DEVELOPMENT OF A PROCESS SAFETY CLIMATE TOOL

Colleen Butler, Chrysanthi Lekka and Caroline Sugden
Health and Safety Laboratory
Harpur Hill, Buxton
Derbyshire SK17 9JN, UK
Telephone: (01298) 218747
Email: colleen.butler@hsl.gov.uk

© British Crown copyright (2010)

ABSTRACT

Process safety is a blend of engineering and management skills focused on preventing catastrophic accidents, particularly explosions, fires and toxic releases, associated with the use of chemicals and petroleum products (Centre for Chemical and Process Safety, 2010). More specifically, it is about the prevention of leaks, spills, equipment malfunction, over-pressures, over-temperatures, corrosion, metal fatigue and other similar conditions (Baker, 2007).

The term ‘safety climate’ describes employees’ perceptions about risk and safety, providing a ‘snapshot’ of the current state of safety (Mearns and Flin, 1999). Climate tools can aid understanding of occupational behaviour in an organisation (Zohar, 1980).

The BP U.S. Refineries Independent Safety Review Panel designed a tool as a ‘one off’ to review process safety culture at BP US refineries. However, there are currently no validated tools to assess process safety climate. Given the importance of climate in understanding behaviour, the aim of this research was to develop a validated Process Safety Climate Tool to assess perceptions towards process safety, to pilot and refine the tool, and evaluate the tool’s psychometric properties.

To date, the development of the tool has involved compilation of an evidence base to support the inclusion of scales within the tool and completion of three stages of piloting. Work on the final stage of piloting, where the tool is administered to multinational process safety companies including chemical and pharmaceutical companies, is underway and future plans for the tool have been formulated. This paper discusses the first three stages of piloting the tool, and summarises its evidence base which has drawn upon two sources: a review of reports on major process safety accidents and literature on the characteristics of high reliability organisations. The evidence base has supported the inclusion of the following scales: management commitment and resources for

---

1Paper to be presented at the Mary Kay O’Connor Process Safety Symposium on the 26-27th of October 2010, College Station, Texas, U.S.A.
process safety, training and competence, communication, maintenance of equipment and condition of plant, procedures, contractors, process alarm management, reporting and investigating, permit to work system and management of change. Current work on the final stage of piloting will be summarised and future work to test the tool’s predictive validity will be discussed.