1. GENERAL

1.1. Introduction

1.1.1 The Installation Supplier shall ensure, as part of the evaluation of the installation, that all equipment added, rearranged or modified is properly installed and in conformance with AT&T installation specifications (ATT-790-100-658).

1.1.2 The Installation Supplier shall assure, as part of the evaluation of the installation, that all work is performed in accordance with the detail specifications or approved changes to the detail specifications (ATT-790-100-658JP).

1.1.3 This section covers the general requirements for the installation of stand-by engine/alternator sets.

1.1.4 Changes in this issue of Section U are summarized in Table U-1.

1.1.5 For more detailed information refer to ATT-790-100-658 and ATT-790-100-658JP.
2. REQUIREMENTS

2.1. General

2.1.1 All exterior engines and associated support equipment shall be protected by bollards, covers, or other protective obstructions to prevent damage from vehicles or other traffic.

2.1.2 Only cabling directly associated with the Engine / Alternator and fuel system shall be run into and out of the Engine/Alternator room/enclosure. Examples of permitted cable includes, the grounding cable, telecommunication cables (commonly referred to as telephones), Alarm Cabling, Telemetry, power for Engine/Alternator accessories, and the AC output of the Engine / Alternator set.

2.2. Exhaust Requirements

2.2.1 Exhaust piping and duct connection joints shall not be insulated until the on-site full load testing has been completed and the bolts have been re-tightened.

2.2.2 A critical grade exhaust silencer equipped with a condensation drain, companion flanges, and a stainless steel bellows type exhaust fitting shall be provided. The flexible stainless steel bellows type exhaust fitting shall be installed within 12" of the exhaust manifold (if possible).

2.2.3 All exhaust components exposed to outside elements (module or building) shall be stainless steel.

2.3. Alarms

2.3.1 The Installation Supplier shall extend and terminate all specified alarm leads as designated by the AT&T Equipment Engineer. The terminal blocks shall be stenciled per Section L.

2.3.2 All new standby engine/alternator sets shall have the capability of forwarding alarms via TCP/IP to the appropriate alarm center. The alarms specified shall be the AT&T minimum alarms and required equipment specific alarms per AT&T drawing ATT-P-05010-E.

2.4. Grounding

2.4.1 The engine/alternator set base/skid, start battery racks, battery chargers, and fuel day tanks (when present and of metallic construction), shall be bonded to the Common Bonding Network (CBN) with stranded copper grounding conductors in conformance with ATT-TP-76416.

2.4.2 The set mounted control cabinet, meter cabinet/panel, and engine/alternator shall be bonded to the engine/alternator metallic base/skid. When present, a factory installed bond is sufficient. Such bonds shall be made with conductors designed to withstand engine/alternator vibrations.

2.4.3 When multiple parallel conduits are used a full sized grounding conductor shall be run in each conduit.

2.4.4 Equipment grounding conductors shall terminate within the engine/alternator cabinet provided for termination of phase conductors. Termination shall be made directly to a non-insulated ACEG bus bar.

2.4.5 To provide grounding continuity between the entire engine/alternator set and the equipment grounding conductors, the engine/alternator cabinet shall be electrically connected to the set frame in one of the following manners:

a) By attachment hardware
b) By a bonding strap of cross-sectional area equal to that of the grounding conductor specified.

2.5. Connections

2.5.1 All field wire and cable connections shall be made in accordance with TP76300 section K.

2.5.2 The installation vendor shall provide means to prevent field-installed connectors from turning at termination points.

2.5.3 The standby engine/alternator set output leads (either single or three phase) shall be connected to the transfer switch, building AC or within a junction box termination point in the following manner:

a) The correct compression type splice connector shall be utilized when the conductors between the alternator and AC transfer switch are spliced or directly joined together.

b) Two-hole compression terminals may be utilized with a bus bar arrangement in the junction box or AC transfer switch when this arrangement is specified.

c) Split bolt type connectors, sometimes called kearnies, shall NOT be used.

d) The splice or junction box shall not be mounted on the engine/alternator set due to vibration.

e) Liquidtight Flexible Metal Conduit (LFMC) shall be used between the junction box and engine/alternator set due to vibration.

2.6. Fuel System

2.6.1 The AT&T Power Equipment Engineer/Capacity Manager will outline basic requirements of the fuel system, such as tank size and the need for a day tank in the ATT-790-100-658JP. CRE will design and implement the fuel system based on those requirements.

2.6.2 Fuel systems shall meet all local, state and federal permitting requirements.

2.6.3 The installation of all fuel systems shall be reviewed by AT&T EH&S. Any time the fuel system (i.e., piping, day tank, fuel storage tank, etc.) from the standby engine/alternator set to any fuel tank supporting the engine/alternator set requires work, the Installation Supplier shall contact the AT&T Environmental Health & Safety at 1-800 KNOW EHS before beginning work.

2.6.4 Fuel lines that are located outside the building and exposed shall be protected from being crushed.

2.6.5 Both the fuel and return lines shall have flexible sections connected to the engine/alternator set.

2.6.6 All field installed fuel hoses shall be of proper length without looping, sharp bends or excessive slack.

2.6.7 Pipe sealant shall be used on all fittings.

2.6.8 Day tanks, when required, shall be located in an engine room that serves as a spill containment room, or if the room does not serve as spill containment, shall be equipped with spill containment dams of adequate capacity to contain the contents of the day tank.

2.7. Guards, Labels and Nameplates

2.7.1 All phase leads between the engine/alternator set and the control board shall be marked showing the phase rotation.

2.7.2 All piping shall be directionally labeled and isolation valves shall be position labeled.
2.7.3 Installation Supplier shall ensure that all high temperature warning labels, insulation, ventilation guards, and safety guards recommended by the manufacturer and provided in accordance with TP76400 section 16 are properly affixed.

2.7.4 All set screws, bolts, keys or keyways shall have no projecting or sharp edges or be suitably guarded. All in-running gears and sprockets shall be completely enclosed or provided with band guards around the face of the gear or sprocket. Working personnel shall not be able to touch any rotating part.

2.7.5 The engine/alternator set AC panel shall have the far end destination point labeled clearly.

2.8. Testing and Acceptance

2.8.1 General testing and acceptance details are described in ATT-TP-76900. Engine/alternator set testing and acceptance details are described in ATT-790-100-658JP. The Installation Supplier shall follow the procedures and requirements set forth in these documents for testing and acceptance of engine/alternator sets.

2.8.2 The Installation Supplier shall verify the availability of lubricating oil and permanent antifreeze required for standby engine/alternator sets.

2.8.3 The Installation Supplier shall verify that the engine/alternator contains the proper levels of lubrication oils and water/antifreeze mixture before the initial test run.

2.8.4 All personnel working in the vicinity of operating engine/alternator sets shall wear ear and eye protection.

2.8.5 The engine/alternator set shall not be started until a manufacturer's representative has performed the initial start-up.

2.8.6 The Installation Supplier shall provide resistive type load bank(s) and connection cables capable of absorbing 110% of the engine/alternator's rated output in kilowatts during shop test and on site load testing.

2.8.7 The Installation Supplier shall provide a representative to assist AT&T personnel in acceptance testing.

2.9. Start Batteries

2.9.1 The engine starting batteries shall be chosen and sized per ATT-790-100-658, sections 3.10.4.2 and 3.10.4.4.

2.9.2 Anti-corrosion coating such as NO-OX-ID-A shall be applied to all battery terminals and connections.

2.9.3 All battery cables shall be secured per section J to prevent chaffing.

2.9.4 The engine/alternator set start and control batteries shall be located so the cells are not exposed to excessive heat.

2.9.5 All batteries shall be contained in an appropriately grounded rack or other manufacturer recommended container that meets local seismic requirements.

2.10. Radiator
2.10.1 Any radiator not located on the engine/alternator base/skid shall comply with all ‘remote’ radiator requirements specified in ATT-790-100-658.

2.10.2 Radiator piping and AC conduit shall not be supported by the radiator stand.

2.10.3 All radiator piping shall be painted with a high temperature outside paint.

2.10.4 Radiator piping shall have braided stainless steel flexible lines with finished ends, flange coupled, at the engine/alternator set and radiator.

2.11. Emergency Shut Down

2.11.1 Both the generator set control cabinet and the alarm annunciator panel shall be equipped with emergency shutdown switches. See 790-100-658, 3.9.10.1 for details regarding the alarm annunciator panel.

2.11.2 The emergency shutdown switch for the engine shall be designated and covered to prevent accidental activation.

[END OF SECTION]