

a) training and instruction in the issue and use of permits;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
b) reviewing the effectiveness of the permit-to-work system;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
c) informing personnel controlling the pipeline system of the work activity and all related safety requirements;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
d) display of permits;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
e) control of pipeline operation in the event of suspension of the work;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
f) handover between shifts.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
The permit-to-work should:											
—define the scope, nature, location and timing of the work;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
—indicate the hazards and define necessary safety measures;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
—refer to other relevant work permits;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
—state the requirements for returning the pipeline system to service;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
—state the authorization for execution of the work.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
13.1.5 Training											
Training of personnel should include, where relevant:											
a) familiarization with the pipeline system, equipment, potential hazards associated with the pipeline fluid, and procedures for operation and maintenance;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
b) the use of permits-to-work;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
c) the use of protective equipment and fire-fighting equipment;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
d) provision of first aid;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
e) response to incidents and emergencies.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
13.1.6 Liaison											
Contacts should be established and maintained with appropriate organizations and individuals, such as:											
a) fire, police and other emergency services;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
b) regulatory and statutory authorities;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
c) operators of public utilities;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
d) operators of other pipelines which connect to, cross, or run in close proximity to the pipeline;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
					5.7						

10.2:Job dependant

5.7:Electrical Cables???

e) members of the public living in close proximity to the pipeline;	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	
f) owners and occupiers of land crossed by the pipeline;	Y	Y		Y	Y	Y	Y	Y	Y	N	Y	
g) third parties involved in any activity which could affect or be affected by the pipeline.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Pipeline route maps should be deposited with statutory authorities or "one-call" organizations, as appropriate.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
NOTE A "one-call" organization collects information on underground facilities and, following notification of construction in the area, advises on the presence of these facilities. Local legislation can stipulate a requirement for soliciting information on the presence of underground utilities before commencement of work.												
13.1.7 Records												
In addition to as-built records and engineering changes, records of operation and maintenance activities should be prepared and retained to:												
a) demonstrate that the pipeline system is operated and maintained in accordance with the operating and maintenance plans;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
b) provide the information necessary for reviewing the effectiveness of the operating and maintenance plans;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
c) provide the information necessary for assessing the integrity of the pipeline system.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
					5.8							5.8:Minimum thickness calculations, leak rupture curves, records of known defects and their wall thicknesses and assessment reports
It is essential that as-built information be provided to the owner/operator of the pipeline as soon as practicable after completion of the work. A documented handover of information before commissioning, including the as-built pipeline engineering dossier and the operation and emergency procedures, is essential to maintain safety. No pipeline should be commissioned without a handover of as-built engineering and operational information to all the relevant parties, ie the responsible people who will be filling, operating or taking from the pipeline.												
13.2 Operation												
13.2.1 General												
Procedures for the operation of the pipeline system should define the envelope of operating conditions permitted by the design, and the operating requirements and constraints for the control of corrosion. Fluid parameters should be monitored to establish that the pipeline system is operated accordingly.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
					5.9							5.9: Metering accuracy??
Procedures for the operation of multi-product pipeline systems should include requirements for the detection, separation and prediction of arrival of batches.	N/A	Y	Y	Y	Y	Y		N/A		N/A		
Procedures for the operation of multi-phase pipeline systems should include requirements for control of liquid hold-up in the pipeline and free volume in the slug catcher.	N/A	?		N	Y	Y		N/A		N/A		

Deviations from the operating plan should be investigated and reported, and measures to minimize recurrence should be implemented.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
13.2.2 Stations and terminals													
Procedures for the operation of stations and terminals should include requirements for start-up and shutdown of equipment, and for the periodic testing of equipment, control, alarm and protection devices.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
13.2.3 Pigging													
A pigging philosophy should be established for each pipeline system as part of the design.	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y		
Procedures for pigging operations should include requirements for:											10		10.3:Pigging philosophy but not done as part of the design
a) confirming that the pipeline is free of restraints or obstructions for the passage of pigs;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
b) control of pig travelling speed;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
c) safe isolation of pig traps;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
d) contingencies in the event of a trapped pig.	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y		
13.2.4 Decommissioning													
NOTE Attention is drawn to the Pipe-lines Act 1962 [11], Regulation 25 and the Pipelines Safety Regulations 1996 [12], Regulation 14 in respect of decommissioning.													
Consideration should be given to decommissioning pipelines planned to be out of service for an extended period. The removal of fluids should be in accordance with 12.2.													
Decommissioned pipelines should be maintained in a safe condition. This might require maintenance of cathodic protection. Where no further use of the pipeline is planned, abandonment should be carried out in accordance with Clause 14.	N/A	?	Y	Y	Y	Y	Y	N/A	Y	Y	Y		
13.2.5 Re-commissioning													
NOTE Attention is drawn to the Pipelines Safety Regulations 1996 [12], Regulation 21 in respect of re-commissioning.													
The condition of a decommissioned pipeline system should be established and its integrity confirmed before re-commissioning. Pipeline filling should be in accordance with 12.5.	N/A	?	Y	Y	Y	Y	Y	Y		Y			
13.3 Integrity assurance management													
13.3.1 Maintenance programme													

NOTE 1 Attention is drawn to the Pipelines Safety Regulations 1996 [12], Regulation 7 in respect of maintenance access; Regulation 10 in respect of work on the pipeline; Regulation 13 in respect of maintenance; and Regulation 23 in respect of major accident prevention documents and safety management systems.

NOTE 2 Attention is drawn to the Pressure Systems Safety Regulations 2000 [14] in respect of written schemes of examination.

Maintenance programmes should be prepared and executed to monitor the condition of the pipeline and to provide the information necessary to assess its integrity.

Y Y Y Y Y Y Y Y Y Y Y

Factors which should be taken into account when defining the requirements for condition monitoring include:

a) pipeline system design;

Y Y Y Y Y Y Y Y Y Y Y

b) as-built condition;

Y Y Y Y Y Y Y Y Y Y Y

c) results of earlier inspections;

Y Y Y Y Y Y Y Y Y Y Y

d) predicted deterioration in the condition of the pipeline;

Y Y Y Y Y Y Y Y Y Y Y

EXAMPLES Possible deteriorations in pipeline condition include general and pitting corrosion, changes in the pipe wall, geometry (such as ovality, wrinkles, dents, gouges), cracking (such as stress corrosion and fatigue cracking), changes in the pipeline position, support or cover, and loss of weight coating.

e) adverse site conditions;

Y Y Y Y Y Y Y Y Y Y Y

f) inspection time intervals.

Y Y Y Y Y Y Y Y Y Y Y

Unfavourable results, such as defects, damage and equipment malfunctioning, should be assessed and corrective action taken where necessary to maintain the intended integrity.

Y Y Y Y Y Y Y Y Y Y Y

The maintenance programmes should cover the complete pipeline system. Particular attention should be paid to pipeline protection and safety equipment.

Y Y Y Y Y Y Y Y Y Y Y

13.3.2 Route inspection

The pipeline route, including the right of way, should be periodically patrolled/surveyed to detect factors that could affect the safety and the operation of the pipeline system. The results of surveys should be recorded and monitored.

Y Y Y Y Y Y Y Y Y Y Y

The right of way should be maintained to provide the necessary access to the pipeline and associated facilities.

Y Y Y Y Y Y Y Y Y Y Y

Pipeline markers should be maintained to ensure that the route of the pipeline is clearly indicated. If necessary, additional markers should be installed in areas where new developments take place.

Y Y Y Y Y Y Y Y Y Y Y

Surveys should identify:

c) correct setting and activation;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
d) inspection for leaks.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
EXAMPLES Protection devices include pressure control and overpressure protection, emergency shutdown isolations, quick-connect/disconnect connectors, storage tank level controls, etc.												
Emergency shutdown valves, including actuators and associated control systems, should be inspected and tested periodically to determine whether the whole system functions correctly and whether valve-seal leakage rates are acceptable.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
							7.1					7.1:What is an acceptable leak rate is an issue and what if anything can be done about it
Particular attention should be paid to storage tank level controls and to relief valves on pressure storage vessels.	N/A	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Appropriate remedial action should be taken where necessary.	Y	Y	Y	Y	Y	5.1	Y	Y	Y	Y	Y	5.14:Pipeline thermal relief on liquid pipelines?
13.3.4.4 Pig-traps and instrumentation												
Instrumentation, telemetry systems, temporary pig traps and the data acquisition, display and storage systems essential for the safe operation of the pipeline system should be examined, tested, maintained and calibrated, and appropriate remedial action should be taken where necessary.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Maintenance procedures should cover the control of temporary disarming or overriding of instrumentation, for maintenance or other purposes.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
13.3.4.5 Pipeline sleeves or casings												
The inspection of pipeline sections in sleeves or casings should cover:												
a) the condition of the pipeline and the sleeve or casing;	N	Y	Y	Y	Y			N	Y	Y	Y	
b) the condition of the pipeline and the sleeve or casing;	N	Y	Y		Y			N	Y	Y	?	
c) the electrical isolation between the pipeline and the sleeve or casing;	Y	Y	Y	Y	Y			Y	Y	Y	11	10.5:Same question
d) leakage into, or from, pressurized sleeve or casing systems.	Y	Y	Y	Y	Y			N/A	N	Y	Y	
Appropriate remedial action should be taken where necessary.						5.2						5.15:Condition of impact protection
							7.2					7.2:Only the pipeline is considered unless it is part of the pressurised system
13.3.5 Pipeline defects and damage												
13.3.5.1 Initial actions												
When a defect or damage is reported, the pipeline pressure should be maintained at or below the pressure at the time the defect or damage was first reported.	Y	Y	Y	Y	?	Y	?	Y	Y	Y	Y	
					5.2		7.3					5.16:Use of leak rupture curves to determine best operating pressure 30% lower??
												7.3:Depends on the severity of the defect

e) the condition of the pipeline and the sleeve or casing;	Y	Y	Y	Y	Y			N	Y	Y	Y		
f) the electrical isolation between the pipeline and the sleeve or casing;	Y	Y	Y	Y	Y			Y	Y	Y	Y		
A preliminary assessment should be carried out by a fully trained and competent person and, if any unsafe condition is found, appropriate remedial action should be taken immediately.	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	11	10.6:Same questions as on p10
					5.2								5.17:Needs leak rupture curves and some sort of defect assessment software to establish extent of damage ie. Use of spy glasses may be appropriate?
NOTE At the time of reporting, the pressure might not necessarily be as low as the pressure within the pipeline at the time of occurrence.													
13.3.5.2 Examination, inspection and assessment of defects													
The rights acquired for the construction of a pipeline usually include rights necessary to maintain and repair the line. Except in emergencies, maintenance and repair work should follow the same procedures as those for the original construction, particularly in relation to notices to landowners and occupiers.	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y		
Care should be taken during preparation and examination of damaged and pressurized pipelines because of the possibility of sudden failure.	Y	Y	Y	Y	Y	Y	7.4	Y	Y	Y	Y		7.4:Depends upon the deed
Consideration should be given to reducing the pipeline operating pressure to ambient conditions, e.g. when divers are to conduct an examination of an underwater pipeline, or to a stress level that is unlikely to lead to pipeline rupture.	Y	N	Y	N	?	Y	Y	Y	Y	Y	Y		5.18:control pressure temperature loads on pipeline
Procedures should be established for assessment of pipeline defects and damages (see BS 7910 or API RP 579).	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Defects and damage permitted under the original fabrication and construction specifications may remain in the pipeline without further action. For other defects, further assessment should be made to determine whether pressure-derating, repair or other corrective action is necessary. These assessments should include:	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
a) review of inspection and measurement data, including orientation of the defect and proximity to other features such as welds or heat-affected zones;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
b) details of the original design and fabrication specifications;	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y		
c) actual pipe-material mechanical and chemical properties;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
d) possible modes of failure;	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y		
e) possible growth of the defect;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
f) operating and environmental parameters, including effect on pigging operations;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
g) possible consequences of failure;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
h) monitoring of the defect where possible.	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	11	10.7:Through OLI

13.3.6 Pipeline repairs and modifications

13.3.6.1 General

Repair procedures should include the selection of repair techniques and the execution of repairs. Repairs should reinstate the intended integrity of the pipeline at the location of the defect or damage.

Y Y Y Y Y Y Y Y Y Y Y Y

NOTE Pipeline defects and damage can be grouped under a number of headings, including:

- a) pipewall defects, e.g. cracks including cracking caused by stress corrosion and fatigue, gouges, dents, corrosion, weld defects, laminations;
- b) pipe coating defects, e.g. loss of wrap or concrete coating;
- c) loss of support, e.g. spanning of pipelines;
- d) pipe movement, e.g. upheaval buckling, frost heave and landslip, which can also result in buckling, denting or cracking.

13.3.6.2 Pipeline isolation

The selection of an isolation method should take into account:

- a) hazards associated with the fluid;
- b) required availability of the pipeline system;
- c) the duration of the work activity;
- d) the need for redundancy in the isolation system;
- e) possible effect on pipeline materials;
- f) possible locations for isolation points.

Y Y Y Y Y Y Y Y Y Y Y Y
 Y Y Y Y Y Y Y Y Y Y Y Y
 Y Y Y Y Y Y Y Y Y Y Y Y
 Y Y Y Y Y Y Y Y Y Y Y Y
 Y Y Y Y Y Y Y Y Y Y Y Y
 Y Y Y Y Y Y Y Y Y Y Y Y

13.3.6.3 Venting and flaring

Hazards and constraints that should be taken into account when planning to vent or flare are:

- a) asphyxiating effects and other localized effects (e.g. gas cloud formation) of vented gases;
- b) ignition of gases by stray currents, static electricity or other potential ignition sources;
- c) noise level limits;
- d) hazard to aircraft movements, particularly helicopters in the vicinity of installations and terminals;
- e) hydrate formation;

5.2
 Y ? N Y Y Y Y Y Y Y
 Y Y Y Y Y Y Y Y Y Y
 Y ? Y Y Y Y Y Y Y Y
 N Y N Y N Y Y Y Y Y
 Y ? N Y Y Y Y Y Y Y

5.19: Availability of temporary and emergency flair equipment?

f) valve freezing;	Y	?		N	Y		Y	Y	Y	Y	Y
g) embrittlement effects on steel pipework.	Y	?		N	Y		Y	Y	Y	N	Y
13.3.6.4 Draining											
a) Liquids should be pumped, or pigged, out of a pipeline using water or an inert gas. Hazards and constraints that should be taken into account when planning to drain include:	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
b) asphyxiating effects and other localized effects (e.g. gas cloud formation) of inert gases;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
c) protection of reception facilities from overpressurization;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
d) drainage of valve cavities, "dead legs" etc.;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
e) disposal of pipeline fluids and contaminated water;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
f) buoyancy effects if gas is used to displace liquids;	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
g) compression effects leading to ignition of fluid vapour;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
a) combustibility of fluids at increased pressures;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
b) accidental launch of trapped pigs by stored energy when driven by inert gas.	Y	Y	Y	Y	Y	Y	Y	Y		Y	
13.3.6.5 Purging											
Hazards and constraints that should be taken into account when preparing for purging include:											
a) asphyxiating effects and other localized effects (e.g. gas cloud formation) of purge gases;	Y	Y	Y	Y	Y		Y	Y	Y	Y	
b) minimizing the volume of flammable or toxic fluids released to the environment;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
c) combustion, product contamination or corrosive conditions when reintroducing.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
5.20											
13.3.6.6 Cold cutting or drilling											
Procedures for cold cutting and drilling should specify requirements for preventing the accidental release or ignition of the fluid, and other unsafe conditions.											
Where appropriate, the section of pipeline to be worked on should be:											
a) isolated;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
b) depressurized by venting, flaring or draining; or	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
5.20:environmental effects?											

c) purged.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
A temporary electrical continuity bond should be fitted across any intended break in an electrically conductive pipeline before making such breaks.	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y		
13.3.6.7 Hot work													
The following should be taken into account prior to carrying out hot work on pipelines in service:													
a) possible physical and chemical reactions, including combustion of the pipeline fluids or their residues;	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
b) the type, properties and condition of the pipe material, and the wall thickness at the location of the hot work;	Y	Y	Y	Y	5.2	Y	Y	Y	Y	Y	Y		5.21:The LEL levels for safe hot work?
c) possible corrosion of pipe and welds.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Welding should be carried out in accordance with 9.5.3.3.4 and 10.12.9 .													
The pressure, temperature and flow rate of the fluid through the pipeline should be monitored and maintained within the limits specified in the approved welding procedure.	N/A	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
All welds should be inspected during and after welding in accordance with BS EN 287 and BS EN 288.	Y	?	Y	Y	5.2	Y	Y	Y	Y	Y	Y		5.22:Hot tapping?
Consideration should be given to leak-testing of welds of sleeves, saddles, reinforcing pads or any associated fitting before introducing fluids.	Y	Y	Y	Y	5.2	Y		Y	Y	Y	Y		5.23:Has this been revised?
13.4 Changes to the design condition													
13.4.1 Change control													
A change control plan should be implemented that defines and documents procedures to be followed when handling changes in the design condition.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
It should be demonstrated that the revised pipeline system and integrity meets the recommendations of this part of PD 8010 before implementing changes to the design condition, such as an increase in MAOP or change of fluid. All documentation relating to the pipeline design and management-of-change records should be updated to reflect the revised design condition.													
NOTE Any alteration to the pipeline registration under the Pipelines Safety Regulations 1996 [12] needs to be notified prior to a change in operation.													
13.4.2 Operating pressure													
An increase in MAOP can necessitate additional hydrostatic testing, inspection, additional cathodic protection surveys and other measures. When increasing operating pressures, pressures should be raised in a controlled manner to allow sufficient time for monitoring the pipeline system.	N/A	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		5.24:Check durations may be 16 weeks or 6 months??

some are a little too prescriptive and whereas the end result
may be achieved it is done in a different way