



Maintenance Considerations for Improving Life and Overhaul Interval Of Our Generators to 20,000 Hours

◆ Regular Maintenance Schedules

- ◆ To increase the reliability of the equipment, Daily, Monthly, Quarterly, Semi-annual and Annual maintenance schedules must be strictly followed.
- ◆ When the unit is inspected and exercised regularly, it continues to deliver consistent output as per expectations. Proactive maintenance also helps in detecting damages and defects at an early stage allowing preventive measures to be taken in a timely fashion.
- ◆ Given below is a short list of activities which must be performed regularly. It is however, of paramount importance that only genuine parts should be used in undertaking repair(s) of any kind. Extra amounts spent in this way will be far less than the catastrophic failures, which can result because of exactly look-alike non-genuine parts. ESL will statistically show you advantages of using genuine parts in a separate article.
 1. Clean the machine and the surrounding space – remember a clean machine delivers more power and lasts longer – Cleaning is half the maintenance. It must be done on day-to-day basis in our dusty environment.
 2. Listen for abnormal noise, vibrations etc
 3. Check any changes in the exhaust smoke being emitted and that it is being vented away from the engine and people.
 4. Check free flow of air for engine intake and engine cooling.
 5. Change oil and filters as per the manufacturer recommendation.
 6. Check cooling system for radiator air restriction, hoses, connections, coolant concentration, belts conditions etc
 7. Check Air intake system for leakages and loose connections
 8. Check Air cleaner, turbocharger, muffler, traps
 9. Check Fuel system for fuel levels, sediments, and proper functioning of the pump
 10. Check Exhaust system for leaks, chokes and flush condensation cap
 11. Check Electrical system to review meters and batteries to be recharged, if required
 12. Check Transfer switch for time delays
 13. Check Performance parameters such as A.C. output and frequency.

◆ Generator set exercising:

- ◆ Generator sets must be able to go from a cold start to being fully operational in a matter of seconds. This can impose a severe burden on engine parts. However, regular exercising keeps engine parts lubricated, prevents oxidation of electrical contacts, uses up fuel before it deteriorates, and, in general, helps provide reliable engine starting.
- ◆ Exercise a standby generator set at least once a month for a minimum of 30 minutes loaded to no less than one-third (30%) of the nameplate rating. Periods of no-load operation should be held to a minimum, because unburned fuel tends to accumulate in the exhaust system.
- ◆ While the above are only generic guidelines, it is very essential for the user to strictly abide by all the guidelines and instructions detailed in the manual. A few, simple precautions can go a long way in ensuring a safe and optimum use of the product.

◆ Importance of Maintenance Contract of Generators:

- ◆ Diesel generator sets – used for either prime or backup (emergency) power – must be regularly maintained to ensure they provide quality power throughout their service life.
- ◆ Larger companies who own many generators, or those who rely on gensets extensively for prime power, may require an in-house engineer to maintain their gensets.
- ◆ Smaller companies, or fleet owners e.g. Banks, Telecom Operators, Gas Filling Stations etc who own a generator to provide backup power in the event of an outage at their countrywide outlets, generally establish maintenance contracts with generator suppliers and / or dealers to maintain their gensets. In either instance, the life-cycle of power generators is well established and professional handling of the units is provided at an economical price. Best generator maintenance practice is following the maintenance schedule provided by the manufacturer of the generator, which the distributors like ESL are provided by their Principals. However, please note that the daily maintenance by the unit operator still holds the key to optimize equipment life and total cost of operations.



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◆ Main responsibilities of Maintenance Contractors:

- ◆ The main responsibilities of the maintenance contractors would be to inspect systems, study the technical data provided by the manufacturers, maintain records and take precautionary measures for safety as suggested by the manufacturers.
- ◆ Some of the steps taken to ensure smooth generator operation while carrying out scheduled maintenance include:
 - ◆ timely removal of worn out parts or upgrading the components
 - ◆ checking fluid levels
 - ◆ battery inspection and cleaning of connections
 - ◆ verifying control panel readings and indicators
 - ◆ changing fuel and air filters.
- ◆ Small investments made in replacing components and maintaining generators on a regular basis can save expensive and unnecessary investments or even replacement of the entire genset in the future.
- ◆ When performing routine maintenance, each action taken should be logged, and the readings and various parameters are recorded along with the date of inspection and hour meter reading of the generator. These set of readings are compared with the next set of data collected. Any abnormal variation of readings indicates faulty performance of the unit.

◆ Cost of an Annual Maintenance Contract:

- ◆ In Pakistan, a qualified Maintenance Contractor charges a labor cost between PKR 30,000 to 60,000 per unit for gensets from 30 kva to 1000 kva. If a generator operates for an average of 3 hours a day for 300 days annually, the following table demonstrates the cost of reliable, qualified service available to a customer as a percentage of fuel cost

KVA Rating	KW Rating	Specific Fuel Consumption (liters/kWhe)	70 % Load	Hourly Fuel Consumption (Liters)	Yearly Hours	Yearly Consumption (Liters)	Fuel Cost (PKR)	Total Fuel Cost (PKR)	Labor Rates AMC (PKR)	Labor Rates % of Fuel Cost
30	24	0.3	16.8	5.04	1000	5040	100	504000	30000	6.0%
50	40	0.3	28	8.4	1000	8400	100	840000	30000	3.6%
100	80	0.3	56	16.8	1000	16800	100	1680000	30000	1.8%
200	160	0.3	112	33.6	1000	33600	100	3360000	36000	1.1%
300	240	0.3	168	50.4	1000	50400	100	5040000	40000	0.8%
500	400	0.285	280	79.8	1000	79800	100	7980000	40000	0.5%
750	600	0.285	420	119.7	1000	119700	100	11970000	50000	0.4%
1000	800	0.285	560	159.6	1000	159600	100	15960000	60000	0.4%

- ◆ It clearly shows advantages of putting your-expensive-lifeline-of-operations into the hands of the experts who are doing this day-in-and-day-out rather than taking chances with hit-and-run-breed of roadside technicians. The later can save you a small amounts in terms of labor cost but may eventually play havoc with your machine in terms of greatly increased fuel consumption and / or vastly decreased reliability / performance.

◆ Final Words:

- ◆ Preventative maintenance by a qualified Maintenance Contractor ensures that you get uninterrupted power supply for all your needs. You are assured of service on priority basis in case of dire emergency and discounted service rates for additional support or work. Once a business enters into such contracts, the customer can relax to a considerable extent as the maintenance provider keeps track of when the next servicing is due and makes the visits in regular intervals.
- ◆ These guidelines help to ensure that your gen-sets can go up-to 20,000 hours and above before overhaul and subsequently between two consecutive overhauls. Please contact ESL at customercare@eslpk.com to learn more about effective maintenance of your generators leading to reduction in Life Cycle Cost of your equipment.