NO. 3 ESS
UNITIZED SYSTEM TEST PLANNING

CONTENTS

1. INTRODUCTION

1.1 The section provides detailed test planning information pertinent to the installation of a unitized No. 3 ESS switching machine. The information contained in this section permits development of an orderly and organized testing plan for each installation. A job planning chart is included to provide recommended test sequencing information.

1.2 Section 1 provides general information pertinent to the installation of a No. 3 ESS machine and should be reviewed.

1.3 The No. 3 ESS may also be ordered for delivery to the office site as individual frames. Section 1B provides detailed test planning information pertinent to the conventional installation of a No. 3 ESS shipped as individual frames.

2. REFERENCE INFORMATION

2.1 The following documentation provides reference information pertaining specifically to unitized No. 3 ESS.

ED-3H010-01 ED-3H011-01	No. 3 ESS method of Unitization drawings (hardware and procedures)
ED-3H200-10	No. 3 ESS Guidebook provides details for handling the unitized No. 3 ESS
HB 261, Sec. 111	Installation details associated with unitized No. 3 ESS

2.2 Additional references are listed in Handbook 269, Section 1.

3. DESCRIPTION OF UNITIZATION

3.1 Purpose

3.11 Each No. 3 ESS is fully assembled, wired and tested as an operational switching system at the factory. The purpose of the unitization packaging concept is to facilitate the shipment of the assembled No. 3 ESS machine to site as a single entity negating the need for factory disassembly and site reassembly.

3.2 Unitization Hardware

3.21 The unitized packaging of No. 3 ESS is facilitated by the addition of shipping braces to the equipment lineups. Steel channels "sandwich" the base of the equipment lineups. Cross aisle supports interconnect the lineups and nylon webbing straps provide cross bracing support giving rigidity to the assembled equipment package. A formed and sectionalized cover is placed over the No. 3 ESS equipment completing the unitization of the factory assembled system.

2.22 Two different but similar designs exist for the unitization hardware and include details for assembly on the No. 3 ESS.

ED-3H010-01 - This unitization hardware design is only applicable for shipment of two lineup No. 3 ESS machines.

ED-3H011-01 - This unitization hardware design is capable of shipping three lineup No. 3 ESS machines with up to ten network frames (a No. 3 ESS office may have a maximum of fifteen network frames but no more than three lineups).

The basic difference between the two designs is the use of a stronger support member for the base of the equipment lineups in the ED-3H011-01 unitization design.

3.3 Factory Equipment Order

3.31 All equipment which is required for the factory assembly and test of the No. 3 ESS is included in the factory order. In general, the following equipment is included in the factory order and as such becomes part of the unitized shipment.

- No. 3 ESS Switching Equipment Frames
- 151A -48 Volt Power Plant
- Miscellaneous Power Frame
- First Distributing Frame Module and Terminal Blocks
- Lineup Cable Rack and Covers
- Cross Aisle Racks (within the switching lineups)
- End Guards
- All Interframe Cabling and Wiring Including Trunk Cross Connections
- Aisle Lights and Associated Wiring

3.32 With the exception of the following items, the unitized equipment is shipped intact to the site. Those items removed for shipment and separately packaged are as follows:

- Cross Aisle Trough(s) to Distributing Frame
- Maintenance Frame Teletypewriter
- Lineup Cable Rack Covers which Interfere with Unitization Hardware
- Miscellaneous Plug-in Mercury Relays
- Miscellaneous Distributing Frame Details

3.4 Site Equipment Order

3.41 The equipment required in addition to the unitized equipment package is included in the site order. This equipment is shipped direct to site in advance of the factory order and is scheduled for a two-week earlier installation start.

3.42 The following equipment is included in the site order:

- Battery Stand Hardware
- Batteries, Intercell Connectors and Charge and Discharge Feeder Cables
- Second Distributing Frame Module (may be included in the toll order)
- Base Covers for Equipment Lineups
- Miscellaneous Conduit and Wire for A.C. Feeders from the House Service Panel to the Switching Equipment and Ground Cables
- Frame Hold-down Hardware and Leveling Blocks

3.5 Shipment and Handling of Unitized Equipment

3.51 Transportation

3.511 The unitized equipment package is loaded on a flat bed transporter and shipped directly to the office site. The equipment is attached to the bed of the transporter with chain binders. A formed protective cover and an additional outer tarp covering are sealed to the bed of the transporter to provide complete weather protection.

3.512 As direct shipment, the site activities required to receive and unload the unitized equipment package must be coordinated with the shipment. The following organization should be contacted for the shipping progress and expected delivery time:

Oklahoma City Works
Resident Transportation Supervisor - OC
Department 961
CORNET 359-3121
Commercial (405) 781-3121

3.52 Receival and Unloading

3.521 The Western Electric Installation Organization is responsible for receiving the unitized shipment. A crane and riggers are contracted by Western Electric to unload the equipment from the transporter and position the equipment within the building. The Western Electric Installation Organization is responsible for specifying the positioning of the equipment, coordinating the

activities of involved organizations, and completing interspersed installation items. The operating company is responsible for removal and reinstallation of any temporary covering for the building access opening.

3.522 The No. 3 ESS Guidebook, ED-3H200-10, provides considerable additional details and procedures associated with the handling of a unitized system.

3.53 Equipment Installation

3.531 With the equipment in position, all unitization hardware will be removed and the frames bolted down to previously installed floor anchors. Concurrent with the assembly of ship loose items, the system can be connected to a.c. power and the battery charge and discharge feeders run and terminated.

3.532 All unitization hardware, webbing, outer and inner covers and cover tie bands will be returned to the factory as specified in Handbook 261, Section 111.

3.533 As a factory assembled and tested equipment package, the installation consists mainly of testing effort which begins shortly after installation start.

3.534 The remainder of this handbook section provides information necessary to develop a detailed job test plan.

4. PRESHIP INSTALLATION PREPARATION

4.1 The installation organization is responsible in the following four areas prior to receival of a unitized system.

RIGGING CONTRACT - The installer must review the rigging and positioning procedures with the contractor. Each site must be assessed for special requirements. Refer to the No. 3 ESS Guidebook, ED-3H200-10, for additional details.

BATTERY PLANT - The battery stand and batteries are included in the site order which is scheduled for an advance installation start. Early installation of this equipment greatly relieves congestion which would be encountered if the battery plant were installed with the No. 3 ESS equipment in position. Also, the batteries should be precharged with a portable rectifier to prevent delaying the installation test effort.

HOLD-DOWN HARDWARE - The floor must be marked and frame anchors installed prior to receival of the unitized equipment. Also, the frame leveling blocks must be measured, assembled and put aside for use when required. Handbook 261, Section 111 provides additional details.

A.C. POWER FEEDERS - Once the unitized system has been positioned in the building, connection of the system to a.c. power and to the batteries lies in the critical path of completing the installation. Running conduits from the house service panel to pull boxes and prepulling and connecting a.c. feeders will allow for an earlier start of the installation test effort.

4.2 The installer should also insure that the building floor is cleared for the unloading exercise. Also, the tools required to remove the unitization hardware (detailed in Handbook 261, Section 111) should be inventoried to insure their availability.

5. DETAILED JOB PLANNING

5.1 Installation Interval

5.11 As a factory assembled, wired and tested equipment package, the installation of a unitized No. 3 ESS machine consists almost entirely of testing effort. For this reason, it is essential that all test equipment and office documentation are available at the beginning of the installation. The testing effort will typically start within a few days after the equipment has been unloaded and placed in the building.

5.12 A detailed job test plan must be developed and followed to insure an orderly installation and completion within the scheduled interval.

5.2 Equipment Assembly

5.21 All details concerning the unloading and final positioning of the equipment is included in the No. 3 ESS Guidebook, ED-3H200-10. The unloading and positioning operation will typically be completed in one day.

5.22 Several hardware installation items must be completed on-site and are best categorized as follows:

HARDWARE INSTALLATION ITEMS

Completion of the following items is required to commence testing:

- Remove unitization hardware (Handbook 261, Section 111)

- Secure frames to floor (Handbook 261, Section 111)
- Reposition CDF module and install associated cross aisle trough(s) (Handbook 261, Section 111)
- Assemble ladder rack to batteries and install charge and discharge feeders (ED-3H154-30)
- Connect a.c. power to system (SD-3H908-01)
- Run and connect grounding cables (ED-3H150-10)
- Install maintenance frame typewriter (ship loose item)

These items may be installed in parallel with the testing effort.

- Install base covers and appliance outlets (ED-3H154-30)
- Extend aisle lights
- Assemble ladder rack and install power feeders to toll PD
- Install CDF ship loose hardware (end guard, outside plant designation board, etc.)
- Install cable rack covers (ship loose items)
- Install distributing frame aisle lights (ED-3H151-30 & ED-3H154-30)
- Complete a.c. work (wiring to toll aisle lights, etc.)
- Remove packaging details

5.23 Temporary power alarms should be connected to the 151A power plant for 24-hour monitoring prior to placing any load on the batteries. Otherwise, it would be necessary to provide 24-hour coverage at the office as indicated by Handbook 18, Section 18F. Connection of temporary alarms is detailed in Handbook 21, Section 130. Once the system is operational with the generic program, office alarms may be remoted eliminating the need for temporary power alarms.

5.3 Installation Testing

5.31 The site installation test methods and the sequence of tests have been written to run in the success mode, thus taking full advantage of the factory effort. The installer can expect to perform these tests without uncovering basic wiring, hardware or translation problems.

5.32 Installation Handbook 269 also contains test methods for installation of No. 3 ESS machines shipped and installed as individual frames. These test methods may be used for troubleshooting purposes or for additional installer information.

5.33 The sequencing of test methods is very important not only to insure an orderly installation, but also to prevent equipment damage. Paragraph 6 provides information for the development of a detailed job test sequence plan.

6. TEST SEQUENCING

6.1 A typical Installation Interval Planning Network for unitized No. 3 ESS machines is depicted in Chart A. This planning chart reflects only a sequence of events and does not reflect either interval or manloading. In order to make effective use of the chart in preparing manpower assignments, the installer should consider the following:

A. In general, the events forming the straight lines of bubbles at the top will have a direct effect upon the completion date of the job. This sequence of events is known as the critical path.

B. Since the events on the critical path directly affect the job interval, the installation should be planned so that there are no gaps or slack time between these events. Events not in the critical path should be assigned in such a manner as to avoid slack time in the critical path awaiting their completion.

The examples on page 5 show how to read Chart A.

6.2 The control complex (processor and maintenance frames) can be power verified and operationally tested independent of the rest of the No. 3 ESS switching equipment. All of the peripheral equipment must be power verified prior to running the peripheral test programs (Handbook 269, Section 300).

6.3 The ITE-5649 volume test set should be wired into the system and the test set verified for correct operation early in the installation interval. Once the generic program is loaded and the system made operational, the installer should begin verifying proper origination and termination of test lines wired into the volume test set. The volume test set will be used during the Maintenance Volume Test (Section 660.31) and Integrated Volume Test (Section 660.41).

ATTACHMENTS
Figure 1 on page 5.
Chart A on page 7.

→Arrows indicate new or changed information.
Reason for Reissue: Updated paragraphs 3.512 and 3.532.

Manager, Development Engineering - 2/2B, 3, 4 and 5 ESS

5-2-80

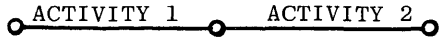
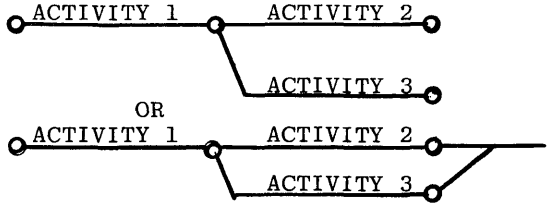
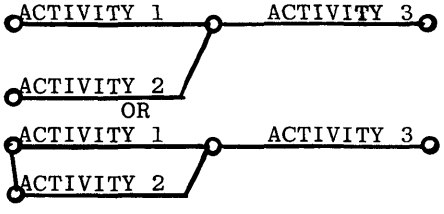
CONFIGURATION	LOGIC
	Activity 1 must be completed before Activity 2 can begin.
	Activity 1 must be completed before starting Activity 2 or 3. Activities 2 and 3 can be performed concurrently.
	Activities 1 and 2 can be performed concurrently but both must be completed before Activity 3 can begin.

FIGURE 1

Explanation of Planning Network Chart A

CHART A

UNITIZED NO. 3 ESS
INSTALLATION INTERVAL PLANNING NETWORK