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Cummins Energy Solutions Business (UK)
Gas Generators Edition

Energy Solutions (Pvt.) Limited

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Editor's Note

Assalam-o-alaikum!

Doing business together may at times pose disagreement and disputes especially when it comes to monetary and assets dealings. Like every other matter, our divine book provides us guidance in the area of business transactions as well in order to avoid consequential disputes and safe-guard the interests of all in the most equitable manner. It says (Chapter 2, Verse 183):

O you who believe! When you incur debt among yourselves for a certain period of time, write it down. And have a scribe write in your presence, in all fairness….

….And do not think it too trivial to write down, whether small or large, including the time of repayment. That is more equitable with God, and stronger as evidence, and more likely to prevent doubt—except in the case of a spot transaction between you—then there is no blame on you if you do not write it down. And let there be witnesses whenever you conclude a contract, and let no harm be done to either scribe or witness. If you do that, it is corruption on your part. And fear God. God teaches you. God is aware of everything.

Thus it is important to write things down while dealing with money, property or any other article of value in the form of a contract, which should be signed by both the parties in the presence of witnesses. The deal, whether small or large, for a short or a long period, should always be in black & white and in the presence of witnesses barring the ones which involve hand to hand transactions. This will prevent disputes and safeguard the rights of all concerned.

Words of Wisdom- Live Wire of Inspiration

1. Deal not unjustly, and you shall not be dealt with unjustly- *Al Qur'an (2:279)*
2. The merchants will be raised on the Day of Resurrection as evil-doers, except those who fear Allah, are honest and speak the truth- *Prophet Muhammad (S.A.W.)*
3. If you see that one of you has slipped, correct him, pray for him and do not help Shaytan against him (by insulting him, etc.)- *Umer Ibn Khattab*
4. If you cannot work with love but only with distaste, it is better that you should leave your work- *Khalil Jibran*
5. If you do not drive your business, you will be driven out of business- *F.B. Forbes*
6. One of the tests of leadership is the ability to recognize a problem before it becomes an emergency - *Arnold H. Glasow*

Customers & Contracts- Current Waves

New breakthrough projects and repeat sales are a regular feature of ESL. Our ever increasing customer list includes prominent names from Textile Industry, Pharmaceutical Sector, Food & Beverage Industry, Tobacco, Fertilizer Plants, Electrical, Electronics Manufacturers, Hospitals, Universities, Oil and Gas Sector, etc. Some of the many worth mentioning customers during the year are:

Telecommunication Sector

ESL has signed a three year contract with Telenor Pakistan for supplies of gensets, installation & commissioning services, deployment of rental sets, routine maintenance, engine rebuilds, supply of parts, etc. This contract has made ESL adequately active in the telecom sector where it is already supplying sets and providing services to Mobilink, Ufone, etc.

Banking Sector

ESL has completed a tally of supplying almost one thousand DG sets to Allied Bank in the last two to three years. Of these, four hundred installations were performed in the second half of 2013. The company also performs maintenance contract of these sets as well as those supplied by the others. The maintenance has been made easy through a 24x7 Complaint Centre established by ESL almost a year ago. The Complaint Centre (Call Centre +92 308 2572 375) measures the MTTR & MTBF of all maintenance activities performed by ESL.

ESL has also almost completely performed the order of supplies and installations of one hundred DG sets to Bank Islami for their countrywide operations.

Oil & Gas Sector

In the oil and gas sector, ESL continues to supply DG sets to Total Parco for their countrywide deployment. In addition to this, ESL has also signed a maintenance contract for all their sets in the region South.

ESL is also performing maintenance contract of Pakistan State Oil in the region Central and North. This contract pertains to sets of high horsepower engines.

This volume's Story

When Leadership Falls Short....!

In Sri Lanka, following the fatal injury of an employee maintaining machinery at a recycling firm employing approximately 30 people, a company director received a 12-month custodial sentence for manslaughter. LOTO was not followed. 'Evidence showed that the director chose not to follow the advice of his health and safety advisor and instead adopted a complacent attitude, allowing the standards in his business to fall.'

In Bangladesh, the managing director of a manufacturing company with around 100 workers was sentenced to 12 months' imprisonment for manslaughter following the death of an employee who became caught in unguarded machinery. The judge made clear that whether the managing director was aware of the situation was not the issue: he should have known as this has always been a known potential hazard.

In India, a company employed ten, mostly young, temporary workers; they were neither trained or equipped to safely remove the asbestos, nor warned of its risk. Its officers were fined a fortune, disqualified from holding any directorship for two years and ordered to pay hefty costs of prosecuting court.

It can happen in India, Bangladesh and Sri Lanka. It happens in Pakistan also every now and then. So bosses, beware!! We call your attention to wake up and put safety first (and foremost) before it gets too late!

alternative
energygasfuels

As energy solution specialists, we design, build and maintain on-site power generating plants that produce electricity by harnessing waste fuels - "free" energy sources such as landfill gas, biogas, coal seam methane, flare gas and more.

News & Events

Cummins Application Training:

ESL engineers attended a four-day training from May 19-May 22, 2014 on Application Engineering at Cummins Power Generation in Dubai.

The training covered application of Cummins Gas Generators with respect to Preliminary Design, Electrical Load Impact on Generator Sizing, Equipment Selection, Electrical Design and Mechanical Design.

Training Programme For Telenor Pakistan

ESL provided training to 210 engineers and technicians of Telenor Pakistan. These training sessions were of four days duration with 32 credit hours.

The training was imparted by the founding Directors of ESL and was focused on Safety, Quality, Operation & Maintenance of diesel generators.

HSSE Training at Various Regions

ESL considers safety its prime responsibility. Safety Day Workshops and Presentations are a regular feature and were conducted this year too at all the regions focusing on health, safety, security and environment of the employees, customers and general public at large.

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Breaking News For Quality & Price Conscious Customers

ESL Officially Announced as Partner of Energy Solutions Business, Cummins Power Generation (CPG) UK…

ESL Directors with the Officials of Cummins Power Generation at the Middle East Electricity Exhibition 2014.

Cummins Energy Solutions Business (ESB) has signed Energy Solutions (Private) Limited (ESL) as their Gas Generating Set Distributor and Service Provider for Pakistan.

The contract was made between Mr. Justin O'Flynn- General Manager Europe, Russia and Middle East, Cummins and Mr. Muhammad Tariq Haq- Director and CEO, Energy Solutions Private Limited in September, 2013.

Mr. Tariq Haq, the Distributer Principal of Cummins Gas Power Generation in Pakistan, on the occasion stated, "With so many USPs, Cummins gas generators are heads and shoulders above other contemporary products. Ability to run on low methane gas, strength to accept 50-70% block loads, fuel consumption matching the best-in-class, inbuilt reliability because of lower BMEPs, low(est) life cycle cost, high(est) IRR, etc., are some of the features which make Cummins gas generators a highly coveted brand worldwide."

"ESL is indeed fortunate to represent Cummins gas generators in Pakistan market. For ESL management, it is a milestone achieved as our twenty one year old association with Cummins has revived. Our love for Cummins which never waned has vindicated our belief that you can get what you sincerely strive for", he added.

On the occasion of exchanging copies of contract, ESL arranged befitting day long introductory seminars in the cities of Karachi and Lahore providing a wholesome platform to Cummins Gas Power Generation in Pakistan to address the local market. The seminars were well attended by consultants, customers, contractors, etc.

Power Pulses

Ten Reasons Why Customers Buy Cummins Gas Generators Worldwide

کمنز کی یکدم اور عمدگی سے لوڈ اٹھانے کی صلاحیت

1) Cummins Gas Generators are known for their single-step-load-acceptance (torque load) capability of 50-70%. For large motors, you may use a single Cummins gas generator instead of more than one of others. It is due to:

a) State of the art Cummins governing system. This keeps monitoring peak pressures, exhaust temperatures and knocks of individual cylinders and then adjusts the ignition timing of individual cylinders to get maximum output from each cylinder.

b) The fact that the conventional type governing system monitors only the engine rpm. When the rpm changes, it starts altering the air fuel mixture. On the other hand, Cummins governing system keeps monitoring the engine rpm as well as the KWm (load) on engine. As soon as KWm changes, it governs the engine rpm through multiple actuators.

c) The main and most important reason that Cummins uses smaller, multiple turbo chargers instead of a big single turbo charger. Smaller turbo chargers easily and rapidly recover their original high rpm as compared to a single, large turbine.

2) Cummins Gas Generators are known for their ability to respond to transient loads and are ideal for applications requiring very fast recovery of voltage and frequency.

a) Due to the reasons cited above, frequency (engine rpm) stabilizes in shortest possible time.

b) For voltage stability Cummins uses its own patent state of the art AVR system, which is integrated with mother board (engine governor, etc.) of the controller. This reacts faster than the conventional type AVR resulting in faster recovery and regulation of the voltage.

ناقص کوالٹی کی گیس پر بھی کمال کارکردگی

3) Cummins Gas Generators are known for their suitability to operate on low methane index natural gas

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and continue to operate whilst others may shut down especially during Pakistani winter(s).

a) This is due to lower BMEP, for example, Cummins operates at 14 to 16 BMEP whereas competitors operate at 18 BMEP.

بلند مقام اور بلند درجہء حرارت پر کمنز کی قوت رہے خاصی برقرار جبکہ دیگر کافی کمی کا شکار

4) Cummins Gas Generators are known for no or low deration at high temperatures and altitudes compared with others.

a) It is due to the reasons explained above in 1 and 3.

5) Cummins Gas Generators may actually accomplish: hours to top overhaul in excess of 30,000 hours and major overhaul in excess of 60,000 hours.

a) It is due to their robust design. They have a construction corresponding to high BMEPs but actually operate at lower BMEP values.

6) Cummins Gas Generators are known for high total efficiencies making them ideal for co-generation and tri-generation.

a) It is due to high exhaust temperatures and exhaust mass flow rates.

فیول کا استعمال، سوئی گیس پر کارکردگی، کفایت کی عمدہ مثال

7) Cummins Gas Generators are tested at LHV of gas (33.44 MJ/Nm^3) which is nearest to that supplied by SSGC and SNGPL (around 33 MJ/Nm^3), whereas others test their generators on a much better fuel quality. This means that the data provided by Cummins sheets would be closer to real life performance than those of others, which will derate a lot more than Cummins in Pakistan. Hence,

a) Cummins Gas Generators may actually have the lowest fuel consumption at high temperatures, high altitudes with gas quality available in Pakistan.

پرزوں کا استعمال، کفایت کی ایک اور مثال

8) Cummins Gas Generators are known for their lowest Break Mean Effective Pressure (BMEP), low compression ratios, high displacement per kWhe. These features make them last longer, wear smaller, use less parts and consume less lube oil.

ہر اعتبار سے کم خرچ، بالانشیں

9) Cummins Gas Generators are known for their low(est) Total Cost of Ownership, high(est) Net Present Value and highest Internal Rate of Return (IRR).

10) Cummins Gas Generators are known for their ruggedness, reliability and ability to operate in island mode at high altitudes and high temperatures with deteriorating gas quality. These features make them the first choice of World's largest rental companies (e.g. Aggreko) and consultants.

کمنز گیس کے موجودہ کسٹمرز

a) Though a late entrant in Pakistan market, Cummins Gas Generators are known for their successful track record in AKUH, Shaukat Khanum Hospital, ATS Synthetic, PPL, University of Engineering & Technology Lahore, PAEC, etc.

Co-generation- the Hallmark of Cummins!

ایک پنتھ، دو کاج

Steam is very powerful. It does not only run an engine but also possesses the ability of air conditioning besides its various other uses. Diesel and/or gas generators not only produce electrical power but may also produce steam which may be used for heating or cooling. This is like killing many birds with one stone. Technically, this is known as Co-generation.

Co-generation, also known as Combined Heat and Power (CHP), is the on-site production of multiple types of energy- usually electricity, heating and/or cooling- from a single source of fuel. Co-generation replaces the traditional methods of acquiring energy, such as:

1. **Purchasing electricity from the power grid, like Karachi Electric (KE) or WAPDA.**
2. **Separately burning natural gas or oil in a furnace to produce heat or steam.**
3. **Using the resultant steam to produce air-conditioning through vapor absorption cycle.**

The traditional method of purchasing electric energy from KE or WAPDA is very inefficient and wastes almost 75 percent of the energy in the original fuel due to production (generation) and transportation (transmission) losses. Typically the energy balance is as under:

1. **Energy input- 100%**
2. **Energy wasted in generation- 60%**
3. **Energy wasted in transmission- 10 to 15%**
4. **Energy delivered as electrical output- 30%**

On-site co-generation systems convert 70 percent to 90 percent of the energy in the fuel that is burned into useful electricity or heat.

Let's try to understand which power generation installations are the most suitable for co-generation.
Almost any facility with a simultaneous need for both electric and thermal energy is a potential candidate for the energy saving benefits of co-generation- that is, on-site systems that produce both electric power and thermal energy from a single source of fuel. Ask yourself the following questions and if answers to all are "yes", then your facility may be a good candidate for a co-generation application.

1. Is the electrical load of your facility consistently greater than 1,000 kW?

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Note: Facilities with larger energy needs can generate larger savings and have a shorter payback period.

2. Is the thermal load of your facility equal to 1 million BTU / hr or more?

(a) This could take the form of hot water, an absorption chiller load, low-pressure steam- or a combination of all three.

3. Is the duration of your simultaneous need for heating/cooling and electric power greater than 4,000 hours per year?

4. Is the cost of electricity significantly higher than cost of natural gas?

(a) Greater the differential between the price of electricity and the price of natural gas (equivalent BTU basis), greater the likelihood of savings.

5. Is the reliability of electric service a matter of concern?

(a) For many commercial and industrial facilities, a power outage can be very costly. On-site co-generation systems- when designed properly- offer significantly better reliability than local utilities. They are less vulnerable to vandalism and transformer or transmission line failures, and, with proper maintenance, will offer decades of reliable operation.

Sources of Heat:
The thermal energy contained in the exhaust gas and cooling systems generally represents 60 to 70 percent of the inlet fuel energy. Waste heat from engine is available in the following:

1. Engine exhaust
2. Jacket coolant
3. Lube oil cooler and
4. Turbocharger's intercooler and after-cooler (if so equipped).

Amount of heat recovered is in direct proportion to the

1. Exhaust gas mass flow rate, exhaust temperatures and minimum temperature exhaust can be cooled down to.
2. Mass flow rate of cooling water in LT and HT circuits and maximum outlet temperatures achieved respectively from both.

It is important to note that

- Heat in the engine jacket coolant accounts for up to 30 percent of the energy input and is capable of producing 90 to 95°C hot water.
- Engine exhaust heat carries 30 to 50 percent of the available waste heat. Exhaust temperatures of 450 to 650°C are usual.
- By recovering heat in the cooling systems and exhaust, approximately 70 to 80 percent of the fuel's energy can be effectively utilized to produce both power and useful thermal energy.
- Exhaust heat is typically used to generate hot water to about 100°C or low-pressure steam (up to 150 psig).
- Only a portion of the exhaust heat can be recovered since exhaust gas outlet temperatures are generally kept above a certain level (120 to 180°C) to prevent the corrosive effects of condensation in the exhaust piping.
- Exhaust heat recovery can be independent of the engine cooling system or coupled with it. For example, hot water from the engine cooling can be used as feed water or feed water pre-heat to the exhaust recovery unit. In a typical heating system, jacket cooling, lube oil cooling, single stage after-cooling and exhaust gas heat recovery are all integrated for steam production.
- Heat which is required to convert feed-water at 100 °F (38°C) into steam at 150 psig (15 bar) is equal to 1128 BTU.
- Quantity of 100 to 150- psig steam which is required to produce one ton of refrigeration/air-conditioning is 10 lb (4.5 Kg).

It is due to the above reasons that Cummins gas generators are the most efficient for co-generation. This Total Efficiency is the hallmark of Cummins gas generators and the basis of Lowest Total Cost of Ownership! For more advice and information on co-generation, please contact us at customercare@eslpk.com.

Cummins Power Generation

Cummins High Performance Lean Burn Gas Generators- Technology of Tomorrow, Unleashed Today!

Reciprocating engines are of two basic types- spark ignition (SI) and compression ignition (CI). Spark ignition engines for power generation use natural gas as the preferred fuel, although they can also be set up to run on propane, gasoline, or landfill gas. Compression ignition engines (often called diesel engines) operate on diesel fuel or heavy oil.

Diesel engines are increasingly confined to emergency standby because of spiraling fuel costs, storage issues and air emission concerns particularly in the West. Consequently, the natural gas-fueled SI engine is now the engine of choice for the higher-duty-cycle stationary power market and is driven by economic and environmental pressures for power density improvements (more output per unit of engine displacement), increased fuel efficiency and reduced emissions.

A lean burn gaseous fueled generator set is a very good alternative to diesel or stoichiometric gas powered generator sets.

What are the air to fuel ratios achievable in Lean Burn gas engines compared with other types?

Lean burn technology uses high air to fuel ratio (.=1.7) and excess oxygen to gain overall output efficiency at greatly reduced NOx emissions. These efficiency levels often exceed those of equivalent sized diesel products. Exhaust emissions are significantly lower than stoichiometric gas engines (.=1) and greatly reduced from a diesel engine. Chemically correct, stoichiometric gas engines run with a normal air to fuel ratio of 15:1. True lean burn gas engines can go as high as 25:1 when full power is not needed, resulting in better fuel economy. When full power is needed it can revert to a stoichiometric ratio or richer. Diesel engines, on the other hand, have air to fuel ratio of 25:1 or 30:1 at full load to 85:1 or 100:1 at no load.

Why is a lean burn gas generator more expensive than a diesel generator of the same size?

Many natural gas spark ignition engines are derived from diesel engines, i.e., they use the same block, crankshaft, main bearings, camshaft, and connecting rods as the diesel engine. However, natural gas spark ignition engines operate at:

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1. Modest compression ratios in the range of 9:1 to 12:1 (compared with diesel engines in the range of 12:1 to 17:1) to prevent auto ignition and knock which can cause serious engine damage. www.eslpk.com 111-222-ESL (375) www.power.cummins.com

2. Lower brake mean effective pressures (BMEP - 16 to 18 bar compared with 24 bar of diesel) and

3. Lower peak combustion pressure levels (120 bar vs. 180 bar for diesel engine).

Due to the essentially lower BMEP, the spark ignition versions of diesel engines often produce only 60 to80 percent of the power output of the parent diesel. Consequently, the $/kW capital costs of natural gas spark ignition engines are generally higher than the diesel engines from which they were derived.

How does a lean burn gas engine behave when subject to high starting torques?

Lean burn combustion technology results in more complete combustion of the gaseous fuel and cooler combustion temperatures. However, there is a trade off for the improved efficiency and emissions, which is:

1. The rapid starting as compared to a diesel engine and
2. High percentage of single step load acceptance capability.

A diesel powered generator set is generally fast responding and able to pick up large load steps without reasonable voltage and frequency variation. Often a diesel genset can pick up 100 percent of rated power in a single step and recover quickly. The load step capability of a lean burn gaseous generator set is normally in a range of 10-75 percent. The difference in response is a result of the differences in fuel delivery systems of the CI and SI engine technologies. The wide range of percentage difference in SI engines is due to the various system technologies within the lean burn spectrum

What is the difference between lean burn engines designed for efficiency and performance?

Within the spectrum of lean burn technology, generator sets are of two types- one optimized for performance (tolerance to temperature, altitude and load steps), the other optimized for efficiency. The latter uses a single large turbo charger as opposed to multiple turbo chargers. These higher efficiency models are designed primarily for operation parallel to a utility grid and pose challenges when operating in Island mode (not connected to a utility grid).

The greatest trade-off of these single turbo models is the ability to pick up a large load in a single step. While Cummins multi-turbo units with twin governors, twin actuators, twin gas control valves can pick up a load step of 50-75 percent of rating with reasonable performance, single turbo, high efficiency models are limited to 10-25 percent of the advertised rating. Single turbo units can be utilized in island mode only after special attention is paid to the load step size and sequence.

Why is the maintenance interval of a lean burn gas generator higher than a diesel engine?

Operation of a lean burn SI engine at lower BMEP and smaller peak combustion pressures results in substantially lower loads on the engine components and the bearings. This, when combined with cleaner combustion environment of natural gas, keeps the lube oil cleaner and healthier for longer. As a result of these, spark ignition engines offer the benefits of substantially extended component life (to the order of twice and beyond) compared to their diesel parents. This is why we find time to overhaul of

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60,000 hours and even beyond for a 16 BMEP SI engine.

Why is a lean burn gas generator difficult to run on island mode as compared with a diesel generator?
A lean burn gas engine cannot rapidly adapt to changes in load compared with a diesel engine. Two reasons which are often cited are:

1. Natural gas has a much lower energy density (1m³ of NG is equivalent to 1litre of diesel). Hence with a richer fuel (diesel) it is easier to follow the varying load and keep frequency and voltage under regulation. The higher volume of natural gas that has to enter the cylinder makes the process of adapting to rapidly varying loads more difficult hence the difficulty in using gas engines in island mode.

2. There is a considerable difference in the reaction speed between diesels and gas engines. This is because diesel engines always have excess air in the cylinder. With suddenly increasing load, you just have to add more fuel and the engine will respond. In diesel engines, this can transpire in less than 1 /16 of a cycle. With modern, lean-burn, gas engines, the fuel to air ratio is critical and must be maintained at all times. If you want more power, you cannot just add more fuel, you have to wait for more air as well. Unlike diesel, oxygen is not available inside the cylinder, it has to be fetched from outside through increased activity by the turbocharger(s). Hence, it can take many cycles to go from (say) 30% to 60% load.

Like diesel generators, Cummins lean burn gas generators are highly suitable for island mode operations while othersare not. Why?
Cummins lean burn gas generators proactively anticipate increase in upcoming load by intelligently sensing dip in voltage instead of reacting to subsequent dip in RPM at the flywheel. Consequently, Cummins own factory built, specially designed multiple turbochargers rapidly fulfill increased demand for more air in the cylinders. Since, increased amount of air / gas mixture is available for combustion instantly after application of a block load (motor starting torque), Cummins gas engines are ideally suited for island mode operations whilst others simply watch and wonder.

What is the advantage of a lower BMEP SI engine over a higher BMEP SI machine?
Some manufacturers of lean burn SI engines offer higher BMEP vs. Cummins (18 bar instead of 16 bar of Cummins). Higher BMEP levels increase power output, improve efficiency and result in lower specific costs ($/kW). BMEP is increased by forcing a larger mass of cooler and denser air through increased turbo charging (defined as air compression by a turbine driven by exhaust gases boosting air pressure on a 3:1 to 4:1 ratio), improved after-cooling (LT cooling circuit), etc. However, higher BMEP increases thermal and pneumatic stresses within the engine, and poses issues with regard to continued engine durability and reliability. We may also see increased engine oil consumption.

How does a lean burn engine respond to fuels other than natural gas?
Lean burn technology has the ability to operate on gas with a wide range of quality. A measurement called the Methane Number (MN) is used to determine fuel gas suitability as an engine fuel. Most natural gas has an MN from 70 to 97, and pipeline quality gas typically has an MN of about 75. Gas from landfills or sewage treatment facilities is typically of lower quality, but is often suitable for use in lean burn engines. Cummins' lean burn gas engine generators can operate on gas with an MN of 50 or greater, providing excellent fuel flexibility. However,gas with an MN below 70 may require derating of the
generator output.

Cummins superiority over other contemporary products:
On account of above cited reasons, Cummins gas generators stand out in the following ways:

1. Truly island mode machine
2. Torque load capability of 50-70%
3. Fast recovery in the wake of transient loads
4. Low deration
5. Operations at low Methane Numbers without losing power
6. Lower wear, higher maintenance intervals (as compared with published numbers), lower con sumption of parts
7. Arguably, the lowest fuel consumption in Pakistan in the context of high temperatures, high altitudes, deteriorating LHV and MN of the gas supplied by SSGC and SNGPL.

زندگی سے محبت (کتابچہ برائے حفاظت سے ماخوذ)

محفوظ عادات کے زریعے خطرات پر فتح حاصل کیجیے

جس طرح انسان کے خیالات اس کے الفاظ کی صورت اختیار کر لیتے ہیں اسی طرح انسان کے انداز اس کی عادات کا روپ دھار لیتے ہیں۔

کسی بھی کام کو کسی خاص انداز میں بار بار انجام دینے کو عادت کہتے ہیں۔ کسی بھی عمل کو بار بار دہرانے سے عادت پختہ ہو جاتی ہے۔ اچھی یا بری عادت کا براہِ راست تعلق ہماری آرام طلبی کی خواہش یا خود کو خطرات میں ڈالنے کے رجحان سے ہوتا ہے۔ عادات ہمیں کام کو ایک رٹے رٹائے (Stereotype) انداز میں کرنے کے قابل بناتی ہیں اور ہمیں یہ اطمینان دلاتی ہیں کہ ہمیں قدم قدم پر منصوبہ بندی کی ضرورت نہیں۔

کام کو محفوظ انداز میں کرنے کی عادت ہمیں انواع واقسام کی ذہنی اور جسمانی تکالیف اور اذیت سے نجات دلا سکتی ہے۔ محفوظ عادات کے حامل افراد غیر اختیاری طور پر بھی خطرات سے بڑی حد تک محفوظ رہتے ہیں۔

اگر ہمارے لئے ہر دم مستعد، چاق و چوبند اور متوجہ رہنا ممکن ہوتا نیز ہم اس بات کو یقینی بنا سکتے کہ ہمارے کام کے طریقے اور آلات ہمہ وقت محفوظ ہیں تو ہمیں محفوظ عادات کی قطعی کوئی ضرورت نہ تھی۔ لیکن ہم جانتے ہیں کہ بشری طور پر ایسا ممکن نہیں۔ بحیثیت انسان ہمارا تھکنا، بور ہونا، مایوسی کی کیفیت کا شکار ہونا، دماغی طور پر الجھنا اور دیگر ذہنی اور جسمانی کیفیات کا شکار ہونا فطری ہے۔ ایسے میں اچھی اور محفوظ عادات ہمارے کام کے طریقوں کو محفوظ بناتی ہیں اور ہم ہمہ وقت موجود خطرات سے خود کو محفوظ رکھ سکتے ہیں۔

چند اچھی اور محفوظ عادات جو ہمیں اور ہمارے خاندان / کارکنان کو ہر دم محفوظ رکھنے میں معاون ثابت ہوتی ہیں، درج ذیل ہیں۔

- ☆ کام کی مناسبت سے لباس پہننے کی عادت۔
- ☆ مشین کے چلتے ہوئے پرزوں مثلاً بیلٹ، چین، اسپروکٹ، گیئر وغیرہ کے گرد گارڈز کے مسلسل استعمال کی عادت۔
- ☆ سیٹ بیلٹ اور ہیلمٹ کے استعمال کی عادت۔
- ☆ گاڑی چلاتے وقت موبائل فون کے استعمال سے گریز کی عادت۔
- ☆ گاڑی چلانے سے قبل ضروری سسٹمز کو چیک کرنے کی عادت۔
- ☆ ہمیشہ سڑک کی صحیح جانب گاڑی چلانا۔ نیز وقت بچانے کی غرض سے غلط جانب گاڑی نہ موڑنے کی عادت۔
- ☆ بجلی کے کام سے قبل اور ایسی مصنوعات یا مشینز کے استعمال سے قبل جن کے متعلق معلومات نہ ہوں، ضروری ہدایات حاصل کرنے اور سیکھنے کی عادت۔

محفوظ عادات اختیار کرنا اپنے جسم میں ایک خودکار نظام نصب کرنے کے مترادف ہے۔ یہ آپ کو اس بات کی اجازت دیتا ہے کہ آپ بغیر کسی ذہنی دباؤ کام سرانجام دے سکیں اور اپنی ذہنی صلاحیتوں کو مثبت انداز میں بروئے کار لا سکیں۔

عادات رفتہ رفتہ، بتدریج اختیار کی جاتی ہیں۔ صحیح کام کریں، پھر اسکو دہرائیں، پھر کریں، پھر دہرائیں، ایک ہی طرح سے بار بار کریں۔ کچھ ہی وقت میں آپ مذکورہ صحیح اور محفوظ عادات اختیار کر لیں گے اور نہ صرف اپنی بلکہ اپنے خاندان اور کارکنان کی زندگی کو محفوظ بنا سکیں گے۔

CPG Seminar in Lahore & Karachi

CPG (UK) seminar in Karachi,- introduction of lean burn gas product range in Pakistan

CPG (UK) seminar in Lahore,- introduction of lean burn gas product range in Pakistan

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CPG Gas Training at Marroitt, Karachi

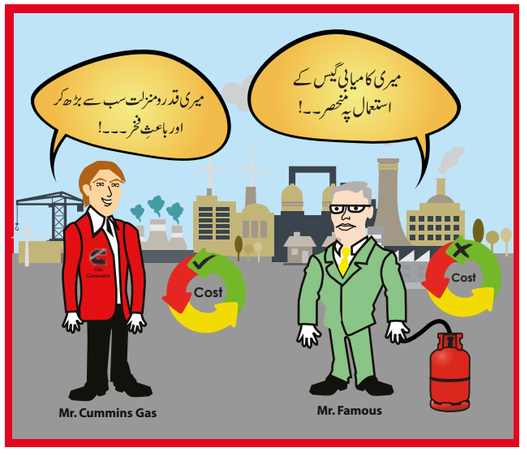
CPG (UK) conducted a day long training session for ESL management team and its technical and commercial staff at Marriott Hotel Karachi in September 2013.

Launch of CPG Lean Burn Gas Generators Through Textile Asia Exhibition 2014

ESL announced the formal launch of Cummins Gas Generators in Pakistan through participation in the International Textile Asia Exhibition held from 11 – 13 March, 2014 at Expo Centre, Karachi. The exhibition had 310 Exhibitors from 29 countries displaying their brands.

DIALOGUE BETWEEN CUMMINS GAS GENERATOR AND FAMOUS BRAND

TORQUE LOAD CAPABALITY



LIFE CYCLE COST