

Diesel Generator Set General Planned Maintenance Programs

Information Sheet # 14

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

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:** Planned 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. Planned 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.

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 planned 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 planned maintenance should verify that radiator hoses and other fuel or electrical connections are working properly and not leaking.
- Corrosion:** Planned 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. Planned 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.

Who is qualified to carry out scheduled planned maintenance checks:

Technicians who do planned 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

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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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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

Diagram of Key Maintenance Points on a Diesel Generating Set

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

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

Outside-mounted generator set

