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SHV India Wins LAPWING Award



SHV India bagged the prestigious “Lapwing” Award for the year 2009 for implementing innovative and effective measures towards improving safety in day-to-day business. The Lapwing Award is instituted by SHV Holdings N.V., Netherlands and awarded every year to a SHV Group company for taking significant initiatives in the field of safety, education, healthcare and

environment. SHV India has won this coveted award twice within a short span of last four years from amongst various SHV Group Companies representing diverse businesses from around 45 countries.

The award was presented by Mr Patrick Kennedy, Chairman, Executive Board of Directors, SHV Holdings to Mr Ajay Kumar, CEO, SHV Energy, India for “Improving Road Safety by using Reflective Signage” on LPG bulk tankers.

Hearty congratulations to the SUPER Gas team for this achievement.



“Safe LPG Transfer”

LPG transfer from road tankers to storage vessels and storage vessels to road tankers is carried out day in & day out in our LPG Industry. Activities involving large quantity transfer include tanker loading /unloading in plants & terminals, unloading at ALDS stations, customer premises etc.

Statistics show that major accidents took place worldwide while LPG transfer operations were going on. Possible Hazard identification & elimination is very important from design stage itself. Following is the list of few hazards & their precautions for safe loading / unloading of LPG:

1. Static Charge: This is a very small electric charge generated due to friction or rubbing of different kind of material having different velocity. Potential static charge is generated when LPG flows above a certain velocity through pipe.

Precaution

- LPG transfers pump and pipeline to be designed such that velocity of LPG should be below 7 m/sec
- Earthing jumper to be provided between flange joints

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From the Editor’s Desk.....

Quite a few important events have happened since the last issue of Chetna.

Our new filling plant at Hyderabad has been commissioned. The National Safety Week was celebrated with much enthusiasm and innovative programmes were conducted in various locations to highlight significance of safety. Participation of many family members in these events was indeed commendable.

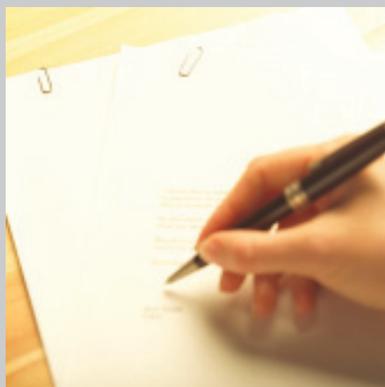
We have tried to present most of these happenings in this new issue of Chetna. In a way, we had to work a bit extra to live up to the high standards set by my predecessor, Cdr. A.S.Oberoi. You would also notice the new look - a touch of green to indicate that LPG is environmentally friendly and of course, a safe fuel. Hope you would like the fresh look as well as the content.

We have received good appreciation for our thrust on safe practices adopted in India. Besides receiving the prestigious Lapwing award, we have also delivered overall improved (i.e. safe) performance in different aspects of our business considering SHV Group perspective globally. As always, we have to maintain this thrust on ensuring safety in all areas and continue to excel in implementing robust safe practices.

Monsoon has arrived in the country. I am sure you would have checked your vehicles for Monsoon-readiness so as to avoid getting stranded on the road. Drive safely and enjoy the rain !

Lastly, I solicit your valued suggestions and continued support to enrich Chetna with a view to strengthen our drive towards improving safety.

Sunil Jhingran



Foundry: Investment Casting - LPG Application: Shell Baking

Investment casting as its name implies attracts a lot of investment in terms of money, time & labour. Investment casting is meant to produce the typical casting components which needs very high surface finish, thus does not require any machining process & is ready to use after appropriate Heat Treatment process. This process is particularly popular to manufacture different kinds of valves bodies, Pump internals like impellers, Gear, Casings, sleeves, diffusers, fittings etc. Petrochemicals, Brewery & dairy, Aerospace & Automobile are some major industries extensively using Investment Casting components.

Process: The process cycle time is of minimum 20 days, if the die to produce a pattern is ready, otherwise it can be prolonged to 30 to 45 days. The flow of basic cycle in Investment casting foundry is depicted as follows:

Wax Department

The liquid wax is injected into the die through wax injection machine to prepare the master piece or pattern, pattern is then subjected to minor cleaning & repairing. A tree comprises of many numbers of such wax pattern is then prepared & assembled alongside the runner which is a path through which molten metal flows from tree hopper to its branches i.e. wax pattern cavities via gate.



Shelling Department

The wax pattern tree is now ready to dip into slurry (ceramic) solution for slurry coating in order to entrench the slurry into wax pattern. Minimum 8 to 10 coats of different slurries are required. Slurries are then kept in temperature & humidity controlled rooms to get the best dimensional accuracy & an excellent surface finish, this takes 4 days time for slurry to dry. The slurry coated tree, is now ready to remove wax which is adhered firmly on slurry tree, this process is known as dewaxing which facilitate the formation of cavity, resembles with pattern & so final shape & size of finished casting. Dewaxing happens by dipping slurry tree into hot bath of wax @ 200 degree temperature.

Shell Baking

The shell has to carry the molten ferrous/nonferrous metal of temperature upto 1650 c .Hence to withstand the thermal shock of molten metal & to prevent the cooling of molten metal, Shell Baking is mandatory. Shells are baked in generally two types of shell baking furnaces. These are Batch type & chamber size is usually L: W: H :: 4:4:4 feet for box type & approx 2750 mm dia. for rotary furnace.

- ❖ Box type Shell baking furnace with 2 nos. burners, located opposite to each other & perpendicular to furnace door.

- ❖ Rotary shell baking furnace with 3 nos. burners situated at 60 degree to each other. The circular furnace which houses Shells, revolves 360 degree, while burners are stationary, to facilitate the homogeneous dispersion of heat.

The shells are require to be baked @ 1100° c temperature according to casting grade, weight & geometry. Cycle time is 60 min. to 90 min depending upon the casting characteristics. The red heated shells are then taken out from furnace & kept at sand bad to pour the molten metal.

Melting Department

Induction furnaces are used to melt the scrap. Various ferrous/Non ferrous metal grades are melted in furnace, size of which varies from 50 kg to 500 kg. Normally a heat (molten metal) is ready within 90 minutes. The molten metal is then transferred by tilting induction furnace into a preheated ladle. Ladle is usually preheated in Shell baking furnace only. Finally pouring of molten metal does happen into baked shells.

Felting Department

Knock out is performed through hammer to remove the slurry from tree. The branches are cut from runners & gate to get the castings. Subsequently finishing process is carried out by sand/shot blasting to clear the slurry burs from final casting.

Appropriate heat treatment is applied to improve the grain structure of casting in order to impart desired physical properties to finished product.

LPG finds application in following areas of Investment Casting Foundry:

1. Shell Baking
2. Dewaxing
3. Ladle preheating
4. Wax and Moisture removal from Shells
5. Heat Treatment

LPG is a preferred fuel over liquid fuels like CBFS, LDO etc. in Shell Baking application because of its numerous benefits :

- ❖ Uniform heating of furnace chamber enables the shells placed at contour of furnaces to achieve required baking, flow of drafting from the bottom of the furnace is advisable to bake the shells from base & to maximize the utilisation of flue gas. In this way, the shells deprived of baking in the wake of limited approach of heat inside the chamber, is exposed to full baking. Shell rejection rates are virtually obviated by using LPG.

- ❖ It is observed that castings with thin walls are baked properly due to better reach of heat inside the shell cavity owing to LPG firing.

- ❖ Liquid fuels are predominantly having high percentage of Sulphur which result in chemical reaction with oxygen & forms Sulphur Die Oxide (SO₂) .Sulphur die oxide is responsible for deterioration of the Shell quality being baked & enhances the possibility of shell rejection. Usage of LPG prevents any oxidation & thus saves a costly Shell.

- ❖ Shells are baked in close tolerance of temperature & fluctuation in temperature deteriorates the shell baking quality. Precise temperature control thus is a prerequisite in shell baking application which is easily achieved with LPG firing.

- ❖ Sundry maintenance activities of Burner owing to adulterated liquid fuels can be fully eliminated by using LPG.

- ❖ LPG contributes towards increased life of furnace lining, chimney & ducting which are prone to get corroded by sulphur emission of liquid fuels.

Vikas Rathore
Rajkot

Hyderabad Filling Plant Becomes Operational



Sri G.M. Reddy, Deputy Chief Controller of Explosives visited LPG Bottling Plant, Hyderabad

The plant construction activity came to an end after a hectic pace of work by the Project team ably supported by the Procurement group. The new Super Gas filling plant at Choutuppal, Hyderabad was successfully commissioned during January 2009. Shri G.M. Reddy, Deputy Chief Controller of Explosives visited the plant for conducting a detailed inspection being the statutory requirement for awarding requisite licenses for filling and storage of cylinders under Gas Cylinder Rules 2003 and Static and Mobile Pressure Vessels Rules 1981.

The automated cylinder filling and dispatch system, bulk handling facilities, safety and fire fighting system etc., installed in the new filling plant were well appreciated and appropriate licenses were awarded to allow commencement of regular operations.

Raghu Kadali
Hyderabad

LPG Properties

LPG or LP Gas is liquefied Petroleum Gas. LPG is a mixture of commercial butane and commercial propane having both saturated and unsaturated hydrocarbons. LPG has such simple chemical structure; it is among the cleanest of any alternative fuels.

LPG is inherently dangerous on account of fire, explosion and other hazards. This calls for special attention on the manner in which it is bottled, transported or used. LPG exists as a gas at normal atmospheric pressures & temperatures, and it is liquefied by application of moderate pressure. If the pressure is released the liquid will convert into vapour again.

Density: LPG at atmospheric pressure and temperature is a gas which is 1.5 to 2.0 times heavier than air. It is readily liquefied under moderate pressures. The density of the liquid is approximately half that of water and ranges from 0.525 to 0.580 @ 15 deg. C.

Since LPG vapour is heavier than air, it would normally settle down at ground level/ low lying places, and accumulate in depressions.

Vapour Pressure: The pressure inside a LPG storage vessel/ cylinder will be equal to the vapour pressure corresponding to the temperature of LPG in the storage vessel. The vapour pressure is dependent on temperature as well as on the ratio of mixture of hydrocarbons.

Flammability:

LPG has an explosive range of 1.9% to 9.5% volume of gas in air. This means that if the percentage level of gas in air is either below 1.9% or above 9.5%, the mixture will not catch fire. Below 1.9% level, the air-fuel mixture is too lean to burn and above 9.5%, the mixture is too rich to burn. These limits are commonly called the "Lower Explosive Limit" (LEL) and the "Upper Explosive Limit" (UEL).

The auto-ignition temperature of LPG is around 410-580° C and hence it will not ignite on its own at normal temperature.

Odour: LPG has only a very faint smell, and consequently, it is necessary to add some odorant, so that any escaping gas can easily be detected. Ethyl Mercaptan is normally used as stenching agent for this purpose. The amount to be added should be sufficient to allow detection in atmosphere 1/5 of lower limit of flammability (LEL) or odour level.

Toxicity: LPG even though slightly toxic, is not poisonous in vapour phase, but can, however, suffocate when in large concentrations due to the fact that it displaces oxygen.

Colour: LPG is colourless both in liquid and vapour phase. During any leakage the vapourisation of liquid cools the atmosphere and condenses the water vapour contained in them to form a whitish fog which may make it possible to see an escape of LPG.

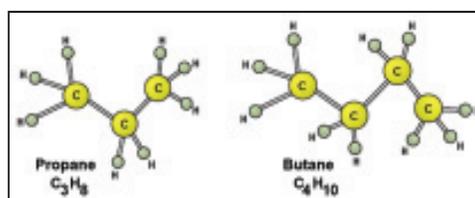
Volatility: When pressure is released, LPG vapourizes rapidly lowering the surrounding temperature. This may lead to frost burns by contact of LPG with the skin. Protective clothing such as gloves and goggles shall therefore be worn when there is any possibility of contact with LPG.

Leaking liquid phase LPG will rapidly expand around 250 times of its own volume thereby creating a greater risk than would occur with a similar sized vapour leakage. Sufficient ullage space for the expansion of liquid when the temperature rises must therefore be left in all storage/ transport containers.

Flame propagation: LPG liquid released will form a vapour which will travel long distance. The vapours of LPG can give violent concussion in explosion than in case of hydrogen, due to faster flame propagation.

Cubical Expansion: Cubical expansion is observed when LPG is transformed to vapour state. It can expand by 240 – 270 time by its volume, i.e: one ml liquid LPG becomes equivalent to 240-270 ml of LPG vapour.

Effect of water in LPG: Water present in LPG may cause rust and corrosion and freeze-up of valves, drain valves, excess-flow check valves, cylinder valves and regulators. Ice-formation may prevent the closure of drain valves, bleeders in LPG vessels and lines, self closing valves, etc. and result in leakage of LPG. Ice crystals formed at the regulator orifice may lead to plugging of the orifice and thus stopping the flow of gas. Ice crystals may also make the linkages in a regulator inoperable.



Tuhin Mitra
Kolkata

Driving In the Rain

Losing control of your vehicle on wet road is an alarming experience. Unfortunately, it can happen unless you take preventive measures.

You can prevent skids by driving slowly and carefully, especially on curves. Steer and brake with a light touch. When you need to stop or slow, do not brake hard or lock the wheels and risk a skid. Maintain mild pressure on the brake pedal.

If you do find yourself in a skid, remain calm, ease your foot off the accelerator and carefully turn in the direction you want the front of the vehicle to go.

While skids on wet road may be alarming, hydroplaning is completely disturbing. Hydroplaning happens when the water in front of your tyres builds up faster than your vehicle's weight can push it out of the way. The water pressure causes your vehicle to rise up and slide on a thin layer of water between your tyres and the road. At this point, your vehicle can be completely out of contact with the road, and you

are in danger of skidding or drifting out of your lane, or even off the road.

To avoid hydroplaning, keep your tyres properly inflated, maintain good tread on your tyres and replace them when necessary, slow down when roads are wet, and stay away from puddles. Try to drive in the tyre tracks left by the vehicles in front of you.

If you find yourself hydroplaning, do not brake or turn suddenly. This could throw your vehicle into a skid. Ease your foot off the accelerator until the vehicle slows and you can feel the road again. If you need to brake, do it gently with light pumping actions.

A defensive driver adjusts his speed to the wet road conditions in time to avoid accident.

Mayur Chudasama
Porbandar

Personal Protective Equipment



Personal Protective Equipment (PPE) is a frail barrier against hazards and is used to prevent or minimize injury. In many incidents, immediate use of PPE has reduced the severity of Occupational exposures or industrial injuries. However it is important to ensure correct use of PPE for the expected hazards. PPE is used during routine and non-routine work for protection against physical injury, chemical splash or for working in adverse atmosphere such as dusty, toxic, noisy and oxygen deficient.

Head Protection

Safety Helmet, is to protect you from impact and penetration caused by objects hitting your head. It is the individuals responsibility to check the head band, chin strap and cleanliness of the helmet before use.

Eyes

Safety goggles, are to protect the eyes from any dust or unexpected particles, liquid droplets etc.,

Welding goggles must be worn while doing any type of welding or gas cutting activity.

Face shield must be worn when any activity involving a risk of splash, leak, spill. The need must be identified while issuing the work permit and same is to be ensured for compliance.

Foot

Foot protection is important to prevent injuries in case a heavy or sharp object falls on your foot or you step on an object that could pierce your shoe.

Ear

Ear plugs or Ear Muffs are to be used where the noise levels are identified > 85 decibels

Hand and arm Protection

Cotton gloves are to be used while climbing up / down stair cases or any structures.

PVC Gloves are to be used while handling any chemical handling or cleaning.

Electrical resistance Gloves are to be used during electrical hazard jobs.

Full Protection:

Body

Safety belt must be worn when a job has to be executed above 2 m height and where a permanent platform not existing.

Safety belt must be worn when a person entering any pits or confined space as per the risk assessments for the particular job.

Respiratory

Dust mask shall be used while performing any activity having risk of free air born dust. Risk assessment shall be made for the particular job.

Self Contained Breathing Apparatus (SCBA) shall be used when entering into confined spaces, Oxygen deficient atmosphere or toxic environment.

Banala Mallaiah
Hyderabad

National Safety Day Celebrations

SHV Energy, observed National Safety Week, during 4-11 March 2009. The National Safety Week was observed with great enthusiasm at corporate office, all regional offices, filling plants, educational institutions and customer locations/industries. The week-long event began with the safety pledge taken by the

employees. To inculcate safety awareness, safety day badges were distributed, safety banners were displayed and a competition on safety quiz, essay, safety cartoons identification of hazards at work places and safety slogans was organised. Some highlights of the celebration are:



Corporate Office Emergency Evacuation Plan, Hyderabad



Employees Training Program at Uluberia Filling Plant



First Aid Training Program at Regional Office, Ahmedabad



Training Program at Saint Gobain, Chennai



External Mock Drill Program at Rohtak Filling Plant



Transport Crew Training Program at Porbandar

Feed-back

We are very glad to receive this news letter from you. This news letter contain very valid and useful information and a bunch of safety bulletins will become a Bible for LPG Safety. We are very much appreciating the safety system implementations at your plants shown in Chetna.

We hope your team will provide more and more information on safety and educate us.

Looking forward for your next issue of Chetna.



N.Ravi Sankar
Safety Manager
Lanco Infratech Limited.

Safety Mock Drill was carried out in our Plant at Nuthankal in view of the Season approaching by Mr. S. Venkat Murali & Team. The Training and information given to our Staff and Security persons has been informative and helpful.

We wish your team best of luck and every success in their future.



K.V. Siva Reddy
General Manager
Bharathi Agro Enterprises

“Safe LPG Transfer”

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c. Double earthing to be provided to tanker while Loading / unloading and earthing must be sound.

2. Leakage: Any minor leakage can lead to fire hazard. Leakage can occur from flange joints, instrumentation & fittings, welded joints or storage vessel body itself due to corrosion, pitting & improper sealing.

Precaution

- Ensure all joints are checked with Soap solution or Explosive meter
- All valves & joints to be provided with proper gasket & seals
- Visual checks for any damage to pipes, hoses, bullets etc.
- Arrest all leakages immediately
- Stop operation immediately in case of any leakage observed and take immediate steps to rectify

3. Excess Temperature: Excess temperature can cause boiling of LPG which lead to excess pressure.

Precaution

- Ensure temperature remains within normal working temperature levels
- Check out for any source of increase in temperature
- Make arrangements to cool the installation in case of excess temperature
- Ensure no ignition source is available

4. Excess Pressure: Increase in pressure beyond design pressure will cause bursting of vessel. Pressure can increase due to several reasons like obstruction in flow, increase in temperature, use of compressor or pump.

Precaution

- Ensure Pressure remains within the designed working pressure
- Provide Safety valves to release any excess pressure built up
- Provide tripping mechanism for compressor & pump to avoid pressure built up
- Ensure instruments like NRV, EFCV, Pressure Gauges, pressure switches etc are provided & are working properly

Apart from above points, few simple steps will help in safe handling of LPG

- Restrict man movement in & around LPG transfer area
- Provide fencing considering safety distance around Storage area
- Ensure no ignition source is allowed near transfer area. (smoking/mobile use/ industrial activity which produce spark)
- No hot work/cold work is carried out in the vicinity of unloading operation
- Avoid metal to metal striking while transfer operation is going on
- Provide fire fighting equipments to control an emergency
- Venting of hoses
- Proper connecting and disconnecting of hoses
- Proper studs are to be used for connecting of hoses
- Vehicle should not be in “ON” condition
- Chokes to be provided to prevent tank truck movement
- The tank truck valves shall be crack opened and ensured there are no leaks
- Pressure and level in the tank truck shall be monitored at regular intervals

Atul Kharate
Delhi

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