

# Technical Talk on “Fire & Explosion – Incidents, Causes, Lessons”

A large and appreciative gathering of 32 members, corporate nominees and guests turned out for the technical talk by Ian Pavey, Principal Electrostatics Specialist at Chilworth Technology Ltd on 22nd May 2007.

## Why do explosions happen?

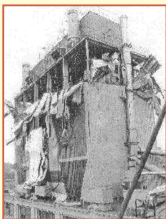
The talk covered four pertinent and important causes, namely:

- Ignorance – e.g. ‘it worked perfectly fine at a smaller scale’.
- “Minor improvements” – e.g. ‘it was a trivial change, it shouldn’t have made any difference’.
- Maintenance – e.g. ‘we only did it once’.
- Complacency – e.g. ‘we have done it like this for 20 years’.

The speaker drew on his wealth of experience in industry and consultancy by presenting several interesting case studies of actual fires and explosions and the outcomes of the incident investigations. The incidents ranged from charge generation during toluene charging into a batch vessel, to explosive decomposition during vacuum discharge from a vacuum dryer, dust explosion caused by poor maintenance of an outlet valve from a fluidized bed dryer, and dust explosion caused by spark discharge in a spray drying and vibratory fluidized bed operation.

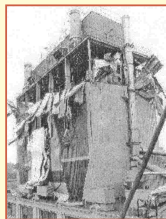
Each incident was comprehensively outlined in terms of the Operation, and the Incident Investigation (Flammable atmosphere? Ignition sources – which are possible, likely, most likely?). Based on the case studies, the speaker detailed several useful Lessons (e.g. Ensure you do understand the hazards associated with the materials you are handling, Ensure change control system is in place such that even the effects of “minor” changes are properly assessed. Protective and safety-critical equipment, even passive units, must be properly maintained) and Recommendations for future safe operation (e.g. Only use suitable electrical equipment in vicinity, Earth all conductive components, Do not disable the suppression system, the primary basis for safety!).

### INVESTIGATION



Flammable Atmosphere?  
Ignition Sources  
- Which are impossible?  
- Which are possible?  
- Which are likely?  
- Which could have ignited the flammable atmosphere  
Conclude which are most likely / likely / possible  
Recommendations for future safe operation

### WHY DO EXPLOSIONS HAPPEN?



Ignorance  
Minor improvements  
Maintenance  
Complacency

### FAMOUS LAST WORDS

“We only did it once”

“It was a trivial change - it shouldn't have made any difference”

“We have done it like this for 20 years”

“It worked perfectly fine at a smaller scale”



Overall, the talk was excellent and highly relevant for our SLP audience. We were left with much to take away, especially a strong cautionary message that ignorance, seemingly minor process changes, maintenance and creeping complacency have all contributed to serious fires and explosions, and will continue to do so unless the safety and loss prevention community remain well-trained, fully aware and alert to the risks in our industry.

The evening ended on a convivial note with a buffet dinner, and an opportunity to catch up with friends old and new.

By Reginald Tan

Editorial note: The speaker has agreed that attendees at the talk may get a copy of his slides on request to SLP's Secretariat.