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Buncefield learning for Pipeline Operators

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Aims of Presentation

- PSLG Final Report
 - *Safety and Environmental Standards for Fuel Storage sites*
- Direct aspects for pipeline operators
- General lessons for Pipeline Operators

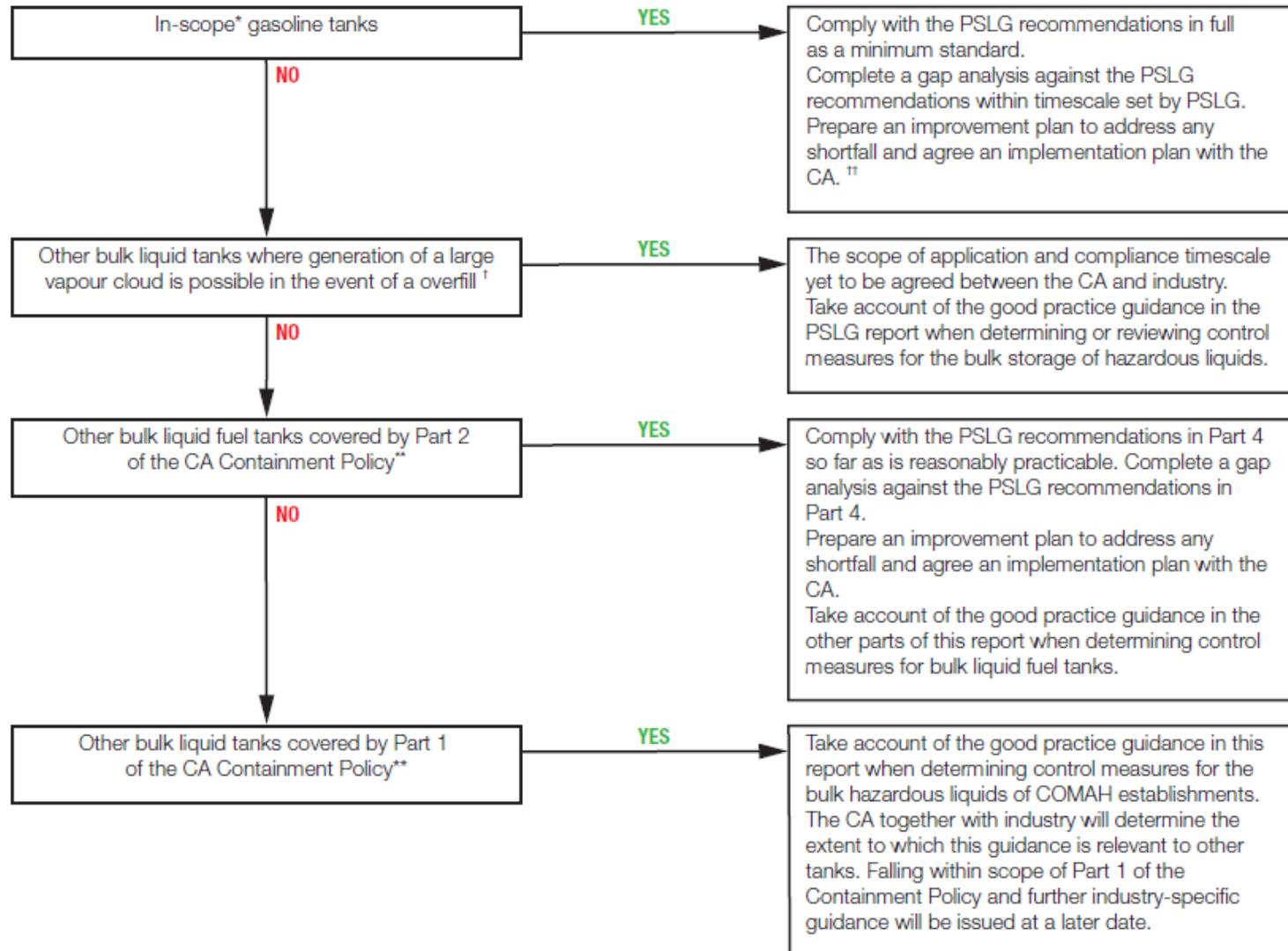
PSLG Final Report – Scope and Application

What is the PSLG and the Final Report?

- Process Safety Leadership Group (PSLG) followed the Buncefield Standards Task Group (BSTG)
- Final report address all 25 recommendations from the MIIB Design and Operations Report
- BSTG report incorporated into PSLG Report – it's guidance and implementation timescales remain

Outstanding issues

- Application of Phase 1 explosion mechanism report



Title

Figure 1 Compliance at existing COMAH establishments

PSLG Final Report – Scope and Application – In scope Tank?

As in the original BSTG Report, in scope tanks are defined as:

- those storing gasoline (petrol) as defined in Directive 94/63/EC European Parliament and Council Directive 94/63/EC of 20 December 1994 on the control of volatile organic compound emissions resulting from the storage of petrol and its distribution from terminals to service stations
- vertical, cylindrical, non-refrigerated, above-ground storage tanks typically designed to standards BS 2654, BS EN 14015, API 620, API 650 (or equivalent codes at the time of construction)
- with side walls greater than 5 m in height
- filled at rates greater than 100 m³/hour (this is approximately 75 tonnes/hour of gasoline)

PSLG Final Report – Key Actions

The PSLG report is split into six parts, aligning with the MIIB's *Design and Operation of fuel storage sites* report

- Part 1, Systematic assessment of safety integrity level requirements
- Part 2, Protecting against loss of primary containment using high integrity systems
- Part 3, Engineering against loss of primary containment
- Part 4, Engineering against loss of secondary containment
- Part 5, Operating with high reliability organisations
- Part 6, Delivering high performance through culture and leadership

PSLG – Final Report – Part 1

Systematic assessment of safety integrity level requirements

- Determine the SIL requirement for overfill protection systems through appropriate risk assessment technique - LOPA, Risk Graph, Fault Tree
 - **PSLG uses LOPA as an example, but recognises other methods are available, much of the guidance is still relevant**
- Review risk assessments for existing installations to take account of new knowledge and development in standards
- Ensure the results of the risk assessment (SIL determination) are included in COMAH safety reports

Part 2 – Protecting against Primary Containment

Automatic overfill protection systems

- UKPIA and TSA have committed to minimum SIL1 Automatic Overfill Protection Systems for 'in-scope' tanks at terminals and refineries
- New systems should be fully compliant with BS EN 61511
- Where existing equipment/systems are used, compliant with BS EN 61511 so far as is reasonably practicable, but attention must be drawn to:
 - Independence
 - Suitability of equipment
 - Evidence of prior use
- Existing systems may use common ROSOV valve or pump as primary means of isolation

Part 2 – Protecting against Primary Containment

Automatic overfill protection systems (Cont)

- Using BS EN 61511 for basis of functional safety management system
 - Safety planning and procedures
 - Operation, maintenance, inspection and testing
 - Functional safety assessment and audit
 - Management of change
- UKPIA is working with Human Reliability Associates to develop minimum standards for operators in a SIL1 safety function – applies to other tanks not 'in-scope'
- BSTG previously identified requirements for ROSOV's and the setting of appropriate set-points (operating, LAH, LAHH etc.)

Part 3 – Engineering Against Loss of Primary Containment

- Review Dangerous Substances and Explosive Atmospheres Regulations (DSEAR)
 - Periodic Risk Assessment
 - Revisit risk assessment if there is reason to believe risk assessment no longer valid, or there has been a significant change
- Review the siting of emergency equipment – is access still available?
- Complete and/or review on and off site emergency plans
- Consider methods of improved leak detection for new or substantially modified facilities
 - CCTV
 - Gas Detection

Part 3 – Engineering Against Loss of Primary Containment

Review the mechanical integrity of tanks

- New tanks designed to BS EN 14015 or API 650 (or equivalent)
- New tanks should be of single bottomed design – double bottom designs may still be an alternative, providing robust integrity management arrangements
- EEMUA 159 and API 653 recognised as good standards for integrity management
- Competency of personnel – EEMUA 159 Tank Integrity Assessor Level 1 or API 653 Tank Inspector

Part 4 - Engineering against loss of secondary / tertiary containment

Provides *supporting* guidance to the containment policy

- Advantages and disadvantages of bund lining systems
- Penetrating pipework and expansion joints
- Secondary containment systems under tanks – refer to Part 3 guidance on mechanical integrity
- Bund capacity definition:
 - Bund sized to 110% of Tank Rated Capacity (See Part 2 of PSLG)
 - Record overfill levels (TRC – Overfill level) for information purposes
 - For bunds with multiple tanks – 25% of the total normal fill level for all tanks within the bund should be used
- Carry out risk assessment to determine the extent of any requirements for tertiary containment

Part 5 - Operating with high reliability organisations

Many human factors elements addressed in the BSTG, PSLG adds guidance:

- Roles and responsibilities
 - Defining for all staff, control room operators, supervisors, management
- Competency management
 - Implementing a competence management system
- Staffing, shift work arrangements and working conditions
 - Assess if staffing levels are adequate to detect, diagnose and react to hazardous situations
 - Fatigue management plans
 - Perform a review of working conditions, and develop a plan to address gaps

Part 5 - Operating with high reliability organisations

- System interfaces
 - Review of control room displays and alarm systems
 - Modifications and upgrades in line with current good practice
- Organisational change and management of contractors
 - Procedure and policy for handling organisational change
 - Retaining adequate competency, retaining corporate memory
 - Maintain 'intelligent customer' role when outsourcing work
 - Arrangements for managing and monitoring contractor activities
- Management of Change
 - Ensuring management of change processes are well defined and understood
- BSTG already tackled such issues as Fuel Transfers (communication and planning), PSPI, Auditing, and incident investigation

Part 6 - Delivering high performance through culture and leadership

PSLG Principles for Process Safety Management

- Process safety leadership from board level
- Engagement of the workforce
- Monitoring performance
- Sharing best practice with other industry sectors

Direct and Indirect Impact of Recommendations for Pipelines

Direct

- Fuel Transfers (communication and planning) – Consignment Agreements
- Impact of terminal changes on pipeline operations (ROSOVs etc)
- Emergency planning, procedures and testing

Good Practice

- Design and Engineering
- PSPI's (KPI's)
- Part 5 - High reliability organisations – Safety Management, Human Factors
- Leadership (Company and Industry level)

Sharing of lessons and good practice

What do UKOPA do?

- Share incidents and lessons (even on a confidential basis)
- Risk Assessment Work Group
 - Formal liaison with HSE, Standards methods of risk assessment, Agreed methods of risk reduction
- Fault Management Work Group
 - Fault and Failure report
- Process Safety Work Group
 - Process Safety Benchmarking and seminars
- Emergency Planning Work group
 - PERO Training, Emergency planning, procedures and testing guidance
- Infringement working Group
- Technical Seminars

Thanks You
and
Questions