Building Alarms Functional Tests

Contents

(continued)

1. General

1.1
Purpose

This practice provides procedures for testing building alarms.

1.2
Filing Instructions and Supersedures

Discard all previous issues and associated addenda of this practice and file this issue numerically in your GTE Telephone Operations practices set.

This practice supersedes and cancels:

- All policies, procedures, general instructions, letters, and memoranda which address this subject.

- Any document which provides information contrary to the information contained in this practice.

1.3
Reason for Reissuing

This practice has been reissued to incorporate multiple changes in the content. Read this entire practice to ensure your familiarity with the new information.

1.4
Responsibility

This practice was published by the GTE Telephone Operations Enterprise Services Department. For more information about this practice, contact the GTE Telephone Operations Headquarters National Building Services and Technologies Group in the Support Assets Department.

1.5
Disclaimer

This practice was prepared solely for the use of GTE Telephone Operations. It must be used only by its employees, contractors, customers and end users, when installing, operating, maintaining, and repairing GTE Telephone Operations' equipment, facilities and services. Any other use of this practice is forbidden. The information contained in this practice may not be applicable in all circumstances and is subject to change without notice. By using this practice the user agrees that GTE Telephone Operations will have no liability (to the extent permitted by applicable law) for any consequential, incidental, special, or punitive damages that may result.

2. **Overview**

2.1
Introduction

Procedures in this practice are used when performing routine building alarm tests. These tests ensure that alarm systems are operating correctly. A correctly operating alarm system ensures proper responses from personnel in the event of a real alarm condition.

2.2
Definitions

The following chart provides definitions for the acronyms and terms used in this practice.

Acronym or Term	Definition
AIRCOND	Alarm condition
ARRESTOR	Surge Arrestor
BAP	Building Alarm Panel – This is the interface point for building alarms to the Alarm Network. Building Services manages and maintains all built in alarm components from the BAP to the Sensor/Device/System. **NOTE:** **Network Reliability, Equipment Engineering, COEI, Customer Operations, and the NOCS Manager maintain and manage the alarm network segments from BAP to the NOC.**
BAS	Building Automation System
CO	Central Office
COE	Central Office Equipment
COEI	Central Off ice Equipment Installation
CORE	Represents a field dispatch and work force management and group/center.
CZT	Customer Zone Technician
EPA	Environmental Protection Agency
FIRE	Fire detection/suppression system
FIRDETR	Fire detection/suppression system trouble
FM	Facilities Management System - A data base and work management system used by Support Assets Building Services.
FOAG	Field Operations Administrative Group - A field dispatching and workforce management group/center.

(continued)

2. **Overview,** continued

**2.2
Definitions,
continued**

Acronym or Term	Definition
FUELLK	Fuel leak
GEN	Generator failure
GENXFR	Generator transfer
HIHUM	High humidity
HITEMP	High temperature
HVAC	Heating, Ventilating, and Air Conditioning
INTRUDER	intrusion
LWFUEL	Low fuel
LWHUM	Low humidity
LWTEMP	Low temperature
NBS&T	National Building Services and Technologies
NOC	Network Operations Center
NOC M&C	Network Operations Center Monitoring & Control
NOC OLS	Network Operations Center On-Line Support
NOCS	Network Operations Center Support
POWER	Commercial power failure
RH	Relative Humidity
TMU	Tank Monitoring Unit
VLTGAS	Cable vault gas
VLTFLOOD	Cable vault flood

2. **Overview,** continued

The following chart provides sources of supplementary information relating to this practice. The documents could be required for performing certain tasks.

See...	For Information About...
205-502-701	Engine-Driven Emergency Power Unit Functional Tests
205-605-503	Central Off ice Alarms Functional Testing Requirements
220-001-002	High Risk Activity Notice
740-200-070	Building Alarms - Engineering Applications
742-100-100	Fire Prevention and Protection
742-100-106	Fenwal®Low Voltage Fire and Smoke Detection and Halon™1301 Fire Suppression Systems Operation and Maintenance
Building Services Alarm Management Manual*	• Building alarm handling and management instructions and process flow. • Alarm guidelines and practices.

* Available from the National Building Services and Technologies.

3. Functional Tests for Building Alarms

3.1 Responsibilities

The following chart describes alarm testing responsibilities assigned to:

- Building Services.
- CZT/CO personnel.
- The alarm installation contractor.

NOTE: **All building alarms must be tested annually. Fire alarms are tested semi-annually.**

If the Tests on Alarms Are. ..	The Testing Responsibility Is Assigned To. ..
Acceptance tests	Building Services Engineer/Supervisor and the alarm installation contractor. **NOTE:** **Alarm training is provided to building maintenance personnel during the acceptance tests.**
Routine building alarm tests	Building Services.
Telecommunication equipment alarm tests	CZT/CO/Network Reliability personnel.

3.2 Methods of Testing

The simulation of conditions that trigger the alarm is the best method for testing alarms. Complete the alarm tests in the shortest time possible to avoid a prolonged adverse environmental impact on the switch. Alarms might not be received at the NOC M&C simultaneously, but the alarms are eventually received by the NOC M&C, even after the alarm condition is cleared.

Pressing the test button in alarms with a built-in test button only checks the electrical circuitry of the alarm system. It does not simulate the actual conditions that trigger the alarm.

Example:

A VLTGAS monitoring unit has a built-in testing button. Since the alarm button does not simulate an actual gas condition in the cable vault, it does not test the device's detector head. Using the alarm button, therefore, does not meet the required testing specifications (see Section 10).

3.3 Procedures for Testing Alarms with the Network Operations Center (NOC)

Building Services initiates the following procedure for testing alarms with the NOC and Region CORE/FOAG.

Step	Actions
1	Notify the Region CORE/FOAG using the following telephone number(s): • 972/659-5561 for the TX, AR, NM, OK, MO, IA, MN, and NE. • 800/827-1508 and 616/727-1460 for MI, WI, IL, OH, PA, and IN. • 800/483-4844 and 813/874-4880 for FL. • 803/946-5218 for KY, AL, SC, NC, and VA. • 800/367-5801 for CA -Longbeach. • 909/794-I 135 for CA - Mentone. • 206/261-7286 for WA, OR, and ID. • 808/546-8100 for HI. NOTE: **Notification of both alarm testing groups is accomplished with one call when the CORE/FOAG conference in the NOC.**
2	Call the NOC M&C at one of the foilowing telephone numbers: . 972/615-8000. . 8OO/GTE-NNOC. . 800/483-6662. NOTE: **The site switch technology (i.e.,** GTD#5, 5ESS, DMS **10, etc.) must be known ahead of time for proper routing to the NOC M&C group. Advise NOC M&C about alarm testing at (provide location) and get an OK to proceed with testing.**
3	Notify other monitoring stations i.e., a third party station or fire department where applicable.
4	Record the time of day before starting the alarm testing.
5	Proceed with alarm testing (see Sections 5 - 11). Record the alarm testing sequence on the Alarm Testing Work Sheet (see Exhibit 1). NOTE: Do **not validate each alarm with NOC M&C at this time.**
6	Record the time of day when testing is complete.

(continued)

3. Functional Tests for Building Alarms, continued

Step	Actions
	3.3
	Procedures for Testing Alarms with the Network Operations Center (NOC), continued

Step	Actions
7	Call back the NOC M&C and request that a technician take a snap shot of the alarm database.
	Provide the testing location, date, and the beginning and ending test times.
	NOTE: The M&C technician taking the call might not be the same technician that took the original call.
8	Set up the lap top at the test location to receive a fax if available or use an on site fax machine.
	NOTE: If fax capabilities are not available, go to next step.
9	The NOC M&C technician:
	• Faxes the alarm snap shot to the provided telephone number.
	OR
	• Communicates the alarm sequence/name by telephone.
10	After receiving the fax or alarm information, review and determine:
	• The correct alarm sequence.
	• If the alarm message matches the tested alarms.
11	Analyze and isolate alarm discrepancies and determine if the alarm:
	• Problems are in the alarm segment, from the sensor/device/system to the Building Alarm Panel.
	• Discrepancies are in the segment from the Building Alarm Panel into the NOC.
	• Message received at the NOC is incorrect for the alarms sent.
	• Is missing.
	• Is bundled with other alarms.
	NOTE: If a contractor tests the alarm, the discrepancy is passed to the BAS center to complete the remaining steps.
12	Document the alarm problems in the designated reporting system." (Refer to the Building Services Alarm Management Manual.)
13	Initiate notification and corrective actions to resolve alarm problems (see Sections 3.4, 3.5, and 3.6).
14	Retest alarms by completing steps 1 – 12 after the alarms are corrected.

3. Functional Tests for Building Alarms, continued

3.4

Failed Alarm Tests or Missing Alarms

Building Services initiates the following procedure if an alarm test fails or a standard alarm is missing. (Refer to GTE Telephone Operations Practice 740-200-070 for standard building alarm requirements.)

Step	Responding to a Failed or Missing Alarm
1	Identify, isolate, and document failed alarms and missing alarms/alarm segments on the Building Alarm Testing Worksheet (see Exhibit 1).
2	Verify the: - Functionality of alarm devices, sensors, and systems. - Integrity of the alarm's wiring and the BAP
3	Notify via e-mail Region Customer Operations, Network Reliability, Switch Engineering, and the Building Services Engineer about the: - Alarm segments that are missing. **NOTE:** Request action to correct alarms segments under their responsibility. - Building Services actions to correct the missing alarm segments under Building Services' responsibility. **NOTE:** Notify the Region INAS Coordinator if the location Is in the future INAS Deployment.
	(continued)
4	Issue a work request and document alarm problems in the designated Building Services management system (FM). (Refer to the Building Services Alarm Management Manual).
5	Complete Building Services related repairs/installation work,
6	Use the Alarm Discrepancy Services Report for following up and working with the appropriate Region personnel until complete alarm resolution.
7	Retest alarms and update/close work requests in the Building Services designated management system (FM).

3. Functional Tests for Building Alarms, continued

3.5

Incorrect Alarm Message

Building Services initiates the following procedure if the wrong alarm message is received at the NOC M&C. Note that the alarm message for the different alarms can vary in description, i.e., generator transfer, generator run, generator on, all convey the same message and would not be reported. A generator transfer alarm coming into the NOC as a High Temperature needs to be reported and corrected.

Step	Responding to the Wrong Alarm Message at the NOC M&C
1	Document the wrong alarm message or alarm category (i.e., critical, major, or minor) from the alarm testing procedure on the Building Alarm Testing Worksheet (see Exhibit 1).
2	Ensure that incorrect alarm messages are not due to sensors, devices, or an incorrect wiring/system setup.
3	Notify Region Customer Operations, Network Reliability, and NOC OLS and NOCS via e-mail.
4	Issue work request and document alarm problems in the designated Building Services Management System (FM). (Refer to the Building Services Alarm Management Manual.)
5	Use the Alarm Discrepancy Report to follow-up with the appropriate Region and NOC groups until alarm resolution occurs.
6	Retest alarms and update/close work requests in the designated Building Services Management System {FM).

3. Functional Tests for Building Alarms, continued

3.6
Time of Testing

Unless care is exercised, the procedures for testing alarm conditions might cause a degradation in service. Observe the following precautions:

- Scheduling during low-traffic periods.
- Simulating in a slow and deliberate manner.

3.6.1   Scheduling During Low-Traffic Periods

Schedule building alarm tests during low customer traffic periods. The maintenance window for high risk activity is normally between the hours of 11p.m. and 6 a.m. Coordinate all building alarm tests with Area Customer Operations to determine the optimum time for testing. Complete an electronic High Risk Activity Notice.

3.6.2   Simulating in a Slow and Deliberate Manner

Simulate alarms in a slow and deliberate manner to minimize the risk of degrading service. Repetitive and rapid alarm tests might:

- Place unusual demands for switch processor time.
- Cause other switch-related problems that might be detrimental to the telephone switching service.

4. Building Alarm Testing Worksheet and Building Alarm Discrepancy Report

4.1

Building Alarm Testing Worksheet Description

The Building Alarm Worksheet:

- **Is** used to record the building alarm functional tests.
- Uses the Exhibit 1 format.
- **Is** used to populate the Building Services Management System (FM). (Refer to the Building Services Alarm Management Manual.)

4.2

Building Alarm Worksheet Contents

The worksheet contains locations or columns for:

- Recording the office name.
- Recording the building number, CORE/FOAG contact name, and CLLI code.
- Recording the alarm testing start and end times.
- Recording the name of the CZT/CO technician supporting alarm testing, when required.
- Recording the call in hold time, if a hold occurs.
- Recording the pre-test checklist.
- Recording the test date.
- Recording the sequence.
- Verifying that the:
    - NOC M&C received an alarm signal.
    - Correct alarm message was received for the alarm sent.
    - On-site visual and audible alarms were annunciated.

    NOTE: **Alarm annunciation is provided through an alarm annunciation panel furnished by COE Engineering. The alarm annunciation panel is a new system being installed, so many existing buildings might not contain on-site alarm annunciation initially.**

- Recording the identified alarm problem segment by marking the:
    - Incorrect Message box if the alarm recorded at the NOC does not match the alarm type sent (see Section 3.5).

        NOTE: **Check the incorrect Message box if the the alarm category is incorrect (i.e., major, minor, etc.).**

    - Sensor/device/system to BAP segment box if the problem was determined to be in this segment of the alarm. BAP problems fall under this segment.
    - Cabling from the Alarm Panel to MDF box if a visual inspection indicates that the cabling from the BAP to the Main Frame is not installed.
    - Building Alarm Panel to the NOC segment box if the alarm problem was isolated to the alarm network beyond the control and responsibilities segments of Building Services.

        NOTES: **Mark on the worksheet both the sensor/system to the BAP box and the BAP to the NOC box when an alarm Is missing (see Exhibit 1).**

        Only mark the BAP to the NOC segment box after careful investigation.

        Do not assume that all alarm problems are in the BAP to the NOC segment of the alarm network.

    - Bundled Alarms box if it is determined that a multiple of alarms are bundled together and arrive at the NOC as one alarm.
- Recording comments and observations.

    Example: Indicate N/A for alarms that are not applicable to the site.

4. **Building Alarm Testing Worksheet and Building Alarm Discrepancy Report, continued**

4.3

Building Alarm Discrepancy Report Description

The Building Alarm Discrepancy Report is:

- A summary of sites with alarm problems.
- a Generated monthly by Support Assets - NBS&T
- Sent to the NOC M&C/OLS, Region Network Reliability Customer Operation, Engineering, COEI, and Support Assets − Building Services groups to:
    - Apprise them of sites with alarm problems.
    - Support corrective processes.

4. 4

Building Alarm Discrepancy Report Contents

The Building Alarm Discrepancy Report contains the:

- Site name.
- State.
- Site building number.
- CLLI code.
- Work request number.
- Alarm type and problem components/segments needing correction.

5. Testing Power-Failure Alarms

5. 1

Alarms Tested

A simulation power failure tests the:

- Commercial power failure alarm.
- Surge arrestor alarm.
- Fire system trouble alarm.

    NOTE: **In Florida, some high-voltage fire systems receive an uninterruptible power supply from the CO battery plant and inverters. As a result, an interruption of commercial power does not generate a fire system trouble alarm.**

- Generator failure alarm.
- Generator transfer alarm.
- HVAC failure alarm, in buildings without a BAS.
- VLTGAS alarm.

    NOTE: **A power failure to the VLTGAS monitor panel provides a system trouble condition and an alarm signal. See Section 10 for gas detection alarm testing instructions.**

5.2

Multipurpose Buildings

Give extra consideration to the time and method of testing alarm power failures in multipurpose buildings containing switching equipment and administrative functions. Keep the inconvenience to administrative functions caused by a power failure to a minimum and avoid if possible.

5.3

Simulating a Power Failure

The following chart describes procedures for simulating a power failure.

NOTE: **Power failure tests must be performed during the maintenance window. Complete an electronic High Risk Activity Notice before testing. Area Customer Operations verifies that the foreign exchange line or cellular back-up is functional and not dependent on commercial power.**

Step	Simulating a Power Failure
1	Arrange for a CZT/CO technician to be present during this test.
2	Notify NOC M&C and Building Services Dispatch Center of the test. Coordinate the test with Area Customer Operations.
3	Find out whether or not the building has a generator and make the following decision:

if the Building...	Then...
Has a generator	● Ensure the proper operation of the generator before commercial power and generator alarm testing.
	● **Throw** the generator circuit breaker to the "off" or "open" position. The generator circuit breaker:
	– Provides overcurrent protection for the phase conductors to the transfer switch.
	– Allows the generator Failure Alarm to activate.
Does not have a generator	Proceed to Step 4.

NOTES: Routine generator inspection and testing requirements are provided in GTE Telephone Operations Practice 205-502-701 for network sites. Generator testing is the responsibility of Area Customer Operations. Generator alarm tests can be coordinated with Area Customer Operations to test the generator alarms during routine generator testing.

Routine generator inspection and testing is the responsibility of Support Assets Building Services for non-network sites.

Step	
4	Notify building occupants that a planned power failure will occur and provide flashlights for travel through the building during the test.

(continued)

5.3

Simulating a Power Failure, continued

Step	Simulating a Power Failure
	CAUTION: **Short cycling of air conditioner compressors is hazardous to the compressor. A built-in time delay prevents compressor short cycling.**
5	Determine whether the building air conditioning units have compressors with built-in time delays that avoid short cycling. Initiate the following decision:

If the Air Conditioners...	Then...
Do not have a built-in time delay	Manually turn off the air conditioning system before starting the power failure alarm test.
Have a built-in time delay	Proceed to Step 6.

Step	
6	Throw the building's main disconnect switch to the "off" or "open" position.

WARNING: The building becomes dark when power is removed from the lighting system.

NOTES: The generator automatically starts at buildings with a generator. The open circuit breaker:

- **Prohibits power to the building.**
- **Simulates the generator failure alarm.**

Some switch gear has a test switch to simulate a power failure. Use the test switch instead of the main disconnect switch, as long as the power interruption simulates the generator start sequence of a real power failure; that is:

- **Normal power is interrupted. There is no power to the building.**
- **The generator starts and achieves steady state conditions. There is no power to the building.**
- **The building load is transferred to the generator after the generator reaches steady state conditions.**

(continued)

5.3
Simulating a
Power Failure,
continued

Step	Simulating a Power Failure
7	Verify with the NOC M&C at the conclusion of all testing that alarm signals were received for the following alarms (see Section 3.3 for testing alarms with the NOC):

. POWER.

> **NOTE:** **In some switch gear, the commercial power failure relay Is wired "upstream" of the building's maln disconnect switch. In this situation, power to the commercial power failure relay must be disconnected to test the power failure alarm.**

. ARRESTOR.

● GEN.

. GENXFER.

. FIRDETR.

> **NOTE:** **In Florida, some high-voltage flre systems are provided an uninterruptible power supply through the CO battery plant and Inverters. The Interruption of commercial power does not generate a flre system trouble alarm.**

● **HVAC** failure at buildings without a **BAS (AIRCOND).**

. **VLTGAS.**

Step	
8	Document any alarms in Step 7 that were not received at the NOC M&C on the Building Alarm Testing Worksheet (see Exhibit 1). Implement alarm corrective action using Sections 3.4, 3.5, and 3.6.
9	Return the building's main disconnect switch to the "on" or "closed" position.
10	If the air conditioning system was manually turned off:

● Turn it back on after the alarm test is completed.

OR

● Five minutes after it was turned off, whichever is greater.

Step	
11	At buildings with a generator:

A. Allow the generator to:

● Time out through the cool-down cycle.

AND

● Shut down.

B. Return the generator circuit breaker to the "on" or "closed" position.

5. Testing Power-Failure Alarms, continued

5.4
Buildings with Permanent Generators

Perform the steps in Sections 5.3 and 5.4 at buildings equipped with a permanent generator.

Step	Additional Power Failure Simulation Procedures...
1	Use the generator Transfer Switch test operation to bring generators on line and transfer the load to the generator.
2	Throw the building's main disconnect switch to the "off" or "open" position again: • If there is no test operation mechanism on the Transfer Switch. AND • The test switch operation will not transfer the load to the generator. **NOTES: The NOC M&C receives alarm signals for the alarms llsted in Section 5.3, Step** 7, **with the exceptlon of the generator failure alarm.** **The generator starts, obtains proper speed, and the transfer switch transfers the building load to the generator. The transfer switch Is automatically activated after the transfer switch senses a loss of power at the utility power source.**
3	Allow the generator to complete the test time and cool/shut down.
4	Return the building's main disconnect switch to the "on" or "closed" position, if applicable.
5	Verify with the NOC M&C that a GENXFR alarm signal is received at the conclusion of all testing.

6. Testing Alarms in Buildings With a Building Automation System (BAS)

6.1

General Information

Alarms are tested in buildings with a BAS by:

NOTE: **Only personnel trained in** BAS **programming can test alarms in buildings with** BAS.

- Modifying the following Alarm Set Points:
  - HITEMP
  - LWTEMP
  - HIHUM
  - LWHUM.
  - LWFUEL.
- Simulating HVAC failures that include:
  - Air-Handling Unit Airflow Failures.
  - Compressor failures.

Fuel leak alarms may be included in a BAS but are not required to be tested.

6.2

Modifying Alarm Set Points

Test the building alarms using the following modified set point methods;

- **HITEMP**
- LWTEMP
- HIHUM
- LWHUM.
- LWFUEL.

NOTE: **The low temperature and low and high humidity alarms might not be present at all buildings (Refer to GTE Telephone Operations Practice 740-200-070).**

Under normal operating conditions, the BAS is programmed to transmit an alarm signal at certain set points. The technician tests the five alarms by changing the BAS program alarm set points. The new setting must be above or below the current operating conditions in the building. This places the building in an alarm condition and tests the alarms.

The following chart describes alarm set point settings for performing the alarm tests.

If the Alarm Being Tested Is. ..	And the Normal Operating Condition Is. ..	And the Normal Alarm Set Point Is. . .	Then Change the Alarm Set Point to. ..
High temperature	78-82 °F (Summer) 64-70°F (Winter)	86°F	62°F
Low temperature	78-82 °F (Summer) 64-70°F (Winter)	60°F	85°F
High humidity	40% RH	60% RH	35% RH
Low humidity	40% RH	25% RH	45% RH
Low fuel	900 gallons	100 gallons	950 gallons

6. Testing Alarms in Buildings With a Building Automation System (BAS), continued

6.2 Modifying Alarm Set Points, continued

Section 6.2 chart explanation:

1. The normal atarm set point for high temperature is 86°F. A high temperature alarm is automatically transmitted when the room temperature reaches 86°F or higher.

2. The normal operating condition (current room temperature setting) is between 78°F–82°F (cooling) or 64°F–70°F (heating).

3. If the set point for the high temperature alarm is lowered to 62°F, the room temperature is higher than the alarm set point.

4. A high temperature alarm is automatically transmitted.

The following chart describes procedures for performing the five alarm tests by modifying the set points.

Step	Testing Alarms by Modifying the Set Points.
1	Notify NOC M&C, Building Services Dispatch Center, and Area Customer Operations of future tests.
2	Change the BAS program alarm set points to the testing values. This generates an alarm condition.
3	Return the BAS program alarm set points to the original settings.
4	Verify with the NOC M&C and Building Services Dispatch Center that an alarm signal was received at both the NOC M&C and Building Services Dispatch Center locations.
	NOTES: Refer to Section 3.3 at the conclusion of all testing.
	If an Alarm Signal is not received at both locations then use the procedures in Sections 3.4, 3.5, **and 3.6.**

6.3 Testing for Heating, Ventilating, and Air Conditioning Failures

Testing for HVAC failures:

- Use Andover Controls@ software program commands for testing HVAC failure alarms.

- Include specific procedures for testing:
  - Air-handling unit airflow failure.
  - Compressor failure.

NOTES: Appropriate commands for the respective vendor must be obtained and used for buildings with a BAS or environmental and control panel other than Andover Controls.

Perform the Section 6.3 tests by obtaining accurate sense-point names for the BAS.

6. Testing Alarms in Buildings With a Building Automation System (BAS), continued

6.3

Testing for Heating, Ventilating, and Air Conditioning Failures, continued

6.3.1 Testing for Airflow Failure in an Air-Handling Unit

The following chart provides the procedures used when testing air-handling unit airflow failures.

Step	Testing for Airflow Failure in an Air-Handling Unit
1	identify the BAS sense point name for unit #I -Airflow. **NOTE:** **In this example, the sense point name is** AC1FS **.**
2	Enter the following program command: R> PRINT AClFS
3	Press Return.
4	Read the response displayed by the workstation and take action described in the following chart.

If The Workstation Displays...	Then...
AC1FS=ON	Airflow is present in unit #1. **Go** to Step 5.
AC1FS=OFF	Turn the air-handling unit on by: • Changing the unit's room temperature set point. **OR** • Reversing the functions of primary and redundant units (if the unit is a redundant unit).

NOTE: **The alr-handllng unit fan must be operating before proceeding with this test.**

Step	
5	Enter the following program command: R> DISABLE AClFS
6	Press Return.
7	Enter the following program command: R> MOD OFF AClFS
a	Press Return. This generates the AIRCOND alarm.

(continued)

6. Testing Alarms in Buildings With a Building Automation System (BAS), continued

6.3.1   Testing for Airflow Failure in an Air-Handling Unit. continued

Step	Testing for Airflow Failure in an Air-Handling Unit
9	Enter the following program command.

If an Alarm Signal...	Then...
Is received	`R> ENABLE AClFS` NOTE: **The sense point must be enabled after performing the alarm test. If It is not enabled, the BAS cannot recognize actual conditions that represent alarm situations. No alarms can be sent.**
Was not received at both locations	Use the procedures in Sections 3.4, 3.5, and 3.6.

Step	
10	Press Return.
11	Repeat this test for all HVAC units with alarm capability.
12	Verify with the NOC M&C and Building Services Dispatch Center that an alarm signal was received at both the NOC M&C and Building Services Dispatch Center locations. NOTE: **Refer to Section 3.3 at the conclusion of all testing.**

6. Testing Alarms in Buildings With a Building Automation System (BAS), continued

6.3

Testing for Heating, Ventilating, and Air Conditioning Failures, continued

6.3.2 **Testing for Compressor Failure**

Use the procedure in the following chart to test for a compressor failure.

Step	Testing for Compressor Failure
1	Identify the BAS sense-point name for unit #l -Compressor.
	NOTE: In **this example, the sense-point name is** AC1COMP .
2	Enter the following program command:
	R> PRINT AClCOMP
3	Press Return.
4	Read the response displayed by the workstation and take action according to the following chart.

If The Workstation Displays.. .	Then...
AClCOMP=ON	This indicates the compressor is running. Go to Step 5.
AClCOMP=OFF	Start the compressor by:
	• Changing the room-temperature set point on the unit.
	OR
	• Reversing the functions of primary and redundant units (if the unit is a redundant unit).

NOTE: me compressor must be operating before proceeding with this test.

Step	
5	Enter the following program command:
	R> DISABLE AClCOMP
6	Press Return.
7	Enter the following program command:
	R> MOD OFF AClCOMP
8	Press Return. This generates the AIRCOND alarm.

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6.3

Testing for Heating, Ventilating, and Air Conditioning Failures, continued

<u>**6.3.2 Testina for Comgressor Failure. continued**</u>

Step	Testing for Compressor Failure
9	Enter the following program command.

If an Alarm Signal...	Then...
Is received	`R> ENABLE AC1COMP` **NOTE:** me sense point must be enabled after performing the alarm test. If it is not enabled, the BAS cannot recognize actual conditions that represent alarm situations. No alarms can be sent.
Was not received at both locations	Use the procedures in Sections 3.4, 3.5, and 3.6.

Step	
10	Press Return.
11	Repeat this test for all **HVAC** units with alarm capability.
12	Verify with the NOC M&C and Building Services Dispatch Center that an alarm signal was received at both the NOC M&C and Building Services Dispatch Center locations. **NOTE:** Refer to Sectlon 3.3 at the conclusion of all testing.

6.4

Testing for Fuel Leaks

Andover Tank Monitoring Unit (TMU) and underground storage tanks do not require fuel-leak alarm tests for the following reasons:

1. Underground storage tanks are monitored for leaks by:

    −   Using a fuel-level probe.

    −   Monitoring the cavity of double-wall tanks using:

        • Hydrostatic means.

            OR

        • Liquid detectors.

2. The fuel-level probe, in conjunction with the BAS, is capable of performing a leak test. The fuel-level probe tracks liquid volume changes in the tank over a specified period of time. Liquid temperature changes, meanwhile, are monitored to compensate for volume changes resulting from rising and falling temperatures. The BAS uses liquid level and temperature data to perform leak detect analysis.

(continued)

6. Testing Alarms in Buildings With a Building Automation System (BAS), continued

6.4
Testing for
Fuel Leaks,
continued

3. If a leak is detected, an alarm signal is transmitted. Local regulations (city, state, EPA) must be reviewed for leak-testing frequency requirements. At a minimum, a leak test must be performed monthly.

4. The BAS and fuel-level probe are capable of monitoring themselves for system failure modes, including:

    - Probe and probe wiring.
    - BAS hardware.
    - Any system failure mode generates a failure message.

5. The fuel-level probe leak test and the self-monitoring system features provide a reliable leak-detection system. If a fuel-level probe fails, the cavity monitoring of double-wall tanks provides backup or redundant fuel-leak detection.

NOTE: **If the underground storage-tank monitoring device Is equipped with an alarm test button, use the button for routine testing of the alarm circuit.**

7. Testing Alarms in Buildings Without a Building Automation System (BAS)

7.1
General
Information

Test the following alarms at buildings without a BAS:

- High temperature.
- Low temperature.
- High humidity.
- Low humidity.

7.2
Testing High
Temperature
Alarms

The following chart describes the procedure for testing high temperature alarms in buildings without a BAS.

Step	Testing High Temperature Alarms
1	Notify the NOC M&C, Building Services Dispatch Center, and Area Customer Operations of a future test.
2	Determine whether the alarm thermostat has an: • Adjustable setting. OR • Interchan geable mercury bulb with preestablished set points (Accustat$^{®}$).

(cont inued)

7. Testing Alarms in Buildings Without a Building Automation System (BAS), continued

7.2

Testing High Temperature Alarms, continued

Step	Testing High Temperature Alarms
3	The following chart describes what actions to take.

If the Thermostat Has...	Then...
An adjustable setting	1. Lower the alarm set point to a temperature lower than the current room temperature. 2. Return the alarm set point to the original setting. 3. Check with the NOC M&C to ensure that a HITEMP alarm signal is received at the conclusion of all testing (see Section 3.3.) **NOTE:** **If the NOC M&C did not receive an alarm signal, apply the procedure in Sections** 3.4, 3.5, **and 3.6.**
An Interchangeable mercury bulb with preestablished set points (Accustat)	**CAUTION: Do not warm the bulb with a heat source such as a hair dryer. The heat might separate the mercury and damage the bulb.** 1. Obtain the key and open the Accustat for access to the bulb. 2. Warm the mercury bulb by grasping it with the hand. 3. Warm the mercury bulb to a temperature above the alarm's set point. At the conclusion of testing, check with the NOC M&C to ensure that a HITEMP alarm signal is received (see Section 3.3). **NOTE:** **If the NOC M&C did not receive an alarm signal, apply the procedure in Sections 3.4, 3.5, and 3.6.**

NOTE: **Check the calibration of the thermostat at least annually.**

7. **Testing Alarms in Buildings Without a Building Automation System (BAS),** continued

7.3

Testing Low Temperature Alarms

The following chart describes the procedure for testing low temperature alarms in buildings without a BAS.

Step	Testing Low Temperature Alarms
1	Notify the NOC M&C, Building Services Dispatch Center, and Area Customer Operations of an upcoming test.
2	Determine whether the alarm thermostat has an: • Adjustable setting. OR • Interchangeable mercury bulb with preestablished set points (Accustat).
3	Take the appropriate action based on the following chart.

If the Thermostat Has...	Then...
An adjustable setting	1. Raise the alarm set point to a temperature higher than the current room temperature. 2. Return the alarm set point to the original setting. 3. Check with the NOC M&C to ensure that a LWTEMP alarm signal is received at the conclusion of all testing (see Section 3.3.) **NOTE:** **If the NOC M&C did not receive an alarm signal,** apply **the procedure in Sections 3.4, 3.5, and 3.6.**
An interchangeable mercury bulb with preestablished set points (Accustat)	Discontinue the test. This type of thermostat cannot be tested for low temperature alarms.

NOTE: **Check the calibration of the thermostat at least annually.**

7.4

Testing High and Low Humidity Alarms

Change the alarm set point to a setting above or below the building operating conditions when testing the high or low humidity alarms at buildings without a BAS.

NOTE: **The low and high humidity alarms might not be present at all buildings. (Refer to** GTE **Telephone Operations Practice 740-200-070.)**

The following chart describes set point values for performing high or low humidity alarm tests.

If the Alarm Being Tested Is. ..	And the Normal Operating Condition Is. ..	And the Normal Set Alarm Set Point Is...	Then Change the Alarm Set Point to. ..
High humidity	40% RH	60% RH	35% RH
Low humidity	40% RH	25% RH	45% RH

Section 7.4 chart explanation:

1. The normal alarm set point for high humidity is 60% RH. This means that when the room humidity reaches 60% or higher, a high humidity alarm is automatically transmitted.

2. The current room humidity (normal operating condition) is 40%.

3. If the high temperature alarm set point is lowered to 35% RH, the room humidity is now higher than the set point for the alarm.

4. A high humidity alarm is automatically transmitted.

The following chart describes procedures for performing the high and low humidity alarm tests.

Step	Performing High and Low Humidity Alarm Tests
1	Notify the NOC M&C, Building Services Dispatch Center, and Area Customer Operations of future tests.
2	Change the alarm set points of the high and low humidistat sensors to the appropriate values for testing the alarms (see examples in Section 8.1).
3	Return the alarm set points at the humidistat sensors to the original settings.
4	Check with the NOC M&C to ensure that the alarm signal (HlHUM or LWHUM) is received (see Section 3.3). **NOTE: Refer to Sections 3.4, 3.5, and 3.6 if the NOC M&C did not receive an alarm signal.**

8. Testing Intrusion Alarms

8.1

Procedure

The following chart describes the testing intrusion alarm procedure.

Step	Testing Intrusion Alarms
1	Notify the NOC M&C, Building Services Dispatch Center, and Area Customer Operations of **Mure** tests.
2	Open a door equipped with a door alarm.
3	Close the door.
4	Repeat the test for all doors equipped with a door alarm.
5	Check with the NOC M&C to ensure that the INTRUDER alarm signal was received at the conclusion of all testing. **NOTE:** Refer to Section 3.4, 3.5, and 3.6 if the NOC M&C did not receive an alarm signal.

9. Testing Fire Detection/Suppression Systems

9.1

Procedure

WARNING: Follow proper fire system power up/down and initiator disconnect procedures for systems with **halon** suppression. This prevents accidental discharge of the system and possible impact to equipment.

Routine preventive maintenance procedures for fire systems:

- Requires testing of detector heads and fire system devices.
- Includes verification of alarm signal transmissions to the NOC M&C (FIRE).

NOTES: Alarm signal transmissions to the NOC M&C are tested semi-annually.

Refer to GTE Telephone Operations Practice 742-l 00-l 06 for fire system preventive maintenance procedures.

Notify the NOC M&C prior to conducting fire alarm testing to prevent the cait-out of the local fire department. The normal operating procedure of the NOC M&C is to first notify the local fire department in the event of a fire alarm.

10. Testing Cable Vault Gas (VLTGAS) Alarms

10. 1
Procedure

The following chart describes the procedure for testing VLTGAS alarms.

Step	Testing VLTGAS Alarms
1	Notify the NOC M&C, Building Services Dispatch Center, and Area Customer Operations of future tests.
2	Place the system into an alarm condition using the gas from a calibration kit.
3	Verify with the NOC M&C that a VLTGAS alarm was received (see Section 3.3).

> **NOTE:** **A single alarm is transmitted for system trouble and gas detection. Since the NOC M&C receives only one alarm for both conditions, the NOC M&C cannot distinguish between the two conditions.**

11. Testing Cable Vault Flood (VLTFLOOD) Alarms

11.1
Procedure

me following chart describes the procedure for testing VLTFLOOD alarms.

Step	Testing Cable VLTFLOOD Alarms
1	Notify the NOC M&C, Building Services Dispatch Center, and Area Customer Operations of future tests.
2	Activate an alarm by manually lifting an alarm device float switch or applying water to a water sensor.
3	Verify with the NOC M&C that a VLTFLOOD alarm was received (see Section 3.3).

Exhibit 1 – Building Alarm Testing Worksheet (Page 1 of 5)

Building Alarm Testing Worksheet

Office Name_____

Office CLLI Code_____

Name of CORE /FOAG Contact_____

Name of NOC M&C Contact(s) _____/_____

Name of site CZT/CO Tech. _____

Building Number_____

Test Start Time_____

Test End Time_____

Call Hold Time, *if applicable*_____

Pre-Testing Check List

Insure the following Pre-Testing activities occur prior to the **start** of aiarm testing:

☑ Review of "When In Doubt Check *It* Out" procedures, including issuance of *"High Risk Activity Notice"*.

☑ Notification of *Third Party Monitoring Stations* and or *Fire Department Monitoring*.

☑ Alarm Testing Notification of *Region CORE/FOAG.*(TX,AR,NM,OK,MO,IA,MN,NE,972/659-5561), (MI,WI,IL,OH,PA,IN, 800/827-1508 or 616/727-14600), (FL 800/483-4844 or 813/874-4880), (AL,KY,SC,NC,VA,803/946-5218), (CA, Long Beach, 8001367-5801 , CA Mentone 909/794-1135) (WA,OR,ID, 206/261-7286), (HI, 8081546-8100)

☑ Alarm Testing Notification of NOC M&C. (800/483-6662 or 972/615-8000)

Note: Do **not** start alarm testing unless the above activities have been accomplished.

Exhibit 1 – Building Alarm Testing Worksheet (Page 2 of 5)

Building Alarm Testing Worksheet

Alarm Type/Category	Test Date	Sequence of alarm testing (1,2,3 etc)	Alarm received by NOC (Y/N)	Correct alarm message for alarm sent? (Y/N)	On site visual and audible alarms (Y/N)	Alarm Tested OK? (Y/N)	Identified Alarm problem segment(s) (Mark the appropriate box or boxes) Note: If an alarm is completely missing then check both the Sen/Sys. to BAP and the BAP to NOC boxes.	Comments
Commercial Power Failure/Major							☑ Incorrect alarm message ☑ Sensor/device/system to Building Alarm Panel (BAP) ☑ Cabling from BAP to MDF ☑ BAP to NOC segment ☑ Bundled Alarm	
Surge Arrestor/Minor							☑ Incorrect alarm message ☑ Sensor/device/system to Building Alarm Panel (BAP) ☑ Cabling from BAP to MDF ☑ BAP to NOC segment ☑ Bundled Alarm	
Generator Failure/Major							☑ Incorrect alarm message ☑ Sensor/device/system to Building Alarm Panel (BAP) ☑ Cabling from BAP to MDF ☑ BAP to NOC segment ☑ Bundled Alarm	
Generator Transfer/Major							☑ Incorrect alarm message ☐ Sensor/device/system to Building Alarm Panel (BAP) ☐ Cabling from BAP to MDF ☑ BAP to NOC segment ☑ Bundled Alarm	
Fire System Trouble/Major							☑ Incorrect alarm message ☑ Sensor/device/system to Building Alarm Panel (BAP) ☑ Cabling from BAP to MDF ☑ BAP to NOC segment ☐ Bundled Alarm	

Building Alarm Testing Worksheet

Alarm Type/Category	Test Date	Sequence of alarm testing (1,2,3 etc)	Alarm received by NOC (Y/N)	Correct alarm message for alarm sent? (Y/N)	On site visual and audible alarms (Y/N)	Alarm Tested OK? (Y/N)	Identified Alarm problem segment(s) (Mark the appropriate box or boxes) Note : If an alarm is completely missing then check both the SenSys. to BAP and the BAP to NOC boxes.	Comments
Fire Detection/ Suppression /Critical							☐ Incorrect alarm message ☑ Sensor/device/system to Building Alarm Panel (BAP) ☑ Cabling from BAP to MDF ☑ BAP to NOC segment ☑ Bundled Alarm	
HVAC Failure #1/Major							☐ Incorrect alarm message ☑ Sensor/device/system to Building Alarm Panel (BAP) ☑ Cabling from BAP to MDF ☑ BAP to NOC segment ☑ Bundled Alarm	
HVAC Failure #2/Major							☐ Incorrect alarm message ☑ Sensor/device/system to Building Alarm Panel (BAP) ☑ Cabling from BAP to MDF ☑ BAP to NOC segment ☑ Bundled Alarm	
HVAC Failure #3/Major							☐ Incorrect alarm message ☑ Sensor/device/system to Building Alarm Panel (BAP) ☑ Cabling from BAP to MDF ☑ BAP to NOC segment ☑ Bundled Alarm	
High Temperature /Major							☐ Incorrect alarm message ☑ Sensor/device/system to Building Alarm Panel (BAP) ☑ Cabling from BAP to MDF ☑ BAP to NOC segment ☑ Bundled Alarm	

Exhibit 1 – Building Alarm Testing Worksheet (Page 3 of 5)

Exhibit, continued

Exhibit 1 – Building Alarm Testing Worksheet (Page 4 of 5)

Building Alarm Testing Worksheet

Alarm Type/Category	Test Date	Sequence of alarm testing (1,2,3 etc)	Alarm received by NOC (Y/N)	Correct alarm message for alarm sent? (Y/N)	On site visual and audible alarms (Y/N)	Alarm Tested OK? (Y/N)	Identified Alarm problem segment(s) (Mark the appropriate box or boxes) Note: if an alarm is completely missing then check both the Sen/Sys. to BAP and the BAP to NOC boxes.	Comments
Low Temperature 'Minor							☑ Incorrect alarm message ☑ Sensor/device/system to Building Alarm Panel (BAP) ☑ Cabling from BAP to MDF ☐ RAP to NOC segment ☑ Bundled Alarm	
High Humidity/*Major*							☑ Incorrect alarm message ☐ Sensor/device/system to Building Alarm Panel (BAP) ☑ Cabling from BAP to MDF ☑ BAP to NOC segment ☑ Bundled Alarm	
Low Humidity 'Minor							☐ Incorrect alarm message ☐ Sensor/device/system to Building Alarm Panel (SAP) ☑ Cabling from BAP to MDF ☐ BAP to NOC segment ☑ Bundled Alarm	
Low Fuel/Major							☐ Incorrect alarm message ☑ Sensor/device/system to Building Alarm Panel (BAP) ☑ Cabling from BAP to MDF ☑ BAP to NOC segment ☐ Bundled Alarm	
Fuel **Leak/Major**							☑ Incorrect alarm message •1 Sensor/device/system to Building Alarm Panel (BAP) ☑ Cabling from BAP to MDF ☑ BAP to NOC segment ☑ Bundled Alarm	

Exhibit, continued

Building Alarm Testing Worksheet

Alarm Type/Category	Test Date	Sequence of alarm testing (1,2,3 etc)	Alarm received by NOC (Y/N)	Correct alarm message for alarm sent? (Y/N)	On site visual and audible alarms (Y/N)	Alarm Tested OK? (Y/N)	Identified Alarm problem segment(s) (Mark the appropriate box or boxes) Note : If an alarm is completely missing then check both the Sen/Sys. to BAP and the BAP to NOC boxes.	Comments
Cable Vault Gas /Major							☐ Incorrect alarm message ☐ Sensor/device/system to Building Alarm Panel (BAP) ☐ Cabling from BAP to MDF ☐ BAP to NOC segment ☐ Bundled Alarm	
Cable Vault Flood /Major							☐ Incorrect alarm message ☐ Sensor/device/system to Building Alarm Panel (BAP) ☐ Cabling from BAP to MDF ☐ BAP to NOC segment ☐ Bundled Alarm	
Intrusion/Minor							☐ Incorrect alarm message ☐ Sensor/device/system to Building Alarm Panel (BAP) ☐ Cabling from BAP to MDF ☐ BAP to NOC segment ☐ Bundled Alarm	

Exhibit 1 – Building Alarm Testing Worksheet (Page 5 of 5)