



Static Electricity and Diesel Fuel

All petroleum fuels are electrical non-conductors, which means that in any process involving movement they will collect or accumulate a static charge. This normally occurs when product flows through a pipe. **Static charge dissipates to earth which causes a crackling or rattling sound**, sometimes a glow can be seen and if enough charge is accumulated a discharge from a sharp point will occur as a spark. This process is normal and is not hazardous **except** for a point discharge or spark which could ignite petrol vapours under the right conditions. Steps are taken to eliminate point discharges by adding conductivity additives at the refinery and by using cables and wires to earth tanks and pumps and lines so that static charge is dissipated to the ground. **(A process called bonding)**

FACTORS AFFECTING STATIC GENERATION

The following factors affect the amount or potential of static charge developed.

- 1) **Natural conductivity of fuel** – many fuels have components that improve conductivity. Additives are also added to Diesel, Kerosine and Jet A-1 at the refinery to improve conductivity. From the refinery these fuels will be manufactured to have a minimum conductivity of 50 units.
- 2) **Weather** – A dry atmosphere promotes static accumulation, a moist atmosphere allows charge to dissipate. Static accumulation is noticeable in hot dry weather.
- 3) **Flow rate** – flow rate and pipeline diameter influence static build up. Smaller pipelines mean a larger internal surface contact area for a given volume and so a rapid static build up for a given flow rate.

WHY IS STATIC ELECTRICITY HAZARDOUS?

If a high enough static potential is developed then a static spark will be produced which is hazardous if there is an explosive atmosphere present. This is most likely to occur when Diesel, Kerosine or Jet Fuel are pumped or gravity fed into a tank that previously contained petrol or avgas.

The reason is that the diesel, kero or Jet displace the petrol or avgas vapours so that the vapour space above the liquid changes from being rich in vapour to lean in vapour. During this change the vapours will pass into the explosive range, a static spark at this point will result in a violent explosion. For this reason Diesel, Kero and Jet are treated with a static dissipator additive to prevent point discharges and when product is moved all lines and tanks are bonded to earth using wires and leads.

**For further information, please call the BP Lubricants and Fuel
Technical Helpline 1300 139 700 local call
or visit www.bp.com.au/fuelnews**