



ASOCIACIÓN REGIONAL DE EMPRESAS DEL SECTOR
PETRÓLEO, GAS Y BIOCMBUSTIBLES
EN LATINOAMÉRICA Y EL CARIBE.

Process Safety Benchmarking Report (2017 data)

ARPEL Publication BE02-2018

Process Safety Incidents Benchmarking – in the oil and gas industry in Latin America and the Caribbean- Data 2017

ARPEL Publication BE02-2018

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Authors

This report was prepared upon request of ARPEL and its Environment, Health and Safety Committee by Pablo Ferragut, Project Manager at ARPEL.

Review

This document was reviewed by professionals of the ARPEL EHS Committee, and the Safety and Process Safety Project Teams.

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Introduction

- The Process Safety Benchmarking Report is an annual comparative study of the ARPEL member companies which objective is helping to improve the safety performance and management of the oil and gas industry, analyzing process safety incidents indicators, establishing benchmarks and bridging gaps.
- The main references for reporting are the API recommended practice 754 and its reporting guidelines 3.0 and the CCPS document Process Safety Leading and Lagging Metrics. The definitions used in this report could be found on the User's Manual – ARPEL Database – Safety Benchmarking in the oil and gas industry in Latin America and the Caribbean, 7th edition, 2017. There is a brief methodological note in the annexes of this document.
- For this report (2017 data) only Tier 1 and Tier 2 indicators were compiled because of comparability issues. The objective is to progress towards the definition and reporting of proactive indicators (Tier 3 and Tier 4), which are in the lower part of the safety pyramid.

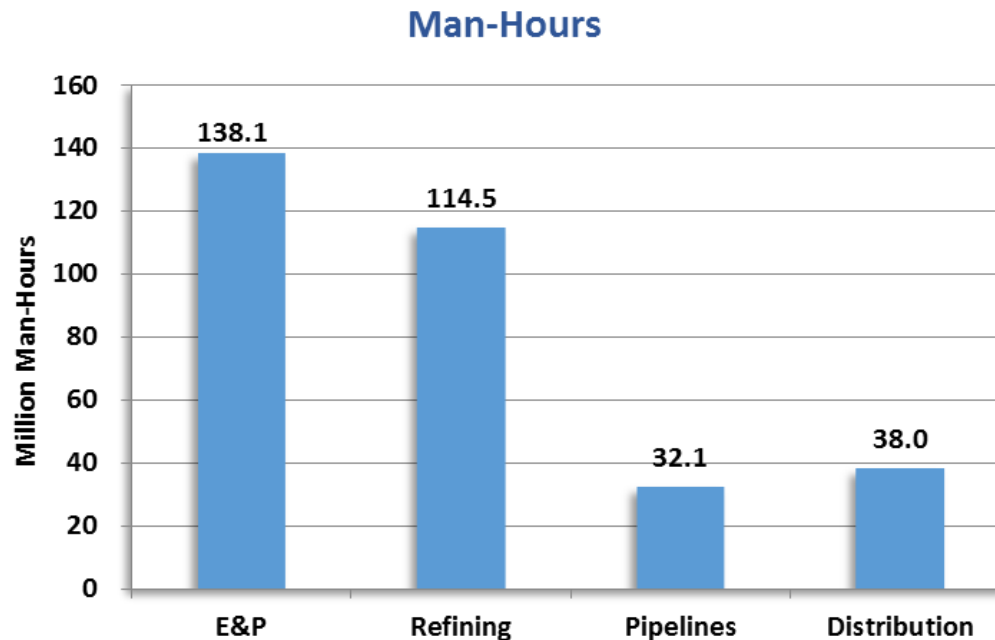
Scope of the Report

- 14 companies coming from 12 different countries shared data for this report.

ANCAP (Uruguay)	Oldelval (Argentina)	Pluspetrol (Argentina, Bolivia and Peru)
Chevron (Argentina, Brazil, Colombia and Venezuela)	Pan American Energy (Argentina)	Repsol (Colombia, Ecuador y Peru)
COGA (Peru)	PCJ (Jamaica)	YPF (Argentina)
ENAP (Chile)	PEMEX (Mexico)	YPFB Transporte (Bolivia)
Equión (Colombia)	Petrotrin (Trinidad & Tobago)	

Scope of the Report

- Data is broken down in 4 different business lines or functions (E&P, Refining, Pipelines and Distribution)
- A total amount of 322,7 million man-hours were reported, as shown in the chart below:

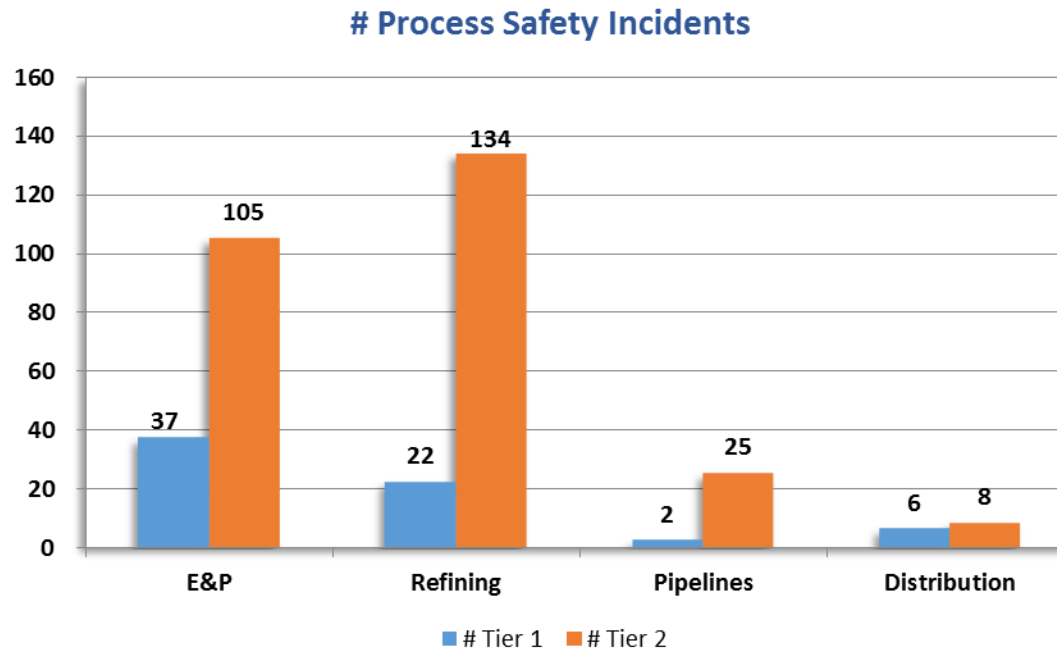


Results: Incidents T1 and T2

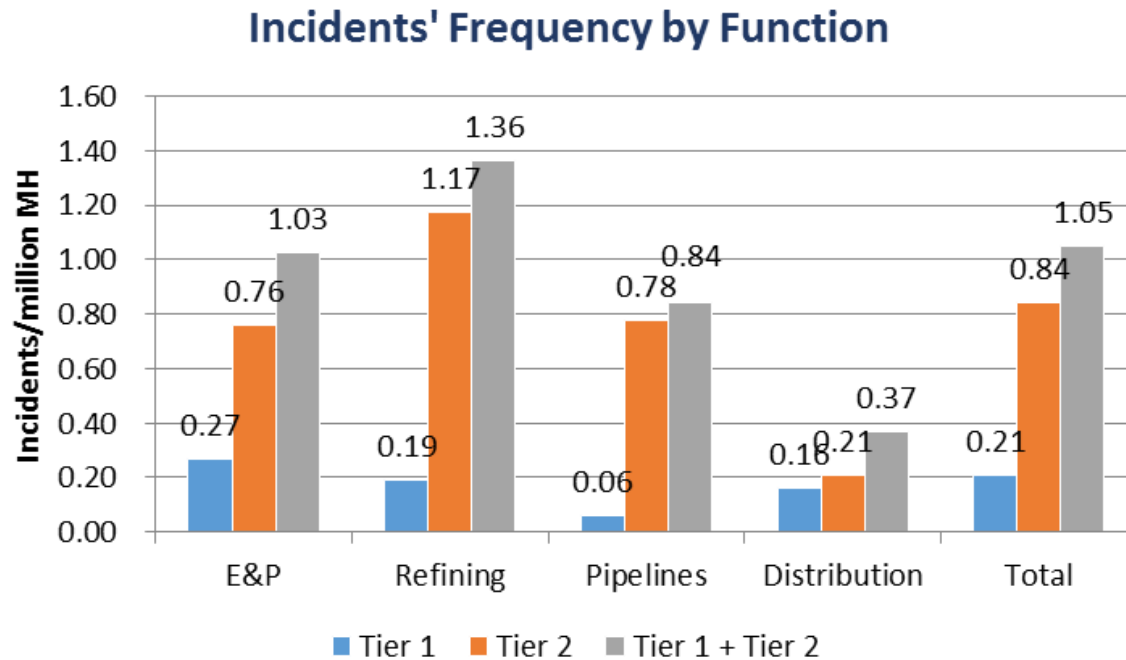
Function	Man-hours	# Tier 1	# Tier 2	Total	# Tier 1/million MH	# Tier 2/million MH	Total/million MH
E&P	138,134	37	105	142	0.27	0.76	1.03
Refining	114,450	22	134	156	0.19	1.17	1.36
Pipelines	32,143	2	25	27	0.06	0.78	0.84
Distribution	37,977	6	8	14	0.16	0.21	0.37
Total	322,703	67	272	339	0.21	0.84	1.05

Function	Man-hours	# Tier 1	# Tier 2	Total	# Tier 1/200 thous. MH	# Tier 2/200 thous. MH	Total/200mil HH
E&P	138,134	37	105	142	0.05	0.15	0.21
Refining	114,450	22	134	156	0.04	0.23	0.27
Pipelines	32,143	2	25	27	0.01	0.16	0.17
Distribution	37,977	6	8	14	0.03	0.04	0.07
Total	322,703	67	272	339	0.04	0.17	0.21

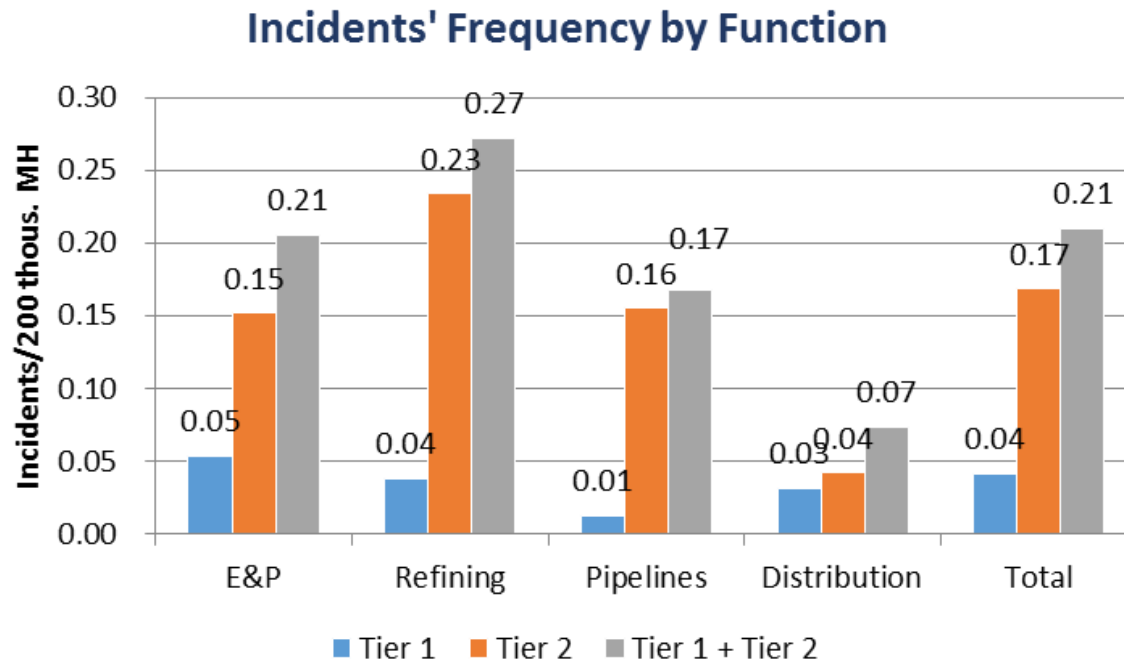
Results: # Process Safety Incidents



Results: T1 and T2 Incidents' rate (per million man-hours worked)

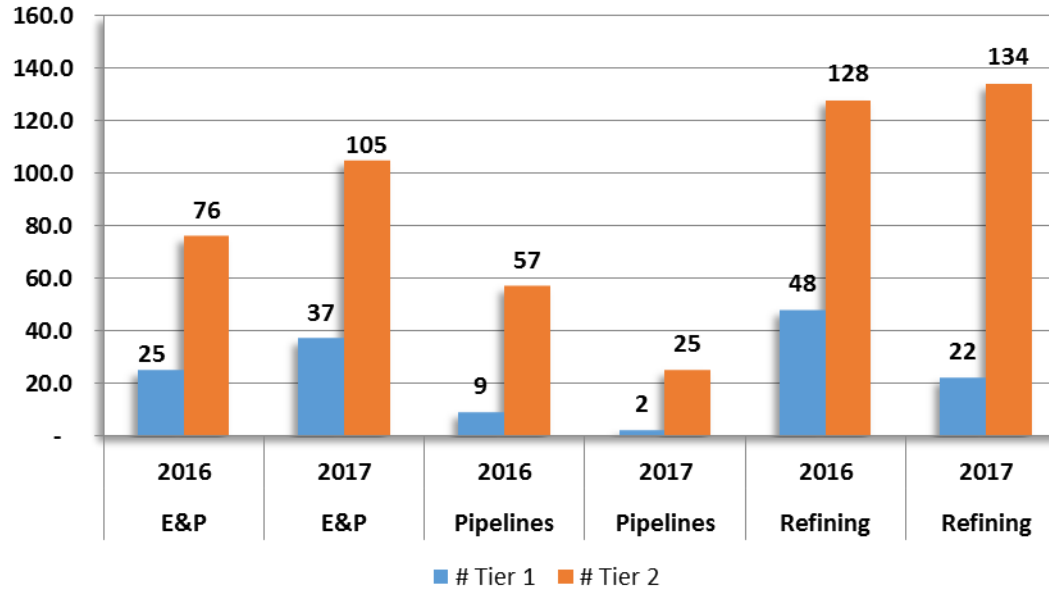


Results: T1 and T2 Incidents' rate (per 200 thousand man-hours worked)

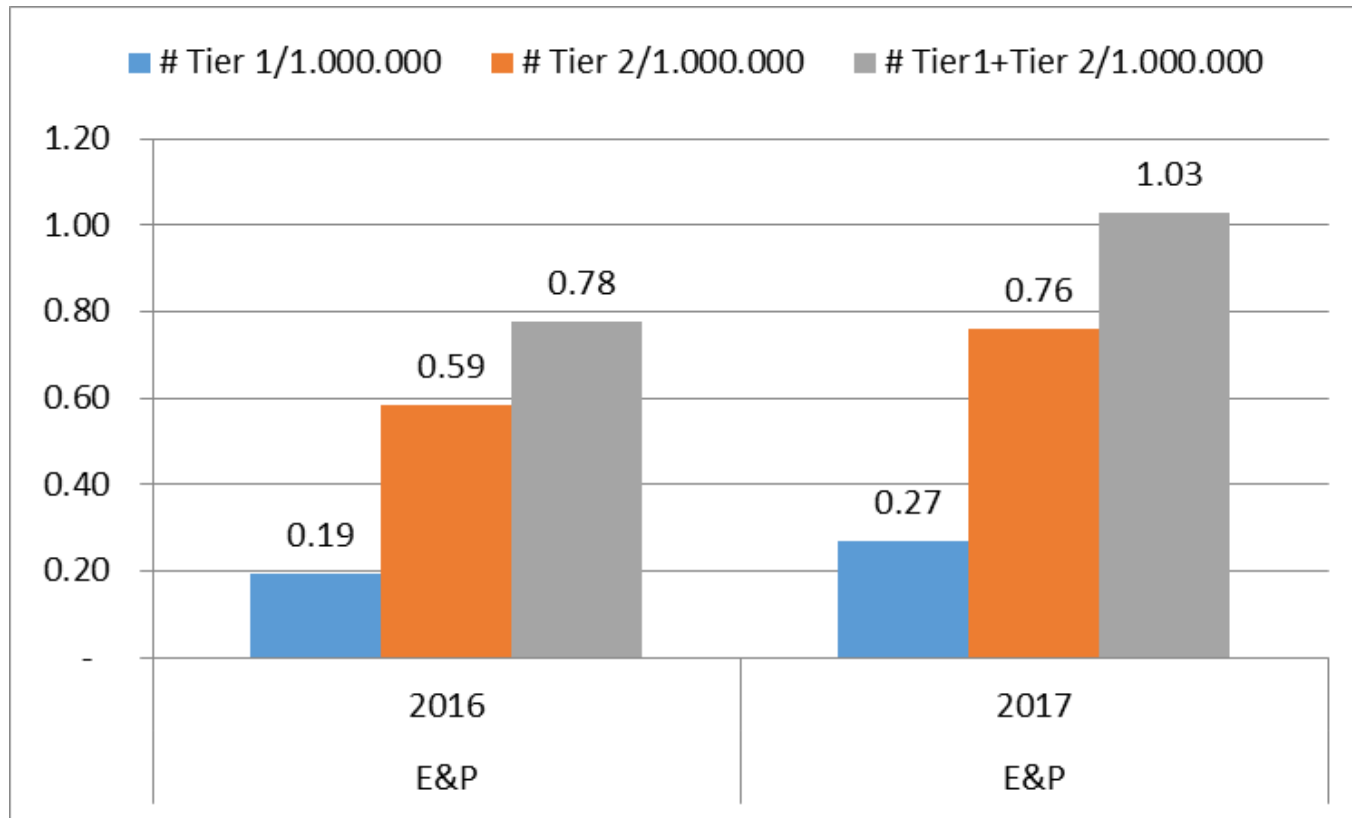


Results: 2017 vs 2016

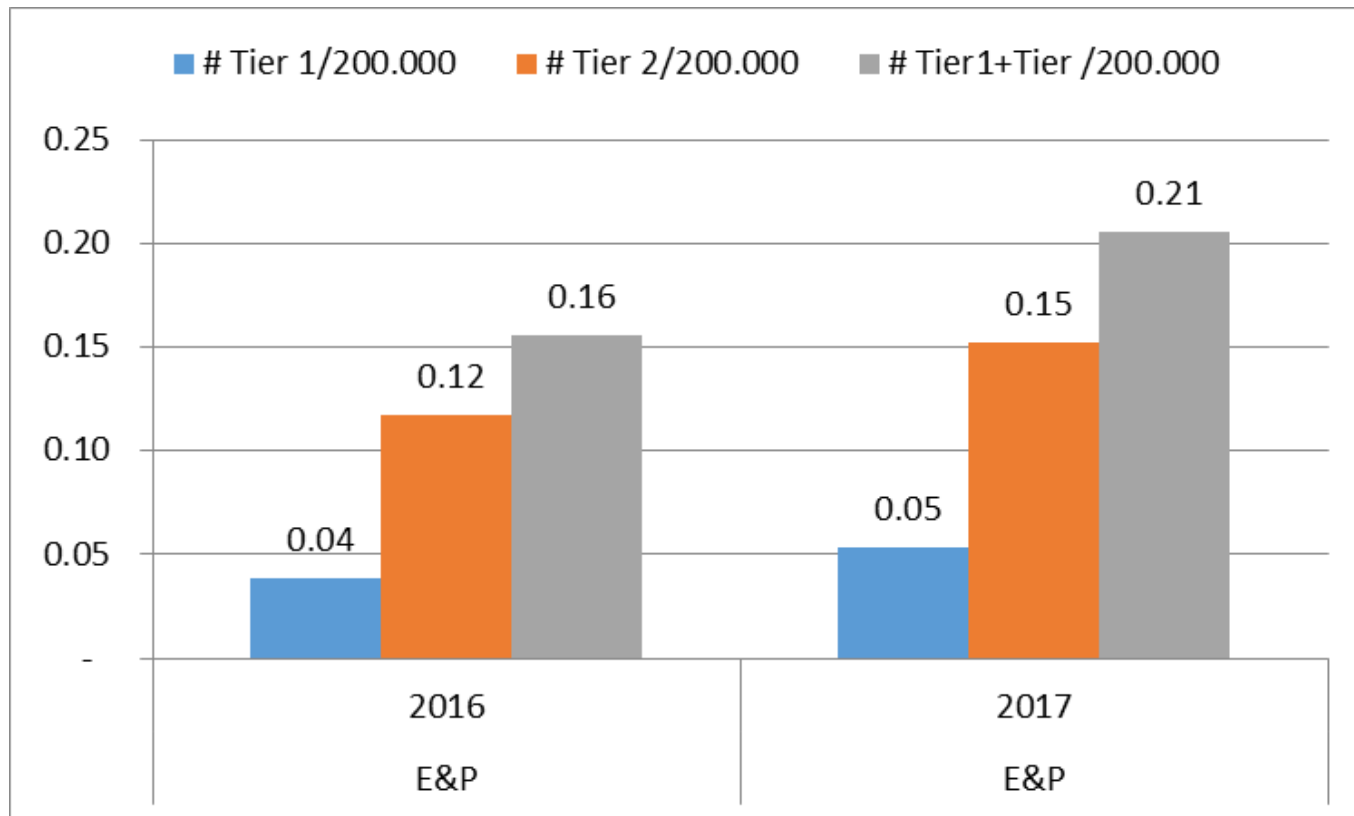
Process Safety Incidents



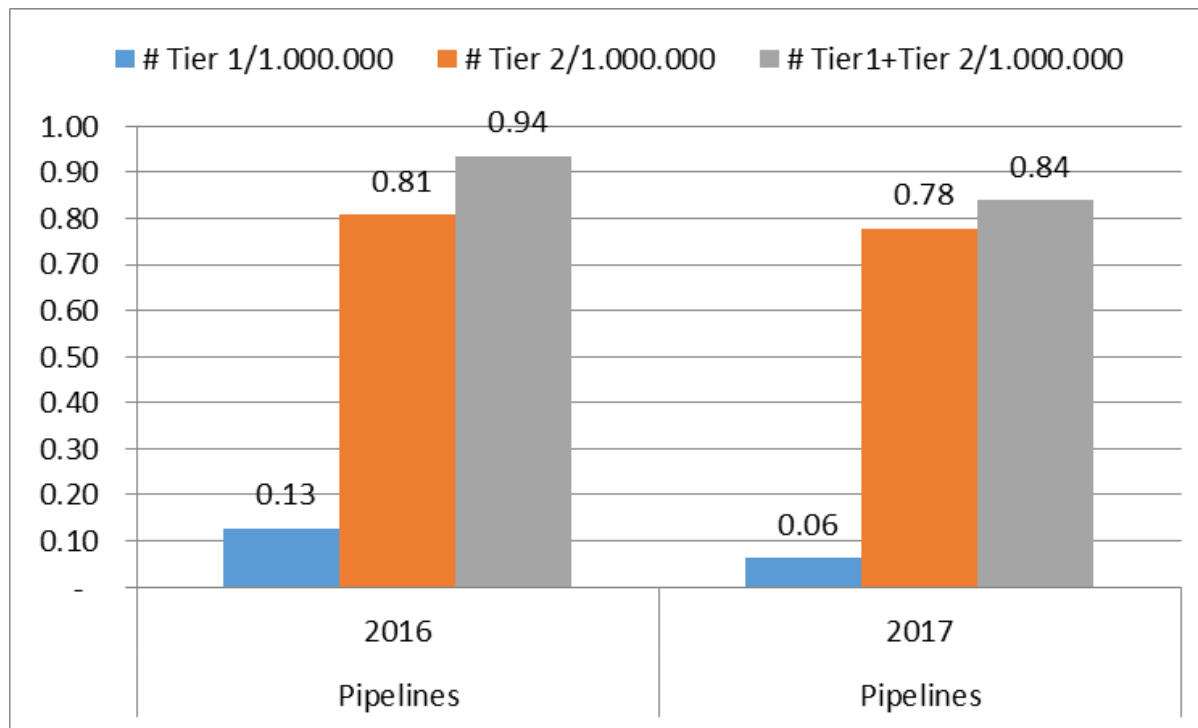
Results: 2017 vs 2016 (E&P)



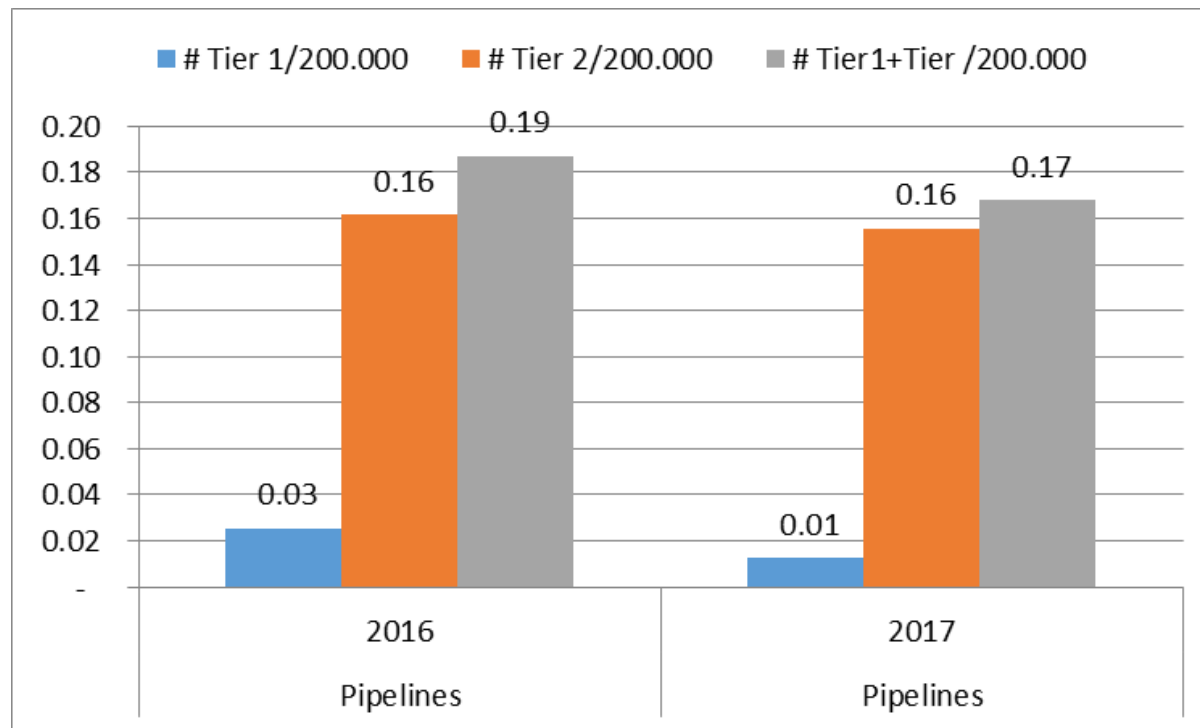
Results: 2017 vs 2016 (E&P)



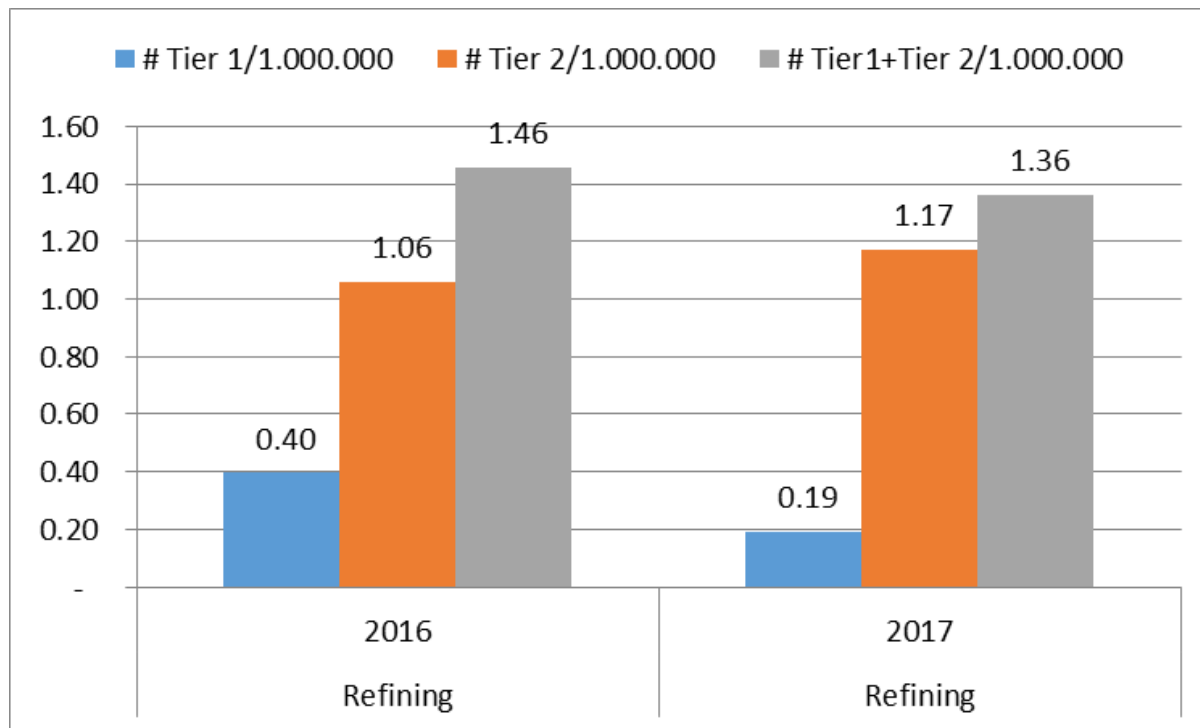
Results: 2017 vs 2016 (Pipelines)



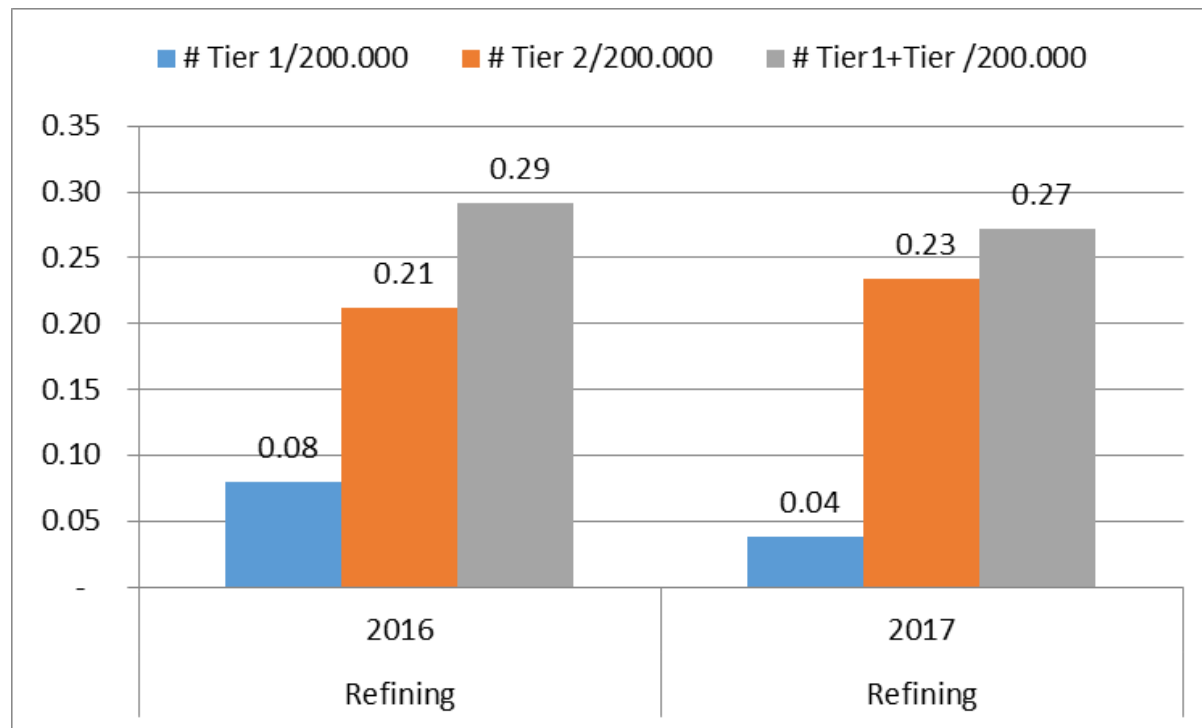
Results: 2017 vs 2016 (Pipelines)



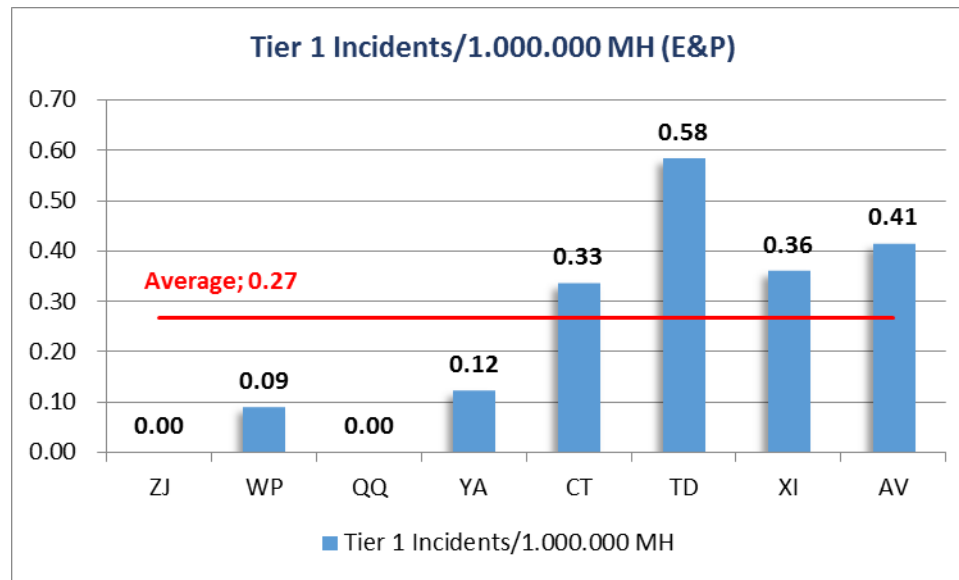
Results: 2017 vs 2016 (Refining)



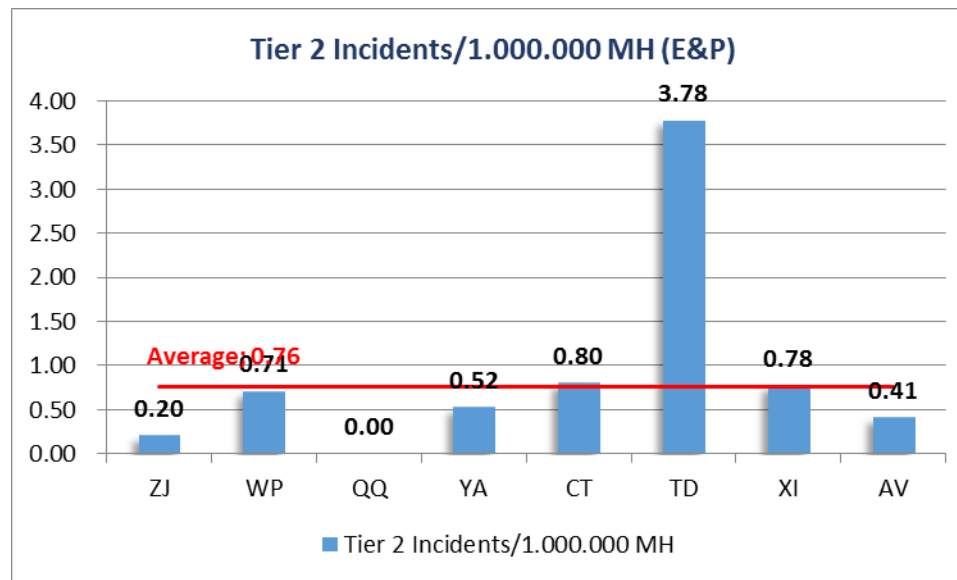
Results: 2017 vs 2016 (Refining)



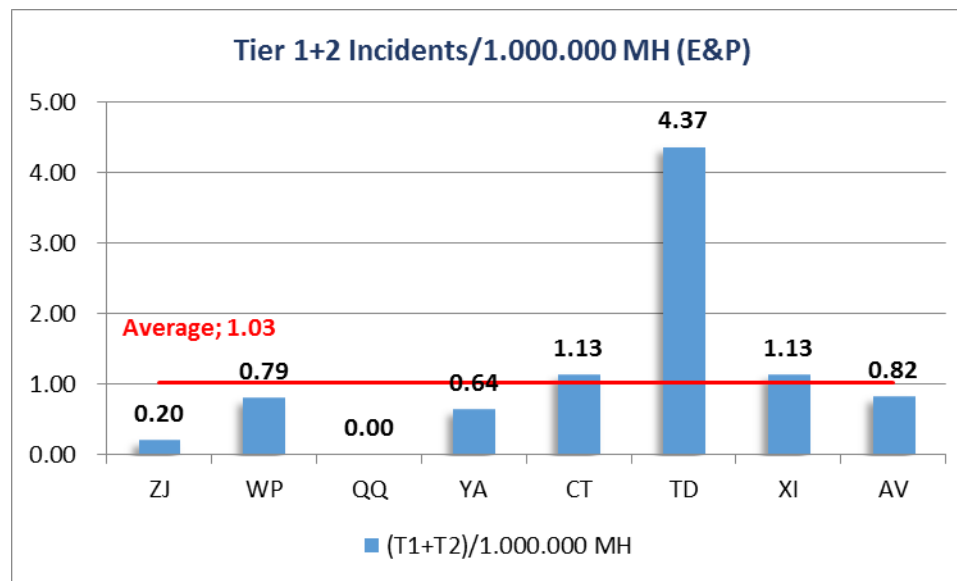
Results by company: E&P (T1 by million hours worked)



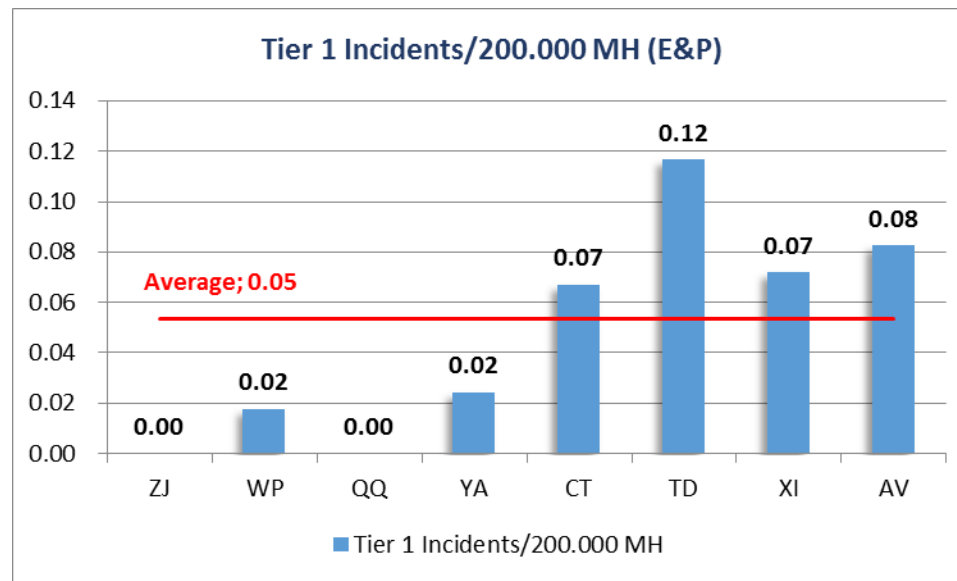
Results by company: E&P (T2 by million hours worked)



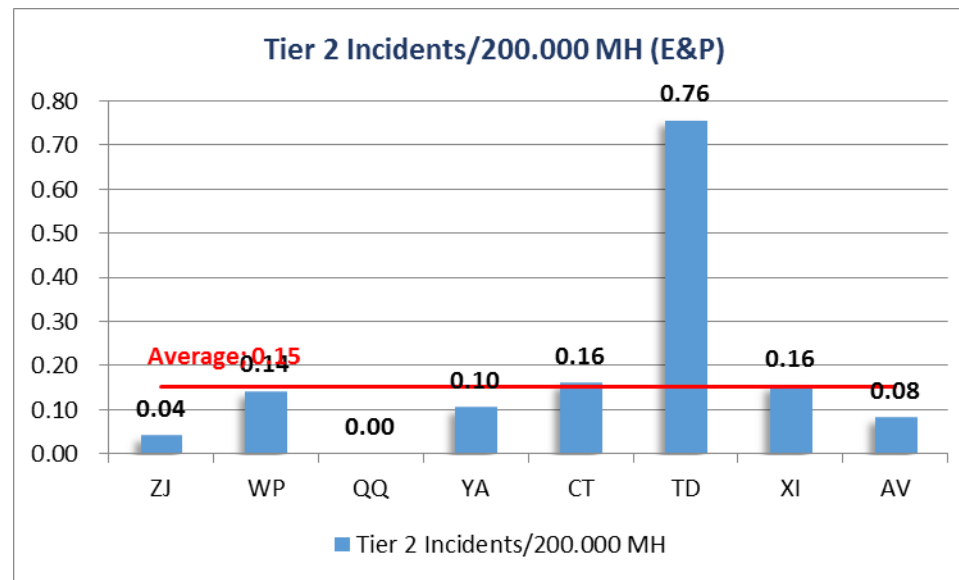
Results by company: E&P (T1+T2 by million hours worked)



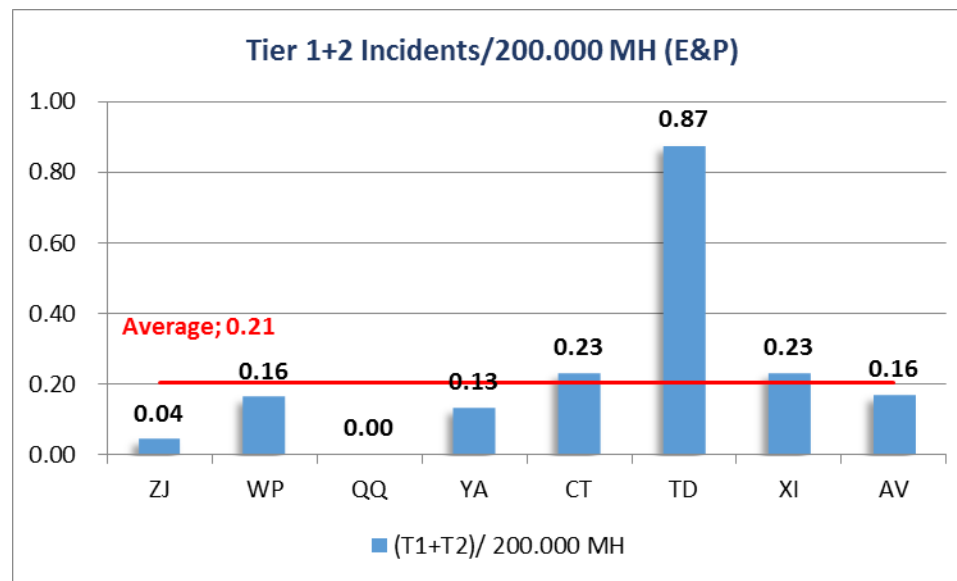
Results by company: E&P (T1 by 200 thous. hours worked)



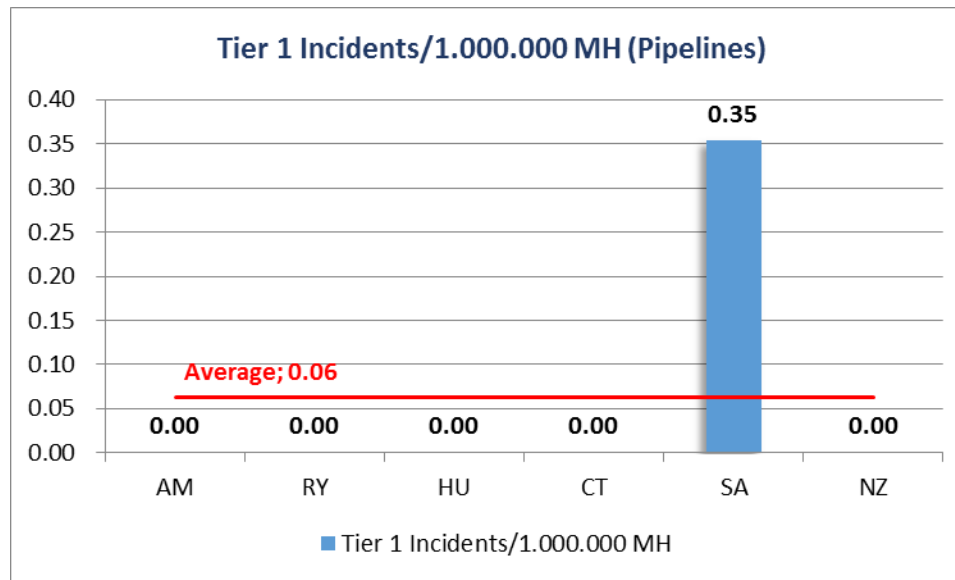
Results by company: E&P (T2 by 200 thous. hours worked)



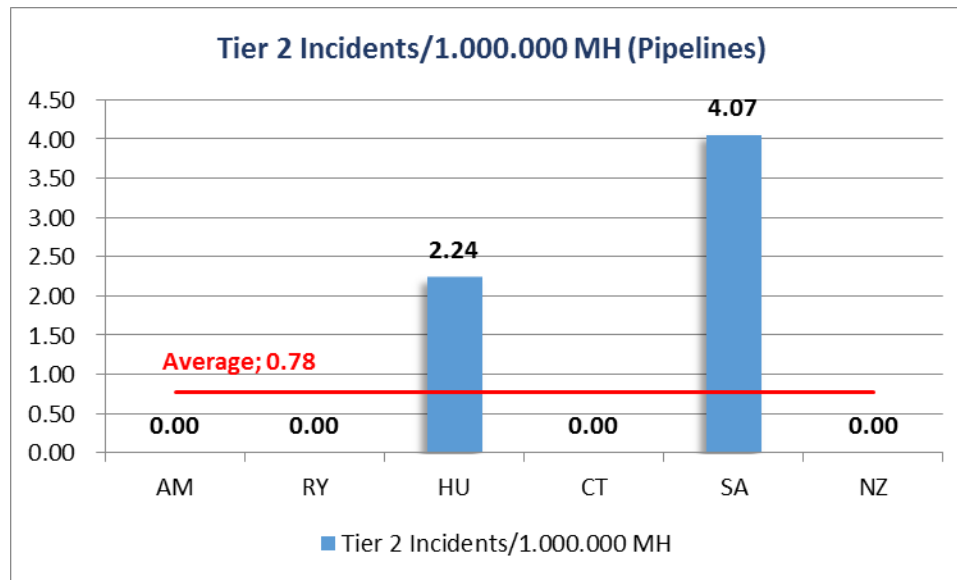
Results by company: E&P (T1+T2 by 200 thous. hours worked)



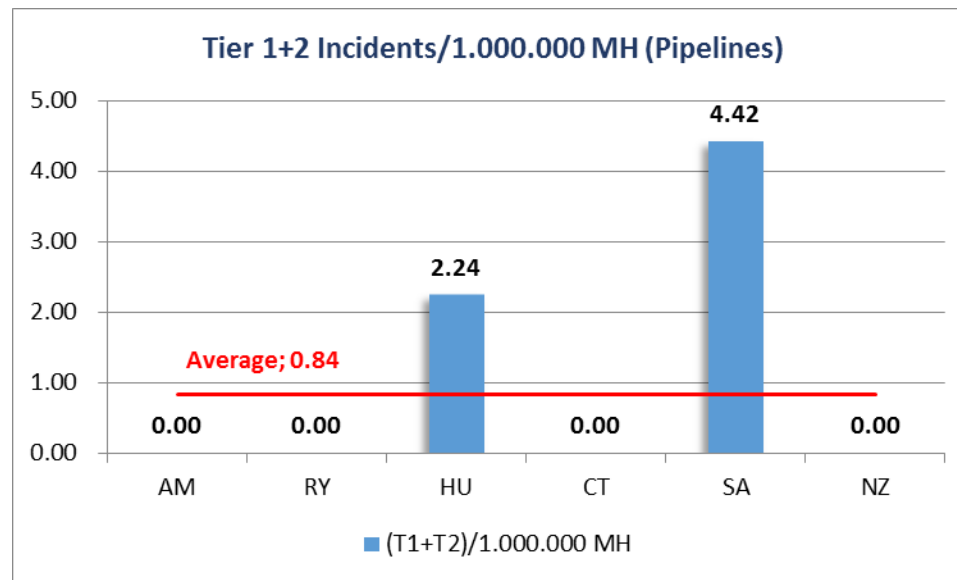
Results by company: Pipelines (T1 by million hours worked)



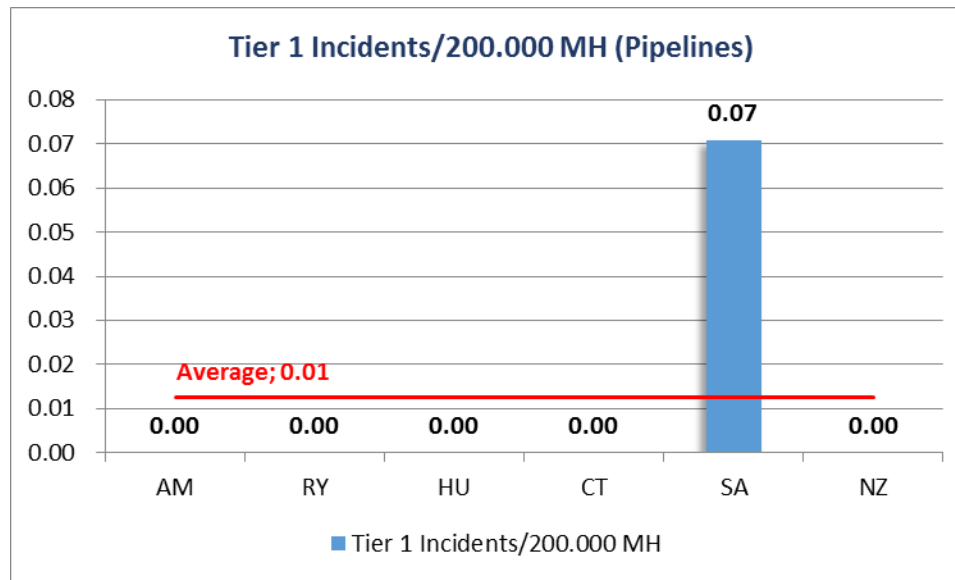
Results by company: Pipelines (T2 by million hours worked)



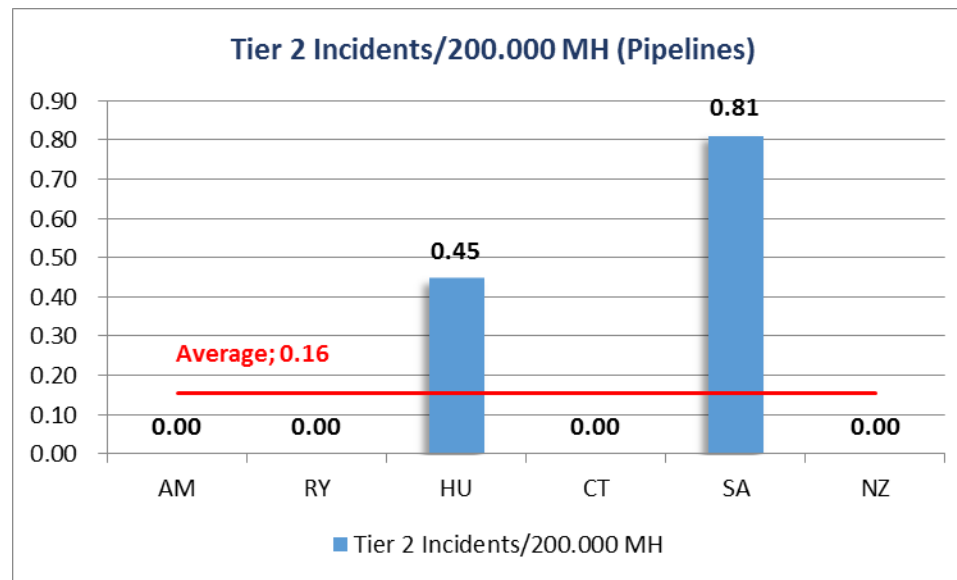
Results by company: Pipelines (T1+T2 by million hours worked)



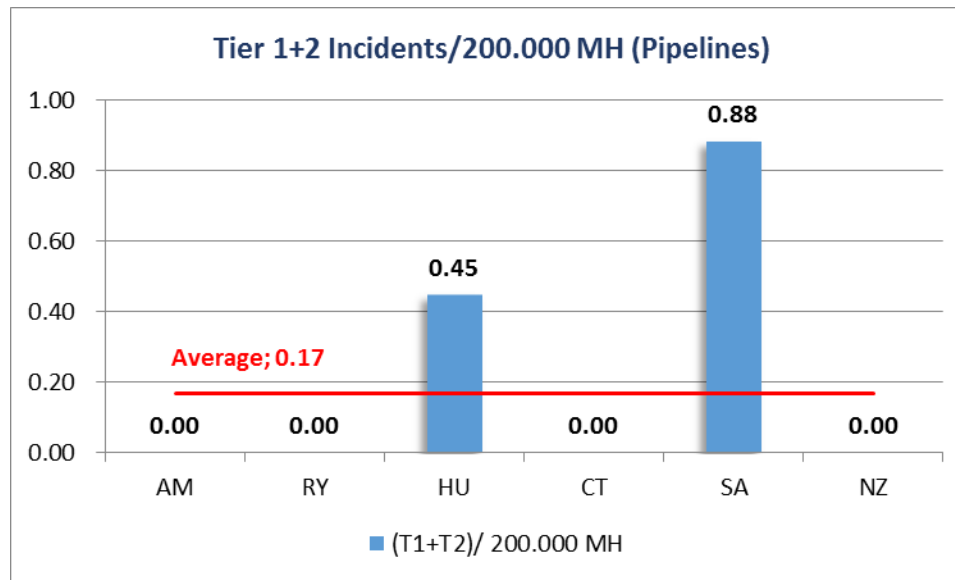
Results by company: Pipelines (T1 by 200 thous. hours worked)



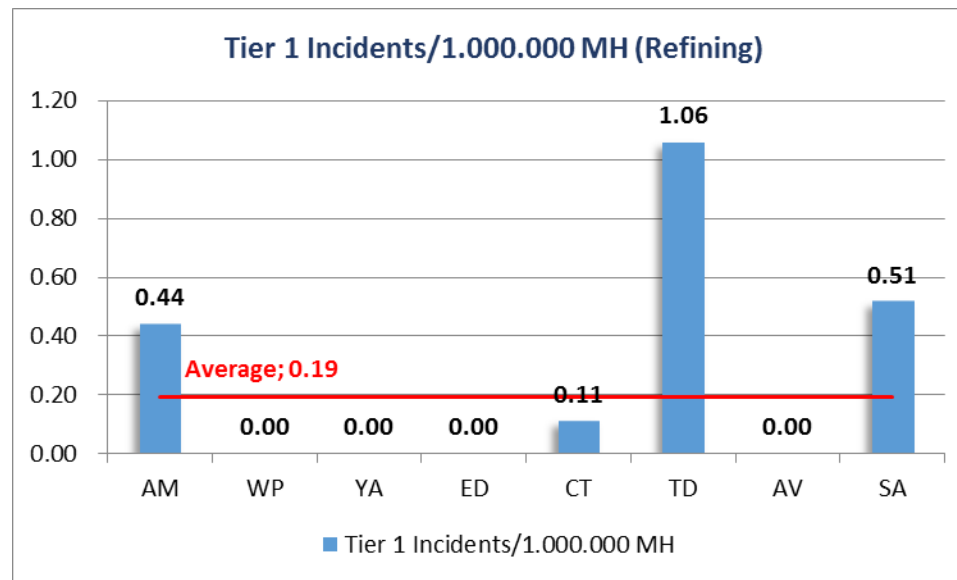
Results by company: Pipelines (T2 by 200 thous. hours worked)



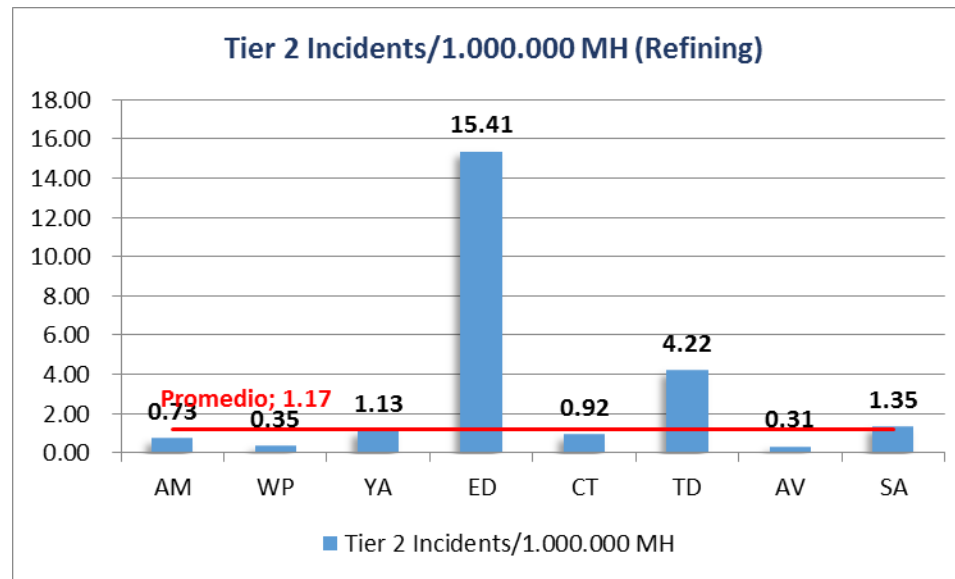
Results by company: Pipelines (T1+T2 by 200 thous. hours worked)



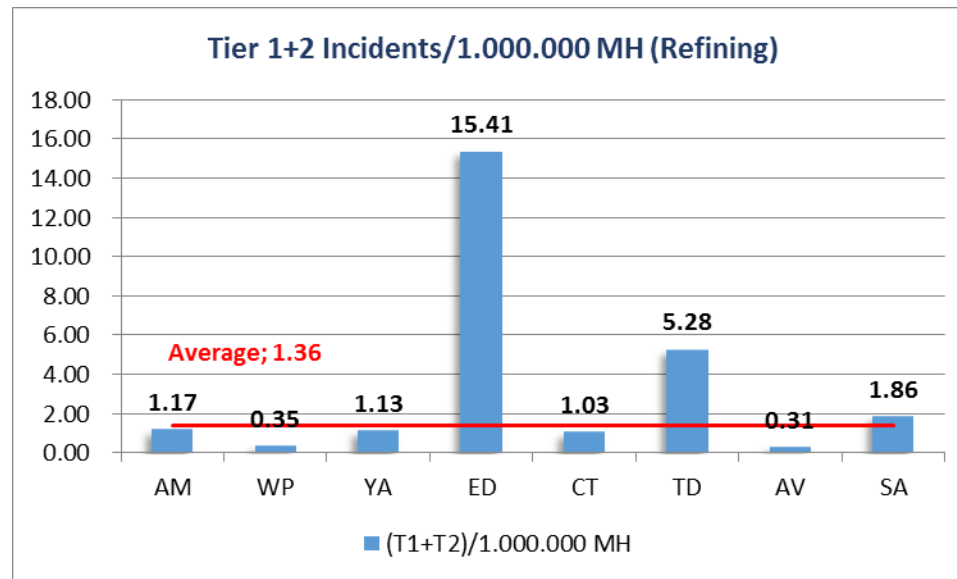
Results by company: Refining (T1 by million hours worked)



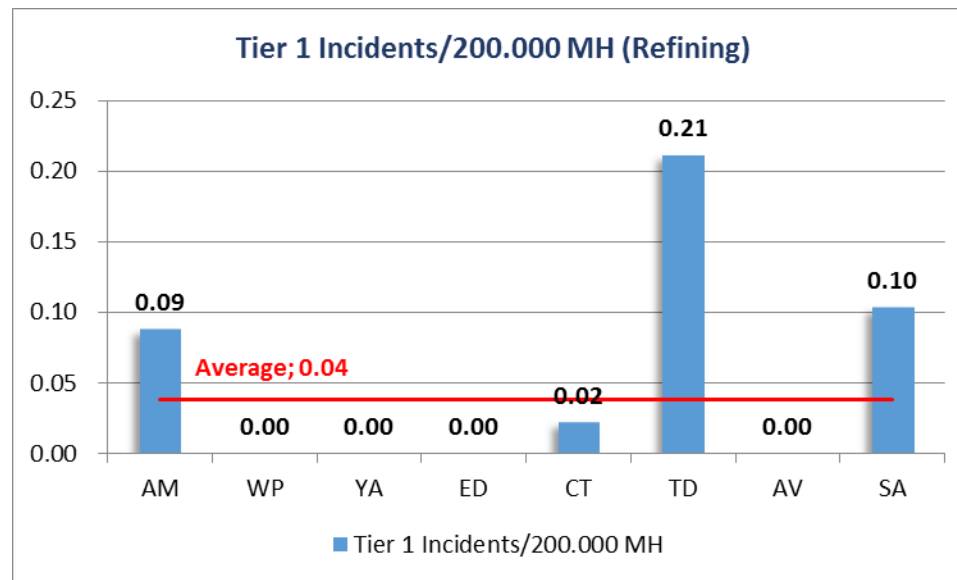
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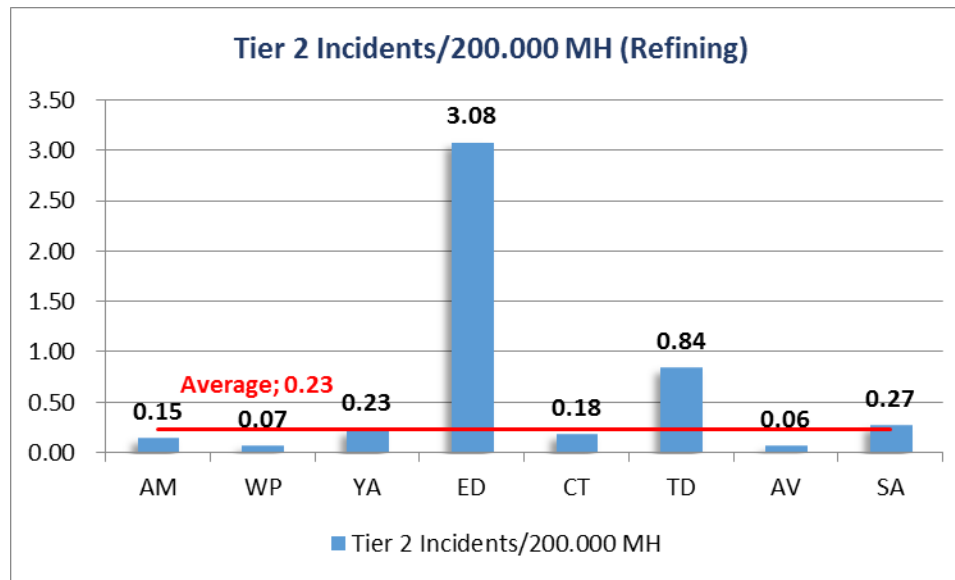
Results by company: Refining (T1+T2 by million hours worked)



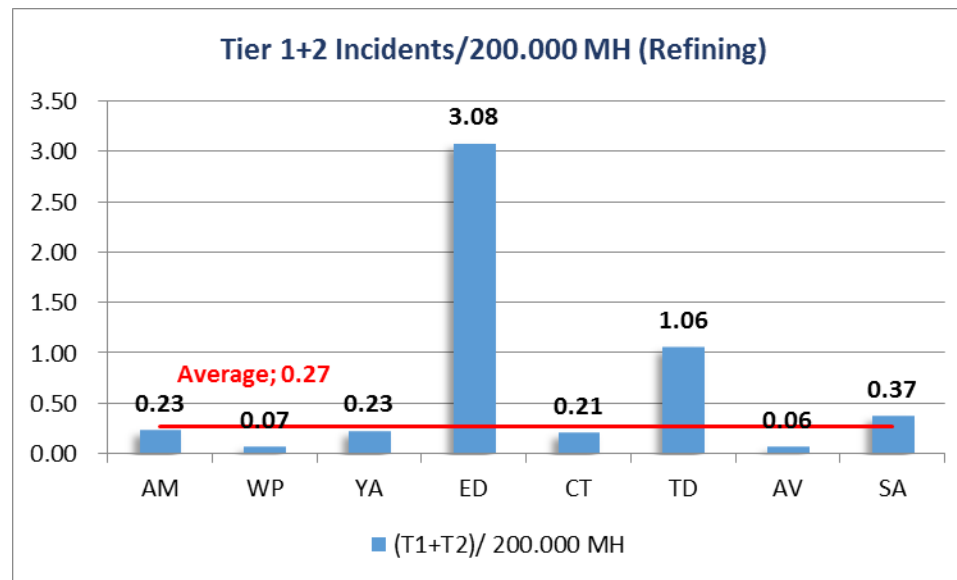
Results by company: Refining (T1 by 200 thous. hours worked)



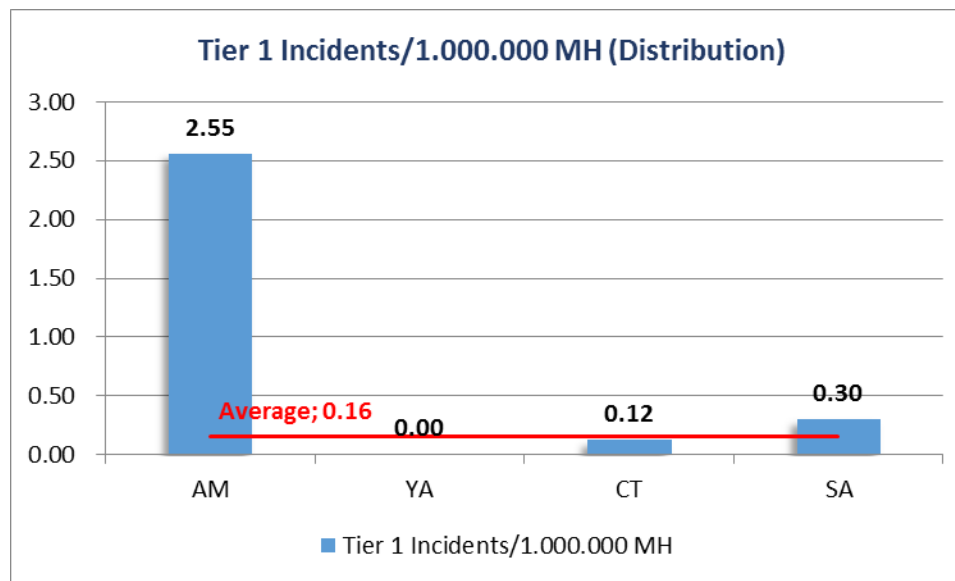
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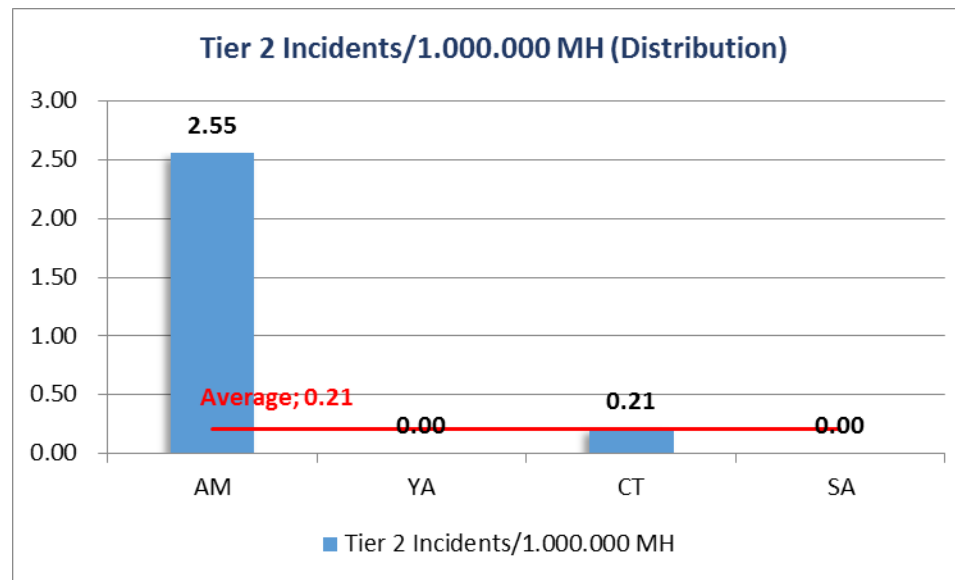
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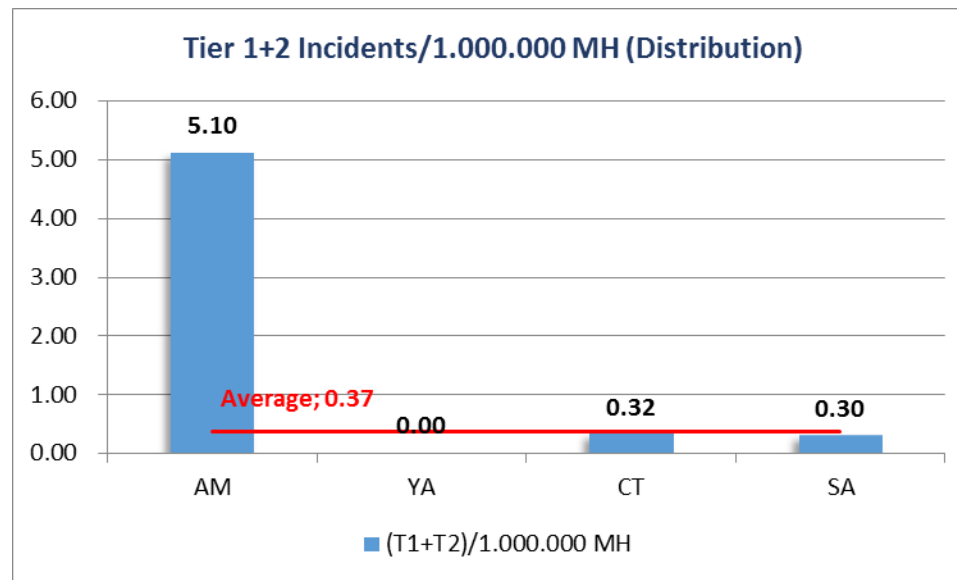
Results by company: Distribution (T1 by million hours worked)



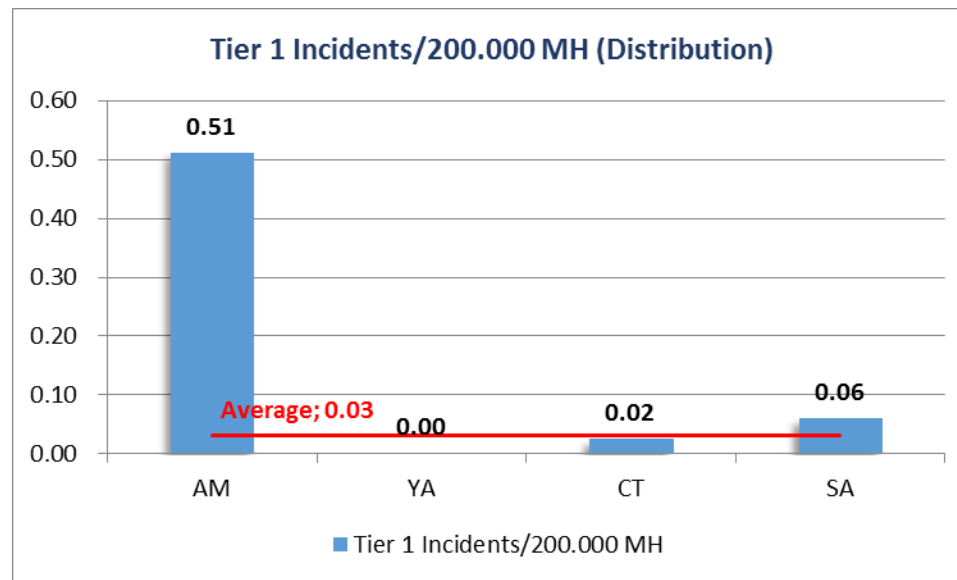
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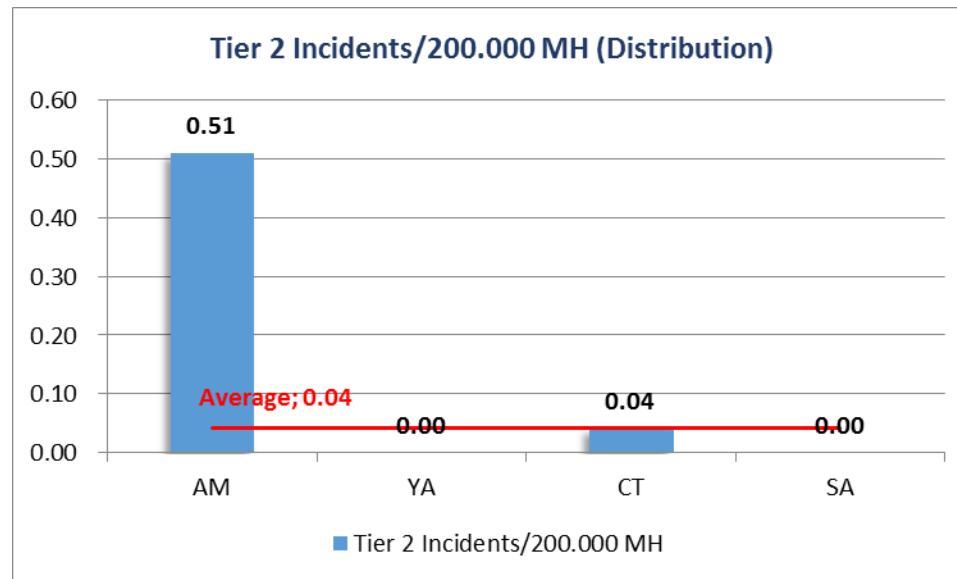
Results by company: Distribution (T1+T2 by million hours worked)



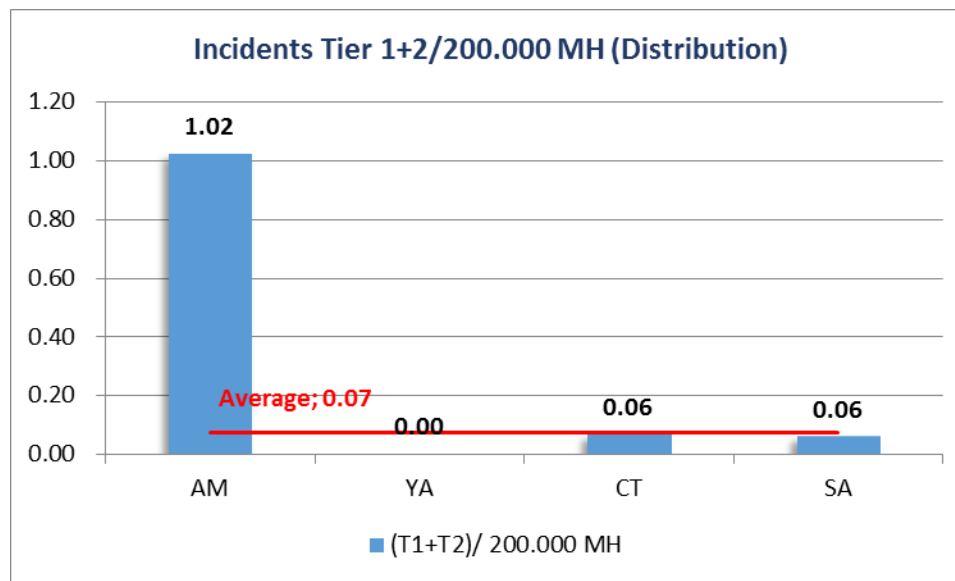
Results by company: Distribution (T1 by 200 thous. hours worked)



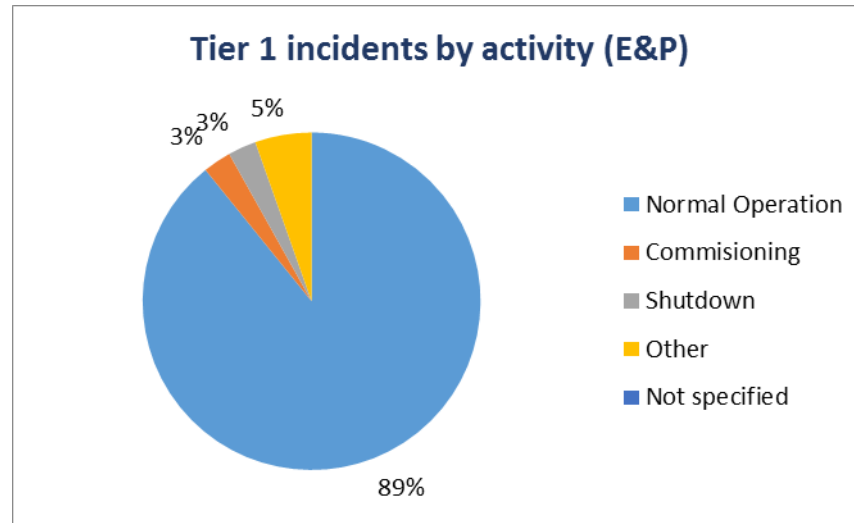
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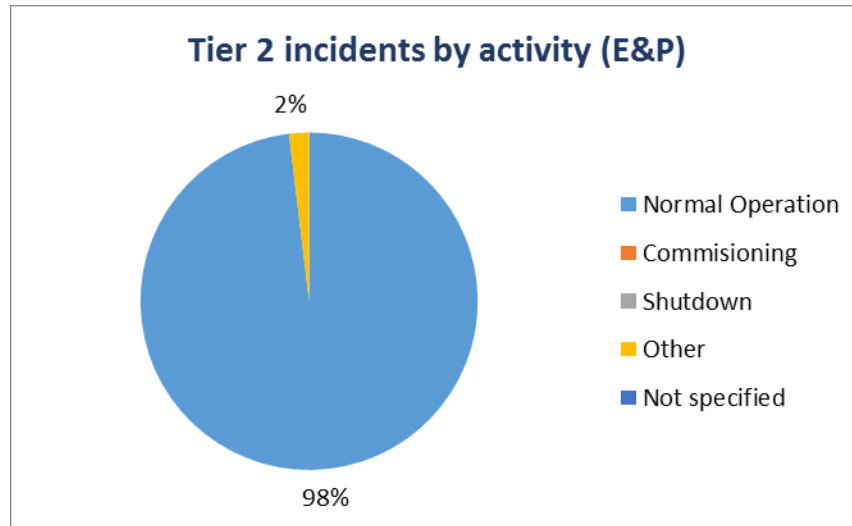
Results by company: Distribution (T1+T2 by 200 thous. hours worked)



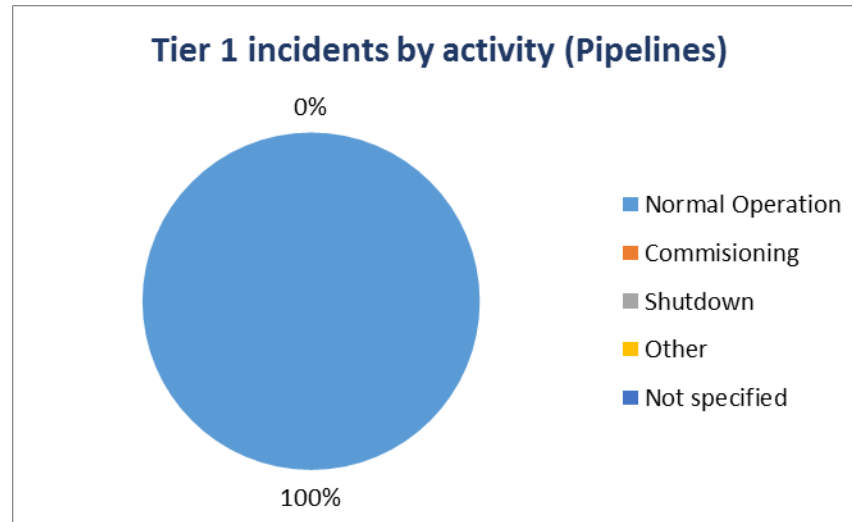
Incidents by Activity E&P T1



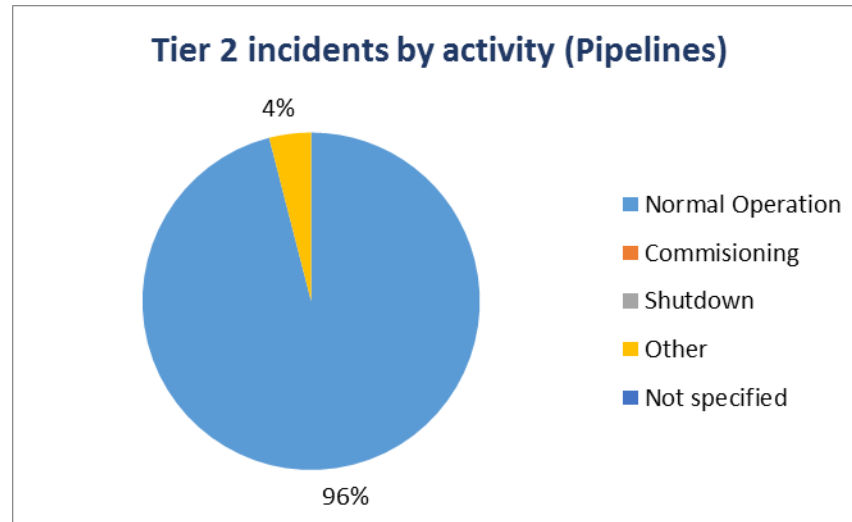
Incidents by Activity E&P T2



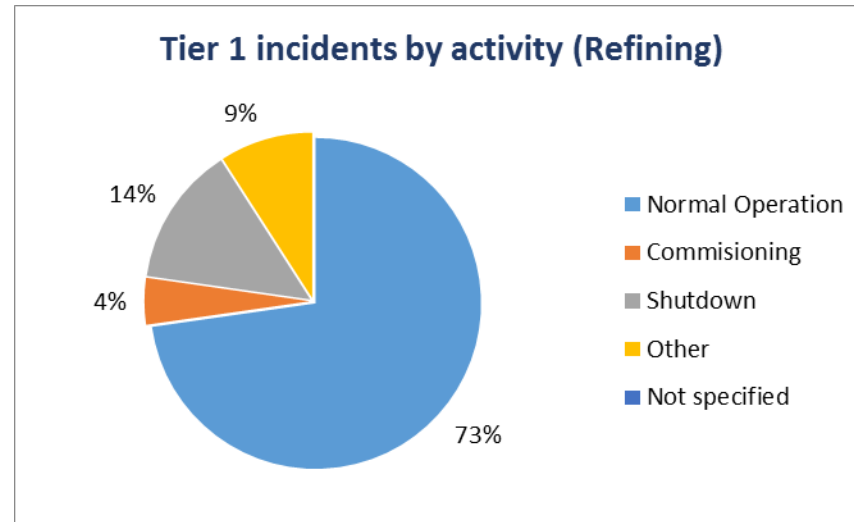
Incidents by Activity Pipelines T1



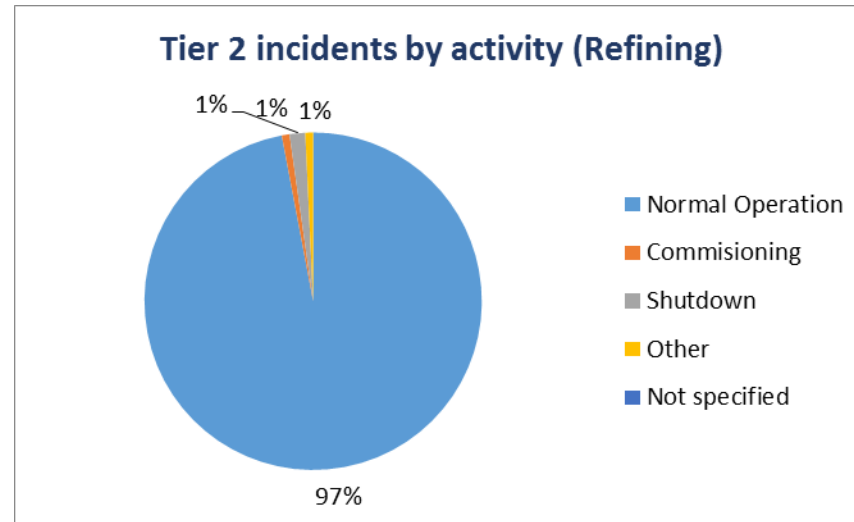
Incidents by Activity Pipelines T2



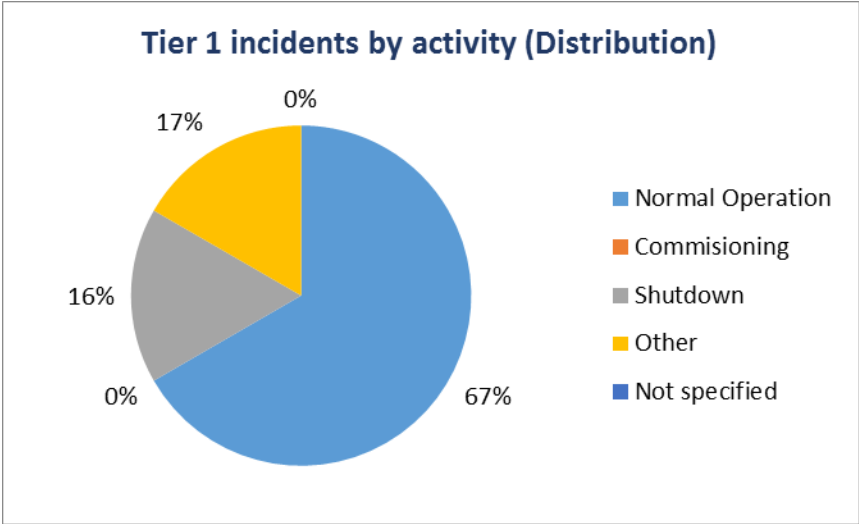
Incidents by Activity Refining T1



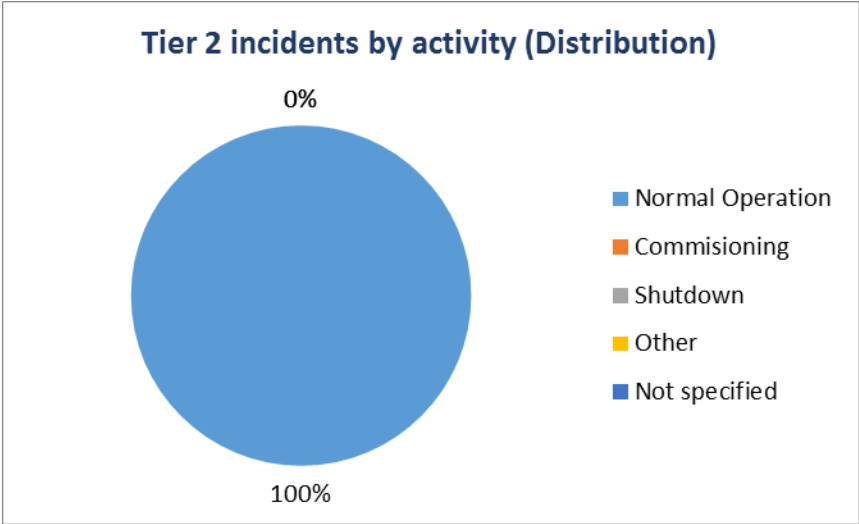
Incidents by Activity Refining T2



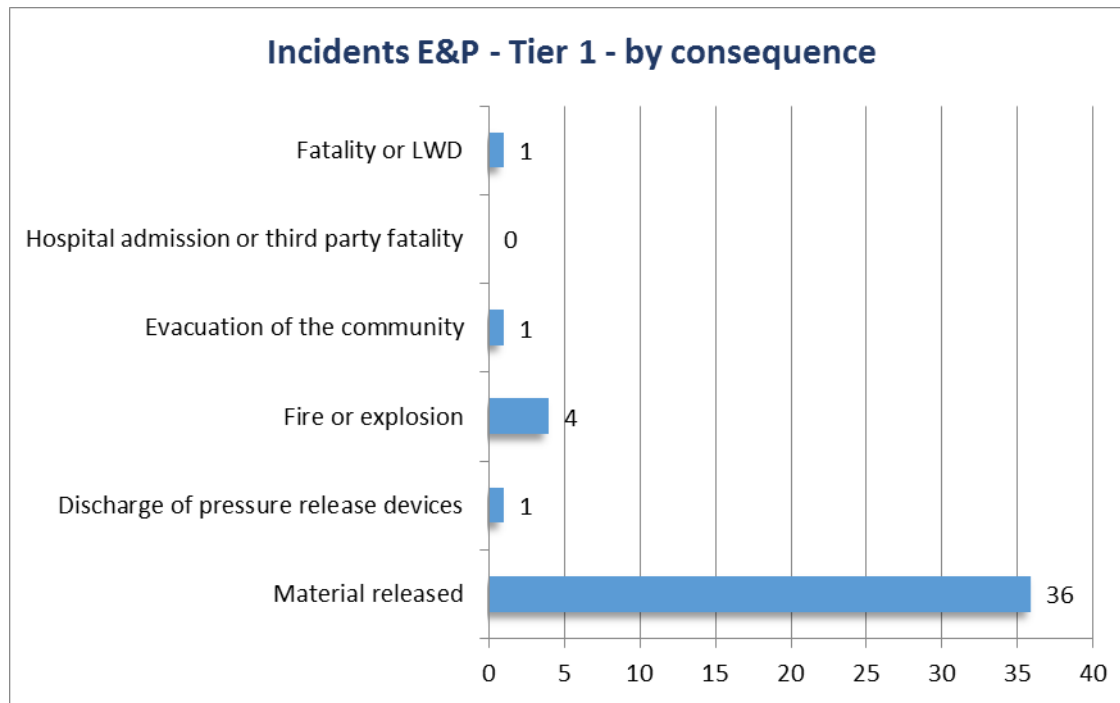
Incidents by Activity Distribution T1



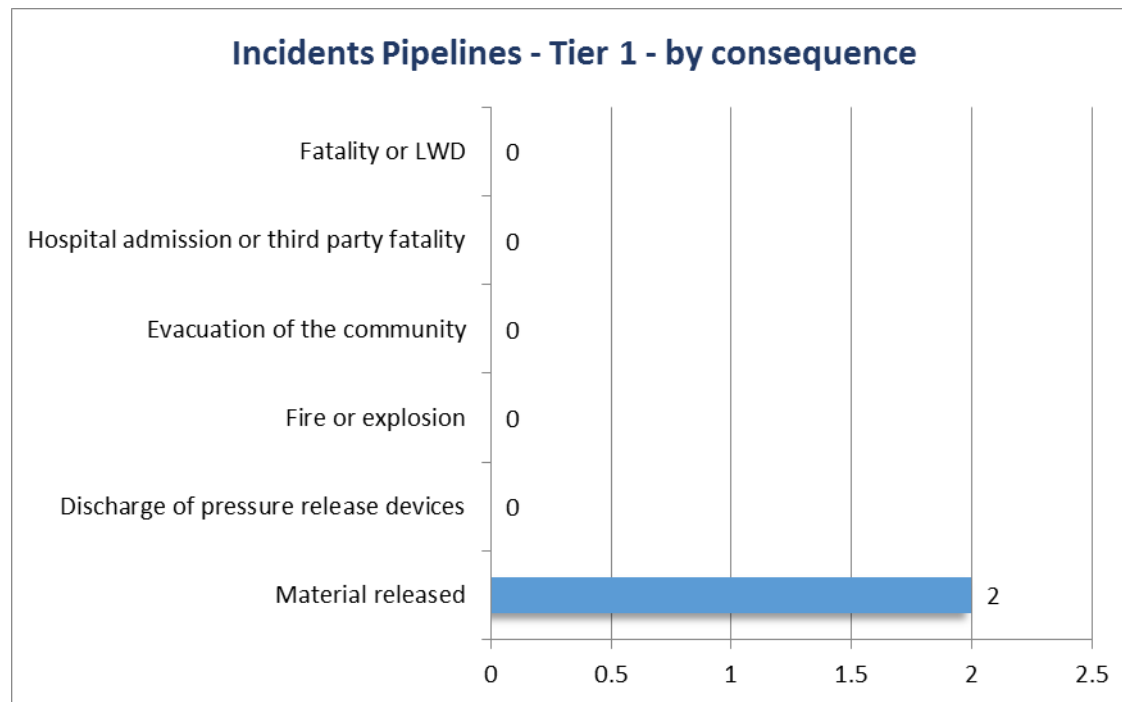
Incidents by Activity Distribution T2



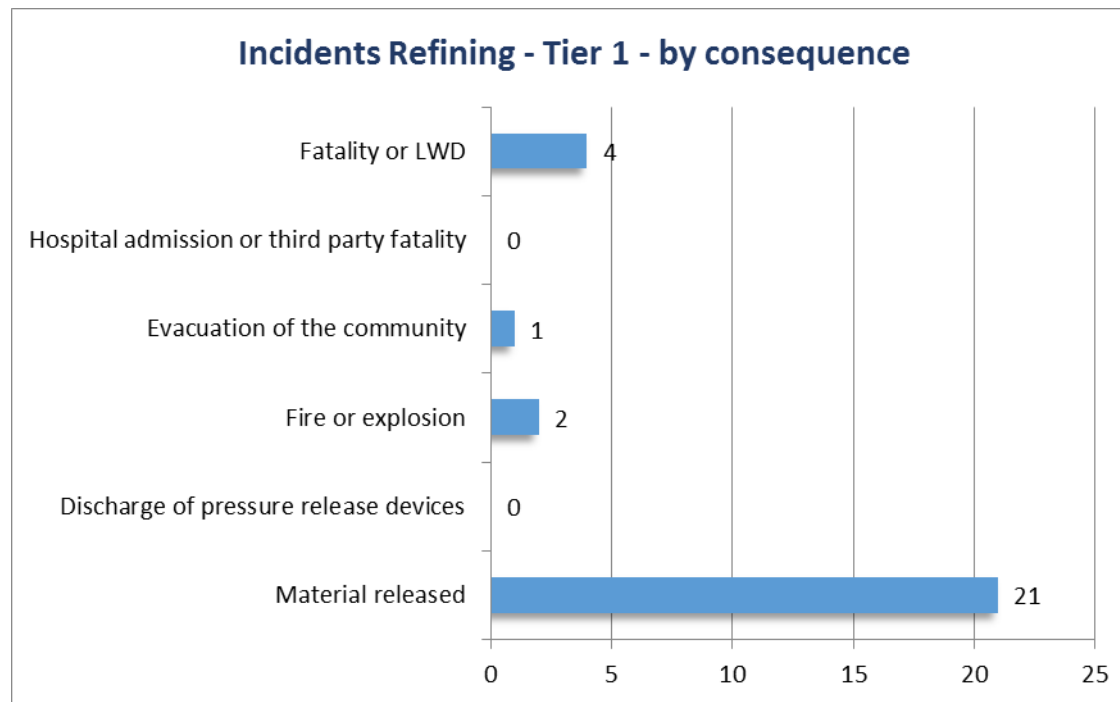
Incidents by consequence: T1 – E&P



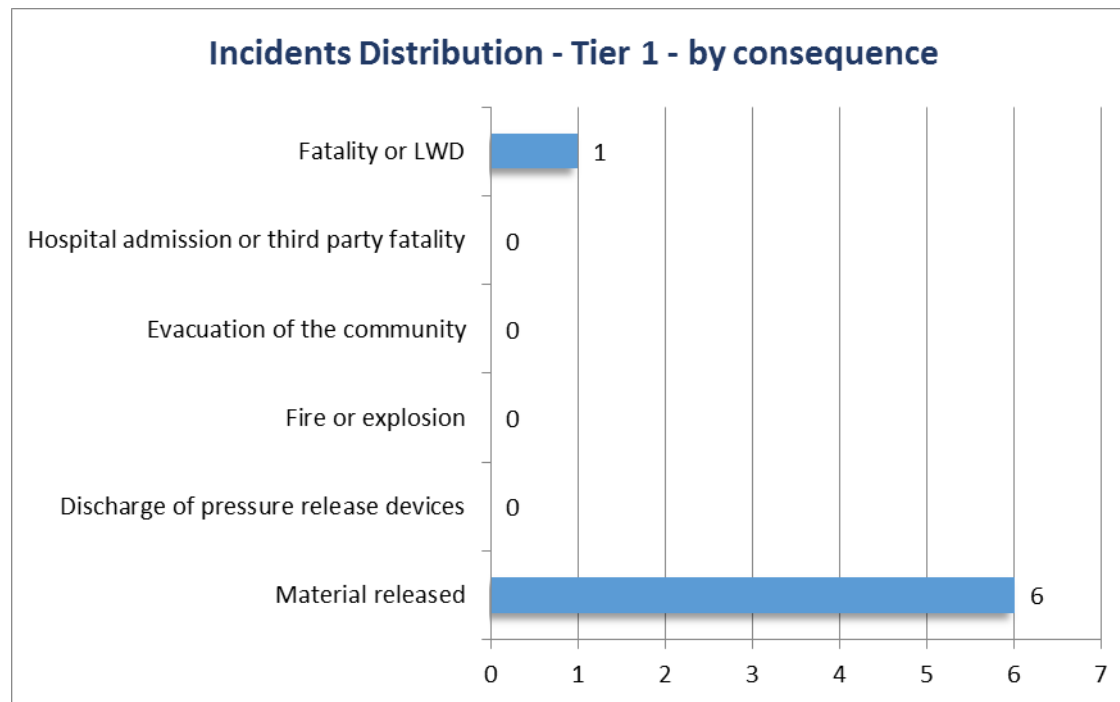
Incidents by consequence: T1 – Pipelines



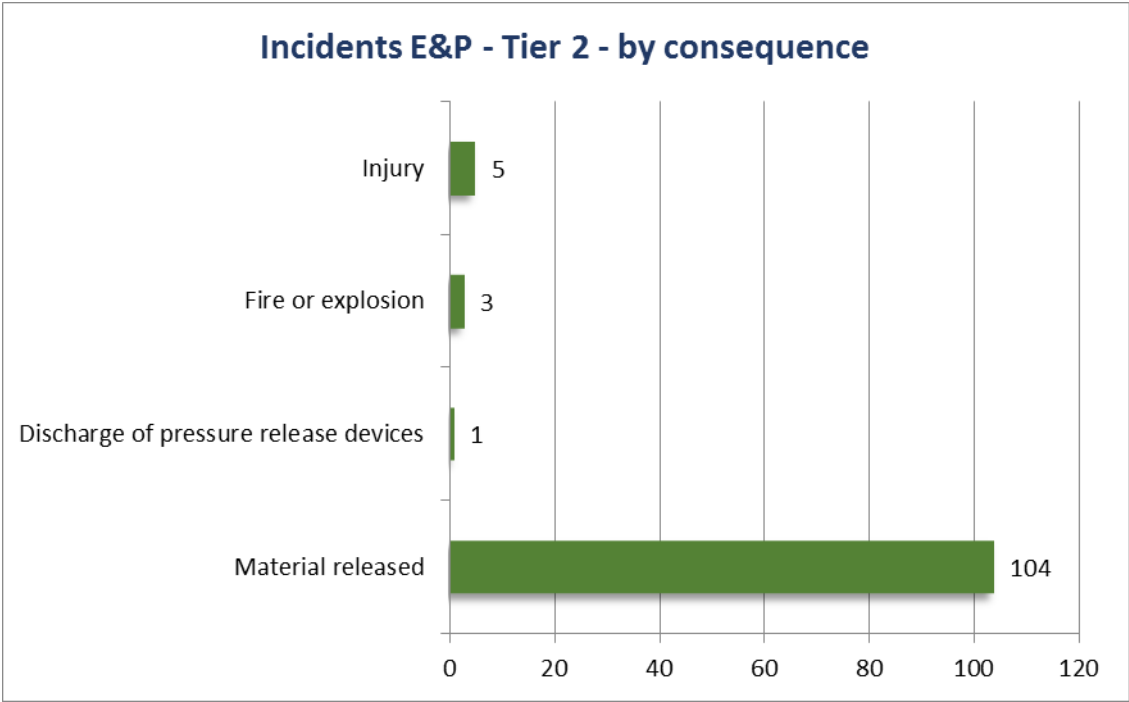
Incidents by consequence: T1 – Refining



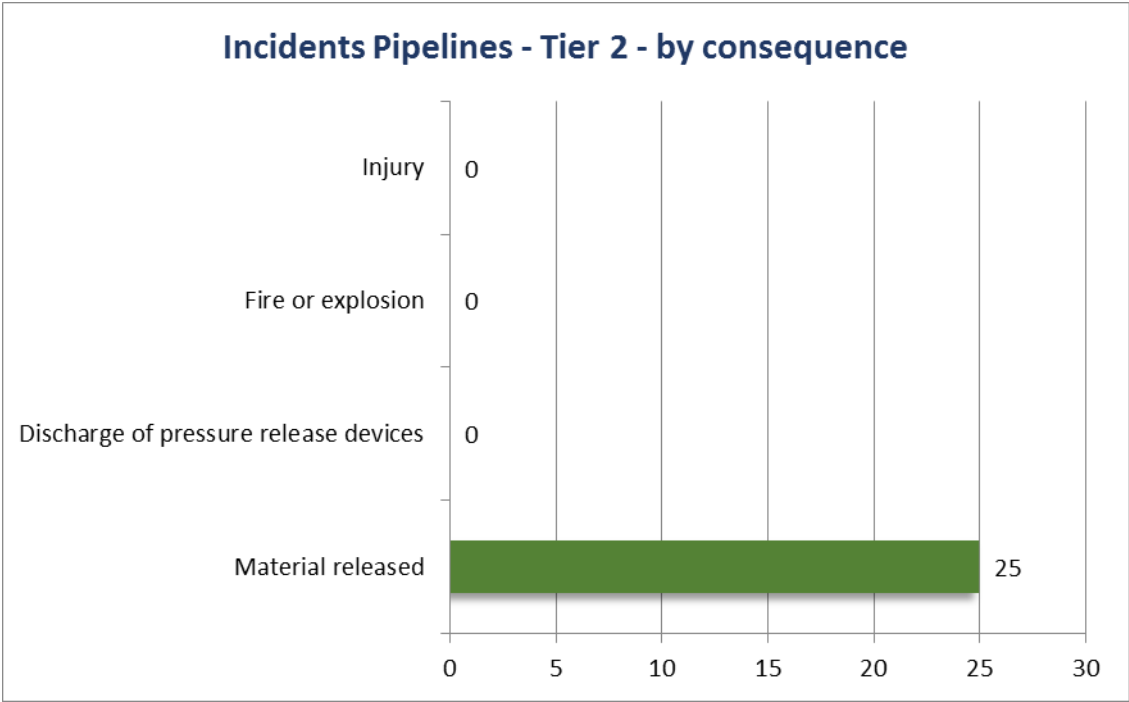
Incidents by consequence: T1 – Distribution



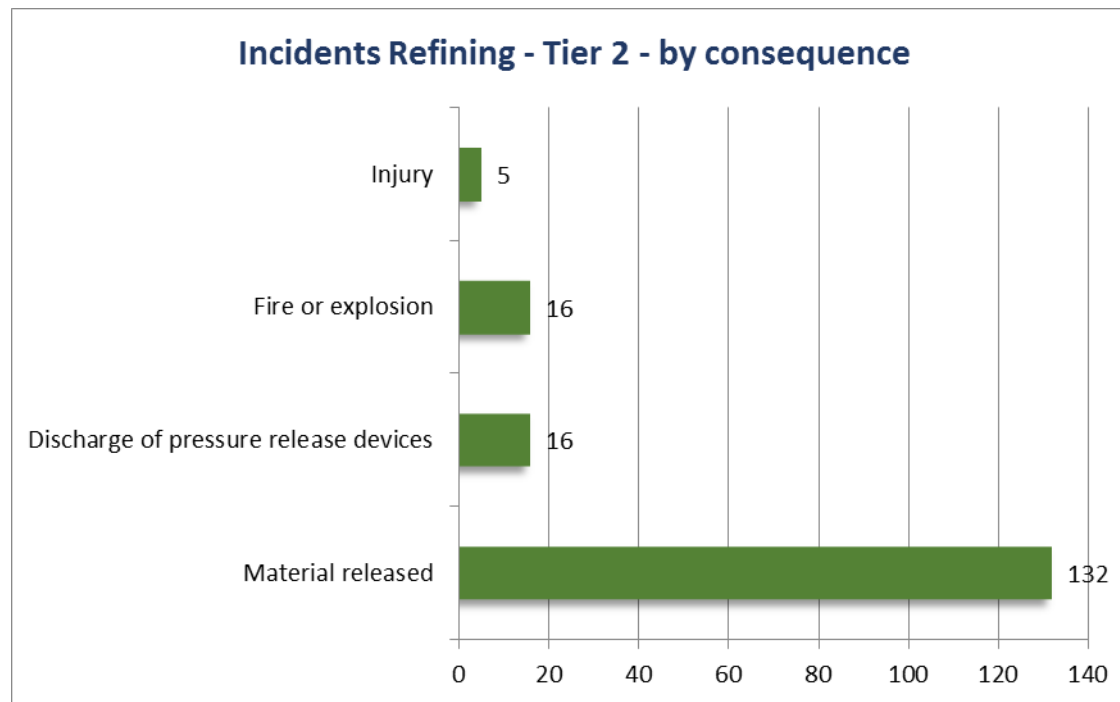
Incidents by consequence: T2 – E&P



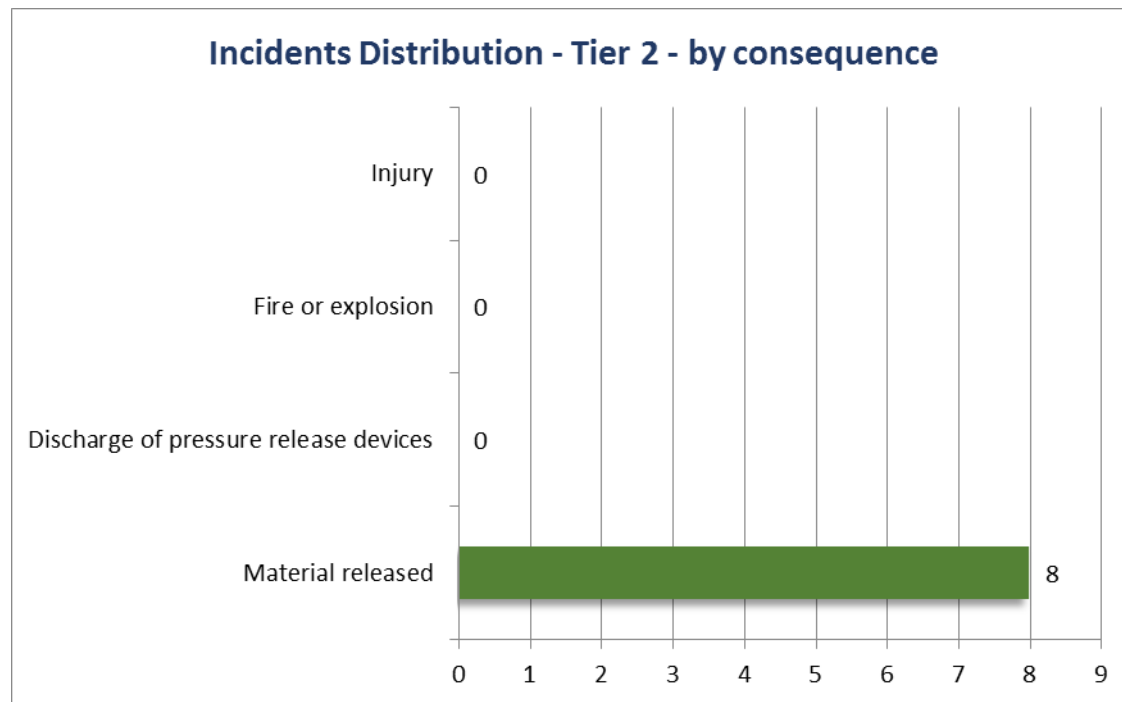
Incidents by consequence: T2 – Pipelines



Incidents by consequence: T2 – Refining

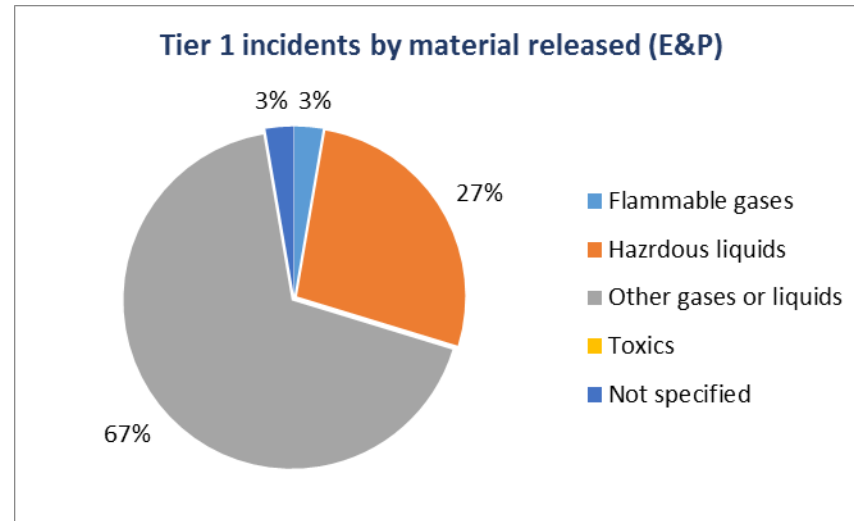


Incidents by consequence: T2 – Distribution



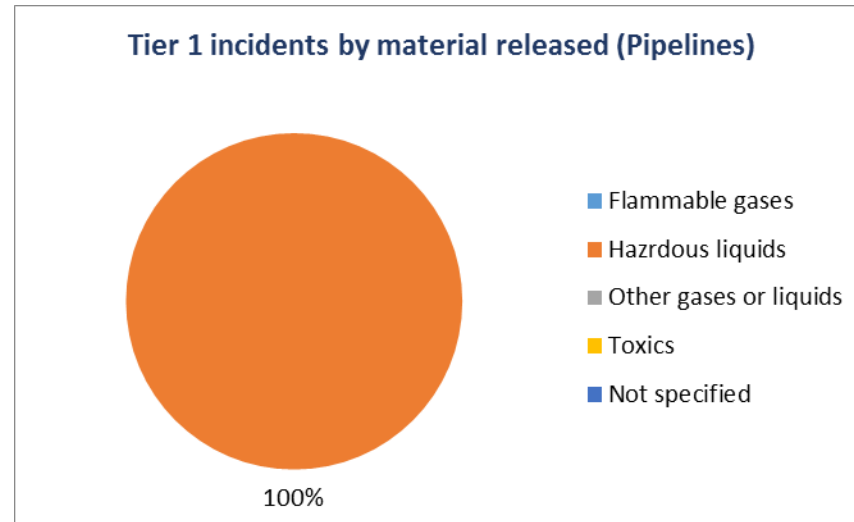
Incidents by material released

T1 – E&P



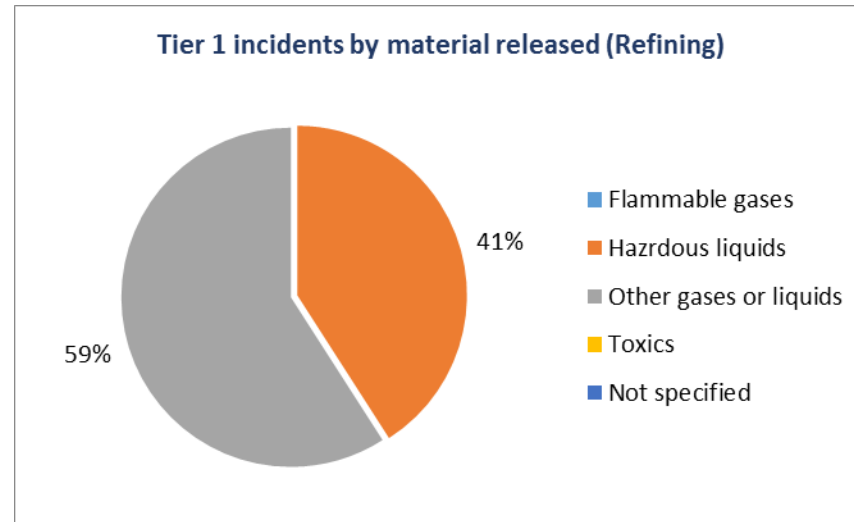
Incidents by material released

T1 – Pipelines



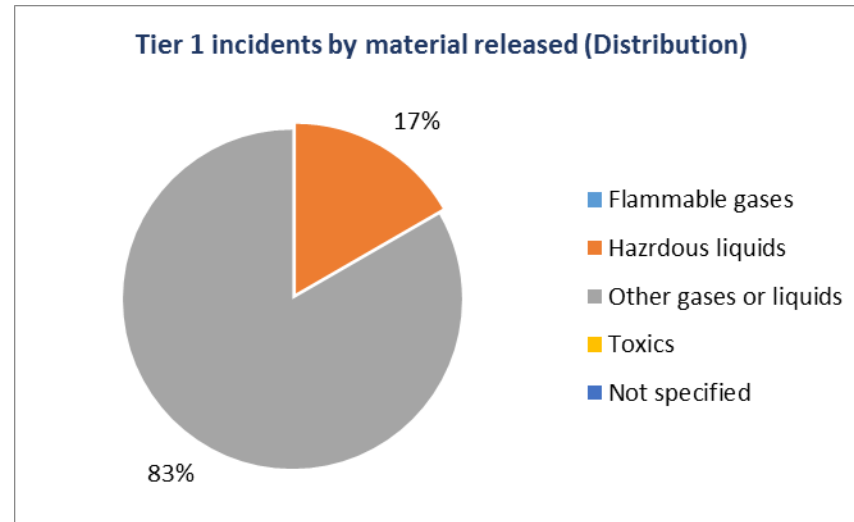
Incidents by material released

T1 – Refining



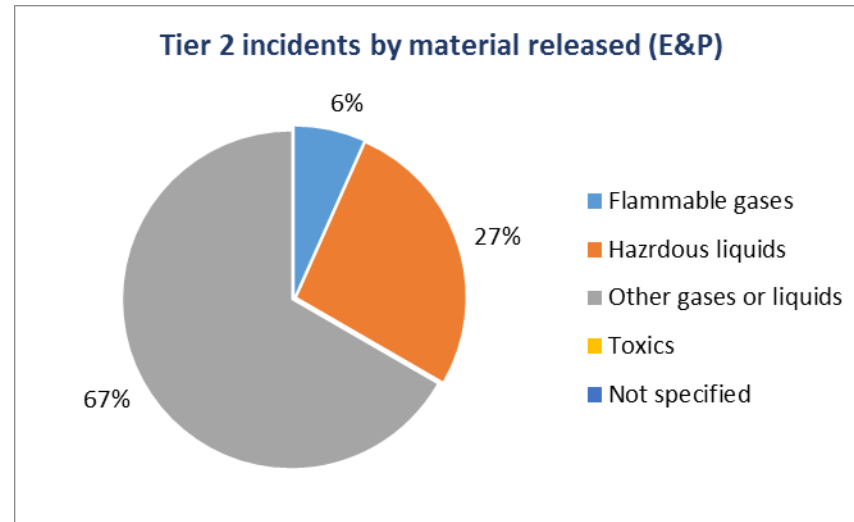
Incidents by material released

T1 – Distribution



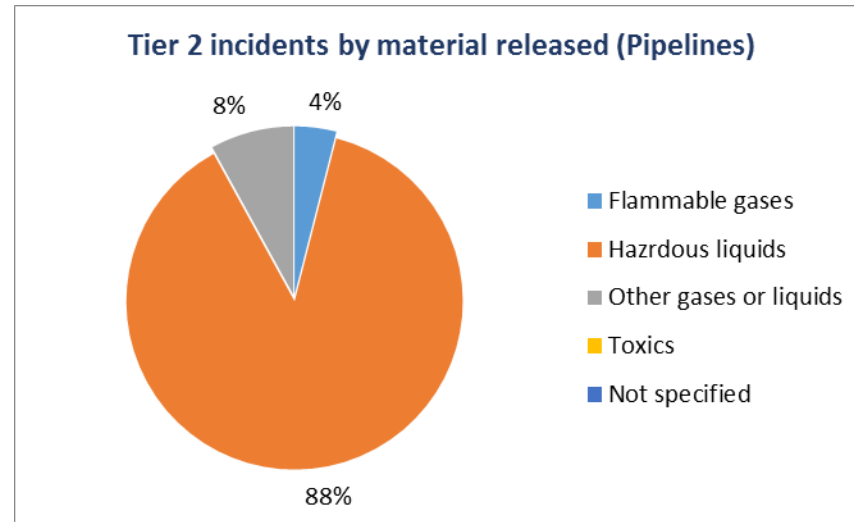
Incidents by material released

T2 – E&P



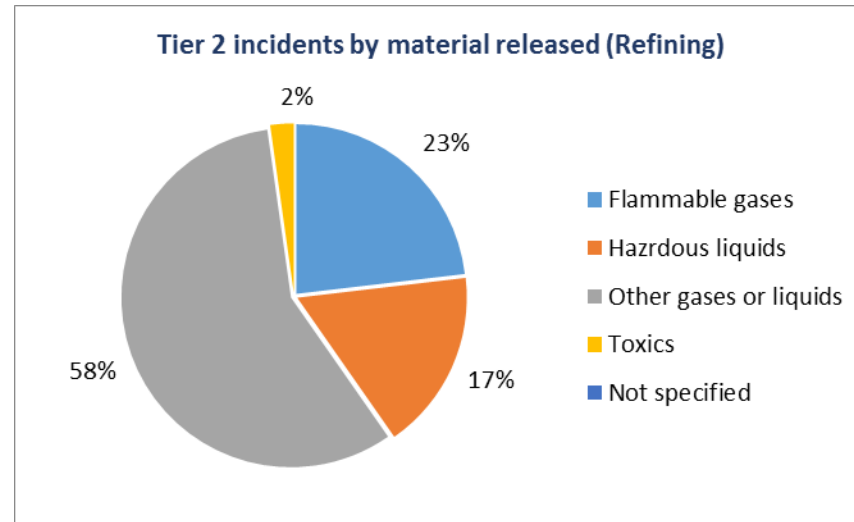
Incidents by material released

T2 – Pipelines



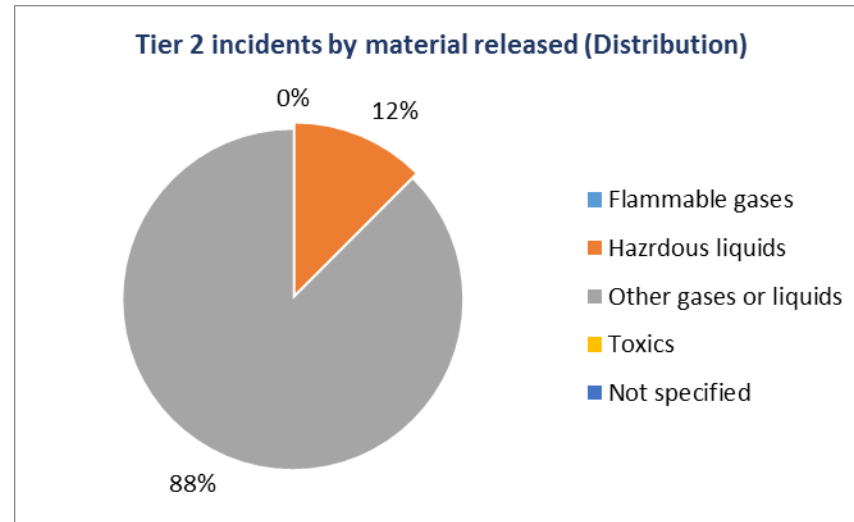
Incidents by material released

T2 – Refining



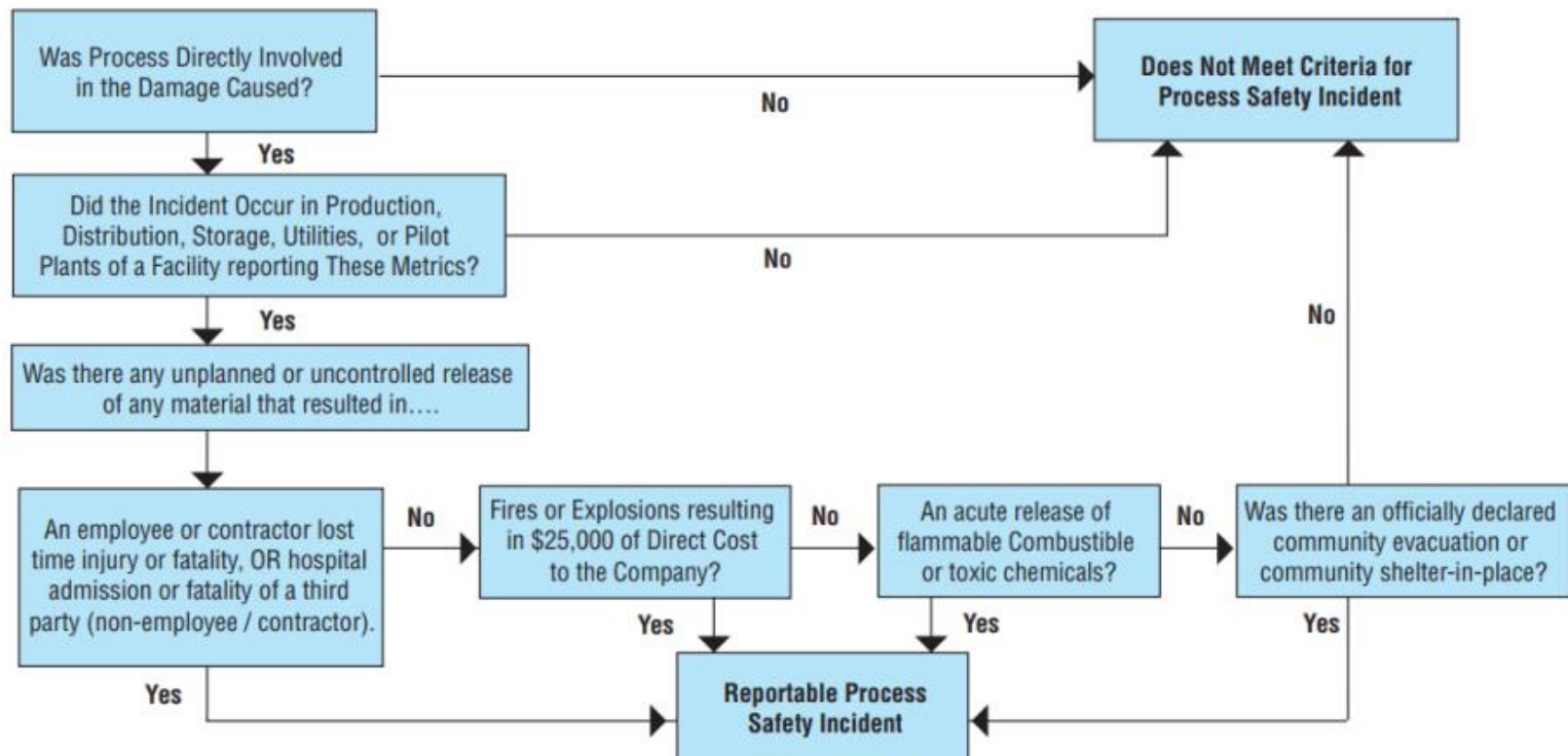
Incidents by material released

T2 – Distribution



Annex: Methodology

- The information presented in this report is compiled by a confidential survey answered by ARPEL member companies. The recommended practice API 754 is the main reference to categorize incidents and reporting thresholds.
- In the following flowchart are shown the characteristics an incident should have to be considered a process safety incident according to API 754.



Annex: Methodology

- The Process Safety Pyramid is shown below. The main difference between a Tier 1 and Tier 2 incident are the consequences.
- A Tier 1 incident implies at least one of the following consequences (fatality –own or third parties-, lost workdays, hospital admission, community evacuation, fire or explosion with losses higher to 25kUSD or a material release exceeding the reporting thresholds)
- A Tier 2 incident implies a non-fatal injury, fires or explosion with losses between 2.5 and 25 kUSD or a material release exceeding a reporting threshold lower than thresholds defined for Tier 1 incidents.



Annex: References

- API “Guide to reporting process safety events. Version 3.0”
- ARPEL (2017) “User’s Manual – ARPEL Database – Safety benchmarking in the oil and gas industry in Latin America and the Caribbean” 7th edition [?](#)
- CCPS “Process Safety Leading and Lagging Indicators”
- IOGP (2017) “Safety Performance Indicators. Process Safety Events, 2016 data”

Process Safety Benchmarking Report (2017 data)

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