Successful assessment and control of the risks associated with gas and vapour explosions is crucial to safety.

The risk of gas or vapour explosion is present in a wide range of process industries. It can arise during normal operation, as a result of process abnormality, or during start-up and shut-down. Such events are generally devastating and can result in significant loss of life and damage to plant.

**What we offer**

Our consultants have many years’ experience in the assessment and control of gas and vapour explosion risks. We can undertake a total or part study on new plant, existing plant or plant modifications. We will identify hazards, assess risk and develop practical, cost-effective solutions. We offer everything from basic consultancy and advice, to complete engineering solutions.

ABB have experience in a wide range of explosion types including:

- BLEVE (Boiling Liquid Expanding Vapour Explosion)
- Vapour cloud explosions (VCE)
- Mist explosions
- Overpressure explosions
- Condensed phase explosions

Our proven approach for investigating and solving gas and vapour explosion issues can be split into four stages:

- Hazard identification - using a wide range of techniques such as; HAZOP, Process Hazard Review (PHR) PHA, LOPA etc
- Risk evaluation - modelling to determine likelihood and specific damage assessments
- Risk reduction - mitigation of results or reducing the likelihood
- Develop basis of safety - establish and document basis of safe operation

Within this framework we offer expertise in:

- Measurement and interpretation of explosion parameters and flammable data
- Fuel concentration and airflow measurement / modelling
- Detonation risk evaluation
- Evaluation of ignition sources including electrostatic hazards
- Hazardous area classification
- Explosion prevention (inerting, air dilution, fuel rich operation)
- Explosion protection (vent sizing, containment, suppression, isolation)
- Explosion consequence modelling

Our expertise in explosions can be applied to:

- Basis of safety and safety case development
- Auditing
- Incident investigations
- Occupied building risk assessments
- Hazard analysis

We have successfully applied these processes to assess and control gas and vapour explosion hazards in a range of situations including:

- Combined cycle gas turbine enclosures
- Hot oil systems
- Vent collection systems
- Centrifuges
- Chemical reactors
- Ethylene heat exchangers
- LPG storage spheres
- Solvent extraction plants
- Dryers
We have successfully applied these processes to assess and control gas and vapour explosion hazards in a range of situations including:

− PHAST professional for extent of flammable atmosphere and thermal radiation or blast overpressure effects
− Computational fluid dynamics for complex fuel concentration modelling
− Software for calculation of explosion pressures
− TNO ‘GAMES’ methodology for vapour cloud explosion modelling

Benefits
− Improved safety, health and environmental compliance
− Reduced risk of personnel injury and plant loss
− Reduced risk of plant downtime
− Fast delivery of a total solution
− A valid plant basis of safety

Why use ABB?
Our engineers and consultants have operational backgrounds and make pragmatic technical judgements based on their experience. It’s an approach that ensures cost-effective, practical-to-implement solutions which work.

We can provide support from gap identification to full implementation of action plans.

For further information please contact:

ABB Consulting
Daresbury Park
Daresbury
Warrington
Cheshire, WA4 4BT
United Kingdom
Phone: +44 (0)1925 741111
Fax: +44 (0)1925 741212
E-Mail: contact@gb.abb.com

www.abb.com/consulting

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