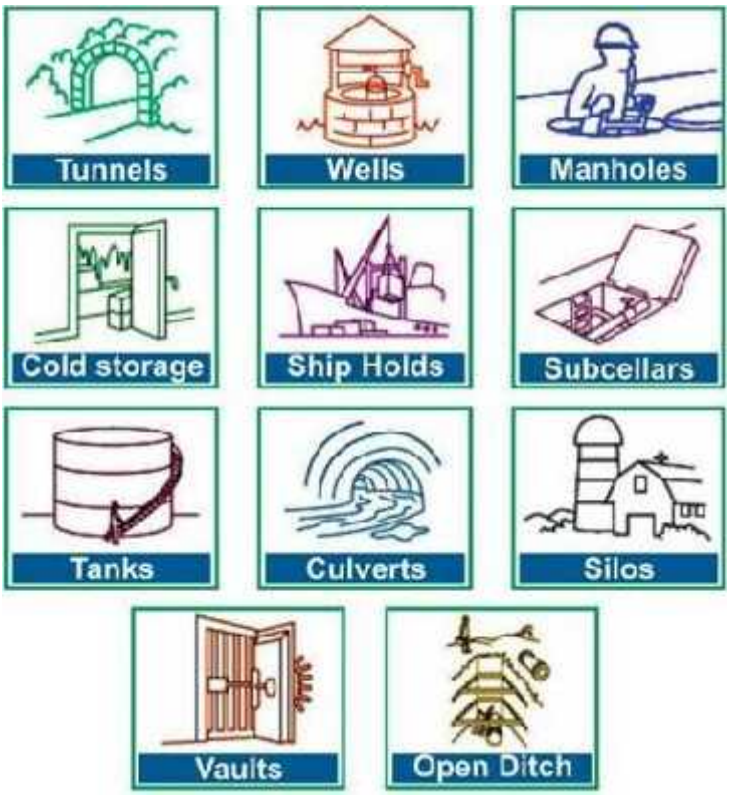
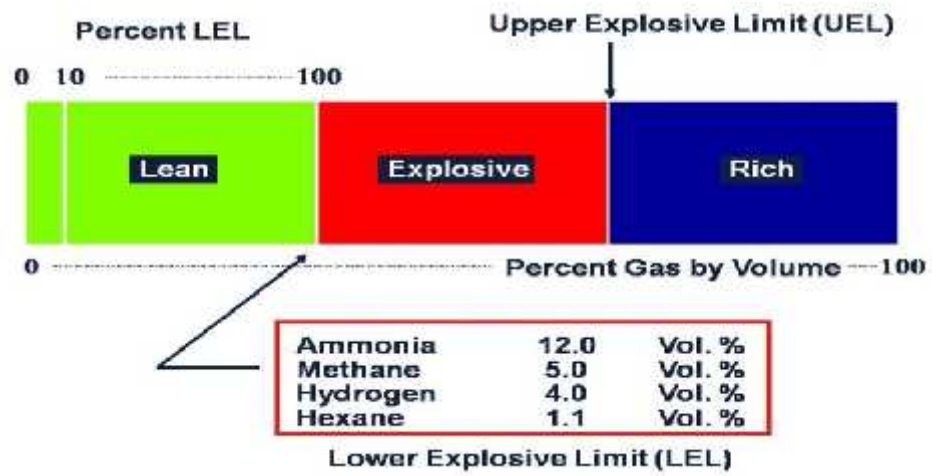
Safety in Confined space



HAZARDS:

- Presence of toxic gases inside vessels or pipeline in harmful concentration.
- Presence of explosive gases in the vessel or pipeline, which may cause an explosion when heated or ignited.
- Danger of asphyxiation for want of oxygen for breathing and also by presence of rich concentration of Nitrogen inside the vessel in case the vessel had been purged with Nitrogen (inert gas).



PRECAUTIONS:

- Effectively isolate the equipment or pipeline from the process.
- Pipeline connecting the piece of equipment or pipelines, to be closed with blank flanges. Do not rely upon valves.
- If it is practicable, one of the connecting pipe should be disconnected and the line part suitably blanked.
- The valve and pipelines connecting the equipment should be tagged. The tags should not be removed without approval of the person who had signed it.
- The residual gas inside the equipment or pipeline should be vented to atmosphere at safe location.
- The equipment or pipe line should be purged with inert gas to remove all the hazardous gases and should be vented at safe locations. The purging agents should be selected after taking hazard into consideration.
- The gases coming out of the vessel or pipe line should be checked and analyzed for the concentration of hazardous gas. In case of vessel that had been purged with nitrogen, a wash with air should be given. Nitrogen will not support life.
- Proper ventilation must be provided to get minimum 19.5 % oxygen
- Appropriate Personal Protective Equipment should be worn by the workers entering vessels. Entry of personnel should not be permitted without checking concentration of gas by using gas meter & safe removal of gas prior to permitting entry.
- If fire hazards are present, suitable firefighting appliances should be kept ready on the spot.
- Confined spaces include deep excavations, working in tunnels, working in pressure parts, vessels, tanks entering through manholes, etc., where along with presence of Oxygen, concentration levels of H2S, NO2, CO & CO2 are also important. When working at such places .escape ladders or routes, life lines, dewatering arrangements, sufficient lighting (24 Volts), communication (telephone lines) and ventilation are essential as per site requirement.