Background

The final report of the Process Safety Leadership Groups (PSLG) safety and environmental standards for fuel storage sites was published in December 2009. The Major Incident Investigation Board (MIIB) report recommendation 13 stated: ‘Operators of Buncefield-type sites should employ measures to detect hazardous conditions arising from loss of primary containment, including the presence of high levels of flammable vapours in secondary containment. Operators should without delay undertake an evaluation to identify suitable and appropriate measures. This evaluation should include, but not be limited to, consideration of the following:

- a) Installing flammable gas detection in bunds containing vessels or tanks into which large quantities of highly flammable liquids or vapour may be released.
- b) The relationship between the gas detection system and the overfill prevention system. Detecting high levels of vapour in secondary containment is an early indication of loss of containment and so should initiate action, for example through the overfill prevention system, to limit the extent of any further loss.
- c) Installing CCTV equipment to assist operators with early detection of abnormal conditions. Operators cannot routinely monitor large numbers of passive screens, but equipment is available that detects and responds to changes in conditions and alerts operators to these changes.’

In response, paragraph 118 of the PSLG report states:

‘There are currently no standards for use of gas detectors for fuel storage installations and no fuel storage installations within the UK where gas detectors are installed. Gas detectors are available but the dispersion of gasoline vapour is complicated and hence effective detection by gas detectors is subject to many uncertainties. Open path detection devices are available and could provide boundary detection at bund walls or around tanks. Liquid hydrocarbon detectors, however, may offer effective detection because it is easier to predict where escaping liquid will collect and travel. There are a number of installations where liquid hydrocarbon detectors are installed. Typical locations would be in a bund drain, gutter or sump where sensors can detect oil on water using conductivity measurement. The detection system may be subject to failures or spurious trips resulting from water collecting in the bund or sump. The installation of liquid hydrocarbon sensors at suitable locations connected to alarms in the control room should be considered’

The purpose of these terms of reference is to define the scope of a working group to develop guidance on types of leak detection available, and the experience of both industry and the Competent Authority (CA) in using these technologies.
Work Scope

The Working Group operates under the direction of the Chemical and Downstream Oil Industry Forum at a technical level, and is tasked to develop a guideline on the techniques and technologies available for leak detection.

The working group should consider the following:

- Review recent Loss of Process Containment (LOPC) incidents and hydrocarbon detection systems that were in place (where this has occurred)
- Review existing research/guidance that is available for leak detection technologies.
- Consider the experience of operators and the Competent Authority in installing and using different leak detection techniques.

The output of the working group will be to produce a summary report detailing the following.

- The different types of hydrocarbon gas and leak detectors available
- The pros and cons of each of these types based on different scenarios, and how they may have performed in LOPC incidents had they been installed
- Information on the types of facilities where these have actually been installed and their efficacy in service

Working Group Membership

Membership of the working group will consist of representatives from:

- Industry
- Trade Associations
- Competent Authority
- Energy Institute

It is intended that the working group is chaired by industry.

The workgroup will provide feedback to CDOIF membership with regard to progress and any issues encountered.

Delivery Timescales

It is intended that the working group meets no more than once or twice for a one day meeting, supported by teleconference and e-mail as appropriate, though this will be confirmed once the group has been formed.

It is anticipated that the working group will deliver the completed guideline in Q2/Q3 2012.

07 November 2011 - UKPIA/CDOIF/Leak Detection/01 Terms of Reference