



MAJOR HAZARD INSTALLATION (MHI)

Applicability and *Implementation in TPL*

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Designation : TPL Technical Risk Manager
Date : 2025/02/28

1. Transnet Pipeline Overview
2. Transnet Pipeline Future in terms of Cleaner Fuels
3. Major Health and Safety Challenges
4. Major Hazard Installation Regulations
5. Emergency Response
6. Conclusion - Collaborations Required



Who is Transnet Pipelines

Transnet is a custodian of rail, ports and pipelines



Transnet Freight Rail

- Owns the largest railway in Africa and is among the top 10 freight railways in the world
- Provides strategic links between ports, terminals and production hubs in the SADC region
- Maintains 30 400km of railway track (80% of Africa's total rail)
- 1 500km dedicated heavy haul lines
- Runs 1 200 trains per day
- Operates the award-winning luxury Blue Train



Transnet Engineering

- Manufacturing division of Transnet, with 143 depots and six main factories
- Core capabilities in research, design, testing, manufacturing, remanufacturing, assembly and maintenance of railway rolling stock, including locomotives, freight wagons, passenger coaches and port equipment
- Expanded its products offerings not just locally, but also in the continent and the world



Transnet National Ports Authority

- 8 Commercial seaports along 2 798km of coastline
- Plans, provides, maintains and improves port infrastructure
- Provides marine-related services, including dredging, aids to navigation, ship repairs and marine operations



Transnet Port Terminals

- 16 sea cargo terminals across 7 commercial ports
- 3 inland terminals in KZN, Northern Cape and North West
- Cargo handling across the four sectors namely: containers, mineral and agricultural bulk, break bulk and automotive (roll-on roll-off/RORO)



Transnet Pipelines

- Owns, operates and maintains a 3 116km network of crude, gas and multi-product pipelines in South Africa

Pipelines market share:

- Transports 65% of the total inland demand of refined petroleum products
- More than 70% of all jet fuel requirements for OR Tambo Airport
- 100% crude requirements for Natref
- 100% methane-rich gas from Secunda to KZN



Transnet Property

- One of South Africa's most significant property owners with a national footprint
- Manages a portfolio of properties used for core operations and investment properties generating revenue from external tenants
- Provides specialised property services including valuations, municipal valuations, roll analysis, land surveys, drawing of plans and deeds management



Transnet Pipelines Overview

• Transnet Pipelines Geographic Spread:

- ☐ KwaZulu-Natal
- ☐ Free State
- ☐ Gauteng
- ☐ North West
- ☐ Mpumalanga



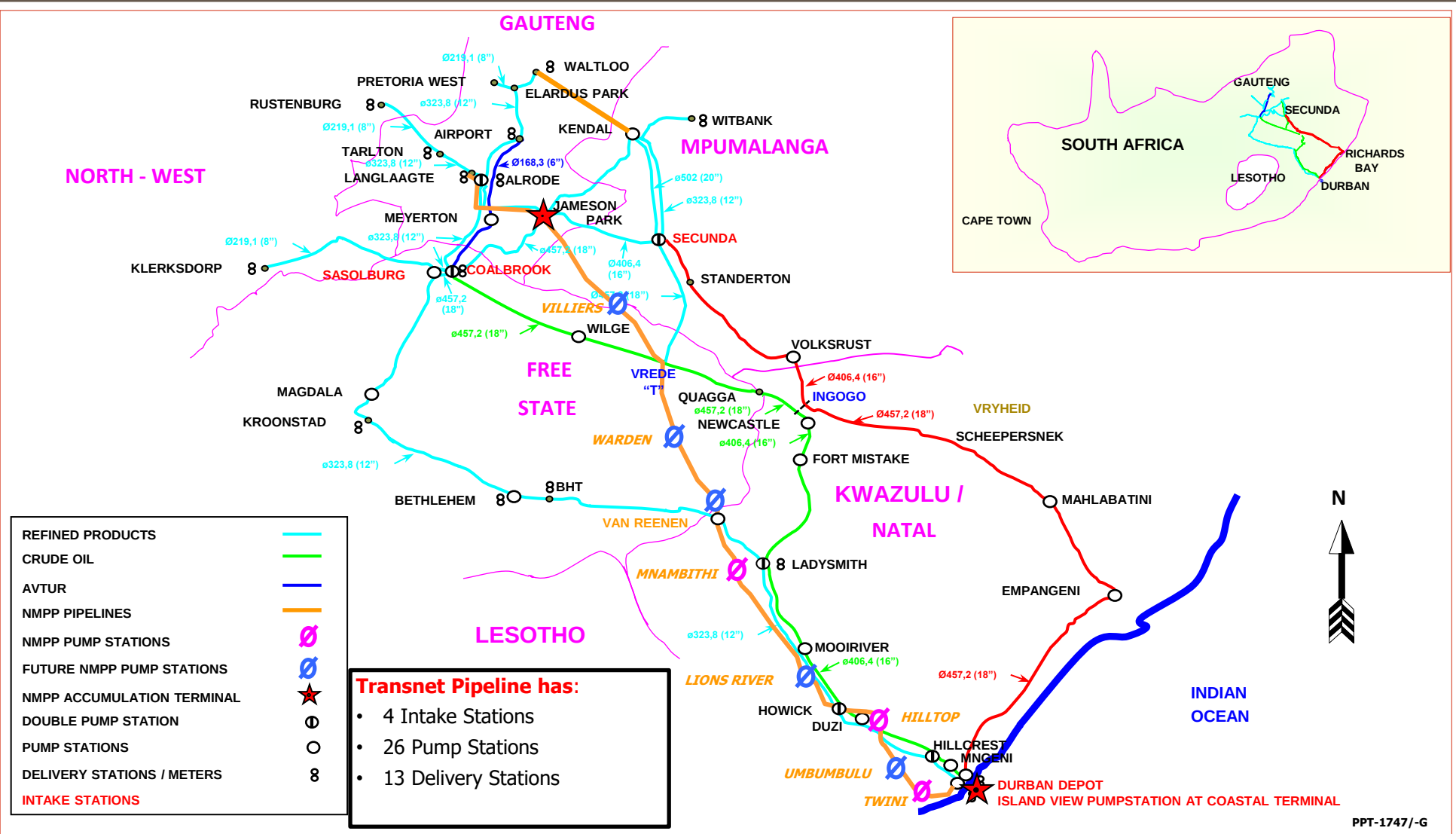
• Regulatory Environment:

- ☐ Petroleum and Gas Pipelines Licenses
- ☐ Storage Facility License



Transnet Petroleum and Gas Pipeline Current Network Layout

TRANSNET





Transnet Pipelines Depots and Pipelines



Transnet Pipeline Manifolds



Transnet Pipelines Depots and Pipelines



Transnet Pipeline
Accumulation Tanks at JMP



Transnet Pipelines Depots and Pipelines



Transnet Pipeline 24" Multi
Product Pipeline DBN to JMP

Note

80% of Transnet Pipelines Infrastructure is made up of Carbon Steel. There is no Transnet Pipelines without *IRON AND STEEL* SECTOR.



Transnet Pipelines Cleaner Fuels Initiatives

LNG Terminal in Richards Bay

- Transnet Pipelines and Vopak Jointed Venture.
- Develop LNG Terminal at the Port of Richards Bay.
- The LNG will be supplied to KZN and Inland customers through existing Transnet gas pipeline (The project to repurpose the gas pipeline is in progress).
- For a minimum period of 25 years.
- The project is still at an initiation stage.
- Expected completion date is 2028.

Other cleaner fuels initiatives:



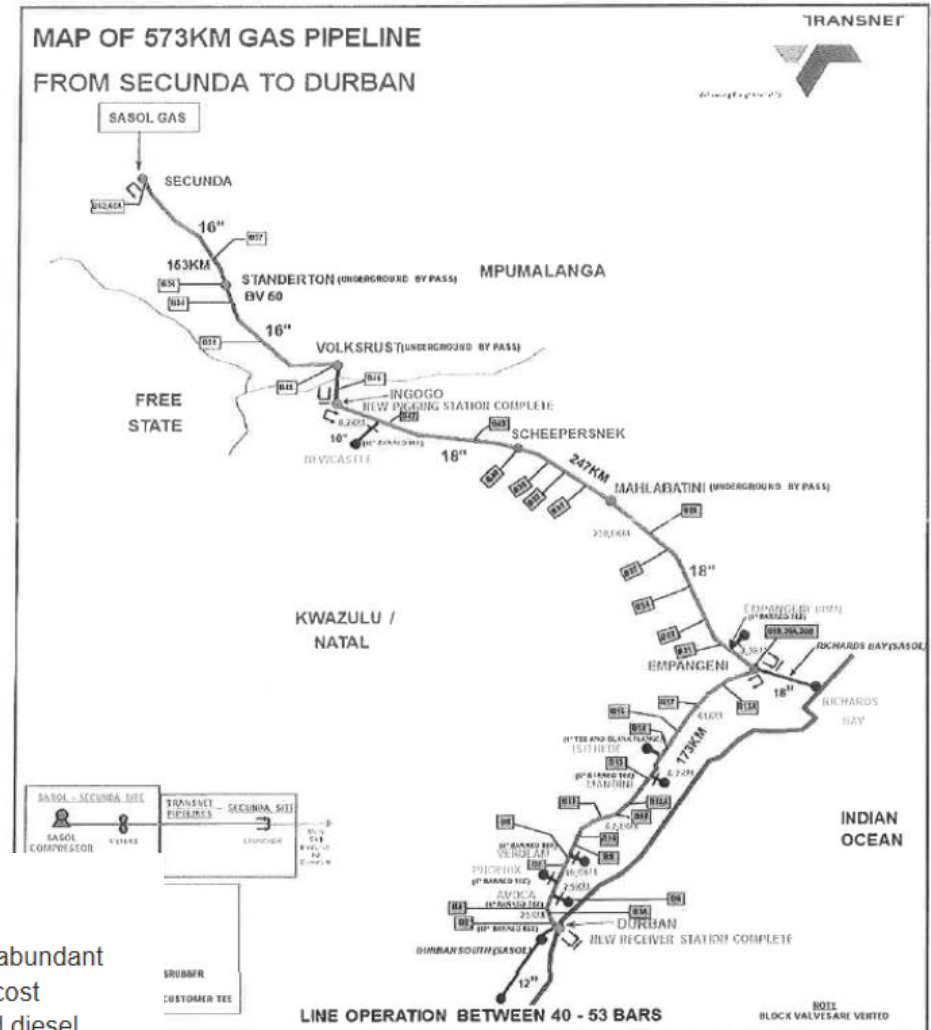
Hydrogen ▶

Hydrogen is a potentially emissions-free alternative fuel that can be produced from renewable resources for use in fuel cell electric vehicles.



Natural Gas ▶

Natural gas is a domestically abundant fuel that can have significant cost advantages over gasoline and diesel fuels.



Major Health and Safety Challenges at Transnet Pipelines



TRANSNET PIPELINES

PRODUCT THEFT

EQUIPMENT VANDALISM _CATHODIC PROTECTION

ENCROACHMENTS

FIRE INCIDENTS

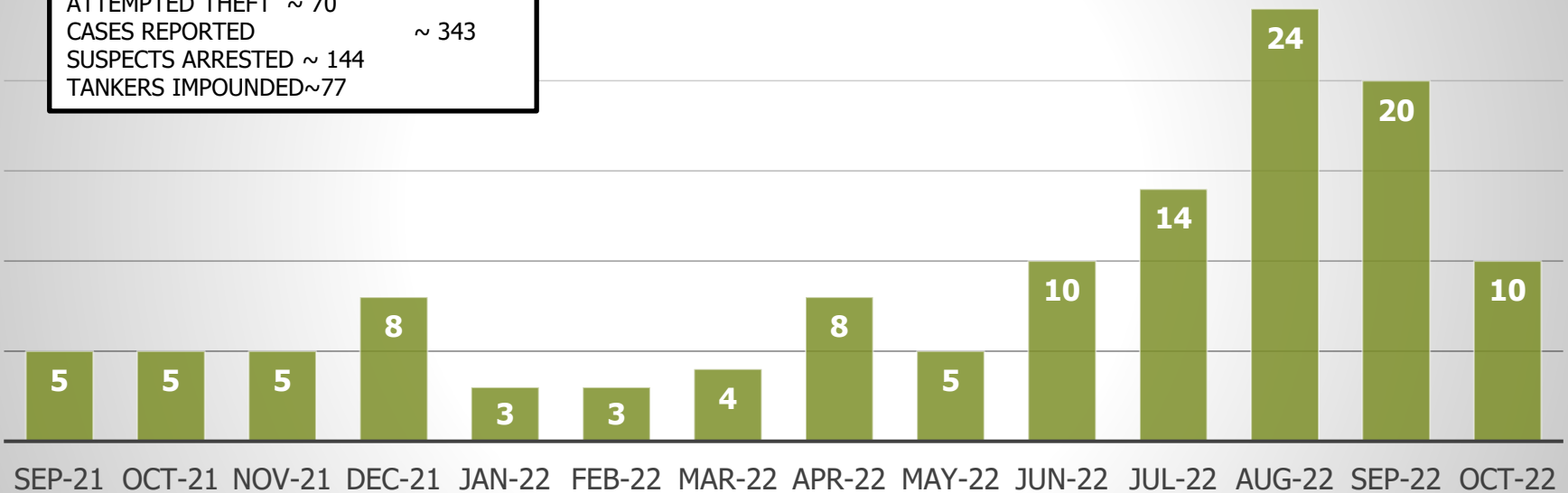
PRODUCT THEFT



Theft Incidents in numbers

Number of incidents

SUMMARY SINCE 2020 TO Oct 2022
ACTUAL THEFTS ~ 447
ATTEMPTED THEFT ~ 70
CASES REPORTED ~ 343
SUSPECTS ARRESTED ~ 144
TANKERS IMPOUNDED ~ 77



■ Number of incidents

Theft Incidents aftermath pictures



Two found dead allegedly trying to steal fuel in KZN

Friday 15 November 2019 - 9:00am



The bodies found in the Transnet pipeline fuel bunker are thought to have been attempting to steal fuel.

Sasolburg suspected fuel thieves expected in court

FREE STATE – Five suspects aged between 52 and 24 are expected to appear in the Sasolburg Magistrate's Court today following their arrest for tampering with essential infrastructure and theft of oil from a Transnet fuel pipeline.

• August 3, 2020

Staff Reporter ■ Less than a minute

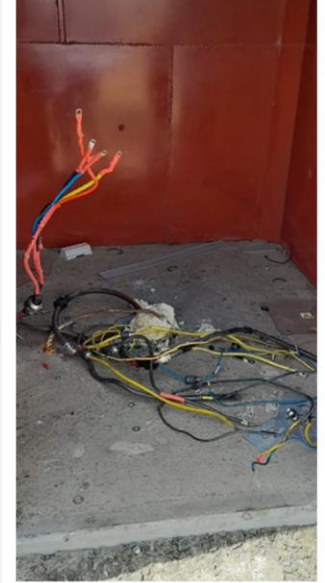


VEREENIGING, South Africa – A 27-year-old man has been convicted in the Vereeniging Magistrates' Court and sentenced to 13 years imprisonment for theft of diesel and tampering with essential infrastructure, the Directorate for Priority Crime Investigation (DPCI), commonly known as the Hawks, in Gauteng said on Saturday.

EQUIPMENT VANDALISM- CATHODIC PROTECTION (CP)



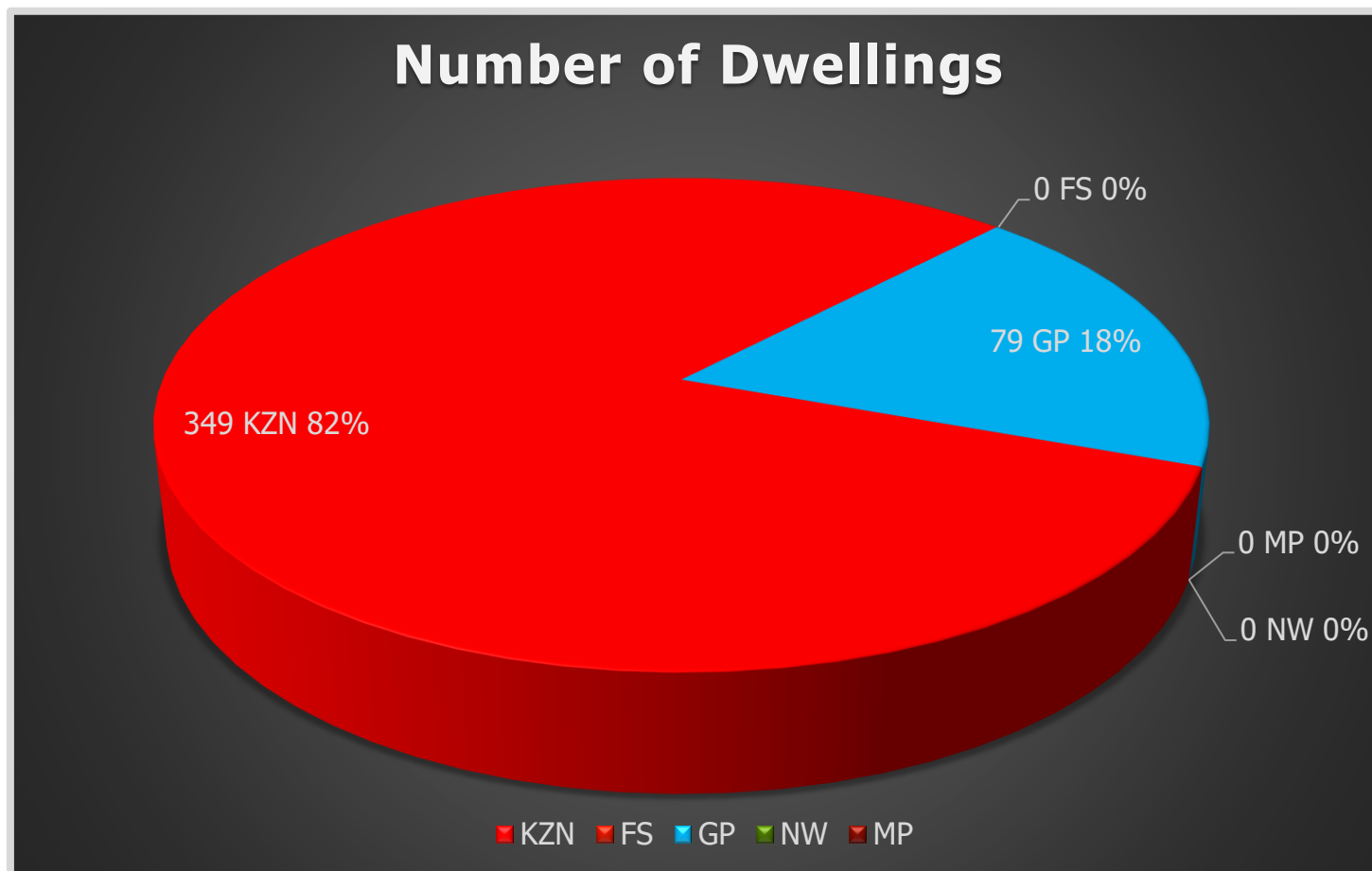
CP Equipment Vandalism in pictures



- Repairs done expeditiously
- Alternative test points solutions being explored
- Resultant Risk include : inability to measure CP protection level
- Drainage of current from pipeline_ CP leakage
- Metal loss on pipeline

ENCROACHMENTS



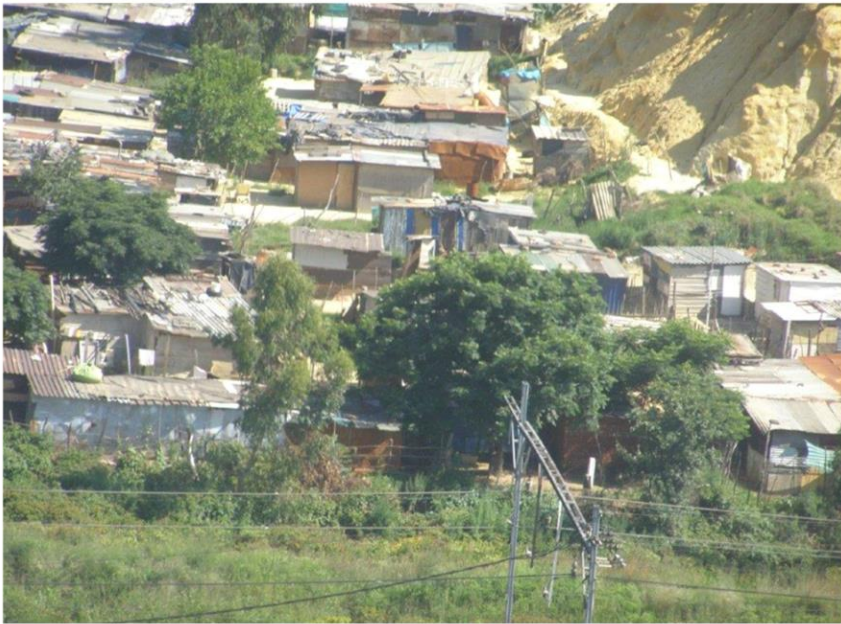


Encroachments

3 Houses extended to
encroach TPL servitude
Clairwood KZN



Encroachments



40 dwellers encroaching TPL servitude covering 1800 m². Delmore Gauteng



FIRES



Fire Incidents- Secunda July 2019



TPL PIPELINE_ SECUNDA/ STANDERTON
FIRE FIGHTING COST~ R1.5m
14Hrs TO EXTINGUISH

TRUCK BURNT DOWN





Fire Incident – Clairwood October 2021



TPL PIPELINE_ CLAIRWOOD
3 FATALITIES, TANKER BURNT
FIRE FIGHTING COST~ R11m
18Hrs TO EXTINGUISH
164 HOUSEHOLDS EVACUATED (298 PEOPLE)
ENVIRONMENTAL POLLUTION



A massive fire broke out on Horebeek Road in Jacobs just after 3am on Sunday morning. PHOTO: Pierre Spierdijk

Major Hazard Installation (MHI) Regulations

Part of Occupational Health and Safety Act 1993 (Act No 85 of 1993)

Promulgated 16th January 1998

Revised and promulgated 30th July 2001

“The main purpose of the MHI Regulations is to protect the employees the public, infrastructure and environment and at the same time plan for major incidents/disaster that may result from major incidents”

*Latest revision: Revised and promulgated 31st January 2022.

Implementation of new MHI Regulations in Transnet Pipeline

GOVERNMENT NOTICES • GOEWERMENTSKENNISGEWINGS

DEPARTMENT OF EMPLOYMENT AND LABOUR

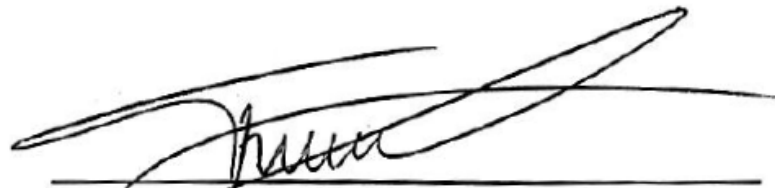
NO. R. 2989

31 January 2023

OCCUPATIONAL HEALTH AND SAFETY ACT (ACT No. 85 OF 1993), as amended

PROMULGATION OF MAJOR HAZARD INSTALLATION REGULATIONS, 2022

I, Thembelani Waltermade Nxesi, Minister of Employment and Labour, hereto, after consultation with the Advisory Council of Occupational Health and Safety, promulgates the new regulation relating to Major Hazard Installations; in terms of section 43(1)(c) of the Occupational Health and Safety Act, 1993 (Act no. 85 of 1993).



MR TW NXESI, MP
MINISTER OF EMPLOYMENT AND LABOUR
DATE: 13/1/2022



Prescribed Quantities Annexure A Chapter 1

Named substances	UN NUMBER	Quantities in tonnes		
		Column 1 Low Hazard	Column 2 Medium Hazard	Column 3 High Hazard
Petroleum products: gasolines, naphthas, kerosenes (including jet fuels), gas oils (including diesel fuels, home heating oils and gas oil blending streams)	Gas (1075)	250	2 500	25 000
	Crude (1275)			

“in a quantity which at any time is equal to or in excess
of.....in a single fixed storage vessel”

NB: Quantities in Tonnes

Classification of Pipelines as Major Hazard Establishment Chapter 3

Chapter 3

Classification of pipelines as major hazard establishment

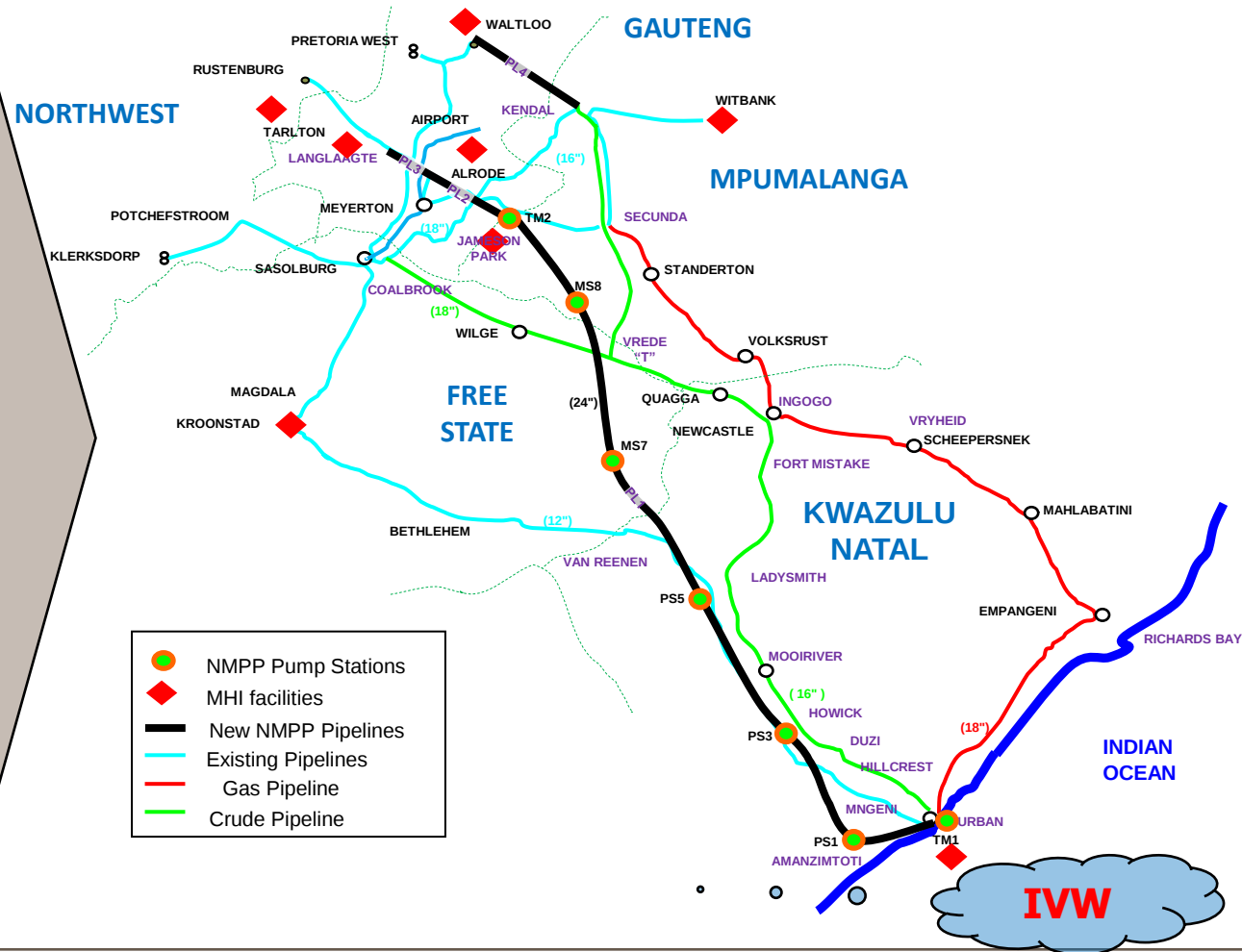
A pipeline is considered an establishment if it contains any of the following:

- (1) A fluid which—
 - (a) is flammable in air;
 - (b) has a boiling point below 5°C at 1 bar absolute; and
 - (c) is or is to be conveyed in a pipeline as a liquid.
- (2) A fluid which is or is to be conveyed in a pipeline as a gas which is—
 - (a) at pressures at above 8 bar absolute*;
 - (b) flammable in air**.
- (3) Pressurised substances:
 - (a) Mixtures of gas and liquid which have a vapour pressure in excess of 0,5 bar above atmospheric pressure when in equilibrium with its vapour included;
 - (b) A liquid which has a vapour pressure greater than 1,5 bar absolute when in equilibrium with its vapour at either the actual temperature of the liquid or at 20°C.
- (4) A very toxic fluid which—
 - (a) at 20°C has a saturated vapour pressure greater than 0,001 bar; or
 - (b) is or is to be conveyed in the pipeline as a liquid at a pressure greater than 4,5 bar absolute.
- (5) A very toxic or toxic fluid which—
 - (a) is a gas at 20°C and 1 bar absolute; and

Facilities which fall within MHI regulations

TPL MHI Facilities

1. IVW
2. KRO
3. JMP
4. ALR
5. LLA
6. TLR
7. WAO
8. WIR
9. TWINI
10. HTP
11. MBT
12. RNB
13. LAY
14. KRO
15. GAS pipeline
16. CRUDE pipeline
17. MULTI Product pipeline



Hazard Establishments Categories

Stations / Depot	Total Design Volumes (m3)	Density of Diesel 850kg/m3	Estimated Tonnage	>250 Tons	MHI Tier	Compliance Within
KLERKSDORP	336	0,85	285	Y	Low	24 Months
RUSTENBURG	733	0,85	623	Y	Low	24 Months
TWINI	286	0,85	243	Y	Low	24 Months
HILLTOP	286	0,85	243	Y	Low	24 Months
MNAMBITHI	286	0,85	243	Y	Low	24 Months
ALRODE***	24769	0,85	21 054	Y	Medium	36 Months
KROONSTAD***	3340	0,85	2 839	Y	Medium	36 Months
LADYSMITH	11822	0,85	10 049	Y	Medium	36 Months
LANGLAAGTE***	7554	0,85	6 421	Y	Medium	36 Months
WALTLOO***	4760	0,85	4 046	Y	Medium	36 Months
WITBANK***	18056	0,85	15 347	Y	Medium	36 Months
JAMESON PARK***	200000	0,85	170 000	Y	High	36 Months
ISLAND VIEW***	180000	0,85	153 000	Y	High	36 Months
TARLTON***	46273	0,85	39 332	Y	High	36 Months
Pipeline				Y	High	36 Months

Comments

	5 Depots are Low MHI establishments
	6 Depots are Medium MHI establishment
	3 Depots are High MHI establishment and our 3 pipeline Gas, Crude and Multi product Pipelines

Transnet Pipeline current approach to MHI Regulations



Step by Step implementation of the MHI regulations at Transnet Pipelines:

1. Regulations published for Public or Industry comments – reviewed and submitted comments.
2. Engagement with the Department of Labour and Transnet Pipeline EXCO – for support.
3. Engagement with AIA's – for clarity.
4. TPL Legal Department developed a Compliance Control Plan for MHI Regulation 2022.
5. Quantification of Total Petroleum Volumes in our depots.
6. Separation of the pipeline network into 3 MHI establishment (Crude, Gas and Multi Product).
7. Transnet Pipeline CEO appointment as a Duty Holder and delegation to Senior Regional Managers.
8. Appointment of Depot Managers and Supervisors as Responsible and Deputy Responsible Person.
9. Notification of MHI establishment - New and Existing.
10. Registration of the MHI establishment -New and Existing.
11. Duration of Registration and renewable - 5 years aligned with the MHI risk assessments.
12. Alteration to particulars of registered establishment - none.
13. Revocation or suspension of registration – none.
14. Revocation or suspension of registration – none.
15. Sharing of information with adjacent establishments – Ongoing
16. Risk assessment – We appointed AIA to do Risk Assessments and are done in accordance to SANS 1461 every 5 years
17. Major incident prevention policy – Developed for Medium and High establishments.

Transnet Pipeline current approach to MHI Regulations

Step by Step implementation of the MHI regulations:

18. Safety report – Development is in progress for High MHI.
19. Licence to operate - application to be send to the Department of labour for High MHI.
20. Emergency plan – Existing emergency plans reviewed and updated according to SANS 1514 – send to Local authorities for approval.
21. Reporting of risk and emergency occurrences – on going to be done within 48 hours.
22. Information and training – Conducted internally and during AIA MHI Risk assessments.
23. Payable fees – budgeted for in our budgeting cycle.
24. Closure of MHI facility – Closing of Kroonstad Depot – Letter prepared to be issued to Local Authorities, Chief Director Provincial and Chief Inspector National within 60 days.
25. Offences and penalties

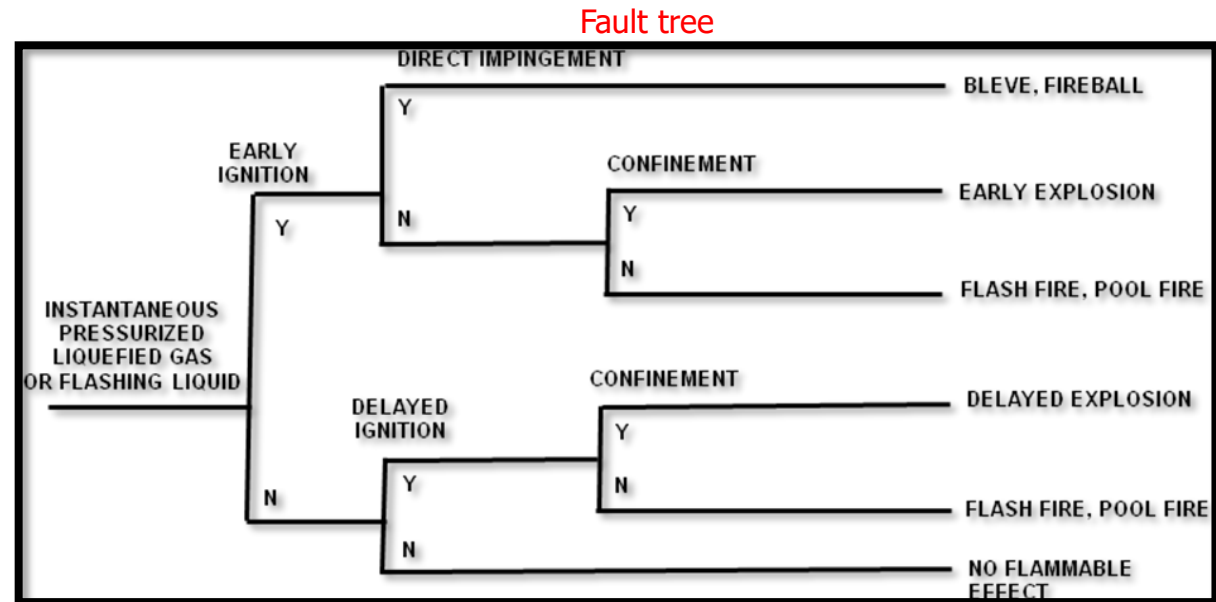
PREVIOUS CONTRAVENTIONS	CONTRAVENTIONS OF REGULATIONS: 3(1), 4(1), 4(4), 6(3), 7, 10, 11(1), 12(1), 13(1), 15(2), 16, 20(6) and 22
No previous contraventions	R500 000
A previous contravention within 12 months	R1 000 000
A previous contravention in respect of the same contravention within three years	R2 500 000
Three previous contraventions in respect of the same provision within three years	R5 000 000

- To identify the risks posed by our sites on its surroundings. (AIA)
- To establish the potential consequences of incidents which could occur on a site.
- To establish the probability of such incidents occurring on the site.
- To identify risk reduction or risk mitigation measures that could be considered, or which are in place. (Process safety).
- To establish land uses in areas in proximity to Major Hazard Installations.

Possible Impacts of Incidence

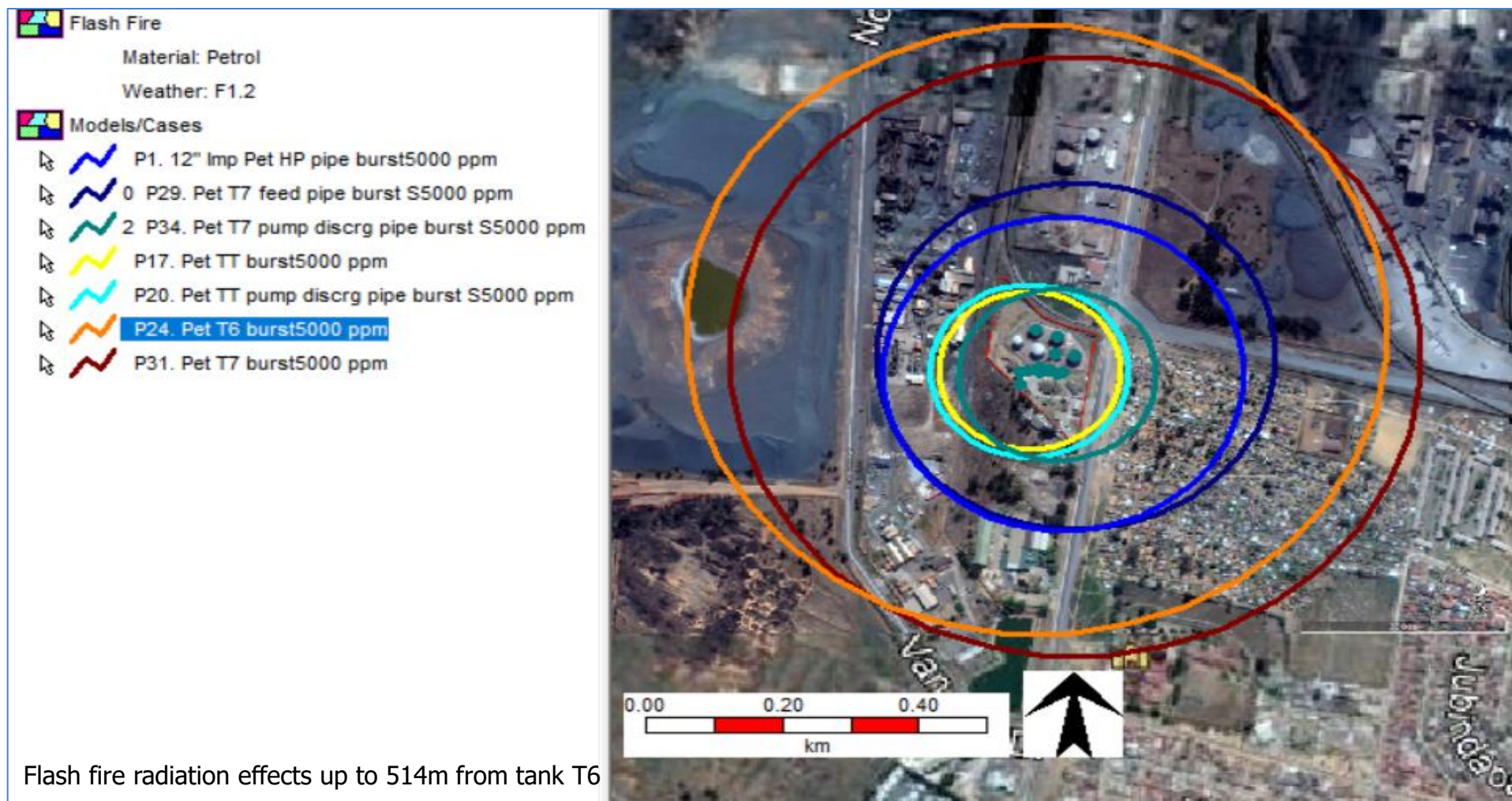


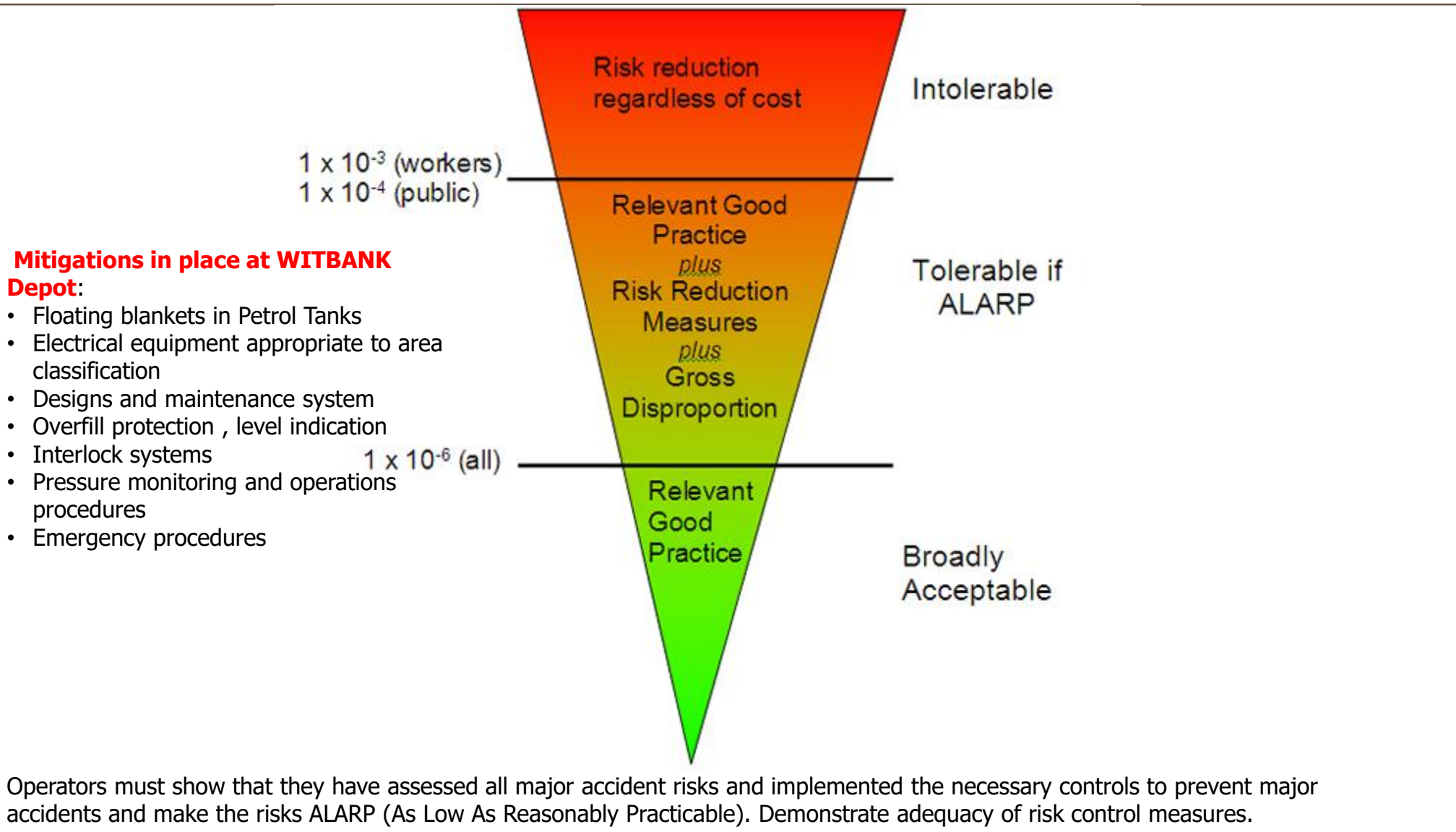
- Fires
 - Pool fires
 - Jet fires
 - Flash fires
 - Fireball



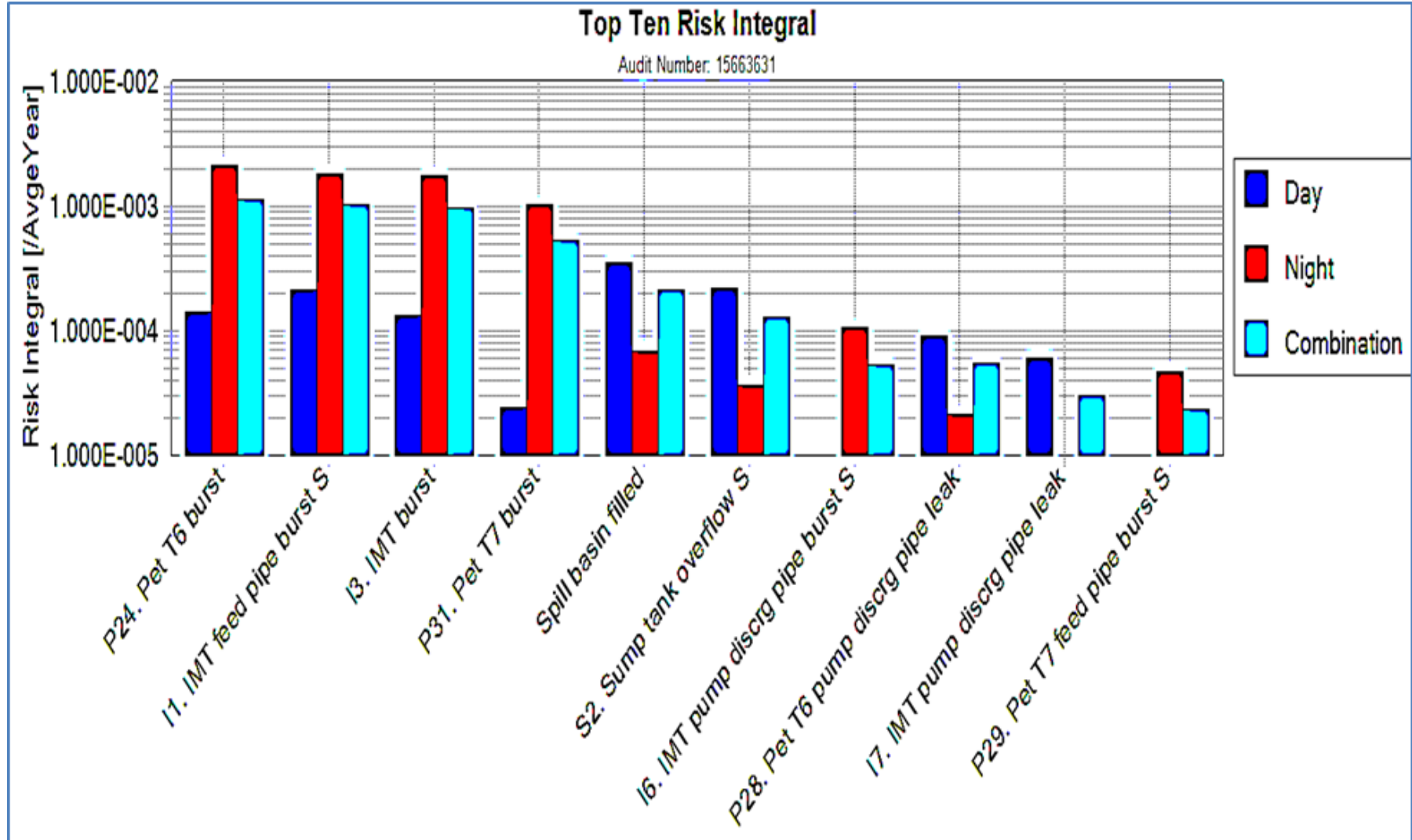
- Explosions
 - Vapour Cloud Explosions (VCE) Early/Late
 - Boiling Liquid Expanding Vapour Explosion (BLEVE)
- Toxic Releases

Risk Assessments Results (Witbank Depot)





Top Societal Risk events for (Witbank Depot)



Top societal risk events for Witbank depot

Mitigations in place at Transnet Pipelines for MHE

- Operator training and procedures
- Design considerations such as interlock system, overfill protection, piping equipment rating 100Bar, emergency shut down
- Process safety
- Electrical equipment selected appropriate to area classification
- Emergency response plan and fire protection system
- Maintenance approach, integrity assurance, Cathodic protection
- Collaboration with stakeholders.

Expectation for MHI facilities (Duty Holder)

- Get a risk assessment done and reduce high risks where practical.
- Compile an emergency plan and test regularly.
- Notify the relevant authorities of the installation.
- Keep record and report.
- Inform relevant authorities of MHI related near misses.
- Inform relevant authorities of an occurrence of a major incident or an incident that brought the emergency plan into operation or any near miss.
- Repeat risk assessment every 5 years.

Implication of the MHI Regulations 2022 to underground pipelines



Advantages of Pipeline being Major Hazard Establishment (MHE)	Disadvantages of Pipeline being MHE
Risks related to pipeline is known to local authorities	The additional emergency response support which will be required to equip local authorities is unknown
Pipeline will be included in Local Authorities Emergency response planning	Additional mitigations which will be required in residential areas or informal settlements is unknown
Town planning will consider presence of pipeline during land use planning	Besides license fees highlighted in the regulations, other financial obligations are unknown
	Notification process to all Local authorities along the pipeline will be an admin challenge with different requirements expected

Emergency Response Challenges

LOW LIGHTS	REMARKS
COALBROOK FIRE INCIDENT	Fire Engine was not operational, Natref responded, Municipality was called and did not respond.
TWINI SUBSTATION FIRE	Local Authorities 2min away, responded accordingly.
JAMESON PARK INSULATED FLANGE FIRE	Local authorities called, and did not respond. Later Nigel emergency services arrived 1 hour later. Fire extinguished by TPL fixed fire system.
MEYERTON BLOCK VALVE 11 FIRE	Local Authorities had no resources to respond, Sasol Secunda responded after requesting assistance via SAPIA Fire Chiefs Forum.
ALBERTON PIPELINE FIRE	Metros Emergency Services had no fire fighting foam, Natref responded with their foam after 3hours.
KENDAL/DELMAS PIPELINE FIRE	Local Fire Authorities were not available on call, responded 3 hour later, they had no foam.
KZN CLAIRWOOD PIPELINE FIRE	eThekwni , Transnet National Port Authority and TPL Fire extinguished a fire, Disaster Management responded and managed the evacuation of residents

Conclusion: Collaboration Required

Intervention by all stakeholders including government in curbing product theft syndicates and vandalism of critical infrastructure

Involvement of Dept. of Employment & Labour, Human settlements, DEPT. of Mineral Resources, Law enforcement agents, SALGA, local authorities in dealing with encroachments and Zama Zamas

Capacitation of local authorities and emergency response teams to deal with incidences in petroleum industries

Blanket court order to address encroachments

Working together with all stakeholders

**We all have a role to play in making
our MHI industry and all its
operations a better and safer place.
We are each other's keeper and the
SAFETY CULTURE starts with **YOU**.**



"LUCK RUNS OUT BUT SAFETY IS GOOD FOR LIFE" author unknown



THANK YOU

Contact details

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Durban

KwaZulu-Natal

