Associate Contractor Subsystem Tests

3.0 ASSOCIATE CONTRACTOR SUBSYSTEM TEST PLANS

This section contains summaries of tests which will be performed on a system-subsystem basis by the following WS-107A-2 associate contractors:

The Martin Company (TMC)

American Machine and Foundry (AMF)

Western Electric Company (WECO) / Remington Rand Univac (RRU)

Stromberg Carlson (S/C)

Aerojet General Corp. (AGC)

The associate contractors are responsible for preparing and performing the detailed sub-system test procedures as indicated below in the subsystems test index.

The tests outlined in this section meet the requirements as set forth in SR-59-101, Integrated Weapon System Activation Plan, Integrated Subsystem Test Plans and Procedures, Section #7, "Master Sequence Plan" displays the sequence of test performance.

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TEST SUMMARY

TITLE: GROUND SYSTEM TEST PROCEDURE FOR SINGLE POINT GROUNDING SYSTEM

RESPONSIBILITY:

The Martin Company

TEST DOCUMENT:

GSTP-X22

TEST COMPONENTS:		LOCATION:
CP9520	28VDC Rectifier Power Supply	Equipment Terminal
CP9521	28VDC Rectifier Inverter Start Unit	Equipment Terminal
CP3300	Standby Battery	Equipment Terminal
CP3400	Power Switchboard	Equipment Terminal
CP9510	400 CPS Motor Generator	Equipment Terminal
CP2010	Control Monitor Group	Equipment Terminal
CP2020	Control Monitor Group	Equipment Terminal
CP2030	Control Monitor Group	Equipment Terminal
CP2040	Control Monitor Group	Control Center
CP2110	Launch Console	Control Center
CP2130	Launch Complex Facilities Console	Control Center
CP4905	Time Display Board	Control Center
CP3500	Launch Control & Checkout Equipment Test Set	Missile Silo, Equipment Terminal
CP9202	Interconnections - Facility and Missile Grounds	Complex Area

OBJECTIVE:

The purpose of this test is to verify the proper grounding of all GOE racks, consoles, junction boxes and equipment frames.

TEST DESCRIPTION:

The following tests shall be performed to verify the grounding system:

a. A visual verification that each rack or pallet in the Equipment Terminal is connected to GOE ground.

TEST DESCRIPTION: (Continued)

b. A visual verification that each rank, console or pallet in the Control Center is connected to facility ground.

c. A visual verification that all motors, contactor racks, junction boxes, and electrical equipment frames (not GOE) are connected to facility ground.

d. Resistance measurements of 28 VDC rectifier power supply negative and 28 VDC missile inverter start negative as follows:

1. With grounding contactors not energized, verify less than 0.2 ohm in the grounding circuit to facility ground.
2. With grounding contactors energized open and umbilicals not connected to CP3500, verify resistance greater than 100,000 ohms in the grounding circuit to facility ground.
3. With umbilicals connected to missile simulator, verify less than 0.2 ohm in the negative power circuits to missile silo ground (single point ground) at the foot of the missile silo.

e. Resistance measurements of 400 cps ground power inverter neutral ground as follows:

1. With ground contactor closed, verify less than 0.2 ohms to facility ground.
2. With grounding contactor energized open and umbilicals disconnected, verify more than 100,000 ohms to facility ground.
3. With umbilicals connected, verify less than 1.0 ohm to ground connection at foot of missile silo.

REFERENCE DRAWINGS:

1P-3500-100	Installation Procedure, Test Set
327P9202103	Grounding Installation
327N2600001	Schematic Diagram A.S.S.
327B1080900	Umbilical Interface Tabulation
327P9040000	Grounding System Plan, O.B.
SR-59-101	Test Plan 2.0

PREREQUISITES:

Installation

Installation of Facility Ground Plates

All TMC/GOE Installation Process Plans

Tests

COE - Facility Ground Tests

SUPPORT EQUIPMENT:

28 VDC Power Supply

Multimeter, Simpson 260

Resistance Bridge

RECOMMENDED MANPOWER:

Test Conductor

1 Engineer

2 Technicians

TEST SUMMARY

TITLE: GROUND SYSTEM TEST PROCEDURE FOR POWER CONVERSION AND DISTRIBUTION SYSTEM PART I, SECONDARY POWER DISTRIBUTION

RESPONSIBILITY:

The Martin Company

TEST DOCUMENT:

GSTP-X10

TEST COMPONENTS:	LOCATIONS:
Facility Power Source (sub-station)	Equipment Terminal Level IV
CP 2040 Control Monitor Group with Chassis #4101	Control Center
Facility Motor Control Center #3	Control Center
CP3400 Power Switchboard	Equipment Terminal Level IV
CP3410 Control Center Transformer	Control Center
CP9202 Interconnections	Complex

OBJECTIVE:

The purpose of this test is to verify that the secondary power conversion and distribution equipment transforms, distributes and controls facility power to the Ground Operating Equipment in accordance with design requirements.

TEST DESCRIPTION:

The following tests shall be performed to verify the compatability and operability of the installed subsystem equipment and interconnecting wiring:

a. Power verification tests in the Equipment Terminal:
   1. Phase sequence checks
   2. Frequency checks
   3. Voltage measurements
   4. Circuit breaker continuity checks

b. Continuity tests of the power control circuits for the Missile Auxiliary Hydraulic Pumping Unit and the Missile Air Conditioner.

TEST DESCRIPTION: (Continued)

c. Power verification tests in the Control Center:

1. Phase sequence checks
2. Voltage measurements

REFERENCE DRAWINGS:

SR-59-101	Test Plan 3.0
327P3400000	Switchboard, Power
PD6450293	Switchboard, Power, Design Criteria
327P9202100	Electrical Installation, Launch Complex
327P9202102	Power Distribution

PREREQUISITES:

The following Installation Process Plans and Facility tests must be completed prior to this test.

Tests

Checkout of electrical systems from power house generators through unit sub-stations by Corp of Engineers sub contractor.

Installation

327P9202102-009-OP-5
327P9202102-009-OP-10
327P9202111-009
327P9202112-009
327P9202113-009
327P9202123-009-OP-5
327P9202123-009-OP-10
327P9202121-009
327P9202122-009
327P9202131-009
327P9202132-009
327P9100108-009-OP-5
327P9100108-009-OP-10
327P9100108-009-OP-15

SUPPORT EQUIPMENT:

Phase Sequence Indicator; Knapp Inc. K-3
Multimeter; Simpson 260
Portable AC voltmeter; GE AP-9
Electronic counter; HP 522B

RECOMMENDED MANPOWER:

1 Engineer
2 Technicians

TEST SUMMARY

TITLE: GROUND SYSTEM TEST PROCEDURE FOR POWER CONVERSION AND DISTRIBUTION SYSTEM, PART II, ACCESSORY SUPPLY SYSTEM

RESPONSIBILITY:

The Martin Company

TEST DOCUMENT:

GSTP-X11

TEST COMPONENTS:	LOCATION:
CP9520 28VDC Rectifier Power Supply	Equipment Terminal Level IV
CP9521 28VDC Rectifier Inv. Start.	Equipment Terminal Level IV
Stand-by Battery	Equipment Terminal Level IV
CP3400 Power Switchboard	Equipment Terminal Level IV
CP9510 400-Cycle Motor Generator Unit	Equipment Terminal Level IV
CP2030 Control Monitor Group with Chassis #2601 through #2607	Equipment Terminal Level III
CP2010 and 2020 Control Monitor Group	Equipment Terminal Level III
CP2040 Control Monitor Group	Control Center
CP9202 Interconnections	Complex

OBJECTIVE:

The purpose of this test is to:

a. Verify that the Accessory Supply System properly supplies, controls and monitors Ground Electrical Power to the Missile Electrical Systems, and GOE during Readiness, Checkout and Launch Modes.

b. Verify that the functions of the Missile Auxiliary Hydraulics System and the Missile Air Conditioning System are properly controlled and monitored during Readiness, Checkout and Launch Modes.

TEST DESCRIPTION:

The following tests shall be performed to verify the compatibility and operability of the installed subsystem equipment and interconnecting wiring:

a. Indicator lamp verification test.

TEST DESCRIPTION: (Continued)

b. Manual test of the system capability to distribute electrical power to Readiness and Checkout busses.

c. Manual tests of the system capabilities to monitor and control functions of the GOE and of the Missile Electrical System.

d. System capability to function properly and automatically during the Launch Sequence.

e. System self-check and malfunction isolation capability.

REFERENCE DRAWINGS:

327N2030004	Wiring Diagram, Control Monitor Group
327N2600001	Schematic Diagram, Accessory Supply System
327N2600005	Design Spec. Accessory Supply System
327N2600009	Operating Procedure, Accessory Supply System
327M2600008	Test Spec. Accessory Supply System
SR-59-101	Test Plan 4.0

PREREQUISITES:

The following Installation Process Plans and GSTP's must be completed prior to the test:

Tests

Ground System Test Procedure for Power Conversion and Distribution System, Part I, Secondary Power Distribution, GSTP-X10

Installation

327P9202103-009-OP-20
327P9202151-009
327P9202152-009
327P9202153-009-OP-5
327P9202161-009
327P9292162-009
327P9292163-009
327P9332100-009-OP-25
327P9332100-009-OP-35
327P9332100-009-OP-45
327P9332100-009-OP-50
327P9332100-009-OP-55
327P9100108-009-OP-25
327P9100108-009-OP-30

SUPPORT EQUIPMENT:

LC & CO Equipment Test Set; CP3500

Multimeter; Simpson 260

Phase Sequence Indicator; Knapp Model K-3

A/C Voltmeter; General Electric A.P.9

Stop watch

RECOMMENDED MANPOWER:

1 Engineer

8 Technicians

TEST SUMMARY

TITLE: GROUND SYSTEM TEST PROCEDURE FOR MISSILE AIR CONDITIONING SYSTEM

RESPONSIBILITY:

The Martin Company

TEST DOCUMENT:

GSTP-X12

TEST COMPONENTS:

CP8851 Air Conditioner Unit

CP9301 Piping Installation

CP2030 Control Monitor Group with all AGS chassis

CP3400 Power Switchboard

CP9202 Interconnections

LOCATION:

Equipment Terminal Level II

Equipment Terminal Utility Tunnel and Missile Silo

Equipment Terminal Level III

Equipment Terminal Level IV

Equipment Terminal Area

OBJECTIVE:

The purpose of this test is to:

a. Verify that the interconnecting cabling provides proper power and signal distribution.

b. Verify that the Air Conditioner Unit and associated ducting supplies conditioned air to the Stage II Missile compartments at the proper flow rates and temperatures.

c. Verify the local and remote control capabilities of the Air Conditioner Unit.

TEST DESCRIPTION:

The following tests shall be performed to verify the compatibility and operability of the installed subsystem equipment and interconnecting wiring:

a. Indicator lamp verification test.

b. Operate the air conditioner unit from the remote control panel.

c. Operational test using the local control capability.

d. Measure temperature and specific humidity of the intake air.

TEST DESCRIPTION: (Continued)

e. Energize the heating and cooling cycling controllers. Measure the discharge air flow rates and temperatures during each cycle.

f. Return the system to normal operating conditions for subsequent local operation.

REFERENCE DRAWINGS:

327M8851009	Operating Procedure Missile Air Conditioner
327N9301005	Design Spec. Ducting
327N9301008	Test Spec. Ducting
SR-59-101	Test Plan 5.0

PREREQUISITES:

The following Installation Process Plans and GSTP's must be completed prior to this test:

Tests

Power Conversion and Distribution System Part I

Secondary Power Distribution GSTP X10

Power Conversion and Distribution System Part II

Accessory Supply System, GSTP X11

Installation

327P9301100-009-OP-5	Steps 5, 10, and 15
327P9301100-009-OP-10	Steps 5, 10, and 15
327P9301100-009-OP-15	
327P9301100-009-OP-20	
327P9301100-009-OP-25	
327P9301100-009-OP-30	Steps 5 and 10
327P9332100-009-OP-10	

SUPPORT EQUIPMENT:

Pitot Tubes; Merian type 303

Manometer; inclined Dwyer

Manometer; Flextube

Sling Psychometer; Bacharach

Psychrometric Chart

Multimeter, Simpson 260

0-32VDC Power Supply; Armour T-225B

RECOMMENDED MANPOWER:

1 Engineer

3 Technicians

TEST SUMMARY

TITLE: GROUND SYSTEM TEST PROCEDURE FOR MISSILE AUXILIARY HYDRAULICS

RESPONSIBILITY:

The Martin Company

TEST DOCUMENT:

GSTP X13

TEST COMPONENTS:	LOCATION:
CP8861 Hydraulic Pumping Unit	Equipment Terminal, Level II
CP9302 Hydraulic Piping Installation	Equipment Terminal, Level II, Utility Tunnel and Missile Silo
CP9202 Interconnections	Equipment Terminal

OBJECTIVE:

The purpose of this test is to:

a. Verify that the interconnecting cabling provides proper power and signal distribution.

b. Verify that the Hydraulic Pumping Unit and associated hydraulic piping supplies hydraulic fluid to both missile stages at the proper fluid flow rate, pressure and temperature.

c. Verify the local and remote control capabilities of the Hydraulic Pumping Unit.

TEST DESCRIPTION:

a. Indicator lamp verification test.

b. Operate the Hydraulic Pumping Unit from the remote control panel.

c. Operational test using the local control capability.

d. Measure fluid flow rates, pressures and temperatures.

e. Checkout of the status indicator lamps on the Hydraulic Unit Control Panel.

f. Functional checkout of the Hydraulic Fire Alarm-Circuit.

g. Pressure drop test on the return lines.

h. Measure the level of hydraulic fluid contamination by the Millipore method.

REFERENCE DRAWINGS:

327M8861009	Operating Procedure, Hydraulic Pumping Unit
327M8861008	Test Specification, Hydraulic Pumping Unit
327M8861005	Design Specification, Hydraulic Pumping Unit
327M9302008	Test Specification, Hydraulic Piping Installation
SR-59-101	Test Plan 6.0

PREREQUISITES:

Tests

GSTP for Power Conversion and Distribution System, Part I, Secondary Power Distribution, GSTP X10

GSTP for Power Conversion and Distribution System, Part II, Accessory Supply System; GSTP X11

Installation

327P9100108-009-OP-25

327P9100108-009-OP-30

SUPPORT EQUIPMENT:

LC & CO Equipment Test Set, CP3500

Multimeter, Simpson 260

0-32VDC Power Supply, Armour T-225

Missile Silo Test Platform, TO-900506

RECOMMENDED MANPOWER:

1 Engineer

4 Technicians

TEST SUMMARY

TITLE: GROUND SYSTEM TEST PROCEDURE FOR LAUNCH CONTROL AND SEQUENCER SYSTEM

RESPONSIBILITY:

The Martin Company

TEST DOCUMENT:

GSTP X14

TEST COMPONENTS:	LOCATION:
CP2010 Control Monitor Group including chassis #2301, 2302, and 2303	Equipment Terminal, Level III
CP2110 Launch Control Console	Control Center
CP2130 Launch Complex Facilities Console	Control Center
CP4905 Time Display Board	Control Center
CP2040 Control Monitor Group including all chassis	Control Center
CP9202 Interconnections	Complex Area

OBJECTIVE:

The purpose of this test is to:

a. Verify normal operation of the Control Center Power Supply and Distribution System.

b. Verify proper illumination of indicator lamps on the Launch Control and Sequencer System Equipment.

c. Verify TMC circuitry associated with the Damage and Hazard Warning Control System and Equipment Status verification.

d. Verify self-check capabilities of the Control Center Circuits and the Launch Sequencer.

e. Verify operation of the clocks on the TDB during the various countdown operations.

f. Verify the capability of the LCC to initiate, monitor and control the four phases of each countdown mode listed below:

1. Launch Mode
2. Launch Exercise Mode
3. Handover Mode

OBJECTIVE: (Continued)

g. Verify the capability of the Launch Sequencer to generate a Shutdown signal if certain prerequisite signals are present.

h. Verify input and output signals of the Launch Control and Sequencer System.

i. Verify the capability of the Control Center Circuits to effectively control the raising and lowering interlocks and those functions associated with the Ground Guidance System.

TEST DESCRIPTION:

The following tests shall be performed to verify the compatibility and operability of the installed subsystem equipment and interconnecting wiring:

a. Indicator lamp verification test.

b. Damage and Hazard Warning Control test of TMC circuitry using the Damage Control Simulator (test tool) as required.

c. Checkout Mode and a Malfunction Mode test to verify the self-check capabilities of the Control Center Circuits, Targeting Control System and the Launch Sequencer.

d. One or more simulated Launch Sequences as necessary to demonstrate the operational capabilities (including shutdown) of the Launch Control and Sequencer System in a Launch Mode.

e. One or more simulated Launch Exercise Sequences as necessary to verify the operation of the Launch Control and Sequencer System in the Launch Exercise Mode.

f. One or more simulated Launch Sequences as necessary to verify the operation of the Launch Control and Sequences System in the Handover Operation.

g. Return the system to normal operating condition.

REFERENCE DRAWINGS:

327N2300008	Test Spec. Launch Sequencer
327N2110005	Design Spec. Launch Control Console
327N2130005	Design Spec. Launch Complex Facilities Console
327N2300005	Design Spec. Launch Sequencer
327N3700005	Design Spec. Control Center Circuits
327N4100005	Design Spec. Control Center Power Supply
327N4905005	Design Spec. Time Display Board
SR-59-101	Test Plan 13.0

PREREQUISITES:

The following Installation Process Plans and GSTP's must be completed prior to this test:

Tests

GSTP for Power Conversion and Distribution System, Part I, Secondary Power Distribution, X10 GSTP for Power Conversion and Distribution System, Part II, Accessory Supply System, X11.

Installation

327NP9401100-009-OP-10

327NP9401100-009-OP-15

327NP9401100-009-OP-25

327NP9401100-009-OP-30

SUPPORT EQUIPMENT:

LC & CO Equipment Test Set; CP3500

Multimeter; Simpson 260

Stop watch

Damage Control Simulator; TO-900510

RECOMMENDED MANPOWER:

4 Engineers

4 Technicians

TEST SUMMARY

TITLE: GROUND SYSTEM TEST PROCEDURE FOR NITROGEN START SYSTEM

RESPONSIBILITY:

The Martin Company

TEST DOCUMENT:

GSTP X15

TEST COMPONENTS:

CP9321 Nitrogen Start System

LOCATION:

Missile Silo

OBJECTIVE:

The purpose of this test is to verify the capability of the Nitrogen Start System to supply Nitrogen gas in sufficient amounts (flow rate and pressure) to comply with AGC design requirements.

TEST DESCRIPTION:

The following tests shall be performed to verify the compatibility and operability of the installed subsystem equipment and interconnecting wiring:

a. Simulate a "Fire Stage I Engine" signal to the Nitrogen Start Valve to pressurize the Nitrogen Start System.

b. Record gas pressure versus time.

c. Compare pressure versus time curve with calibration curve specified in System Test Specification.

d. Repeat flow tests as necessary with other orifices until operating curve is compatible with the pressure versus time curve defined in System Test Specification.

e. Return the system to normal operating conditions.

REFERENCE DRAWINGS:

327P9321005	Design Specification, Launcher and Tower Mounted Gas and Propellant services
327P9321008	Test Specifications, Launcher and Tower Mounted Gas And Propellant services

REFERENCE DRAWINGS: (Continued)

327P9321009	Operating Procedure, Launcher and Tower Mounted Gas And Propellant services
SR-59-101	Test Plan 12.0

PREREQUISITES:

The following Installations Process Plans, Facility Tests and GSTP's shall be completed prior to this test.

Tests

Checkout of facility air conditioning system by Corp of Engineers.

GSTP for Power Conversion and Distribution System, Part I Secondary Power Distribution, GSTP X10.

Installation

327P9211000-009

327P9302100-009

327P9302100-009-10 step 20

327P9302100-009-20 step 10

327P9100108-009

327P9100108-009-OP-30

SUPPORT EQUIPMENT:

Engine Start System Simulator; TO-900507

Recorder (Analog) 2 channel: Sanborn

Set, Orfice Plates (1.2" - 1.7"): TO-900508

Transducer, Pressure: PD-74S0007-29

RECOMMENDED MANPOWER:

1 Engineer

3 Technicians

TEST SUMMARY

TITLE: GROUND SYSTEM TEST PROCEDURE FOR FLIGHT CONTROL SYSTEM

RESPONSIBILITY:

The Martin Company

TEST DOCUMENT:

GSTP X17

TEST COMPONENTS:

CP2010 Control Monitor Group
including chassis #2401, 2402, 2403,
2405, 2406, 2408 and 2409
CP9202 Interconnections

LOCATION:

Equipment Terminal, Level III
Equipment Terminal and Missile Silo

OBJECTIVE:

The purpose of this test is to:

a. Verify that the FCS and its interconnecting cabling is capable of satisfactory performance in the Launch, Checkout, and Malfunction Modes of operation.
b. Verify that FCS light logic indications correspond to system conditions.
c. Verify that the FCS operates correctly in both Shutdown and Handover Sequences.

TEST DESCRIPTION:

The following tests shall be performed to verify the compatibility and operability of the installed subsystem equipment and interconnecting wiring:

a. Checkout of the FCS GOE by manually stepping through the Self Test portion of the 2409 Command Programmer Tape with no simulated malfunctions inserted.
b. Checkout of the GCS GOE by manually stepping through the Missile Test portion of the 2409 Command Programmer Tape with selected malfunctions inserted until one of the End-To-End test frames is reached. The GOE shall determine that the inserted malfunctions exist and will drive to the malfunction isolation portion of the test tape.

TEST DESCRIPTION: (Continued)

c. Malfunction detection checkout of the FCS GOE by manually stepping through the Missile Test and Malfunction isolation test frames of the 2409 Command Programmer Tape using malfunctions different from those used in Test b.

d. Checkout of the FCS GOE by automatically stepping through the Self Test and Missile Test portions of the 2409 Command Programmer Tape.

e. Checkout of the operation of the FCS GOE during Launch Mode by simulating a Launch Sequence, inserting malfunctions at specified times in the Sequence and monitoring FCS outputs to the LS and CCC.

f. Checkout of the operation of the FCS GOE during Launch Sequence Handover by simulating the FCS Handover signal and monitoring FCS outputs to the LS and CCC.

g. Checkout of the operation of the FCS GOE during Launch Sequence Shutdown by simulating the Shutdown signal and monitoring FCS outputs to the LS and CCC.

REFERENCE DRAWINGS:

327N2400000	Top Drawing FCS
327N2400005	Design Spec. FCS
327N2400008	Test Spec. FCS
327N2400009	Operating Procedure, FCS
SR-59-101	Test Plan 10.0

PREREQUISITES:

The following Installation Process Plans and sub-system tests must be completed prior to this test:

Tests

Power Conversion and Distribution System, Part I, Secondary Power Distribution, GSTP- X10.

Power Conversion and Distribution System, Part II, Accessory Supply System, GSTF X11.

Installation

327P9202132-009-OP-5

327P9100108-009-OP-25

327P9100108-009-OP-32

SUPPORT EQUIPMENT:

LC & CO Equipment Test Set, CP-3500

Variav, GRW-5M

VTVM, HP-410B

Ocilloscope with Dual Trace

Plug-in, Tektronix -531A

Scopemobile, Tektronix -500-53A

Stop watch

Digital Voltmeter, Electro Inst. DVA-510

Electronic Counter, HP-522B

Peak Readout AC Voltmeter, Ballentine-305

Multimeter, Simpson 260

0-32VDC Power Supply, Armour T-225B

RECOMMENDED MANPOWER:

2 Engineers

5 Technicians

TEST SUMMARY

TITLE: GROUND SYSTEM TEST PROCEDURE FOR THE PROPELLANT LOADING AND PRESSURIZATION SYSTEM

RESPONSIBILITY:

The Martin Company

TEST DOCUMENT:

GSTP X18

TEST COMPONENTS:

CP2020 Control Monitor Group including PLPS (Propellant Loading & Pressurization System) Chassis 2503, 2504, 2505, 2506, 2507, 2508, 2511, 2512, 2514, 2515, 2516

CP9202 Interconnections

LOCATION:

Equipment Terminal Level III

Equipment Terminal, Missile Silo and Propellant Terminal

OBJECTIVES:

The purpose of this test is to:

a. Verify the capabilities of the PLPS GOE to monitor and manually control the transfer of LOX, Helium and Fuel between the Complex storage facilities and the Missile tanks.

b. Verify that the PLPS GOE can, upon receipt of command and check signals, automatically perform its required functions as a part of a Launch Sequence.

c. Automatic Lox Checkout and verify proper lamp indications denoting ability of PLPS to load LOX.

d. Automatic Gas Checkout and verify proper lamp indications denoting ability of PLPS to load Helium.

e. Automatic Fuel Checkout and verify proper lamp indications denoting ability of the PLPS to open Fuel Zero-Leakage Prevalves.

f. Demonstrate capability of PLPS to control the manual loading and unloading of missile fuel.

g. Generate signals to energize simulated valves, liquid sensors, and pressure switches in the PLPS. Record the receipt of command and check signals to demonstrate ability of PLPS to perform its required functions automatically as a part of a Launch Sequence.

h. Malfunction checkout and verify the response of the PLPS to each malfuntion which the system has been designed to detect.

i. Return the system to normal operating conditions.

REFERENCE DRAWINGS:

327N2500001	Schematic Wiring Diagram, PLPS
327N9200118	Functional Schematic, PLPS
327N9202101	Interconnection Block Diagram
327N2020000	Control Assembly, Pallet 2020
327N2500005	Design Specification, PLPS
327N2500008	Test Specification, PLPS
327N2500009	Operating Procedure, PLPS
SR-59-101	Test Plan 7.1

PREREQUISITES:

The following Installation Process Plans and subsystem tests must be completed prior to this test.

Tests

Ground System Test Procedures for Power Conversion and Distribution System, Parts I and II, GSTP's X10[illegible]

Installation

327P9202102-009-OP-15
327P9202141-009
327P9202142-009
327P9202143-009-OP-5
327P9202143-009-OP-10
327P9332100-009-OP-20
327P9100108-009-OP-20

SUPPORT EQUIPMENT:

LC & CO Equipment Test Set, CP3500

Multimeter, Simpson 260

0-32VDC Power Supply, Armour T-225B

RECOMMENDED MANPOWER:

1 Engineer

6 Technicians

TEST SUMMARY

TITLE: GROUND SYSTEM TEST PROCEDURE FOR ENGINE CONTROL SYSTEM

RESPONSIBILITY:

The Martin Company

TEST DOCUMENT:

GSTP X19

TEST COMPONENTS:

CP2010 Control Monitor Group includes
chassis 2802 through 2806
CP9202 Interconnections

LOCATION:

Equipment Terminal, Level III
Equipment Terminal, Missile Silo

OBJECTIVE:

The purpose of this test is to:

a. Verify the capability of the Engine Control System to check the Engine Start System.

b. Verify the capability of the Engine Control System to check the Stage I and Stage II Engine circuits and properly identify and display circuit faults.

c. Verify the capability of the Engine Control System to detect malfunctions.

d. Verify the capability of the Engine Control System to properly perform a Shutdown Sequence.

TEST DESCRIPTION:

The following tests shall be performed to verify the compatibility and operability of the installed subsystem equipment and interconnecting wiring:

a. Indicator lamp verification test.

b. Demonstrate the operation of the Start Sequencer by verifying the satisfactory completion of an Engine Start System Check.

c. Check the ECS NO GO and ECS IN CHECKOUT indicators for proper indication in the event of a malfunction by performing a Malfunction Check.

TEST DESCRIPTION: (Continued)

d. Perform an 87-Engine Check using Normal (in tolerance), High (out of tolerance) and Low (out of tolerance) simulated engine signals.

e. Perform a 91-Engine Check using Normal (in tolerance), High (out of tolerance) and Low (out of tolerance) simulated engine signals.

f. Perform one or more simulated launches to verify the proper operation and timing or Engine Control System signals during the Launch Mode. GGVS Malfunction and late TCPS signals will be inserted to verify the capability of the Engine Control System to detect these malfunctions.

g. Perform a simulated launch to verify the capability of the Engine Control System to perform the proper shutdown operation.

h. Return the system to normal operating conditions.

REFERENCE DRAWINGS:

327N2800008	Test Spec. for ECS (Martin)
1-241501	Electrical Diagram, ECS Rack (Aerojet)
1-241511	Interface Connection Diagram, AGC to TMC (Aerojet)
GSE-Den-7	Operating Instructions, ECS (Aerojet)
SR-59-101	Test Plan 11.0

PREREQUISITES:

The following Installation Process Plans and subsystem tests must be completed prior to this test:

Tests

Power Conversion and Distribution System, Part I
Secondary Power Distribution - GSTP X10.
Power Conversion and Distribution System, Part II, Accessory Supply System
GSTP X11.

Installation

327P9302100-009-OP-5	Steps 5, 10, and 15
327P9302100-009-OP-10	Steps 5, 10, 15, and 25
327P9302100-009-OP-15	Steps 5, 10, and 15
327P9302100-009-OP-20	Steps 5, 10, and 15
327P9302100-009-OP-25	Steps 5 and 10
327P9332100-009-OP-5	

SUPPORT EQUIPMENT:

Hydraulic Filler Line TO-900500

Hydraulic Load Simulator TO-900505

Manifold, Hydraulic Pressure Line CP-M1775

Multimeter, Simpson 260

0-32VDC Power Supply, Armour T-225B

Pressure Gauge, 0 to 60 PXI$\frac{1}{4}$ NPT connections

RECOMMENDED MANPOWER:

1 Engineer

3 Technicians

TEST SUMMARY

TITLE: GROUND SYSTEM TEST PROCEDURE FOR RE-ENTRY VEHICLE SYSTEM

RESPONSIBILITY:

The Martin Company

TEST DOCUMENT:

X20

TEST COMPONENTS:	LOCATION:
CP2020 Control and Monitor Group, including chassis CP3201 thru 3205	Equipment Terminal, Level III
CP9202 Interconnections	Equipment Terminal, Missile Silo

OBJECTIVE:

The purpose of this test is to verify the functional capability of the RVS/GOE and its ability to properly control the fuzing functions of the re-entry vehicle and to monitor and display the Ready or Fault status of the RVS/GOE and re-entry vehicle.

TEST DESCRIPTION:

The following tests shall be performed to verify the compatibility and operability of the installed subsystem equipment and interconnecting wiring:

a. Indicator lamp verification test.

b. Checkout of the Self Test capability of the R/V GOE to initiate a self test of the Unit and isolate malfunctions to chassis level.

c. Checkout of the capability of the R/V GOE to set a fuze in the Re-Entry Vehicle.

d. Checkout of the capability of the R/V GOE to recognize Launch Sequence signals and send the proper responses to the Launch Sequencer and the Re-Entry Vehicle.

REFERENCE DRAWINGS

327N3200008	Test Spec. Re-entry Vehicle GOE
PD327N00002	Design Spec. Re-entry Vehicle GOE
327N3200009	Operating Procedure for Re-entry Vehicle GOE
327N3200015	Drawing Index for Re-entry Vehicle GOE
SR-59-101	Test Plan 8.0

PREREQUISITES:

The following installation Process Plans and GSTP's must be completed prior to this test:

Tests

GSTP for Power Conversion and Distribution System, Part II

Accessory Supply System, GSTP XII.

Installation

327P9100108-009-OP-25

327P9100108-009-OP-30

SUPPORT EQUIPMENT:

LC & CO Equipment Test Set, CP3500

Targeting Card System Simulator, TO-900509

Multimeter, Simpson 260

RECOMMENDED MANPOWER:

2 Engineers

2 Technicians