completing all required field

testing, perform a successful PVT and endurance test. All tests shall be

successfully completed, and test reports received, prior to final

acceptance of the UMCS and building level DDC. Perform and document

Contractor field test on UMCS and building level DDC.

3.2 COORDINATION

Coordinate the testing schedule with the Government. Coordination shall

include controls specified in other sections or divisions which include

controls and control devices that are to be part of or interfaced to the

UMCS specified in this section.

3.3 PROTECTION

Protect all work and material from damage by the work or workers. The

Contractor is liable for any damage caused and responsible for the work

and equipment until finally inspected, tested, and accepted. Protect the

work against theft, and carefully store material and equipment received

onsite that is not immediately installed.

3.4 FACTORY TEST

3.4.1 Factory Test Plan

Prior to the scheduling of the factory tests, provide the Government with

a Factory Test Plan for approval, and wait to receive notification of

approval of the Test Plan and Procedures before performing the tests. The

plan shall include the following, as a minimum:

a. System one-line block diagram of equipment used in the factory test

model, indicating servers, workstations, peripherals, network

equipment, controllers, and instrumentation.

b. System hardware description used in the factory test.

c. System software description used in the factory test.

d. Listing of control and status points in the factory test model; plus a

table with the following information:

(1) Input and output variables.

(2) SNVTs for each variable.

(3) Expected engineering units for each variable.

(4) Node ID.

(5) Domain & subnet addressing.

e. Required passwords for each operator access level.

SECTION 25 08 10 Page 10

f. List of other test equipment.

3.4.2 Test Procedures

Develop the factory test procedures from the generic test procedures in

ATTACHMENT A. The test procedures shall consist of detailed instructions

for test setup, execution, and evaluation of test results. Edit the

generic test procedure for the provided UMCS and building level DDC.

Perform a factory test on a model of the UMCS and building level DDC for

the Government to verify the system will function to the requirements of

the contract documents. The test architecture shall mimic a two building

arrangement. There shall be a TCP/IP layer with two Internet Protocol

(IP) to Lon routers. Below each of the routers shall be both programmable

(GPPC) and application-specific controllers (ASC). One server and one

workstation with printers shall be connected to the IP layer. There shall

be simulated input devices connected to controllers to enable the creation

of changing variables. If, during testing, the system fails a portion of

a test, the Government will inform the Contractor if the entire test or

only the portion that failed shall be re-performed. Give the Government a

written report of those items which failed, what the problem was, and what

was done to correct it. Provide onsite technical support to perform the

PVT. ATTACHMENT A presents the generic Test Procedures with the following

information:

a. Test identification number.

b. Test title.

c. Objective.

d. Initial conditions (if applicable).

e. Test equipment (if required).

f. Sequence of events.

g. Expected results.

3.4.3 Test Report

Submit a factory final, complete test report after completing the test,

consisting of the following, as a minimum:

a. Section one of the submittal shall be a short summary of the factory

test.

b. Section two of the submittal shall be a copy of the test plans.

c. Section three shall be the executed test procedure and shall be

divided using tabs. Each tab section shall include all pertinent

information pertaining to the executed and approved test, showing date

and Government representative who witnessed/approved the test.

3.5 FIELD TEST REQUIREMENTS

The UMCS contractor shall perform and document contractor start-up and

field tests as required by Sections 25 10 10 UTILITY MONITORING AND

CONTROL SYSTEM (UMCS) FRONT END AND INTEGRATION and 23 09 00

SECTION 25 08 10 Page 11

INSTRUMENTATION AND CONTROL FOR HVAC. The field test validates that the

UMCS and building level DDC are in operation without any problems or

system errors prior to starting a PVT. Validate that all software along

with all hardware is installed to meet or exceed the contract document

requirements. This includes all LONWORKS(r) networking and monitoring

hardware and all peripherals associated with the network and hardware.

Start-up and field testing shall include:

3.5.1 Start-up Testing

All testing listed in Sections 25 10 10 and 23 09 00 shall be completed.

3.5.2 Point-to-Point Testing

All point-to-point testing of end field devices through proper

input/output to graphic and operator interface shall be completed and

approved.

3.5.3 Field Calibration

All field calibration shall be completed and approved.

3.5.4 Detailed Functional Testing

Detailed functional tests, verified by the Government that the system

operation adheres to the Sequences of Operation.

3.5.5 Alarms and Interlocks All alarm limits and testing shall be completed.

3.5.6 System Schedules and Setpoints

All schedule start/stops and system setpoints shall be entered, operating,

and approved.

3.6 PERFORMANCE VERIFICATION TEST

3.6.1 Test Plan

Prior to the scheduling of the performance verification tests, provide the

Government with a Performance Verification and Endurance Test Plan and

Procedures for approval, and receive notification of approval of the Test

Plan and Procedures. The plan shall include the following, as a minimum:

a. Installed system one-line block diagram, indicating servers,

workstations, peripherals, network equipment, controllers, and

instrumentation.

b. Installed system hardware description.

c. Installed system software description, including any software revisions

made since the factory test.

d. Listing of control and status points installed in the system; plus a

table with the following information:

(1) Input and output variables.

(2) SNVTs for each variable.

(3) Expected engineering units for each variable.

(4) Node ID.

SECTION 25 08 10 Page 12

(5) Domain & subnet addressing.

e. Required passwords for each operator access level.

f. List of other test equipment.

3.6.2 Test Procedures

Develop the performance verification test procedures from the generic test

procedures in ATTACHMENT A. The test procedures shall consist of detailed

instructions for test setup, execution, and evaluation of test results.

Edit the generic test procedure for the provided UMCS and building level

DDC. Perform a performance verification test (PVT) on the completed UMCS

and building level DDC for the Government to verify the system is

completely functional. If, during testing, the system fails a portion of

a test, the Government will inform the Contractor if the entire test or

only the portion that failed shall be re-performed. Give the Government a

written report of those items which failed, what the problem was, and what

was done to correct it. Provide on-site technical support to perform the

PVT. ATTACHMENT A presents the generic UMCS Performance Verification Test

Procedures with the following information:

a. Test identification number.

b. Test title.

c. Objective.

d. Initial conditions (if applicable).

e. Test equipment (if required).

f. Sequence of events.

g. Expected results.

3.6.3 Test Report

Submit a final, complete PVT test report, after completing the test,

consisting of the following, as a minimum:

a. Section one of the submittal shall be a short summary of the

performance verification test.

b. Section two of the submittal shall be a copy of the test plans.

c. Section three shall be the executed test procedure and shall be

divided using tabs. Each tab section shall include all pertinent

information pertaining to the executed and approved test, showing date

and Government representative who witnessed/approved the test.

3.7 ENDURANCE TESTING

3.7.1 General

Endurance Test shall be designed to demonstrate the specified overall

system reliability requirement of the completed system. Conduct the

Endurance Test in four phases as described below. The Endurance Test

shall not be started until the Government notifies the Contractor, in

SECTION 25 08 10 Page 13

writing, that the Performance Verification Tests have been satisfactorily

completed, training as specified has been completed, correction of all

outstanding deficiencies has been satisfactorily completed, and that the

Contractor has permission to start the Endurance Test. Provide an

operator to man the system eight hours per day during first shift

operations, including weekends and holidays, during Phase I and Phase III

Endurance testing, in addition to any Government personnel that may be

made available. The Government may terminate testing at any time if the

system fails to perform as specified. Upon termination of testing by the

Government or by the Contractor, commence an assessment period as

described for Phase II and Phase IV. Upon successful completion of the

Endurance Test, submit test reports to the Government explaining in detail

the nature of any failures, corrective action taken, and results of tests

performed, prior to acceptance of the system. Keep a record of the time

and cause of each outage that takes place during the test period.

3.7.2 Phase I

During the Phase I testing, operate the system as specified for 24 hours

per day, 7 days per week, for 15 consecutive calendar days, including

holidays. Do not make repairs during this phase of testing unless

authorized by the Government, in writing. If the system experiences no

failures during the Phase I test, proceed directly to Phase III testing,

after receiving written permission from the Government.

3.7.3 Phase II

In Phase II, which occurs after the conclusion of Phase I, identify all

failures, determine the causes of all failures, repair all failures, and

submit a test failure report to the Government. After submitting the

written report, convene a test review meeting at the job site to present

the results and recommendations to the Government. The meeting shall be

scheduled no earlier than five business days after receipt of the report

by the Government. As a part of this test review meeting, demonstrate

that all failures have been corrected by performing appropriate

Performance Verification Tests. Based on the Contractor's report, the

test review meeting, and the Contractor's recommendation, the Government

will independently determine the restart point and may require that the

Phase I test be totally or partially rerun. Do not commence any required

retesting until after receipt of written notification by the Government.

3.7.4 Phase III

After the conclusion of any retesting which the Government may require,

repeat the Phase II assessment as if Phase I had just been completed. If

the retest is completed without any failures, proceed directly to Phase

III testing, after receiving written permission from the Government.

During Phase III testing, operate the system as specified for 24 hours per

day, 7 days per week, for 15 consecutive calendar days, including

holidays. Do not make repairs during this phase of testing unless

authorized by the Government, in writing.

3.7.5 Phase IV

In Phase IV, which occurs after the conclusion of Phase III, identify all

failures, determine the causes of all failures, repair all failures, and

submit a test failure report to the Government. After submitting the

written report, convene a test review meeting at the job site to present

the results and recommendations to the Government. The meeting shall not

SECTION 25 08 10 Page 14

be scheduled earlier than five business days after receipt of the report

by the Government. As a part of this test review meeting, demonstrate

that all failures have been corrected by performing appropriate

Performance Verification Tests. Based on the Contractor's report, the

test review meeting, and the Contractor's recommendation, the Government

will independently determine the restart point and may require that the

Phase III test be totally or partially rerun. Do not commence any

required retesting until after receipt of written notification by the

Government. After the conclusion of any retesting which the Government

may require, the Phase IV assessment shall be repeated as if Phase III had

just been completed. The Contractor will not be held responsible for

failures resulting from the following:

a. An outage of the main power supply in excess of the capability of any

backup power source, provided that the automatic initiation of all

backup sources was accomplished and that automatic shutdown and

restart of the UMCS performed as specified.

b. Failure of a Government-furnished communications link, provided that

the LON nodes and LON routers automatically and correctly operate in

the stand-alone mode as specified, and that the failure was not due to

contractor furnished equipment, installation, or software.

c. Failure of existing Government-owned equipment, provided that the

failure was not due to contractor-furnished equipment, installation,

or software.

3.7.6 Failure Reports

Provide UMCS Endurance Test Failure Reports. UMCS Test Failure Reports

shall explain in detail the nature of each failure, corrective action

taken, results of tests performed. If any failures occur during Phase I

or Phase III testing, recommend the point at which the Phase I or Phase

III testing, as applicable, should be resumed.

3.8 ATTACHMENT A

SECTION 25 08 10 Page 15

TEST PROCEDURES

TITLE: Test Index

OBJECTIVE: The following is an index of tests.

NOTES: Tests one through twenty contain specific "item(s)" that apply

to Sections 25 10 10 UTILITY MONITORING AND CONTROL SYSTEM (UMCS) FRONT END

AND INTEGRATION) and 23 09 00 INSTRUMENTATION AND CONTROL FOR HVAC. The

following index of tests provides a summary of which "items numbers" apply

to which specification.

Test No. Test Title Section 23 09 00,

Section 25 10 10

DDC for HVAC

One Initial System

Equipment Verification

Items 1 through 15 Items 16 through 32

Two System Start-up Items 1 through 4 Items 5 and 6

Three Monitor and Control

Software

Items 1 through 5 Not Applicable

Four Graphic Display of Data Items 1 through 18 Not Applicable

Five Graphic Navigation

Scheme

Items 1 and 2 Not Applicable

Six Command Functions Items 1 through 6 Not Applicable

Seven Command Input Errors Items 1 through 6 Items 1 through 6

Eight Special Functions Item 1 Not Applicable

Nine Software Editing Tools Items 1 through 42 Items 1 through 42

Ten Scheduling Items 1 through 7 Items 8 through 10

Eleven Alarm function Items 1 through 15 item 16

Twelve Trending Items 1 through 8 Not Applicable

Thirteen Demand Limiting Items 1 through 8 Not Applicable

Fourteen Report Generation Items 1 through 6 Not Applicable

Fifteen UPS Test Items 1 through 5 Not Applicable

Sixteen CTA CTA-709.1-D to IP

Router Test

Items 1 through 3 Not Applicable

Seventeen CTA CTA-709.1-D Router

and Repeater

Not Applicable Items 1 through 4

SECTION 25 08 10 Page 16

Test No. Test Title Section 23 09 00,

Section 25 10 10

DDC for HVAC

Eighteen CTA CTA-709.1-D Gateway

Test

Items 1 through 5 Items 1 through 5

Nineteen Local Display Panel Not Applicable Items 1 through 5

Twenty Network Configuration

Tool

Items 1 through 8 Items 1 through 8

Twenty-One Custom Tests Item 1 and 2 Item 1 and 2

SECTION 25 08 10 Page 17

**PVT Checklist**

**OBJECTIVE**:

1. Inspect/test/verify that building-level DDC system is compliant with

Section 23 09 00 and capable of integration with UMCS

**INITIAL REQUIREMENTS/CONDITIONS**

1. The following tests shall be completed and documentation shall be

submitted to the Government.

2. Date of Checklist: \_\_\_\_\_\_\_\_\_\_

3. Time of Checklist: \_\_\_\_\_\_\_\_\_\_

4. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**CHECKLIST PROCEDURES**

Expected

Item Action Item Results Approved

**UMCS AND DDC FOR HVAC**

1 Draft or Final Drawings submitted and

As-Built Drawings approved \_\_\_\_\_\_\_\_\_\_

Point schedule(s) showing

all required UMCS SNVTs

submitted \_\_\_\_\_\_\_\_\_\_

Point schedules(s) showing

device network addresses

submitted \_\_\_\_\_\_\_\_\_\_

Local display panel (LDP)

locations indicated on

drawings submitted \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2 Network Bandwidth Test Test completed, accepted,

Report and a report documenting

results submitted \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3 Programming software Most recent version of the

programming software for

each type of GPPC has been

submitted \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SECTION 25 08 10 Page 18

Expected

Item Action Item Results Approved

4 XIF Files External interface files (XIF)

files for each model of

LONWORKS®-based DDC hardware

has been submitted \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5 LNS Database Copies of the LNS database

for the completed control

network has been submitted \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6 LNS Plug-in LNS Plug-ins for each

application specific

controller has been

submitted \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7 Start-up testing report Start-up has been

successfully completed

and testing report

submitted \_\_\_\_\_\_\_\_\_\_

Controller tuning has

been completed and document

on point schedule \_\_\_\_\_\_\_\_\_\_

Calibration accuracy check

completed and documented in

test report \_\_\_\_\_\_\_\_\_\_

Actuator range check

completed and documented in

test report \_\_\_\_\_\_\_\_\_\_

Functional test to

demonstrate control sequence

completed and documented in

test report \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8 Software License Software licenses received

for all software on the

project \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SECTION 25 08 10 Page 19

Expected

Item Action Item Results Approved

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

SECTION 25 08 10 Page 20

**TEST NUMBER**: One

**TITLE**: Initial System Equipment Verification

**OBJECTIVE**:

1. To verify that the hardware and software components of the system

provided by the Contractor are in accordance with the contract plans and

specifications and all approved submittals.

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittals

a. Submit a detailed list of all approved hardware with

Manufacturer, model number and location. This list is based on the contract

plans, specifications, change orders (if any) and approved submittals which

shall be available for reference purposes during the test.

b. Submit a detailed list of all approved software with revision

number and purpose of software. This list is based on the contract plans,

specifications, change orders (if any) and approved submittals which shall

be available for reference purposes during the test.

2. Equipment

a. Verify all equipment is functional.

3. Reference Documentation

a. List user manual documentation and sections pertaining to the

testing.

4. Date of Test: \_\_\_\_\_\_\_\_\_\_

5. Time of Test: \_\_\_\_\_\_\_\_\_\_

6. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**UMCS**

1 The workstation hardware is

installed and complies with

specification paragraph

titled "Workstation Hardware". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2 The Server hardware is installed

and complies with specification

paragraph titled "Server

Hardware". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Expected

Item Action Item Results Approved

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3 The fiber optic patch panel is

installed and complies with

specification paragraph titled

"Fiber Optic Patch Panel". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4 The fiber optic media converter

is installed and complies with

specification paragraph titled

"Fiber Optic Media Converter". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5 The Ethernet switch is installed

and complies with specification

paragraph titled "Ethernet

Switch". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6 The IP router is installed and

complies with specification

paragraph titled "IP Router". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7 The CTA CTA-709.1-D to IP router is

installed and complies with

specification paragraph titled

"CTA CTA-709.1-D to IP Router". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8 The CTA CTA-709.1-D gateway is

installed and complies with

specification paragraph titled

"CTA CTA-709.1-D Gateway". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SECTION 25 08 10 Page 22

Expected

Item Action Item Results Approved

9 The alarm printer is installed

and complies with specification

paragraphs titled "PRINTERS" and

"Alarm Printer". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10 The laser printer is installed

and complies with specification

paragraphs titled "PRINTERS" and

"Laser Printer". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11 The color printer is installed and

complies with specification paragraphs

titled "PRINTERS" and "Color

Printer". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12 The operating system is installed

and complies with specification

paragraph titled "Operating

System (OS)". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13 The office automation software is

installed and complies with

specification paragraph titled

"Office Automation Software". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

14 The virus protection software is

installed and complies with

specification paragraph titled

"Virus Protection Software". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

15 The configuration server is

installed and complies with

specification paragraph titled

SECTION 25 08 10 Page 23

Expected

Item Action Item Results Approved

"CTA CTA-852-C Configuration Server". \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**DDC FOR HVAC**

16 The CTA CTA-709.1-D Router is installed

and complies with specification

paragraph titled "CTA CTA-709.1-D

Router". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

17 The CTA CTA-709.3 Repeater is installed

and complies with specification

paragraph titled "CTA CTA-709.3

Repeater". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

18 The TP/FT-10 network is installed

in accordance with CTA CTA-709.3, with

double-terminated bus topology. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

19 Network wiring extends to the

location of UMCS BPOC. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

20 The Gateway is installed and

complies with specification

paragraph titled "Gateway". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

21 All control valves are installed

and comply with their associated

specification paragraph under the

section titled "Control Valves". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SECTION 25 08 10 Page 24

Expected

Item Action Item Results Approved

22 All dampers are installed and

comply with their associated

specification paragraph under the

section titled "Dampers". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

23 All sensors are installed and

comply with their associated

specification paragraph under the

section titled "Sensors". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

24 All indicating devices are

installed and comply with their

associated specification

paragraph under the section

titled "Indicating Devices". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

25 All user input devices are

installed and comply with their

associated specification paragraph

under the section titled "User

Input Devices". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

26 All output devices are installed

and comply with their associated

specification paragraph under the

section titled "Output Devices". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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27 All multifunction devices are

installed and comply with their

associated specification paragraph

under the section titled

"Multifunction Devices". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Expected

Item Action Item Results Approved

28 All compressed air equipment is

installed and complies with their

associated specification paragraph

under the section titled

"Compressed Air". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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29 All ASCs are installed and comply

with the specification paragraph

titled "Application Specific

Controller". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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30 All LDPs and laptop computers are

provided and comply with the

specification paragraph titled

"Local Display Panel". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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31 All GPPCs are installed and comply

with the specification paragraph

titled "General Purpose

Programmable Controller". \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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32 LNS-based system used to address

nodes, bind variables, and LNS

database of network exists on

system. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

SECTION 25 08 10 Page 26

**TEST NUMBER**: Two

**TITLE**: System Start-up

**OBJECTIVE**:

1. To validate that the system properly initializes and that the GUI

properly reconnects to all communicating devices.

2. To validate that both application specific and programmable devices

retain all vital information upon a power cycle.

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittals

a. Provide a list of all software that will be used to verify point

connection at field level controllers and user interface.

b. Provide a list of all software need to verify application

specific and programmable controller start-up.

2. Equipment

a. All peripherals and cables shall be connected in accordance with

manufacturer's requirements.

b. The workstation shall be in the off mode.

c. All controls shall be fully functional and tested.

d. A programmable and application specific controller shall be

randomly selected for the test.

3. Date of Test: \_\_\_\_\_\_\_\_\_\_

4. Time of Test: \_\_\_\_\_\_\_\_\_\_

5. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**UMCS**

1 Energize the workstation. The workstation will

power-up and perform its

start-up procedure without

generating any errors or

problems. \_\_\_\_\_\_\_\_\_\_

a) Operating system Operating system shall be

latest version of windows. \_\_\_\_\_\_\_\_\_\_

b) Start Network The Network Configuration

Configuration Tool. Tool drawing will open. \_\_\_\_\_\_\_\_\_\_

c) Start the System The System plug-in will

Plug-in. open. \_\_\_\_\_\_\_\_\_\_

d) Start the Server. The Server will start. \_\_\_\_\_\_\_\_\_\_

e) Start the Workstation. The Workstation will start.

The operator shall now have

the ability to view data

from any device on the

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Expected

Item Action Item Results Approved

network. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2 Check the communication Within the workstation

from the server to the software, when a device is

controllers. selected, dynamic points

lists become visible.

Dynamic data represents

success. A completion event

failure message represents

failure. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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3 Verify on-line status. All devices shall have

on-line status indicated

by the workstation software

(green indicator). \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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4 View data from the When a graphics page is

graphical environment. opened, the points on the

page should update.

Question marks in lieu of

data reflect failure. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**DDC FOR HVAC**

5 Verify that configuration All configuration

data in application parameters should be

specific controllers is accessible. \_\_\_\_\_\_\_\_\_\_

written to EEPROM.

a) Open the LONWORKS® Software should open

plug-in. without errors. \_\_\_\_\_\_\_\_\_\_

b) Note several Operator is able to view

parameters such as a sample of parameters

temperature setpoints (data values and setpoints).

and flow settings. \_\_\_\_\_\_\_\_\_\_

c) Remove power from the Device should go off-line

controller for a in Network Configuration

minimum of 3 minutes. Tool and workstation/server. \_\_\_\_\_\_\_\_\_\_

d) Replace power to the Device should return to

controller. on-line status. \_\_\_\_\_\_\_\_\_\_

e) Using the plug-in, Parameters shall not have

verify that the changed.

parameters have not \_\_\_\_\_\_\_\_\_\_

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Expected

Item Action Item Results Approved

changes.

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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6 Verify that configuration

data in programmable

controllers is retained

after a power cycle. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

a) From the Workstation Values of the parameters

view several can be viewed from the

configuration tree structure.

parameters

and note the values. \_\_\_\_\_\_\_\_\_\_

b) Remove power for a Controller will go offline

minimum of 3 minutes. in workstation software. \_\_\_\_\_\_\_\_\_\_

c) Replace power to the Controller will return to

controller. online status. \_\_\_\_\_\_\_\_\_\_

d) From the Workstation Parameters values shall

view the same not have changed.

configuration

parameters

and note the values. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

SECTION 25 08 10 Page 29

**TEST NUMBER**: Three

**TITLE**: Monitor and Control (M&C) Software Passwords

**OBJECTIVE**:

1. To validate that the system utilizes four basic password levels

2. To validate that each password level has the specified authority

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittals

a. Provide documentation of M&C user password capacity in comparison

with specification.

b. Provide a complete list of all users along with their passwords

and user level prior to testing.

2. Equipment

a. Server and Workstation

3. Reference Documentation

a. Provide user manual documentation for setting up passwords

4. Date of Test: \_\_\_\_\_\_\_\_\_\_

5. Time of Test: \_\_\_\_\_\_\_\_\_\_

6. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**UMCS**

1 Create password for new New users shall exist in

users. the server Database. \_\_\_\_\_\_\_\_\_\_

a) Set-up 4 users. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

b) Assign different

levels to each. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2 Demonstrate level 1

authority. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

a) Sign in as the level 1 Sign in shall be

user. successful. \_\_\_\_\_\_\_\_\_\_

b) Attempt to view a Action shall be possible.

system graphic. \_\_\_\_\_\_\_\_\_\_

c) Attempt to acknowledge Action shall be denied.

an alarm. \_\_\_\_\_\_\_\_\_\_

d) Attempt to configure a Action shall be denied.

trend. \_\_\_\_\_\_\_\_\_\_

e) Attempt to configure a Action shall be denied.

report. \_\_\_\_\_\_\_\_\_\_

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Expected

Item Action Item Results Approved

f) Attempt to override a Action shall be denied.

point. \_\_\_\_\_\_\_\_\_\_

g) Attempt to configure an Action shall be denied.

alarm. \_\_\_\_\_\_\_\_\_\_

h) Attempt to configure a Action shall be denied.

schedule. \_\_\_\_\_\_\_\_\_\_

i) Attempt to configure a Action shall be denied.

demand limiting

parameter. \_\_\_\_\_\_\_\_\_\_

j) Attempt to modify a Action shall be denied.

graphic page. \_\_\_\_\_\_\_\_\_\_

k) Attempt to create a Action shall be denied.

custom program. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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3 Demonstrate level 2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

authority.

a) Sign in as the level 2 Sign in shall be successful.

user. \_\_\_\_\_\_\_\_\_\_

b) Attempt to view a Action shall be possible.

system graphic. \_\_\_\_\_\_\_\_\_\_

c) Attempt to acknowledge Action shall be possible.

an alarm. \_\_\_\_\_\_\_\_\_\_

d) Attempt to configure a Action shall be possible.

trend. \_\_\_\_\_\_\_\_\_\_

e) Attempt to configure a Action shall be possible.

report. \_\_\_\_\_\_\_\_\_\_

f) Attempt to override a Action shall be denied.

point. \_\_\_\_\_\_\_\_\_\_

g) Attempt to configure an Action shall be denied.

alarm. \_\_\_\_\_\_\_\_\_\_

h) Attempt to configure a Action shall be denied.

schedule. \_\_\_\_\_\_\_\_\_\_

i) Attempt to configure a Action shall be denied.

demand limiting

parameter. \_\_\_\_\_\_\_\_\_\_

j) Attempt to modify a Action shall be denied.

graphic page. \_\_\_\_\_\_\_\_\_\_

k) Attempt to create a Action shall be denied.

custom program. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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4 Demonstrate level 3

authority. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

a) Sign in as the level 3 Sign in shall be

user. successful. \_\_\_\_\_\_\_\_\_\_

b) Attempt to view a Action shall be possible.

system graphic. \_\_\_\_\_\_\_\_\_\_

c) Attempt to acknowledge Action shall be possible.

an alarm. \_\_\_\_\_\_\_\_\_\_

d) Attempt to configure a Action shall be possible.

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Expected

Item Action Item Results Approved

trend. \_\_\_\_\_\_\_\_\_\_

e) Attempt to configure a Action shall be possible.

report. \_\_\_\_\_\_\_\_\_\_

f) Attempt to override a Action shall be possible.

point. \_\_\_\_\_\_\_\_\_\_

g) Attempt to configure an Action shall be possible.

alarm. \_\_\_\_\_\_\_\_\_\_

h) Attempt to configure a Action shall be possible.

schedule. \_\_\_\_\_\_\_\_\_\_

i) Attempt to configure a Action shall be possible.

demand limiting

parameter. \_\_\_\_\_\_\_\_\_\_

j) Attempt to modify a Action shall be denied.

graphic page. \_\_\_\_\_\_\_\_\_\_

k) Attempt to create a Action shall be denied.

custom program. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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5 Demonstrate level 4

authority. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

a) Sign in as the level 3 Sign in shall be

user. successful. \_\_\_\_\_\_\_\_\_\_

b) Attempt to view a Action shall be possible.

system graphic. \_\_\_\_\_\_\_\_\_\_

c) Attempt to acknowledge Action shall be possible.

an alarm. \_\_\_\_\_\_\_\_\_\_

d) Attempt to configure a Action shall be possible.

trend. \_\_\_\_\_\_\_\_\_\_

e) Attempt to configure a Action shall be possible.

report. \_\_\_\_\_\_\_\_\_\_

f) Attempt to override a Action shall be possible.

point. \_\_\_\_\_\_\_\_\_\_

g) Attempt to configure an Action shall be possible.

alarm. \_\_\_\_\_\_\_\_\_\_

h) Attempt to configure a Action shall be possible.

schedule. \_\_\_\_\_\_\_\_\_\_

i) Attempt to configure a Action shall be possible.

demand limiting

parameter. \_\_\_\_\_\_\_\_\_\_

j) Attempt to modify a Action shall be possible.

graphic page program. \_\_\_\_\_\_\_\_\_\_

k) Attempt to create a Action shall be possible.

custom program. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

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SECTION 25 08 10 Page 33

**TEST NUMBER**: Four

**TITLE**: Graphic Display of Data

**OBJECTIVE**:

1. To validate that floor plans and equipment can be graphically

displayed through GUI.

2. To validate the proper display of alarms on GUI.

3. To validate the proper display of trend data on GUI.

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittals

a. Provide hard copies of "snap shots" of sample graphics pages

prior to testing.

2. Equipment

a. Complete all graphics.

3. Reference Documentation

a. List user manual documentation and sections pertaining to the

testing.

4. Notes

a. Different types of data and states should be clearly

distinguishable from each other.

5. Date of Test: \_\_\_\_\_\_\_\_\_\_

6. Time of Test: \_\_\_\_\_\_\_\_\_\_

7. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

1 Demonstrate the use of a Equipment shall be

three dimensional represented in a three

representation of a dimensional manner.

mechanical system. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2 Demonstrate the Dynamic real time data

presentation of real time shall be presented on a

data. graphics page. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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3 Demonstrate the A user defined parameter

presentation of user such as a setpoint shall be

SECTION 25 08 10 Page 34

Expected

Item Action Item Results Approved

entered data. presented on a graphics page.

Different types of data and

states should be clearly

distinguishable from each

other. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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4 Demonstrate the An indication of override

presentation of a point condition shall be viewable

in override. on the graphic page.

Different types of data

and states should be

clearly distinguishable

from each other. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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5 Demonstrate the An indication of the alarm

presentation of a device state shall be viewable on

in the alarm state. the graphic page. Different

types of data and states

should be clearly

distinguishable from each

other. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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6 Demonstrate the An indication of out of range

presentation of data that condition shall be viewable

is out of range. on the graphic page.

Different types of data and

states should be clearly

distinguishable from each

other. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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7 Demonstrate the An indication of missing data

presentation of missing shall be viewable on the

data (controller is graphic page. Different

offline). types of data and states

should be clearly

distinguishable from each

other. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Expected

Item Action Item Results Approved

8 Demonstrate an error An error message shall be

message when the operator displayed.

attempts to execute in

improper command. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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9 Demonstrate point and click Operator shall be able to

access to context sensitive easily access context

help. sensitive help using the

mouse. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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10 Demonstrate point and click Operator shall be able to

access to an engineering access an engineering

diagram. diagram using the mouse. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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11 Demonstrate the creation of Operator shall be able to

an engineering diagram. create an engineering

diagram. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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12 Demonstrate the printing of Operator shall be able to

a prepared report. print a report using the

mouse. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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13 Demonstrate the display of Operator shall be able to

one or more points. request the display of one

or more points. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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14 Demonstrate the operator Operator shall be able to

override of a point. override a point. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Expected

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15 Demonstrate the Operator shall be able to

modification of a modify a time schedule.

time schedule. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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16 Demonstrate the execution Operator shall be able to

of a report. initiate a report. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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17 Demonstrate the Operator shall be able to

presentation of an view an alarm with all of

alarm to include: the required data. \_\_\_\_\_\_\_\_\_\_

a) Identification \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

b) Date and time \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

c) Alarm Type \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

d) Set Points \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

e) Units \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

f) Current Value \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

g) Priority \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

h) Associated message &

Secondary message \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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18 Demonstrate the Operator shall be able to

presentation of view real time trend data

real time trend data. as a function of time. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

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**TEST NUMBER**: Five

**TITLE**: Graphic Navigation Scheme

**OBJECTIVE**:

1. To validate hierarchical graphic displays from main screen to end

devices.

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittals

a. Provide a hierarchical block diagram of the system network prior

to testing.

2. Equipment

a. Have all programming completed to demonstrate graphic display.

3. Reference Documentation

a. List user manual documentation and sections pertaining to the

testing.

4. Date of Test: \_\_\_\_\_\_\_\_\_\_

5. Time of Test: \_\_\_\_\_\_\_\_\_\_

6. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**UMCS**

1 Demonstrate the creation Operator shall be able to

of a hierarchical tree organize point data graphic

structure for the display in a hierarchical

presentation of point tree structure based on any

data with at least five organization desired.

levels.

A typical organization

could be:

- Installation

- Building

- Building sub area

- Main System-Unit

- Terminal Unit \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2 Demonstrate the creation Operator shall be able or

of a hierarchical organize the graphical

navigation structure for navigation from page to

the graphic pages. page using any hierarchical

structure desired.

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Expected

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Examples:

Home page to building 1

Building 1 to AHU 1

Building 1 back to Home Page

Building 1 to 1st Floor Plan

AHU 1 back to Building 1

AHU 1 back to Home Page

AHU 1 to Terminal Unit

Summary

1st Floor Plan back to

Building 1

1st Floor Plan back to

Home Page

1st Floor Plan to Any

Terminal Device

Terminal Unit Summary back

to AHU 1

Terminal Unit Summary back

to Building 1

Terminal Unit Summary back

to Home Page

Terminal Unit Summary to

Individual Device \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

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**TEST NUMBER**: Six

**TITLE**: Command Functions

**OBJECTIVE**:

1. To demonstrate the functionality and ability to execute command to

the end devices.

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittals

a. Provide documentation of all command functions prior to testing.

2. Equipment

a. Have all command functions programmed and functional.

3. Reference Documentation

a. List user manual documentation and sections pertaining to the

testing.

4. Date of Test: \_\_\_\_\_\_\_\_\_\_

5. Time of Test: \_\_\_\_\_\_\_\_\_\_

6. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**UMCS AND DDC FOR HVAC**

1 From the tree structure, The modified value shall be

modify a parameter such as downloaded to the controller

a set point. without delay and the

controller performance shall

be viewable by the monitoring

of other dynamic points. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2 From a graphic page, modify The modified value shall be

a parameter such as a set downloaded to the controller

point. without delay and the

controller performance shall

be viewable by the monitoring

of dynamic points. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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3 From the tree structure, The analog output point

place an analog output shall accept the assigned

point under operator value and ignore changes

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Expected

Item Action Item Results Approved

override and assign a from application logic until

fixed value. the point is taken out of

override. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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4 From a graphic page, place The analog output point shall

an analog output point accept the assigned value and

under operator override ignore changes from

and assign a fixed value. application logic until the

point is taken out of

override. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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5 From the tree structure, The digital output point shall

place a digital output accept the assigned value and

point under operator ignore changes from application

override and assign a logic until the point is taken

fixed value. out of override. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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6 From a graphic page, place The digital output point shall

a digital output point accept the assigned value and

under operator override ignore changes from application

and assign a fixed value. logic until the point is taken

out of override. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

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**TEST NUMBER**: Seven

**TITLE**: Command Input Errors

**OBJECTIVE**:

1. To validate that the system ensures the necessary authority for

command inputs

2. To validate that the system can control the range of command input

values

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittals

a. Provide all command input error messages prior to testing.

2. Equipment

a. UMCS and DDC hardware and software

3. Reference Documentation

a. List user manual documentation and sections pertaining to the

testing.

4. Date of Test: \_\_\_\_\_\_\_\_\_\_

5. Time of Test: \_\_\_\_\_\_\_\_\_\_

6. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**UMCS AND DDC FOR HVAC**

1 Login using a password Login occurs. \_\_\_\_\_\_\_\_\_\_

with point command.

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2 Request a display of a The system displays the

SNVT. controllers SNVT value. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3 Override the SNVT point The SNVT value override

to a selected value. changes the value in the

controller. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4 Release the override of The SNVT value returns to

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Expected

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a SNVT. normal. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5 For an nvi to a The value will go the

controller with a limit of maximum of 80.

50 to 80, command the nvi

to a value of 90. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6 For an nvi to a The operator will be denied

controller for which the the ability to command the

operator only has read nvi to any value.

privileges, command the

nvi to a value of 90. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

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**TEST NUMBER**: Eight

**TITLE**: Special Functions

**OBJECTIVE**:

1. Verify system has special integration as defined.

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittals

a. Provide documentation of all integrations prior to testing.

2. Equipment

a. Have all UMCS and DDC hardware and software programmed,

integrated, and completed.

3. Reference Documentation

a. List user manual documentation and sections pertaining to the

testing.

4. Date of Test: \_\_\_\_\_\_\_\_\_\_

5. Time of Test: \_\_\_\_\_\_\_\_\_\_

6. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**UMCS**

1 Verify that a building Data from the other vendors

that uses controls from a controllers shall be integrated

vendor other than the one into the GUI and the same

being installed can be functionality that would exist

integrated into the GUI if the controllers were from

without any loss of the same manufacture shall

functionality. exist.

(A simulated building will

be set up using an IP-L

router and controllers from

Honeywell, TAC, Trane, etc.) \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

SECTION 25 08 10 Page 44

**TEST NUMBER**: Nine

**TITLE**: Software editing tools

**OBJECTIVE**:

1. To validate the performance of the M & C application programming tool

for the GPPC.

2. To validate the performance of the display editing tool.

3. To validate the performance of the report generation display tool.

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittals

a. Provide documentation and a backup softcopy of the editing tool

prior to testing.

b. Provide documentation of any future software upgrade versions

that pertain to the software-editing tool.

2. Equipment

a. Have working knowledge of the full capability of the

software-editing tool.

3. Reference Documentation

a. List user manual documentation and sections pertaining to the

testing.

4. Date of Test: \_\_\_\_\_\_\_\_\_\_

5. Time of Test: \_\_\_\_\_\_\_\_\_\_

6. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**UMCS and DDC for HVAC**

1 Demonstrate the Operator shall be able to

programming of an override use the programmed function

function in a GPPC. to override an output point

in a GPPC. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2 Demonstrate software that Operator shall be able to

enables the monitoring of monitor points from a GPPC.

data from a GPPC. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3 Demonstrate timer Control logic shall honor

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Expected

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functions within the built in timers.

applications of GPPC. \_\_\_\_\_\_\_\_\_\_

a) delay on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

b) delay off \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

c) one second delays \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

d) interval timers \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4 Demonstrate logic loops Control logic shall honor

("for" and "while") in the criteria.

GPPC. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5 Demonstrate if-then-else Control logic shall properly

logic in GPPC. follow the if, then, else

requirements. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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6 Demonstrate basic math Control logic shall properly

functions in GPPC. execute math functions. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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7 Demonstrate Boolean math Control logic shall properly

functions in GPPC. execute the functions. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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8 Demonstrate exponential Control logic shall properly

math functions in GPPC. execute the functions. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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9 Demonstrate trigonometric Control logic shall properly

math functions in GPPC. execute the functions. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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10 Demonstrate bitwise math Control logic shall properly

functions in GPPC. execute the functions. \_\_\_\_\_\_\_\_\_\_

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Expected

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Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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11 Create a user defined Subroutine/function shall

subroutine/function in work correctly and be easily

GPPC. reused. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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12 Create alarm conditions Alarm variables shall be

in GPPC. created according to the

criteria. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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13 Create and save a graphic Symbol shall be reusable

symbol at the server. on a new graphic. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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14 Modify a graphic symbol Operator shall be able to

at the server. open an existing symbol and

make changes. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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15 Save a graphic symbol to Symbol shall be available

a library at the server. from the library for reuse. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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16 Delete a graphic symbol Symbol shall no longer exist

at the server. for use. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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17 Place a graphic symbol When the new page is opened,

on a new graphic page at the symbol shall be there.

server. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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18 Associate particular When the conditional variable

conditions with changes, the display should

particular displays at change.

the server. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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19 Overlay alphanumeric Text shall properly display.

text on a graphic at

the server. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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20 Create a new graphic New graphic shall properly

from an old one at the display.

server. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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21 Place dynamic data on The dynamic data shall be

a graphic at the server. viewable on the graphic. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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22 Define the background The new graphic shall show

color of a new graphic the selected background

at the server. color. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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23 Define a foreground The color of the dynamic

color for an element on data that uses the

a graphic to distinguish foreground color shall display

it from the background in the foreground color.

color at the server. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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24 Position a symbol on a The operator shall be able to

graphic at the server. place a symbol at any location

on a graphic. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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25 Position and edit The alphanumeric display shall

alphanumeric descriptors be as designed.

at the server. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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26 Draw lines on a graphic Lines shall display as

at the server. drawn. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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27 Associate source of Correct data shall be

dynamic data for displayed.

presentation on a

graphic at the server. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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28 Display analog data on Correct data shall be

a graphic page at the displayed.

server. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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29 Demonstrate the movement Crosshairs shall follow

of the curser (crosshairs) the commands from the mouse.

by the use of the mouse

at the server. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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30 Demonstrate the Operator shall see the use

simultaneous use of of the tile function and

multiple graphics the use of the tab function

(coincident graphics)at to manage multiple graphics.

the server. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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31 Associate graphic Graphic properties shall

properties such as color change as the value of the

with the values from dynamic variable changes.

dynamic variables at

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the server. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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32 Create conditional The graphic display shall

displays based on the change as the dynamic

value of a dynamic variable changes.

variable at the server. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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33 Review the standard Operator shall see how to

symbol library at the access symbols from the

standard symbol library. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

34 Demonstrate how to move The executed report shall

data from the database to contain data from the

a report at the server. database. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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35 Add comments and headers The executed report shall

to a report at the server. contain the comments and

headers. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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36 Demonstrate the time Data presented in a report

stamping of data in a shall include the date and

report at the server. time the data was sampled. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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37 Demonstrate the time A report shall include the

stamping of the report date and time it executed.

generation at the server. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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38 Demonstrate basic Report shall display the

mathematical manipulation results of the mathematical

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of data within a report manipulations.

(daily averages, highs,

lows, etc.) at the server. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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39 Demonstrate the Reports shall execute per

operator's ability to the operator's instructions.

select either automatic

or manual generation of a

report. Report one shall execute per

the operator's instructions.

Report two shall execute

automatically on a time basis

per operator's instructions. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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40 Demonstrate the Reports shall execute per

selection of either the operator's instructions.

display, print to printer

or print to file. Report one is printed to printer.

Report two is printed to

file. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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41 Demonstrate how a Modified list of variables

modified application shall be available from

program is imported into a workstation.

the server database for

presentation to the

workstations. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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42 Demonstrate how a new New list of variables from

device is added to the the new device shall be

server database for available from a workstation.

presentation to the

workstations. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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End of Test

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Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

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**TEST NUMBER**: Ten

**TITLE**: Scheduling

**OBJECTIVE**:

1. Verify that M&C software has ability to operate end devices off a

time of day schedule utilizing defined parameters.

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittals

a. Provide documentation of the minimum programmable schedules in

comparison to the specification requirement prior to testing.

b. Provide documentation of all schedules programmed in the UMCS

prior to testing.

c. Provide a trend or report log of all equipment on a schedule

prior to testing.

2. Equipment

a. Have GPPC and ASC with all scheduling completed for testing.

3. Reference Documentation

a. List user manual documentation and sections pertaining to the

testing.

4. Date of Test: \_\_\_\_\_\_\_\_\_\_

5. Time of Test: \_\_\_\_\_\_\_\_\_\_

6. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

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**UMCS**

1 Demonstrate the basic The value of SNVT\_occupancy

functionality of a time shall properly track the

schedule by monitoring time schedule.

the value ~~of~~

SNVT\_occupancy as the

time changes through a

start time or a stop time. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2 Setup a weekly time Scheduling software shall

schedule for a demo accommodate the described

system with independent requirements.

times for each day of the

week and with up to 6

events per day. \_\_\_\_\_\_\_\_\_\_

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Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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3 Setup a special event or The special event schedule

date specific time shall take precedence.

schedule and verify that

this schedule takes

precedence over the

weekly schedule. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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4 Setup a group time The group schedule shall

schedule for a collection take precedence.

of systems. This group

schedule shall take

precedence over the

individual time schedules. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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5 Demonstrate operator Operator shall be able to

access to a time schedule access the time scheduling

from a graphic page. editor from a graphic page. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6 Display the current date Operator shall be able to

and time on a graphic view the current date and

page. time from a graphic page. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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7 Demonstrate automatic Time of day shifts

daylight savings time automatically.

adjustment. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**HVAC**

8 Demonstrate the ability Equipment shall change

of GPPC to accept an modes based on the UMCS or

occupied, unoccupied and from "system scheduler"

standby command from the SNVT schedule data.

UMCS. \_\_\_\_\_\_\_\_\_\_

SECTION 25 08 10 Page 54

Expected

Item Action Item Results Approved

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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9 Demonstrate the ability Equipment shall change

of ASC to accept an modes based on the UMCS

occupied, unoccupied and SVNT schedule data.

standby command from the

UMCS. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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10 Demonstrate use of the Equipment should use the

default schedule when default schedule until

communication is lost to communication is

the UMCS. reestablished. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

SECTION 25 08 10 Page 55

**TEST NUMBER**: Eleven

**TITLE**: Alarm Function

**OBJECTIVE**:

1. Verify M&C software is capable of alarm notification and routing.

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittals

a. Provide documentation of alarm managing capacity in caparison

with specification.

b. Provide documentation of all alarm types and priorities utilized

in the M&C prior to testing.

c. Provide documentation of the alarm routing in this particular M&C.

2. Equipment

a. Provide GPPC and ASC will alarms programmed.

3. Reference Documentation

a. List user manual documentation and sections pertaining to the

testing.

4. Date of Test: \_\_\_\_\_\_\_\_\_\_

5. Time of Test: \_\_\_\_\_\_\_\_\_\_

6. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**UMCS**

1 Initiate a basic binary The nvo (SNVT) displayed on

alarm condition such as designated server/workstation

a fan fail to start. shall change from a value of

0 to a value of 1.

The alarm shall be presented

in the alarm window.

The alarm shall define the

source of the alarm.

The alarm shall define the

time of the alarm.

The alarm shall present its

assigned priority.

The alarm shall display a

text message. \_\_\_\_\_\_\_\_\_\_

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Expected

Item Action Item Results Approved

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2 Demonstrate the With a simple point and

capability of associating click, the operator shall

a secondary text message have access to the

with the alarm. secondary text message. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3 Acknowledge the alarm. The status of the alarm

shall changed to acknowledged.

The user that acknowledged

the alarm shall be recorded

along with the date and time

of the action. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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4 Demonstrate the "pop up" When the alarm occurs,

of the alarm window when the alarm window shall

an alarm occurs. automatically open. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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5 Demonstrate the The numeric page is

capability to send a received.

numeric page when an

alarm occurs. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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6 Demonstrate the The e-mail shall be received.

capability to send an

e-mail when an alarm

occurs. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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7 Demonstrate the printing The printer shall print

of an alarm on the alarm the alarm.

printer. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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SECTION 25 08 10 Page 57

Expected

Item Action Item Results Approved

8 Identify the file on the Opening the file shall

hard disk that contains display a list of all of

all of the alarms. the alarms. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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9 Execute a user sort on The presentation shall

the alarm file. follow the defined sort. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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10 Print the alarm file. Paper copy shall be printed. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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11 Take an application An alarm should be generated.

specific controller

off-line. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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12 Take a programmable An alarm should be generated.

controller off line. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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13 Simulate a data circuit An alarm should be generated.

going off line. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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14 Simulate a point not An alarm should be generated.

responding to a command. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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15 Simulate a change of state An alarm should be generated.

without command. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Expected

Item Action Item Results Approved

**DDC FOR HVAC**

16 Initiate an alarm DDC system shall dial a pager

condition such as a fan and send a numerical alarm.

fail to start.

DDC system shall dial an e-mail

server. The node shall be able

to dial and connect to a remote

server and send an e-mail via

Simple Mail Transfer Protocol

(SMTP).

DDC system shall send an e-mail

over IP Network. The alarm

handling node shall be capable

of connecting to an IP network

and sending e-mail via Simple

Mail Transfer Protocol

(SMTP). \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

SECTION 25 08 10 Page 59

**TEST NUMBER**: Twelve

**TITLE**: Trending

**OBJECTIVE**:

1. To validate the capability for historical trend data collection and

presentation

2. To validate the capability for real time trend data collection and

presentation

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittals

a. Provide documentation of trending capability in comparison with

specification.

2. Equipment

a. Provide GPPC or ASC and workstation/server programmed with trend

data.

3. Reference Documentation

a. List user manual documentation and sections pertaining to the

testing.

4. Date of Test: \_\_\_\_\_\_\_\_\_\_

5. Time of Test: \_\_\_\_\_\_\_\_\_\_

6. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**UMCS**

1 Set up a trend with a It shall be possible to

1 second sample rate. collect data on a 1 second

sample rate. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2 Set up a trend to start It shall be possible to

and stop at specific times. start and stop a trend

based on time. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3 Open a trend data display Trend plots shall show

that has 8 values trended all 8 variables as a

versus time. function of time. \_\_\_\_\_\_\_\_\_\_

a) historical data \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

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Expected

Item Action Item Results Approved

b) instantaneous data \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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4 Open a pre-programmed Trend plot shall open

trend data presentation. without operator

programming. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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5 Open the trend Operator shall be able to

configuration dialog box configure a trend plot.

and set up a trend. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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6 Set up a trend for a Any binary or analog

randomly selected binary variable shall be

value and a randomly trendable.

selected analog value. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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7 Verify that historical With the controller offline,

trend data is stored on historical trend data from

the hard drive. that controller shall be

presented in a graphical

form. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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8 Export trend log data to Data shall be presented

Microsoft Excel for in a \*\*\*\*.xls form.

manipulation and printing

by the operator. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

SECTION 25 08 10 Page 61

SECTION 25 08 10 Page 62

**TEST NUMBER**: Thirteen

**TITLE**: Demand Limiting

**OBJECTIVE**:

1. Verify M&C software has the capability of performing demand-limiting

strategies

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittals

a. Provide documentation of the specific equipment being monitored.

b. Provide documentation of the load shed priority and the equipment

associated with the priorities.

2. Equipment

a. Provide GPPC and ASC programmed for demand-limit strategies.

3. Reference Documentation

a. List user manual documentation and sections pertaining to the

testing.

4. Date of Test: \_\_\_\_\_\_\_\_\_\_

5. Time of Test: \_\_\_\_\_\_\_\_\_\_

6. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**UMCS**

1 From the home page of the The demand-limiting page

M&C go to or click on the will open without any errors.

graphical demand-limiting

page. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2 Document the present The M&C will display

kW load\_\_\_\_\_\_\_\_\_. the actual kW. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3 Set kW limit setpoint to

cause program to shed load. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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SECTION 25 08 10 Page 63

Expected

Item Action Item Results Approved

4 Turn off 25% of the The kW usage will decrease.

mechanical equipment

being monitored. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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5 Allow the building(s) The building(s) will

to remain at 75% for a warm-up/cool down.

given time as to generate

a temperature load. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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6 After time period has The kW usage will greatly

expired, turn all increase.

equipment on at the

same time. The M&C will stop other

pieces of equipment as to

shed the load.

The equipment shut down will

be priority based.

After the building(s) come

under temperature control

the M&C will start all of

the equipment.

The equipment start up will

be priority based. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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7 Verify the building(s) The building(s) will come

remain under temperature under control.

control and go back to

the home page. The home page will be

displayed. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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8 Reset kW setpoint to The UMCS goes back to

normal limits. normal control. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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SECTION 25 08 10 Page 64

Expected

Item Action Item Results Approved

End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

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**TEST NUMBER**: Fourteen

**TITLE**: Report Generation

**OBJECTIVE**:

1. To demonstrate that M&C software has ability to generate reports in a

fixed format initialized by operator request

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittals

a. Provide documentation of all report logs set-up and the equipment

associated with the report logs.

2. Equipment

a. Provide server/workstation, GPPC, ASC and I/O to create reports.

3. Reference Documentation

a. List user manual documentation and sections pertaining to the

testing.

4. Date of Test: \_\_\_\_\_\_\_\_\_\_

5. Time of Test: \_\_\_\_\_\_\_\_\_\_

6. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**UMCS**

1 Manually generate a Report shall present itself

report for viewing on for viewing without disrupting

the workstation. the operation of the control

system. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2 Manually generate a Report shall print on

report and direct it to the specified printer.

a specific printer. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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3 Verify that the report Data samples listed in

contains the date and the report shall have

time associated with the associated date and

the raw data. time the samples were

collected. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SECTION 25 08 10 Page 66

Expected

Item Action Item Results Approved

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4 Verify that the report The report shall include

has the date and time the date and time of the

the report was generated. report generation. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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5 Save a report to a file The report shall be saved

that is compatible with in a \*\*\*.xls format.

Microsoft Office products. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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6 Generate a comma The comma delimited data

delimited file with shall be produced.

trend log data. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

SECTION 25 08 10 Page 67

**TEST NUMBER**: Fifteen

**TITLE**: UPS Test

**OBJECTIVE**:

1. Validate UPS requirements

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittals

a. The Contractor provides documentation on UPS.

2. Equipment

a. The server/workstation and the UPS needs to be on and operating

for a minimum of one week.

3. Reference Documentation

a. List user manual documentation and sections pertaining to the

testing.

4. Date of Test: \_\_\_\_\_\_\_\_\_\_

5. Time of Test: \_\_\_\_\_\_\_\_\_\_

6. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**UMCS**

1 The UMCS home graphic The home page is displayed.

page is called up. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2 Unplug the UPS from the The UMCS home page

wall outlet. remains displayed.

UPS LED-warning lights

if applicable.

UPS sound audible warning

alarm if applicable. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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3 Log out of the home page The UPS will not affect

of the M&C and then log the UMCS hardware and

back into it. all associated software. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SECTION 25 08 10 Page 68

Expected

Item Action Item Results Approved

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4 Allow the UPS to be The UPS will not affect

unplugged for 20 minutes. the UMCS hardware and

all associated software. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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5 Return the UPS plug to The UPS will not affect

the wall outlet. the UMCS hardware and

all associated software. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

SECTION 25 08 10 Page 69

**TEST NUMBER**: Sixteen

**TITLE**: CTA CTA-709.1-D to IP Router Test

**OBJECTIVE**:

1. Validate CTA CTA-709.1-D to IP Router requirements

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittals

a. Submittal information on router and O&M manual on network

analysis tool.

2. Equipment

a. The router needs to be on and operating.

b. Provide a LONWORKS® network analysis tool and router

configuration tool.

3. Reference Documentation

a. List user manual documentation and sections pertaining to the

testing.

4. Date of Test: \_\_\_\_\_\_\_\_\_\_

5. Time of Test: \_\_\_\_\_\_\_\_\_\_

6. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**UMCS**

1 Connect and open network Tool shall identify function,

analysis tool and verify network address, and

router. identifier of the device. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2 Using router configuration Router shall be utilizing

tool, open network a static IP address and

properties dialog box. shall not be configured

for DHCP. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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3 Confirm LON data is All LONWORKS® network

transmitted to/from LON data is being transmitted

bus to IP network. to/from the IP network. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SECTION 25 08 10 Page 70

Expected

Item Action Item Results Approved

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End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

SECTION 25 08 10 Page 71

**TEST NUMBER**: Seventeen

**TITLE**: CTA CTA-709.1-D Router and Repeater

**OBJECTIVE**:

1. Validate EIA-709.1B Router and Repeater requirements

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittals

a. Submittal information on router/repeater and O&M Manual on

network analysis tool.

2. Equipment

a. The router needs to be on and operating for a minimum of one week.

b. The repeater needs to be on and operating for a minimum of one

week.

c. Provide a LONWORKS® network analysis tool and router/repeater

configuration tool.

3. Reference Documentation

a. List user manual documentation and sections pertaining to the

testing.

4. Date of Test: \_\_\_\_\_\_\_\_\_\_

5. Time of Test: \_\_\_\_\_\_\_\_\_\_

6. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**DDC FOR HVAC**

1 Connect and open network Tool shall identify function,

analysis tool and verify network address, and

router and repeater. identifier of the devices. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2 Using router configuration Only the data that is

tool, open the properties configured to pass

dialog box. Verify what through the router is

data is configured to pass being sent.

through router. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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3 Using repeater Dialog box opens.

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Expected

Item Action Item Results Approved

configuration tool,

open the properties

dialog box. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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4 Verify that repeater is Verify that all data is

configured as a repeater being sent through the

and that all data is repeater.

being sent. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

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**TEST NUMBER**: Eighteen

**TITLE**: CTA CTA-709.1-D Gateway Test

**OBJECTIVE**:

1. Validate CTA CTA-709.1-D Gateway requirements.

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittals

a. Provide a list of all software that will be used to verify

CTA CTA-709.1-D Gateway configuration.

b. Provide a LonMark external interface file (XIF) for the gateway.

2. Equipment

a. The gateway needs to be on and operating.

b. Provide a LonWorks® network analysis tool and gateway

configuration tool.

3. Reference Documentation

a. List user manual documentation and sections pertaining to the

testing.

4. Date of Test: \_\_\_\_\_\_\_\_\_\_

5. Time of Test: \_\_\_\_\_\_\_\_\_\_

6. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**UMCS and DDC FOR HVAC**

1 Connect a LONWORKS® a. Tool shall identify

Network Analysis Tool to function, network address,

the network. and identifier of the device.

b. All network traffic from

gateway shall be utilizing

the CTA CTA-709.1-D

protocol. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2 Use gateway a. Gateway allows binding

configuration tool to of the Standard Network

verify or create a Variable Types from the

binding from gateway to a gateway to a LONWORKS®

LONWORKS® controller on controller.

the network. b. Information from gateway

should be bounded and

SECTION 25 08 10 Page 74

Expected

Item Action Item Results Approved

LONWORKS® controller

should be receiving

data. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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3 Using gateway or network

configuration tool verify

the following:

Open the properties dialog Gateway should allow the

box for one of the SNVT to be transmitted on

configured SNVTs. "min", "max" and "delta". \_\_\_\_\_\_\_\_\_\_

Rename one of the SNVTs Gateway should allow all

from the gateway. variable names to be

customized. \_\_\_\_\_\_\_\_\_\_

Check total capacity of Gateway shall have 50%

Gateway. extra capacity to map

over additional points. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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4 Press service pin on Gateway should broadcast

gateway. the neuron ID and Program ID

over the network. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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5 Remove power source from Gateway should retain all

gateway for two hours. configuration data.

Then return power to

gateway. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

SECTION 25 08 10 Page 75

**TEST NUMBER**: Nineteen

**TITLE**: Local Display Panel (LDP)

**OBJECTIVE**:

1. To demonstrate capability of the Local display panel to view and

override control points

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittal

a. O & M Manual for LDP

2. Equipment

a. Hardware and software to connect and demo LDP configuration tool

3. Reference Documentation

a. List user manual documentation and sections pertaining to the

testing.

4. Date of Test: \_\_\_\_\_\_\_\_\_\_

5. Time of Test: \_\_\_\_\_\_\_\_\_\_

6. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**DDC FOR HVAC**

1 Connect LDP to LON bus. LDP Controller should

Push service pin button broadcast its neuron ID.

on LDP. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2 Use navigation buttons LCP should allow user

on LDP to display a to read all status points.

status point such as a

temperature or fan

status. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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3 Use navigation buttons LCP should allow user

to display a control to read all control points.

point such as a

discharge air

temperature setpoint. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Expected

Item Action Item Results Approved

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4 Use LDP to override System accepts new

setpoint. setpoint. Verify system

reacts to new setpoint. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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5 Use LDP to release local Verify system returns

control override. to normal control. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

SECTION 25 08 10 Page 77

**TEST NUMBER**: Twenty

**TITLE**: Network Configuration Tool

**OBJECTIVE**:

1. To validate the performance of the network configuration tool

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittal

a. Network configuration tool manuals

2. Equipment

a. Hardware, network connection, LNS database, and network

configuration tool

3. Reference Documentation

a. List user manual documentation and sections pertaining to the

testing.

4. Date of Test: \_\_\_\_\_\_\_\_\_\_

5. Time of Test: \_\_\_\_\_\_\_\_\_\_

6. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**UMCS AND DDC FOR HVAC**

1 Open network The Network Configuration

configuration tool and Tool is being used and

verify LNS data for entire LNS database for

project opens is being project is exposed.

used. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2 Open a typical LNS Plug-in shall open and

plug-in. enable configuration of

the device. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3 Reconstruct a database The database and drawing

by connecting to an shall be created.

existing network and

uploading the data. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Expected

Item Action Item Results Approved

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4 Verify that a graphical Note that Network

interface is use. Configuration Tool uses

Visio (type) as a

graphical interface. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5 Print the graphical Printing shall be successful.

representation. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6 Merge two LNS The merge shall be successful.

databases into a

single database. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7 Print reports from Address table, SNVT I/O

network configuration table, and SCPT/UCPT table

tool. reports shall be successfully

printed. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8 Randomly select a Correct SNVT types were used.

sample of network

variable and confirm

they are using correct

SNVT types. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

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**TEST NUMBER**: Twenty one

**TITLE**: Custom Tests

**OBJECTIVE**:

1. To test custom applications for UMCS and/or DDC for HVAC, that are

specific to a project

**INITIAL REQUIREMENTS/CONDITIONS**

1. Submittal

a. Documents related to custom application - to be identified

2. Equipment

a. Equipment to be provided related to custom application - to be

identified

3. Date of Test: \_\_\_\_\_\_\_\_\_\_

4. Time of Test: \_\_\_\_\_\_\_\_\_\_

5. Contractor's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Government's Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TEST PROCEDURES**

Expected

Item Action Item Results Approved

**UMCS AND DDC FOR HVAC**

1 Identify special tests To be completed by designer.

for the UMCS that relate

to a custom application

for a specific

project - to be completed

by designer. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2 Identify special tests To be completed by designer.

for the DDC for HVAC

systems that relate to a

custom application for a

specific project - to be

completed by designer. \_\_\_\_\_\_\_\_\_\_

Notes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

End of Test

Specific Abbreviations:

Y = Yes

N = No

NA = Not Applicable

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-- End of Section --

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