	DISTRIBUTION SHEET
--	--------------------

To DISTRIBUTION

From Projects

Page 1 of

Date 10/94

Project Title/Work Order
R-631

EDF No. 135152

ECI No. _____

[illegible]

Sta # 10
OCT 18 1994 (23)

ENGINEERING DATA TRANSMITTAL

1. EDT 135152

2. To: (Receiving Organization)

DISTRIBUTION

3. From: (Originating Organization)

PROJECTS

4. Related EDT No:

NONE

7. Purchase Order No:

N/A

5. Proj/Prog/Dept/Div: B-631

6. Cog/Proj Engr: S.G. Hodge

9. Equip/Component No:

N/A

8. Originator Remarks:

RELEASE FOR APPROVAL

10. System/Bldg/Facility:

234-5Z FIRE ALARM

12. Major Assm Dwg No:

N/A

11. Receiver Remarks:

NONE

13. Permit/Permit Application No

N/A

14. Required Response Date:

10/13/94

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev No.	(E) Title or Description of Data Transmitted	(F) Impact Level	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	WHC-SD-631-ATP-006	ALL	0	FIRE ALARM SYSTEM IMPROVEMENT	SQ	1/2	1/2	1/2

16. KEY

Impact Level (F)	Reason for Transmittal (G)	Disposition (H) & (I)
1, 2, 3, or 4 see MRP 5.43 and EP-1.7	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

(G)	(H)	17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)								(G)	(H)
Reason	Disp	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	Reason	Disp
1/2	1	Cog./Proj. Eng SG Hodge	<i>SG Hodge</i>	10/13/94							
1/2	1	Cog./Proj. Eng. Mgr. JL Munko	<i>J.L. Munko</i>	10/13/94							
1/2	1	QA JW Schultz	<i>Per phone call</i>	10/13/94							
1/2	1	Safety IM Wyatt	<i>S.M. Wyatt</i>	10/13/94							
		Eng. NA									
1/2	1	HH Nguyen	<i>H.H. Nguyen</i>	10/13/94							

18. Signature of EDT Originator <i>SG Hodge</i> Date 10/13/94	19. Authorized Representative for Receiving Organization <i>NA</i> Date	20. Cognizant/Project Engineer's Manager <i>J.L. Munko</i> Date 10-13-94	21. DOE APPROVAL (if required) Ltr No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments
--	---	---	---

BD-7400-172 (2/89)

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Document Number: WHC-SD-631-ATP-006, Rev.0

Document Title: Fire Alarm Safety Improvement

Release Date: October 13, 1994

* * * * *

This document was reviewed following the
procedures described in WHC-CM-3-4 and is:

APPROVED FOR PUBLIC RELEASE

* * * * *

WHC Information Release Administration Specialist:

Kara Broz

(Signature)

October 13, 1994

(Date)

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SUPPORTING DOCUMENT

1. Total Pages 61

2. Title Fire Alarm System Improvement	3. Number WHC-SD-631-ATP-006	4. Rev No. 0
5. Key Words Acceptance Test <i>Kmb 10/13/94</i>	6. Author Name: S. G. Hodge Signature Organization/Charge Code 7F160/KJMPM	
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ACCEPTANCE TEST PROCEDURE WHC-SD-631-ATP-006

TEST TITLE Fire Alarm System

LOCATION Building 234-5Z, 200-West Area

PROJECT NUMBER B-631 WORK ORDER CR1343

PROJECT TITLE Fire Alarm System Improvements

Prepared By
ICF Kaiser Hanford Company
Richland, Washington

For the U.S. Department of Energy
Contract DE-AC06-93RL12359

PROCEDURE APPROVAL

ICF KAISER HANFORD COMPANY (ICF KH)

<u>C. M. Gough</u>	<u>10-12-94</u>	<u>J. E. Breed</u>	<u>10-11-94</u>
Originator	Date	Technical Documents	Date

<u>C. D. Egger</u>	<u>10/12/94</u>	<u>D. Lundgren</u>	<u>10-12-94</u>
Checker	Date	Safety	Date

<u>R. Newell</u>	<u>10-12-94</u>	<u>John D. Schultz</u>	<u>10-12-94</u>
Environmental	Date	Quality Engineering	Date

<u>Russell Wright</u>	<u>10/12/94</u>		
Project Management	Date		

Westinghouse Hanford Company (WHC)

<u>Edward J. Hodge</u>	<u>10/13/94</u>	<u>J. Schultz</u>	<u>10-12-94</u>
Projects Department	Date	Quality Assurance	Date

<u>David M. Wyatt</u>	<u>10/13/94</u>	<u>Huey H. Nguyen</u>	<u>10-13-94</u>
PFP Safety	Date	PFP Cognizant Engineer	Date

<u>WM KNIGHT R. A. Fisher for</u>	<u>10/13/94</u>		
Hanford Fire Department	Date		

EXECUTION AND TEST APPROVAL

EXECUTED BY

_____ Test Director/Organization	_____ Date	_____ Test Operator/Organization	_____ Date
_____ Recorder/Organization	_____ Date		

WITNESSES

_____ Witness/Organization	_____ Date	_____ Title III Inspector	_____ Date
_____ Witness/Organization	_____ Date	_____ Witness/Organization	_____ Date

A-E APPROVAL

ICF Kaiser Hanford Company (ICF KH)

Without exceptions _____	With exceptions resolved _____	With exceptions outstanding _____
--------------------------	--------------------------------	-----------------------------------

_____ Acceptance Inspection	_____ Date	_____ Design Engineer	_____ Date
_____ Project Manager	_____ Date		

TEST APPROVAL AND ACCEPTANCE

<Operating Contractor>.

Without exceptions _____	With exceptions resolved _____	With exceptions outstanding _____
--------------------------	--------------------------------	-----------------------------------

_____ <Title or Department>	_____ Date	_____ <Title or Department>	_____ Date
_____ <Title or Department>	_____ Date	_____ <Title or Department>	_____ Date

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A Pretest Approval

NOTE: At completion of test, enter pages added during performance of test to this Table of Contents.

1 PURPOSE

This Acceptance Test Procedure (ATP) has been prepared to demonstrate that the modifications to the Fire Protection systems function as required by project criteria.

The ATP will test the Fire Alarm Control Panels, Flow Alarm Pressure Switch, Heat Detectors, Smoke Detectors, Flow Switches, Manual Pull Stations, and Gong/Door By Pass Switches.

2 REFERENCES

2.1 DRAWINGS

H-2-24174, Sh 1 through 4 Fire Protection - Alarm and Detection, Floor Plans

H-2-97481, Sh 1 through 58 Fire Protection - Alarm and Detection FCP Wiring Diagrams & Misc

2.2 SPECIFICATIONS

B-631-C7, Rev 0 Construction Specification

2.3 ENGINEERING CHANGE NOTICES (ECN)

Prior to final test approval, enter ECNs written against this ATP.

3 RESPONSIBILITIES

3.1 GENERAL

Each company or organization participating in this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The designees shall become familiar with this ATP and the systems involved to the extent that they can perform their assigned duties.

3.2 WHC PROJECT ENGINEER

3.2.1 Designates a Test Director.

3.2.2 Coordinates testing with the Building Manager and Hanford Fire Department. Provide 10 day advance notification.

3.2.3 Acts as liaison between the participants in acceptance testing.

3.2.4 Distributes the approved testing schedule before start of testing.

3.2.5 Schedules and conducts a pretest kickoff meeting with test participants when necessary.

3.2.6 Notifies the persons supporting the test 2 days before the start of testing.

3.2.7 Schedules a dry run.

- 3.2.8 Notifies concerned parties when a change is made in the testing schedule.
- 3.2.9 Signs Execution and Test Approval page when test is approved and accepted.
- 3.2.10 Takes necessary action to clear exceptions to the test.
- 3.2.11 Signs Exception Form when exception has been resolved.
- 3.2.12 Provides a distribution list for the approved and accepted ATP(ATR).

3.3 TEST DIRECTOR

- 3.3.1 Coordinates and directs acceptance testing.
- 3.3.2 Confirms that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.3.3 Stops any test which, in his or her judgment, may cause damage to the system until the problem has been resolved.
- 3.3.4 After verifying there is no adverse impact, may alter the sequence in which systems or subsystems are tested.
- 3.3.5 Ensures that required environmental conditions are maintained.
- 3.3.6 If a test is to be suspended for a period of time, ensures that the system is left in a safe mode.
- 3.3.7 Before restarting suspended test, re-verifies the test prerequisites.
- 3.3.8 Initiates ECNs to document required changes to the ATP.
- 3.3.9 Reviews recorded data, discrepancies, and exceptions.
- 3.3.10 Obtains information or changes necessary to clear or resolve objections during the performance of the test.
- 3.3.11 Signs Execution and Test Approval page when test has been performed.
- 3.3.12 Signs Exception Form when exception has been resolved.
- 3.3.13 Obtains required signatures on the ATP Master prior to reproduction and distribution.
- 3.3.14 Notifies the Hanford Fire Department (HFD) before each testing day that the tests will begin on time or that the tests will be delayed. Gives the expected time of delay when possible.

3.4 WITNESSES (Provided by Participating Organizations. One witness shall be a Title III acceptance inspector.)

3.4.1 Witness the tests.

3.4.2 Review results of testing.

3.4.3 Assist the Test Director when requested.

3.4.4 Sign Execution and Test Approval page when test has been performed.

3.4.5 Sign Exception Form when exception has been resolved.

3.5 RECORDER (Provided by ICF KH)

3.5.1 Prepares a Field copy from the ATP Master.

3.5.2 Records names of all designated personnel on Field copy of ATP prior to start of testing.

3.5.3 Records test instrument identification numbers and calibration expiration dates as required.

3.5.4 Initials and dates every test step on the Field copy as it is completed next to the step number or on a data sheet, when provided. Records test data. On data sheets where there is not room for both the initial and date, date may be entered at bottom of column.

3.5.5 Records objections and exceptions on an Exception form. Uses additional Exception forms as needed. Notifies the Test Director at time the objection is made.

3.5.6 Signs Execution and Test Approval page when test has been performed.

3.5.7 After test is finished, assigns alpha numeric page numbers to added data sheets and Exception forms. Records page numbers in the Table of Contents.

3.5.8 Transfers Field copy entries for each step to the Master in ink or type, signs, and dates. Transmits the completed Master to the Test Director for approval signature routing. Transmits the Field copy to Construction Document Control for inclusion in the official project file.

3.5.9 Signs Exception Form when exception has been resolved and transmits to Test Director.

3.6 TEST OPERATOR

3.6.1 Performs test under direction of the Test Director.

3.6.2 Provides labor, equipment, and test instruments required for performing tests which have not been designated as being provided by others.

3.6.3 Confirms that all equipment required for performing test will be available at the start of testing.

3.6.4 Signs the Execution and Test Approval page.

3.7 A-E ACCEPTANCE INSPECTION, DESIGN ENGINEER, AND PROJECT MANAGER

3.7.1 Evaluate results.

3.7.2 Sign for A-E Approval on Execution and Test Approval page.

4 CHANGE CONTROL

Required changes to this ATP must be processed on ECNs in accordance with company procedures. If a need for change is discovered in the course of running the test, the test shall be stopped until the ECN is approved. However, this does not prevent the running of another portion of the test unaffected by the change.

5 EXECUTION

5.1 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves and others from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects.

5.2 PERFORMANCE

5.2.1 Conduct testing in accordance with ICF KH Procedure CON 3.5 (Performance and Recording of Acceptance Test Procedures).

5.2.2 Perform test following the steps and requirements of this procedure.

NOTE: Tests may be run without completing an entire section before proceeding to the next.

6 EXCEPTIONS

6.1 GENERAL

Exceptions to the required test results are sequentially numbered and recorded on individual Exception forms. This enables case-by-case resolution and approval of each exception.

Errors/exceptions in the ATP itself shall NOT be processed as test exceptions (see Section 4 CHANGE CONTROL).

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Form (KEH-428), sample appended.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

Record the action taken to resolve each exception. Action taken may not be the same as planned action.

- 6.3.1 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Form.
- 6.3.2 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Form.

6.4 APPROVAL AND ACCEPTANCE

The customer provides final approval and acceptance of exceptions by checking 1 of the following on Exception Form:

- 6.4.1 Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
- 6.4.2 Exception Accepted-As-Is: Requires detailed explanation.
- 6.4.3 Other: Requires detailed explanation.

The customer signs and dates the Exception Form and obtains other customer internal approvals, if required.

6.5 DISTRIBUTION

A copy of the approved Exception Form is distributed to each participant. The signed original is attached to the ATP Master.

7 PREREQUISITES, EQUIPMENT/INSTRUMENTS, AND ABBREVIATIONS

7.1 PREREQUISITES

The following conditions shall exist at start of testing for that portion of the system being tested.

- 7.1.1 Systems have been inspected for compliance with construction documents, Appendix A, and the following.
 - a) All wiring contains no T-taps
 - b) All system modules in place
 - c) All EOL's verified in place
 - d) System has power and is operating normally

- 7.1.2 Reference documents (including this ATP) have been verified for correct revision number and outstanding ECNs.
- 7.1.3 A Prejob Safety Analysis has been prepared and a Prejob Safety Meeting has been conducted.
- 7.1.4 Test instruments have a valid calibration stamp attached. Test instrument identification numbers and calibration expiration dates have been recorded in Para 7.2, if applicable.
- 7.1.5 Methods of water disposal have been approved by Facilities Management.
- 7.1.6 Power is available.
- 7.1.7 Water is available to the sprinkler system.
- 7.1.8 Test has been coordinated with the Hanford Fire Department.
- 7.1.9 The FCP standby battery has been load tested at the 1 or 2 hour discharge rate and verified to hold at least 100% of the nameplate rated capacity. The battery was recharged. _____ (Date)
- 7.1.10 Battery fully charged. Verify it has been on charger for at least 48 hours within past week.
- 7.1.11 Ensure lift/land tracking forms are available.

7.2 EQUIPMENT/INSTRUMENTS

Supplied by Test Operator unless otherwise noted.

- 7.2.1 Voltohmmeters (VOM): Portable, 0-50 V dc, 0-1 megohm.
Instrument No. _____ Expiration Date _____
- 7.2.2 Ammeters: 0-10 A.
Instrument No. _____ Expiration Date _____
- 7.2.3 Shorting jumpers.
- 7.2.4 Shorting jumpers with ON-OFF switch.
- 7.2.5 Heat Source: For example, heat gun.
- 7.2.6 Calculator.

7.3 ABBREVIATIONS

- ADM Administration
- ATP Acceptance Test Procedure
- ATR Acceptance Test Report

ECN	Engineering Change Notice
EOLR	End of Line Resistor
FCP	Fire Alarm Control Panel
FAS	Flow Alarm Pressure Switch
FS	Flow Switch (vane type)
HD	Heat Detector
HFD	Hanford Fire Department
LED	Light Emitting Diode
ME	Master Element
MFCP	Master Fire Alarm Control Panel (Gamewell Flex 500)
MS	Manual Pull Station
PIV	Post Indicator Valve
RFAR	Radio Fire Alarm Reporting Box
SCP	Supervisory Control Panel
SD	Smoke Detector
TS	Tamper Switch

8 FIRE ALARM SYSTEM TEST FOR FCP 1412

8.1 PREPARATION

- _____ 8.1.1 All prerequisites of Para 7.1 have been met.
- _____ 8.1.2 Request the Hanford Fire Department dispatcher bypass all signals from Box 2780/2781 and acknowledge all supervisory and alarm signals received at 200 Area Fire Station, as requested.
- _____ 8.1.3 Install RFAR door tamper switch override device.
- _____ 8.1.4 Verify FCP door is lockable and keyed with Cat 60 set key only.
- _____ 8.1.5 Have Operations announce to personnel in building that a fire alarm test is in progress; evacuation is not required.
- 8.1.6 Gong/Door Bypass
NOTE: Notify Security of this Step
- _____ 8.1.6.1 At Fire Alarm Gong Relay and Bypass Enclosure (FCP500-GONG) switch security door interlock bypass switch and gong silence switch to "BYPASS."
- _____ 8.1.6.2 Verify FCP system trouble LEDs are ON.
- _____ 8.1.6.3 Verify "LOCAL PANEL" trouble message for box 2780/2781 received at 200 Area Fire Station.
- _____ 8.1.6.4 Trip Manual Pull Station 1-1 in Building 234-5Z.
- _____ 8.1.6.5 Verify audible devices are not sounding and security doors do not unlock.
- _____ 8.1.6.6 Reset manual pull station and FCP.

8.2 CIRCUIT SUPERVISION

8.2.1 FCP Zone Circuit Supervision

Record the following steps for the zones shown on Data Sheet 8.2.1.

8.2.1.1 At FCP Flex 300, move zone switch to OFF.

8.2.1.2 Verify Flex 300 FCP zone trouble LEDS are ON.

8.2.1.3 Move zone switch to ON.

8.2.1.4 Verify Flex 300 FCP zone trouble LEDS are OFF.

DATA SHEET 8.2.1								
STEP	PERFORM/VERIFY	ZONE						
		1	2	3	4	5	6	7
8.2.1.1	Move zone switch to OFF							
8.2.1.2	Zone trouble LEDS are ON							
8.2.1.3	Move zone switch to ON							
8.2.1.4	Zone trouble LEDS are OFF							

DATA SHEET 8.2.1								
STEP	PERFORM/VERIFY	ZONE						
		8	9	10	11	12	13	14
8.2.1.1	Move zone switch to OFF							
8.2.1.2	Zone trouble LEDS are ON							
8.2.1.3	Move zone switch to ON							
8.2.1.4	Zone trouble LEDS are OFF							

DATA SHEET 8.2.1									
STEP	PERFORM/VERIFY	ZONE							
		15	16	17	18	19	20	21	22
8.2.1.1	Move zone switch to OFF								
8.2.1.2	Zone trouble LEDs are ON								
8.2.1.3	Move zone switch to ON								
8.2.1.4	Zone trouble LEDs are OFF								

8.3 ALARM FUNCTION: This test will verify initiation circuit alarm and supervisory function.

8.3.1 Heat Detectors

Record the following steps for detectors shown on Data Sheet 8.3.1.

8.3.1.1 Activate detector with a heating appliance.

8.3.1.2 Verify RFAR "Zone *M Fire" Box 2780/2781 message received at 200 Area Fire Station.

8.3.1.3 Verify FCP system and FCP, ME, and MFCP zone alarm LEDs are ON.

8.3.1.4 Remove heat source and allow detector to cool.

8.3.1.5 Reset FCP.

8.3.1.6 Verify FCP system, FCP, ME, and MFCP zone alarm LEDs are OFF.

DATA SHEET 8.3.1									
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS							
		2-1	3-7	3-8	3-9	4-1	5-1	5-2	5-3
8.3.1.1	Activate detector								
8.3.1.2	Alarm LEDs are ON								
8.3.1.3	Message received			NA	NA			NA	NA
8.3.1.4	Allow detector to cool								
8.3.1.5	Reset FCP								
8.3.1.6	Alarm LEDs are OFF								

DATA SHEET 8.3.1									
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS							
		5-4	5-5	5-6	6-1	6-2	6-3	6-4	
8.3.1.1	Activate detector								
8.3.1.2	Alarm LEDs are ON								
8.3.1.3	Message received	NA	NA	NA		NA	NA	NA	
8.3.1.4	Allow detector to cool								
8.3.1.5	Reset FCP								
8.3.1.6	Alarm LEDs are OFF								

*Denotes zone number

DATA SHEET 8.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		6-5	6-6	6-7	6-8	8-2	8-3	8-4
8.3.1.1	Activate detector							
8.3.1.2	Alarm LEDs are ON							
8.3.1.3	Message received	NA	NA	NA	NA		NA	NA
8.3.1.4	Allow detector to cool							
8.3.1.5	Reset FCP							
8.3.1.6	Alarm LEDs are OFF							

DATA SHEET 8.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		8-5	8-6	8-7	8-8	8-9	9-1	10-1
8.3.1.1	Activate detector							
8.3.1.2	Alarm LEDs are ON							
8.3.1.3	Message received	NA	NA	NA	NA	NA		
8.3.1.4	Allow detector to cool							
8.3.1.5	Reset FCP							
8.3.1.6	Alarm LEDs are OFF							

DATA SHEET 8.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		11-1	14-1	15-1	15-2	15-3	15-4	15-5
8.3.1.1	Activate detector							
8.3.1.2	Alarm LEDs are ON							
8.3.1.3	Message received				NA	NA	NA	NA
8.3.1.4	Allow detector to cool							
8.3.1.5	Reset FCP							
8.3.1.6	Alarm LEDs are OFF							

DATA SHEET 8.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		15-6	15-7	15-8	15-9	15-10	15-11	15-12
8.3.1.1	Activate detector							
8.3.1.2	Alarm LEDs are ON							
8.3.1.3	Message received	NA	NA	NA	NA	NA	NA	NA
8.3.1.4	Allow detector to cool							
8.3.1.5	Reset FCP							
8.3.1.6	Alarm LEDs are OFF							

DATA SHEET 8.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		15-13	15-14	15-15	15-16	15-17	15-18	15-19
8.3.1.1	Activate detector							
8.3.1.2	Alarm LEDs are ON							
8.3.1.3	Message received	NA	NA	NA	NA	NA	NA	NA
8.3.1.4	Allow detector to cool							
8.3.1.5	Reset FCP							
8.3.1.6	Alarm LEDs are OFF							

DATA SHEET 8.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		15-20	15-21	15-22	20-1	21-1		
8.3.1.1	Activate detector							
8.3.1.2	Alarm LEDs are ON							
8.3.1.3	Message received	NA	NA	NA				
8.3.1.4	Allow detector to cool							
8.3.1.5	Reset FCP							
8.3.1.6	Alarm LEDs are OFF							

8.3.2 Manual Pull Stations

Record the following steps for manual pull stations shown on Data Sheet 8.3.2.

8.3.2.1 Trip MS.

8.3.2.2 Verify MFCP, ME, FCP zone and FCP system alarm LEDs are ON.

8.3.2.3 Verify RFAR "Zone *M Fire - Box 2780/2781" message received at 200 Area Fire Station.

8.3.2.4 Reset MS and FCP. Verify clear of alarm.

DATA SHEET 8.3.2							
STEP	PERFORM/VERIFY	ZONE/MANUAL PULL STATION					
		1-1	3-4	8-1	8-10	13-1	13-2
8.3.2.1	Trip MS						
8.3.2.2	Zone and system LEDs are ON						
8.3.2.3	Message received				NA		NA
8.3.2.4	Reset MS and FCP						

*Denotes zone number

8.4 FLOW SWITCHES: This test will verify the operation of the flow switches.

8.4.1 Flow Alarm Pressure Switch (Wet-Pipe Sprinkler System)

Record the following steps for the switches shown on Data Sheet 8.4.1.

8.4.1.1 Open Inspector's test valve quickly and completely.

8.4.1.2 Verify water is flowing immediately at Inspector's test valve.

8.4.1.3 Record elapsed time to system panel, signaling devices _____
(90 seconds max)

8.4.1.4 Verify FCP system, MFCP, FCP, and ME Zone ____*____ alarm LEDs are ON.

8.4.1.5 Close Inspector's test valve.

8.4.1.6 Verify RFAR "Zone *M Fire" message for Box 2780/2781 received at 200 Area Fire Station.

8.4.1.7 Reset FCP.

8.4.1.8 Verify FCP system, MFCP, FCP, and ME zone alarm LEDs are OFF.

DATA SHEET 8.4.1							
STEP	PERFORM/VERIFY	Zone/Flow Alarm Pressure Switch					
		1-1	7-1	12-1	13-1	22-1	**64-1
8.4.1.1	Open test valve						
8.4.1.2	Water flow						
8.4.1.3	Record time						
8.4.1.4	LEDs are ON						
8.4.1.5	Close test valve						
8.4.1.6	Message received						
8.4.1.7	Reset FCP						
8.4.1.8	LEDs are OFF						

*Denotes zone number

** Zone 64 FAS, which does not come into FLEX 300 (FCP1412) panel, will light master element and FLEX 500 LEDs only.

8.5 BATTERY DRAW DOWN AND POWER TRANSFER: This test will verify battery load and system recharge capability. This test will verify automatic transfer to battery upon ac power interruption and restoration upon return to normal.

- _____ 8.5.1 At Alarm Gong Relay and Bypass Enclosure, switch Gong Bypass Switch to NORMAL.
- _____ 8.5.2 Verify FCP system trouble LEDs are OFF.
- _____ 8.5.3 Disconnect 1 battery lead. Verify battery trouble LED is ON.
- _____ 8.5.4 Connect ammeter in battery/panel circuit. Reconnect battery to panel. Verify battery trouble LED is OFF.
- _____ 8.5.5 At Power Panel EP-1, open Breaker 11 to interrupt ac power to FCP.
- _____ 8.5.6 Verify ac power trouble indication. Do not silence trouble buzzer.
- _____ 8.5.7 Verify "Local Panel Trouble" message for Box 2780/2781 received at 200 Area Fire Station.
- _____ 8.5.8 Record battery supervisory current. (Is)=_____A.
- _____ 8.5.9 Put the system into alarm by placing a momentary short between zone terminals.
- _____ 8.5.10 Verify building alarm signaling appliances OPERATE until alarm message acknowledged at Fire Station.
- _____ 8.5.11 Verify alarm message received at 200 Area Fire Station.
- _____ 8.5.12 Record battery alarm current. (Ia)=_____A.
- _____ 8.5.13 Silence alarm gongs and trouble buzzer.
- _____ 8.5.14 Close and secure Breaker 11.
- _____ 8.5.15 Remove ammeter from battery circuit, reconnect battery to panel.
- _____ 8.5.16 Reset the manual pull station (if used).
- _____ 8.5.17 Reset FCP.
- _____ 8.5.18 At Alarm Gong Relay and Bypass Enclosure, switch Security Door Interlock switch to NORMAL.
- _____ 8.5.19 Verify FCP is in NORMAL condition. All LEDs are OFF.

8.5.20 Using the test results obtained in Steps 8.5.8 and 8.5.12, calculate the battery requirement using the following formula:

$$(H_s \times I_s) + (H_a \times I_a) = \text{Battery requirement in ampere hours}$$

H_s = hours of standby (60)

H_a = hours of alarm (.083)

I_s = standby current in amperes

I_a = alarm current in amperes

_____ 8.5.20.1 Calculated requirement

$$(60 \times \text{_____}) + (.083 \times \text{_____}) = \text{_____ Ah}$$

_____ 8.5.21 Record the nameplate ampere hour rating of the batteries.
_____ Ah.

_____ 8.5.22 Verify the battery requirement calculated is less than the nameplate rating of the batteries.

END OF SECTION 8

9 FIRE ALARM SYSTEM TEST FOR FCP 1415

9.1 PREPARATION

_____ 9.1.1 All prerequisites of Para 7.1 have been met.

_____ 9.1.2 Request the Hanford Fire Department dispatcher bypass all signals from Box 2780/2781 and acknowledge all supervisory and alarm signals received at 200 Area Fire Station, as requested.

_____ 9.1.3 Install RFAR door tamper switch override device.

_____ 9.1.4 Verify FCP door is lockable and keyed with Cat 60 set key only.

_____ 9.1.5 Have Operations announce to personnel in building that a fire alarm test is in progress; evacuation is not required.

9.1.6 Gong/Door Bypass

NOTE: NOTIFY SECURITY OF THIS STEP.

_____ 9.1.6.1 At Fire Alarm Gong Relay and Bypass Enclosure (FCP500-GONG) switch security door interlock bypass switch and gong silence switch to "BYPASS."

_____ 9.1.6.2 Verify FCP system trouble LEDs are ON.

_____ 9.1.6.3 Verify LOCAL PANEL trouble message for box 2780/2781 received at 200 Area Fire Station.

_____ 9.1.6.4 Trip Manual Pull Station 1-1 in Building 234-5Z.

_____ 9.1.6.5 Verify audible devices are not sounding and security doors do not unlock.

_____ 9.1.6.6 Reset manual pull station and FCP.

9.2

CIRCUIT SUPERVISION

9.2.1 FCP/Zone Circuit Supervision

Record the following steps for the zones shown on Data Sheet 9.2.1.

9.2.1.1 At FCP Flex 300, move zone switch to OFF.

9.2.1.2 Verify Flex 300 FCP zone trouble LEDs are ON.

9.2.1.3 Move zone switch to ON.

9.2.1.4 Verify Flex 300 FCP zone trouble LEDs are OFF.

DATA SHEET 9.2.1								
STEP	PERFORM/VERIFY	ZONE						
		23	24	25	26	27	28	29
9.2.1.1	Move zone switch to OFF							
9.2.1.2	Zone trouble LEDs are ON							
9.2.1.3	Move zone switch to ON							
9.2.1.4	Zone trouble LEDs are OFF							

DATA SHEET 9.2.1								
STEP	PERFORM/VERIFY	ZONE						
		30	31	32	33	34	35	36
9.2.1.1	Move zone switch to OFF							
9.2.1.2	Zone trouble LEDs are ON							
9.2.1.3	Move zone switch to ON							
9.2.1.4	Zone trouble LEDs are OFF							

DATA SHEET 9.2.1								
STEP	PERFORM/VERIFY	ZONE						
		37	38	39	40	41	42	43
9.2.1.1	Move zone switch to OFF							
9.2.1.2	Zone trouble LEDs are ON							
9.2.1.3	Move zone switch to ON							
9.2.1.4	Zone trouble LEDs are OFF							

DATA SHEET 9.2.1

STEP	PERFORM/VERIFY	ZONE					
		44	45	46	47	48	
9.2.1.1	Move zone switch to OFF						
9.2.1.2	Zone trouble LEDs are ON						
9.2.1.3	Move zone switch to ON						
9.2.1.4	Zone trouble LEDs are OFF						

9.3 ALARM FUNCTION: This test will verify initiation circuit alarm and supervisory function.

NOTE:

9.3.1 Heat Detectors

Record the following steps for detectors shown on Data Sheet 9.3.1.

9.3.1.1 Activate detector with a heating appliance.

9.3.1.2 Verify RFAR "Zone *M Fire" Box 2780/2781 message received at 200 Area Fire Station.

9.3.1.3 Verify FCP system and FCP, ME, and MFCP zone alarm LEDs are ON.

9.3.1.4 Remove heat source and allow detector to cool.

9.3.1.5 Reset FCP.

9.3.1.6 Verify FCP system, FCP, ME, and MFCP zone alarm LEDs are OFF.

9.3.1.7 Restore SM-30 and RM-30 to Modules to DISC. (This step only involves Zone/Heat Detector 46-1-5 and is not included on any other data sheet.)

DATA SHEET 9.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		23-1	23-2	23-3	23-4	23-5	23-6	24-1
9.3.1.1	Activate detector							
9.3.1.2	Alarm LEDs are ON							
9.3.1.3	Message received		NA	NA	NA	NA	NA	
9.3.1.4	Allow detector to cool							
9.3.1.5	Reset FCP							
9.3.1.6	Alarm LEDs are OFF							

*Denotes zone number

DATA SHEET 9.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		24-2	24-3	24-4	24-5	24-6	24-7	24-8
9.3.1.1	Activate detector							
9.3.1.2	Alarm LEDs are ON							
9.3.1.3	Message received	NA	NA	NA	NA	NA	NA	NA
9.3.1.4	Allow detector to cool							
9.3.1.5	Reset FCP							
9.3.1.6	Alarm LEDs are OFF							

DATA SHEET 9.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		24-9	24-10	24-11	24-12	24-13	24-14	24-15
9.3.1.1	Activate detector							
9.3.1.2	Alarm LEDs are ON							
9.3.1.3	Message received	NA	NA	NA	NA	NA	NA	NA
9.3.1.4	Allow detector to cool							
9.3.1.5	Reset FCP							
9.3.1.6	Alarm LEDs are OFF							

DATA SHEET 9.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		25-1	25-2	25-3	25-4	25-5	25-6	25-11
9.3.1.1	Activate detector							
9.3.1.2	Alarm LEDs are ON							
9.3.1.3	Message received		NA	NA	NA	NA	NA	NA
9.3.1.4	Allow detector to cool							
9.3.1.5	Reset FCP							
9.3.1.6	Alarm LEDs are OFF							

DATA SHEET 9.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		26-17	26-18	26-19	26-20	26-21	26-22	26-23
9.3.1.1	Activate detector							
9.3.1.2	Alarm LEDs are ON							
9.3.1.3	Message received		NA	NA	NA	NA	NA	NA
9.3.1.4	Allow detector to cool							
9.3.1.5	Reset FCP							
9.3.1.6	Alarm LEDs are OFF							

DATA SHEET 9.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		26-24	27-1	27-2	28-1	28-2	29-1	29-2
9.3.1.1	Activate detector							
9.3.1.2	Alarm LEDs are ON							
9.3.1.3	Message received	NA		NA		NA		NA
9.3.1.4	Allow detector to cool							
9.3.1.5	Reset FCP							
9.3.1.6	Alarm LEDs are OFF							

DATA SHEET 9.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		30-1	30-2	30-3	30-4	31-3	31-4	31-5
9.3.1.1	Activate detector							
9.3.1.2	Alarm LEDs are ON							
9.3.1.3	Message received		NA	NA	NA		NA	NA
9.3.1.4	Allow detector to cool							
9.3.1.5	Reset FCP							
9.3.1.6	Alarm LEDs are OFF							

DATA SHEET 9.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		31-6	31-7	31-8	32-5	33-3-1	34-1	35-4
9.3.1.1	Activate detector							
9.3.1.2	Alarm LEDs are ON							
9.3.1.3	Message received	NA	NA	NA				
9.3.1.4	Allow detector to cool							
9.3.1.5	Reset FCP							
9.3.1.6	Alarm LEDs are OFF							

DATA SHEET 9.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		36-4	39-1	40-1	41-11	42-2	43-3	43-4
9.3.1.1	Activate detector							
9.3.1.2	Alarm LEDs are ON							
9.3.1.3	Message received							NA
9.3.1.4	Allow detector to cool							
9.3.1.5	Reset FCP							
9.3.1.6	Alarm LEDs are OFF							

DATA SHEET 9.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		43-5	44-2	45-23	46-1-5*	47-1		
9.3.1.1	Activate detector							
9.3.1.2	Alarm LEDs are ON							
9.3.1.3	Message received	NA						
9.3.1.4	Allow detector to cool							
9.3.1.5	Reset FCP							
9.3.1.6	Alarm LEDs are OFF							
9.3.1.7	Restore Modules to NORM	NA	NA	NA		NA		

*Take precautions against Halon release by bypassing Switch No. 1 at SM-30 Module and operate all 4 RM-30u Modules to DISC.

9.3.2 Manual Pull Stations

Record the following steps for manual pull stations shown on Data Sheet 9.3.2.

9.3.2.1 Trip MS.

9.3.2.2 Verify MFCP, ME and FCP zone and FCP system alarm LEDs are ON.

9.3.2.3 Verify RFAR "Zone *M Fire - Box 2780/2781" message received at 200 Area Fire Station.

9.3.2.4 Reset MS and FCP. Verify clear of alarm.

DATA SHEET 9.3.2								
STEP	PERFORM/VERIFY	ZONE/MANUAL PULL STATION						
		26-11	27-7	27-14	27-50	28-14	28-26	31-1
9.3.2.1	Trip MS							
9.3.2.2	Zone and system LEDs are ON							
9.3.2.3	Message received			NA	NA		NA	
9.3.2.4	Reset MS and FCP							

DATA SHEET 9.3.2								
STEP	PERFORM/VERIFY	ZONE/MANUAL PULL STATION						
		31-2	32-2	37-17	38-1	42-1	43-1	
9.3.2.1	Trip MS							
9.3.2.2	Zone and system LEDs are ON							
9.3.2.3	Message received	NA						
9.3.2.4	Reset MS and FCP							

*Denotes zone number

9.4 FLOW SWITCHES: This test will verify the operation of the flow switches.

9.4.1 Flow Alarm Pressure Switch (Wet-Pipe Sprinkler System)

Record the following steps for the switches shown on Data Sheet 9.4.1.

9.4.1.1 Open Inspector's test valve quickly and completely.

9.4.1.2 Verify water is flowing immediately at Inspector's test valve.

9.4.1.3 Record elapsed time to system panel, signaling devices _____
(90 seconds max)

9.4.1.4 Verify FCP system, MFCP, FCP, and ME Zone ____*__ alarm LEDs are ON.

9.4.1.5 Close Inspector's test valve.

9.4.1.6 Verify RFAR "Zone *M Fire" message for Box 2780/2781 received at
200 Area Fire Station.

9.4.1.7 Reset FCP.

9.4.1.8 Verify FCP system, MFCP, FCP, and ME zone alarm LEDs are OFF.

DATA SHEET 9.4.1			
STEP	PERFORM/VERIFY	Zone/Flow Alarm Pressure Switch	
		37-1	48-1
9.4.1.1	Open test valve		
9.4.1.2	Water flow		
9.4.1.3	Record time		
9.4.1.4	LEDs are ON		
9.4.1.5	Close test valve		
9.4.1.6	Message received		
9.4.1.7	Reset FCP		
9.4.1.8	LEDs are OFF		

* Denotes zone number

9.5 SMOKE DETECTORS: This test will verify the operation of the smoke detectors.

Record the following steps for detectors shown on Data Sheet 9.5.

9.5.1 Activate detector with approved aerosol smoke source.

9.5.2 Verify FCP system and FCP, MFCP, and ME zone alarm LEDs are ON.

9.5.3 Verify detector base LED is ON.

9.5.4 Verify "RFAR "Zone * M Fire - Box 2780/2781" message received at 200 Area Fire Station.

9.5.5 Clear detector and reset FCP.

9.5.6 Verify FCP system, FCP, MFCP, and ME alarm LEDs are OFF.

9.5.7 Verify detector base LED is OFF.

DATA SHEET 9.5				
STEP	PERFORM/VERIFY	SMOKE DETECTORS		
		27-1A	27-1B	27-1C
9.5.1	Activate detector			
9.5.2	Alarm LEDs are ON			
9.5.3	Detector base LED is ON			
9.5.4	Message received		NA	NA
9.5.5	Clear detector. Reset FCP.			
9.5.6	Alarm LEDs are OFF			
9.5.7	Detector base LED is OFF			

*Denotes zone number

9.6 FLOW SWITCHES: This test will verify the operation of the flow switches.

9.6.1 Flow Switches (Vane type)

Record the following steps for the switches shown on Data Sheet 9.6.1.

9.6.1.1 Open Inspector's test valve quickly and completely.

9.6.1.2 Verify water is flowing at inspection test valve.

9.6.1.3 Verify FCP system, MFCP, FCP, and ME zone alarm LEDs are ON.

9.6.1.4 Close Inspector's test valve.

9.6.1.5 Verify RFAR "Zone *M Fire" message for Box 2780/2781 received at 200 Area Fire Station.

9.6.1.6 Reset FCP.

9.6.1.7 Verify FCP system, MFCP, FCP, and ME zone alarm LEDs are OFF.

DATA SHEET 9.6.1						
STEP	PERFORM/VERIFY	Zone/Flow Switch				
		26-1	27-2	28-3	32-4	12-1-1**
8.4.1.1	Open test valve					
8.4.1.2	Water flow					
8.4.1.3	LEDs are ON					
8.4.1.4	Close test valve					
8.4.1.5	Message received					
8.4.1.6	Reset FCP					
8.4.1.7	LEDs are OFF					

*Denotes zone number

**Located in Building 242-Z.

9.7 BATTERY DRAW DOWN AND POWER TRANSFER: This test will verify battery load and system recharge capability. This test will verify automatic transfer to battery upon ac power interruption and restoration upon return to normal.

- _____ 9.7.1 At Alarm Gong Relay and Bypass Enclosure, switch Gong Bypass Switch to NORMAL.
- _____ 9.7.2 Verify FCP system trouble LEDs are OFF.
- _____ 9.7.3 Disconnect 1 battery lead. Verify battery trouble LED is ON.
- _____ 9.7.4 Connect ammeter in battery/panel circuit. Reconnect battery to panel. Verify battery trouble LED is OFF.
- _____ 9.7.5 At Power Panel E, open Breaker 13 to interrupt ac power to FCP.
- _____ 9.7.6 Verify ac power trouble indication. Do not silence trouble buzzer.
- _____ 9.7.7 Verify "Local Panel Trouble" message for Box 2780/2781 received at 200 Area Fire Station.
- _____ 9.7.8 Record battery supervisory current. (I_s)=_____ A.
- _____ 9.7.9 Put the system into alarm by placing a momentary short between zone terminals.
- _____ 9.7.10 Verify building alarm signaling appliances OPERATE until alarm message acknowledged at Fire Station.
- _____ 9.7.11 Verify alarm message received at 200 Area Fire Station.
- _____ 9.7.12 Record battery alarm current. (I_a)=_____ A.
- _____ 9.7.13 Silence alarm gongs and trouble buzzer.
- _____ 9.7.14 Close and secure Breaker 13.
- _____ 9.7.15 Remove ammeter from battery circuit, reconnect battery to panel.
- _____ 9.7.16 Reset the manual pull station (if used).
- _____ 9.7.17 Reset FCP.
- _____ 9.7.18 At Alarm Gong Relay and Bypass Enclosure, switch Security Door Interlock switch to NORMAL.
- _____ 9.7.19 Verify FCP is in NORMAL condition. All LEDs are OFF.

9.7.20 Battery Calculation: Using the test results obtained in Steps 9.7.8 and 9.7.12, calculate the battery requirement using the following formula:

$$(H_s \times I_s) + (H_a \times I_a) = \text{Battery requirement in ampere hours}$$

H_s = hours of standby (60)

H_a = hours of alarm (.083)

I_s = standby current in amperes

I_a = alarm current in amperes

_____ 9.7.20.1 Calculated requirement

$$(60 \times \text{_____}) + (.083 \times \text{_____}) = \text{_____ Ah}$$

_____ 9.7.21 Record the nameplate ampere hour rating of the batteries.
_____ Ah.

_____ 9.7.22 Verify the battery requirement calculated is less than the nameplate rating of the batteries.

END OF SECTION 9

10 FIRE ALARM SYSTEM TEST FOR FCP 1416

10.1 PREPARATION

_____ 10.1.1 All prerequisites of Para 7.1 have been met.

_____ 10.1.2 Request the Hanford Fire Department dispatcher bypass all signals from Box 2780/2781 and acknowledge all supervisory and alarm signals received at 200 Area Fire Station.

_____ 10.1.3 Install RFAR door tamper switch override device.

_____ 10.1.4 Verify FCP door is lockable and keyed with Cat 60 set key only.

_____ 10.1.5 Have Operations announce to personnel in building that a fire alarm test is in progress; evacuation is not required.

10.1.6 Gong/Door Bypass

NOTE: NOTIFY SECURITY OF THIS STEP.

_____ 10.1.6.1 At Fire Alarm Gong Relay and Bypass Enclosure (FCP500-GONG) switch security door interlock bypass switch and gong silence switch to "BYPASS."

_____ 10.1.6.2 Verify FCP system trouble LEDs are ON.

_____ 10.1.6.3 Verify "LOCAL PANEL" trouble message for box 2780/2781 received at 200 Area Fire Station.

_____ 10.1.6.4 Trip Manual Pull Station 1-1 in Building 234-5Z.

_____ 10.1.6.5 Verify audible devices are not sounding and security doors do not unlock.

_____ 10.1.6.6 Reset manual pull station and FCP.

10.2 CIRCUIT SUPERVISION

10.2.1 FCP Zone Circuit Supervision

Record the following steps for the zones shown on Data Sheet 10.2.1.

10.2.1.1 At FCP Flex 300, move zone switch to OFF.

10.2.1.2 Verify Flex 300 FCP zone trouble LEDs are ON.

10.2.1.3 Move zone switch to ON.

10.2.1.4 Verify Flex 300 FCP zone trouble LEDs are OFF.

DATA SHEET 10.2.1								
STEP	PERFORM/VERIFY	ZONE						
		49	50	51	52	53	54	55
10.2.1.1	Move zone switch to OFF							
10.2.1.2	Zone trouble LEDs are ON							
10.2.1.3	Move zone switch to ON							
10.2.1.4	Zone trouble LEDs are OFF							

DATA SHEET 10.2.1								
STEP	PERFORM/VERIFY	ZONE						
		56	57	58	59	60	61	62
10.2.1.1	Move zone switch to OFF							
10.2.1.2	Zone trouble LEDs are ON							
10.2.1.3	Move zone switch to ON							
10.2.1.4	Zone trouble LEDs are OFF							

DATA SHEET 10.2.1								
STEP	PERFORM/VERIFY	ZONE						
		63						
10.2.1.1	Move zone switch to OFF							
10.2.1.2	Zone trouble LEDs are ON							
10.2.1.3	Move zone switch to ON							
10.2.1.4	Zone trouble LEDs are OFF							

ALARM FUNCTION: This test will verify initiation circuit alarm and supervisory function.

NOTE: Signalling devices may be silenced after alarm message received at 200 Area Fire Station.

10.3.1 Heat Detectors

Record the following steps for detectors shown on Data Sheet 10.3.1.

10.3.1.1 Activate detector with a heating appliance.

10.3.1.2 Verify RFAR "Zone *M Fire" Box 2780/2781 message received at 200 Area Fire Station.

10.3.1.3 Verify FCP system and FCP, ME, and MFCP zone alarm LEDs are ON.

10.3.1.4 Remove heat source and allow detector to cool.

10.3.1.5 Reset FCP.

10.3.1.6 Verify FCP system, FCP, ME, and MFCP zone alarm LEDs are OFF.

DATA SHEET 10.3.1							
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS					
		49-6	49-7	49-8	49-9	49-10	49-11 50-1
10.3.1.1	Activate detector						
10.3.1.2	Alarm LEDs are ON						
10.3.1.3	Message received		NA	NA	NA	NA	
10.3.1.4	Allow detector to cool						
10.3.1.5	Reset FCP						
10.3.1.6	Alarm LEDs are OFF						

*Denotes zone number

DATA SHEET 10.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		51-1	51-2	51-3	51-4	51-5	51-6	52-1
10.3.1.1	Activate detector							
10.3.1.2	Alarm LEDs are ON							
10.3.1.3	Message received		NA	NA	NA	NA	NA	
10.3.1.4	Allow detector to cool							
10.3.1.5	Reset FCP							
10.3.1.6	Alarm LEDs are OFF							

DATA SHEET 10.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		52-2	52-3	52-4	52-5	53-1	53-2	53-3
10.3.1.1	Activate detector							
10.3.1.2	Alarm LEDs are ON							
10.3.1.3	Message received	NA	NA	NA	NA		NA	NA
10.3.1.4	Allow detector to cool							
10.3.1.5	Reset FCP							
10.3.1.6	Alarm LEDs are OFF							

DATA SHEET 10.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		53-4	53-5	54-1	54-2	54-3	54-4	54-5
10.3.1.1	Activate detector							
10.3.1.2	Alarm LEDs are ON							
10.3.1.3	Message received	NA	NA		NA	NA	NA	NA
10.3.1.4	Allow detector to cool							
10.3.1.5	Reset FCP							
10.3.1.6	Alarm LEDs are OFF							

DATA SHEET 10.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		54-6	54-7	54-8	54-9	54-10	55-40	55-41
10.3.1.1	Activate detector							
10.3.1.2	Alarm LEDs are ON							
10.3.1.3	Message received	NA	NA	NA	NA	NA		NA
10.3.1.4	Allow detector to cool							
10.3.1.5	Reset FCP							
10.3.1.6	Alarm LEDs are OFF							

DATA SHEET 10.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		55-42	55-43	55-44	56-2	56-3	56-4	56-5
10.3.1.1	Activate detector							
10.3.1.2	Alarm LEDs are ON							
10.3.1.3	Message received	NA	NA	NA		NA	NA	NA
10.3.1.4	Allow detector to cool							
10.3.1.5	Reset FCP							
10.3.1.6	Alarm LEDs are OFF							

DATA SHEET 10.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		56-6	56-7	56-8	56-9	56-10	56-11	57-1
10.3.1.1	Activate detector							
10.3.1.2	Alarm LEDs are ON							
10.3.1.3	Message received	NA	NA	NA	NA	NA	NA	
10.3.1.4	Allow detector to cool							
10.3.1.5	Reset FCP							
10.3.1.6	Alarm LEDs are OFF							

DATA SHEET 10.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		57-2	57-3	57-4	57-5	57-6	57-7	58-2
10.3.1.1	Activate detector							
10.3.1.2	Alarm LEDs are ON							
10.3.1.3	Message received	NA	NA	NA	NA	NA	NA	
10.3.1.4	Allow detector to cool							
10.3.1.5	Reset FCP							
10.3.1.6	Alarm LEDs are OFF							

DATA SHEET 10.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		58-3	58-4	58-5	58-6	60-1	61-1	63-1
10.3.1.1	Activate detector							
10.3.1.2	Alarm LEDs are ON							
10.3.1.3	Message received	NA	NA	NA	NA			
10.3.1.4	Allow detector to cool							
10.3.1.5	Reset FCP							
10.3.1.6	Alarm LEDs are OFF							

DATA SHEET 10.3.1								
STEP	PERFORM/VERIFY	ZONE/HEAT DETECTORS						
		63-2	63-3	63-4	63-5			
10.3.1.1	Activate detector							
10.3.1.2	Alarm LEDs are ON							
10.3.1.3	Message received	NA	NA	NA	NA			
10.3.1.4	Allow detector to cool							
10.3.1.5	Reset FCP							
10.3.1.6	Alarm LEDs are OFF							

10.3.2 Manual Pull Stations

Record the following steps for manual pull stations shown on Data Sheet 10.3.2.

10.3.2.1 Trip MS.

10.3.2.2 Verify MFCP, ME and FCP zone and FCP system alarm LEDs are ON.

10.3.2.3 Verify RFAR "Zone *M Fire - Box 2780/2781" message received at 200 Area Fire Station.

10.3.2.4 Reset MS and FCP. Verify clear of alarm.

DATA SHEET 10.3.2								
STEP	PERFORM/VERIFY	ZONE/MANUAL PULL STATION						
		49-1	55-2	55-14	55-24	56-1	58-1	59-1
10.3.2.1	Trip MS							
10.3.2.2	Zone and system LEDs are ON							
10.3.2.3	Message received			NA	NA			
10.3.2.4	Reset MS and FCP							

*Denotes zone number

10.4 FLOW SWITCHES: This test will verify the operation of the flow switches.

10.4.1 Flow Alarm Pressure Switch (Wet-Pipe Sprinkler System)

Record the following steps for the switches shown on Data Sheet 10.4.1.

10.4.1.1 Open Inspector's test valve quickly and completely.

10.4.1.2 Verify water is flowing immediately at Inspector's test valve.

10.4.1.3 Record elapsed time to system panel, signaling devices _____
(90 seconds max)

10.4.1.4 Verify FCP system, MFCP, FCP, and ME Zone ____*__ alarm LEDs are ON.

10.4.1.5 Close Inspector's test valve.

10.4.1.6 Verify RFAR "Zone *M Fire" message for Box 2780/2781 received at
200 Area Fire Station.

10.4.1.7 Reset FCP.

10.4.1.8 Verify FCP system, MFCP, FCP, and ME zone alarm LEDs are OFF.

DATA SHEET 10.4.1							
STEP	PERFORM/VERIFY	Zone/Flow Alarm Pressure Switch					
		59-1	62-1				
10.4.1.1	Open test valve						
10.4.1.2	Water flow						
10.4.1.3	Record time						
10.4.1.4	LEDs are ON						
10.4.1.5	Close test valve						
10.4.1.6	Message received						
10.4.1.7	Reset FCP						
10.4.1.8	LEDs are OFF						

* Denotes zone number

- 10.5 BATTERY DRAW DOWN AND POWER TRANSFER: This test will verify battery load and system recharge capability. This test will verify automatic transfer to battery upon ac power interruption and restoration upon return to normal.
- _____ 10.5.1 At Alarm Gong Relay and Bypass Enclosure, switch Gong Bypass Switch to NORMAL.
 - _____ 10.5.2 Verify FCP system trouble LEDs are OFF.
 - _____ 10.5.3 Disconnect 1 battery lead. Verify battery trouble LED is ON.
 - _____ 10.5.4 Connect ammeter in battery/panel circuit. Reconnect battery to panel. Verify battery trouble LED is OFF.
 - _____ 10.5.5 At Power Panel EA, open Breaker 22 to interrupt ac power to FCP.
 - _____ 10.5.6 Verify ac power trouble indication. Do not silence trouble buzzer.
 - _____ 10.5.7 Verify "Local Panel Trouble" message for Box 2780/2781 received at 200 Area Fire Station.
 - _____ 10.5.8 Record battery supervisory current. (Is)=_____ A.
 - _____ 10.5.9 Put the system into alarm by placing a momentary short between zone terminals.
 - _____ 10.5.10 Verify building alarm signaling appliances OPERATE until alarm message acknowledged at Fire Station.
 - _____ 10.5.11 Verify alarm message received at 200 Area Fire Station.
 - _____ 10.5.12 Record battery alarm current. (Ia)=_____ A.
 - _____ 10.5.13 Silence alarm gongs and trouble buzzer.
 - _____ 10.5.14 Close and secure Breaker 22.
 - _____ 10.5.15 Remove ammeter from battery circuit, reconnect battery to panel.
 - _____ 10.5.16 Reset the manual pull station (if used).
 - _____ 10.5.17 Reset FCP.
 - _____ 10.5.18 At Alarm Gong Relay and Bypass Enclosure, switch Security Door Interlock switch to NORMAL.
 - _____ 10.5.19 Verify FCP is in NORMAL condition. All LEDs are OFF.

10.5.20 Battery Calculation: Using the test results obtained in Steps 10.5.8 and 10.5.12, calculate the battery requirement using the following formula:

$$(H_s \times I_s) + (H_a \times I_a) = \text{Battery requirement in ampere hours}$$

H_s = hours of standby (60)

H_a = hours of alarm (.083)

I_s = standby current in amperes

I_a = alarm current in amperes

_____ 10.5.20.1 Calculated requirement

$$(60 \times \text{_____}) + (.083 \times \text{_____}) = \text{_____ Ah}$$

_____ 10.5.21 Record the nameplate ampere hour rating of the batteries.
_____ Ah.

_____ 10.5.22 Verify the battery requirement calculated is less than the nameplate rating of the batteries.

END OF SECTION 10

11 GROUND FAULT DETECTION TEST: This test will verify that each Control Panel has ground fault detection capability.

11.1 Record the following steps for each control panel shown on Data Sheet 11.1.

11.1.1 At Flex 300 FCP, momentarily short Terminal S(+) to ground using a 10k resistor.

11.1.2 At System 3 FCP, momentarily short PS-35, Terminal 5 to ground.

11.1.3 Verify System Ground Fault Detection LED is ON, momentarily.

DATA SHEET 11.1						
STEP	PERFORM/VERIFY	INPUT DEVICE				
		FCP-1412-1	FCP-1415-1	FCP-1416-1	AFCP-AGCC-2	AFCP-AGCC-3
11.1.1	Short Terminal S(+) to ground				NA	NA
11.1.2	Short Terminal 5 to ground	NA	NA	NA		
11.1.3	System ground fault detection LED is ON momentarily					

DATA SHEET 11.1						
STEP	PERFORM/VERIFY	INPUT DEVICE				
		FCP-1415-236Z-B	SUPV-ENCL-1			
11.1.1	Short Terminal S(+) to ground	NA	NA			
11.1.2	Short Terminal 5 to ground					
11.1.3	System ground fault detection LED is ON momentarily					

- 12 MASTER ELEMENT TEST: This test will verify the operation of the master element.
- 12.1 Master Element Supervision: Record the following steps for the items shown on Data Sheet 12.1.
- 12.1.1 Disconnect a wire from Terminal 4a of indicated Master Element.
- 12.1.2 Verify FCP system and zone trouble LEDs are ON.
- 12.1.3 Reconnect the wire disconnected in Step 12.1.1.
- 12.1.4 Reset FCP.
- 12.1.5 Verify FCP system and zone trouble LEDs are OFF.

DATA SHEET 12.1								
STEP	PERFORM/VERIFY	MASTER ELEMENTS						
		1-1	1-2	1-3	1-4	1-5	1-6	1-7
12.1.1	Disconnect wire							
12.1.2	Trouble LEDs are ON							
12.1.3	Reconnect wire							
12.1.4	Reset FCP							
12.1.5	Trouble LEDs are OFF							

DATA SHEET 12.1								
STEP	PERFORM/VERIFY	MASTER ELEMENTS						
		1-8	1-9	1-10	1-11	1-12	1-13	1-14
12.1.1	Disconnect wire							
12.1.2	Trouble LEDs are ON							
12.1.3	Reconnect wire							
12.1.4	Reset FCP							
12.1.5	Trouble LEDs are OFF							

DATA SHEET 12.1								
STEP	PERFORM/VERIFY	MASTER ELEMENTS						
		1-15	1-16	1-17	1-18	1-19	1-20	1-21
12.1.1	Disconnect wire							
12.1.2	Trouble LEDs are ON							
12.1.3	Reconnect wire							
12.1.4	Reset FCP							
12.1.5	Trouble LEDs are OFF							

DATA SHEET 12.1								
STEP	PERFORM/VERIFY	MASTER ELEMENTS						
		1-22	2-1	2-2	2-3	2-4	2-5	2-6
12.1.1	Disconnect wire							
12.1.2	Trouble LEDs are ON							
12.1.3	Reconnect wire							
12.1.4	Reset FCP							
12.1.5	Trouble LEDs are OFF							

DATA SHEET 12.1								
STEP	PERFORM/VERIFY	MASTER ELEMENTS						
		2-7	2-8	2-9	2-10	2-11	2-12	2-13
12.1.1	Disconnect wire							
12.1.2	Trouble LEDs are ON							
12.1.3	Reconnect wire							
12.1.4	Reset FCP							
12.1.5	Trouble LEDs are OFF							

DATA SHEET 12.1								
STEP	PERFORM/VERIFY	MASTER ELEMENTS						
		2-14	2-15	2-16	2-17	2-18	2-19	2-20
12.1.1	Disconnect wire							
12.1.2	Trouble LEDs are ON							
12.1.3	Reconnect wire							
12.1.4	Reset FCP							
12.1.5	Trouble LEDs are OFF							

DATA SHEET 12.1								
STEP	PERFORM/VERIFY	MASTER ELEMENTS						
		1-21	2-22	2-23	2-24	2-25	2-26	2-27
12.1.1	Disconnect wire							
12.1.2	Trouble LEDs are ON							
12.1.3	Reconnect wire							
12.1.4	Reset FCP							
12.1.5	Trouble LEDs are OFF							

DATA SHEET 12.1								
STEP	PERFORM/VERIFY	MASTER ELEMENTS						
		3-1	3-2	3-3	3-4	3-5	3-6	3-7
12.1.1	Disconnect wire							
12.1.2	Trouble LEDs are ON							
12.1.3	Reconnect wire							
12.1.4	Reset FCP							
12.1.5	Trouble LEDs are OFF							

- 13 SALT LOOP PANEL ALARM TEST: This test will verify the Salt Loop Controllers alarm functions.
- 13.1 Record the following steps for each controller shown on Data Sheet 13.1.
- 13.1.1 Activate the zone on the indicated controller by placing a momentary jumper between Sig and GND.
- 13.1.2 Verify controller, ME and FCP systems and zone alarm LEDs are ON.
- 13.1.3 Verify FCP system alarm LED is ON.
- 13.1.4 Verify RFAR "Zone *M Fire" message for Box 2780/2781 received at 200 Area Fire Station.
- 13.1.5 Reset FCP.
- 13.1.6 Verify controller, ME FCP system and zone alarm LEDs are OFF.

DATA SHEET 13.1								
STEP	PERFORM/VERIFY	SALT-LOOP CONTROLLERS						
		16-1	16-2	16-3	17-1	19-1	19-2	19-3
13.1.1	Activate zone							
13.1.2	Alarm LEDs are ON							
13.1.3	FCP alarm LED is ON							
13.1.4	Message received		NA	NA			NA	NA
13.1.5	Reset FCP							
13.1.6	Alarm LEDs are OFF							

14

SALT LOOP PANEL ZONE SUPERVISION:

14.1

Record the following steps for the items shown on Data Sheet 14.1.

14.1.1 At Salt Loop Controller, lift a wire at Sig terminal for the indicated zone.

14.1.2 Verify controller, FCP system, and zone circuit trouble LEDs are ON.

14.1.3 Reland wire lifted in Step 14.1.1.

14.1.4 Reset FCP.

14.1.5 Verify controller, FCP system, and zone trouble LEDs are OFF.

DATA SHEET 14.1								
STEP	PERFORM/VERIFY	ZONE/CONTROLLER						
		16-1	16-2	16-3	17-1	19-1	19-2	19-3
14.1.1	Lift wire							
14.1.2	Trouble LEDs are ON							
14.1.3	Reland wire							
14.1.4	Reset FCP							
14.1.5	Trouble LEDs are OFF							

15 SUPERVISORY SYSTEM TEST

15.1 FCP/RFAR INTERFACE

- _____ 15.1.1 Lift 1 wire from zone Module 2A Term 2 on SCP.
- _____ 15.1.2 Verify "LOCAL PANEL" trouble message for Box 2780/2781 received
 at 200 Area Fire Station.
- _____ 15.1.3 Reconnect wire lifted in Step 15.1.1.
- _____ 15.1.4 Reset SCP.
- _____ 15.1.5 Verify RFAR zone trouble LEDs are OFF.

Record the following steps for the switches shown on Data Sheet 15.2.

15.2.1 Lift 1 wire from each zone.

15.2.2 Verify SCP system and SCP zone trouble LEDs are ON.

15.2.3 Reconnect wire lifted in Step 15.2.1.

15.2.4 Reset SCP.

15.2.5 Verify SCP system and SCP zone trouble LEDs are OFF.

DATA SHEET 15.2						
STEP	PERFORM/VERIFY	ZONE/SUPERVISORY SWITCH				
		OS&Y TS 100-1	PS 101-1	PS 102-1	PIVTS 103-1	PS 104-1
15.2.1	Wire lifted					
15.2.2	Trouble LEDs are ON					
15.2.3	Reconnect wire					
15.2.4	Reset SCP					
15.2.5	Trouble LEDs are OFF					

DATA SHEET 15.2						
STEP	PERFORM/VERIFY	ZONE/SUPERVISORY SWITCH				
		PIVTS 105-1	PS 106-1	OS&Y TS 107-1	PS 108-1	PIVTS 109-1
15.2.1	Wire lifted					
15.2.2	Trouble LEDs are ON					
15.2.3	Reconnect wire					
15.2.4	Reset SCP					
15.2.5	Trouble LEDs are OFF					

DATA SHEET 15.2						
STEP	PERFORM/VERIFY	ZONE/SUPERVISORY SWITCH				
		PS 110-1	PIVTS 111-1	OS&Y TS 112-1	PS 113-1	PIVTS 114-1
15.2.1	Wire lifted					
15.2.2	Trouble LEDs are ON					
15.2.3	Reconnect wire					
15.2.4	Reset SCP					
15.2.5	Trouble LEDs are OFF					

DATA SHEET 15.2						
STEP	PERFORM/VERIFY	ZONE/SUPERVISORY SWITCH				
		PS 115-1	PIVTS 116-1	PS 117-1	LT 118-1	PIVTS 119-1
15.2.1	Wire lifted					
15.2.2	Trouble LEDs are ON					
15.2.3	Reconnect wire					
15.2.4	Reset SCP					
15.2.5	Trouble LEDs are OFF					

DATA SHEET 15.2						
STEP	PERFORM/VERIFY	ZONE/SUPERVISORY SWITCH				
		OS&Y TS 121-1	PS 122-1	FCP 123-1	FCP 125-1	FCP 126-1
15.2.1	Wire lifted					
15.2.2	Trouble LEDs are ON					
15.2.3	Reconnect wire					
15.2.4	Reset SCP					
15.2.5	Trouble LEDs are OFF					

DATA SHEET 15.2						
STEP	PERFORM/VERIFY	ZONE/SUPERVISORY SWITCH				
		FCP 127-1	FCP 128-1	FCP 129-1	FCP 130-1	FCP 131-1
15.2.1	Wire lifted					
15.2.2	Trouble LEDs are ON					
15.2.3	Reconnect wire					
15.2.4	Reset SCP					
15.2.5	Trouble LEDs are OFF					

DATA SHEET 15.2						
STEP	PERFORM/VERIFY	ZONE/SUPERVISORY SWITCH				
		FCP 132-1	FCP 133-1			
15.2.1	Wire lifted					
15.2.2	Trouble LEDs are ON					
15.2.3	Reconnect wire					
15.2.4	Reset SCP					
15.2.5	Trouble LEDs are OFF					

15.3 TAMPER SWITCHES

Record the following steps for the switches shown on Data Sheet 15.3.

15.3.1 Close valve 2 turns.

15.3.2 Verify SCP system and SCP zone trouble LEDs are ON.

15.3.3 Open valve.

15.3.4 Reset SCP.

15.3.5 Verify SCP system and SCP zone trouble LEDs are OFF.

DATA SHEET 15.3							
STEP	PERFORM/VERIFY	ZONE/POST INDICATOR/OS&Y VALVE TAMPER SWITCH					
		OS&Y 100-1	PIVTS 100-2	PIVTS 103-1	PIVTS 105-1	OS&Y 107-1	PIVTS 107-2
15.3.1	Close valve 2 turns						
15.3.2	SCP system and SCP zone trouble LEDs are ON						
15.3.3	Open valve						
15.3.4	Reset SCP						
15.3.5	SCP system and SCP zone trouble LEDs are OFF						

DATA SHEET 15.3							
STEP	PERFORM/VERIFY	ZONE/POST INDICATOR/OS&Y VALVE TAMPER SWITCH					
		PIVTS 109-1	PIVTS 111-1	OS&Y 112-1	PIVTS 114-1	PIVTS 116-1	PIVTS 119-1
15.3.1	Close valve 2 turns						
15.3.2	SCP system and SCP zone trouble LEDs are ON						
15.3.3	Open valve						
15.3.4	Reset SCP						
15.3.5	SCP system and SCP zone trouble LEDs are OFF						

DATA SHEET 15.3

STEP	PERFORM/VERIFY	ZONE/POST INDICATOR/OS&Y VALVE TAMPER SWITCH					
		OS&Y 121-1	OS&Y 121-2	PIVTS 121-3			
15.3.1	Close valve 2 turns						
15.3.2	SCP system and SCP zone trouble LEDs are ON						
15.3.3	Open valve						
15.3.4	Reset SCP						
15.3.5	SCP system and SCP zone trouble LEDs are OFF						

15.4 LOW PRESSURE SWITCHES

Record the following steps for the switches shown on Data Sheet 15.4.

- 15.4.1 Isolate air or water to system.
- 15.4.2 Activate zone by placing a jumper across zone terminals.
- 15.4.3 Verify SCP system and SCP zone supervisory LEDs are ON.
- 15.4.4 Restore air or water to system.
- 15.4.5 Reset SCP.
- 15.4.6 Verify SCP system and SCP zone Supervisory LEDs are OFF.

DATA SHEET 15.4

STEP	PERFORM/VERIFY	ZONE/LOW PRESSURE SWITCHES						
		101-1	102-1	104-1	106-1	108-1	110-1	113-1
15.4.1	Isolate air or water to system							
15.4.2	Activate zone							
15.4.3	Supervisory LEDs are ON							
15.4.4	Restore air or water to system							
15.4.5	Reset SCP							
15.4.6	SCP system and SCP zone Supervisory LEDs are OFF							

DATA SHEET 15.4

STEP	PERFORM/VERIFY	ZONE/LOW PRESSURE SWITCHES						
		115-1	117-1	122-1				
15.4.1	Isolate air or water to system							
15.4.2	Activate zone							
15.4.3	Supervisory LEDs are ON							
15.4.4	Restore air or water to system							
15.4.5	Reset SCP							
15.4.6	Supervisory LEDs are OFF							

15.5 LOW TEMPERATURE SWITCH

This test will verify a Supervisory condition when low temperature occurs.

- _____ 15.5.1 Activate Low Temperature Switch by placing ice (or using other approved method) around Switch 118-1.
- _____ 15.5.2 Verify SCP system and SCP Zone 118 Supervisory LEDs are ON.
- _____ 15.5.3 Remove ice (or other) and allow switch to return to normal temperature.
- _____ 15.5.4 Reset SCP.
- _____ 15.5.5 Verify SCP system and SCP zone Supervisory LEDs are OFF.

END OF SECTION 15

16 BATTERY DRAW DOWN AND POWER TRANSFER: This test will verify battery load and system recharge capability. This test will verify automatic transfer to battery upon ac power interruption and restoration upon return to normal.

- _____ 16.1 Verify SCP system trouble LEDs are OFF.
- _____ 16.2 Disconnect 1 battery lead. Verify battery trouble LED is ON.
- _____ 16.3 Connect ammeter in battery/panel circuit. Reconnect battery to panel. Verify battery trouble LED is OFF.
- _____ 16.4 At Power Panel EP-1, open Breaker 13 to interrupt ac power to FCP.
- _____ 16.5 Verify ac power trouble indication. Do not silence trouble buzzer.
- _____ 16.6 Verify "Local Panel Trouble" message for Box 2780/2781 received at 200 Area Fire Station.
- _____ 16.7 Record battery supervisory current. (Is)=_____A.
- _____ 16.8 Put the system into alarm by placing a momentary short between zone terminals.
- _____ 16.9 Verify trouble message received at 200 Area Fire Station.
- _____ 16.10 Record battery alarm current. (Ia)=_____A.
- _____ 16.11 Silence trouble buzzer.
- _____ 16.12 Close and secure Breaker 13.
- _____ 16.13 Remove ammeter from battery circuit, reconnect battery to panel.
- _____ 16.14 Reset the manual pull station (if used).
- _____ 16.15 Reset SCP.
- _____ 16.16 At Alarm Gong Relay and Bypass Enclosure, switch Security Door Interlock and gong bypass switches to NORMAL.
- _____ 16.17 Verify SCP is in NORMAL condition. All LEDs are OFF.

- 16.18 Using the test results obtained in Steps 16.7 and 16.11, calculate the battery requirement using the following formula:

$$(H_s \times I_s) + (H_a \times I_a) = \text{Battery requirement in ampere hours}$$

H_s = hours of standby (60)

H_a = hours of alarm (.083)

I_s = standby current in amperes

I_a = alarm current in amperes

- _____ 16.18.1 Calculated requirement

$$(60 \times \text{_____}) + (.083 \times \text{_____}) = \text{_____ Ah}$$

- _____ 16.19 Record the nameplate ampere hour rating of the batteries.
_____ Ah.

- _____ 16.20 Verify the battery requirement calculated is less than the nameplate rating of the batteries.

END OF SECTION 16

EXCEPTION NO.		Project No.		ATP No.		Rev.		
Recorded by			Organization		Date Recorded		ATP Page No.	
Step No.		Requirement						
Description of Problem								
Objector 1 (Name/Organization)				Objector 2 (Name/Organization)				
Planned Action								
Action Taken								
RETEST EXECUTION AND ACCEPTANCE								
Retest Installation Contractor		Date		Recorder		Date		
Witness 1 (Name/Organization)		Date		Witness 2 (Name/Organization)		Date		
Field Engineering		Date		Test Director (Name/Organization)		Date		
Design Engineering (Author of ATP)		Date		A-E Project Engineer		Date		
APPROVAL AND ACCEPTANCE – OPERATING CONTRACTOR								
☐ Retest Approved and Accepted ☐ Exception Accepted-as-is* ☐ Other*								
* Explanation								
Approver 1		Date		Approver 2		Date		
Approver 3		Date		Approver 4		Date		

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APPENDIX A

- A. **PURPOSE:** This appendix is provided as a checklist of activities and verifications to be performed by the fire alarm system installer to ensure proper installation and operation. Responsibility for completion of the following items are the responsibility of the installer, both to meet NFPA 72 installation testing requirements and to ensure that the ATP proceeds in an efficient manner.
- B. **INSTALLER:** Prior to terminating conductors that have been laid or pulled outside of the fire alarm panel, perform and document the following:
- _____ 1. Verify that all conductors other than those intentionally and permanently grounded have been tested for isolation from ground using a non-destructive insulation testing device such as a VOM.
 - _____ 2. Verify that all conductors have been tested for conductor-to-conductor isolation using a non-destructive insulation testing device such as a VOM.
- C. **INSTALLER and INSPECTOR:** After completing the terminations of the system and conductors in accordance with the installation drawings, perform and verify the following:
- _____ 1. Verify that the system is installed and wired in accordance with the installation drawings.
 - _____ 2. Inspect each initiating device and alarm output device and verify that the conductors are properly wired for supervision.
 - _____ 3. Verify that each required end-of-line device is in place.
 - _____ 4. With battery installed and normal power supplied, verify that the FCP is in a NORMAL supervisory condition as defined by the manufacturer's manual.
 - _____ 5. By lifting leads or end-of-line devices, verify that each supervised zone produces proper trouble indication.
 - _____ 6. Verify that each alarm/supervisory initiating device produces proper alarm conditions when activated.
 - _____ 7. Verify that auxiliary functions (eg, HVAC shutdown) operate correctly in accordance with the design.