ULTIMATE SERVICE ASSOCIATES

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Diesel Generator Set General Planned Maintenance Programs

1.0 Introduction

Scheduled planned maintenance programs are the most effective process for ensuring a generator system is maintained fully operational and ready to start and take its load when primary power is off-line for any planned or unplanned reason.

The diesel engine generator is the most commonly used prime mover in standby power generators. This information sheet details the routine planned maintenance to ensure high reliability.

2.0 Principal reasons for planned maintenance programs:

Reliability - Diesel power systems provide standby power to many critical applications including hospitals, airports, military installations, telecommunications, nuclear plants, data systems and others.

Performance - Preventative maintenance greatly reduces the risk that an internal or ancillary component malfunction will cause the generator to produce insufficient power. By identifying problems before generator power is needed, users can schedule backup power while the primary standby unit is being serviced.

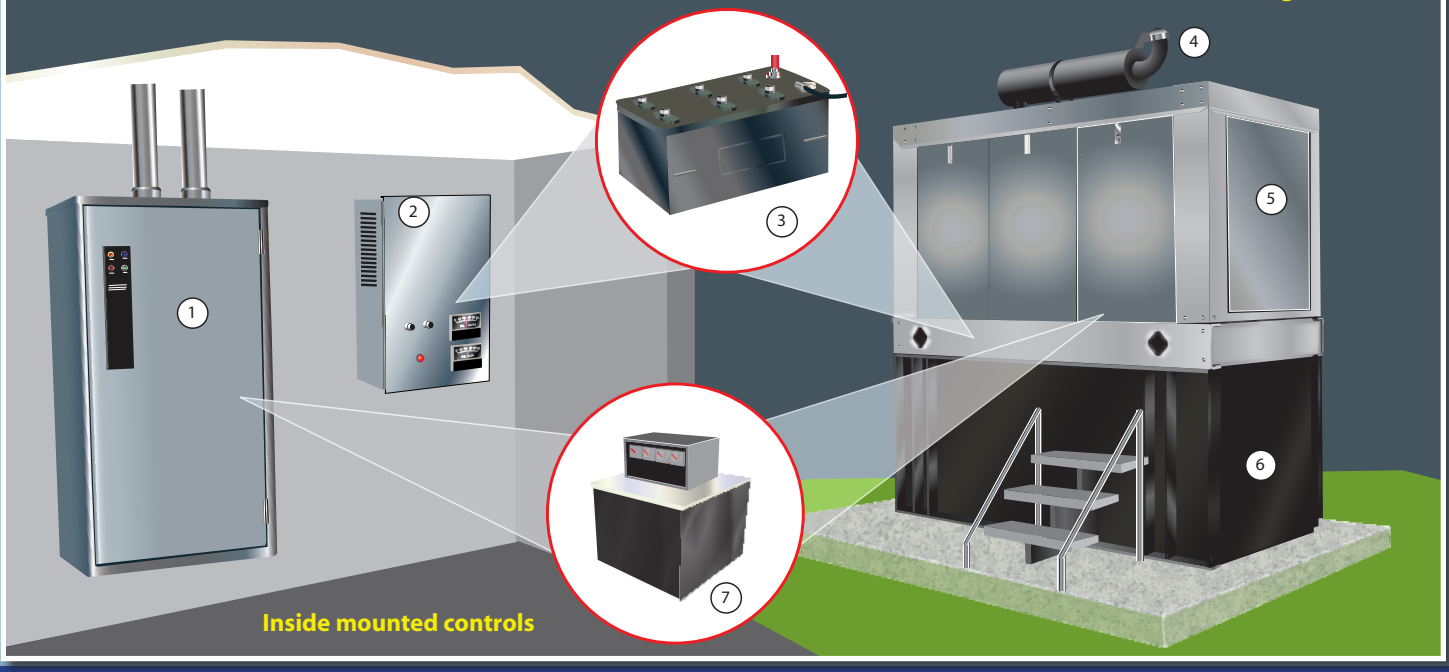
Safety - Component failure presents risks both to personnel on site and to those relying on the output of the generator set. Preventative maintenance programs are designed to detect normal life-cycle deterioration of components within the system and replace those components before they fail.

Economics - Early detection of internal or external problems enables the correction of those problems before a failure occurs. This yields significant savings through shorter down times and lower repair costs. It can prevent larger economic losses that would occur if a standby system failed to come online when needed. *(Continued over)*

Diagram of Key Maintenance Points on a Diesel Generating Set

1) The transfer switch contactor condition can be tested with any thermal imaging device for poor contact. *(For maintenance switch to "Off" position)*
2) Check battery charger is operating as specified. *(Switch off charger during maintenance)*
3) Starting batteries condition should be regularly checked. *(Disconnect negative lead during maintenance)*
4) If exhaust has a water trap drain the water as specified.
5) Within the generator set housing check oil, air and fuel filters, hoses, belt tension, coolant level and any fluid leaks.
6) Diesel fuel degrades and the quality should be monitored as well as the level of fuel.
7) The automatic transfer switch and generator set mounted control functions are checked.

Consult your local distributor before carrying out maintenance on the generating set system



To fulfill our commitment to be the leading network service provider in the Power Generation Industry, the USA, Inc. team maintains up-to-date technology and information standards on Power Industry changes, regulations and trends. As a service, our **Information Sheets** are circulated on a regular basis, to existing and potential Power Customers to maintain awareness of changes and developments in engineering standards, electrical codes, and technology impacting the Power Generation Industry.

The installation information provided in this information sheet is informational in nature only, and should not be considered the advice of a properly licensed and qualified electrician or used in place of a detailed review of the applicable National Electric Codes and local codes. Specific questions about how this information may affect any particular situation should be addressed to a licensed and qualified electrician.

Chart - Sample Planned Maintenance Items for a Diesel Generator Set

	Diesel Generator Set Key Maintenance Items	Method of Checking and Action to Take					Frequency of Check
		Visual	Record	Change	Drain	Test	
1	Coolant heater and level	X	X				Daily
2	Check and record oil and fuel Level	X	X				Daily
3	Examine charge-air piping	X					Daily
4	Drain water from tank & filter		X		X		Weekly
5	Check air cleaner	X					Weekly
6	Check battery charger	X					Weekly
7	Check coolant concentration		X		X		Monthly
8	Exhaust water-trap	X			X		Monthly
9	Check drive belt tension	X					Monthly
10	Check starting batteries	X	X			X	Monthly
11	Change fuel, oil and air filters		X	X			6 months
12	Clean crankcase breather				X		6 months
13	Examine radiator hoses	X					6 months
14	Flush and clean cooling system				X		Annually

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3.0 Items covered by generator planned maintenance programs:

(See diagram and chart for details of maintenance points)

Fuel Systems - Diesel fuel degrades over time and is susceptible to contamination. The fuel, pipes, filters and injection equipment are key items to check in any preventive maintenance program.

Batteries - Inadequate battery maintenance and neglecting to monitor the condition of the battery charger and starter motor are among the most common reasons generator sets fail.

Coolant - Leaking coolant or a poor coolant mixture can lead to overheating of the system.

Filters - Filters are used to avoid contamination of a systems that can lead to failure and reduced performance. PM programs will ensure air, fuel and oil filters are inspected and changed when required.

Contacts - Switch contacts in the electrical control systems must be regularly checked. Poor contacts generate excessive heat and carbon deposits that ultimately cause the contact to fail.

Connections - Technicians performing preventative maintenance should verify that radiator hoses and other fuel or electrical connections are working properly and not leaking.

Corrosion - Preventative maintenance schedules call for specific checks for corrosion of wiring, piping, fixtures, ancillaries and other components exposed to the elements.

Mechanical - Any mechanical system is subject to wear and a reduction in structural integrity due to load, vibration and other causes. Preventative maintenance technicians check known vulnerable components, such as belts, for tightness or wear. They also verify that all fittings are tightened to the right torque settings and not showing signs of excessive wear or stress.

4.0 Who is qualified to carry out scheduled planned maintenance checks:

Technicians who do preventative maintenance must be qualified to make all the electrical and mechanical checks that a maintenance schedule calls for, using the required testing and measuring equipment for each task. A top quality distributor will have technicians on staff who are qualified to perform all tests that are needed to keep customers' equipment in line with manufacturers' recommendations.

Always turn battery chargers off, disconnect negative battery cables and be sure that the Auto-Manual-Off switch on a systems's control panel is in the 'Off' position before doing any maintenance work. Afterward, run the generator set at its rated load for at least two hours.

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