

MOBILE UTILITIES SUPPORT EQUIPMENT

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215



**MOBILE UTILITIES
SUPPORT EQUIPMENT**

**NAVFAC MO-215
JUNE 1970**

**DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
WASHINGTON, D. C. 20390**

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FOREWORD

This manual provides technical information and is to serve as a source of guidance to Public Works Officers and others involved with the operation and maintenance of utility systems at Naval and Marine Corps activities. This publication provides information on the various types of Mobile Utilities Support Equipment (MUSE) available and in the selection of MUSE to fulfill particular requirements.

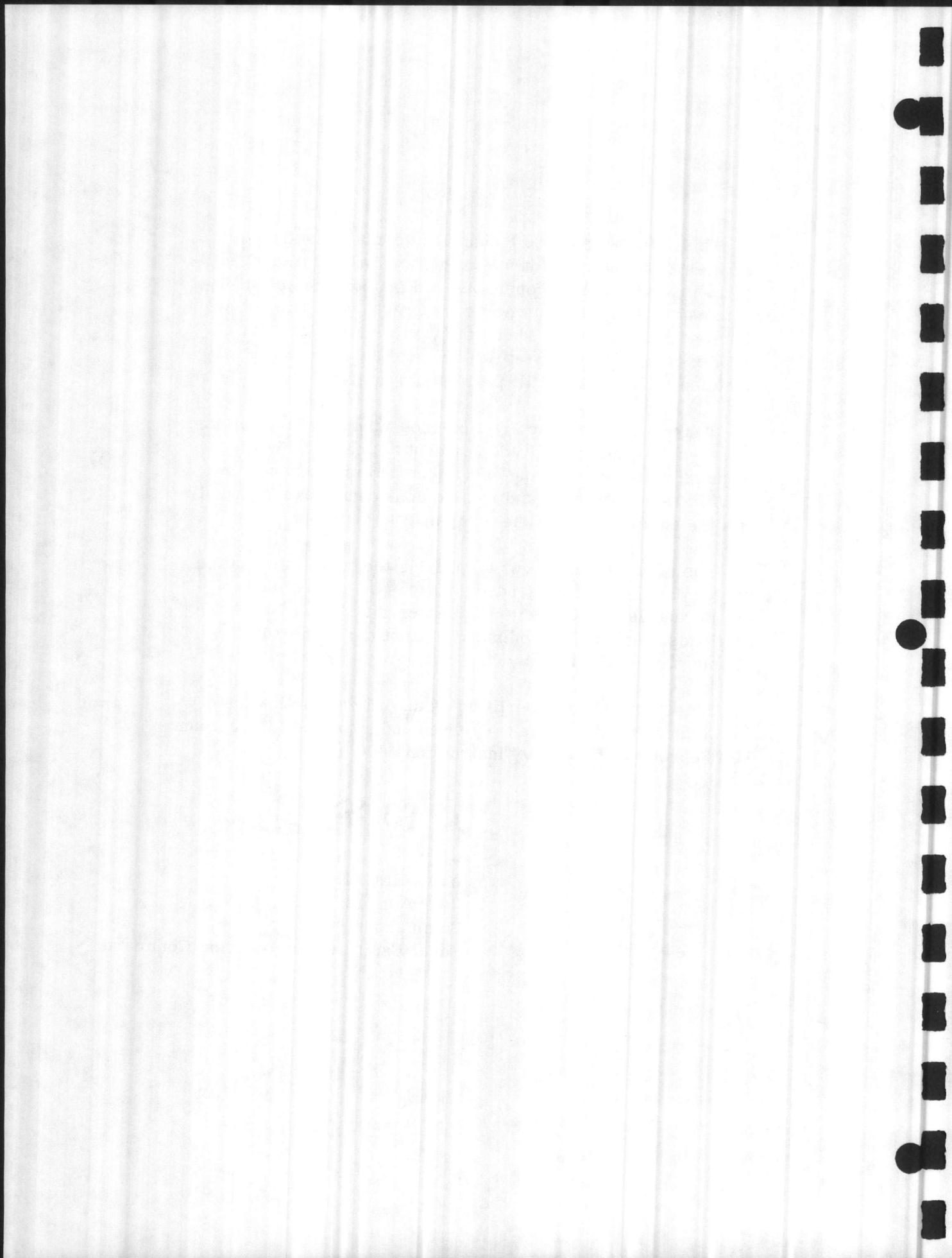
The technical characteristics presented should facilitate necessary planning and predeployment actions. Detailed technical manuals covering operations and maintenance of specific items of MUSE and related components are included with the equipment when the equipment is deployed.

The point of contact for amplifying technical information, catalog data and recommended additions or corrections to this manual is the Acquisition Manager for MUSE, Naval Facilities Engineering Command, Attention: Code 102, Washington, D. C. 20390.

This publication is certified as an official publication of the Command and has been reviewed and approved in accordance with Secretary of the Navy Instruction 5600.16.

W M Enger

W. M. ENGER
Rear Admiral, CEC, USN
Commander
Naval Facilities Engineering Command



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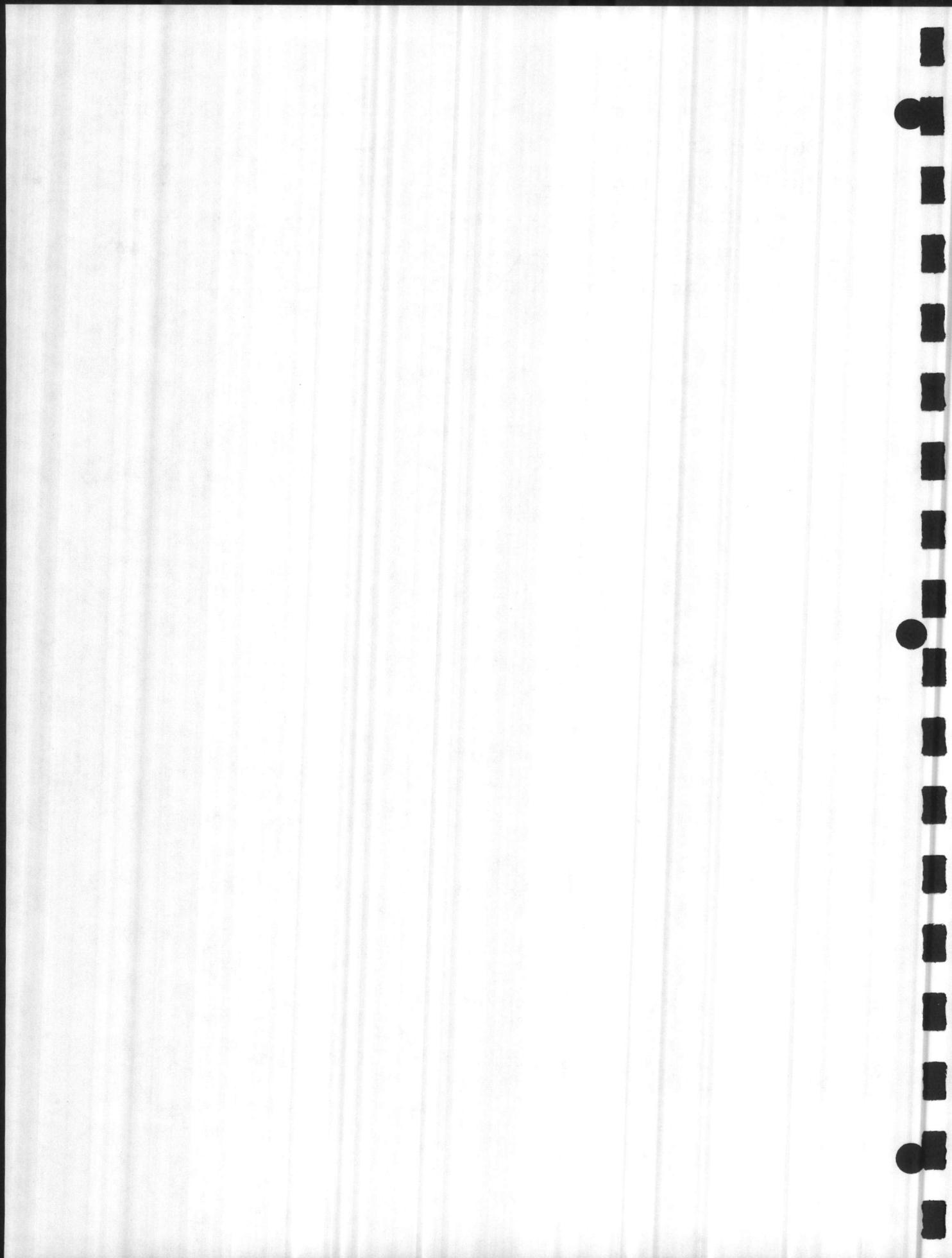
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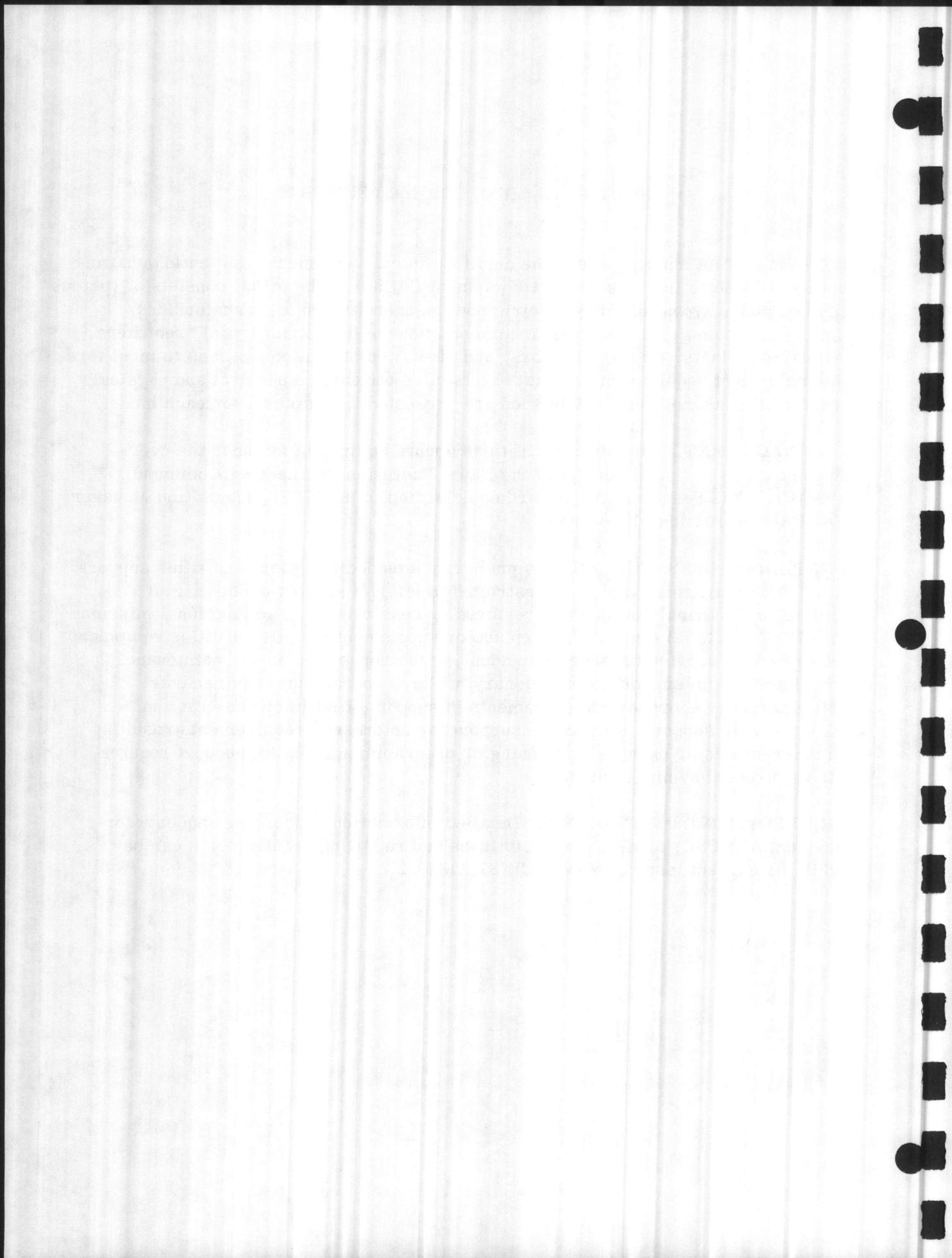
CHAPTER 1. MUSE CHARACTERISTICS

1.1 TYPES. This manual covers the detail technical and general application characteristics for Mobile Utilities Support Equipment (MUSE). The MUSE consists of various utility equipment types including electric power generating units, transformers/substations, steam generating plants, air conditioners (industrial types), rectifiers, desalinization plants, air compressors, and electric distribution systems to meet foreseen employment requirements. Data sheets of electrical, mechanical and physical characteristics as presently established are presented in Chapter 2 for each model.

1.2 MANAGEMENT. The Mobile Utilities Support Equipment is under the overall management and technical control of the Naval Facilities Engineering Command (NAVFAC). This responsibility is further delegated to the MUSE Acquisition Manager in NAVFAC Instruction 11310.38A.

1.3 INTENDED USES. The MUSE is primarily intended for interim utilities support at Naval field activities. Usage is restricted to interim support under exigent conditions until normal sources are restored or constructed. The functional missions of the MUSE are to (a) temporarily replace or supplement installed utilities equipment which are out of service because of accident, catastrophe or planned maintenance/overhaul action, (b) support expeditionary military operational requirements, (c) fill emergency short term requirements in support of military construction, RDT&E and ship support, (d) provide support for unforeseen requirements resulting from emergencies or changes in planning or programming, and (e) support requirements as directed by higher authority.

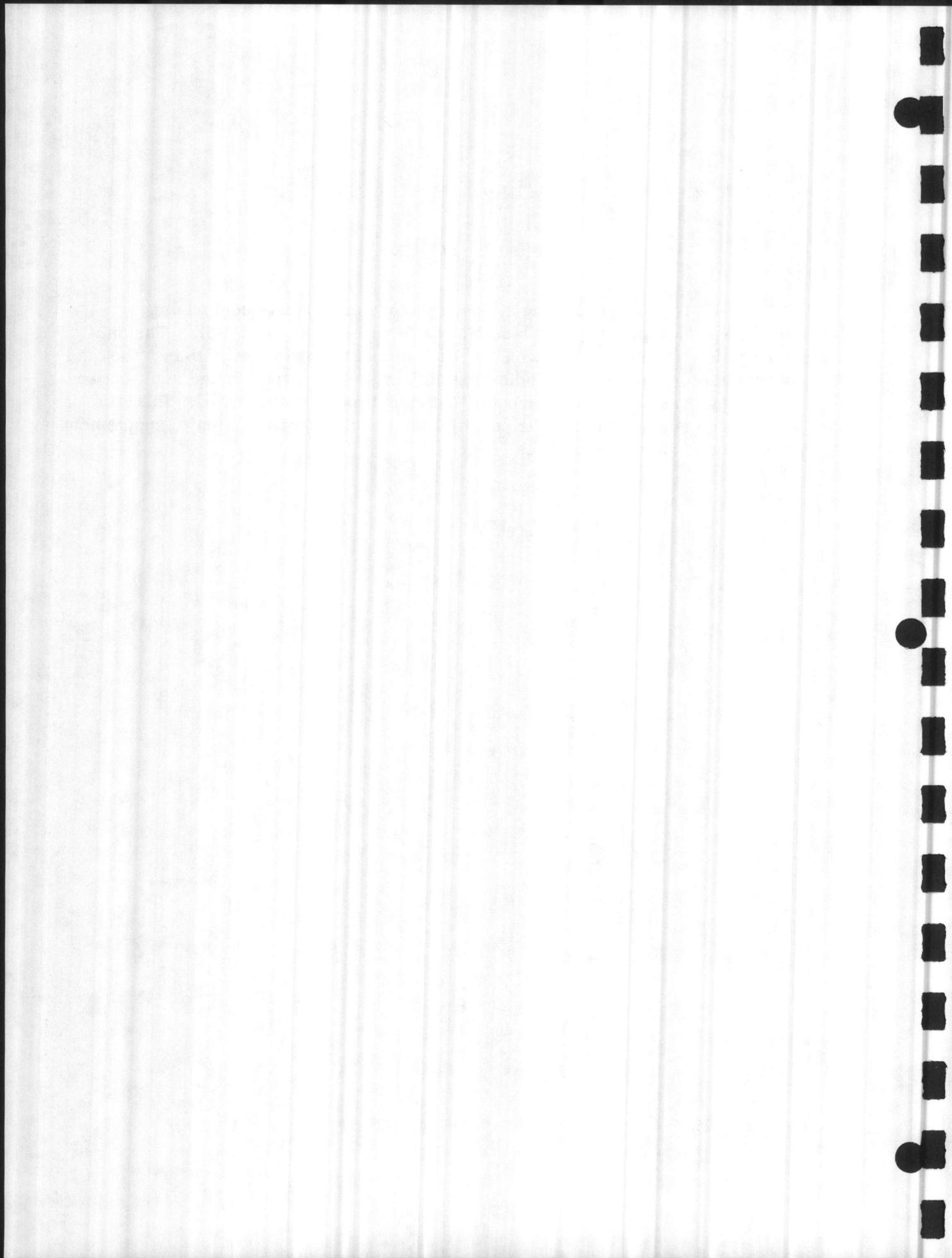
1.4 DEPLOYMENT PROCEDURES. Detailed information concerning requests for deployment of MUSE, funding responsibilities and reporting requirements can be found in the current issue of NAVFACINST 11310.2.



CHAPTER 2. TECHNICAL CHARACTERISTICS

Section 1. SCOPE

2.1.0 DATA SHEETS. The following sections include data sheets comprising technical and general application characteristics for each model of MUSE. The data and information is current to the extent that such is established or available. The data sheets are numbered consecutively indicating the chapter, the section and sub-section further divided by consecutive numbering of individual models illustrated. Pictures of each model are provided to give the potential user a visual description to supplement the technical data of the unit described.



Section 2. POWER PLANTS

2.2.0 SCOPE. This section includes data for engine driven generators, power generating barges and a power plant built on railroad cars. These power plants are divided into three groups to provide individual recognition and data for the ease in selection. The Engine Generators are listed in order from the smallest size unit to the largest mobile unit in the MUSE inventory. The models vary slightly in size depending on the prime contractor/manufacturer. Each model is built to a performance specification. The units are all mounted on skids or semi-trailers for mobility as indicated on each data sheet. The diesel driven power plants are designed for deployments where a large number of operating hours is anticipated with the resultant decrease in mobility. The gas turbine driven power plants are designed for use where high/rapid mobility is required with resultant increases in operating costs. The power barges are normally used in a stationary state to support large power requirements/fleet requirements. The barges are mobile only to the extent of towing from base to base. The Power Train was built during World War II for relatively long term power requirements. The following units vary in output capacity from 100 to 34,500 Kilowatts.

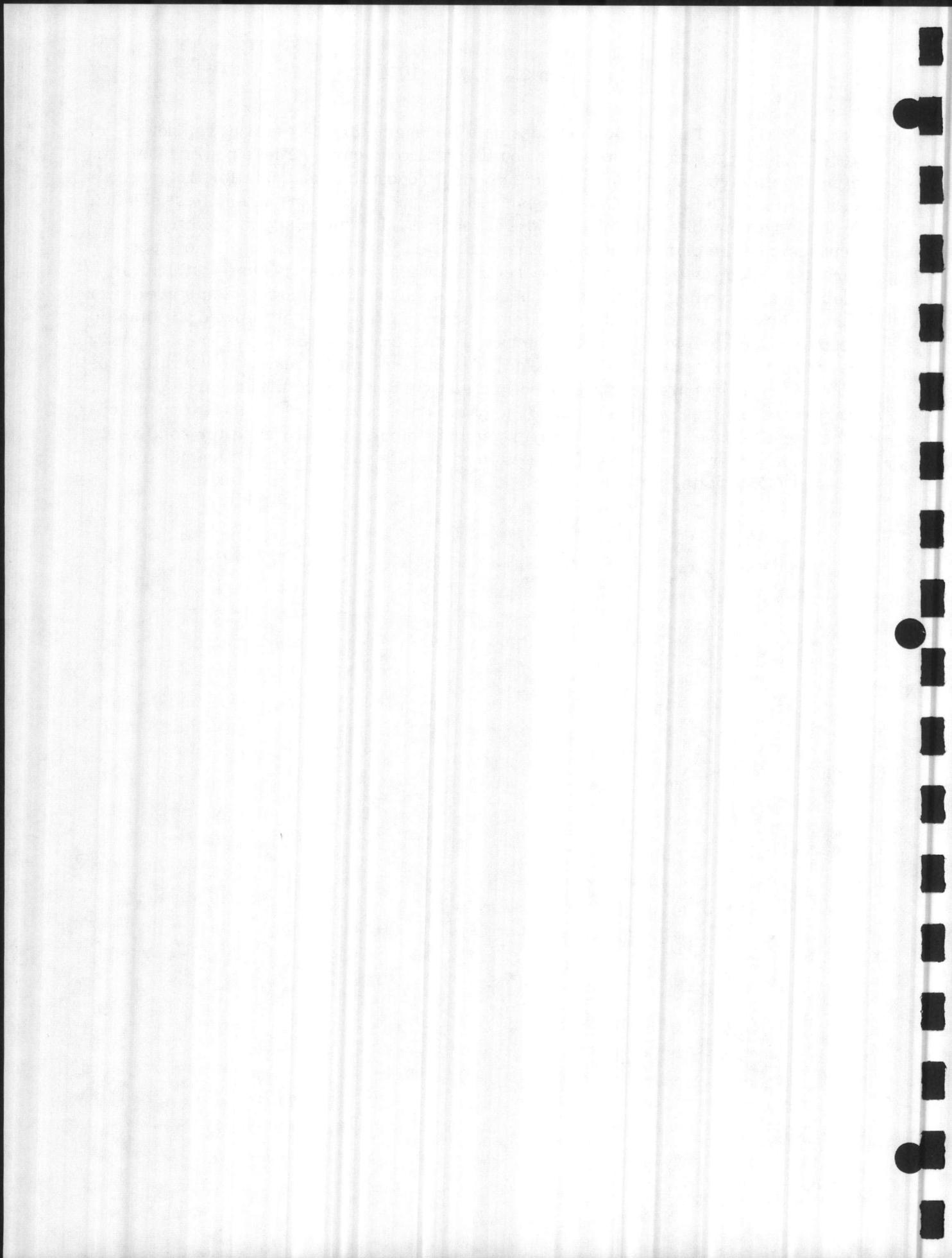




FIGURE 1
Generator 100 Kilowatt, Diesel

2.2.1.1.1 100 Kilowatt, Diesel Driven, Skid Mounted

GENERAL DATA

System Rating: 100-KW, 120/208-V, Wye or 240/416-V, Wye, 3- ϕ , 60 Hz
75-KW, 110/190-V, or 220/380-V, 3- ϕ , 50 Hz

Dimensions: Length 10'-6" Width 5'-0" Height 7'-0"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- (X) Forklifting Provisions
- (X) Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 16 man-hours

Altitude Limits (at rated load): 1500 feet

Ambient Operating Temperature Limits (at rated load): -25°F to +125°F

Cooling System: Radiator

Monitoring Requirements (normal operating conditions):

- 1 - man, 1 - hour Interval, Roving Watch

Shore Power Requirements: None

Manufacturer: Fermont Division - Dynamics Corp. of America

Model Nomenclature : J-114
Technical Manual: (NAVFAC) P-8-313.9

MECHANICAL DATA

Rated Speed: 1800 RPM
Governor:
Fuels: JP-5 or Diesel
Fuel Consumption: 8.5 GPH at rated load using Diesel
Fuel Tank: 70 gallons
Fuel Transfer System: (X) Manual () Automatic
Starting System: Electric
Engine Time Between Overhaul: 10,000 hours

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -10% to +10%
Regulation: 2%
Steady State Stability: 1%

Frequency Characteristics:

Regulation: 1%
Constant Load Deviation: 0.5%
Radio Interference Suppression: (X) Yes () No
Adjustment Range: -25% to +5%
Droop: 4%

Paralleling Capability: Yes

Voltage Regulator: Static

Exciter: Rotating Brushless

Battery Charging System: Yes

Output Power Cable:

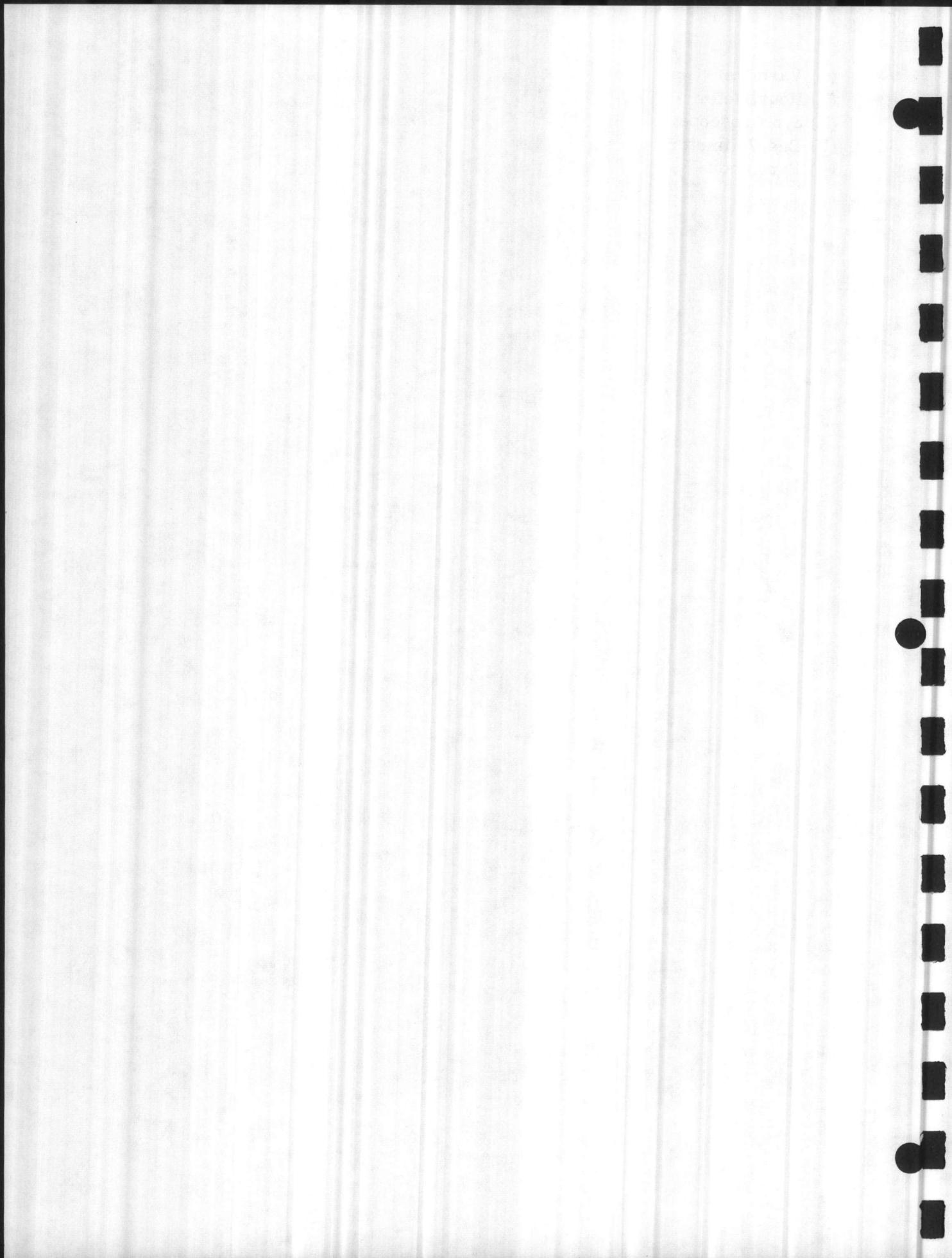
Safety Features:

- () Over Voltage Protection
- () Under Voltage Protection
- (X) Short Circuit Protection
- (X) Reverse Power Relay
- (X) Fault Indicator
- (X) Low Fuel Level Indicator
- (X) Low Lube Oil Pressure Indicator
- (X) High Coolant Temperature Indicator
- (X) Overspeed Indicator

Instrumentation:

- (X) Voltmeter
- (X) Ammeter
- (X) Wattmeter
- (X) Frequency Meter

- Varmeter
- Hour Meter
- Synchroscope
- Bus Voltmeter
- Pyrometer



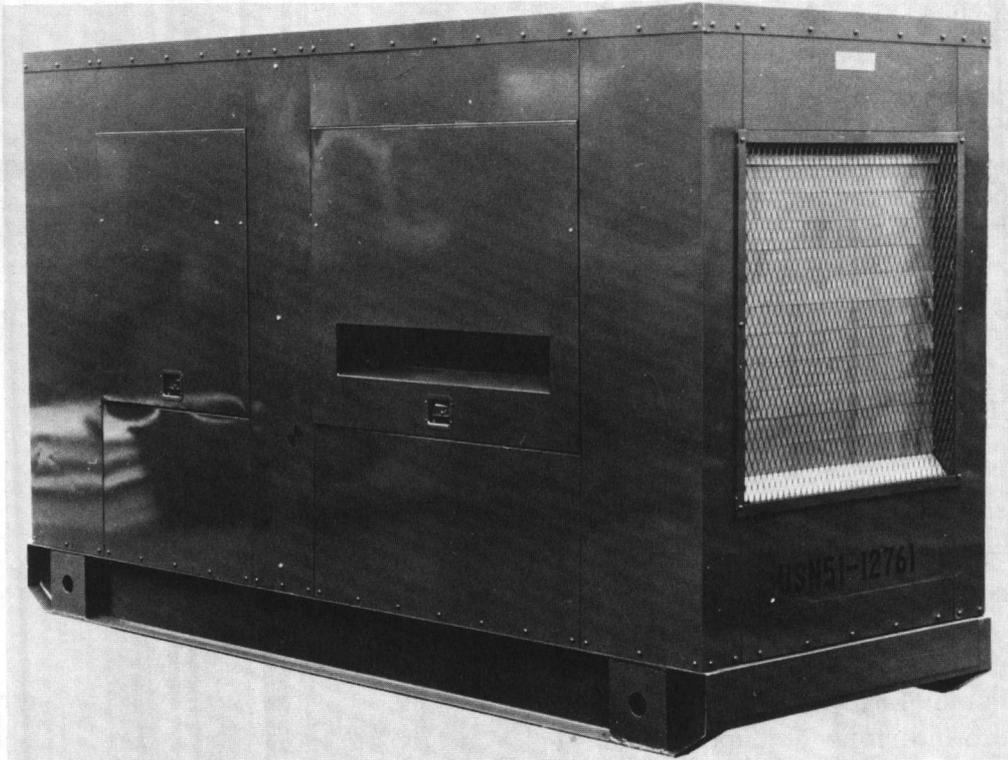


FIGURE 2
Generator 100 Kilowatt, Diesel

2. 2. 1. 1. 2 100 Kilowatt, Diesel Driven, Skid Mounted

GENERAL DATA

System Rating: 100-KW, 120/208-V, Wye, 3- ϕ , 60 Hz

Weight: 6900 Pounds

Dimensions: Length 10'-6", Width 4'-0", Height 7'-8"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 16 man-hours

Altitude Limits (at rated load): 1500 feet

Ambient Operating Temperature Limits (at rated load): +32°F to +90°F

Cooling System: Radiator

Monitoring Requirements (normal operating conditions):

1-man, 1-hour Interval, Roving Watch

Shore Power Requirements: None

Manufacturer: Fermont Division - Dynamics Corp.

Model Nomenclature: J-124

Technical Manual: Commercial

MECHANICAL DATA

Rated Speed: 1200 RPM
Governor: Woodward PSG
Fuels: JP-5 or Diesel
Fuel Consumption: 8.5 GPH at rated load using Diesel
Fuel Tank: 80 gallons
Fuel Transfer System: (X) Manual () Automatic
Starting System: Electric
Engine Time Between Overhaul: 10,000 hours

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -10% to +10%

Regulation: 2%

Steady State Stability: 1%

Frequency Characteristics:

Regulation: 1%

Constant Load Deviation: 0.5%

Radio Interference Suppression: () Yes, (X) No

Transient: (a) Application of Rated Load

Dip: 2%

Recovery: 2 Seconds

(b) Rejection of Rated Load

Rise: 2%

Recovery: 2 Seconds

Adjustment Range: -25% to +5%

Droop: 4%

Paralleling Capability: Yes

Voltage Regulator: Static

Exciter: Rotating Brushless

Battery Charging System: Yes

Output Power Cable:

Safety Features:

() Over Voltage Protection

() Under Voltage Protection

(X) Short Circuit Protection

(X) Reverse Power Relay

() Fault Indicator

(X) Low Fuel Level Indicator

(X) Low Lube Oil Pressure

(X) High Coolant Temperature Indicator

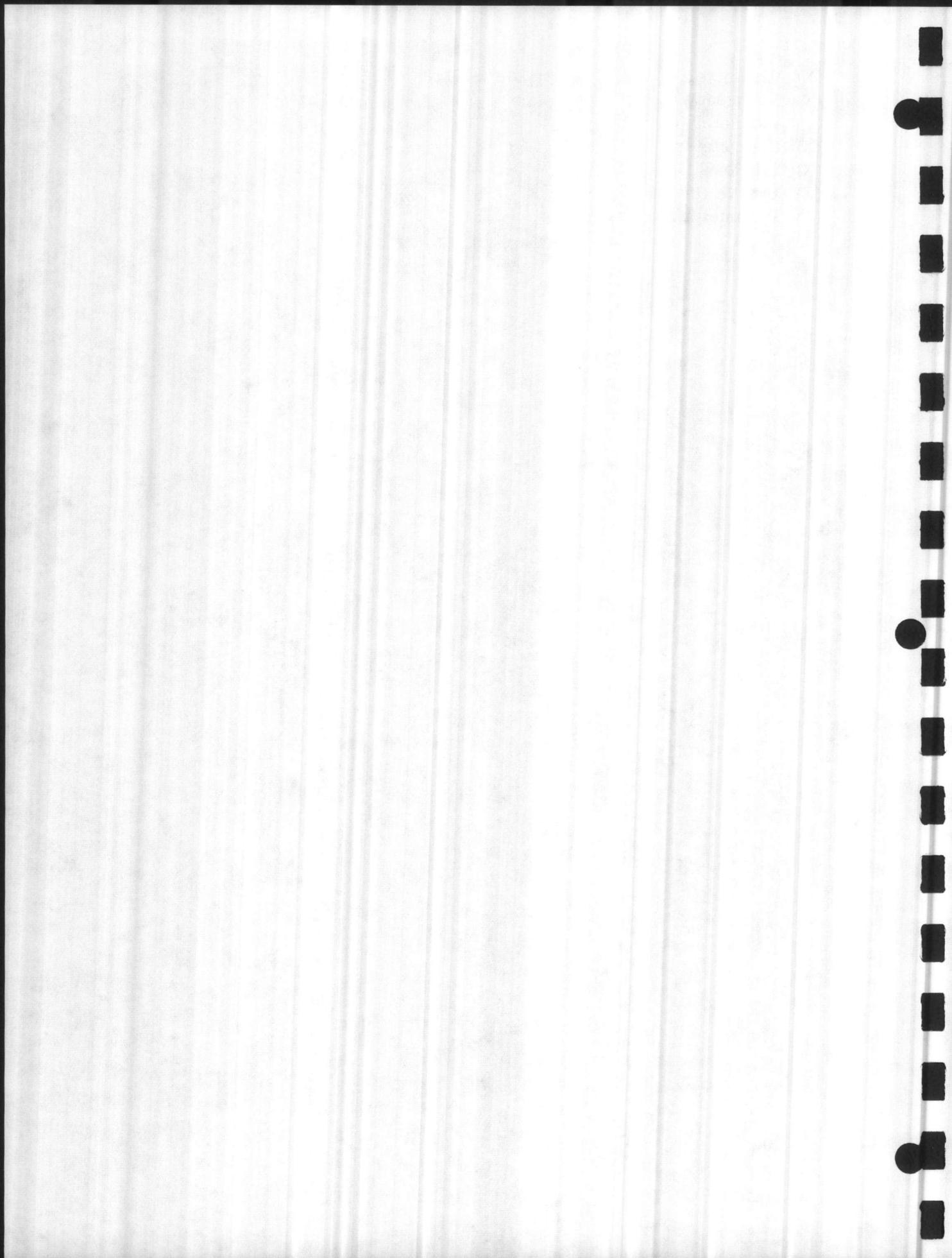
(X) Overspeed Indicator

Instrumentation:

(X) Voltmeter

(X) Ammeter

- Wattmeter
- Frequency Meter
- Varmeter
- Hour Meter
- Synchroscope
- Bus Voltmeter
- Pyrometer



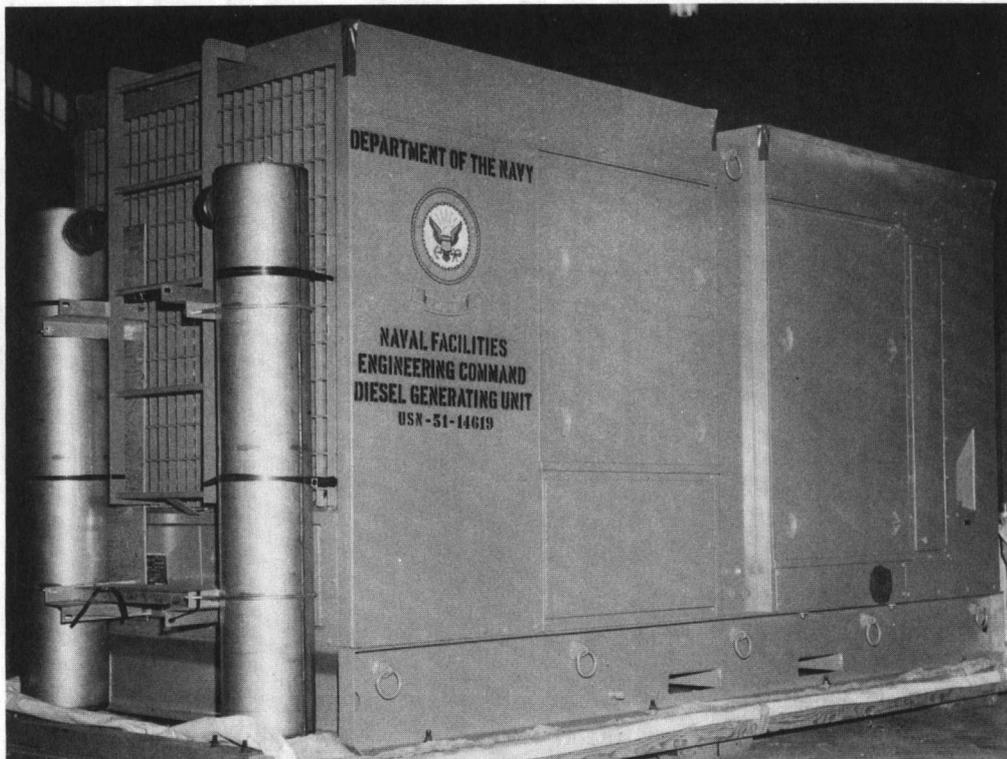


FIGURE 3
Generator 150 Kilowatt, Diesel

2.2.1.2 150 Kilowatt, Diesel Driven, Skid Mounted

GENERAL DATA

System Rating: 150-KW, 120/128-V, Wye or 240/416-V, Wye, 3- ϕ , 60 Hz

Weight: 12,000 Pounds

Dimensions: Length 10'-0", Width 4'-6", Height 7'-0"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- (X) Forklifting Provisions
- (X) Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 16 man-hours

Altitude Limits (at rated load): 6000 feet

Ambient Operating Temperature Limits (at rated load): -25°F to +125°F

Monitoring Requirements (normal operating conditions):

1-man, 1-hour Interval, Roving Watch

Shore Power Requirements: 120-V, 30-Amp, 1- ϕ , 60-Hz, 2 wire

Manufacturer: A. G. Schoonmaker Co.

Model Nomenclature: EMU 18

Technical Manual: T.O. 35C2-3-399-1 (AF Series)

MECHANICAL DATA

Rated Speed: 1200 RPM
Governor: Woodward PSG
Fuels: JP-5 or Diesel
Fuel Consumption: 13 GPH at rated load using Diesel
Fuel Tank: 94 gallons
Fuel Transfer System: (X) Manual, () Automatic
Starting System: Electric
Engine Time Between Overhaul: 10,000 hr.

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -10% to +10%
Regulation: 2%
Steady State Stability: 1%
Transient: (a) Application of Rated Load
Dip: 10%
Recovery: 0.5 Seconds
(b) Rejection of Rated Load
Rise: 10%
Recovery: 0.5 Seconds

Frequency Characteristics:

Regulation: 1.0%
Constant Load Deviation: 0.5%
Radio Interference Suppression: (X) Yes, () No
Transient: (a) Application of Rated Load
Dip: 2%
Recovery: 2 Seconds
(b) Rejection of Rated Load
Rise: 2%
Recovery: 2 Seconds

Adjustment Range: -25% to +5%

Drop: 4%

Paralleling Capability: Yes

Voltage Regulator: Static

Exciter: Rotating Brushless

Battery Charging System: Yes

Receptacles: Convenience 115 Volt

Output Power Cable:

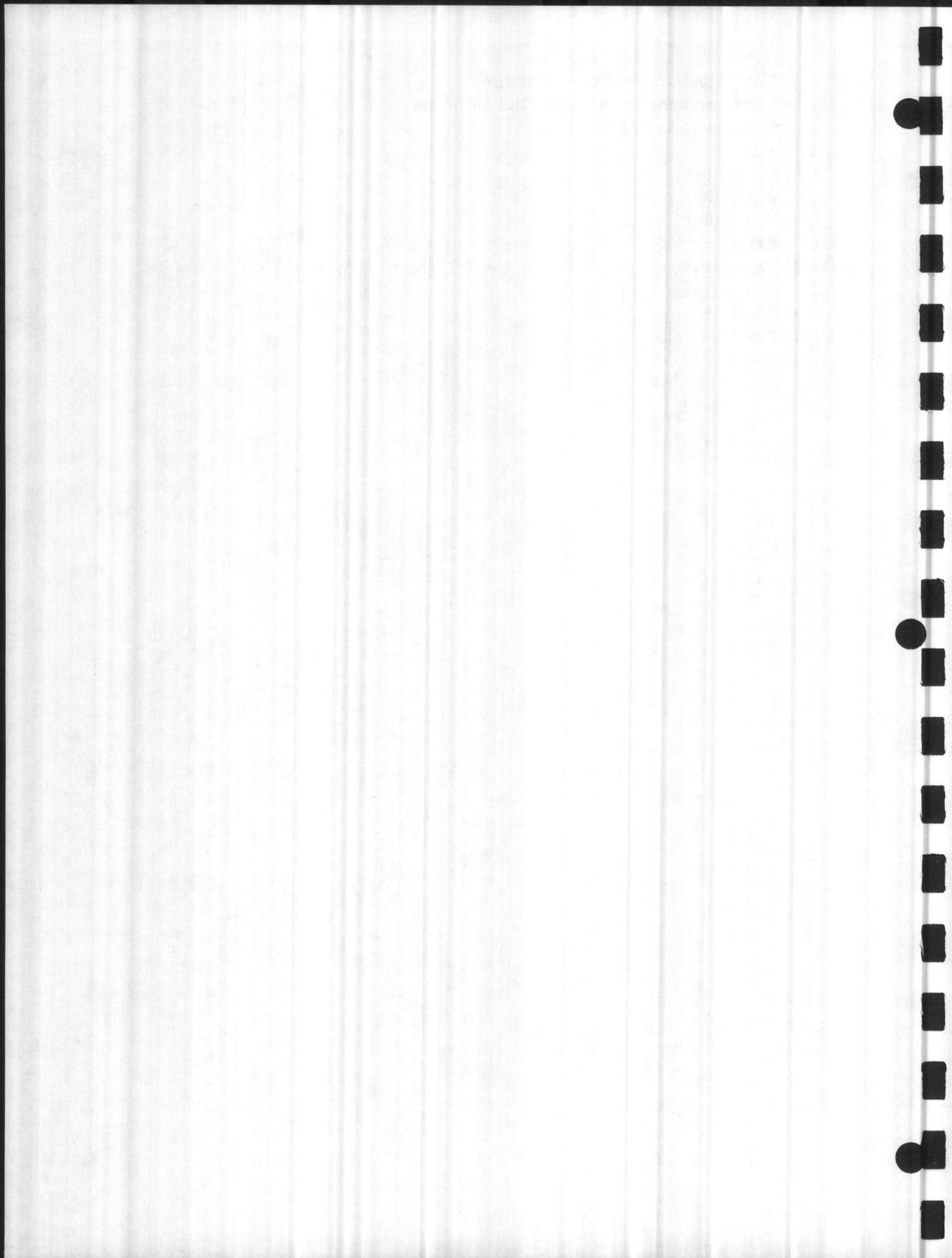
Safety Features:

(X) Over Voltage Protection
(X) Under Voltage Protection
(X) Short Circuit Protection
(X) Reverse Power Relay
(X) Fault Indicator
(X) Low Fuel Level Indicator

- (X) Low Lube Oil Pressure Indicator
- (X) High Coolant Temperature Indicator
- (X) Overspeed Indicator

Instrumentation:

- (X) Voltmeter
- (X) Ammeter
- (X) Wattmeter
- (X) Frequency Meter
- () Varmeter
- (X) Hour Meter
- (X) Synchroscope
- (X) Bus Voltmeter
- (X) Pyrometer



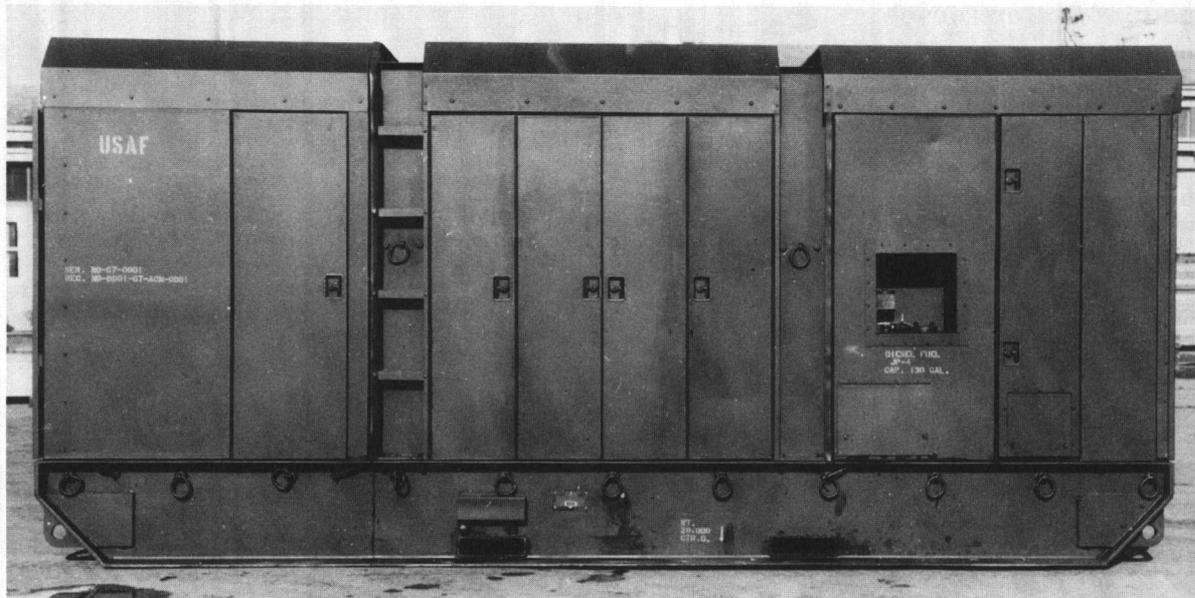


FIGURE 4
Generator 200 Kilowatt, Diesel

2.2.1.3 200 Kilowatt, Diesel Driven, Skid Mounted

GENERAL DATA

System Rating: 200-KW, 120/208-V, Wye or 240/416-V, Wye, 3- ϕ , 60 Hz

Weight: 19,850 Pounds

Dimensions: Length 16'-6", Width 5'-0", Height 7'-6"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- (X) Forklifting Provisions
- (X) Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 24 man-hours

Altitude Limits (at rated load): 6000 feet

Ambient Operating Temperature Limits (at rated load): -65°F to +125°F

Cooling System: Radiator

Monitoring Requirements (normal operating conditions):

1-man, 1-hour Interval, Roving Watch

Shore Power Requirements: None

Manufacturer: A.G. Schoonmaker Co., Inc.

Model Nomenclature: EMU 28/E

Technical Manual: T.O. 35C2-3-425-1 (AF Series)

MECHANICAL DATA

Rated Speed: 1200 RPM

Governor: Woodward UG-8

Fuels: JP-4 or Diesel
Fuel Consumption: 17 GPH at rated load using Diesel
Fuel Tank: 140 gallons
Fuel Transfer System: (X) Manual, () Automatic
Starting System: Electric
Engine Time Between Overhaul: 10,000 hours

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -10% to +10%
Regulation: 2%
Steady State Stability: 1%
Transient: (a) Application of Rated Load
Dip: 10%
Recovery: 2 Seconds
(b) Rejection of Rated Load
Rise: 10%
Recovery: 2 Seconds

Frequency Characteristics:

Regulation: 0.3%
Constant Load Deviation: 0.2%
Radio Interference Suppression: (X) Yes, () No
Transient: (a) Application of Rated Load
Dip: 2%
Recovery: 2 Seconds
(b) Rejection of Rated Load
Rise: 2%
Recovery: 2 Seconds

Adjustment Range: -25% to +5%

Drop: 4%

Paralleling Capability: Yes

Voltage Regulator: Static

Exciter: Rotating Brushless

Battery Charging System: Yes

Receptacles: Convenience 115 Volt

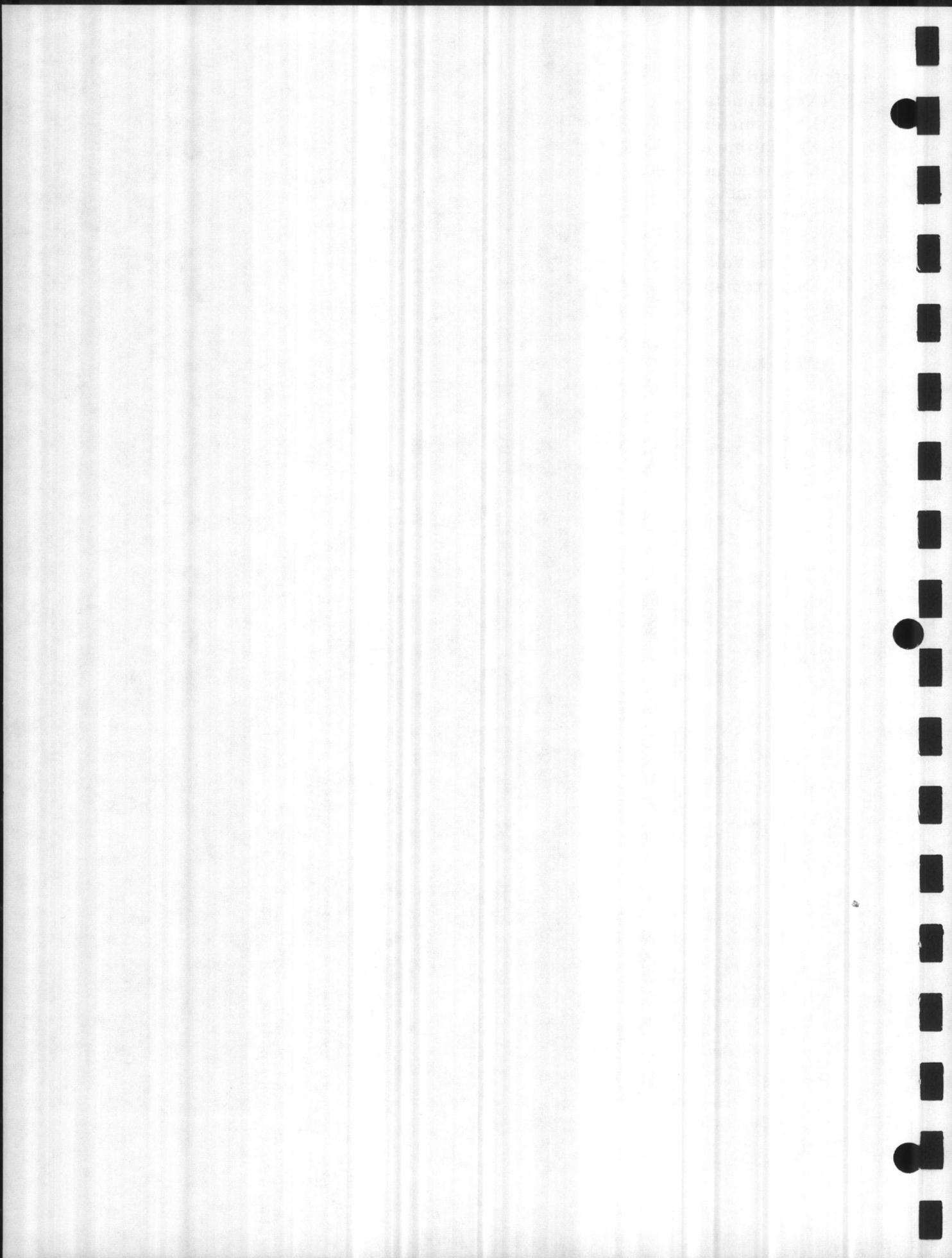
Output Power Cable:

Safety Features:

(X) Over Voltage Protection
() Under Voltage Protection
(X) Short Circuit Protection
(X) Reverse Power Relay
(X) Fault Indicator
(X) Low Fuel Level Indicator
(X) Low Lube Oil Pressure Indicator
(X) Overspeed Indicator

Instrumentation:

- Voltmeter
- Ammeter
- Wattmeter
- Frequency Meter
- Varmeter
- Hour Meter
- Synchroscope
- Bus Voltmeter
- Pyrometer



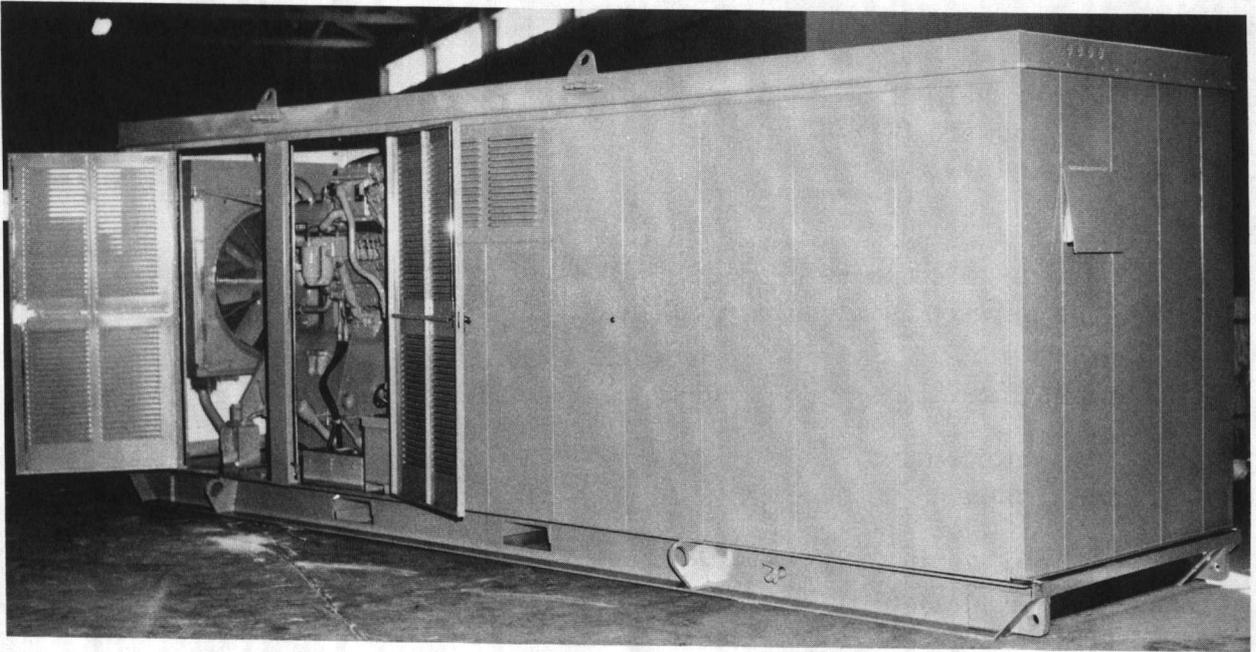


FIGURE 5
Generator 250 Kilowatt, Diesel

2.2.1.4 250 Kilowatt, Diesel Driven, Skid Mounted

GENERAL DATA

System Rating: * 250-KW, 67/115-V, Wye or 133/230-V, Wye, 3- ϕ , 60 Hz
** 250-KW, 133/230-V, Wye or 266/460-V, Wye, 3- ϕ , 60 Hz

Weight: 16,000 Pounds

Dimensions: Length 14'-0", Width 6'-0", Height 8'-3"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- (X) Forklifting Provisions
- (X) Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 24 man-hours

Altitude Limits (at rated load): 1500 feet

Ambient Operating Temperature Limits (at rated load): -10°F to +90°F

Cooling System: Radiator

Monitoring Requirements (normal operating conditions):

1-man, 1-hour Interval, Roving Watch

Shore Power Requirements: None

Manufacturer: A.G. Schoonmaker Co.

Model Nomenclature:

Technical Manual: (NAVFAC) P-8-323.10

MECHANICAL DATA

Rated Speed: 1200 RPM
Governor: Woodward UG 8
Fuels: JP-4 and Diesel
Fuel Consumption: 21 GPH at rated load using Diesel
Fuel Tank: 100 gallons
Starting System: Electric
Engine Time Between Overhaul: 10,000 hours

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -10% to +10%
Regulation: 3%
Steady State Stability: 2%

Frequency Characteristics:

Regulation: 1%
Constant Load Deviation: 0.5%
Radio Interference Suppression: () Yes, (X) No
Adjustment Range: -25% to +5%
Droop: 4%

Paralleling Capability: Yes

Voltage Regulator: Static

Exciter: Rotating, Brush Type

Battery Charging System: Yes

Output Power Cable:

Safety Features:

- (X) Over Voltage Protection
- (X) Under Voltage Protection
- (X) Short Circuit Protection
- (X) Reverse Power Relay
- () Fault Indicator
- (X) Low Lube Oil Pressure Indicator
- (X) Low Fuel Level Indicator
- (X) High Coolant Temperature Indicator
- (X) Overspeed Indicator

Instrumentation:

- (X) Voltmeter
- (X) Ammeter
- (X) Wattmeter
- (X) Frequency Meter
- () Varmeter
- () Hour Meter
- (X) Synchroscope

(X) Bus Voltmeter

() Pyrometer

* 280-V Model

** 460-V Model

No Asterisk indicates data common.

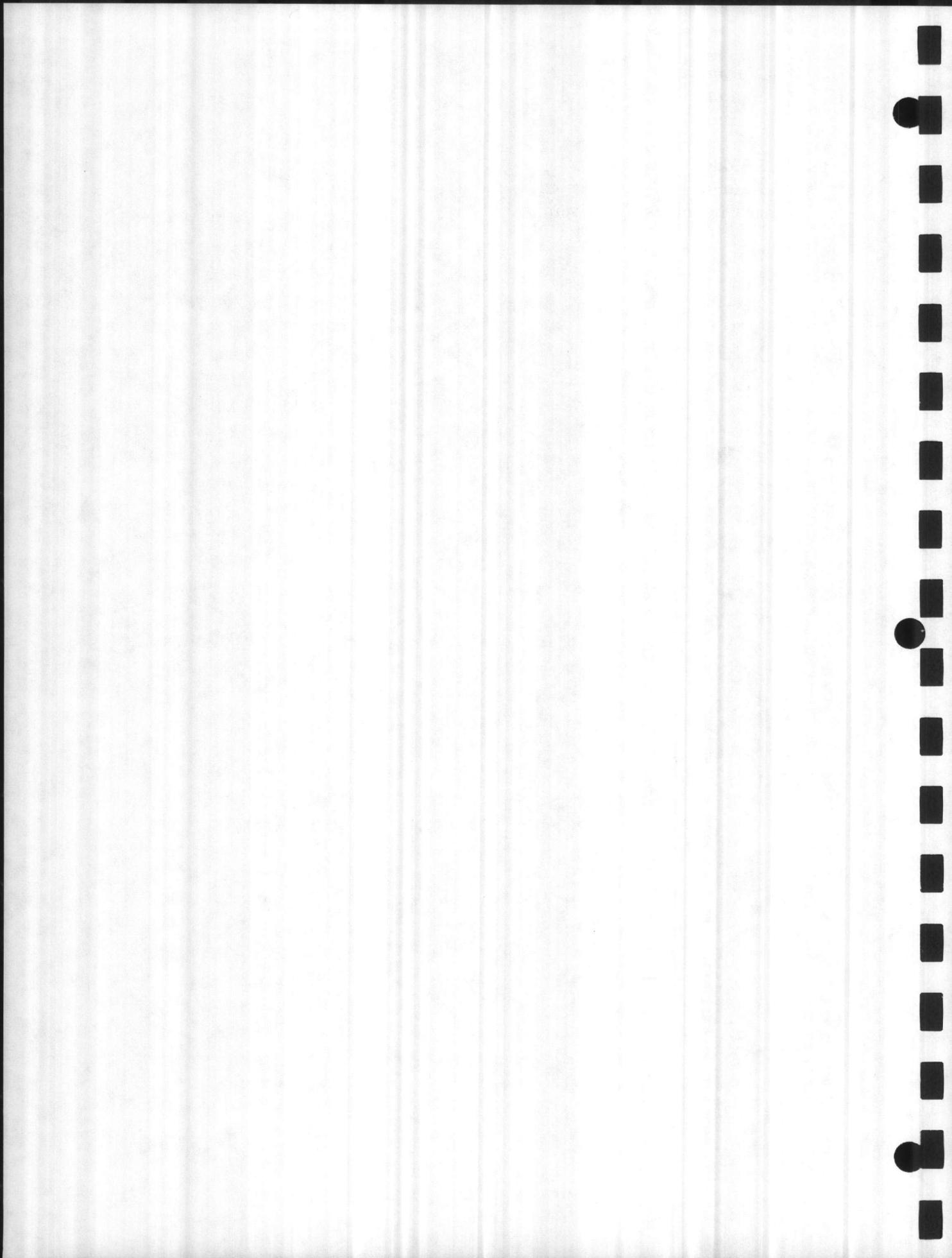




FIGURE 6
Generator 500 Kilowatt, Diesel

2.2.1.5 500 Kilowatt, Diesel Driven, Semi-Trailer Mounted

GENERAL DATA

System Rating: 500-KW, 2400-V, Delta or 2400/4160-V, Wye, 3- ϕ , 60 Hz

Weight: 64,000 Pounds

Dimensions: Length 33'-0", Width 8'-0", Height 11'-10"

Transportability: Railcar, Ship, Truck

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 64 man-hours

Altitude Limits (at rated load): 1500 feet

Ambient Operating Temperature Limits (at rated load): -25°F to +105°F

Cooling System: Radiator

Monitoring Requirements (normal operating conditions):

- 1-man, 1-hour Interval, Roving Watch

Shore Power Requirements:

Manufacturer: General Motors

Model Nomenclature: 567

Technical Manual: Commercial

MECHANICAL DATA

Rated Speed: 720 RPM

Governor:

Fuels: JP-5, and Diesel

Fuel Consumption: 40 GPH at rated load using Diesel

Fuel Tank:

Fuel Transfer System: (X) Manual, () Automatic

Starting System: Electric

Engine Time Between Overhaul: 15,000 Hours

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -10% to +10%

Regulation: 3%

Steady State Stability: 1%

Frequency Characteristics:

Regulation: 1%

Constant Load Deviation: 0.5%

Radio Interference Suppression: () Yes, () No

Adjustment Range: -25% to +5%

Drop: 4%

Paralleling Capability: Yes

Voltage Regulator:

Exciter: Rotating Brush Type

Battery Charging System: Yes

Safety Features:

(X) Short Circuit Protection

(X) Low Lube Oil Pressure Indicator

(X) Reverse Power Relay

(X) High Coolant Temperature Indicator

(X) Overspeed Indicator

Instrumentation:

(X) Voltmeter

(X) Ammeter

(X) Wattmeter

(X) Synchroscope

(X) Bus Voltmeter



FIGURE 7
Generator 600 Kilowatt, Gas Turbine

2. 2. 1. 6. 1 600 Kilowatt, Gas Turbine Driven, Semi-Trailer Mounted

GENERAL DATA

System Rating: 600-KW, 2400-V Delta or 2400/4160-V, Wye, 3- ϕ , 60 Hz

Weight: 33,500 Pounds

Dimensions: Length 27'-0", Width 8'-0", Height 12'-6"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 20 man-hours

Altitude Limits (at rated load): 1500 feet

Ambient Operating Temperature Limits (at rated load): -25°F to +90°F

Cooling System: None

Monitoring Requirements (normal operating conditions):

1-man, 1-hour Interval, Roving Watch

Shore Power Requirements: 240-V, 30-Amp, 1- ϕ , 3 wire or from outgoing power circuit.

Manufacturer: General Electric

Model Nomenclature: LM-100
Technical Manual: (NAV DOCKS) P-8-312.3

MECHANICAL DATA

Rated Speed: 26,000 RPM
Governor: Woodward EG-B2
Fuels: JP-4, JP-5, or Diesel
Fuel Consumption: 77 GPH at rated load using Diesel
Fuel Tank: 700 gallons
Fuel Transfer System: () Manual, (X) Automatic
Starting System: Electric
Engine Time Between Overhaul: 4000 hours

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -5% to +15%
Regulation: 1%
Steady State Stability: 0.5%
Transient: (a) Application of 50 Percent Load
Dip: 6%
Recovery: 1 second
(b) Rejection of 50 Percent Load
Rise: 4%
Recovery: 1 second

Frequency Characteristics:

Regulation: .05%
Constant Load Deviation: .02%
Radio Interference Suppression: () Yes, (X) No
Transient: (a) Application of 50 Percent Load
Dip: 2.7%
Recovery: 1.8 second
(b) Rejection of 60 Percent Load
Rise: 2.5%
Recovery: 3.6 second

Adjustment Range: -10% to +3%

Droop: 4%

Paralleling Capability: Yes
Exciter: Rotating Brushless
Battery Charging System: Yes
Receptacles: Convenience 120 Volt
Output Power Cable: 50 feet, 5-KW, 3 wire
Safety Features:

- () Over Voltage Protection
- () Under Voltage Protection
- (X) Short Circuit Protection
- (X) Reverse Power Relay

- (X) Fault Indicator
- (X) Low Fuel Level Indicator
- (X) Low Lube Oil Pressure Indicator
- (X) High Lube Temperature Indicator
- (X) Overspeed Indicator

Instrumentation:

- (X) Voltmeter
- (X) Ammeter
- (X) Wattmeter
- (X) Frequency Meter
- (X) Varmeter
- (X) Hour Meter
- (X) Synchroscope
- (X) Bus Voltmeter
- (X) Pyrometer

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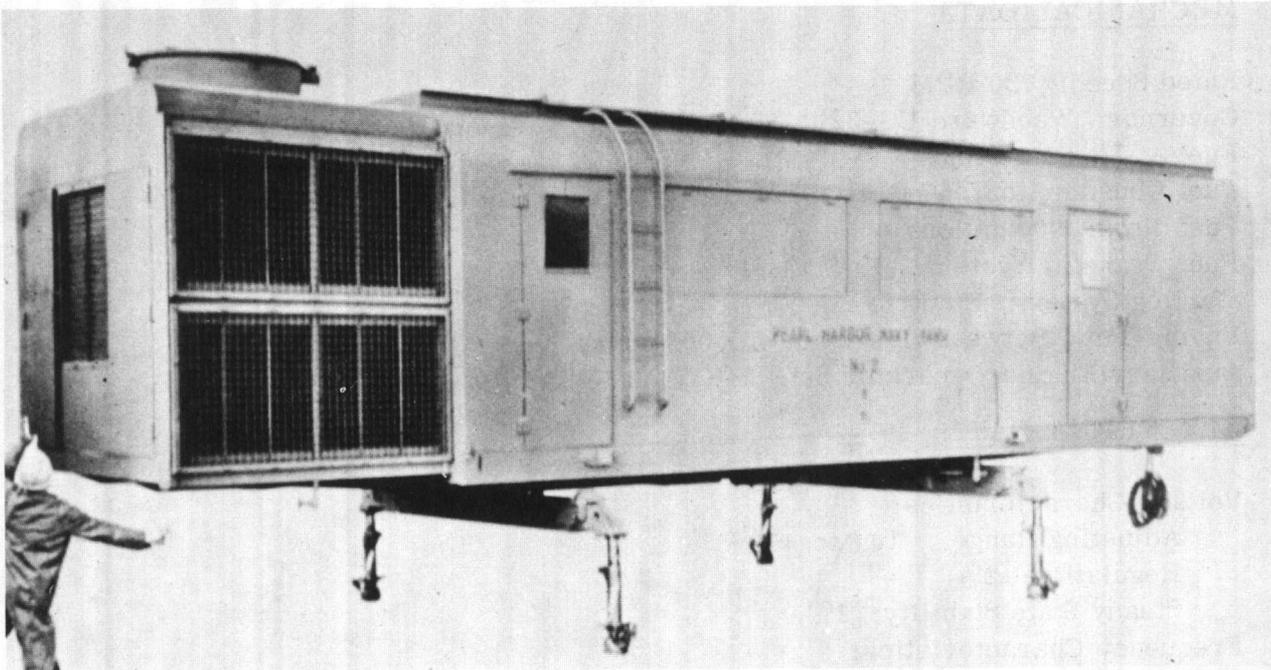


FIGURE 8
Generator 600 Kilowatt, Diesel

2.2.1.6.2 600 Kilowatt, Diesel Driven, Skid Mounted

GENERAL DATA

System Rating: 600-KW, 2400/4160-V, Wye, 3- ϕ , 60 Hz

Weight: 90,000 Pounds

Dimensions: Length 38'-1", Width 10'-2", Height 11'-0"

Transportability: Ship, Railcar, Truck

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 64 man-hours

Altitude Limits (at rated load): 1500 feet

Ambient Operating Temperature Limits (at rated load): -25°F to +90°F

Cooling System: Radiator

Monitoring Requirements (normal operating conditions):

1-man, 1-hour Interval, Roving Watch

Shore Power Requirements: 115-V, 20-Amp, 1- ϕ , 60 Hz, 2 Wire or from auxiliary generator or from outgoing feeder.

Manufacturer: General Electric Co.

Model Nomenclature: Model 567

Technical Manual: GEI-17072 Commercial

MECHANICAL DATA

Rated Speed: 720 RPM
Governor: Woodward UG-32
Fuels: JP-5 or Diesel
Fuel Consumption: 47 GPH at rated load using Diesel
Fuel Tank: 900 gallons
Fuel Transfer System: (X) Manual () Automatic
Starting System: Electric
Engine Time Between Overhaul: 15,000 hours
Auxiliary Engine-Generator Set: 5-KVA, 115-V, 1- ϕ , 60 Hz

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -10% to +10%

Regulation: 2%

Steady State Stability: 1%

Frequency Characteristics:

Regulation: 1%

Constant Load Deviation: 0.5%

Radio Interference Suppression: () Yes, (X) No

Adjustment Range: -25% to +5%

Droop: 4%

Paralleling Capability: Yes

Voltage Regulator: Static

Exciter: Rotating Brush Type

Battery Charging System: Yes

Output Power Cable: 150 Feet, 5-KV, 3 Wire

Safety Features:

- () Over Voltage Protection
- () Under Voltage Protection
- (X) Short Circuit Protection
- (X) Reverse Power Relay
- (X) Fault Indicator
- () Low Fuel Level
- (X) Low Lube Oil Pressure
- (X) High Coolant Temperature
- (X) Overspeed

Instrumentation:

- (X) Voltmeter
- (X) Ammeter
- (X) Wattmeter
- (X) Frequency Meter
- () Varmeter
- () Hour Meter
- (X) Synchroscope
- (X) Bus Voltmeter
- () Pyrometer
- (X) Watthour Meter

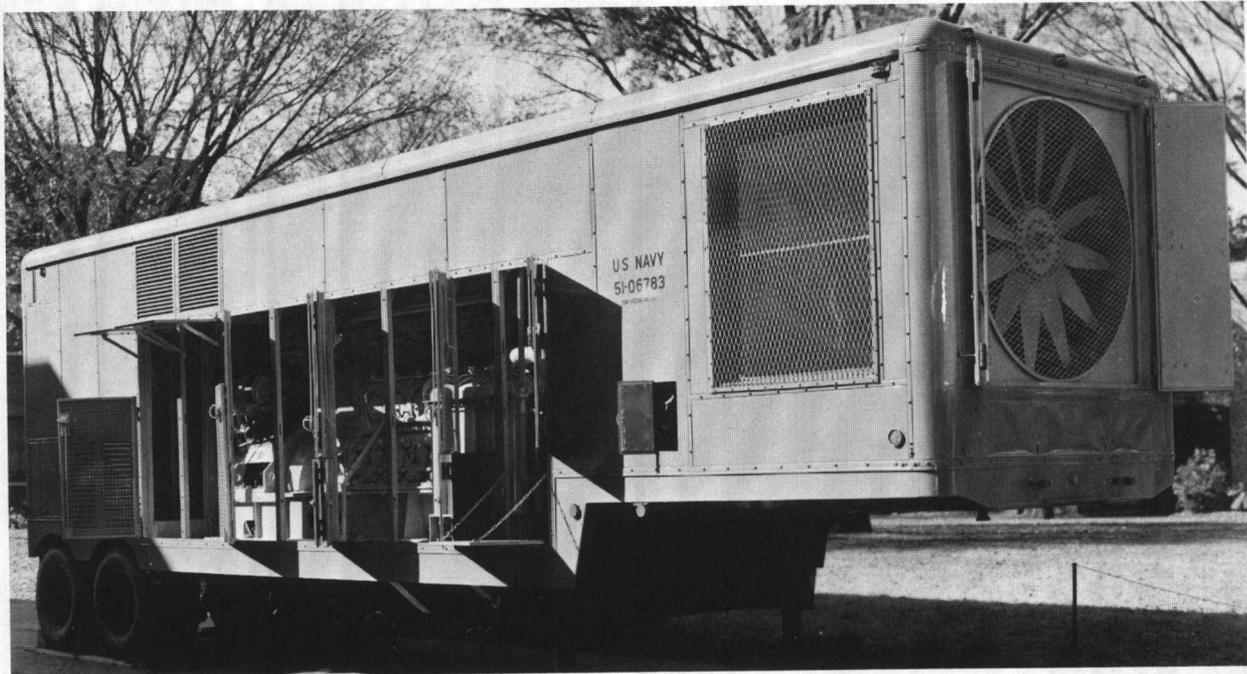


FIGURE 9
Generator 675 Kilowatt, Diesel

2.2.1.7 675 Kilowatt, Diesel Driven, Semi-Trailer Mounted

GENERAL DATA

System Rating: 675-KW, 2400/4160-V, Wye, 3- ϕ , 60-Hz

Weight: 70,000 Pounds

Dimensions: Length 36'-2", Width 8'-0", Height 12'-6"

Transportability: Railcar, Ship, Truck

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 64 man-hours

Altitude Limits (at rated load): 1500 feet

Ambient Operating Temperature Limits (at rated load): -25°F to 90°F

Cooling System: Radiator

Monitoring Requirements (normal operating conditions):

1-man, 1-hour Interval, Roving Watch

Shore Power Requirements:

Manufacturer: Fairbanks Morse

Model Nomenclature: 38 D 8 1/8

Technical Manual: Commercial

MECHANICAL DATA

Rated Speed: 720 RPM

Governor:

Fuels: JP-5 or Diesel

Fuel Consumption: 58 GPH at rated load using Diesel

Fuel Tank: 500 gallons

Starting System: Pneumatic

Engine Time Between Overhaul: 15,000 hours

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -10% to +10%

Regulation: 2%

Steady State Stability: 1%

Frequency Characteristics:

Regulation: 0.5%

Constant Load Deviation: 0.3%

Radio Interference Suppression: () Yes, (X) No

Adjustment Range: -25% to +5%

Droop: 4%

Paralleling Capability: Yes

Voltage Regulator:

Exciter:

Battery Charging System:

Output Power Cable:

Safety Features:

() Over Voltage Protection

() Under Voltage Protection

(X) Short Circuit Protection

(X) Reverse Power Relay

() Fault Indicator

() Low Fuel Level Indicator

(X) Low Lube Oil Pressure Indicator

(X) High Coolant Temperature Indicator

(X) Overspeed Indicator

Instrumentation:

(X) Voltmeter

(X) Ammeter

() Wattmeter

(X) Frequency Meter

() Varmeter

() Hour Meter

(X) Synchroscope

(X) Bus Voltmeter

() Pyrometer

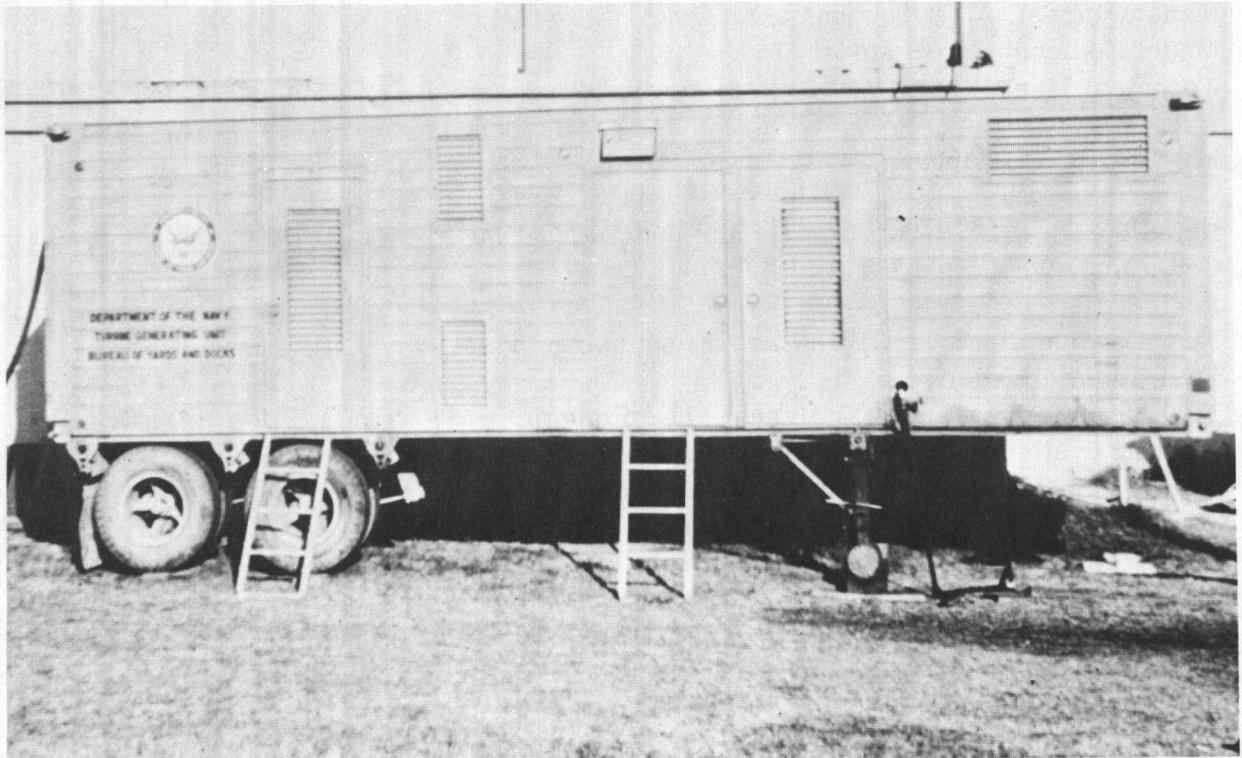


FIGURE 10
Generator 750 Kilowatt, Diesel

2.2.1.8.1 750 Kilowatt, Diesel Driven, Semi-Trailer/Skid Mounted

GENERAL DATA

System Rating: 750-KW, 2400-V, Delta or 2400/4160-V, Wye, 3- \emptyset , 60 Hz
625-KW, 2200-V, Delta or 2200/3800-V, Wye, 3- \emptyset , 50 Hz

Weight: 86,000 Pounds to 88,000 Pounds

Dimensions: *Length 40'-0", Width 8'-0", Height 12'-10"
**Length 39'-0", Width 10'-10", Height 11'-5"

Transportability: Railcar, Ship, Truck

Modes of Mobility:

- () Forklifting Provisions
- (X) Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 64 man-hours

Altitude Limits (at rated load): 1500 feet

Ambient Operating Temperature Limits (at rated load): -25°F to +120°F

Cooling System: Radiator

Monitoring Requirements (normal operating conditions):

1-man, 1-hour Interval, Roving Watch

Shore Power Requirements: 240-V, 60-Amp, 1- \emptyset , 3 Wire or from main outgoing circuit.

Manufacturer: A. G. Schoonmaker Co.

Model Nomenclature: Model 567

Technical Manual: (NAVFAC) P-8-323.1, 323.2, 323.3, 323.5 and 323.7***

MECHANICAL DATA

Rated Speed: 720-RPM at 60-Hz and 600-RPM at 50-Hz

Governor: Woodward UG-8

Fuels: JP-5 or Diesel

Fuel Consumption: 62 GPH at rated load using Diesel

Fuel Tank: 750 gallons

Fuel Transfer System: (X) Manual () Automatic

Starting System: Pneumatic

Engine Time Between Overhaul: 15,000 hours

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -10% to +10%

Regulation: 2%

Steady State Stability: 1%

Transient: (a) Application of Rated Load

Dip: 12%

Recovery: 1.4 seconds

(b) Rejection of Rated Load

Rise: 24%

Recovery: 2.4 seconds

Frequency Characteristics:

Regulation: 0.3%

Constant Load Deviation: 0.2%

Radio Interference Suppression: () Yes, (X) No

Transient: (a) Application of Rated Load

Dip: 2.8%

Recovery: 2.8 seconds

(b) Rejection of Rated Load

Rise: 2.3%

Recovery: 3.2 seconds

Adjustment Range: -25% to +5%

Droop: 4%

Paralleling Capability: Yes

Voltage Regulator: Static

Exciter: Rotating Brushless

Battery Charging System: Yes

Receptacles: Convenience 120 Volt

Output Power Cable: 75 feet, 5-KV, 4 Wire

Safety Features:

(X) Over Voltage Protection

(X) Under Voltage Protection

- (X) Short Circuit Protection
- (X) Reverse Power Relay
- (X) Fault Indicator
- (X) Low Fuel Level Indicator
- (X) Low Lube Oil Pressure Indicator
- (X) High Coolant Temperature Indicator
- (X) Overspeed Indicator

Instrumentation:

- (X) Voltmeter
- (X) Ammeter
- (X) Wattmeter
- (X) Frequency Meter
- (X) Varmeter
- (X) Hour Meter
- (X) Synchroscope
- (X) Bus Voltmeter
- (X) Pyrometer

*Model Semi-Trailer Mounted

**Model Skid Mounted

***NAVFAC Manual P-8-323.7 Covers Semi-Trailer or Skid Mounted Unit

NOTE: Semi-Trailer Mounted unit cannot be transported long distances over the highway because of weight.

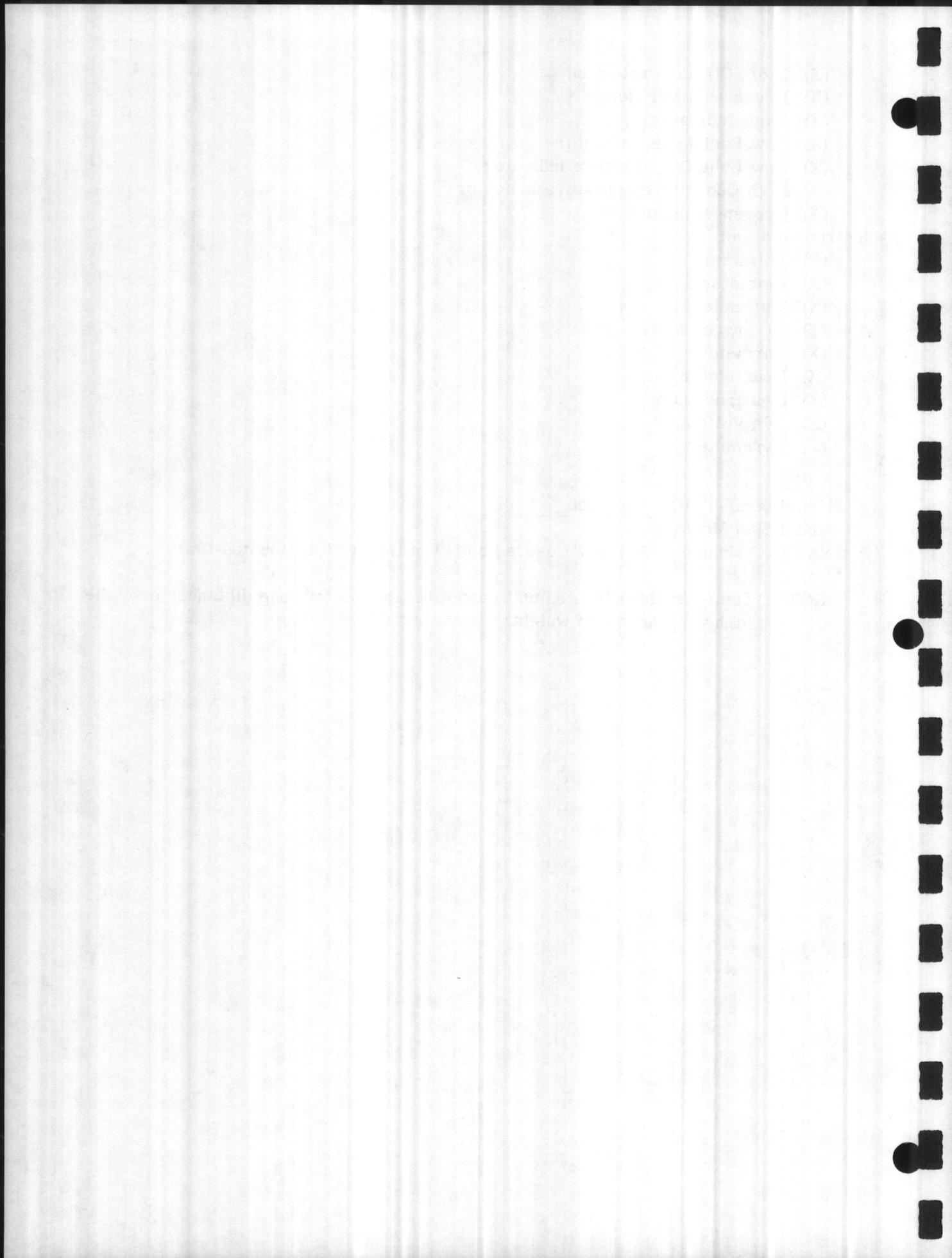




FIGURE 11
Generator 750 Kilowatt, Gas Turbine

2.2.1.8.2 750 Kilowatt, Gas Turbine Driven, Semi-Trailer Mounted

GENERAL DATA

System Rating: *750-KW, 2400-V, Delta or 2400/4160-V, Wye, 3- ϕ , 60 Hz
**750-KW, 480-V, 3- ϕ , 60 Hz

Weight: 38,000 Pounds

Dimensions: Length 30'-0", Width 8'-0", Height 12'-3"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restriction: Level

Set-up-time: 20 man-hours

Altitude Limits (at rated load): 1500 feet

Ambient Operating Temperature Limits (at rated load): -25°F to +90°F

Cooling System: None

Monitoring Requirements (normal operating conditions):

1-man, 1-hour Interval, Roving Watch

Shore Power Requirements: 220-V, 30-Amp, 1- ϕ , 3 Wire or from outgoing power circuit.

Manufacturer: Solar Division

Model Nomenclature: Saturn

Technical Manual: (NAVFAC) P-8-312.2 or 312.4 or 313.10

MECHANICAL DATA

Rated Speed: 22,300 RPM
Governor: Woodward UG-8
Fuels: JP-4, JP-5, Kerosene, or Diesel
Fuel Consumption: 100 GPH at rated load using Diesel
Fuel Tank: 700 gallons
Fuel Transfer System: () Manual, (X) Automatic
Starting System: Electric
Engine Time Between Overhaul: 4,000 Hours

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -5% to 15%
Regulation: 1%
Steady State Stability: 0.5%
Transient: (a) Application of Rated Load
Dip: 8.7%
Recovery: 1 second
(b) Rejection of Rated Load
Rise: 5.8%
Recovery: 1 second

Frequency Characteristics:

Regulation: 0.6%
Constant Load Deviation: 0.3%
Radio Interference Suppression: () Yes, (X) No
Transient: (a) Application of Rated Load
Dip: 7.0%
Recovery: 2.2 second
(b) Rejection of Rated Load
Rise: 7.0%
Recovery: 2.2 second

Adjustment Range: -10% to +3%

Drop: 4%

Paralleling Capability: Yes

Voltage Regulator: Static

Exciter: Rotating Brushless

Battery Charging System: Yes

Receptacles: Convenience 120-Volt

Output Power Cable: 50 feet, 5-KV, 3 wire

Safety Features:

(X) Over Voltage Protection
() Under Voltage Protection
(X) Short Circuit Protection
(X) Reverse Power Relay
(X) Fault Indicator

- (X) Low Fuel Level Indicator
- (X) Low Lube Oil Pressure Indicator
- (X) High Lube Temperature Indicator
- (X) Overspeed Indicator

Instrumentation:

- (X) Voltmeter
- (X) Ammeter
- (X) Wattmeter
- (X) Frequency Meter
- (X) Varmeter
- (X) Hour Meter
- (X) Synchroscope
- (X) Bus Voltmeter
- (X) Pyrometer

*4160 Volt Model

**480 Volt Model

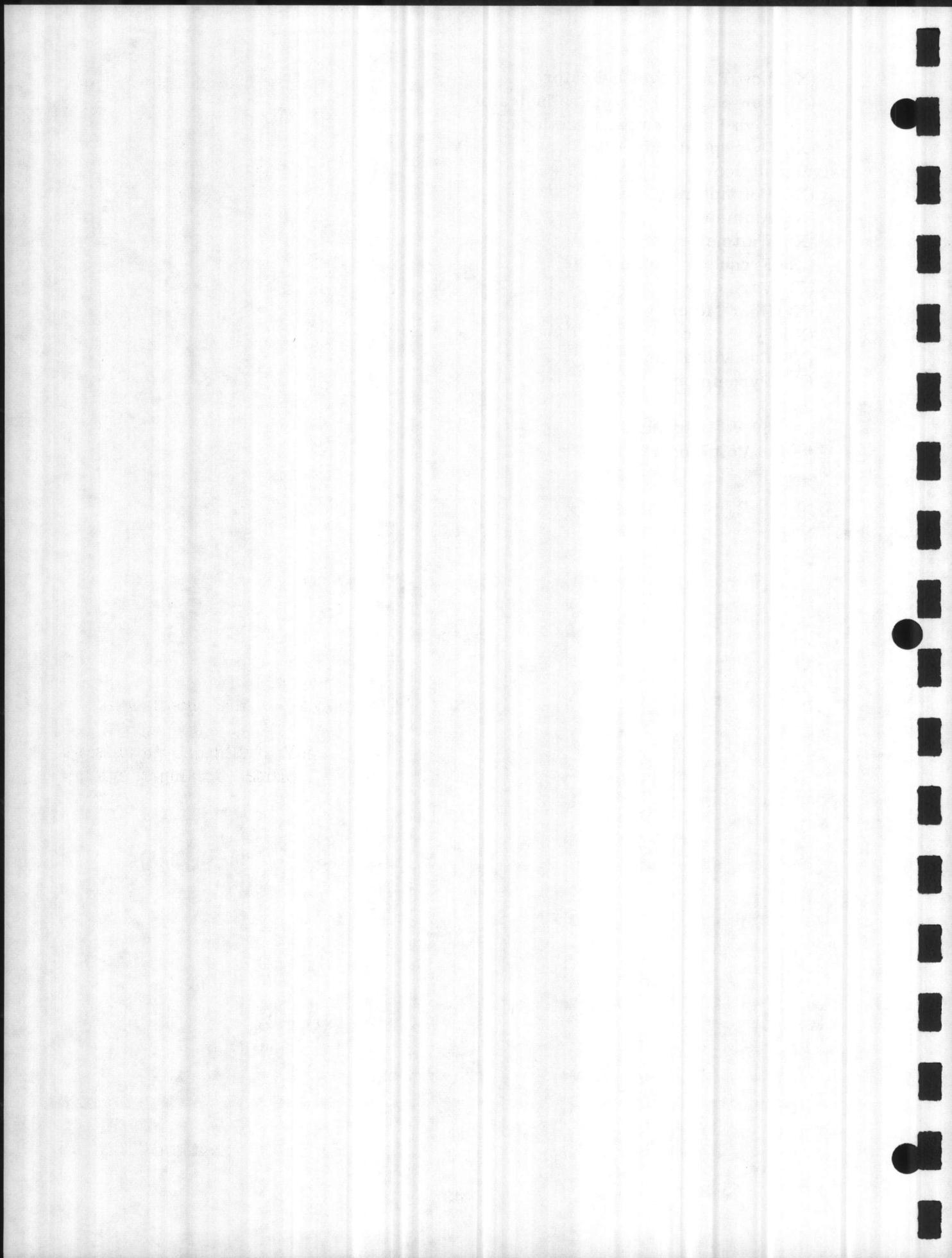




FIGURE 12
Generator 800 Kilowatt, Diesel

2.2.1.9 800 Kilowatt, Diesel Driven, Skid Mounted

GENERAL DATA

System Rating: 800-KW, 2400-V, Delta or 2400/4160-V, Wye, 3- ϕ , 60 Hz
650-KW, 2200-V, Delta or 2200/3800-V, Wye, 3- ϕ , 50 Hz

Weight: 88,000 Pounds

Dimensions: Length 38'-0", Width 10'-0", Height 11'-5"

Transportability: Railcar, Ship, Truck (low boy)

Modes of Mobility:

- () Forklifting Provisions
- (X) Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 64 man-hours

Altitude Limits (at rated load): 1500 feet

Ambient Operating Temperature Limits (at rated load): -25°F to +120°F

Cooling System: Radiator

Monitoring Requirements (normal operating conditions):

1-man, 1-hour Interval, Roving Watch

Shore Power Requirements: 240-V, 60-Amp, 1- ϕ , 3 Wire or from main outgoing power circuit.

Manufacturer: A. G. Schoonmaker Co.

Model Nomenclature: Model 645

Technical Manual: (NAVFAC) P-8-323.2 "800 KW only"

MECHANICAL DATA

Rated Speed: 720 RPM at 60 Hertz and 600 Revolutions per Minute at 50 Hertz

Governor: Woodward UG-8

Fuels: JP-5 or Diesel

Fuel Consumption: 65 GPH at rated load using Diesel

Fuel Tank: 750 gallons

Fuel Transfer System: (X) Manual, () Automatic

Starting System: Pneumatic

Engine Time Between Overhaul: 15,000 hours

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -10% to +10%

Regulation: 2%

Steady State Stability: 1%

Transient: (a) Application of Rated Load

Dip: 12%

Recovery: 1.4 second

(b) Rejection of Rated Load

Rise: 24%

Recovery: 2.4 second

Frequency Characteristics:

Regulation: 0.3%

Constant Load Deviation: 0.2%

Radio Interference Suppression: () Yes, (X) No

Transient: (a) Application of Rated Load

Dip: 2.8%

Recovery: 2.8 second

(b) Rejection of Rated Load

Rise: 2.3%

Recovery: 3.2 second

Adjustment Range: -25% to +5%

Droop: 4%

Paralleling Capability: Yes

Voltage Regulator: Static

Exciter: Rotating Brushless

Battery Charging System: Yes

Receptacles: Convenience 120-Volt

Output Power Cable: 75 feet, 5-KV, 4 Wire

Safety Features:

(X) Over Voltage Protection

(X) Under Voltage Protection

- (X) Short Circuit Protection
- (X) Reverse Power Relay
- (X) Fault Indicator
- (X) Low Fuel Level Indicator
- (X) Low Lube Oil Pressure Indicator
- (X) High Coolant Temperature Indicator
- (X) Overspeed Indicator

Instrumentation:

- (X) Voltmeter
- (X) Ammeter
- (X) Wattmeter
- (X) Frequency Meter
- (X) Varmeter
- (X) Hour Meter
- (X) Synchroscope
- (X) Bus Voltmeter
- (X) Pyrometer

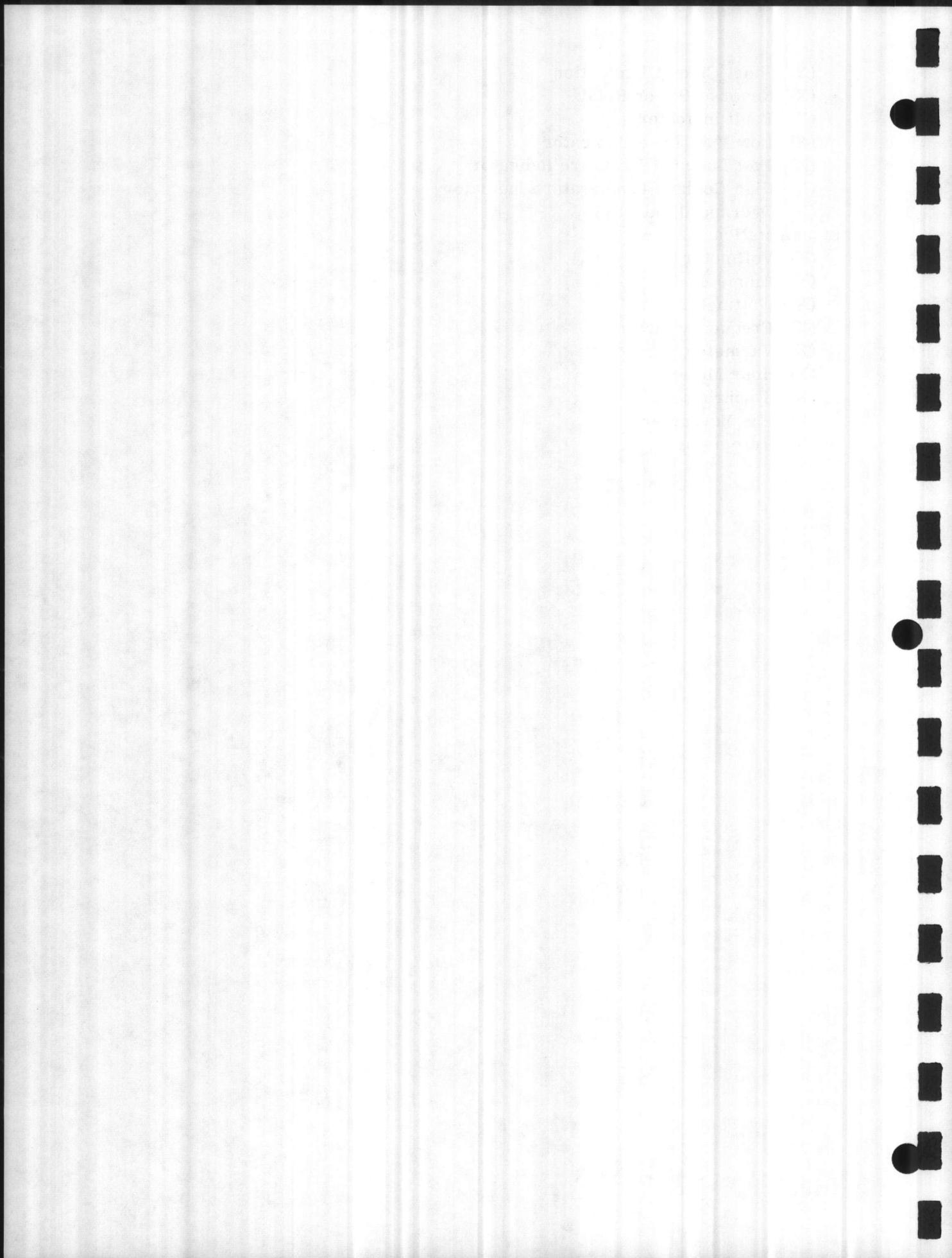




FIGURE 13
Generator 1000 Kilowatt, Diesel

2.2.1.10 1000 Kilowatt, Diesel Driven, Skid Mounted

GENERAL DATA

System Rating: 1000-KW, 2400-V, Delta or 2400/4160-V, Wye, 3- ϕ , 60 Hz

Weight: 115,000 Pounds

Dimensions: Length 33'-0", Width 10'-6", Height 13'-0"

Transportability: Railcar, Ship, Truck (Low boy)

Modes of Mobility

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 64 man-hours

Altitude Limits (at rated load): 1500 Feet

Ambient Operating Temperature Limits (at rated load): -25°F to +90°F

Cooling System: Radiator

Monitoring Requirements (normal operating conditions):

1-man, 1-hour Interval, Roving Watch

Shore Power Requirements: Use Outgoing Feeders

Manufacturer: Enterprise Engine & Machinery Co.

Model Nomenclature: DSG - 38 (8-cyl)

Technical Manual: (NAVFAC) P-8-313.1

MECHANICAL DATA

Rated Speed: 600 RPM

Governor: Woodward UG-8

Fuels: JP-5 or Diesel

Fuel Consumption: 71.4 GPH at rated load using Diesel
Fuel Tank: 250 gallons
Fuel Transfer System: (X) Manual, () Automatic
Starting System: Pneumatic
Engine Time Between Overhaul: 15,000 hours
Auxiliary Engine Generator: 10-KW, 120-V, 1- ϕ , 60-Hz, diesel engine driven

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -10% to +10%
Regulation: 1.5%
Steady State Stability: 1%
Transient: (a) Application of Rated Load
Dip: 18.0%
Recovery: 0.5 Second
(b) Rejection of Rated Load
Rise: 22%
Recovery: 1.0 Second

Frequency Characteristics:

Regulation: 0.3%
Constant Load Deviation: 0.2%
Radio Interference Suppression: (X) Yes, () No
Adjustment Range: -25% to +5%
Droop: 4%

Paralleling Capability: Yes

Voltage Regulator: Static

Exciter: Static

Battery Charging System: Yes

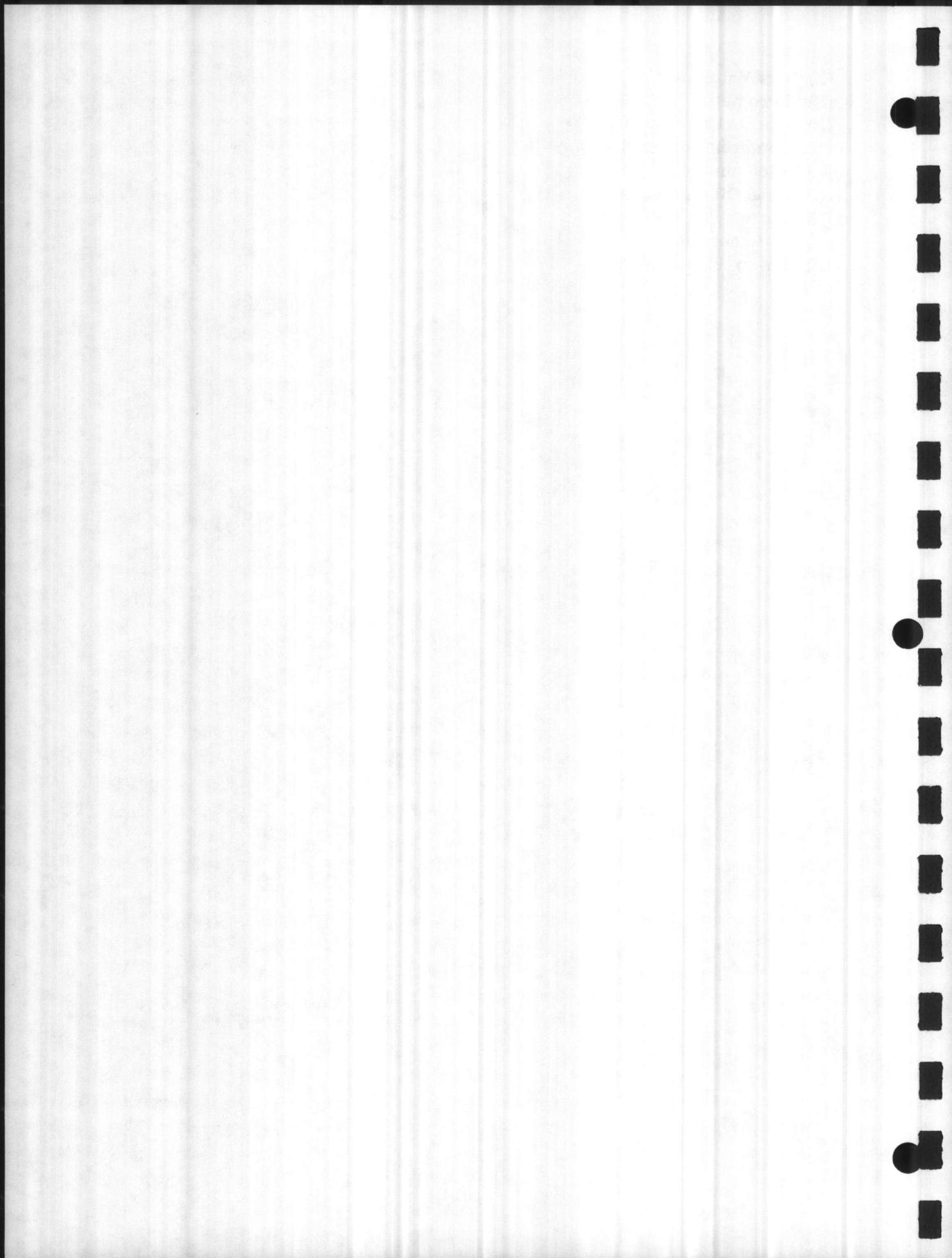
Safety Features:

() Over Voltage Protection
() Under Voltage Protection
(X) Short Circuit Protection
(X) Reverse Power Relay
(X) Fault Indicator
(X) Low Fuel Level
(X) Low Lube Oil Pressure
(X) High Coolant Temperature
(X) Overspeed

Instrumentation:

(X) Voltmeter
(X) Ammeter
(X) Wattmeter
(X) Frequency Meter
() Varmeter
() Hour Meter
(X) Synchroscope

- (X) Bus Voltmeter
- (X) Pyrometer
- (X) Fuel Oil Pressure
- (X) Compressed Air Pressure
- (X) Tachometer
- (X) Lube Oil Pressure
- (X) Jacket Water Pressure
- (X) Watthour Meter
- (X) Power Factor Meter



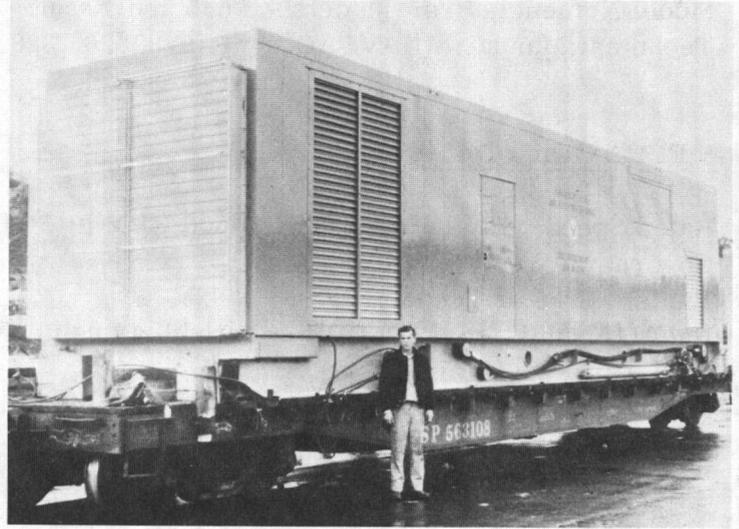
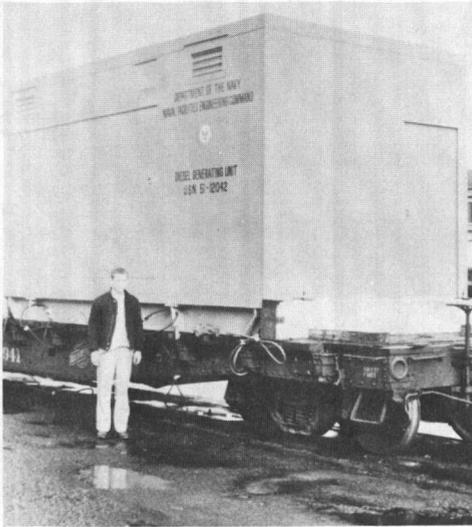


FIGURE 14
Generator 1500 Kilowatt, Diesel

2.2.1.11.1 1500 Kilowatt, Diesel Driven, Skid Mounted

GENERAL DATA

System Rating: 1500-KW, 2400-V, Delta or 2400/4160-V, Wye, 3- ϕ , 60 Hz
1250-KW, 2200-V, Delta or 2200/3800-V, Wye, 3- ϕ , 50 Hz

Weight: (1) Engine Generator-105,000 Pounds (2) Control-18,200 Pounds

Dimensions: (1) *Length 40'-0", Width 10'-5", Height 11'-6"
**Length 45'-0", Width 10'-5", Height 11'-6"
(2) Length 18'-0", Width 10'-5", Height 10'-5"

Transportability: Railcar, Ship, Truck (low boy)

Modes of Mobility:

- () Forklifting Provisions
- (X) Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 100 man-hours

Altitude Limits (at rated load): 1500 feet

Ambient Operating Temperature Limits (at rated load): -25°F to +120°F

Cooling System: Radiator

Monitoring Requirements (normal operating conditions):

1-man, 1-hour Interval, Roving Watch

Shore Power Requirements: 480-V, 100 Amp, 3- ϕ , 60 Hz, 3 Wire

Manufacturer: A. G. Schoonmaker Co.

Model Nomenclature: Models - *645 and **567

Technical Manual: (NAVFAC) *P-8-323.6, 328.8 or 323.11

**P-8-323.4

MECHANICAL DATA

Rated Speed: 720 RPM at 60 Hz, 600 RPM at 50 Hz

Governor: Woodward UG-8

Fuels: JP-5 or Diesel

Fuel Consumption: 120 GPH at rated load using diesel

Fuel Tank: 400 gallons

Fuel Transfer System: () Manual, (X) Automatic

Starting System: Pneumatic

Engine Time Between Overhaul: 15,000 Hours

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -10% to +10%

Regulation: 2%

Steady State Stability: 1%

Transient: (a) Application of Rated Load

Dip: 19%

Recovery: 2 Seconds

(b) Rejection of Rated Load

Dip: 19%

Recovery: 2 Seconds

Frequency Characteristics:

Regulation: 0.3%

Constant Load Deviation: 0.2%

Radio Interference Suppression: () Yes, (X) No

Transient: (a) Application of Rated Load

Dip: 2%

Recovery: 4 Seconds

(b) Rejection of Rated Load

Rise: 2.3%

Recovery: 3.5 Seconds

Adjustment Range: -25% to +5%

Droop: 4%

Paralleling Capability: Yes

Voltage Regulator: Static

Exciter: Rotating Brush Type

Battery Charging System: Yes

Receptacles: Convenience 120-Volt

Output Power Cable: 3-50 foot lengths, 5-KV, Single Wire

Safety Features:

(X) Over Voltage Protection

(X) Under Voltage Protection

- Short Circuit Protection
- Reverse Power Relay
- Fault Indicator
- Low Fuel Level Indicator
- Low Lube Oil Pressure Indicator
- High Coolant Temperature Indicator
- Overspeed Indicator

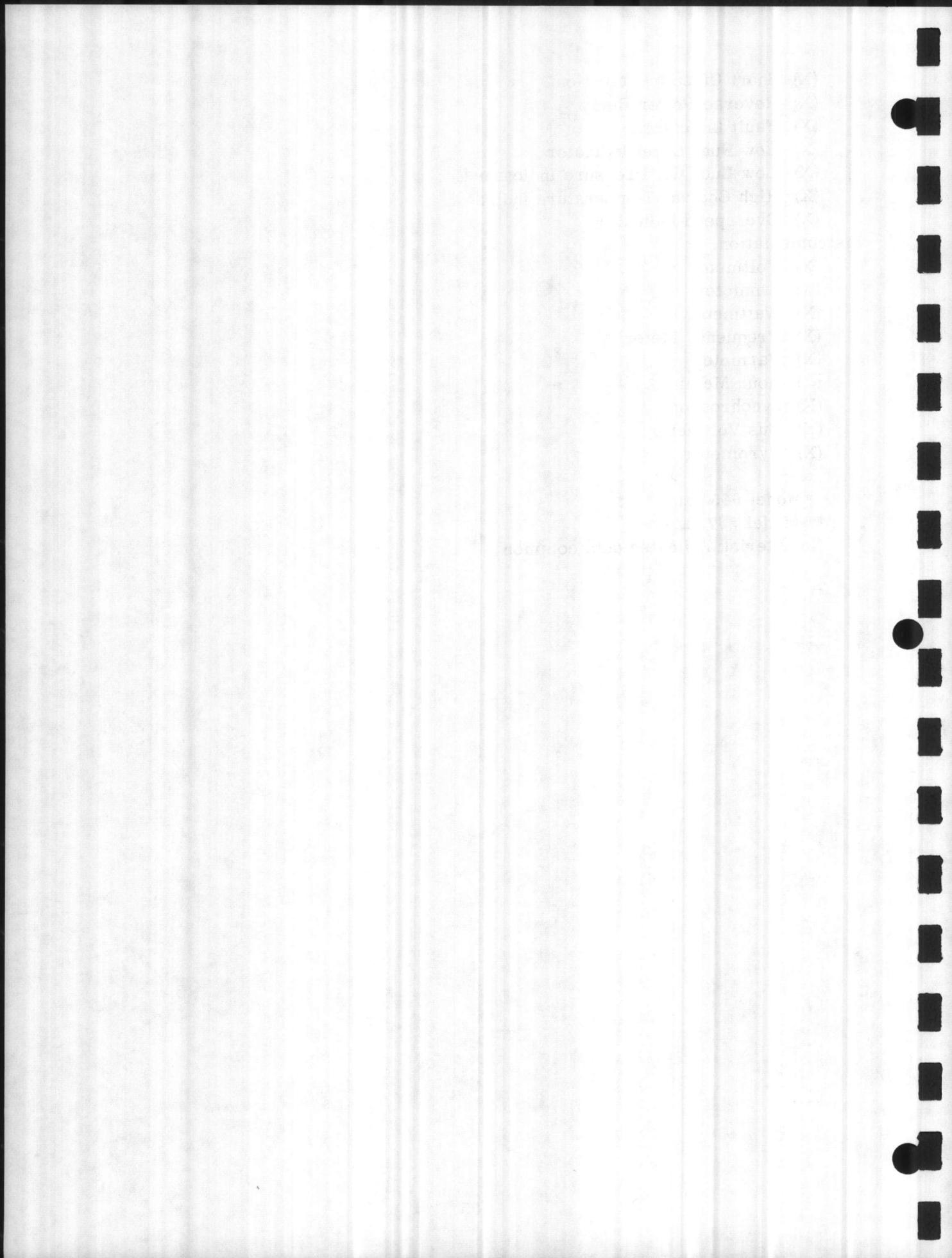
Instrumentation:

- Voltmeter
- Ammeter
- Wattmeter
- Frequency Meter
- Varmeter
- Hour Meter
- Synchroscope
- Bus Voltmeter
- Pyrometer

*Model 645 data

**Model 567 data

No asterisk indicates data common



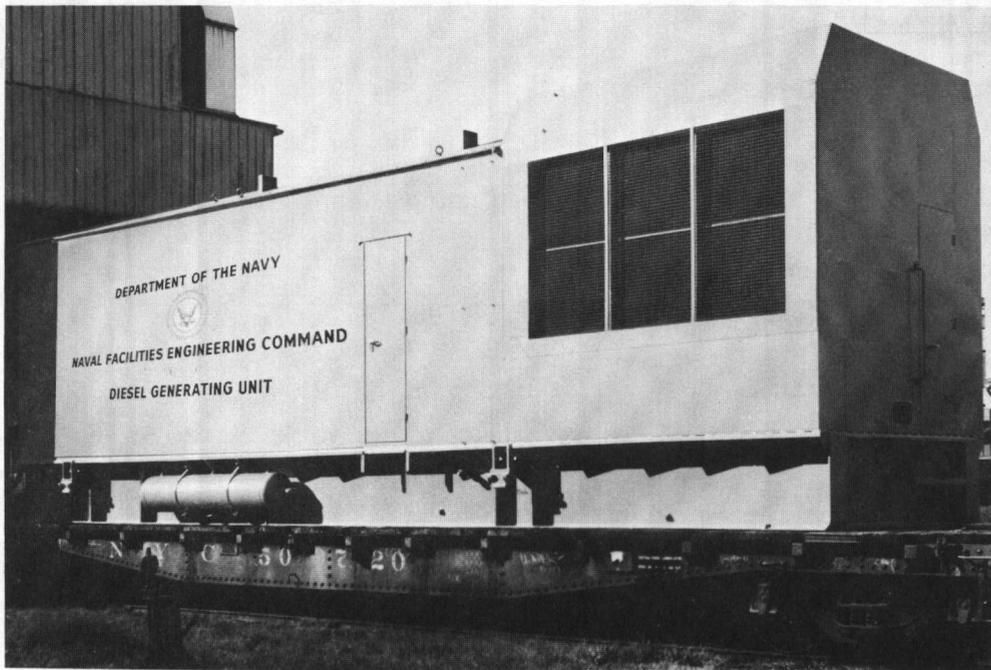


FIGURE 15
Generator 1500 Kilowatt, Diesel

2.2.1.11.2 1500 Kilowatt, Diesel Driven, Skid Mounted

GENERAL DATA

System Rating: 1500-KW, 2400/4160-V, Wye, 3- ϕ , 60 Hz

Weight: (1) Power Unit: 122,000 Pounds

(2) Control unit: 11,600 Pounds

Dimensions: (1) Length 39'-8", Width 10'-5", Height 13'-0"

(2) Length 14'-0", Width 7'-6", Height 10'-6"

Transportability: Railcar, Ship, Truck (low boy)

Modes of Mobility:

- () Forklifting Provisions
- (X) Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 100 man-hours

Altitude Limits (at rated load): 1500 feet

Ambient Operating Temperature Limits (at rated load): -25°F to +105°F

Cooling System: Radiator

Monitoring Requirements (normal operating conditions):

1-man, 1-hour Interval, Roving Watch

Shore Power Requirements: From outgoing power circuit.

Manufacturer: Fairbanks-Morse Div., Colt Industries

Model Nomenclature: 38 TD 8 1/8

Technical Manual: (NAVFAC) P-8-323.8

MECHANICAL DATA

Rated Speed: 720 RPM
Governor: Woodward EG-B-10
Fuels: JP-5 or Diesel
Fuel Consumption: 120 GPH at rated load using Diesel
Fuel Tank: 100 gallons
Fuel Transfer System: Pneumatic
Engine Time Between Overhaul: 15,000 hours

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -10% to +10%

Regulation: 2%

Steady State Stability: 1%

Frequency Characteristics:

Regulation: 0.3%

Constant Load Deviation: 0.2%

Radio Interference Suppression: () Yes, (X) No

Adjustment Range: -25% to +5%

Droop: 4%

Paralleling Capability: Yes

Voltage Regulator: Static

Exciter: Rotating Brush Type

Battery Charging System: Yes

Output Power Cable: 150 feet

Safety Features:

(X) Over Voltage Protection

(X) Under Voltage Protection

(X) Short Circuit Protection

(X) Reverse Power Relay

(X) Fault Indicator

(X) Low Fuel Level

(X) Low Lube Oil Pressure

(X) High Coolant Temperature

(X) Overspeed

Instrumentation:

(X) Voltmeter

(X) Ammeter

(X) Wattmeter

(X) Frequency Meter

(X) Varmeter

(X) Hour Meter

(X) Synchroscope

(X) Bus Voltmeter

(X) Pyrometer

(X) Watthour Meter

Inter Unit Cable: 50 feet interconnecting cable between generator and control house.

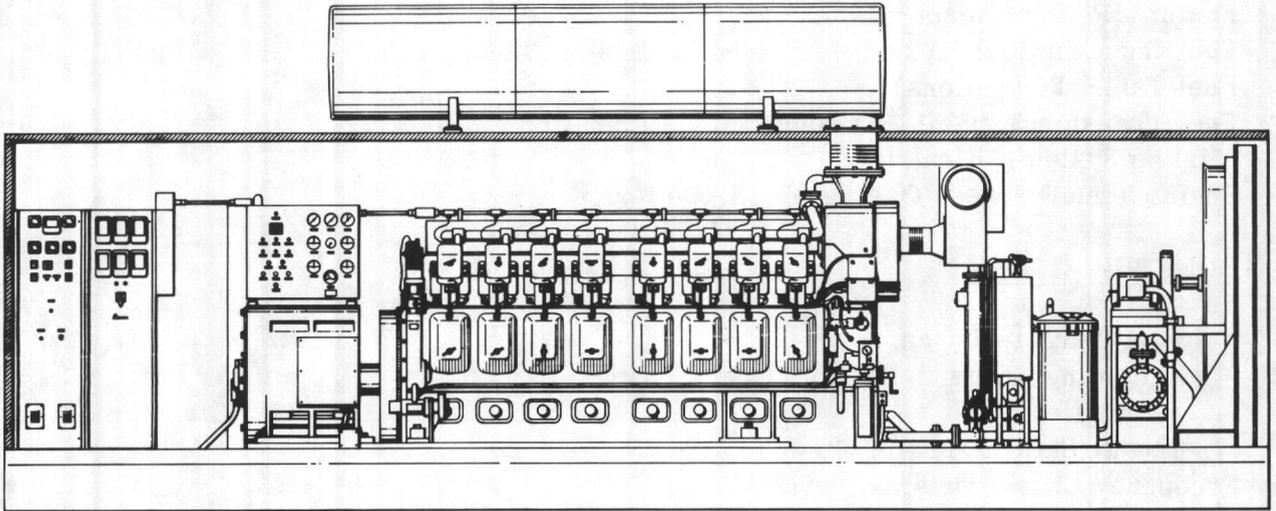


FIGURE 16
Generator 1500 Kilowatt, Diesel

2.2.1.11.3 1500 Kilowatt, Diesel Driven, Skid Mounted

GENERAL DATA

System Rating: 1300-KW (Maximum), 2400-V Delta or 2400/4160-V, Wye, 3- ϕ , 60 Hz

Weight: 110,200 Pounds

Dimensions: Length 40'-0", Width 10'-0", Height 12'-0"

Transportability: Railcar, Ship, Truck (low boy)

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Must be leveled and shimmed to allow for proper engine generator alignment.

Set-up-time: 200 man-hours

Altitude Limits (at rated load): 1500 feet

Ambient Operating Temperature Limits (at rated load): -25°F to +90°F

Cooling System: Radiator

Monitoring Requirements (normal operating conditions):

1-man, 1-hour Interval, Roving Watch

Shore Power Requirements: 440-V, 60 Amp, 3- ϕ , 60 Hz, 3 Wire or 110/120-V, 20 Amp, 1- ϕ , 60 Hz, 3 Wire or from outgoing feeders.

Manufacturer: A. G. Schoonmaker Co.

Model Nomenclature: 251

Technical Manual: (Two Volumes) Commercial

MECHANICAL DATA

Rated Speed: 900 RPM

Governor: Woodward UG-32

Fuels: JP-5 or Diesel
Fuel Consumption: 102 GPH at rated load using Diesel
Fuel Tank: 200 gallons
Fuel Transfer System: () Manual (X) Automatic
Starting System: Electric
Engine Time Between Overhaul: 15,000 Hours

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -10% to +10%
Regulation: 2%
Steady State Stability: 1%

Frequency Characteristics:

Regulation: 1%
Constant Load Deviation: 0.5%
Radio Interference Suppression: () Yes, (X) No
Adjustment Range: -25% to +5%
Droop: 4%

Paralleling Capability: Yes

Voltage Regulator: Static

Exciter: Static

Battery Charging System: Yes

Receptacles: Convenience 120-V

Output Power Cable:

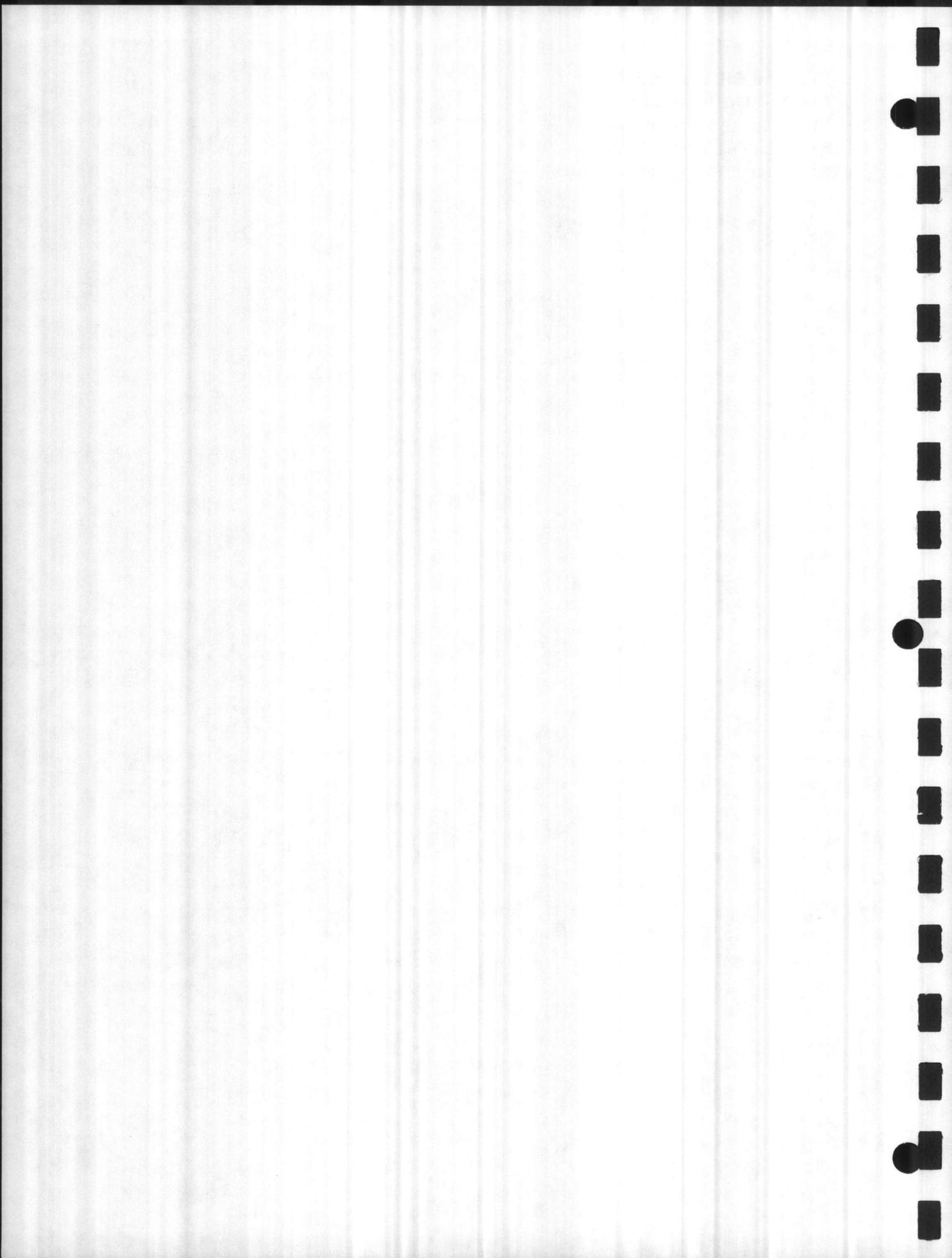
Safety Features:

- (X) Over Voltage Protection
- (X) Under Voltage Protection
- (X) Short Circuit Protection
- (X) Reverse Power Relay
- (X) Fault Indicator
- (X) Low Fuel Level
- (X) Low Lube Oil Pressure
- (X) High Coolant Temperature
- (X) Overspeed

Instrumentation:

- (X) Voltmeter
- (X) Ammeter
- () Wattmeter
- (X) Frequency Meter
- () Varmeter
- () Hour Meter
- (X) Synchroscope
- (X) Bus Voltmeter
- (X) Pyrometer
- (X) Tachometer
- (X) Watthour Meter

- (X) Lube Oil Pressure
- (X) Fuel Oil Pressure
- (X) Jacket Water Pressure
- (X) Lube Oil Temperature
- (X) Jacket Water Temperature



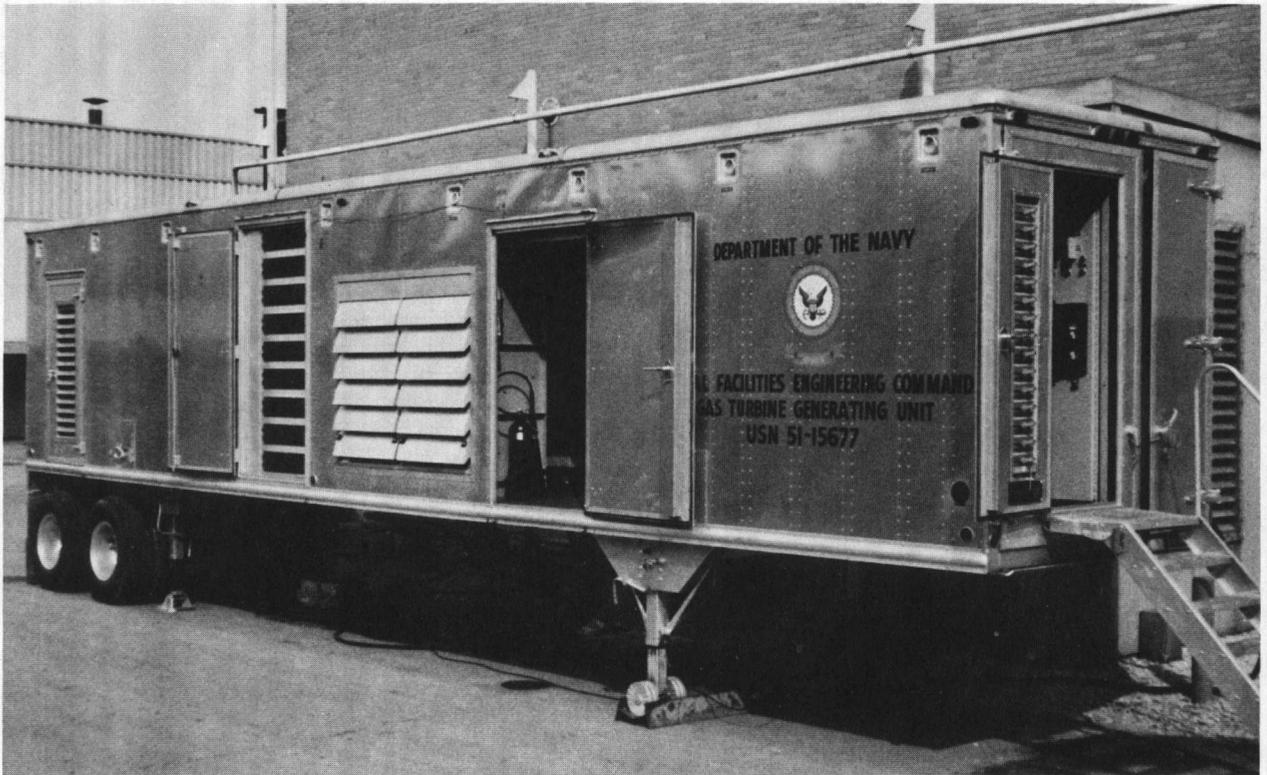


FIGURE 17
Generator 2000 Kilowatt, Gas Turbine

2. 2. 1. 12. 1 2000 Kilowatt, Gas Turbine Driven, Semi-Trailer Mounted

GENERAL DATA

System Rating: 2000-KW, 2400-V, Delta or 2400/4160-V, Wye, 3- ϕ , 60 Hz

Weight: 61,000 Pounds

Dimensions: Length 40'-0", Width 8'-0", Height 12'-6"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 20 man-hours

Altitude Limits (at rated load): 1500 feet

Ambient Operating Temperature Limits (at rated load): -25°F to +125°F

Cooling System: None

Monitoring Requirements (normal operating conditions):

1-man, 1-hour Interval, Roving Watch

Shore Power Requirements: 240-V, 70 Amp, 1- ϕ , 3 Wire or from main outgoing power circuits.

Manufacturer: Allison Division of General Motors Corp.

Model Nomenclature: Model 701-K14
Technical Manual: (NAVFAC) P-8-312.8

MECHANICAL DATA

Rated Speed: 13,800 RPM
Governor: Woodward EG-B2
Fuels: JP-4, JP-5, Kerosene or Diesel
Fuel Consumption: 250 GPH at rated load using Diesel
Fuel Tank: 500 gallons
Fuel Transfer System: () Manual, (X) Automatic
Starting System: Turbine Starter, Electric Energized
Engine Time Between Overhaul: 4,000 hours

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -10% to +10%
Regulation: 1%
Steady State Stability: 0.1%
Transient: (a) Application of Rated Load
Dip: 16.5%
Recovery: 2.5 Seconds
(b) Rejection of Rated Load
Rise: 19.0%
Recovery: 2 Seconds

Frequency Characteristics:

Regulation: 0.2%
Constant Load Deviation: 0.1%
Radio Interference Suppression: () Yes, (X) No
Transient: (a) Application of Rated Load
Dip: 2%
Recovery: 2 Seconds
(b) Rejection of Rated Load
Rise: 1.3%
Recovery: 1 Second

Adjustment Range: -5% to +5%

Droop: 4%

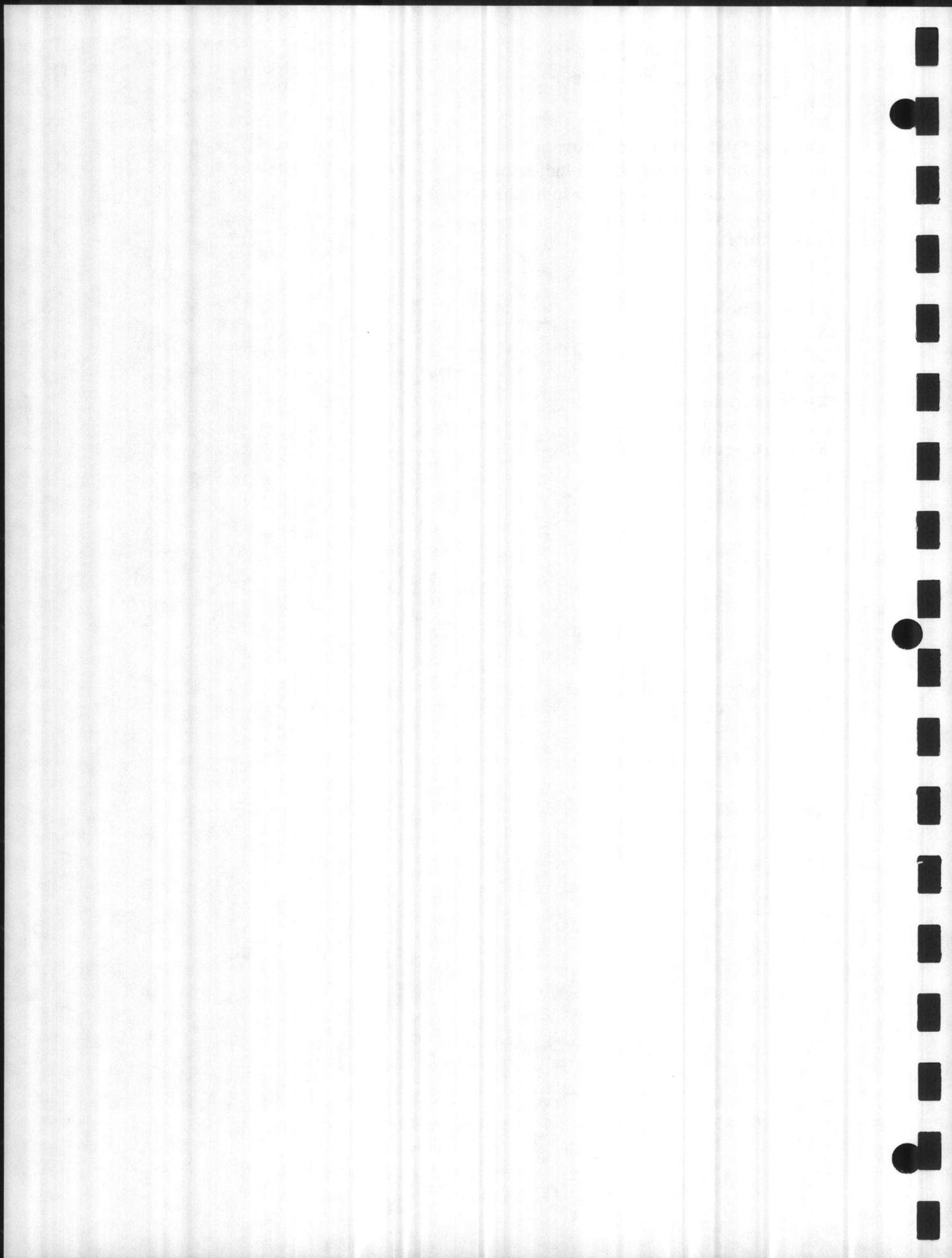
Paralleling Capability: Yes
Voltage Regulator: Static
Exciter: Rotating Brushless
Battery Charging System: Yes
Receptacles: Convenience 120-Volts
Output Power Cable: 50 feet, 5-KW, 3 Wire
Safety Features:

(X) Over Voltage Protection
() Under Voltage Protection

- (X) Short Circuit Protection
- (X) Reverse Power Relay
- (X) Fault Indicator
- (X) Low Fuel Level Indicator
- (X) Low Lube Oil Pressure Indicator
- (X) High Lube Temperature Indicator
- (X) Over Speed Indicator

Instrumentation:

- (X) Voltmeter
- (X) Ammeter
- (X) Wattmeter
- (X) Frequency Meter
- (X) Varmeter
- (X) Hour Meter
- (X) Synchroscope
- (X) Bus Voltmeter
- (X) Pyrometer



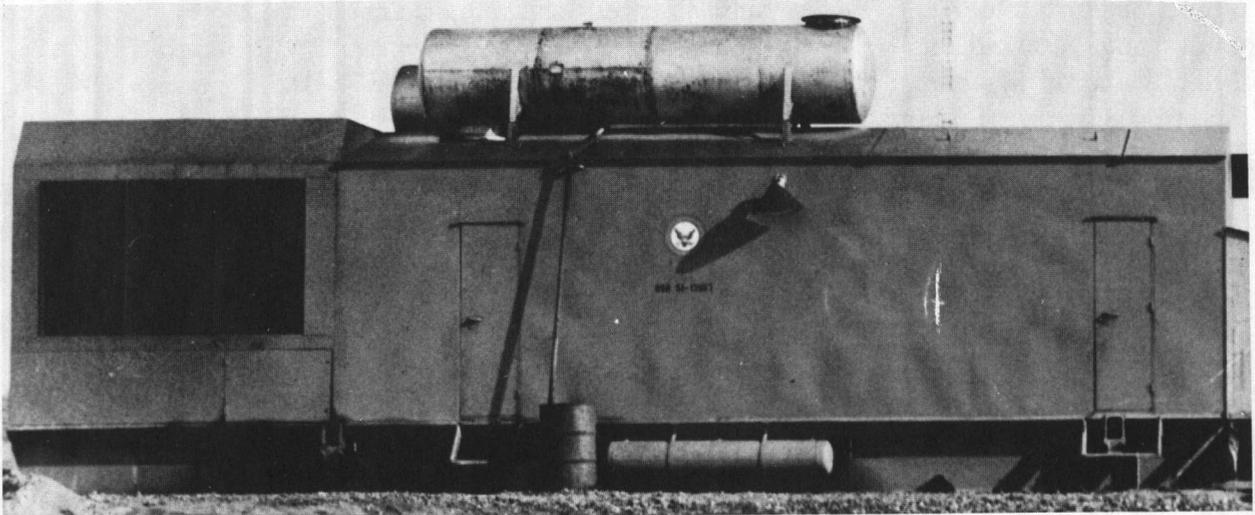


FIGURE 18
Generator, (2) 2000 Kilowatt, Diesel with Single Control Unit

2.2.1.12.2 Two - 2000 Kilowatt, Diesel Driven, Skid Mounted

GENERAL DATA

System Rating: 4000-KW, 2400/4160-V, Wye, 3- ϕ , 60 Hz

Weight Per Generator (1): 142,000 Pounds, Control Unit (2): 28,000 Pounds

Dimensions: (1) Length 42'-6", Width 10'-5", Height 13'-0"

(2) Length 22'-0", Width 10'-6", Height 11'-6"

Transportability: Railcar, Ship, Truck (low boy)

Modes of Mobility:

- () Forklifting Provisions
- (X) Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 150 man-hours

Ambient Operating Temperature Limits (at rated load): -25°F to +105°F

Cooling System: Radiator

Monitoring Requirements (normal operating conditions):

1-man, 1-hour Interval, Roving Watch

Shore Power Requirements: Unit must be connected from outgoing power circuit

Manufacturer: Fairbanks-Morse Div., Colt Industries

Model Nomenclature: 38 TD 8 1/8

Technical Manual: (NAVFAC) P-8-323.9

MECHANICAL DATA

Rated Speed: 720 RPM

Governor: Woodward EG-B-10

Fuels: JP-5 or Diesel

Fuel Consumption: 156 GPH per unit at rated load using Diesel
Fuel Tank: 100 gallons
Fuel Transfer System: () Manual, (X) Automatic
Starting System: Pneumatic
Engine Time Between Overhaul: 15,000 hours

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -10% to +10%
Regulation: 2%
Steady State Stability: 1%

Frequency Characteristics:

Regulation: 0.3%
Constant Load Deviation: 0.2%
Radio Interference Suppression: () Yes, (X) No
Adjustment Range: -25% to +5%
Droop: 4%

Paralleling Capability: Yes

Voltage Regulator: Static

Exciter: Static

Battery Charging System: Yes

Output Power Cable: 150 feet

Safety Features:

(X) Over Voltage Protection
(X) Under Voltage Protection
(X) Short Circuit Protection
(X) Reverse Power Relay
(X) Fault Indicator
(X) Low Fuel Level
(X) Low Lube Oil Pressure
(X) High Coolant Temperature
(X) Overspeed
() Low Frequency

Instrumentation:

(X) Voltmeter
(X) Ammeter
(X) Wattmeter
(X) Frequency Meter
(X) Varmeter
(X) Hour Meter
(X) Synchroscope
(X) Bus Voltmeter
(X) Pyrometer
(X) Watthour Meter

Inter Unit Cable: 50 feet interconnecting cable between each generator and the control house.

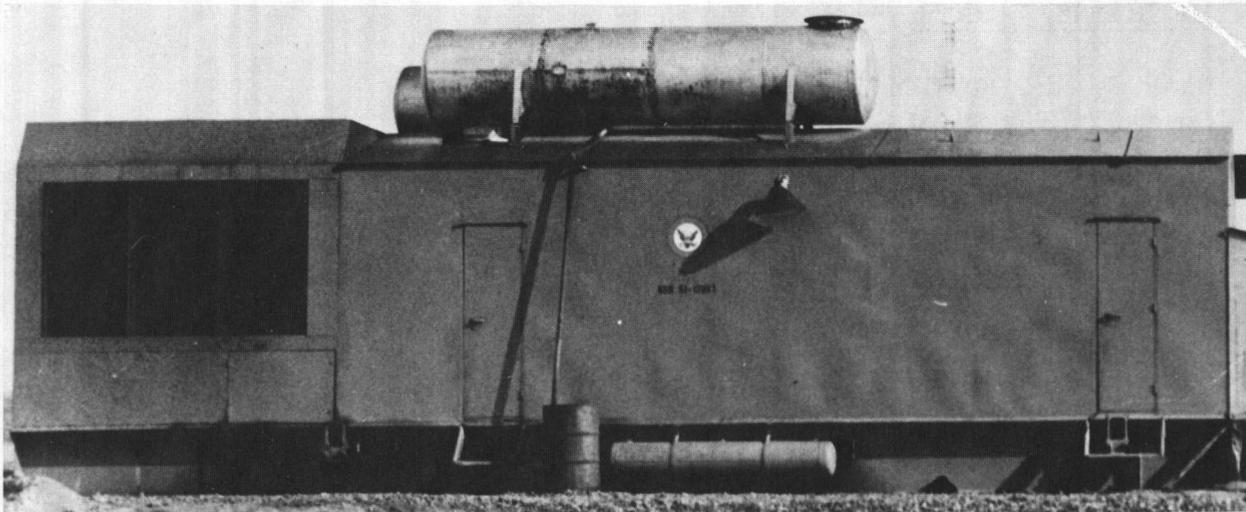


FIGURE 19
Generator 2000 Kilowatt, Diesel

2.2.1.12.3 2000 Kilowatt, Diesel Driven Skid Mounted

GENERAL DATA

System Rating: 2000-KW, 2400/4160-V, Wye, 3- ϕ , 60-Hz

Weight: (1) Power Unit, 142,000 Pounds, (2) Control Unit, 11,600 Pounds

Dimensions: (1) Length 42'-6", Width 10'-5", Height 13'-0"

(2) Length 14'-0", Width 7'-6", Height 10'-6"

Transportability: Railcar, Ship, Truck (low boy)

Modes of Mobility:

- () Forklifting Provisions
- (X) Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 100 man-hours

Altitude Limits (at rated load): 1500 feet

Ambient Operating Temperature Limits (at rated load): -25°F to +105°F

Cooling System: Radiator

Monitoring Requirements (normal operating conditions):

1-man, 1-hour Interval, Roving Watch

Shore Power Requirements: From outgoing power circuit.

Manufacturer: Fairbanks-Morse Div., Colt Industries

Model Nomenclature: 38 TD 8 1/8

Technical Manual: (NAVFAC) P-8-323.9

MECHANICAL DATA

Rated Speed: 720 RPM
Governor: Woodward EG-B-10
Fuels: JP-5 or Diesel
Fuel Consumption: 156 GPH at rated load using Diesel
Fuel Tank: 100 gallons
Fuel Transfer System: () Manual, (X) Automatic
Starting System: Pneumatic
Engine Time Between Overhauls: 15,000 hours

ELECTRICAL DATA

Voltage Characteristics:

Adjusting Range: -10% to +10%

Regulation: 2%

Steady State Stability: 1%

Frequency Characteristics:

Regulation: 0.3%

Constant Load Deviation: 0.2%

Radio Interference Suppression: () Yes, (X) No

Adjustment Range: -25% to +5%

Droop: 4%

Paralleling Capability: Yes

Voltage Regulator: Static

Exciter: Static

Battery Charging System: Yes

Output Power Cable: 150 feet

Safety Features:

(X) Over Voltage Protection

(X) Under Voltage Protection

(X) Short Circuit Protection

(X) Reverse Power Relay

(X) Fault Indicator

(X) Low Fuel Level

(X) Low Lube Oil Pressure

(X) High Coolant Temperature

(X) Overspeed

() Low Frequency

Instrumentation:

(X) Voltmeter

(X) Ammeter

(X) Wattmeter

(X) Frequency Meter

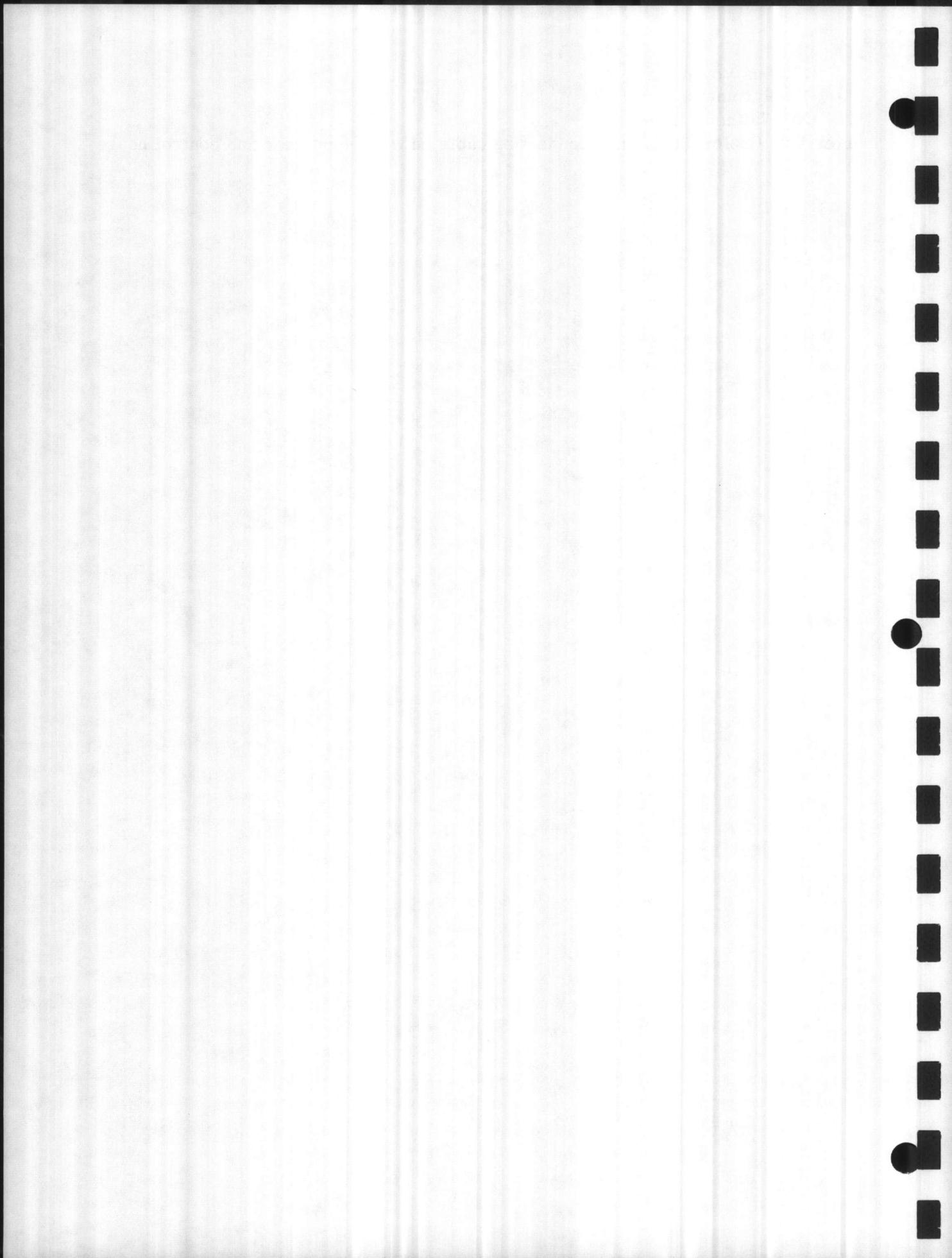
(X) Varmeter

(X) Hour Meter

(X) Synchroscope

- (X) Bus Voltmeter
- (X) Pyrometer
- (X) Watthour Meter

Inter Unit Cable: 50 ft. interconnecting cable between generator and control house.



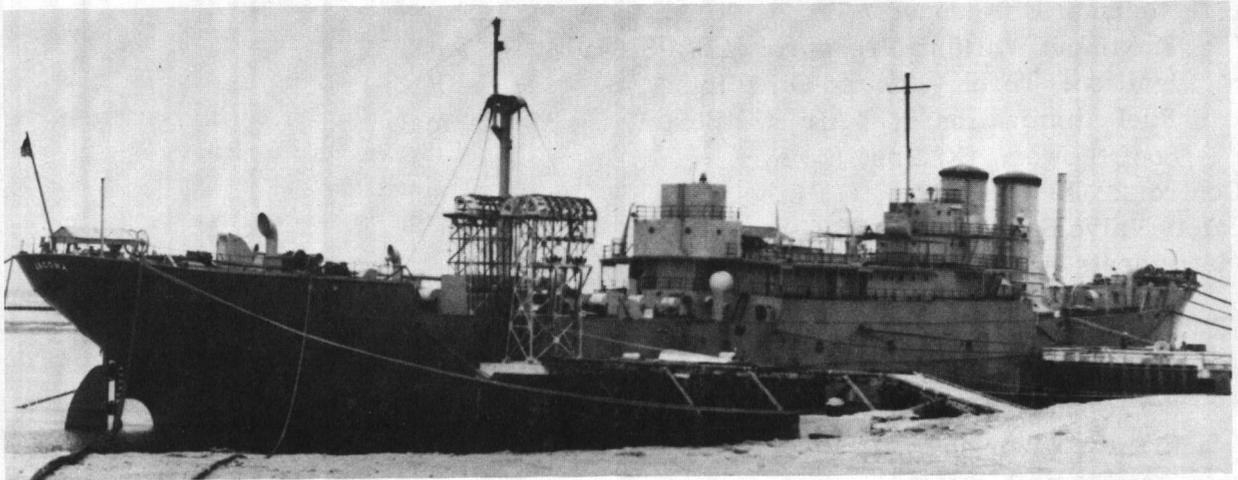


FIGURE 20
YFP-1, Power Plant

2.2.2.1 YFP-1, 20 Megawatt, Turbine Driven, Barge Mounted

GENERAL DATA

System Rating: 20-Mw, 6900-V, Delta or 6900/11,900-V, Wye, 3- ϕ , 60 Hz (Unit may be modified for 50 Hz operation)

Weight: 5238 Tons

Dimensions: Length 396'-0", Width 53'-0"

Draft: 24 feet (loaded)

Set-up-time: 4,800 man-hours

Shore Power Requirements: Off of outgoing feeders

Ship-to-Shore Telephone System: Yes

Ambient Operating Temperature Limits (at rated load): -25°F to +125°F

Recommended Operation and Maintenance Crew: 28 men

Personnel Berthing Accommodations: 20 Bunks

Galley Provisions: (X) Yes, () No

Ocean Travel Capability: (X) Yes, () No

Technical Manual(s): Commercial

BOILER CHARACTERISTICS

Number Boilers: Four - 70,000 Pounds per hour each

Fuels: Bunker C

Fuel Consumption: 2,500 gal/hr at rated load using Bunker C Fuel

Fuel Tank: 250,000 gallons

Water Tank: 300,000 gallons

Evaporator 34,000 gallons per day

Chemical Feed System: Yes

Hotwell or Deaerator Capacity:

Boilers and Burners:

Circulation: Natural

Thermal Efficiency: 75%

Maximum Working Pressure: 425 PSIG at 670 F FT

Ignition: Torch - Ignited Oil Pilots

Fuel Atomization: () Air, () Steam, () Mechanical

Soot Blower: (X) Yes, () No

Controls: (X) Pneumatic, () Electric

Safety Valve Setting: 475 PSIG

Instruments/Alarms:

(X) Low Water Level

(X) High Water Level

() Feedwater Temperature

() Condensate Flowmeter

(X) High Working Pressure

(X) Flame Monitor

(X) Fuel Temperature

(X) Fuel Pressure

(X) Control Air Pressure

Manufacturer: Babcox & Wilcox Company

Model Nomenclature:

TURBINE CHARACTERISTICS

Turbine Drive: Two-10,000 Kilowatt Turbines, Curtis

Speed: 3600 Revolutions per Minute

Steam Conditions: 400 PSIG at 670 F

TRANSFORMER/SWITCHGEAR CHARACTERISTICS

Transformer: Two-12,500 KVA, 3- ϕ

Type: Oil Filled

Connections: 11,000 Volts to 13,800 Volts

Power Circuit Breaker: 2-800 Amperes, 15 Kilovolt, 500 Megavolt Amperes Interrupting Capacity

AUXILIARY ENGINE GENERATORS

Diesel Engine Ratings: Two-100 Kilowatt, 440 Volts, 3 Phase, 60 Hertz

Starting System:

Battery Charging Provisions:

Fuels: Diesel

Fuel Tank Capacity:

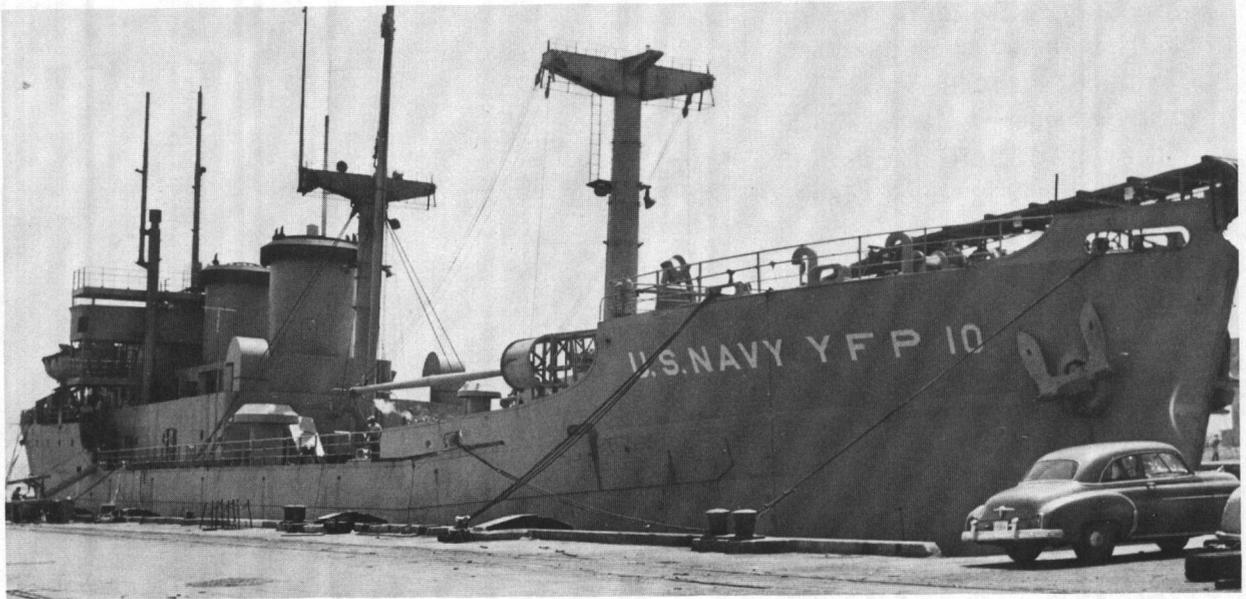


FIGURE 21
YFP-10, Power Plant

2.2.2.2 YFP-10, 34.5 Megawatt, Turbine Driven Barge Mounted

GENERAL DATA

System Rating: 34,500-KW, 7200/12,500-V, Wye, 3- ϕ , 60 Hz (Unit may be modified for 50-Hz operation)

Weight: 5000 Tons

Dimensions: Length 338 feet, Width 50 feet

Draft: 20 feet (Loaded)

Set-up and Installation: 4,800 man-hours

Shore Power Requirements: 480-V, 600 Amps or 13,800-V at 250 KVA, 3- ϕ , 60 Hz

Ship-to-Shore Telephone System: Yes

Ambient Operating Temperature Limits (at rated load): -25°F to +125°F

Recommended Operation and Maintenance Crew: 31 Men

Personnel Berthing Accommodations: Yes (used during towing operation)

Galley Provisions: (X) Yes, () No

Ocean Travel Capability: (X) Yes, () No

Technical Manual(s): Commercial

BOILER CHARACTERISTICS

Number Boilers: Three-Type 'D' Boilers rated at 123,000 Pounds per hour each

Fuels: Bunker "C"

Fuel Consumption: 3,400 GPH at rated load using Bunker C

Fuel Tank: 703,540 gallons

Water Tank: 72,017 gallons;

Evaporator 20,000 gallons per day

Chemical Feed System: Yes

Hotwell or Deaerator Capacity: 370,000 pounds per hour with 6 minutes capacity

Boilers and Burners:

Circulation: Natural

Thermal Efficiency: 86%

Maximum Working Pressure: 625 PSIG at 830 FTT

Ignition: Electrode - Ignited Gas Pilots

Fuel Atomization: (X) Air, (X) Steam, () Mechanical

Soot Blower: (X) Yes, () No

Controls: (X) Pneumatic, () Electric

Safety Valve Setting: 675 PSIG

Instruments/Alarms:

(X) Low Water Level

(X) High Water Level

(X) Feedwater Temperature

(X) Condensate Flowmeter

(X) High Working Pressure

(X) Export Steam Pressure

(X) Flame Monitor

(X) Fuel Temperature

(X) Fuel Pressure

(X) Control Air Pressure

Manufacturer: Foster-Wheeler Corporation

Model Nomenclature: Type "D" top fired

TURBINE CHARACTERISTICS:

Turbine Drive: Three-impulse turbines connected to three-11,500 Kilowatt Generators

Speed: 3600 RPM

Steam Conditions: 600 PSIG at 825°F

GENERATOR CHARACTERISTICS

Generators: Three - 11,500 Kilowatt

Voltage Characteristics:

Adjusting Range: 11,500 Volts to 13,800 Volts at 60 Hertz

Paralleling Capability: Yes

Voltage Regulator: Yes

Exciter: Rotating Brush Type

Output Power Cable: Yes - 9 ea. single conductor, 15-KV, 50-ft, 1,250 MCM

Safety Features:

(X) Over Voltage Protection

(X) Under Voltage Protection

(X) Short Circuit Protection

(X) Reverse Power Relay

(X) Fault Indicator

() Permissive Paralleling Capability

- (X) Low Lube Oil Indicator
- (X) Overspeed Indicator
- (X) Low Frequency Indicator

Instrumentation:

- (X) Voltmeter
- (X) Ammeter
- (X) Wattmeter
- (X) Frequency Meter
- (X) Varmeter
- (X) Hour Meter
- (X) Synchroscope
- () Percent-Rated-Current Meter
- (X) Bus Voltmeter
- () Pyrometer
- () Percent-Rated-Load Meter

TRANSFORMER/SWITCHGEAR CHARACTERISTICS

Transformer: Two transformers, 20 Megavolt amperes each

Type: Oil Filled

Voltage Taps: Two $\pm 2-1/2\%$, No load taps

Connections: 34.5 Kilovolts, Wye to 12.5 Kilovolts Delta

Power Circuit Breaker: Two-Oil Circuit breakers 34.5-KVA, 3- ϕ , 1500 MVA,
Interrupting Rating:

AUXILIARY ENGINE GENERATORS

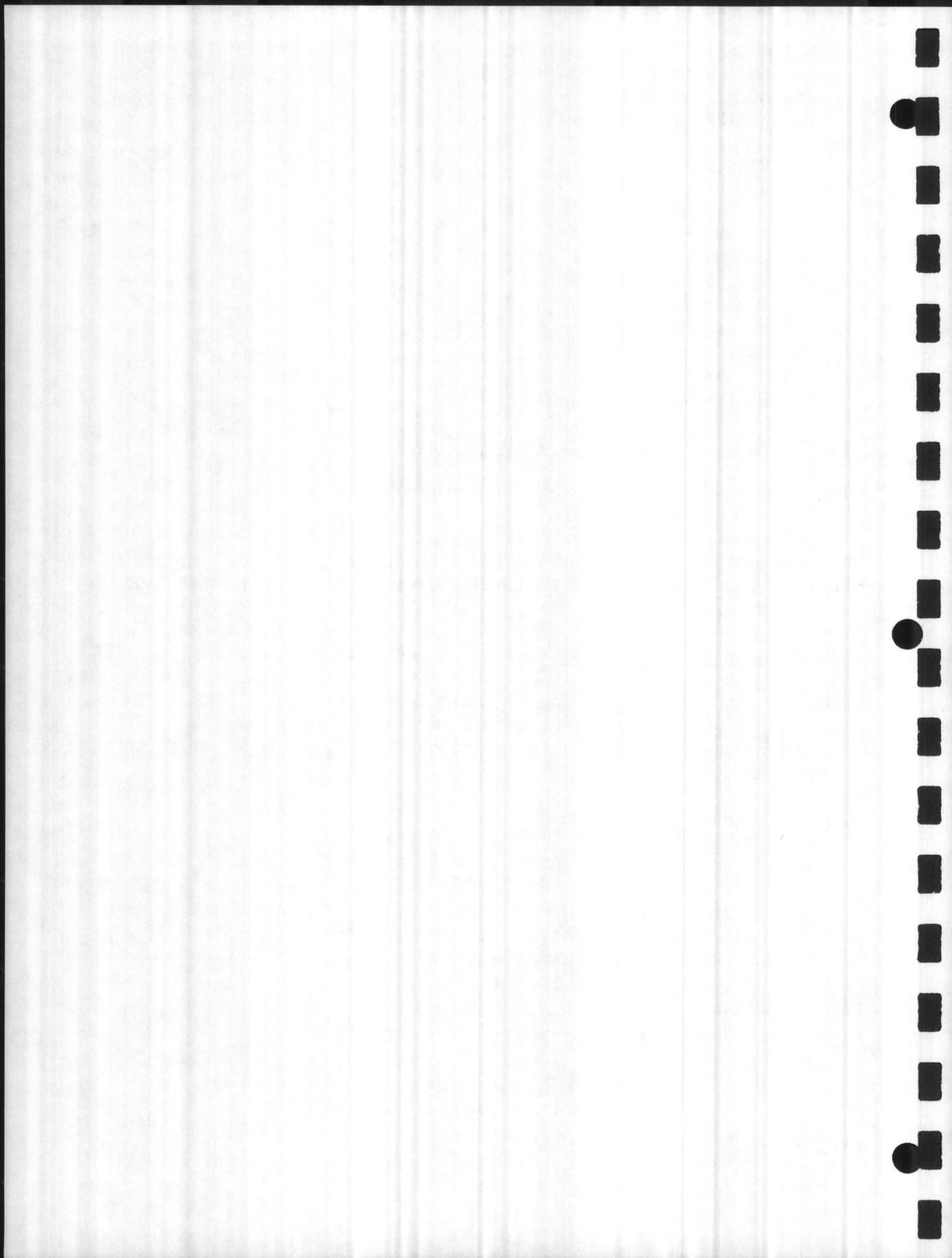
Diesel Engine Rating: Two - 250-KW Diesel Generators, 480-V, 3- ϕ , 60 Hz
One - 15-KW D. C. Emergency Diesel Generator

Starting Systems: Pneumatic for the 250-KW units, and electric for the 15-KW unit

Battery Charging Provisions: Yes

Fuels: Diesel

Fuel Tank Capacity: 9470 gallons



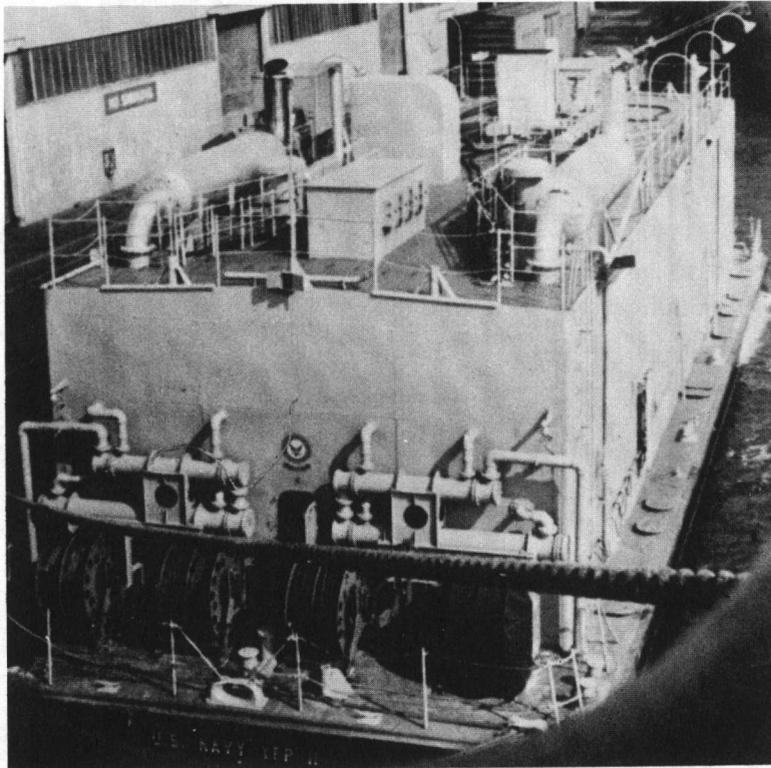


FIGURE 22
YFP-11, Power and Steam Plant

2.2.2.3 YFP-11, 2400 Kilowatt Diesel Driven and 60,000 Pounds per Hour Export Steam, Barge Mounted

GENERAL DATA

System Rating: 2400-KW, 450-V, Wye, 3- ϕ , 60 Hz-500 KVA, 230-V 3- ϕ ,
60 Hz-115/230-V DC and 60,000 Pounds per hour Steam.

Weight: 550 Tons

Dimensions: Length 110 feet, Height 26.5 feet, Width 32 feet

Draft: 7 feet-8 inches (Loaded)

Set-up-time: 80 man-hours

Shore Power Requirements: 110-V, 30-Amp, 1- ϕ , 60 Hz, 2 Wire

Ship-to-Shore Telephone System: Yes

Ambient Operating Temperature Limits (at rated load): +32 $^{\circ}$ F to +125 $^{\circ}$ F

Recommended Operation and Maintenance Crew: 3 men

Personnel Berthing Accommodations: No

Galley Provisions: () Yes, (X) No

Ocean Travel Capability: (X) Yes, () No

Technical Manual(s): Commercial

BOILER CHARACTERISTICS

Fuels: Diesel No. 2

Fuel Consumption: 660 gallons per hour at rated load using # 2 Diesel

Fuel Tank: 17,233 gallons

Water Tank: 65,105 gallons

Softener, 100% Make up Capacity

Chemical Feed System: Yes

Hotwell or Deaerator Capacity: 241 gallons

Export Steam Capability: 60,000 pounds per hour

Export Steam Line: Yes

Boilers and Burners

Circulation: Natural

Thermal Efficiency: 78%

Maximum Working Pressure: 675 P.S.I.

Discharge Pressure Range: 100 P.S.I. to 150 P.S.I.

Ignition:

Electrode - Ignited Gas Pilots

Fuel Atomization: (X) Air, (X) Steam, () Mechanical

Soot Blower: (X) Yes, () No

Controls: (X) Pneumatic, () Electric

Safety Valve Setting: 200 PSIG

Instruments/Alarms:

(X) Low Water Level

(X) High Water Level

(X) Feedwater Temperature

(X) Condensate Flowmeter

(X) High Working Pressure

(X) Export Steam Pressure

(X) Flame Monitor

(X) Fuel Temperature

(X) Fuel Pressure

(X) Control Air Pressure

Manufacturer: Combustion Engineering

Model Nomenclature: Type 'A' Boiler

ENGINE CHARACTERISTICS

Generator Drive: Two Diesel Engine Driven Generators 1200-KW each, 720-RPM

Starting System: Pneumatic

Fuel: Diesel

Fuel Consumption: 200 GPH at rated load using Diesel # 2

Fuel Tank: Same as Boiler

Safety Features:

(X) Low Lube Oil Pressure Indicator

(X) Low Fuel Level Indicator

(X) High Coolant Temperature

(X) Hour Meter

- (X) Pyrometer
- (X) Overspeed Indicator

GENERATOR CHARACTERISTICS

Voltage Adjustment Range: -5% to +15%
Frequency Adjustment Range: -15% to +5%

Droop: 4%

Paralleling Capability: Yes

Voltage Regulator: Static

Exciter: Rotating Brush Type

Output Power Cable: Yes

Safety Features:

- () Over Voltage Protection
- () Under Voltage Protection
- (X) Short Circuit Protection
- (X) Reverse Power Relay
- (X) Fault Indicator
- () Permissive Paralleling Capability
- () Low Frequency Indicator

Instrumentation:

- (X) Voltmeter
- (X) Ammeter
- (X) Wattmeter
- (X) Frequency Meter
- (X) Varmeter
- (X) Synchroscope
- () Percent-Rated-Current Meter
- (X) Bus Voltmeter
- () Percent-Rated-Load Meter

TRANSFORMER/SWITCHGEAR CHARACTERISTICS

Transformer: 500-KVA, 3- ϕ

Type: Dry

Voltage Taps:

Connections: 450 Volts Primary to 230 Volts Secondary

RECTIFIER

Type Rectifier: Two - 300 Kilovolt Amperes

Input: 480 Volts AC, 3- ϕ , 60 Hz

Output: 115/230-V DC, 3 Wire

Instrumentation: (X) D.C. Voltmeter (X) D.C. Ammeter

AUXILIARY ENGINE GENERATORS

Diesel Engine Rating: 250 Kilowatts, 450 Volts

Starting System: Electric

Battery Charging Provisions: Yes

Fuels: Diesel

Fuel Tank Capacity: Same as Boiler

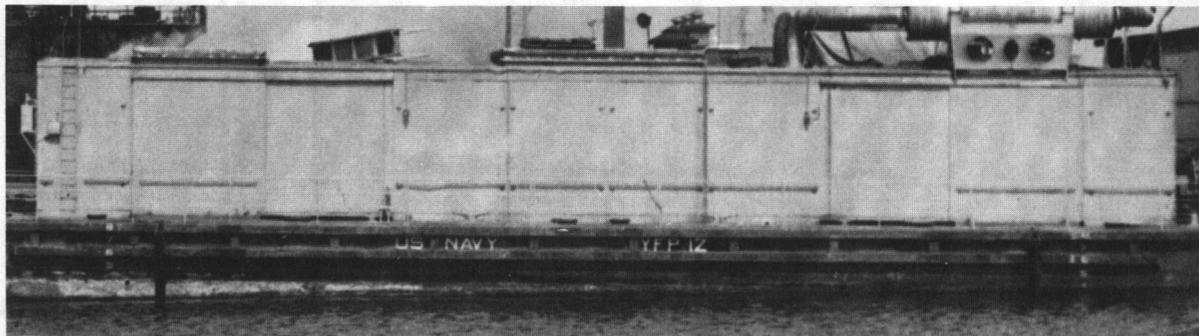


FIGURE 23
YFP-12, Power Plant

2.2.2.4 YFP-12, 2400 Kilowatt, Diesel Driven, Barge Mounted

GENERAL DATA

System Rating: 2400-KW, 450-V, Wye, 3- ϕ , 60 Hz

Weight: 550 Tons

Dimensions: Length 110 feet, Height 22 feet, Width 32 feet

Draft: 4 feet (Loaded)

Set-up-time: 80 man-hours

Shore Power Requirements: 120/240-V, 60 Amp, 1- ϕ , 60 Hz, 3 Wire

Ship-to-Shore Telephone System: None

Ambient Operating Temperature Limits (at rated load): +32 F to +125 F

Recommended Operation and Maintenance Crew: 2 men

Personnel Berthing Accommodations: None

Galley Provisions: () Yes, (X) No

Technical Manual(s): Commercial

ENGINE CHARACTERISTICS

Generator Drive: Two-Diesel Engine Driven Generators 1200-KW each, 900 RPM

Starting System: Pneumatic

Fuel: Diesel

Fuel Consumption: 200 GPH at rated load using Diesel #2

Fuel Tank: 2000 gallons

Safety Features:

- (X) Low Lube Oil Pressure Indicator
- (X) Low Fuel Level Indicator
- (X) High Coolant Temperature
- (X) Overspeed Indicator
- (X) Hour Meter
- (X) Pyrometer

GENERATOR CHARACTERISTICS

Voltage Adjustment Range: -5% to +15%

Frequency Adjustment Range: -15% to +5%

Droop: 4%

Paralleling Capability: Yes

Voltage Regulator: Static

Exciter: Rotating Brush Type

Output Power Cable: Yes

Safety Features:

- Over Voltage Protection
- Under Voltage Protection
- Short Circuit Protection
- Reverse Power Relay
- Fault Indicator
- Permissive Paralleling Capability
- Low Frequency Indicator

Instrumentation:

- Voltmeter
- Ammeter
- Wattmeter
- Frequency Meter
- Varmeter
- Synchroscope
- Percent-Rated-Current Meter
- Bus Voltmeter
- Percent-Rated-Load Meter



FIGURE 24
Power Train, 10,000 Kilowatts

2.1.3 10,000 Kilowatt, Power Plant, Railway Mounted

GENERAL DATA

System Rating: 10,000-KW, 13,800-V, Delta, 3- ϕ , 60-Hz

Weights and Dimensions:

Boiler Car:	Length 89'5"	Height 15'3"	Width 10'2"	Tons 195
Turbine Car:	Length 86'1"	Height 15'3"	Width 10'2"	Tons 237
Switchgear Car:	Length 63'6"	Height 15'11"	Width 10'2"	Tons 71
Transformer Car:	Length 59'8"	Height 15'3"	Width 10'2"	Tons 89
Box Car:	Length 54'0"	Height 15'0"	Width 10'7-1/2"	Tons 41
Gondola Car:	Length 53'7-1/4"	Height 14'8"	Width 10'0"	Tons 53

Site Restrictions:

Train Axle Load:

55,000 lb. per axle track supported required.

Straight and level track required for spotting, 386 ft. minimum

Requires periodical check for track settling.

Set up distances limitation (max):

Transformer Car to Load Connection	250 ft.
Transformer Car to Switchgear Car	1000 ft.
Turbine Car to Circulating Water Supply	250 ft.
Fuel Oil Supply to farthest Tank Car	200 ft.
Raw Water Supply	500 ft.

Set-up-time: 1000 Man-hours

Shore Utilities Requirements:

Water: Circulating Cooling Water 7500 gallons per minute

Power: Lighting 120/240-V, 60 Amp, 1- ϕ , 60 Hz, 3 Wire
Equipment 480-V, 400 Amp, 3- ϕ , 60 Hz

Fuel Connection: 2-1/2 inches in five-20 feet sections

Manufacturer: General Electric

Tank Capacities (Approximate):

Bunker C Oil (Bunker Car) 1200 gallon

No. 3 Oil (Boiler Car) 400 gallon

No. 3 Oil (Switchgear Car) 280 gallon

Distilled Water (Boiler Car) 800 gallon

Drinking Water (Switchgear Car) . . . 159 gallon

Internal Telephone System Provided

Manual: GE1-18513 (Commercial)

Volume I - Setting-up, Operation and Maintenance of Plant.

Volume II - Description, Operation and Maintenance of Associated Equipment.

Volume III - Supplementary Instructions for Associated Equipment.

Volume IV - Supplementary Instructions for Associated Equipment.

Fuel Consumption

Heavy Fuel Oil (Bunker C or Navy Special)

10,000 KW 1,200 gallons per hour

Light Oil (No. 3 or Diesel Fuel)

Train Heating Boiler (at 1500 lb per hr) 15 gallons per hour

Diesel Engines (at 30 KW) 2 gallons per hour.

BOILER CAR:

Rating: 140,000 lb steam/hr at 600 PSI, 825° F

Manufacturer: Babcock & Wilcox Company

Type: Water Tube Natural Circulation

Burners: Five - Steam/Air Atomizing

Maximum Working Pressure: 675 PSIG

Boiler Relief Valve Setting: 650 PSIG

Super Heater Relief Valve Setting: 585 PSIG

Soot Blowers: Yes

Controls: Pneumatic

Ignition: Torch

Instrumentation:

(X) Low Water Level

(X) High Water Level

(X) Indicator Temp

(X) Steam Drum Pressure

(X) Fuel Oil Pressure

TURBINE CAR

Main Generating Unit:

10,000 KW, 14 Stage, 3600 RPM Turbine Connected to 12,500 KVA,
13,800 Volt, Delta, 3-Phase, 60 Hertz generator.

Evaporator Rated 7,000 lb of raw water per hour.

Auxiliary 350 Kilowatt, 480 Volt, 3 Phase, generator for pumps during start.

SWITCHGEAR CAR

Consists of:

Oil Circuit Breaker, Rated 15,000 Volt, 12,000 Ampere, 500 Megavolt-Ampere
Interrupting Capacity

Auxiliary Power Transformer, 450 Kilovolt-Ampere, 13,800 to 420 Volt,
3 Phase.

Diesel Engine-Generator, 50 Kilowatt, 60 Hertz, 480 Volt.

TRANSFORMER CAR

Contains:

Transformer: 12,500 Kilovolt-Ampere and Installation Cabling

Cooling System: Forced Air

Type: Oil Filled

High Voltage Taps: Two $\pm 2-1/2\%$, above and below

Connections and Ratings:

13,200 Volt Delta to 11,500 Volt Delta, 12,500 Kilovolt-Ampere

13,200 Volt Delta to 2400/4160 Volt, Wye, 12,500 Kilovolt-Ampere

13,200 Volt Delta to 2400 Volt Delta, 12,500 Kilovolt-Ampere

11,500 Volt Delta to 2400/4160 Volt, Wye, 12,500 Kilovolt-Ampere

11,500 Volt Delta to 2400 Volt Delta, 12,500 Kilovolt-Ampere

Impedance: 0.67%

Instrumentation:

(X) Oil Level Gage

(X) Pressure Vacuum Gage

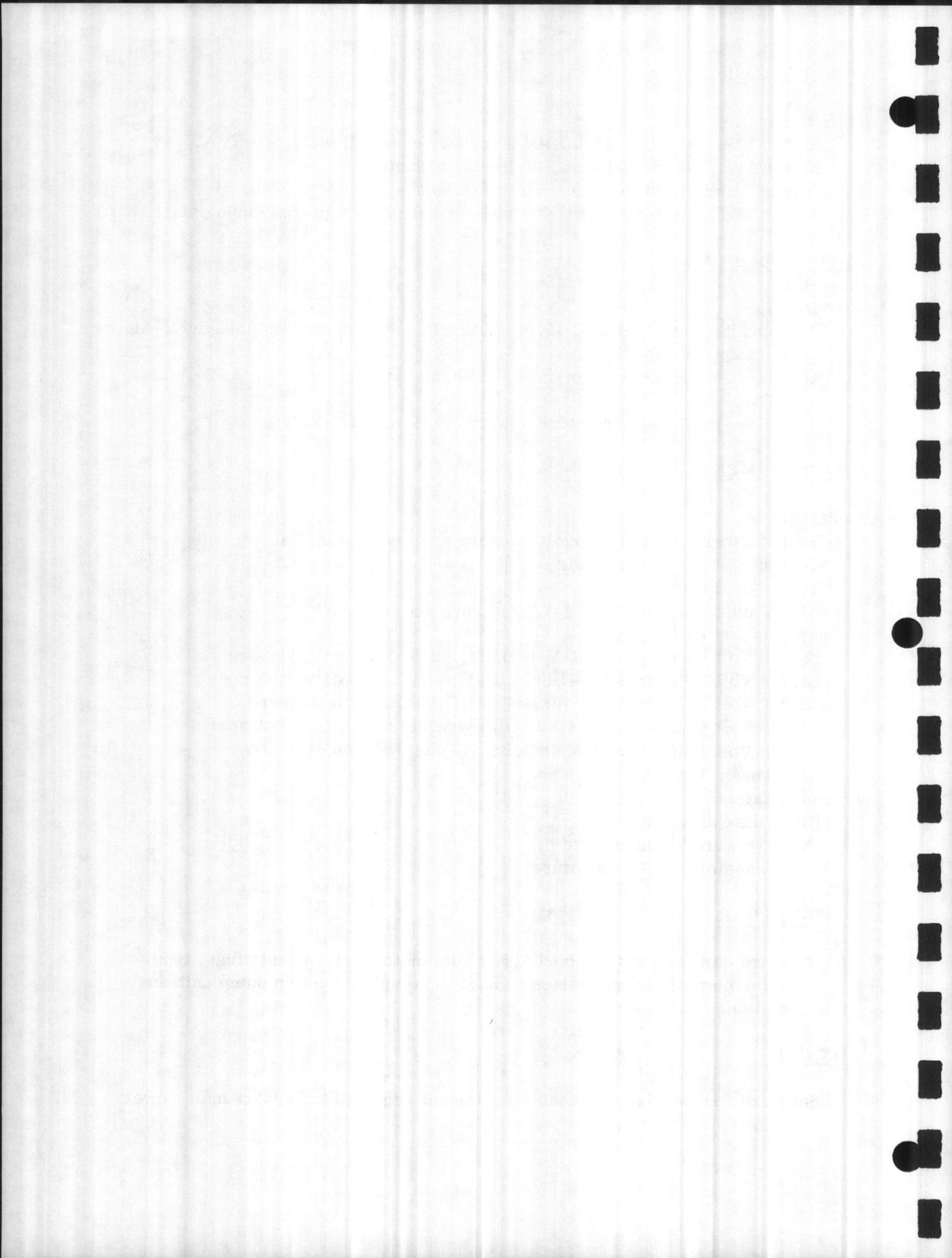
(X) Transformer Temperature

GONDOLA CAR

Standard car used to transport 7,500 gpm motor-driven centrifugal type
water pump and accessories to make a complete suction pump unit for
cooling.

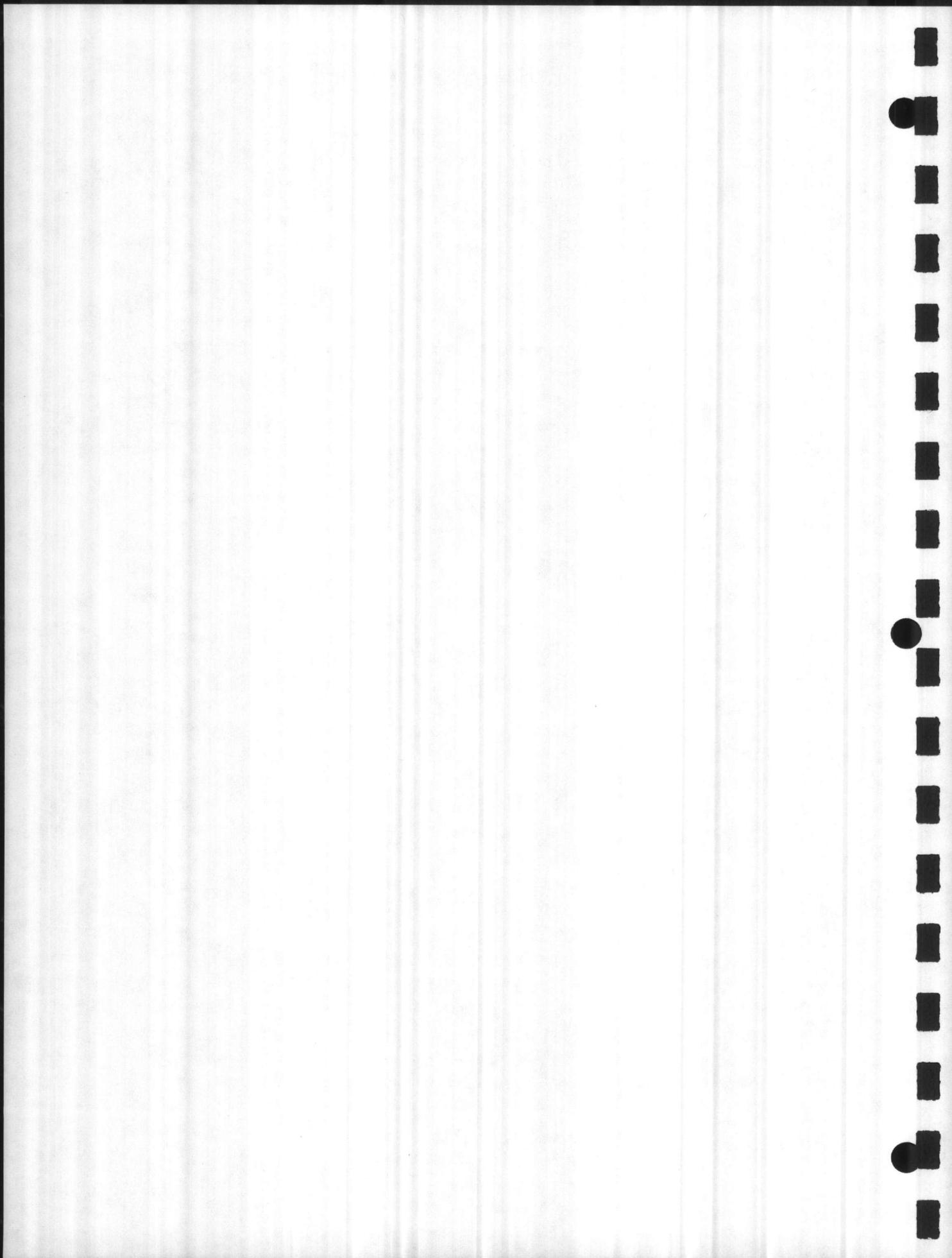
BOX CAR

Standard car carries detachable equipment required to support main power
plant.



Section 3. TRANSFORMERS AND SUBSTATIONS

2.3.0 GENERAL. MUSE transformers and substations are designed to support a variety of power requirements. These units are mounted on skids or trailers for maximum mobility and are of weatherproof design for out door use. The units range in size from 300 to 12,500 kilovolt-Amperes.



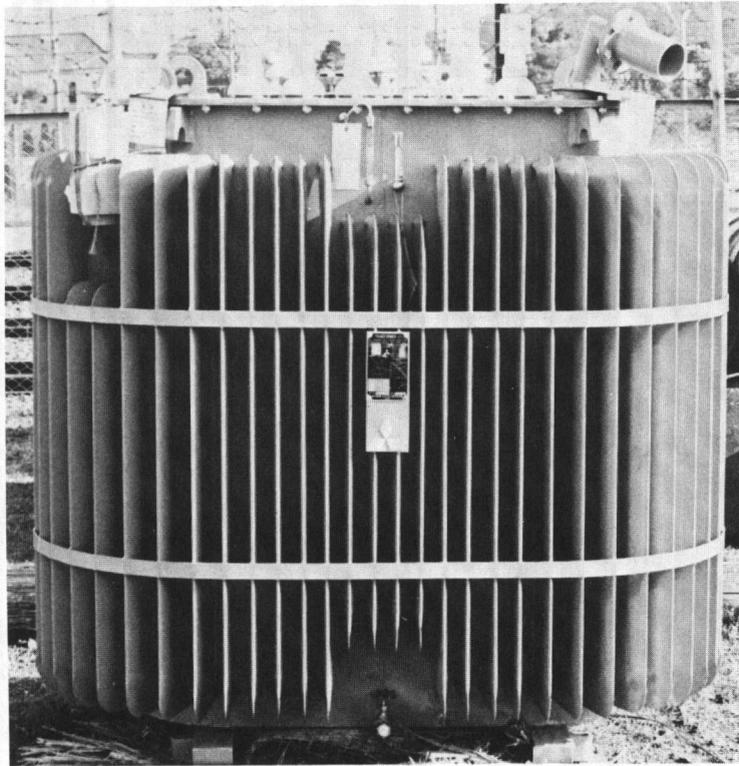


FIGURE 25
Transformer, 500 Kilovolt-Amperes

2.3.1 500 Kilovolt-Ampere, Transformer, Skid Mounted

GENERAL DATA

System Rating: 500-KVA, 3150-V, 230 X 460-V, 3- ϕ , 60 Hz

Weight: 5950 Pounds

Dimensions: Length 5'-10", Width 3'-6", Height: 6'-3"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 4 man-hours

Ambient Operating Temperature Limits (at rated load): -25° F to +125° F

Cooling System: Convection

Monitoring Requirements (normal operating conditions);

1 - man, 24 - hour Intervals, Roving Watch

Lightning Arrestors: () Yes, (X) No

Manufacturer: Mitsubishi Electric

Model Nomenclature:

Technical Manual(s): Commercial

ELECTRICAL DATA

Transformer: Mitsubishi Electric

Type: Oil Filled

High Voltage Taps: Two - 5% Above and Below

Connections: 3150-Volt, Wye to 460-Volt, Delta
3150-Volt, Wye to 230-Volt, Delta

Instrumentation:

- Ammeter
- High Voltage Line Voltmeter
- Secondary Voltage Voltmeter
- Watt Meter
- Watt-Hour Meter
- Oil Level Gage
- Pressure Vacuum Gage
- Transformer Temperature

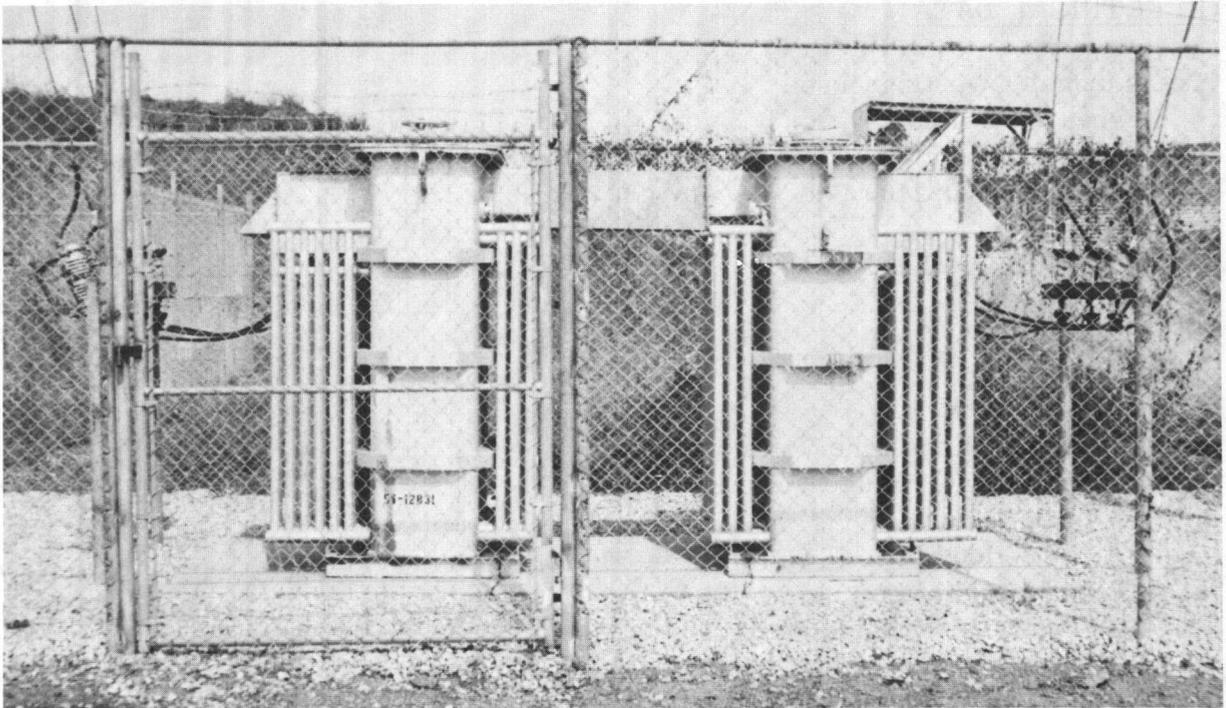


FIGURE 26
Transformers, 750-Kilovolt-Amperes

2.3.2 Transformer , 750 Kilovolt-Ampere, Skid Mounted

GENERAL DATA

System Rating: 750-KVA, 4160/2400-V, 480-V, 3- ϕ , 60 Hz

Weight: 11,900 Pounds

Dimensions: Length 6'-0", Width 5'-0", Height 9'-0"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 4 man-hours

Ambient Operating Temperature Limits (at rated load): -25° F to +125° F

Cooling System: Convection

Monitoring Requirements (normal operating conditions):

- 1 - man, 24 - hour Interval, Roving Watch

Shore Power Requirements: None

Lightning Arrestors: () Yes, (X) No

Manufacturer: Westinghouse

Technical Manual(s): Commercial

ELECTRICAL DATA

Transformer: Westinghouse

Type: Oil Filled

High Voltage Taps: Two - 2-1/2% above and below

Connections: 4160/2400 Volt, Wye to 480 Volt

Impedance:

Power Circuit Breaker: None

Switch:

Type: None

Instrumentation:

- () Ammeter
- () High Voltage Line Voltmeter
- () Secondary Voltage Voltmeter
- () Watt Meter
- () Watt-Hour Meter
- (X) Oil Level Gage
- (X) Pressure Vacuum Gage
- (X) Transformer Temperature



FIGURE 27
Substation, 2000 Kilovolt-Amperes

2.3.3.1 Substation, 2000 Kilovolt-Amperes, Trailer Mounted

GENERAL DATA

System Rating: 2000 KVA, 13,800/7620 X 11,500/6640-V, 4160 X 2400-V,
480/277 X 240/138 X 208/120-V, 3- ϕ , 60 Hz

Weight: 42,000 Pounds

Dimensions: Length 25'-7", Width 8'-0", Height 12'-2"

Transportability: Truck, Railcar, Ship, Aircraft

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 32 man-hours

Ambient Operating Temperature Limits (at rated load): -25° F to +125° F

Cooling System: Forced Air

Monitoring Requirements (normal operating conditions):

- 1 - man, 8 - hour Interval, Roving Watch

Shore Power Requirements: 240/120-V, 50-Amp, 1- ϕ , 3 Wire for station services,
120-V, 20-Amp, 1- ϕ , 2 Wire for heaters or from substation feeders.

Lightning Arrestors: (X) Yes, () No
Manufacturer: Delta Switchboard Co.
Technical Manual(s): (NAVFAC) P-8-317.7

ELECTRICAL DATA

Transformer: H.K. Porter

Type: Oil Filled

High Voltage Taps: Two - 2-1/2% above and below

Connections:

13,200/7620 X 11,500/6640-V, Wye to 4160 X 2400-V, Delta, 2000 KVA

13,200/7620 X 11,500/6640-V, Wye to 480/277-V, Wye, 2000-KVA

13,200/7620 X 11,500/6640-V, Wye to 240/138-V, Wye, 1000-KVA

13,200/7620 X 11,600/6640-V, Wye to 208/120-V, Wye, 1000-KVA

4160 X 2400-V, Delta to 480/277-V, Wye, 2000 KVA

4160 X 2400-V, Delta to 240/138-V, Wye, 1000 KVA

4160 X 2400-V, Delta to 208/120-V, Wye, 1000 KVA

Power Circuit Breakers: Quantity 2 ea 600-V, 1600-Amp

Quantity 2 ea 600-V, 600 Amp

Switch:

Type: Load Breaker

Capacity: 600 Amp

Voltage Rating: 13.8 KV

Connection(s): Primary or Intermediate

Instrumentation:

(X) Ammeter

(X) High Voltage Line Voltmeter

(X) Intermediate Voltage Voltmeter

(X) Low Voltage Voltmeter

(X) Watt Meter

(X) Watthour Meter

(X) Oil Level Gage

(X) Pressure Vacuum Gage

(X) Transformer Temperature



FIGURE 28
Substation, 2000 Kilovolt-Amperes

2.3.3.2 Substation, 2000 Kilovolt-Amperes, Trailer Mounted

GENERAL DATA

System Rating: 2000-KVA, 13,800 X 11,500-V, 4160 X 2400-V, 480/277 X
240/138 X 208/120-V, 3- ϕ , 60 Hz

Weight: 43,540 Pounds

Dimensions: Length 35'-2", Width 8'-0", Height 12'-6"

Transportability: Railcar, Ship, Truck

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 32 man-hours

Ambient Operating Temperature Limits (at rated load): -25° F to +125° F

Cooling System: Forced Air and Oil

Monitoring Requirements (normal operating conditions):

1 - man, 8 - hour Interval, Roving Watch

Shore Power Requirements: 120-V, 30-Amp, 1- ϕ , 2 Wire or from substation feeders.

Lightning Arrestors: (X) Yes () No
Manufacturer: Golden Gate Switchboard Co.
Technical Manual(s): (NAVFAC) P-8-317.3

ELECTRICAL DATA

Transformer: Standard Transformer Co.

Type: Oil filled

High Voltage Taps: Two - 2-1/2% above and below

Connections and Ratings:

13,800 X 11,500 Volt Delta to 4160 X 2400 Volt Delta, 2000 KVA

13,800 X 11,500 Volt Delta to 480/277 Volt Wye, 2000 KVA

13,800 X 11,500 Volt Delta to 240/138 Volt Wye, 1000 KVA

13,800 X 11,500 Volt Delta to 208/120 Volt Wye, 1000 KVA

4160 X 2400 Volt Delta to 480/277 Volt Wye, 2000 KVA

4160 X 2400 Volt Delta to 240/138 Volt Wye, 1000 KVA

4160 X 2400 Volt Delta to 208/120 Volt Wye, 1000 KVA

Transformer Impedance: % at 2000 KVA

Power Circuit Breakers: quantity 6 ea 600 Volt, 400 - 750-Amps

Trip (Adjustable)

Switch:

Type: Load Break

Capacity: 600 Amperes

Voltage Rating: 13.2 Kilovolt

Connection(s): Primary or Intermediate

Instrumentation:

(X) Ammeter

(X) High Voltage Line Voltmeter

(X) Intermediate Voltage Voltmeter

(X) Low Voltage Voltmeter

(X) Watt Meter

(X) Watt-Hour Meter

(X) Oil Level Gage

(X) Pressure Vacuum Gage

(X) Transformer Temperature



FIGURE 29
Substation, 2000 Kilovolt-Amperes

2.3.3.3 Substation, 2000 Kilovolt-Ampere, Semi-Trailer Mounted

GENERAL DATA

System Rating: 2000-KVA, 13,800 X 11,500 X 4160 X 2400-V, 480/277 X 240/138 X
208/120-V, 3- ϕ , 60 Hz

Weight: 37,950 Pounds

Dimensions: Length 32'-6", Width 8'-0", Height 12'-9"

Transportability: Railcar, Ship, Truck

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 32 man-hours

Ambient Operating Temperature Limits (at rated load): -25°F to +125°F

Cooling System: Forced Air and Oil

Monitoring Requirements (normal operating conditions):

1 - man, 8 - hour Interval, Roving Watch

Shore Power Requirements: 120-V, 30-Amp, 1- ϕ , 2 Wire or from substation feeders.

Lightning Arrestors: (X) Yes () No

Manufacturer: Golden Gate Switchboard Co.
Technical Manual(s): (NAVFAC) P-8-317.4

ELECTRICAL DATA

Transformer: Standard Transformer Co.

Type: Oil Filled

High Voltage Taps: Two-2-1/2% above and below

Connections and Ratings:

13,800 X 11,500 X 4160 X 2400-V, Delta to 480/277-V Wye, 2000 KVA

13,800 X 11,500 X 4160 X 2400-V, Delta to 240/138-V Wye, 1000 KVA

13,800 X 11,500 X 4160 X 2400-V, Delta to 208/120-V Wye, 1000 KVA

Transformer Impedance: 7.0% at 2000 KVA

Power Circuit Breakers: Quantity - Six ea. - 600 V, 400 - 750

Ampere Trip (Adjustable)

Switch:

Type: Load Break

Capacity: 600 Ampere

Voltage Rating: 13.2 Kilovolt

Connection(s): Primary

Instrumentation:

- (X) Ammeter
- (X) High Voltage Line Voltmeter
- (X) Low Voltage Voltmeter
- (X) Watt Meter
- (X) Watt-Hour Meter
- (X) Oil Level Gage
- (X) Pressure-Vacuum Gage
- (X) Transformer Temperature

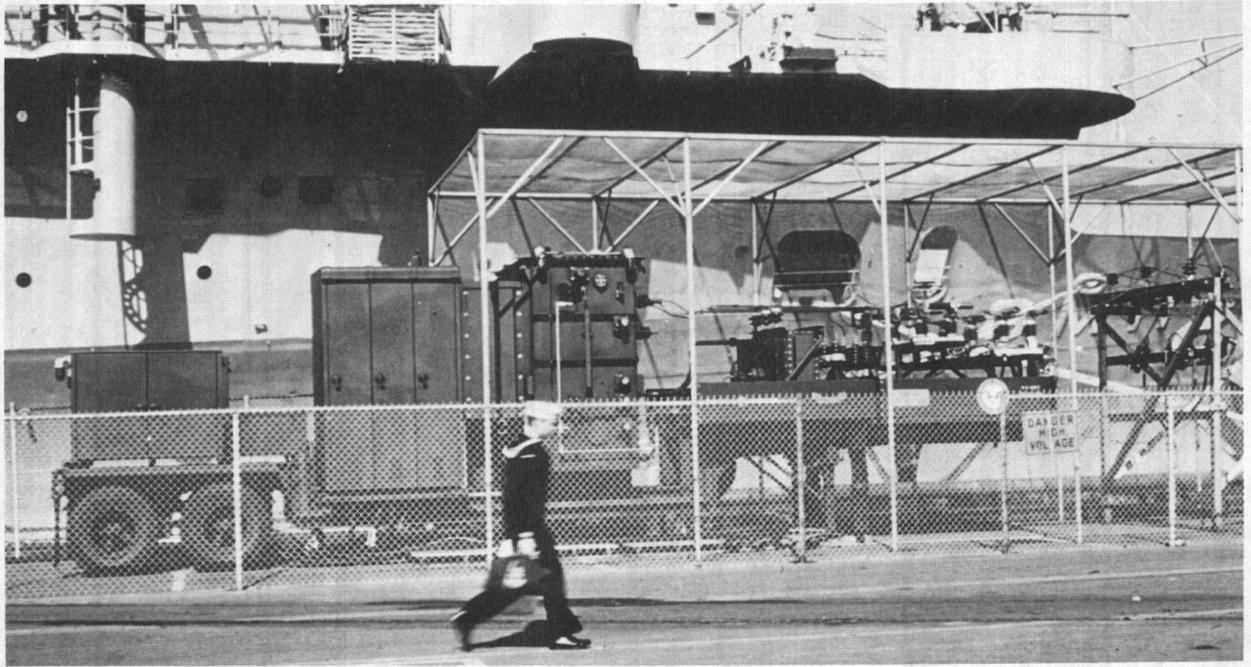


FIGURE 30
Substation, 2000 Kilovolt-Amperes

2.3.3.4 Substation, 2000 Kilovolt-Ampere, Semi-Trailer Mounted

GENERAL DATA

System Rating: 2000-KVA, 13,800 X 11,500-V, 4160 X 2400-V, 480/277 X 240/138 X
208/120-V, 3- ϕ , 60 Hz

Weight: 41,345 Pounds

Dimensions: Length 41'-0", Width 8'-0", Height 12'-6"

Transportability: Railcar, Ship, Truck

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 32 man-hours

Ambient Operating Temperature Limits (at rated load): -25°F to +125°F

Cooling System: Forced Air and Oil

Monitoring Requirements (normal operating conditions):

- 1 - man, 8 - hour Interval, Roving Watch

Shore Power Requirements: 240/120-V, 60 Amp, 1- ϕ , 3 Wire or from substation feeder.

Lightning Arrestors: (X) Yes, () No

Manufacturer: General Electric Co.

Technical Manual(s): (NAVFAC) P-8-317.2

ELECTRICAL DATA

Transformer: General Electric

Type: Oil Filled

High Voltage Taps: Two - 2-1/2% above and below

Connections and Ratings:

13,800 X 11,500-V Delta to 4160 X 2400-V Delta, 2000 KVA

13,800 X 11,500-V Delta to 480/277-V, Wye, 2000 KVA

13,800 X 11,500-V Delta to 240/138-V, Wye, 1000 KVA

13,800 X 11,500-V Delta to 208/120-V, Wye, 1000 KVA

4160 X 2400-V Delta to 480/277-V, Wye, 2000 KVA

4160 X 2400-V Delta to 240/138-V, Wye, 1000 KVA

4160 X 2400-V Delta to 208/120-V, Wye, 1000 KVA

Transformer Impedance:

Power Circuit Breakers: Quantity: Six ea. - 600-V, 600-Ampere Trip

Switch:

Type: Load Break

Capacity: 600 Ampere

Voltage Rating: 13.8 Kilovolt

Connection(s): Primary or Intermediate

Instrumentation

(X) Ammeter

(X) High Voltage Line Voltmeter

(X) Intermediate Voltage Voltmeter

(X) Low Voltage Voltmeter

(X) Watt-Hour Meter

(X) Oil Level Gage

(X) Pressure-Vacuum Gage

(X) Transformer Temperature

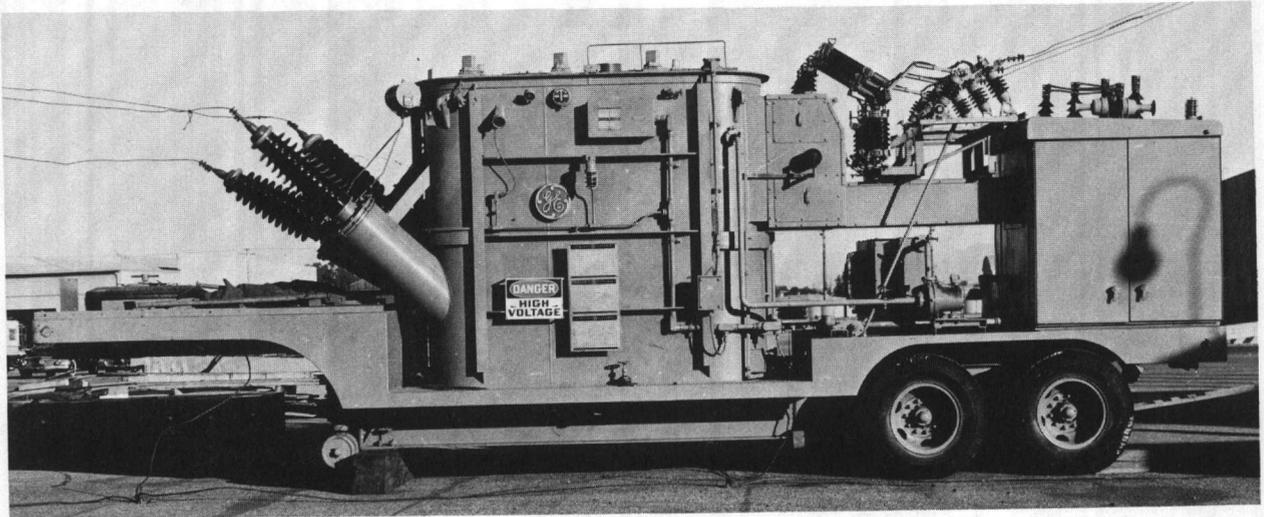


FIGURE 31
Substation, 2500 Kilovolt-Amperes

2.3.4 Substation, 2500 Kilovolt-Ampere, Trailer Mounted

GENERAL DATA

System Rating: 2500-KVA, 116,000/67,000-V, 12,470/7200 X 4160/2400-V, 2400-V,
12,470-V, 3- ϕ , 60-Hz

Weight: 57,700 Pounds

Dimensions: Length 34'-10", Width 8'-0", Height 12'-3"

Transportability: Railcar, Ship, Truck

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachment

Site Restrictions: Level

Set-up-time: 60 man-hour

Ambient Operating Temperature Limits (at rated load): -25°F to +125°F

Cooling System: Forced Air and Oil

Monitoring Requirements (normal operating conditions):

- 1 - man, 8 - hour Interval, Roving Watch

Shore Power Requirements: From Substation Feeder

Lightning Arrestor: (X) Yes, () No

Manufacturer: General Electric

Technical Manual(s): Commercial

ELECTRICAL DATA

Transformer: General Electric

Type: Oil Filled

Voltage Taps: Three - 2-1/2% above and below on high voltage winding, Two - 2-1/2% above and below on the other two windings

Connections:

116,000/67,000-V, Wye to 12,470-V, Delta, 1000-KVA
116,000/67,000-V, Wye to 12,470/7200-V, Wye, 2500-KVA
116,000/67,000-V, Wye to 7200-V, Delta, 2500-KVA
116,000/67,000-V, Wye to 4160/2400-V, Wye, 2500-KVA
116,000/67,000-V, Wye to 2400-V, Delta, 2500-KVA
67,000-V, Delta to 12,470-V, Delta, 1000-KVA
67,000-V, Delta to 12,470/7200-V, Wye, 2500-KVA
67,000-V, Delta to 7200-V, Delta, 2500-KVA
67,000-V, Delta to 4160/2400-V, Wye, 2500-KVA
67,000-V, Delta to 2400-V, Delta, 2500-KVA
12,470/7200-V, Wye to 12,470-V, Delta, 1000-KVA
7200-V, Delta to 12,470-V, Delta, 1000-KVA
4160/2400-V, Wye to 12,470-V, Delta, 1000-KVA
2400-V, Delta to 12,470-V, Delta, 1000-KVA

Impedance:

Power Circuit Breakers: Quantity 1 each 150-KV, 1200-Amp
Connectable to: Low Voltage Windings

Switch:

Type: Disconnect
Capacity: 600 Amp
Voltage Rating: 15 KV
Connection(s): Secondary

Instrumentation:

Ammeter
 High Voltage Line Voltmeter
 Intermediate Voltage Voltmeter
 Low Voltage Voltmeter
 Watt Meter
 Watt-Hour Meter
 Oil Level Gage
 Pressure-Vacuum Gage
 Transformer Temperature

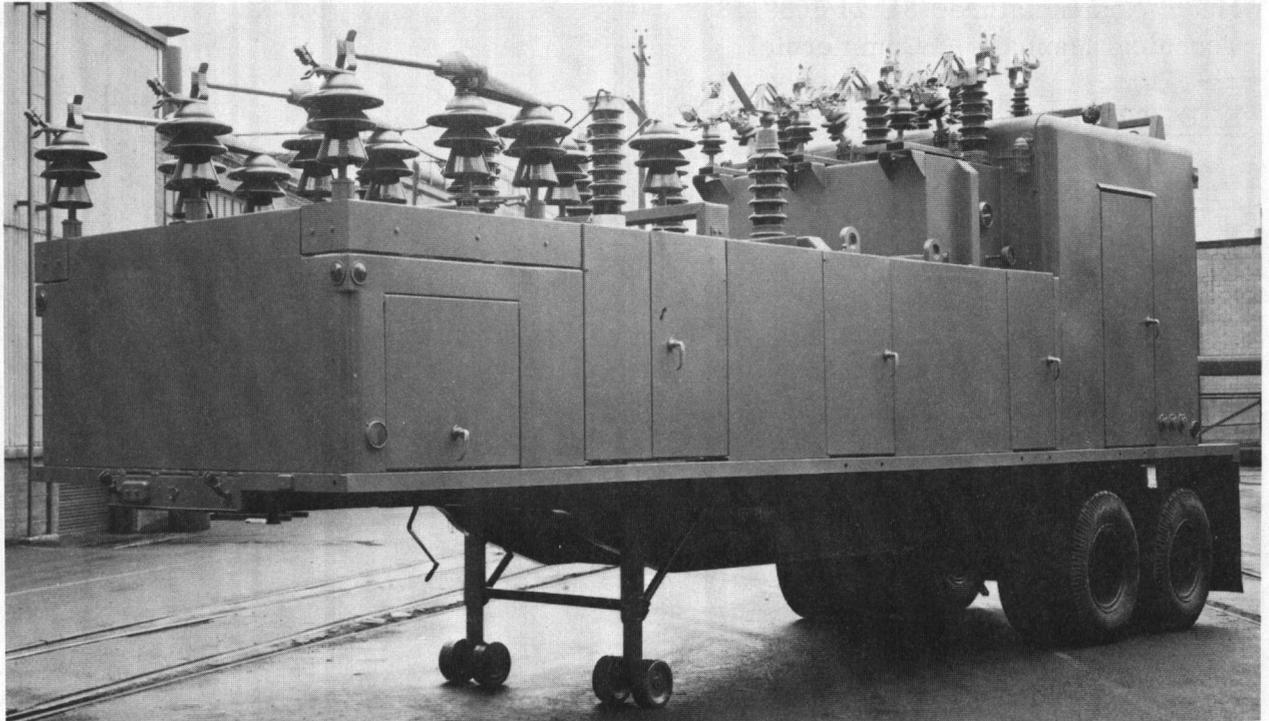


FIGURE 32
Substation, 3000 Kilovolt-Amperes

2.3.5 Substation, 3000 Kilovolt-Ampere, Trailer Mounted

GENERAL DATA

System Rating: 3000 KVA, 44,000 X 33,000 X 22,000-V, 13,200/7620-V,
12,470/7200 X 4160/2400-V, 3- ϕ , 60 Hz

Weight: 51,000 Pounds

Dimensions: Length 30'-0", Width 8'-0", Height 11'-3"

Transportability: Railcar, Ship, Truck

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 32 man-hours

Ambient Operating Temperature Limits (at rated load): -25°F to +100°F

Cooling System: Forced Air & Oil

Monitoring Requirements (normal operating conditions):

- 1 - man, 8 - hour Interval, Roving Watch

Shore Power Requirements: None

Lightning Arrestors: (X) Yes, () No

Manufacturer: Westinghouse Electric Corp.

Model Nomenclature: 8U 24 5068158
Technical Manual(s): Commercial

ELECTRICAL DATA

Transformer: Westinghouse Manufacturing Co.

Type: Oil Filled

High Voltage Taps:

Connections and Ratings:

44,000 X 33,000 X 22,000-V, Delta to 13,200/7620-V, Wye,

44,000 X 33,000 X 22,000-V, Delta to 12,470/7200 X 4160/2400-V, Wye,

13,200/7620-V, Wye to 12,470/7200 X 4160/2400-V, Wye

Transformer Impedance:

Power Circuit Breakers:

Switch:

Type:

Capacity:

Voltage Rating:

Connection(s):

Instrumentation:

- () Ammeter
- () High Voltage Voltmeter
- () Intermediate Voltage Voltmeter
- () Low Voltage Voltmeter
- () Watt Meter
- () Watt-Hour Meter
- () Oil Level Gage
- () Pressure Vacuum Gage
- () Transformer Temperature



FIGURE 33
Substation, 3750 Kilovolt-Amperes

2.3.6 Substation, 3750 Kilovolt-Ampere, Skid Mounted

GENERAL DATA

System Rating: 3750-KVA, 13,200/7620, 4160-V, 3- ϕ , 60 Hz

Weight: 35,400 Pounds

Dimensions: Length 21'-6", Width 6'-9", Height 10'-0"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- () Forklifting Provisions
- (X) Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 40-man-hours

Ambient Operating Temperature Limits (at rated load): -25° F to +125° F

Cooling System: Forced Air

Monitoring Requirements (normal operating conditions):

- 1 - man, 8 - hour Interval, Roving Watch

Shore Power Requirements: From Substation Feeders

Lightning Arrestors: (X) Yes, () No

Manufacturer: Golden Gate Switchboard Co.

Technical Manual: (NAVFAC) P-8-317.5

ELECTRICAL DATA

Transformer: HK Porter

Type: Oil Filled

High Voltage Taps: Two - 2-1/2% above and below

Connections: 13,200/7620-V, Wye to 4160-V, Delta

Transformer Impedance:

Power Circuit Breakers:

Quantity 1 ea 13,800 Volt, 1200 Ampere, Primary connection

Quantity 1 ea 4,160 Volt, 1200 Ampere, Secondary connection

Switch:

Type: Disconnect

Capacity: 600 Ampere

Voltage Rating: 5000 Volt

Connection(s): Secondary

Instrumentation:

Ammeter

High Voltage Voltmeter

Secondary Voltage Voltmeter

Watt Meter

Watt-Hour Meter

Oil Level Gage

Pressure Vacuum Gage

Transformer Temperature

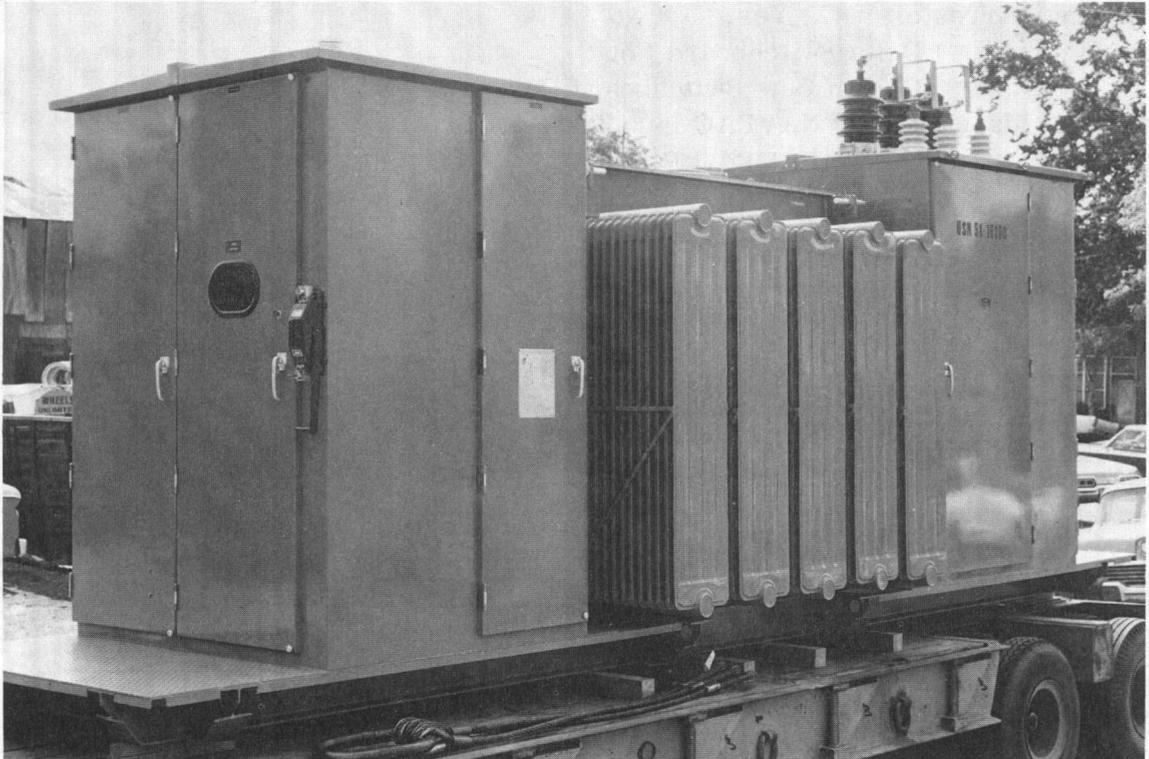


FIGURE 34
Substation, 5000 Kilovolt-Amperes

2.3.7 Substation, 5000 Kilovolt-Ampere, Skid Mounted

GENERAL DATA

System Rating: 5000-KVA, 13,200/7620-V, 4160-V, 3- ϕ , 60 Hz

Weight: *36,000 Pounds **36,300 Pounds

Dimensions: *Length 24'-0", Width 7'-4", Height 8'-3"

**Length 22'-7", Width 7'-4", Height 10'-0"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- () Forklifting Provisions
- (X) Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 40 man-hours

Ambient Operating Temperature Limits (at rated load): -25° F to +125° F

Cooling System: *Natural ** Forced Air

Monitoring Requirements (normal operating conditions):

1 - man, 8 - hour Interval, Roving Watch

Shore Power Requirements: From Substation Feeders

Lightning Arrestors: (X) Yes, () No
Manufacturer: *Delta Switchboard Co.
**Golden Gate Switchboard Co.
Technical Manual(s): *NAVFAC P-8-317.6
**NAVFAC P-8-317.5

ELECTRICAL DATA

Transformer: H. K. Porter

Type: Oil Filled

High Voltage Taps: Two - 2-1/2% above and below

Connections: 13,200/7620-V, Wye to 4160-V, Delta

Transformer Impedance:

Power Circuit Breakers:

Quantity 1 ea 13,800 Volt, 1200 Ampere, Primary connection

Quantity 1 ea 4,160 Volt, 1200 Ampere, Secondary connection

Switch:

Type: Disconnect

Capacity: 600 Ampere

Voltage Rating: 5000 Volt

Connection(s): Secondary

Instrumentation:

(X) Ammeter

(X) High Voltage Line Voltmeter

(X) Secondary Voltage Voltmeter

() Watt Meter

(X) Watt-Hour Meter

(X) Oil Level Gage

(X) Pressure Vacuum Gage

(X) Transformer Temperature

* Peculiar to Unit Manufactured by Delta Switchboard Co.

** Peculiar to Unit Manufactured by Golden Gate Switchboard Co.

No Asterisk Indicates Specifications Common to Both Units

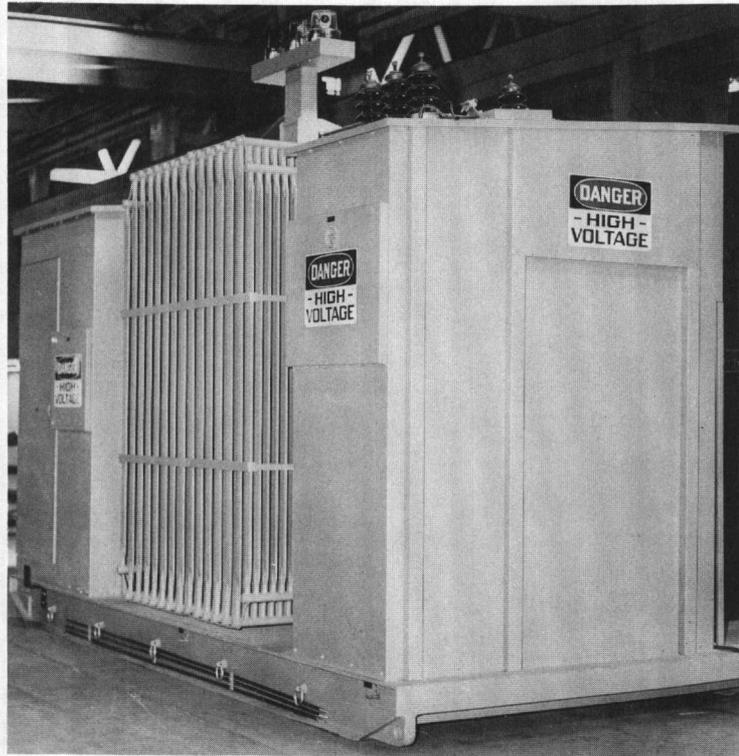


FIGURE 35
Substation, 7500 Kilovolt-Amperes

2.3.8 Substation, 7500 Kilovolt-Ampere, Skid Mounted

GENERAL DATA

System Rating: 7500-KVA, 13,200/7620-V, 4160-V, 3- ϕ , 60 Hz

Weight: 55,000 Pound

Dimensions: Length 18'-0", Width 8'0", Height 10'-10"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- () Forklifting Provisions
- (X) Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 40 man-hours

Ambient Operating Temperature Limits (at rated load): -25°F to +125°F

Cooling System: Natural

Monitoring Requirements (normal operating conditions):

- 1 - man, 8 - hour Interval, Roving Watch

Shore Power Requirements: From Substation Feeders

Lightning Arrestors: (X) Yes, () No

Manufacturer: A. G. Schoonmaker Co.

Technical Manual(s): Commercial

ELECTRICAL DATA

Transformer: General Electric

Type: Oil Filled

High Voltage Taps: Two - 2-1/2% above and below

Connections: 13,200/7620-V, Wye to 4160-V, Delta

Power Circuit Breakers:

Quantity 1 ea 13,800-V, 1200-Amp, primary connection

Quantity 1 ea 4,160-V, 1200-Amp, secondary connection

Switch:

Type: Disconnect

Capacity: 400 Ampere

Voltage Rating: 5000 Volt

Connection(s): Secondary

Instrumentation:

(X) Ammeter

(X) High Voltage Line Voltmeter

(X) Secondary Voltage Voltmeter

(X) Watt Meter

(X) Watt-Hour Meter

(X) Oil Level Gage

(X) Pressure Vacuum Gage

(X) Transformer Temperature Gage

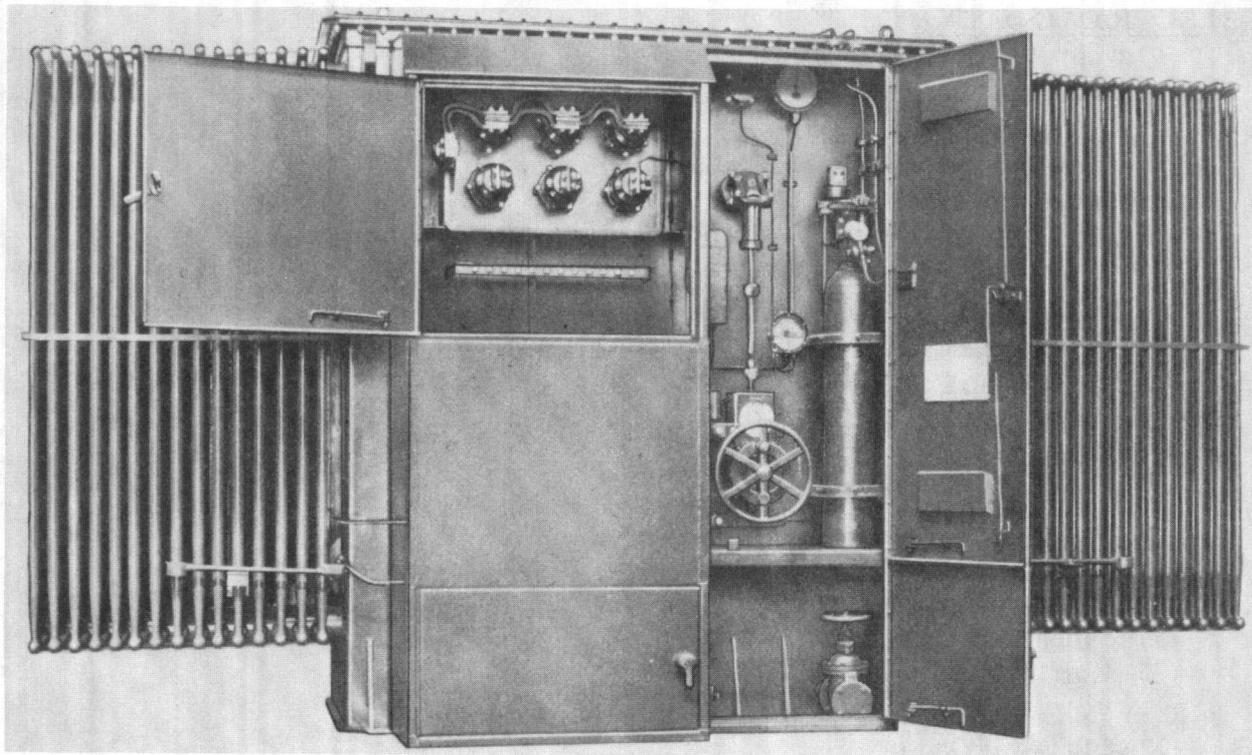


FIGURE 36
Transformer, 12,500 Kilovolt-Ampere

2.3.9 Transformer, 12,500 Kilovolt-Ampere, Base Mounted

GENERAL DATA

System Rating: 12,500-KVA, 13,200-V, 11,500-V, 4160/2400 X 2400-V, 3- ϕ , 60 Hz

Weight: 74,500 Pounds

Dimensions: Length 18'-0", Width 8'-0", Height 11'-0"

Transportability: Railcar, Ship, Truck

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 16 man-hours

Ambient Operating Temperature Limits (at rated load): -25°F to +125°F

Cooling System: Forced Air

Monitoring Requirements (normal operating conditions):

- 1 - man, 24 - hour Interval, Roving Watch

Shore Power Requirements: None

Lightning Arrestors: () Yes, (X) No

Manufacturer: General Electric

Technical Manual(s): Commercial

ELECTRICAL DATA

Transformer: General Electric

Type: Oil Filled

High Voltage Taps: Two - 2-1/2% above and below

Connections:

13,200-V, Delta to 11,500-V, Delta, 12,500 KVA

13,200-V, Delta to 4160/2400-V, Wye, 12,500 KVA

13,200-V, Delta to 2400-V, Delta, 12,500 KVA

11,500-V, Delta to 4160/2400-V, Wye, 12,500 KVA

11,500-V, Delta to 2400-V, Delta, 12,500 KVA

Impedance: 0.67%

Power Circuit Breakers: None

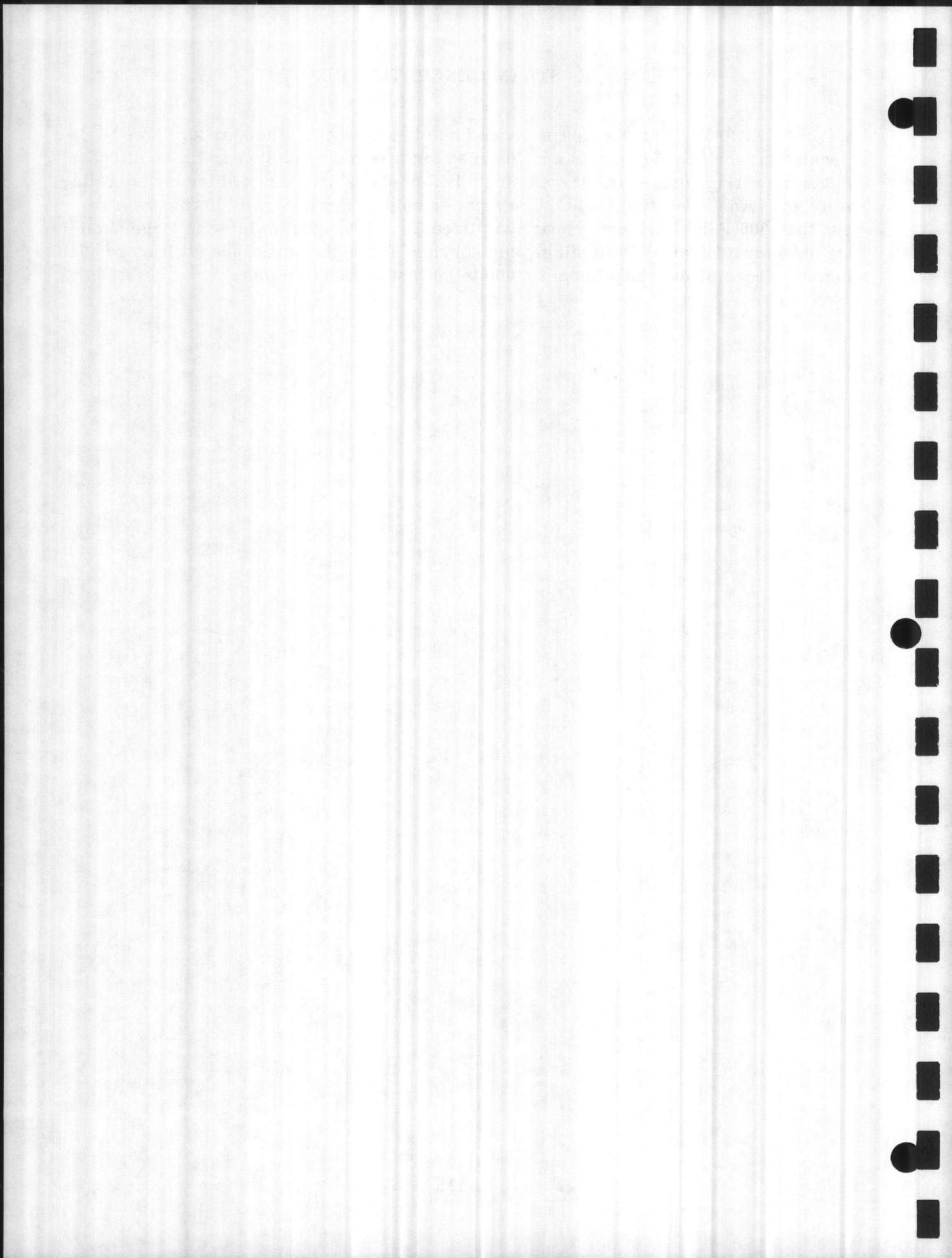
Switch: None

Instrumentation:

- () Ammeter
- () High Voltage Line Voltmeter
- () Secondary Voltage Voltmeter
- () Watt Meter
- () Watt-Hour Meter
- (X) Oil Level Gage
- (X) Pressure Vacuum Gage
- (X) Transformer Temperature

Section 4. STEAM GENERATING PLANTS

2.4.0 GENERAL. The plants are divided into two classes. The smaller forced circulation, multi boiler plants are designed for maximum mobility and have attendant higher operating costs. The larger single boiler plants are designed for higher reliability and lower operating costs. The smaller boilers are generally lower pressure, less than 300 PSIG, and are primarily utilized for utility steam while the larger boilers are used for nuclear, R&D testing, ship service, and higher pressure utilities requirements. These plants range from 20,000 to 60,000 pounds per hour.



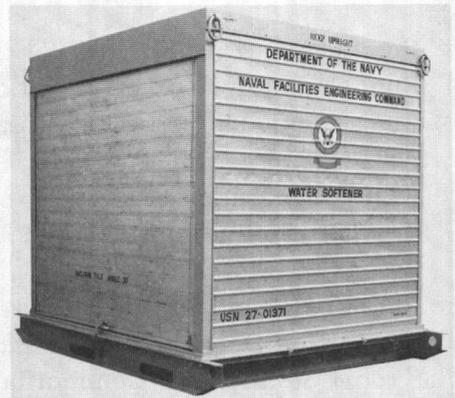


FIGURE 37
Steam Plant, 20,000 Pounds per hour

2.4.1 Steam Plant, 20,000 Pounds Per Hour, Semi-Trailer Mounted with separate Skid Mounted Water Softener

GENERAL DATA

System Rating: 22,400 PPH, 70-230 PSIG

Weight: Steam Plant 45,000 Pounds; Water Softner 5000 Pounds

Dimensions: Steam Plant, Length 40'-0", Width 8'-0", Height 12'-6"

Water Softner, Length 9'-6", Width 7'-6", Height 7'-2"

Transportability: Ship, Aircraft, Railcar, Truck

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 24 man-hours

Altitude Limits (at rated load): Sea Level to 5000 ft.

Ambient Operating Temperature Limits (at rated load): -25° F to +125° F

Monitoring Requirements (normal operating conditions):

- 1 - man, Full Time Watch

Shore Power Requirements: 480-V, 100 Amp, 3-Ø, 60 Hz

Manufacturer: Clayton Mfg. Co.

Model Nomenclature: Model RO-175-3M Steam Generators

Technical Manual(s): (NAVFAC) P-8-314.5 or P-8-314.7

MECHANICAL DATA

Fuels: No. 1 or No. 2 Fuel Oil

Fuel Consumption: 52.2 gallons per hour at rated load using No. 2 fuel oil.

Fuel Tank: 900 gallons with automatic fuel transfer system

Water Tank: None

Water Treatment System:

Softener, 100% Make up Capacity

Automatic

Chemical Feed System: Yes - 35 gallon Tank and Pump

Hotwell or Deaerator: 800 gallons

Export Steam Line Connection: 8 inch Flange

Intake Raw Water Line Connection: 2 inch IPS

Condensate Return Line Connection: 3 inch IPS

Boilers and Burners:

Circulation: Forced

No. Boilers per plant: Four (4) at 5600 pounds per hour

Thermal Efficiency: 80%

Maximum Working Pressure: 300 PSIG

Discharge Pressure Range: 70-230 PSIG

Carry Over: Less than 0.5%

Ignition:

Electrode - Ignited Oil Pilots

Electrode - Ignited Gas Pilots

Direct Electric - High Tension Spark

Fuel Atomization: Air, Steam, Mechanical

Soot Blower: Yes, No

Controls: Pneumatic, Electric

Safety Valve Setting: 250 PSIG

Instruments/Alarms

Low Water Level

High Water Level

Feedwater Temperature

Condensate Flowmeter

High Working Pressure

Export Steam Pressure

Flame Monitor

Fuel Temperature

Fuel Pressure

Control Air Pressure

Hour Meter

Boiler Header Pressure



FIGURE 38
Steam Plant, 27,000 Pounds per hour

2.4.2 Steam Plant, 27,000 Pounds Per Hour, Semi-Trailer Mounted

GENERAL DATA

System Rating: 26,000 PPH, 100-600 PSIG

Weight: 58,000 Pounds

Dimensions: Length: 35'-0", Width 8'-0", Height 12'-6"

Transportability: Ship, Railcar, Truck

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 4 man-hours

Altitude Limits (at rated load): None

Ambient Operating Temperature Limits (at rated load): +32°F to +125°F

Monitoring Requirements (normal operating conditions):

- 1 - man, Full Time Watch

Shore Power Requirements: 440-V, 100 Amp, 3- ϕ , 60 Hz

Manufacturer: Vapor Corporation

Model Nomenclature: Model Nos. 43012 and 4370 L

Technical Manual: (NAVFAC) P-8-314.2

MECHANICAL DATA

Fuels: No. 2 Fuel Oil

Fuel Consumption: 480 GPH at rated load using No. 2 Fuel Oil

Fuel Tank: 250 gallons with automatic fuel transfer system.

Water Tank: 800 gallons

Water Treatment System: None

Chemical Feed System: Yes, 50 gallon tank and pump

Export Steam Line Connection: 6 inch flange

Intake Raw Water Line Connection: 2 inch flange

Condensate Return Line Connection: 3 inch flange

Boilers and Burners:

Circulation: Forced

No. Boilers per Plant: Four

Thermal Efficiency: 80%

Maximum Working Pressure: 675 PSIG

Discharge Pressure Range: 100-600 PSIG

Carry Over: Less than 1%

Ignition:

Electrode - Ignited Oil Pilot

Electrode - Ignited Gas Pilot

Direct Electric - High Tension Spark

Fuel Atomization: Air, Steam, Mechanical

Soot Blower: Yes, No

Controls: Pneumatic, Electric

Safety Valve Setting: 675 PSIG

Instruments/Alarms

Low Water Level

High Water Level

Feedwater Temperature

Condensate Flowmeter

High Working Pressure

Export Steam Pressure

Flame Monitor

Fuel

Fuel Pressure

Control Air Pressure

Hour Meter

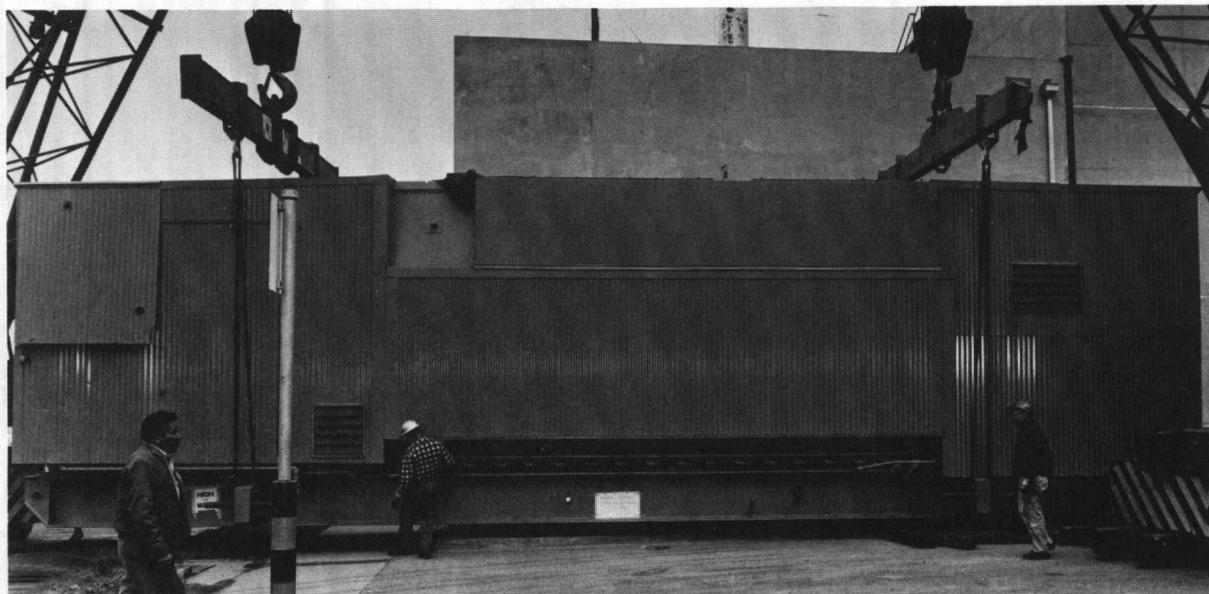


FIGURE 39
Steam Plant, 60,000 Pounds per hour

2.4.3 Steam Plant, 60,000 Pounds Per Hour, Skid Mounted

GENERAL DATA

System Rating: 60,000 PPH, 100-600 PSIG

Weight: *166,000 Pounds to 170,000 Pounds

Dimensions: Length 48'-6", Width 11'-6", Height 14'-0"

Transportability: Railcar, Ship

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 80-man-hours

Altitude Limits: None

Ambient Operating Temperature Limits: * +32°F to +125°F and
-25°F to +125°F

Monitoring Requirements (normal operating conditions):

- 1 - man, Full Time Watch

Shore Power Requirements: 480-V, 200-Amp, 3- ϕ , 60 Hz

Manufacturer: Wickes Boiler Co./Combustion Engineering Inc.

Model Nomenclature: Type "A" Boiler

Technical Manual(s): *(NAVDOCKS) P-8-314.3,
P-8-314.4 and
P-8-314.5

MECHANICAL DATA

Fuels: Numbers 2, 4, 5, 6 and Navy Special Fuel Oils

Fuel Consumption: 660 GPH at rated load using Number 2 Fuel Oil

Fuel Tank: 3000 Gallons

Water Treatment System:*

- Softener: 100% Make up Capacity
- Demineralizer: 33% Make up Capacity
- Automatic
- Manual

Chemical Feed System: Tank and Pump; Chemical can be introduced while operating
Hotwell or Deaerator: Capacity 741 Gallons

Export Steam Line Connection: 8 inch flange

Intake Raw Water Line Connection: *1-1/2 inch IPS and
2-1/2 inch IPS

Condensate Return Line Connection: 2 inch IPS

Boilers and Burners:

Circulation: Natural

No. Boilers per Plant: One

Thermal Efficiency: 77%

Maximum Working Pressure: 675 PSIG

Discharge Pressure Range: 100-600 PSIG

Carry Over: less than 0.5%

Ignition:

- Electrode - Ignited Oil Pilots
- Electrode - Ignited Gas Pilots
- Direct Electric - High Tension Spark

Fuel Atomization: Air, Steam, Mechanical

Soot Blower: Yes, No

Controls: Pneumatic, Electric

Safety Valve Setting: 675 PSIG

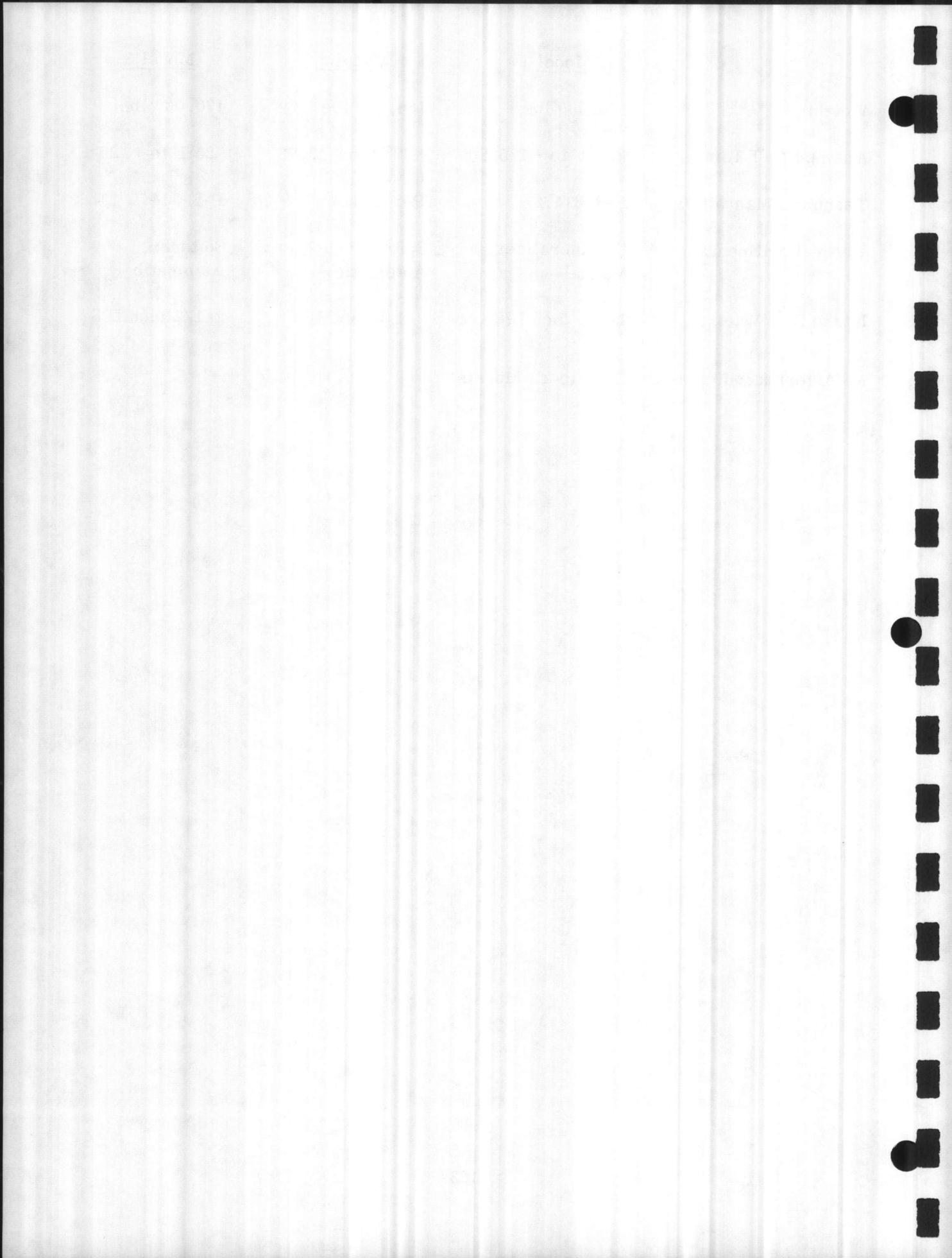
Instruments/Alarms:

- Low Water Level
- High Water Level
- Feedwater Temperature
- Condensate Flowmeter
- High Working Pressure
- Export Steam Pressure
- Flame Monitor
- Fuel Temperature
- Fuel Pressure
- Control Air Pressure
- Hour Meter
- Combustion Air Pressure

*The MUSE Steam Plants consists of three basic models with the following variations noted:

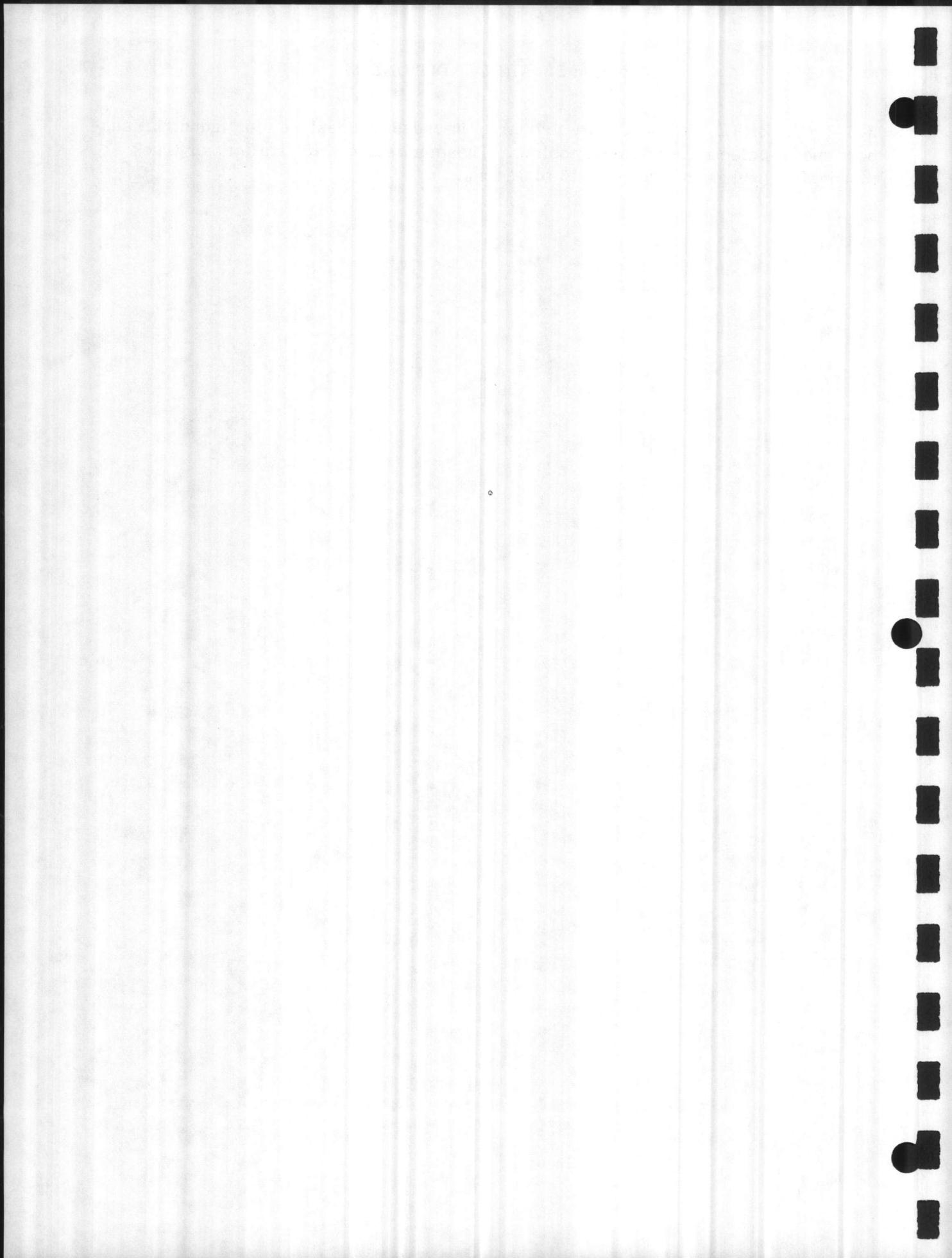
	<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>
Weight:	166,000 lbs	166,000 lbs	170,000 lbs
Ambient O/T Limits	+32°F to +125°F	+32°F to +125°F	-25°F to +125°F
Technical Manual(s):	P-8-314.3	P-8-314.4	P-8-314.5
Water Treatment:	Demineralizer, Manual	Softener, Automatic	Softener, Automatic
Intake Raw Water:	1-1/2 inch IPS	2-1/2 inch IPS	2-1/2 inch IPS

No Asterisk Indicates Common to all Models



Section 5. AIR CONDITIONERS

2.5.0 GENERAL. The units are primarily intended and designed for industrial support such as electric equipment cooling. These units are skid, trailer, or truck mounted and range in size from 15 to 34 tons.



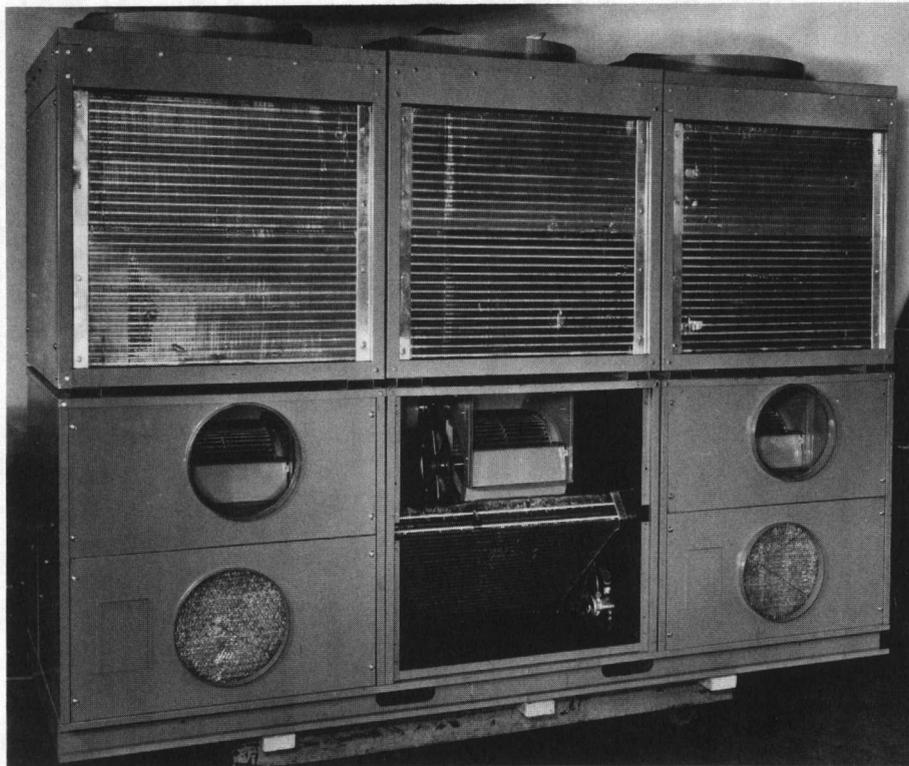


FIGURE 40
Air Conditioner, 15 Ton

2.5.1 15 Ton Air Conditioner, Electric Motor Driven, Skid Mounted

GENERAL DATA

System Rating: 180,000 BTU/Hr (15 Ton)

Weight: 4500 Pounds

Dimensions: Length 8'-6", Width 3'-0", Height 6'-2"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- (X) Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level, vibration-free foundation; vibration isolation pads under unit recommended; minimum 3 ft. free space at fan discharge (ducting acceptable); condensate drain line required.

Set-up-time: 16 man-hours

Ambient Operating Temperature Limits: +40°F to +125°F

Monitoring Requirements (normal operating conditions):

- 1 - man, 24 hour Interval, Roving Watch

Shore Power Requirements: 208-V, 3-Ø, 60 Hz, 4 Wire

Manufacturer: Redmonson Corp. - Therm-Air Mfg. Co. Inc.

Model Nomenclature: AV-15-3

Mounted: Three 5-Ton Units on a Common Base.

Technical Manual(s): (NAVFAC) P-8-315.1

MECHANICAL DATA

Evaporator Cooling Air Flow: Fans - 6000 CF/MIN at 2.0 inches Water Gage
Temperature Drop:

Static Pressure:

Compressors

Number: 3 each

Capacity: 5 Ton

Type:

Refrigerant: R-22

Condenser: Air Cooled

Temperature Control

Type: Return air sensing thermostat, 60°F to 90°F

Mode of Operation: Three-step sequenced compressor starting

Safety Features:

Low Pressure Fan Control

High Pressure Fan Control

Pumpdown

Low Pressure Compressor Control

High Pressure Compressor Control

Electrical Overload Protection

Instrumentation:

Discharge Air Pressure

Suction Pressure

Air Temperature

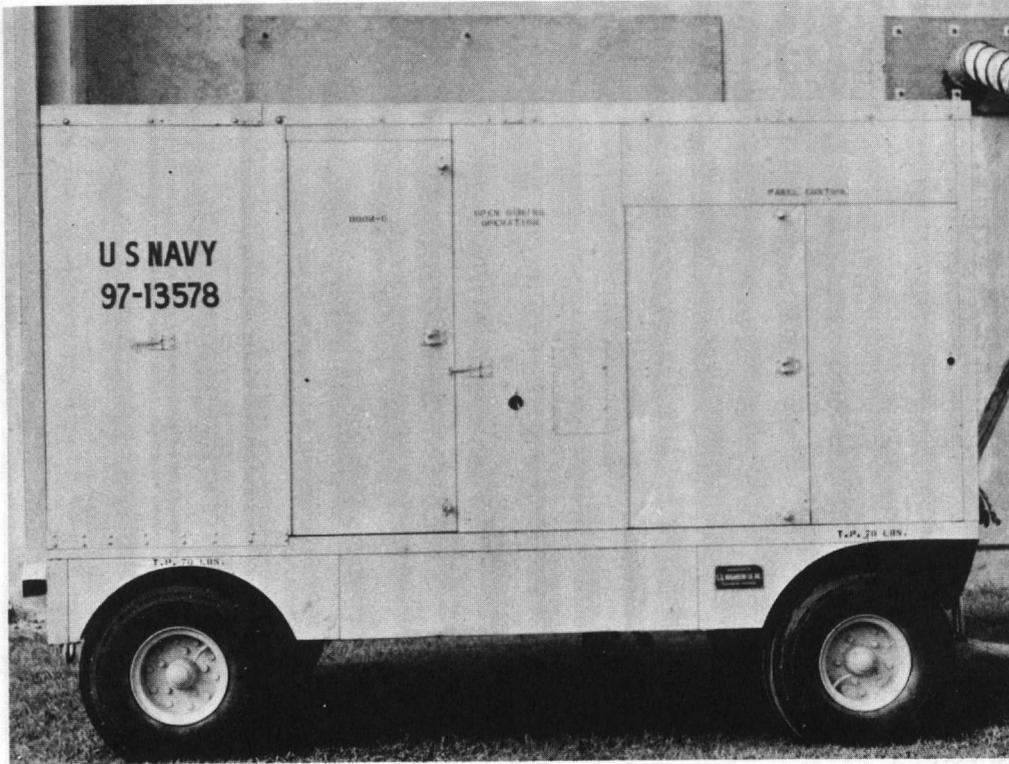


FIGURE 41
Air Conditioner, 30 Ton

2.5.2 30 Ton Air Conditioner, Electric Motor Driven, Trailer Mounted

GENERAL DATA

System Rating: 360,000 BTU/HR (30-Ton)

Weight: 8000 Pounds

Dimensions: Length 10'-0", Width 7'-0", Height 7'-0"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 8 man-hours

Ambient Operating Temperature Limits (at rated load): +32°F to +90°F

Monitoring Requirements:

- 1 - man, 24 hour Interval, Roving Watch

Shore Power Requirements: 440-V, 3- ϕ , 60 Hz

Manufacturer: Chrysler Air-Temp Co.

Technical Manual(s): Commercial

MECHANICAL DATA

Evaporator Cooling Air Flow:

Temperature Drop:

Static Pressure:

Compressors:

Number: 1 each

Capacity: 30 ton

Type:

Refrigerant:

Condensor: Air Cooled

Condensor Blower Capacity:

Temperature Control

Type:

Mode of Operation:

Safety Features:

Low Pressure Fan Control

High Pressure Fan Control

Pumpdown

Low Pressure Compressor Control

High Pressure Compressor Control

Instrumentation:

Discharge Air Pressure

Suction Pressure

Air Temperature

Power: Electric Motor Drive, 1200 RPM, 50 Hp.

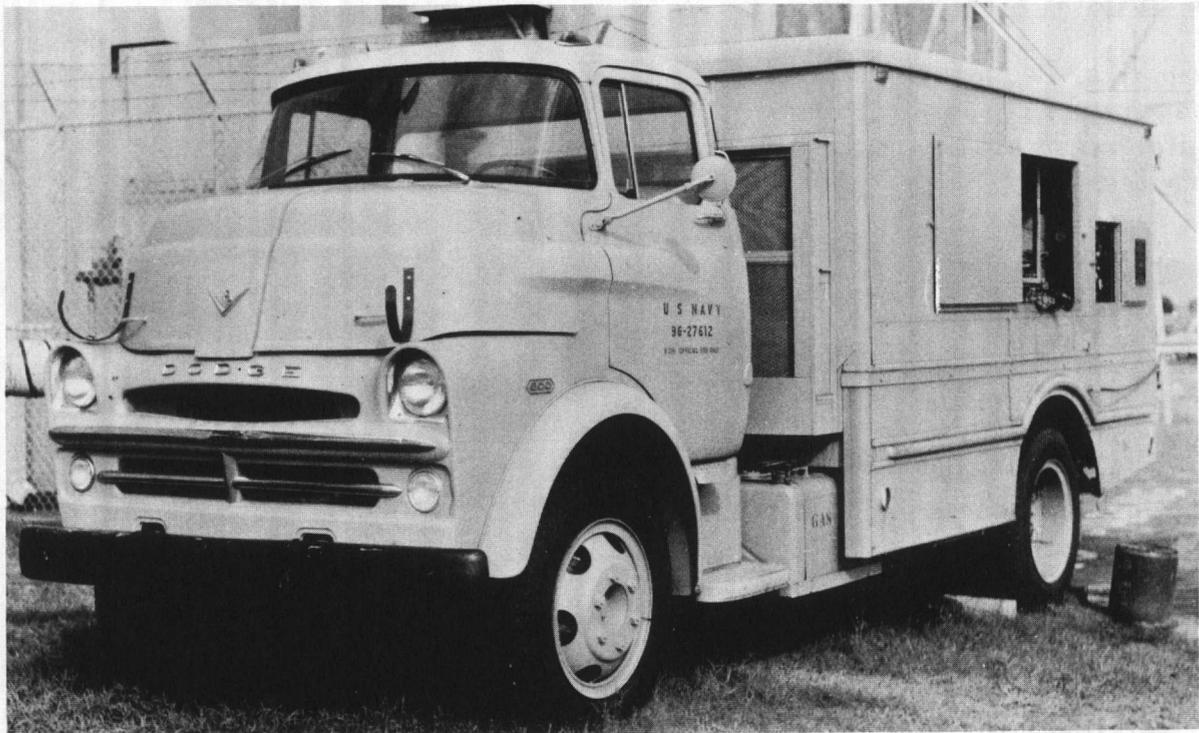


FIGURE 42
Air Conditioner, 34 Ton

2.5.3 34 Ton Air Conditioner, Engine Driven, Truck Mounted

GENERAL DATA

System Rating: 408,000 BTU/HR (34 Ton)

Weight: 14,300 Pounds

Dimensions: Length 20'-0", Width 7'-6", Height 8'-4"

Transportability: Railcar, Ship, Truck

Modes of Mobility: Truck Mounted

Site Restrictions: Level

Set-up-time: 8 man-hours

Altitude Limits (at rated load): 1500 feet

Ambient Operating Temperature Limits (at rated load): +32°F to +90°F

Cooling System: Radiator

Monitoring Requirements (normal operating conditions):

1 - man, 1 - hour Interval, Roving Watch

Shore Power Requirements: None

Manufacturer: Chrysler Air Temp

Model Nomenclature: ACM7-2905 F 22

Technical Manual(s): (NAV WEPS) 19-60-55

MECHANICAL DATA

Evaporator Cooling Air Flow:

Temperature Drop:

Static Pressure:

Compressors

Number: 1 each

Capacity: 34 Tons

Type: Radial - 7 Cylinders

Refrigerant: Freon 22

Condensor: Air cooled

Condensor Blower Capacity:

Temperature Control

Type: Thermostat

Modes of Operation: Compressor Unloading

Safety Features:

Low Pressure Fan Control

High Pressure Fan Control

Pumpdown

Low Pressure Compressor Control

High Pressure Control

Low Engine and Compressor Oil Pressure

High Engine Coolant Temp

Instrumentation:

Discharge Air Pressure

Suction Pressure

Air Temperature

Ammeter Battery Charger

Engine and Compressor Oil Temp

Fuel Level

Engine Coolant Temp

Engine: International Harvester Model U-450

Type: Gasoline, 6 Cylinder, 4 Cycle

Rated Speed: 2000 RPM

Governor: Mechanical

Fuels: Gasoline

Fuel Consumption:

Fuel Tank:

Fuel Transfer System: Manual, Automatic

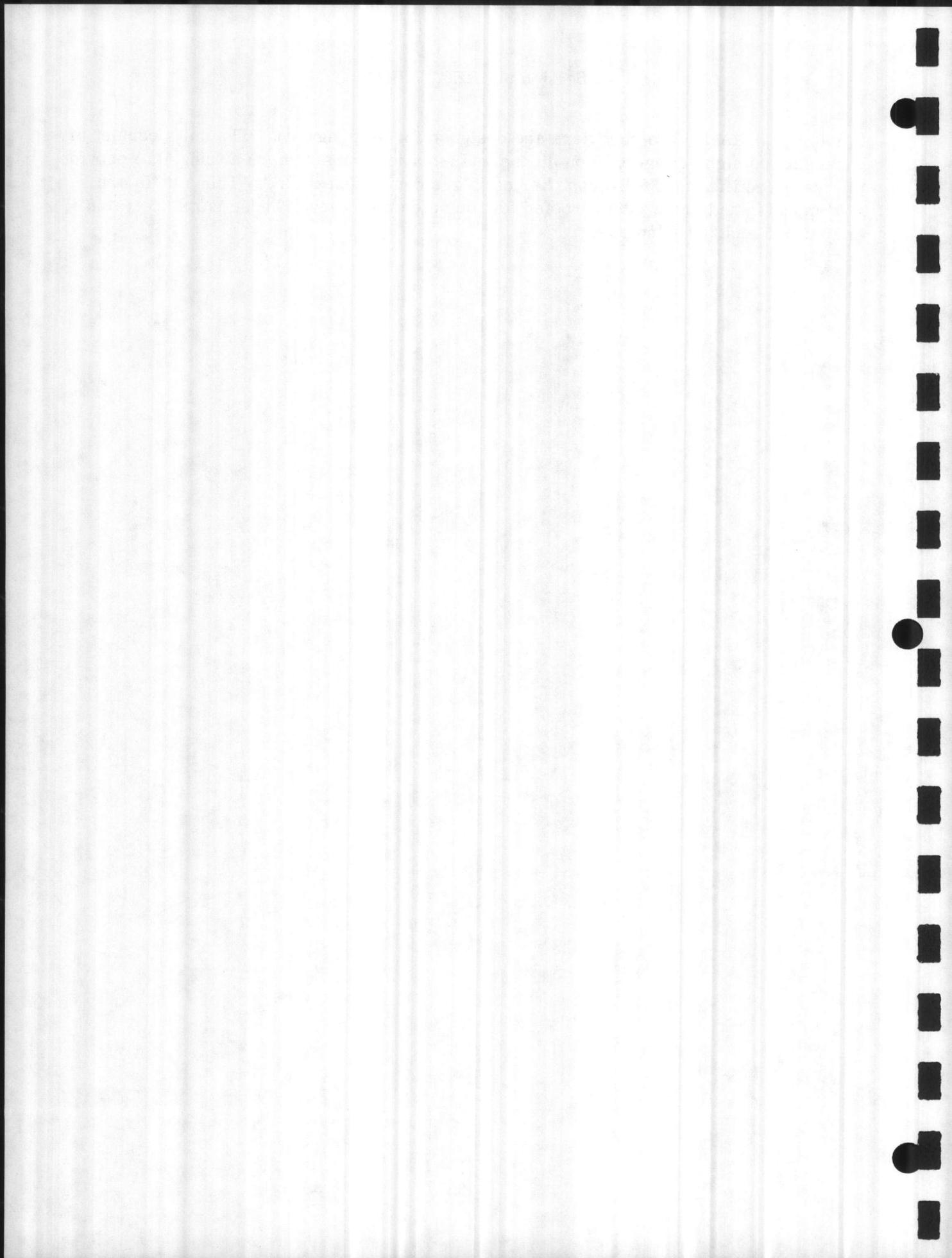
Starting System: Electric

Engine Mean Time Between Overhaul: 5000 hours

Battery Charging System: Yes

Section 6. RECTIFIERS

2.6.0 GENERAL. The rectifiers are designed for ship support. The units consist of encapsulated high voltage silicon diodes and isolation transformers arranged to provide full wave rectification. The rectifier cells are convection cooled. These units are skid mounted and are weatherproofed for pier side operation. These units are rated at 100, 125 and 200 kilowatts.



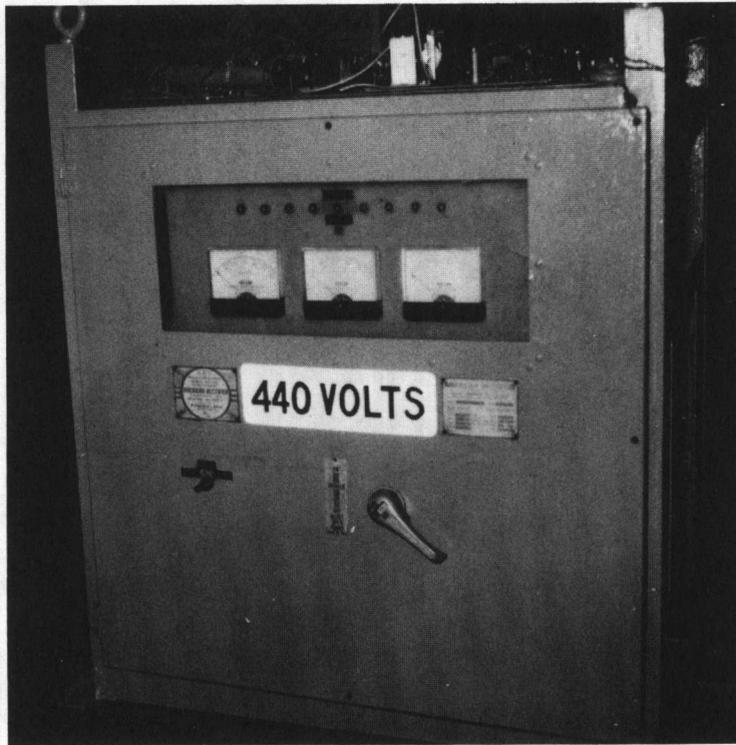


FIGURE 43
Rectifier, 100 Kilowatt

2.6.1 100 Kilowatt, Rectifier, Skid Mounted

GENERAL DATA

System Rating: 100 KW, 125/250-V, 800/400 Amp

Weight: 1200 Pounds (Est)

Dimensions: Length 2'-7", Width 3'-0", Height 3'-6"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- (X) Forklifting Provisions
- (X) Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 4 man-hours

Ambient Operating Temperature Limits (at rated load): -25°F to +125°F

Cooling System: Convection

Monitoring Requirements (normal operating conditions):

- 1 - man, 24-hour Interval, Roving Watch

Manufacturer: American Rectifier

Model Nomenclature:

Technical Manual(s): Commercial

ELECTRICAL DATA

Type Rectifier: Silicon

Input: 440-V \pm 5%, 200-Amp, 3- ϕ , 60 Hz

Output: 125-V, 800-Amp or 250-V, 400-Amp, 3 Wire, D.C.

Voltage Regulation (no load - full load): 5%

Efficiency (at rated load):

Output Voltage Ripple:

D.C. Overcurrent Protection: Yes, () No

Full Wave Rectification: Yes, () No

Minimum Interrupting Rating:

Incoming Disconnect Switch: , () No

Incoming Circuit Breaker: () Yes, () No

Outgoing Circuit Breaker: () Yes, () No

Surge Suppression Capacitors: () Yes, () No

High Speed Fuses: () Yes, () No

Control Power Transformer:

Instrumentation:

D.C. Voltmeter

D.C. Ammeter

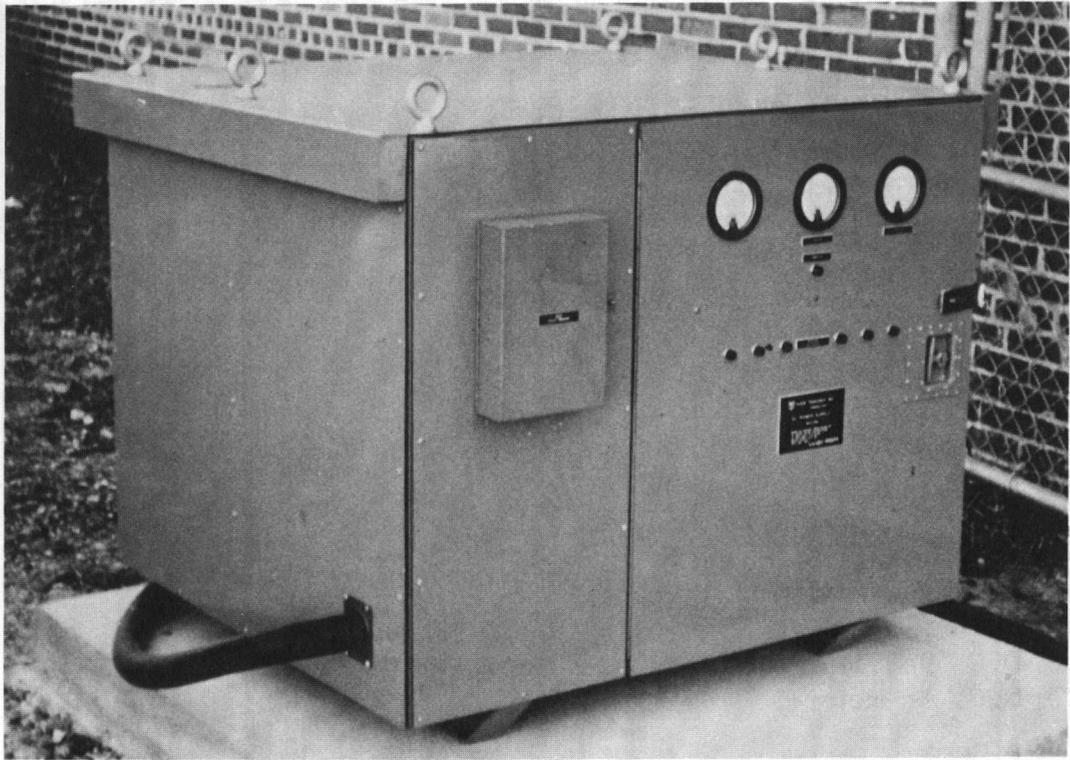


FIGURE 44
Rectifier, 125 Kilowatt

2.6.2 125 Kilowatt, Rectifier, Skid Mounted

GENERAL DATA

System Rating: 125 KW, 125/250-V, 1000/500 Amp

Weight: 1200 Pounds (Est)

Dimensions: Length 2'-7", Width 3'-0", Height 3'-6"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- (X) Forklifting Provisions
- (X) Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Level

Set-up-time: 4 man-hours

Ambient Operating Temperature Limits (at rated load): -25°F to +125°F

Cooling System: Convection

Monitoring Requirements (normal operating conditions):

- 1 - man, 24 - hour Interval, Roving Watch

Manufacturer: Thiem-Transrex, Inc.

Model Nomenclature:

Technical Manual(s): Commercial

ELECTRICAL DATA

Type Rectifier: Silicon

Input: 460-V \pm 5%, 170-Amp, 3- ϕ , 60-Hz

Output: 125-V, 1000-Amp or 250-V, 500-Amp, 3 Wire, D.C.

Voltage Regulation (no load - full load): 5%

Efficiency (at rated load):

Output Voltage Ripple:

D.C. Overcurrent Protection: (X) Yes, () No

Full Wave Rectification: (X) Yes, () No

Minimum Interrupting Rating:

Incoming Disconnect Switch: () Yes, (X) No

Incoming Circuit Breaker: (X) Yes, () No, 480-Volt, 20,000 Ampere

Outgoing Circuit Breaker: () Yes, (X) No

Surge Suppression Capacitors: (X) Yes, () No

High Speed Fuses: (X) Yes, () No

Control Power Transformer: Yes

Instrumentation:

(X) D.C. Voltmeter

(X) D.C. Ammeter



FIGURE 45
Rectifier, 200 Kilowatt

2.6.3 200 Kilowatt, Rectifier with 250 Kilovolt-Ampere Power Transformer, Skid Mounted

GENERAL DATA

System Rating: 200-KW, 125/250-V, 1600/800-Amp

Weight: 5798 Pounds

Dimensions: Length 12'-7", Width 6'-7", Height 9'-0"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- Forklifting Provisions
- Skid Towing Provisions
- Lifting Attachments

Site Restrictions: Level

Set-up-Time: 24 man-hours

Ambient Operating Temperature Limits (at rated load): -25°F to +125°F

Cooling System: Forced Air

Monitoring Requirements (normal operating conditions):

- 1 - man, 8 hour Interval, Roving Watch

Manufacturer: Tokyo Electric Co.

Model Nomenclature:

Technical Manual(s): Commercial

ELECTRICAL DATA

Type Rectifier: Silicon Power Rectifiers

Input: 3150-V \pm 10%, 42-Amp or 6300-V \pm 10%, 21-Amp, 3- ϕ , 60 Hz, 3 Wire

Output: 125-V, 1600-Amp or 250-V, 800-Amp, D.C., 3 Wire

Voltage Regulation (no load - full load):

Efficiency (at rated load):

Output Voltage Ripple:

D.C. Overcurrent Protection: (X) Yes, () No

Full Wave Rectification: (X) Yes, () No

Minimum Interrupting Rating:

Incoming Disconnect Switch: (X) Yes, () No, 6900-V, 400 Amp

Incoming Circuit Breaker: (X) Yes, () No, 7200-V, 1000 MVA

Outgoing Circuit Breaker: (X) Yes, () No, 2-Pole, 250-V, 1000 Amp

Surge Suppression Capacitors: (X) Yes, () No

High Speed Fuses: (X) Yes, () No

Control Power Transformer: Yes

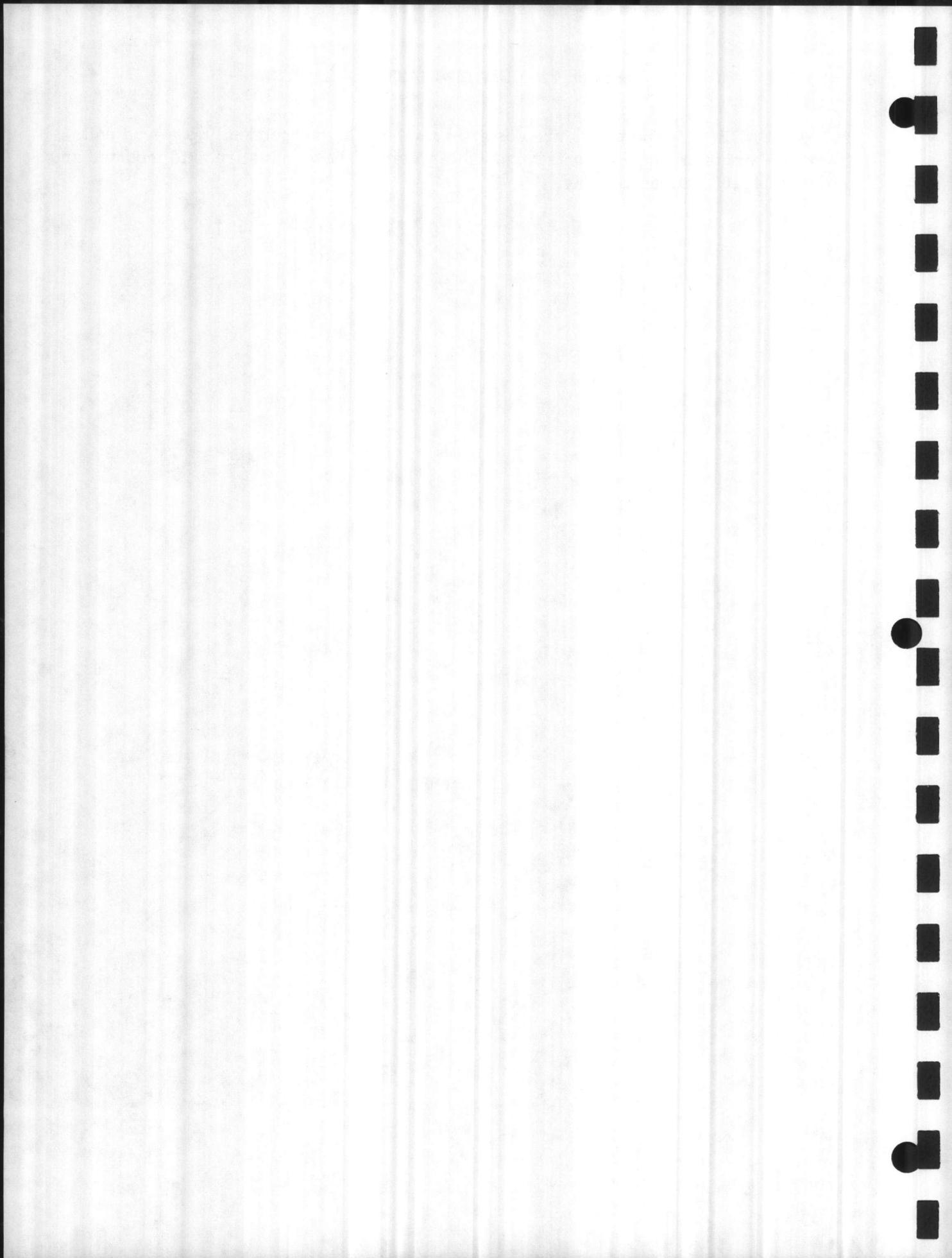
Instrumentation:

(X) D.C. Voltmeter

(X) D.C. Ammeter

Section 7. DESALINIZATION PLANTS

2.7.0 GENERAL. The plants are designed and built as independently powered units to meet short term requirements for potable water. These units are skid mounted and rated at 14,400 gallons per day.



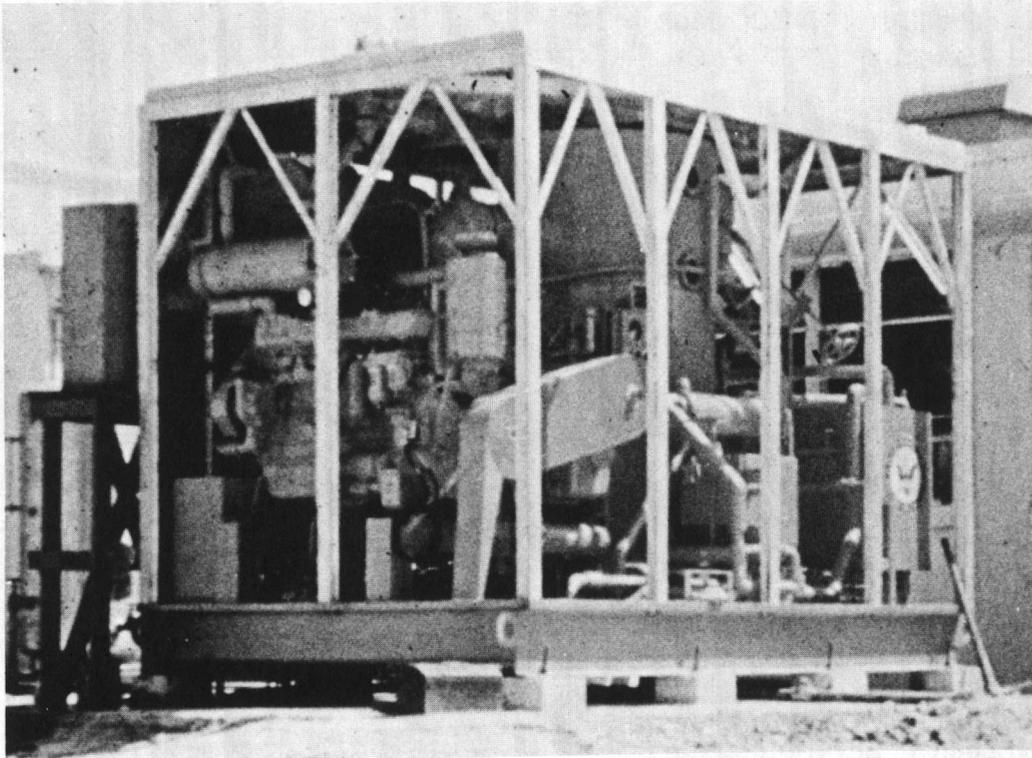


FIGURE 46
Desalinization Plant

2.7.1 Desalinization Plant, 14,400 Gallons per Day, Diesel Driven Skid Mounted

GENERAL DATA

System Rating: 600 GPH (14,400 GPD)

Weight: 14,500 Pounds

Dimensions: Length 9'-0", Width 6'-9", Height 7'-3"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- () Forklifting Provisions
- (X) Skid Towing Provisions
- (X) Lifting Attachments

Site Restrictions: Available source of sea water. Level.

Set-up-time: 32 man-hours

Altitude Limits (at rated load): Sea Level

Ambient Operating Temperature Limits (at rated load): +70°F to +125°F

Cooling System: None - Engine heat used in distillation process

Monitoring Requirements (normal operating conditions):

1 - man, 1 - hour Interval, Roving Watch

Shore Power Requirements: None

Manufacturer: Mechanical Equipment Co. New Orleans

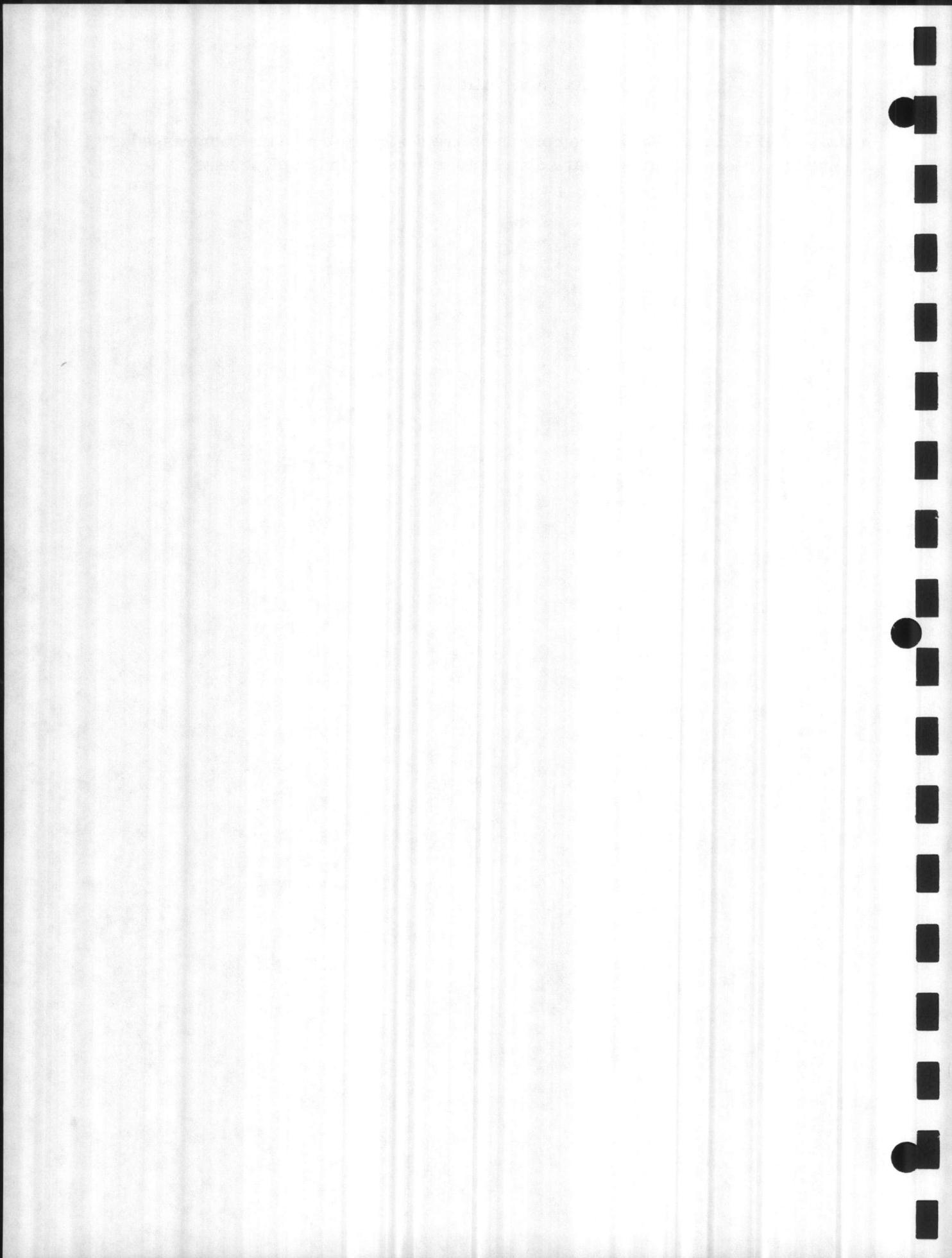
Model Nomenclature: MECO Model "M"
Technical Manual(s): (NAVFAC) P-8-316.1 or 316.2

MECHANICAL DATA

Drive: Diesel Engine 1500 RPM
Fuels: Diesel
Fuel Consumption: 3 GPH at rated load using Diesel
Fuel Tank: None
Starting System: Electric
Feedwater Intake Line Connection: 2-1/2 inches IPS
Feedwater Flow Rate: 25 GPM
Feedwater Strainer: (X) Yes, () No
Feedwater Pump: (X) Yes, () No
Maximum Suction Lift: Zero feet
Distillate Discharge Line Connection: 1-1/2 inches IPS
Brine Discharge Line Connection: 1-1/4 inches IPS
Acid Cleaning System: Yes
Instrumentation:
 (X) Engine Lube Oil Pressure Indicator
 (X) Lube Oil Level Indicator
 (X) Fuel Level Indicator
 (X) Coolant Temperature
 (X) Tachometer
 (X) Battery Charging Indicator
 (X) Compressor Oil Level Indicator
 (X) Distillate Temperature

Section 8. AIR COMPRESSORS

2.8.0 GENERAL. The air compressors are designed to provide compressed air for industrial uses such as shipyard distribution systems and drydock uses.



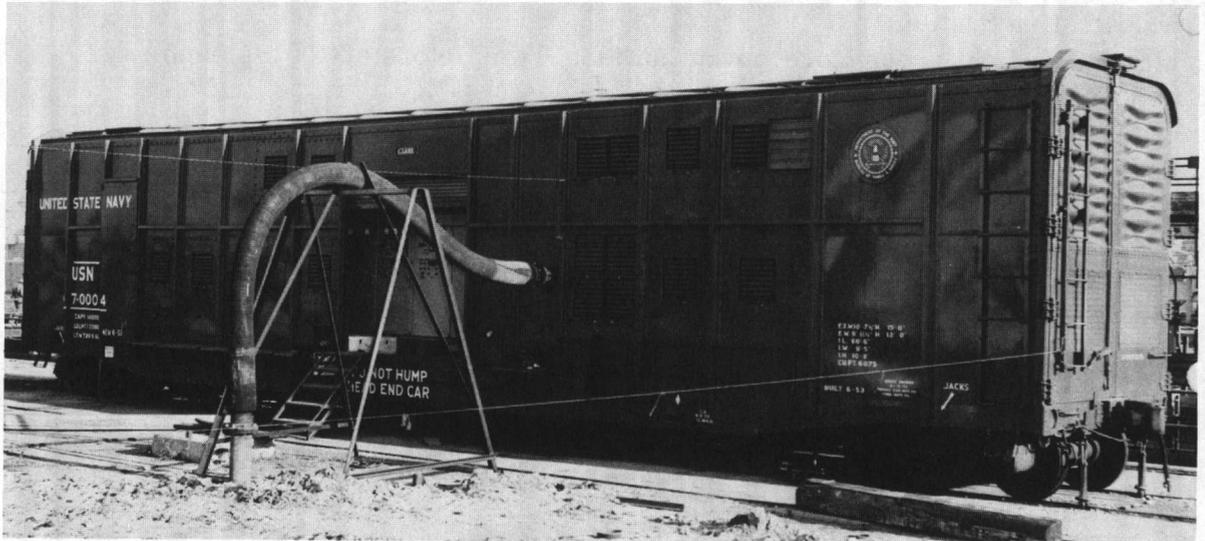


FIGURE 47
Air Compressor, 5000 Cubic Feet Per Minute

2.8.1 Air Compressor, Motor Driven, 5000 CFM, Railcar Mounted

GENERAL DATA

System Rating: 5000 CFM at 125 PSIG
Weight: 229,100 Pounds
Dimensions: Length 61'-0", Width 11'-0", Height 15'-0"
Transportability: Railcar, Ship
Site Restrictions: Rail Spur
Set-up-time: 80 man-hours
Monitoring Requirements (normal operating conditions):
 1 - man, 1 - hour Interval, Roving Watch
Shore Power Requirements: 2300-V, 3- ϕ , 60 Hz, 450 Amp
Manufacturer: Clark Bros.
Technical Manual(s): Commercial

MECHANICAL DATA

Compressor Type: Positive Displacement
Number Compressors: Two
Number Stages: Two
Intercoolers: Yes
Aftercoolers:
Compressor Lube Oil Cooling System: Yes
Air Pressure Control:
Discharge Air Line Size:
Discharge Air Temperature
Moisture Separator:
Oil Content of Discharge Air:

Air Filtration System:

Motor Drive Continuous Horsepower Rating: Two Motors at 100 Hp each

Safety Features:

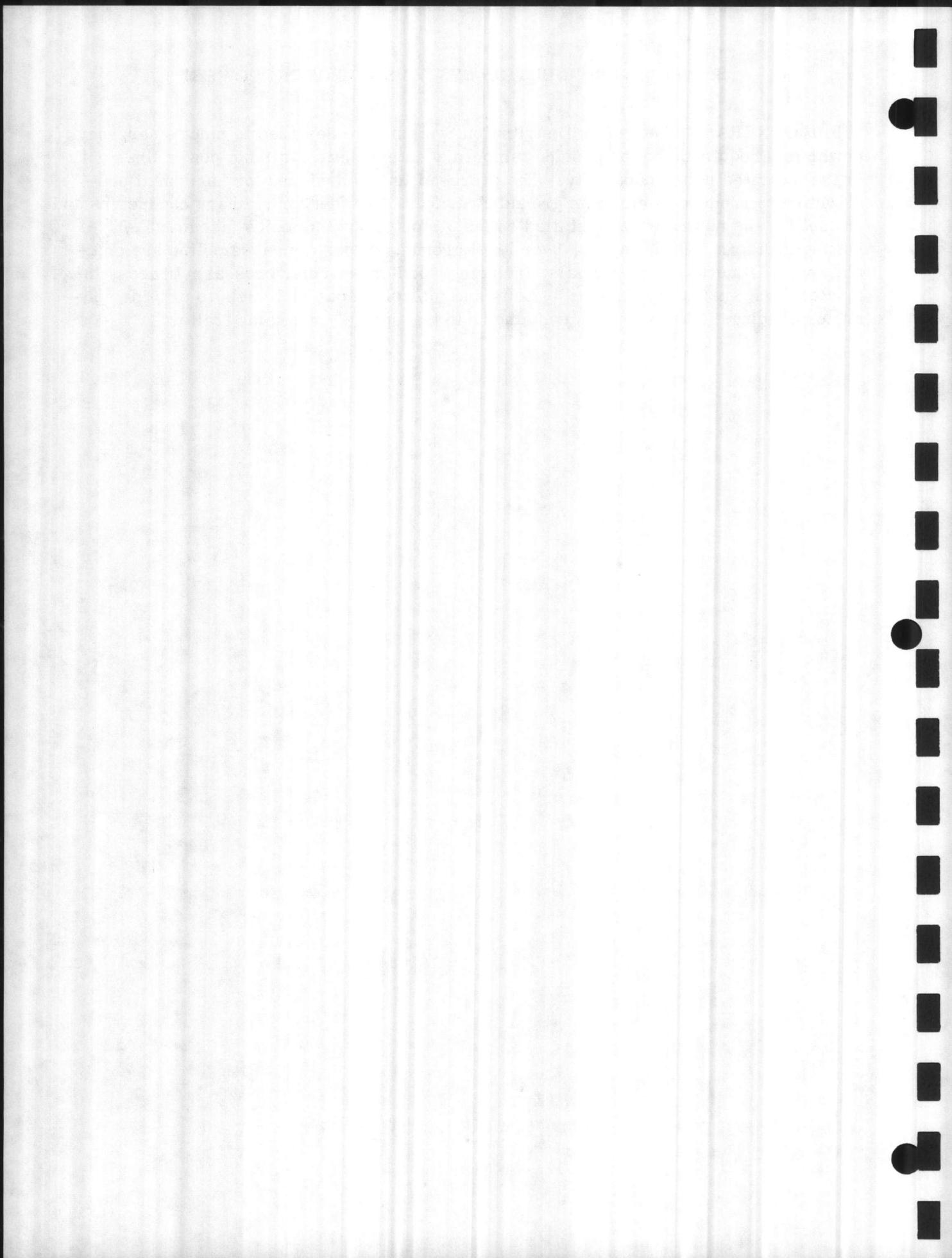
- High Compressor Lube Oil Temperature
- Low Compressor Lube Oil Pressure
- High Air Discharge Temperature
- High Air Discharge Pressure

Instrumentation:

- Lube Oil Level
- Lube Oil Pressure
- Lube Oil Temperature
- Discharge Air Temperature
- Master Head Pressure
- Hour Meter

Section 9. DISTRIBUTION SYSTEMS (ELECTRIC POWER)

2.9.0 GENERAL. The Power Distribution Systems are designed to meet emergency power line requirements or provide temporary extension to available power lines within the indicated rating capability. The overhead line is designed for horizontal construction to produce a minimum ground clearance of 20 feet for primary conductors and 18 feet for the neutral when installed on the 30 foot aluminum poles (assume 5'-6" setting depth) in 150 foot spans, over level ground. Cross arm assemblies are complete with all necessary materials, including wood crossarms, crossarm braces, insulator pins, insulators, assembly bolts and miscellaneous materials to provide conductor spacing. The system is contained and transported in a semi-trailer.



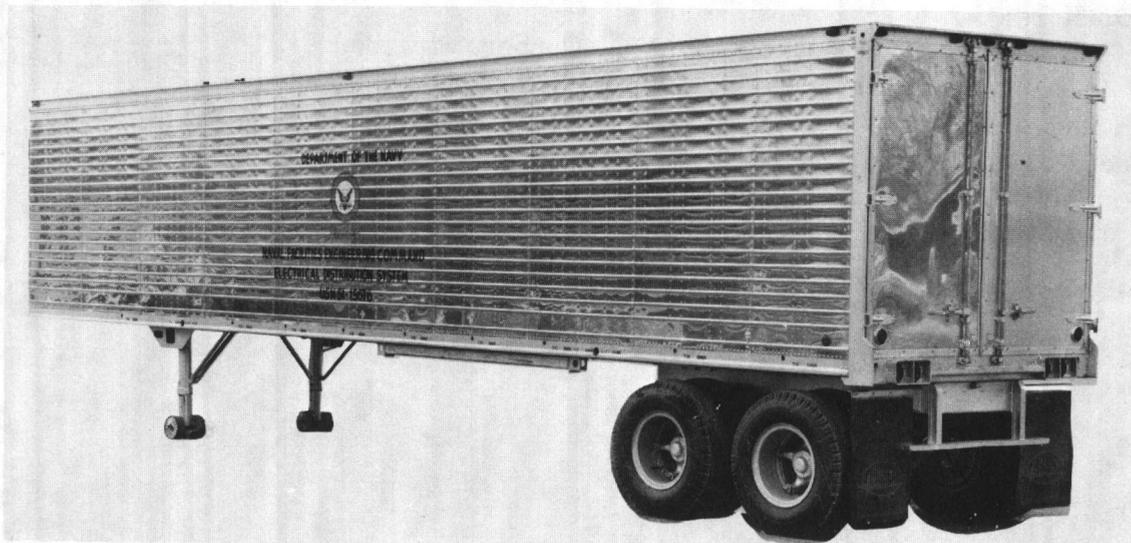


FIGURE 48
Distribution System, Power

2.9.1 Power Distribution System, Semi-Trailer Mounted

GENERAL DATA

System Rating: 4000-KVA at 13.8-KV

Weight: 57,000 Pounds

Dimensions: Length 40'-0", Width 8'-0", Height 12'-6"

Transportability: Railcar, Ship, Truck, Aircraft

Modes of Mobility:

- () Forklifting Provisions
- () Skid Towing Provisions
- (X) Lifting Attachments

Siting Restrictions: Suitable for line installation along streets and roadside, or field free from trees, etc.

Installation: 425 man-hours

Power Requirements: Any power source of the nominal voltages 2400-V, 4160-V, or 13,200-V

Length of System: 5280 feet, 3 Phase, 4 Wire

Installation Hardware and Tools Included: (X) Yes, () No

Poles:

Quantity: 30, Material: Aluminum, Length: 30 feet

Quantity: 10, Material: Aluminum, Length: 35 feet

Distribution Transformers:

Quantity: 12, Rating: 37-1/2 KVA, 1 Phase, Pole Mounting

Quantity: 12, Rating: 25 KVA, 1 Phase, Pole Mounting

Voltage Rating: Pri.-2400 X 7620-V, (dual Voltage) with selector switch. Sec.-120/240-V

Conductors:

Primary: 21,000 feet, No. 2 AWG, Copper, Stranded

Secondary: 3,000 feet, No. 1/0 Stranded, Copper, Weatherproof

Manufacturer: Hayes International Corp.

Model Nomenclature:

Technical Manual(s): Commercial