Health and Safety
Executive

Emergency planning and Major Accident Hazard Pipelines – HSE perspective

Helen Berry

HSE Gas and Pipelines Unit

Pipelines & the law

HSE position:

- Where pipelines are properly designed, built, operated, maintained and eventually decommissioned they are safe
- Specialist area with unique challenges
- Specific set of legal duties reflect this
- Pipeline Safety Regulations 1996 - **PSR**
- Further info – HSE publication L82: *'A guide to the Pipelines Safety Regulations 1996'*

Pipeline major accidents

- No pipeline major accidents in UK to date
- High consequence/low likelihood events:
  - few occasions where emergency arrangements tested
  - low general awareness of pipeline hazards/risks
  - ‘it can’t happen here’ mentality
- Experience from abroad shows how catastrophic pipeline MAs can be e.g. Ghislenghien, Belgium, 2004 – 24 dead (including 5 fire fighters & 1 police officer)
- Potentially large scale of event means many parties may need to mobilise, co-ordinate & work together effectively
- This won’t happen without proper planning

Example of a pipeline major accident

- San Bruno, California, 9 September 2010:
  - sudden failure of large gas transmission pipeline
  - approx 47 million cubic feet of gas released
  - crater approx 72 ft x 26 ft created
  - pipe segment 28 ft long thrown about 100 ft
  - gas release ignited some time after pipeline failure
  - 8 people killed, 56 injured, 38 homes destroyed & many more damaged
  - fires burned for 2 days

Example of a pipeline major accident

- San Bruno, California, 9 September 2010:
  - Information, including photos can be found in the report about the incident

  http://www.ntsb.gov/doclib/reports/2011/PAR1101.pdf

Some investigation findings

- Delay in establishing cause of incident - earthquake? Plane crash? Gas station explosion?
- Local fire department unaware of presence of pipeline & potential continuing danger to responders
- Damage caused to nearby water main severely hampered fire fighting efforts
- Disorganised response by pipeline operator:
  - delay in informing fire department that incident was due to transmission pipeline failure
  - delay in establishing location of failure
  - isolated by off-duty staff acting on their own initiative

Post-investigation recommendations

- NTSB recommendations included several relating to emergency response, e.g.
  - provide system-specific information about pipeline systems to emergency response agencies
  - ensure control room operators immediately alert local emergency call center(s) if possible pipeline rupture indicated
  - equip SCADA systems with tools to help pinpoint the location of leaks
  - establish comprehensive emergency response procedures for responding to large-scale emergencies on transmission lines

UK legislation: scope of PSR emergency planning requirements

- Legal position very different to US
- Majority of emergency planning duties only apply to major accident hazard pipelines (MAHPs) as defined by PSR Reg 18
- Includes entire ‘pipeline’ as defined by PSR Reg 3 e.g. for a gas pipeline includes apparatus such as:
  - block valve sites
  - pig trap sites
  - offtakes
  - pressure reduction stations
  - compressor stations

MAHP operator duties: PSR Regs 24 & 25(4)

- PSR Reg 24 requirements:
  - 24(1): organisation, arrangements & procedures for emergencies in place & documented before MAHP commissioned
  - 24(2): revision/replacement of emergency arrangements & procedures
  - 24(3): testing of emergency arrangements & procedures
- Reg 25(4): provide necessary info to LAs to enable them to prepare emergency plans

Pipeline operator duties: HSE 'success criteria'

- Adequate pipeline emergency arrangements in place (required for all pipelines, not just MAHPs – PSR Reg 12 duty)
- MAHP emergency procedures tested, reviewed and revised periodically and in the light of lessons learned from tests
- Competence of key personnel in emergency procedures is assured e.g. via pipeline emergency response officer (PERO) course
- Adequate consideration of emergency response in control room design e.g. alarm handling

Pipeline operator duties: HSE 'success criteria' (2)

- Operator carries out checks on the effectiveness of emergency shutdown procedures, including operation and testing of shut off valves
- Effective control room interface and communications between field staff and control room staff
- Leakage detection systems utilised as appropriate

(From HID SI3 Pipeline Integrity Management Delivery Guide for Onshore Pipelines)

Local Authority duties: PSR Regulation 25

- PSR Reg 25 requirements (MAHPs only):
  - 25(1): defines timescales for LA to prepare EP following receipt of MAHP notification from HSE (25(5) recognises that pipeline operator must provide info promptly to LA for them to comply)
  - 25(2): consultation with HSE, pipeline operator etc
  - 25(3): 3 yearly review/revision of EPs
  - 25(6): multiple LAs along route can prepare single plan for MAHP
- Reg 26: allows LA to charge pipeline operator for preparation of EP

TT site (COMAH duties)	VS	MAHP (PSR duties)
Duty to test onsite emergency plans not explicit in Regs (but implicit in Reg 4); LA offsite emergency plans must be tested at least 3 yearly		No duty to test LA emergency plans; pipeline operator arrangements must be tested ‘as often as may be appropriate’
Operator must provide information to public within PIZ		No duty to provide information about MAHP to the public
Environmental consequences have to be considered during emergency planning		No requirement to consider environmental consequence of pipeline incident
Derogation can be granted by CA so if no foreseeable offsite effects, offsite EP not required		HSE can grant exemptions to any PSR Reg if H&S of persons affected not prejudiced

LA emergency plans (EPs)

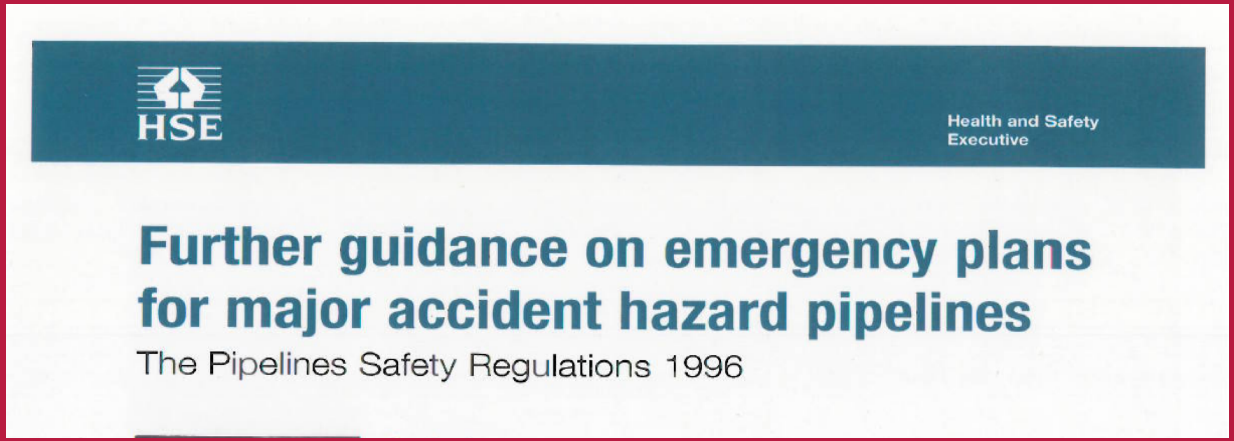
- Approaches to MAHP emergency planning can vary e.g.
  - include MAHPs in general EPs & show how arrangements for MAHPs are integrated into them
  - generic plan for specifically identified pipelines operated by same operator & carrying same fluid
  - single EP for MAHPs in same location or LA area
  - single plan for whole pipeline (may cover >1 LA area)
  - if MAHP connects COMAH sites, integrate into their offsite EPs
- Need to specifically reference each MAHP & operator in EP, irrespective of which approach is followed

In any event, emergency plans should….

- Be clear, simple & easy to understand
- Be flexible – potential for incident 24/7 anywhere along pipeline route should be addressed
- Consider H&S of public and responders (can opt to include environmental & economic aspects too)
- Allocate clear roles & responsibilities
- Contain robust communication arrangements
- Address range of credible MA scenarios
- Recognise LA boundaries
- Dovetail with other relevant emergency plans
- Consider restoration phase of response

Personal observations

- Do not underestimate the demands placed on individuals – make sure each role is ‘doable’
- Be very careful about making assumptions
- Desktop exercises will never prepare you for certain things e.g. noise, cold, rain, poor lighting
- Procedures will not be followed to the letter
- Use job aids to summarise key tasks
- Not all equipment will work as it should
- Do not underestimate the impact of the media
- Take as much pressure off responders as possible
- Key steps can be tested, as well as whole response



- Specific guidance including:
  - Legal requirements
  - Planning for pipeline failure
  - Example pipeline notification letter
  - Suggested content & structure for pipeline emergency plans
- Available free at: *www.hse.gov.uk/pipelines/emergencyplanpipe.pdf*

Other sources of guidance

- A guide to the Pipeline Safety Regulations 1996
  www.hse.gov.uk/pubns/priced/l82.pdf
- HID SI3 Pipeline Integrity Management Delivery Guide for Onshore Pipelines:
  www.hse.gov.uk/pipelines/delivery-guide-onshore-pipelines.htm
- COMAH Off-site Emergency Planning (Operational Delivery Guide)
  www.hse.gov.uk/comah/guidance/off-site-emergency-planning.pdf
- COMAH On-site Emergency Planning and Mitigation (Operational Delivery Guide)
  www.hse.gov.uk/comah/guidance/on-site-emergency-planning.pdf

ANY QUESTIONS?