



UKOPA Good Practice Guide

GP 07: Management of Pipeline Illegal Tappings

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- ☐ Landowner and easement management
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- ☐ Inspection of tapping
- ☐ Repair techniques and lifespan

For full details refer to

Good Practice Guide GP07: Management of Pipeline Illegal Tappings

TYPES OF ILLEGAL TAPPINGS

Directly connected valve - threaded / welded / soldered



TYPES OF ILLEGAL TAPPINGS



Clamp

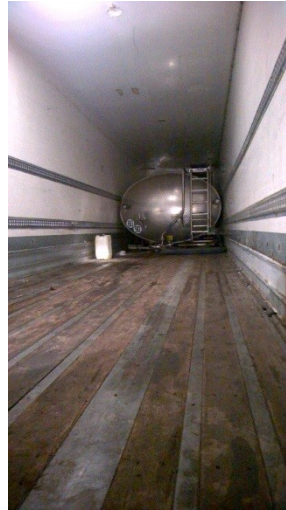


Driven spike

TYPICAL STORAGE METHODS



Van in lay-by



Milk storage
tank in trailer



Buried IBCs

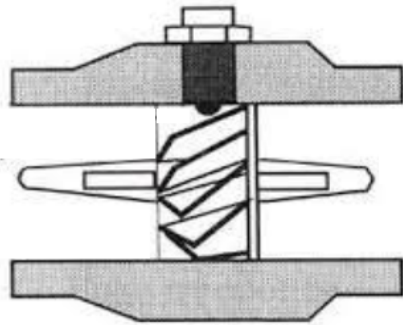


Pillow tanks in barn

RISKS TO BUSINESS

- ☐ High risk of leak during illegal tapping
- ☐ Significant risk to people and the environment
- ☐ Non standard installations on pipeline with limited integrity
- ☐ On average 25% are leaking when discovered
- ☐ High financial cost
 - Value of stolen fuel
 - Cost of temporary and permanent repairs
 - Clean-up costs if significant leak
- ☐ Unplanned shutdown for draindown and repair
- ☐ Damage to Operator reputation

DETECTION TECHNIQUES



Leak Detection:

- Line balance and static monitoring.
- Statistical and hydraulic modelling.
- Pressure wave detection.



In-Line Inspection:

- MFL presently most suitable for tapping detection.

DETECTION TECHNIQUES



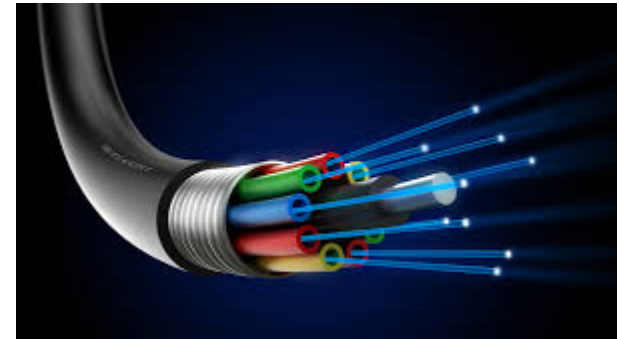
Coating Surveys:

- Assists search
- May detect normal degradation



Leak Detection Dogs:

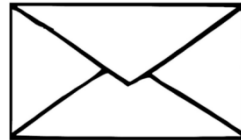
- Full audit of line
- Localised searches



Fibre Optic Cable:

- Intruder detection
- Leak detection

EASEMENT AND LANDOWNERS



Increased landowner liaison

- Includes extra correspondence
- Raise awareness

Note: Occupiers could be involved

Easement maintenance

- Assists surveillance
- Increases operator presence

INCREASED SURVEILLANCE



Security patrols:

- Increased easement vigilance**
- Increased visibility is a deterrent**

SURVEILLANCE - WHAT TO LOOK FOR



Markers:

- Tape on CP post
- Stake in ground
- Dead bird tied to tree
- Bag tied to gate



Disturbed ground

- Paths
- Slit trenches

SURVEILLANCE - WHAT TO LOOK FOR



Fake roadworks

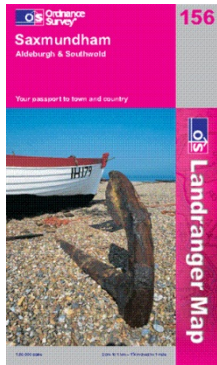


Sticks used to detect disturbance



Hose and rubbish pile

TOOLS FOR LOCAL SEARCHES



Route maps GIS, GPS etc.



Examples of search tools to look for metallic hoses, slit trenches, spilt fuel etc.

SURVEILLANCE – Prioritising Higher Risk Locations

- ☐ Areas of previous illegal activity.
- ☐ Above ground sections
- ☐ Shut down sections
- ☐ Leak detection or other intelligence indications
- ☐ Secluded areas.
- ☐ Areas similar to previous tappings. Profile previous tappings:
 - Geographical location.
 - Location type
 - Access
 - Product
 - Ground cover.
 - Proximity to previous tappings
 - Type of facility
 - Buildings/structures involved

SURVEILLANCE – Highest Consequence Locations

- ❑ Rank higher risk locations on consequence:
 - Environmental sensitivity
 - Proximity to people
 - Schools
 - Sporting venues
 - Major roads and railways
- ❑ Prioritise surveillance of highest risk & consequence locations

SUSPECTED TAPPINGS – Surveillance Risks

- ❑ Manage personnel safety:
 - Risk assessment (possibility of violent criminals)
 - Survey from a distance
 - Survey from vantage points
 - Drive-past survey, unmarked vehicles.
 - Searching in groups.
 - Maintain contact
 - **Police assistance where required**

INSPECTION OF ILLEGAL TAPPINGS

Prior to excavation / inspection consider:

- Risk of disturbing tapping
- Reduce operating pressure
- Controlled shutdown (i.e. low pressure)
- Depressurise
- Emergency response on standby
- Assess pipeline details
 - Profile & isolation valves
 - Drain-down calculations
 - Logistics & access in case of leak
 - Temporary repair options
 - Assessment local area (environment, population etc.)
 - Assessment by qualified personnel

MAIN REPAIR TYPES (Tapping removed)



Stand-off clamp



Composite wrap



Pinhole Clamp

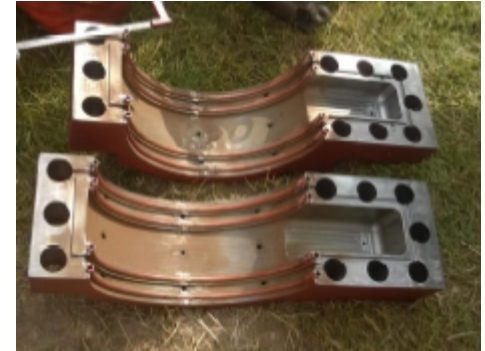
MAIN REPAIR TYPES (Tapping Still in Place)



**Grouted tee
(by DNV)**



Welded tee



**Epoxy filled tee
(by Team Inc)**

TEMPORARY REPAIR CONSIDERATIONS

- Limited lifespan of repairs
 - Technical risk assessment
 - Periodic review
- Quality assurance and inspection during repair.
- Degradation of the repair (internal / external corrosion)
- Compatibility of elastomer seal with hydrocarbons
- Ability to monitor elastomer seal performance.
- Pressure fluctuations & fatigue life
- Structural integrity of the tapping / pipeline / the repair
- Weakening of pipe (adjacent to a weld, pipe deformation, grinding, high temps due to welding, multiple adjacent tapping attempts)
- Timescale for permanent repair.
- Life of epoxy / composites and seals
- Will tapping leak into repair and cause degradation?
- Access for periodic inspection / maintenance / leak monitoring (e.g. boreholes)

SUMMARY - Tapping Management

- Prioritise tapping preparedness
- Implement all reasonable detection techniques
- Response management (e.g. set up working group, industry liaison)
- Tapping response procedures
- Training (e.g. leak detection, tapping surveillance, tapping response)
- Technical support for assessment and repair
- Safety of personnel during searches
- Prioritise emergency preparedness
 - Leak equipment
 - Training
 - Procedures
 - Police and other liaison