

# Generator Safety



CECOM

Logistics Assistance Representative

Training

# Generators



Service	Quantity	Percent
<b>Army</b>	<b>85,675</b>	<b>83%</b>
<b>Air Force</b>	<b>10,931</b>	<b>11%</b>
<b>Marines</b>	<b>5,054</b>	<b>5%</b>
<b>Navy</b>	<b>1,480</b>	<b>1%</b>
<b>TOTAL</b>	<b>103,140</b>	<b>100%</b>

# Generators



## History:

**1960 - 2000 Makes and Models**

**1967 - PM MEP Established**

**Reduces Makes and Models to 37!**

**1988 - TQG Development initiated**

**Greater Mobility, Reliability & Maintainability**

**Enhanced Survivability**

**Reduced Infrared & Acoustic signatures**

**Lower Costs, Operate on Diesel/JP Fuels**

# Generators



## Army TOE Requirements(BOIP 97)

SIZE	QUANTITY	PERCENT
2-3 kW	24,137	36%
5 kW	20,278	30%
10 kW	11,939	18%
15 kW	3,847	6%
30 kW	2,953	4%
60 kW	3,366	5%
100-750 kW	800	1%
<b>Total</b>	<b>67,526</b>	<b>100%</b>

# Generators



## Safety

- **FM 20-31**
  - **Electric Power Generation in the Field**
  
- **TB 43-0125**
  - **C-E Hookup to Generators**

# Generators



## Site Selection

- Clearances
- Noise
- Level Ground
- Fire Point
- Environmental Protection
- Auxiliary Fuel

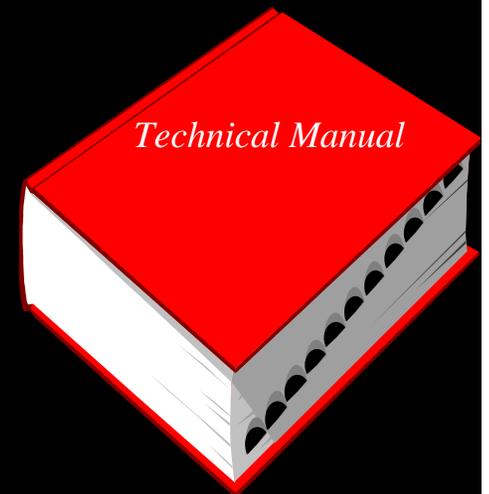


# Generators



## Operating Procedures

- Inspect Equipment
- Service Equipment
- Install/Maintain Fuel Supply
- Perform Pre-Op Checks & Services
- Connect Distribution Cables
- Establish Fire Point



# Generators



## Adverse Operating Conditions

- Extreme Cold
- Dusty Sandy Areas
- Rainy and Humid Areas
- Saltwater Areas
- High Altitudes

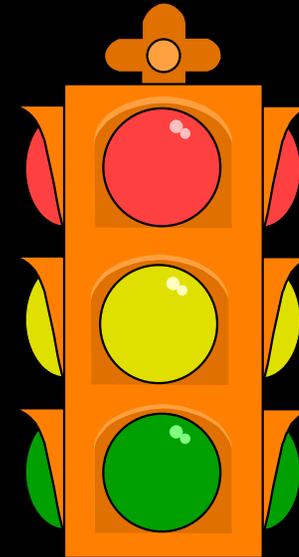


# Generators



## Safety Controls

- **Low Fuel Level/Oil Pressure**
- **High Coolant Temperature**
- **Over Current**
- **High Engine speed**
- **Battle Short Switch**
- **Battery Charge Ammeter**



# Generators



## PMCS

- Lubrication
  - Crank Case/Breather, Filter, Lines
- Cooling, Radiator, Water Pump, Belts
- Fuel
  - Pump, Filters, Supply, Tank, Lines
- Electrical
  - Batteries, Starter, Lights/Switches,
  - Regulator, Gages, Meters, Cables

# Generators



## Safety Hazards

- Electrical Safety
- Noise
- Circuit Breakers
- Fueling
- Exhaust



# Generators



## Electrical Safety Precautions

- Bonding and Grounding
- Neutral/Ground Continuity Check
- Power Distribution/Feeder
- Voltage/Phase Matching
- Power Cables

# Generators

## TQG Problem Areas



### **WETSTACKING**

*The buildup of unburned diesel fuel and carbon residues in the engine and exhaust system causing 65% of maintenance problems in generator sets!*

### **PRINCIPLE CAUSE**

*The **UNDERLOADING** of the generator. Operating at less than 50% of rated load. Reduce the problem by increasing power consumption above 70% of the rated load.*

# Generators

## TQG Problem Areas



### ***OPERATOR/MAINTAINER TRAINING***

*The major contributors to poor operations and maintenance of TQGs is the lack of sustainment training by using units.*

***Help***

***PM MEP WEB PAGE***

***HTTP://WWW.PMMEP.ORG***

# Generators



## ACCIDENT HISTORY

- **Shorting out battery terminals**
- **Turbine & compressor wheels disintegrated**
- **Improper voltage selector setting**
- **Personnel contact cooling fan blades**
- **Incorrect fuel can used to fill tank**

# Generators



## *SAFETY MESSAGES*

- **No GFCI on 2 kW (CECOM GPM 97-014)**
- **Leaking Fuel Lines (ATCOM SOUM 96-001)**
- **Frayed Wires on 5&10 kW TQGs  
(ATCOM SOUM 95-003)**

# Generators

## Military vs Commercial



<b>Military</b>	<b>Commercial</b>
<b>Uses Diesel Fuel</b>	<b>Sets &gt; 30 kW are Diesel</b>
<b>24 V Systems</b>	<b>12 V Systems</b>
<b>Severe Environments</b> -25 125 degree F -65 160 degree F	<b>Do not meet range of operating and storage temperatures</b>
<b>NBC protection</b>	<b>None</b>
<b>Reliable</b>	<b>No dealer on battlefield</b>
<b>Transportable</b>	<b>Not air liftable,</b>