

CONCLUSIONS REPORT ON HID LD 3E FLAMMABLE ATMOSPHERE ELECTRICAL EQUIPMENT PROJECT 2001/2002.

1. INTRODUCTION.

- 1.1. This project was initiated for a number of reasons. Firstly, the issues surrounding the management of risk from this type of equipment was poorly dealt with by a number of COMAH safety reports. Secondly, there was evidence from some installations, that the standard of maintenance of fixed electrical installations in the chemical industry was not generally high. This view was backed up by a number of dangerous occurrences that were investigated.

2. GENERAL.

- 2.1. The original project scope asked for sub-COMAH sites and lower tier COMAH sites. No number was given in the project specification.
- 2.2. In practice, any company where the subject of hazardous area electrics was an inspection issue was included, and this led to a number of top tier sites being inspected, some as a part of the ongoing COMAH inspection strategy.
- 2.3. A good mix of sites was therefore included which would be a good indicator of the general condition in this area across the industry sector.
- 2.4. The findings from twelve sites were considered for this report.
 - 2.4.1. Only one site had no problems identified by the inspection.
 - 2.4.2. On six sites, the inspection resulted in formal enforcement action being taken.
 - 2.4.3. Of the remaining five sites, three had problems sufficient to warrant formal action in the form of an Improvement Notice, but in these cases, local factors as identified by the relevant Regulatory Specialists led to alternative action being taken.
- 2.5. The approach taken in the majority of inspections was to discuss the management systems the site had in place for controlling the risk of electrical ignition prior to a site inspection to determine whether these systems were effective.
- 2.6. Evidence was sought during inspections of the following issues:
 - # Risk assessment – usually in the form of a site zoning exercise based on the substances likely to be included in any flammable atmosphere.
 - # Equipment selection – what was the company's policy on the sourcing of equipment.
 - # Planned maintenance – systems for ensuring that appropriate steps were taken to ensure the continuing safety of the equipment. This included looking for the keeping of appropriate documents and plant histories, as well as identifying which, if any standards were applied on site.

Competence Issues – how did the company ensure that anyone working on the equipment, whether employee or contractor, was qualified to do so? Did site management have access to knowledge that would allow them to successfully control the issues surrounding hazardous area equipment?

Effectiveness of maintenance – visual examination of a representative number of items of equipment to see if the maintenance was being carried out to an acceptable standard.

3. MAIN ISSUES ARISING.

The two areas where problems occurred are discussed here under the broad categories 'hard issues' and 'soft issues'.

3.1.1. 'Hard' issues are those faults and problems identified on specific items of plant during the visual inspections. These were mainly minor in nature, and were used to demonstrate to the relevant managers that their maintenance systems weren't working adequately.

3.1.2. 'Soft' issues such as expertise available to site management on this issue, competence of maintenance personnel, risk assessments etc. were far more prevalent, and were widespread throughout the industry, irrespective of size or COMAH rating.

3.2. 'Soft' Issues.

3.2.1. Most sites claimed to have 'zoned areas', but not many of them could produce supporting documentation, or state to which standard was carried out. It was frequently found that companies 'zoned' an entire production area whether it was required or not.

3.2.2. Many sites had no access to engineering expertise, either on-site or via consultants, to help inform management policy in this area.

3.2.3. Competency issues were weak in almost half of the sites visited. Of the sites claiming to employ craftsmen competent in hazardous area equipment maintenance, only one organised refresher training for its employees.

3.2.4. Maintenance histories were not kept on a number of smaller sites, including lower tier COMAH sites. Lack of maintenance histories would make it very difficult to demonstrate that a particular item of equipment continued to meet the requirements of its design standard.

3.2.5. In all sites, there was a reliance on third party motor repair companies to inform site management on technical issues surrounding repair and maintenance of flameproof equipment.

3.2.6. On the majority of small sites, maintenance of electrical equipment in flammable atmospheres was carried out by contract labour. In many cases, there were no formal arrangements for competence to be specified and dealt with at the purchase stage.

3.3. 'Hard' Issues.

- 3.3.1.** The most common failing of equipment during inspection was that over-painting had sealed flame paths and obscured rating plates. This was more common on those sites that made use of older equipment, particularly 'FLP' rated switches and distribution boards.
- 3.3.2.** The next most common failure was missing flange bolts on flameproof fittings.
- 3.3.3** The subject of ignition from sources of static electricity was relatively well managed on the sites where it was recognised as a problem, and control measures were usually in place.

4. CONCLUSIONS.

- 4.1.** The general standard of management of hazardous area electrical systems was poor.
- 4.2.** In most cases where problems were found, lack of understanding of the issues surrounding the use of flammable atmosphere electrical equipment meant that sites were not able to properly manage the risk of ignition from this source.
- 4.3.** The main failings were essentially of a non-technical nature: the issues could be addressed by application of sound health and safety management principles such as risk assessment.

5. RECOMMENDATIONS.

- 5.1.** The subject of hazardous area electrical equipment should be included in the inspection plans for all applicable sites as a matter of course.
- 5.2.** Work needs to be done to improve awareness of what is required by companies to make sure that they adequately manage the risks posed. This information is readily available in the appropriate British and European standards on the subject.