



# Safety Benchmarking in the oil and gas industry in Latin America and the Caribbean (2017 data)

  
ARPEL Publication BE03-2018  
November, 2018

# **Safety Benchmarking in the oil and gas industry in Latin America and the Caribbean; 2017 statistics for ARPEL member companies**

**Report BE 03-2018**

**November, 2018**

## **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 the ARPEL Safety Benchmarking Project Team the EHS Committee.

## **Copyright**

The copyright of this document, whether in its printed, electronic or any other version, is held by the Regional Association of Oil, Gas and Biofuels Sector Companies in Latin America and the Caribbean (ARPEL), Any copy of this document must include this copyright notice, The user shall give – in future use of this document – full credit to ARPEL for being the source of information.

## **Disclaimer**

Although efforts were made to ensure the accuracy of the information contained in this document, neither ARPEL nor any of its Member Companies, neither the authors or reviewers, nor the companies and institutions they represent, assume any responsibility for any use made hereof. No references made to names or trademarks of equipment manufacturers and/or processes represent any endorsement by the authors, ARPEL or any of its Member Companies.

# Introduction

- The Safety Benchmarking Annual Report is a compilation of safety statistics of ARPEL member companies.
- It analyzes four reactive indicators (total incidents, gravity, frequency of incidents with lost workdays and fatalities) and two proactive indicators (safety training intensity and task planned observations). Data is broken down by business line (E&P, refining, pipelines, distribution and others) and by category (company and contractors), and also including historical data for the last 5 years.

# Sources and Methodology

Data collection for this report is based on voluntary reporting by ARPEL member companies. The definitions can be found in the User's Manual (7th edition, 2017)

<https://arpel.org/library/publication/493/>

This report collects four reactive indicators and two proactive indicators, which are detailed below:

## 1.1. Reactive

1. **Total incidents' rate** = 
$$\frac{\text{Total recordable cases (injuries+illnesses+fatalities)}}{\text{Hours worked (in millions)}}$$
2. **Incidents gravity rate** = 
$$\frac{\text{Number of days away from work}}{\text{Hours worked (in millions)}}$$
3. **Incidents' frequency rate with lost workdays** = 
$$\frac{\text{cases with lost workdays}}{\text{Hours worked (in millions)}}$$
4. **Fatalities' rate** = 
$$\frac{\text{Number of fatalities}}{\text{Hours worked (in millions)}}$$

## 1.2. Proactive

5. **TPO Indicator** = 
$$\frac{\text{Number of Task Planned Observations (TPO) recorded}}{\text{Average number of workers}}$$
6. **Safety Training Intensity** = 
$$\frac{\text{Total number of safety training hours}}{\text{Hours worked (in millions)}} * 100$$

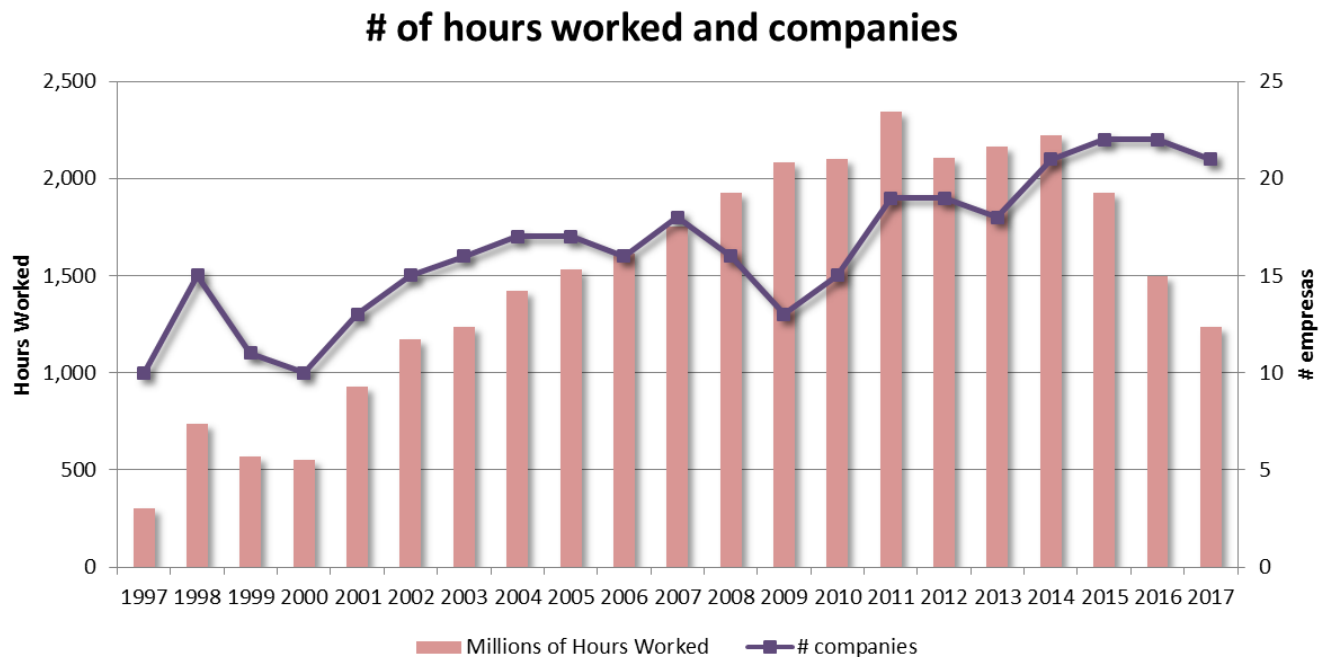
# Scope

- For this report, 21 companies submitted data, including operations in 15 different countries of the region.

<b>ANCAP (Uruguay)</b>	<b>Pan American Energy (Argentina)</b>	<b>RECOPE (Costa Rica)</b>
<b>Chevron (Argentina, Brazil, Colombia y Venezuela)</b>	<b>PCJ (Jamaica)</b>	<b>REFINOR (Argentina)</b>
<b>COGA (Peru)</b>	<b>PEMEX (Mexico)</b>	<b>REPSOL (Colombia, Ecuador y Peru)</b>
<b>ENAP (Chile, Argentina, Ecuador)</b>	<b>PETROBRAS (Brazil)</b>	<b>STAATSOLIE (Surinam)</b>
<b>EP PETROECUADOR (Ecuador)</b>	<b>PETROPAR (Paraguay)</b>	<b>TECPETROL (Argentina)</b>
<b>Equión (Colombia)</b>	<b>PETROTRIN (Trinidad &amp; Tobago)</b>	<b>YPF (Argentina)</b>
<b>Oldelval (Argentina)</b>	<b>PLUSPETROL (Argentina, Bolivia y Peru)</b>	<b>YPFB Transporte (Bolivia)</b>

# Scope

- For this report (2017 data), 21 companies and a total amount of 1.236 millions hours worked were reported.
- Regarding the hours worked, this figure is a decrease of 18% in comparison with the previous year.
- This is explained by a structural reduction of the hours worked in the industry since the 2014 crisis and a because less companies submitted data.











# Scope

Function	# Companies	Company		Contractors		Totals	
		# workers	Man Hours (thousands)	# workers	Man Hours (thousands)	# workers	Man Hours (thousands)
<b>E&amp;P</b>	12	68,035	160,286	156,049	385,520	224,084	545,806
<b>Refining</b>	12	54,548	124,378	42,100	90,239	96,648	214,617
<b>Pipelines</b>	11	20,334	43,253	18,422	35,714	38,756	78,967
<b>Transport-Maritime</b>	3	8,610	9,597	-	-	8,610	9,597
<b>Distribution</b>	8	30,868	64,366	13,199	25,461	44,067	89,827
<b>Others</b>	11	72,203	158,825	69,590	138,636	141,793	297,461
<b>Total</b>	<b>21</b>	<b>254,598</b>	<b>560,705</b>	<b>299,360</b>	<b>675,570</b>	<b>553,957</b>	<b>1,236,275</b>

- A total amount of 1,236.28 hours worked were reported, of which 560.7 (45.4%) correspond to company workers and 675.57 (54,6%) to contractors.
- The function which has reported most hours is E&P with 44.1% of the total amount of hours reported, followed by Others (24.1%) and Refining (17.4%)

# Global Reactive Indicators

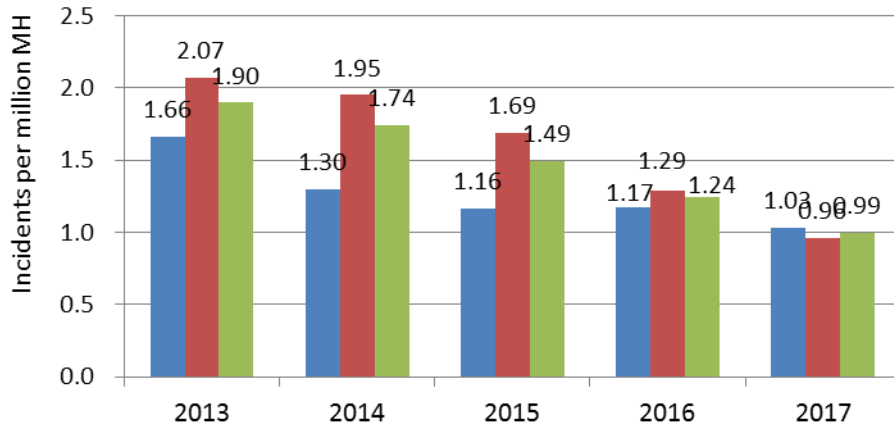
- The total incidents' rate has decreased 20% and the cases with lost workdays' rate has decreased 17%, both in comparison to 2016
- The gravity's rate, while it shows the same level than in 2016, it is 32% below the five years' average.
- However, the fatalities' indicators rate increased 105% in comparison to 2016 and it is 15% above the 5 years average.

Indicator	2013	2014	2015	2016	2017	5 years average		var 17/16		2017 vs 5y avg
Total incidents rate	1.90	1.74	1.49	1.24	0.99	1.47		-20%		-33%
Gravity rate	42.98	89.36	61.16	36.29	36.39	53.24		0%		-32%
Incidents w/LWD rate	0.76	0.84	0.80	0.73	0.61	0.75		-17%		-19%
Fatalities rate	0.012	0.015	0.024	0.009	0.018	0.015		105%		15%

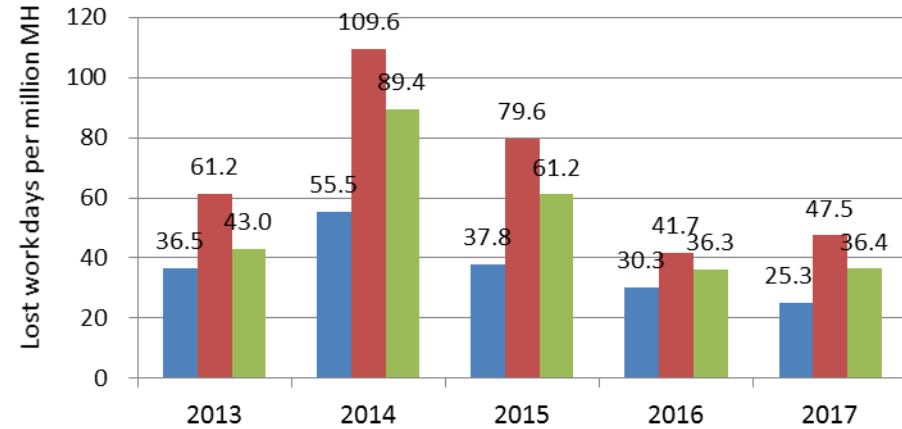


# Global Reactive Indicators

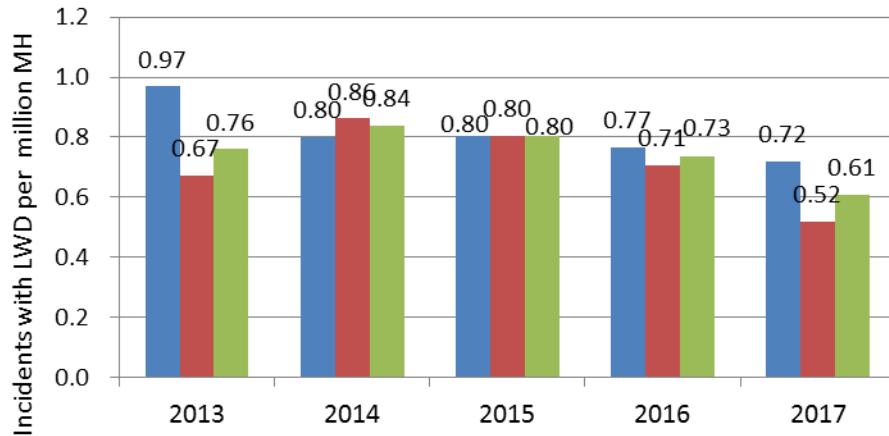
## Total incidents' rate



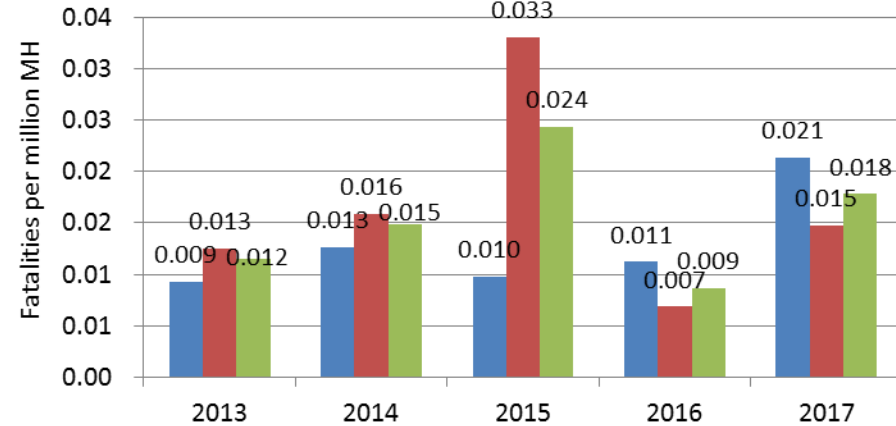
## Incidents' gravity rate



## Incidents' frequency rate with lost workdays



## Fatalities' rate



# Reactive Indicators by Function

Category	Function	TIR	GRAV	LWDC	FAT
Company	E&P	0.72	23.65	0.44	0.000
Company	Refining	1.13	24.93	0.72	0.032
Company	Pipelines	1.13	43.14	0.99	0.023
Company	Transport-Maritime	3.02	50.02	2.19	0.000
Company	Distribution	2.30	42.86	1.38	0.093
Company	Others	0.61	15.85	0.57	0.006
Company	Total	<b>1.03</b>	<b>25.29</b>	<b>0.72</b>	<b>0.021</b>

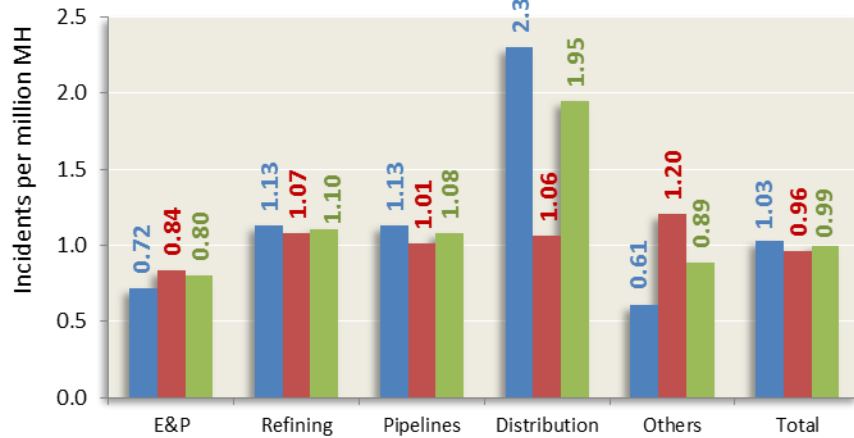
Category	Function	TIR	GRAV	LWDC	FAT
Contractors	E&P	0.84	62.33	0.45	0.005
Contractors	Refining	1.07	28.67	0.57	0.000
Contractors	Pipelines	1.01	10.76	0.39	0.000
Contractors	Transport-Maritime	NA	NA	NA	NA
Contractors	Distribution	1.06	26.64	0.59	0.196
Contractors	Others	1.20	42.88	0.69	0.022
Contractors	Total	<b>0.96</b>	<b>47.51</b>	<b>0.52</b>	<b>0.015</b>

Category	Function	TIR	GRAV	LWDC	FAT
Combined	E&P	0.80	47.78	0.45	0.004
Combined	Refining	1.10	26.39	0.66	0.019
Combined	Pipelines	1.08	23.99	0.72	0.013
Combined	Transport-Maritime	3.02	50.02	2.19	0.000
Combined	Distribution	1.95	38.42	1.16	0.122
Combined	Others	0.89	28.34	0.63	0.013
Combined	Total	<b>0.99</b>	<b>36.39</b>	<b>0.61</b>	<b>0.018</b>

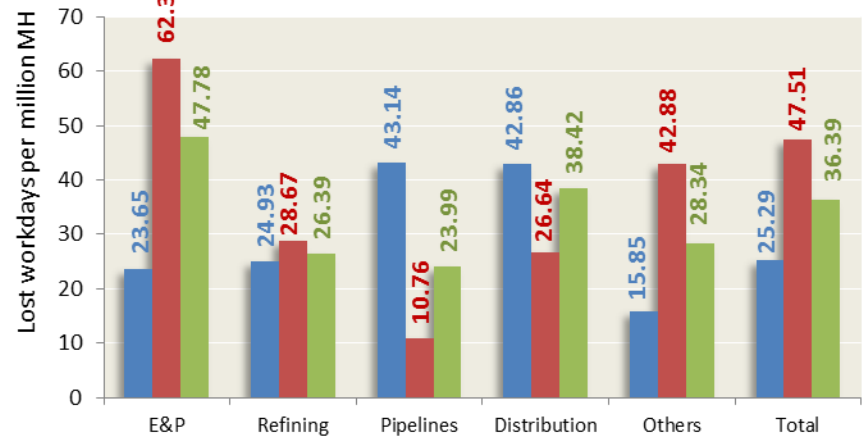
- Distribution is the function that shows the most incidents per million hours worked (1.95), incidents with lost workdays (1.16) and fatalities (0.122). E&P shows the highest incidents' gravity rate (47.78)
- Transport-Maritime is not considered for the comparison because only 3 companies submitted information reporting 9.6 million hours, which is not representative of the industry.

# Reactive Indicators by Function

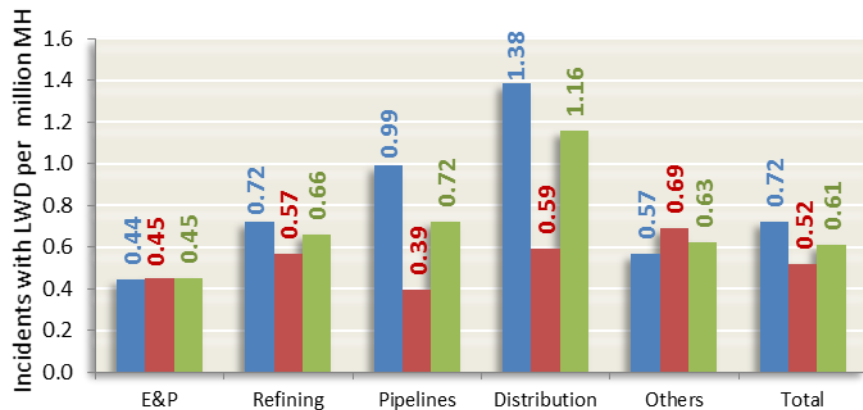
### Total incidents' rate



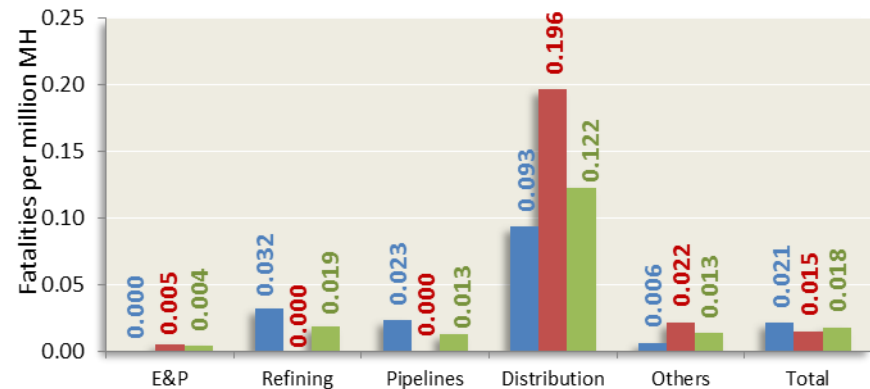
### Incidents' gravity rate



### Incidents' frequency rate with lost work days



### Fatalities' rate



Company Contractors Combined

# Reactive Indicators by Function (total incidents' rate)

Indicator	Category	Function	2013	2014	2015	2016	2017	2017/2016	2017 vs 5y average
TIR	Company	E&P	1.220	1.086	0.905	0.824	0.717	-13%	-25%
TIR	Company	Refining	2.368	1.895	1.560	1.898	1.126	-41%	-36%
TIR	Company	Pipelines	1.346	1.150	1.074	0.989	1.133	15%	0%
TIR	Company	Distribution	1.806	1.684	2.242	1.866	2.299	23%	16%
TIR	Company	Others	1.669	0.993	0.840	0.821	0.611	-26%	-38%
TIR	Company	<b>Total</b>	1.658	1.296	1.164	1.173	1.031	-12%	-18%
TIR	Contractors	E&P	2.051	2.136	1.707	1.171	0.835	-29%	-47%
TIR	Contractors	Refining	3.294	2.097	1.486	1.389	1.075	-23%	-42%
TIR	Contractors	Pipelines	1.574	1.411	0.984	0.925	1.008	9%	-15%
TIR	Contractors	Distribution	0.850	1.727	1.891	1.082	1.060	-2%	-20%
TIR	Contractors	Others	2.176	1.763	1.933	1.674	1.205	-28%	-31%
TIR	Contractors	<b>Total</b>	2.071	1.949	1.690	1.290	0.961	-26%	-40%
TIR	Combined	E&P	1.842	1.888	1.504	1.069	0.801	-25%	-44%
TIR	Combined	Refining	2.627	1.976	1.530	1.683	1.104	-34%	-38%
TIR	Combined	Pipelines	1.500	1.333	1.018	0.949	1.076	13%	-8%
TIR	Combined	Distribution	1.297	1.700	2.125	1.638	1.948	19%	12%
TIR	Combined	Others	2.039	1.554	1.523	1.281	0.888	-31%	-39%
TIR	Combined	<b>Total</b>	1.895	1.740	1.494	1.241	0.992	-20%	-33%

# Reactive Indicators by Function (incidents' gravity rate)

Indicator	Category	Function	2013	2014	2015	2016	2017	2017/2016	2017 vs 5y average
GRAV	Company	E&P	39.774	34.441	47.257	24.680	23.645	-4%	-30%
GRAV	Company	Refining	47.402	113.196	42.314	43.970	24.932	-43%	-54%
GRAV	Company	Pipelines	28.740	20.410	24.103	16.303	43.139	165%	63%
GRAV	Company	Distribution	21.143	96.943	37.791	42.911	42.864	0%	-11%
GRAV	Company	Others	28.111	27.450	27.760	24.700	15.848	-36%	-36%
GRAV	Company	<b>Total</b>	36.546	55.542	37.789	30.301	25.290	-17%	-32%
GRAV	Contractors	E&P	70.629	145.110	123.458	51.466	62.334	21%	-31%
GRAV	Contractors	Refining	52.112	28.868	41.386	26.335	28.671	9%	-19%
GRAV	Contractors	Pipelines	38.364	15.882	21.074	18.307	10.756	-41%	-48%
GRAV	Contractors	Distribution	12.347	458.961	32.731	17.820	26.643	50%	-76%
GRAV	Contractors	Others	63.372	81.113	43.779	45.952	42.882	-7%	-23%
GRAV	Contractors	<b>Total</b>	61.238	109.592	79.583	41.730	47.513	14%	-30%
GRAV	Combined	E&P	59.193	110.298	97.943	41.012	47.780	17%	-33%
GRAV	Combined	Refining	48.872	84.822	42.004	36.994	26.386	-29%	-45%
GRAV	Combined	Pipelines	35.186	17.283	22.262	17.556	23.993	37%	3%
GRAV	Combined	Distribution	17.987	223.265	36.228	35.959	38.421	7%	-45%
GRAV	Combined	Others	56.163	65.651	37.193	35.898	28.344	-21%	-37%
GRAV	Combined	<b>Total</b>	42.983	89.356	61.160	36.293	36.394	0%	-32%

# Reactive Indicators by Function (incidents' frequency rate with lost workdays)

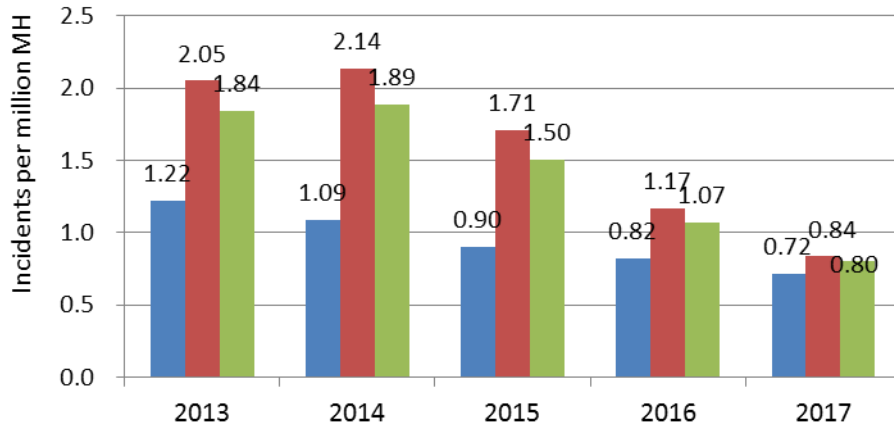
Indicator	Category	Function	2013	2014	2015	2016	2017	2017/2016	2017 vs 5y average
LWDC	Company	E&P	0.675	0.635	0.558	0.446	0.443	-1%	-20%
LWDC	Company	Refining	1.234	1.050	1.137	1.225	0.724	-41%	-33%
LWDC	Company	Pipelines	0.769	0.767	0.710	0.710	0.994	40%	26%
LWDC	Company	Distribution	1.302	0.943	1.274	1.328	1.383	4%	11%
LWDC	Company	Others	1.178	0.783	0.710	0.588	0.567	-4%	-26%
LWDC	Company	<b>Total</b>	0.969	0.800	0.805	0.766	0.721	-6%	-11%
LWDC	Contractors	E&P	0.720	1.143	0.958	0.727	0.451	-38%	-44%
LWDC	Contractors	Refining	0.676	0.706	0.648	0.526	0.565	7%	-9%
LWDC	Contractors	Pipelines	0.483	0.606	0.313	0.683	0.392	-43%	-21%
LWDC	Contractors	Distribution	0.333	0.817	0.577	0.536	0.589	10%	3%
LWDC	Contractors	Others	0.671	0.636	0.782	0.784	0.692	-12%	-3%
LWDC	Contractors	<b>Total</b>	0.671	0.862	0.803	0.706	0.518	-27%	-27%
LWDC	Combined	E&P	0.709	0.983	0.826	0.619	0.449	-27%	-37%
LWDC	Combined	Refining	1.023	0.934	0.974	0.942	0.657	-30%	-27%
LWDC	Combined	Pipelines	0.575	0.656	0.469	0.693	0.722	4%	16%
LWDC	Combined	Distribution	0.786	0.899	1.059	1.109	1.158	4%	16%
LWDC	Combined	Others	0.773	0.678	0.752	0.692	0.625	-10%	-11%
LWDC	Combined	<b>Total</b>	0.760	0.839	0.804	0.734	0.610	-17%	-19%

# Reactive Indicators by Function (Fatalities' Rate)

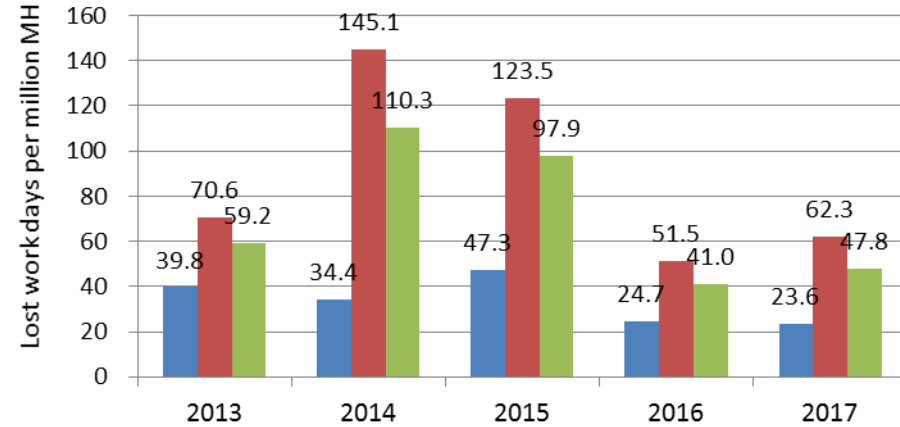
Indicator	Category	Function	2013	2014	2015	2016	2017	2017/2016	2017 vs 5y average
FAT	Company	E&P	0.013	0.009	0.014	0.026	0.000	-100%	-100%
FAT	Company	Refining	0.012	0.041	0.000	0.007	0.032	330%	74%
FAT	Company	Pipelines	0.000	0.000	0.017	0.000	0.023	NA	186%
FAT	Company	Distribution	0.000	0.000	0.032	0.016	0.093	490%	230%
FAT	Company	Others	0.000	0.000	0.005	0.000	0.006	NA	170%
FAT	Company	<b>Total</b>	0.009	0.013	0.010	0.011	0.021	91%	66%
FAT	Contractors	E&P	0.010	0.020	0.041	0.009	0.005	-41%	-69%
FAT	Contractors	Refining	0.058	0.026	0.059	0.020	0.000	-100%	-100%
FAT	Contractors	Pipelines	0.034	0.010	0.032	0.000	0.000	NA	-100%
FAT	Contractors	Distribution	0.018	0.057	0.096	0.000	0.196	NA	167%
FAT	Contractors	Others	0.004	0.006	0.000	0.000	0.022	NA	246%
FAT	Contractors	<b>Total</b>	0.013	0.016	0.033	0.007	0.015	116%	-11%
FAT	Combined	E&P	0.010	0.017	0.034	0.014	0.004	-74%	-77%
FAT	Combined	Refining	0.029	0.035	0.024	0.013	0.019	44%	-22%
FAT	Combined	Pipelines	0.023	0.007	0.026	0.000	0.013	NA	-8%
FAT	Combined	Distribution	0.010	0.021	0.054	0.011	0.122	991%	181%
FAT	Combined	Others	0.003	0.004	0.002	0.000	0.013	NA	195%
FAT	Combined	<b>Total</b>	0.012	0.015	0.024	0.009	0.018	105%	15%

# Reactive Indicators (E&P)

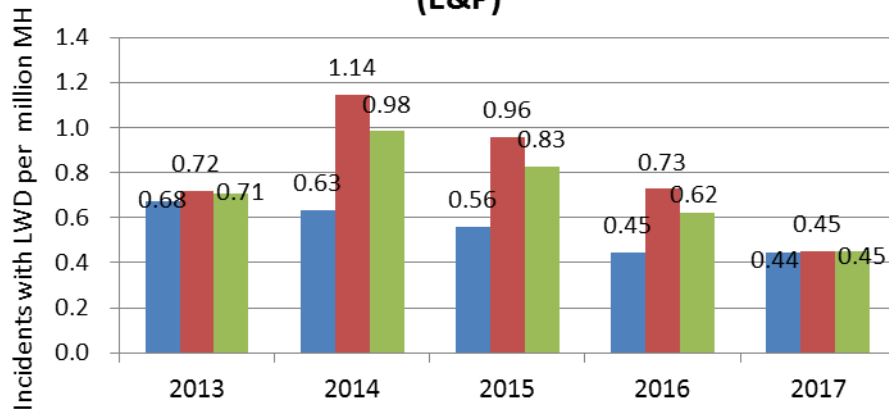
## Total incidents' rate (E&P)



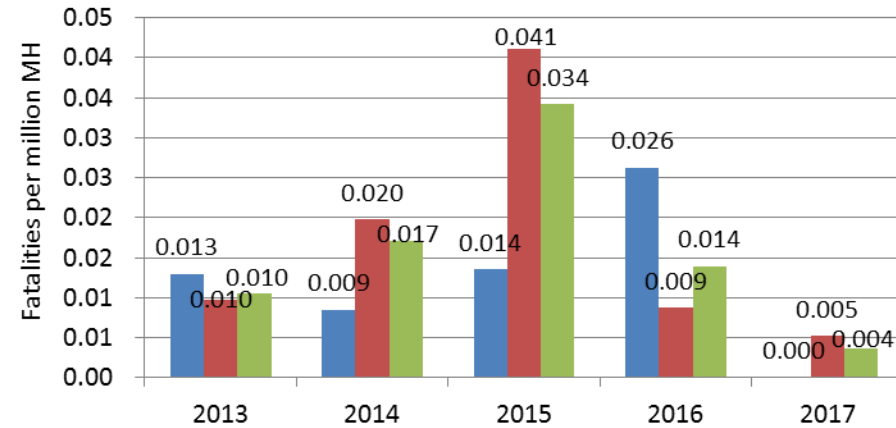
## Incidents' gravity rate (E&P)



## Incidents' frequency rate with lost workdays (E&P)



## Fatalities' rate (E&P)

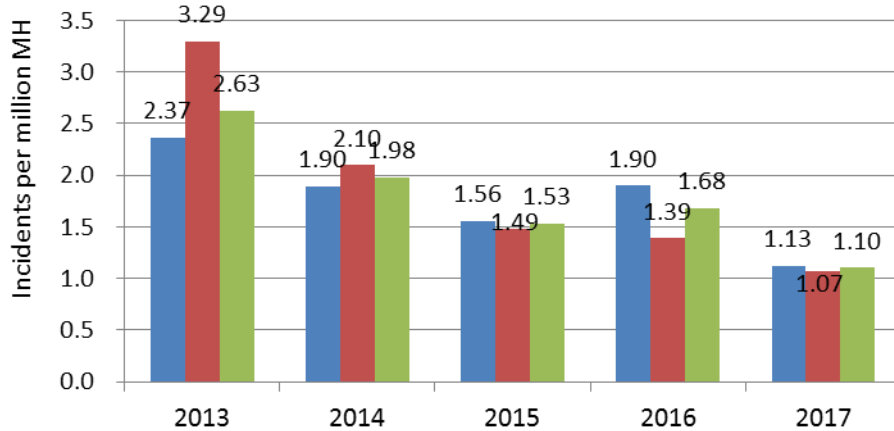


Company Contractors Combined

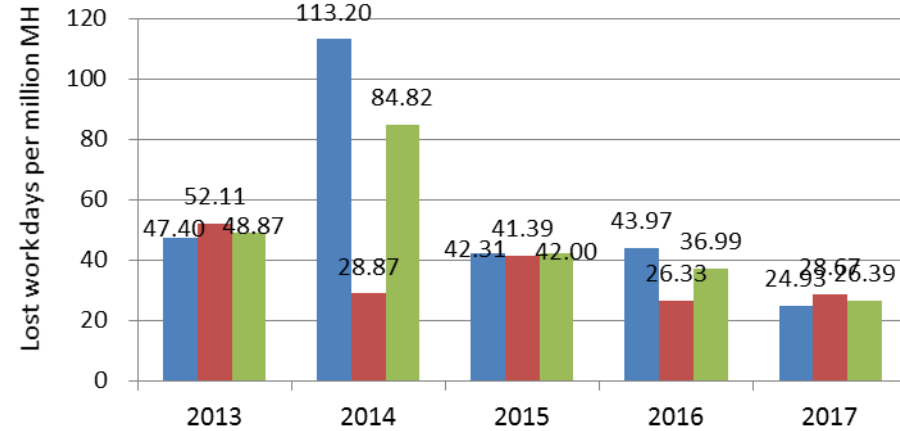


# Reactive Indicators (Refining)

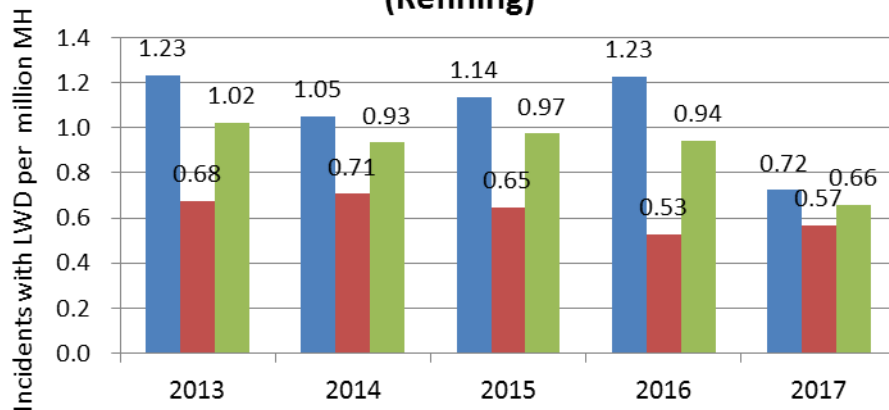
### Total incidents' rate (Refining)



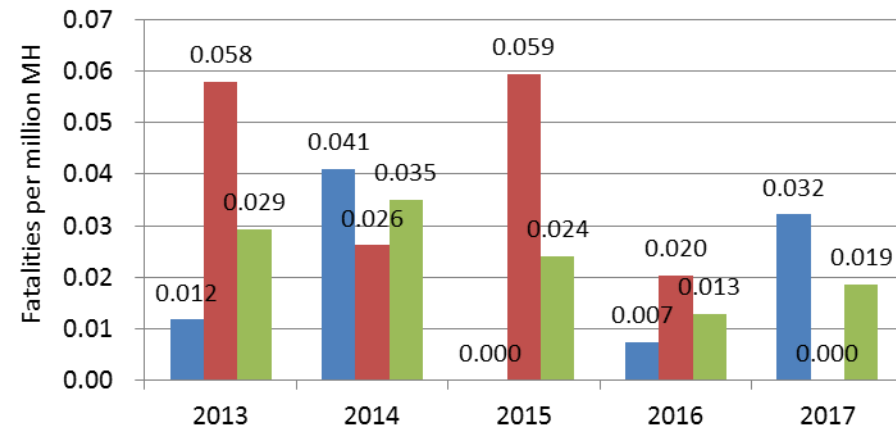
### Incidents' gravity rate (Refining)



### Incidents' frequency rate with lost workdays (Refining)



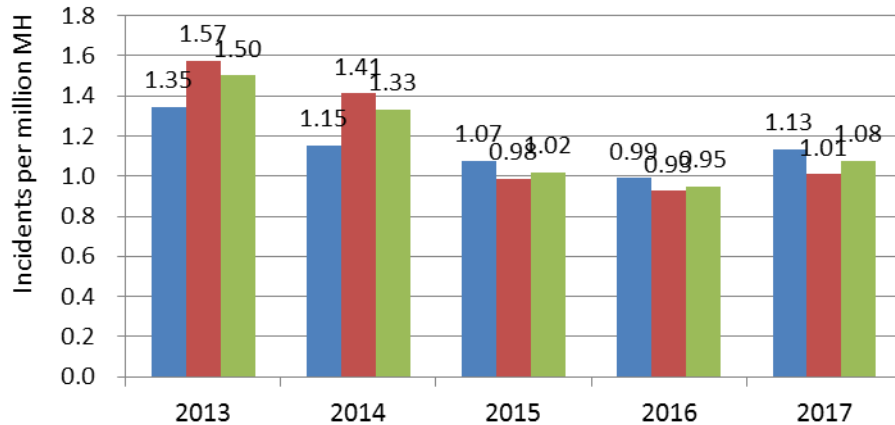
### Fatalities' rate (Refining)



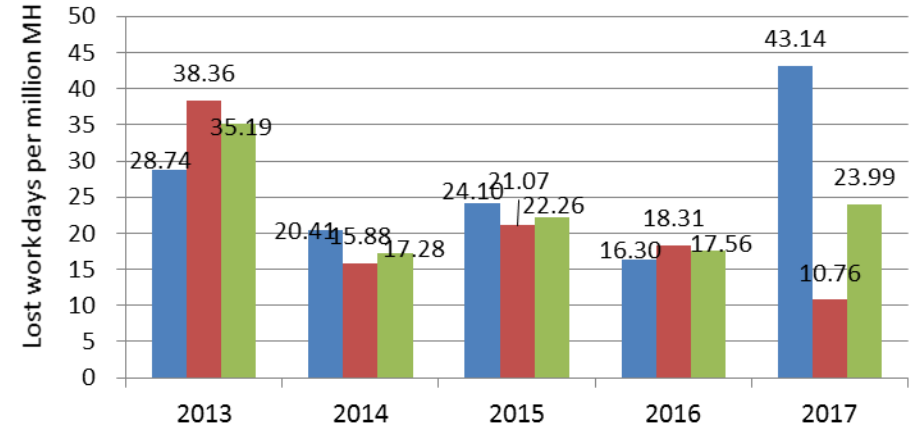
Company Contractors Combined

# Reactive Indicators (Pipelines)

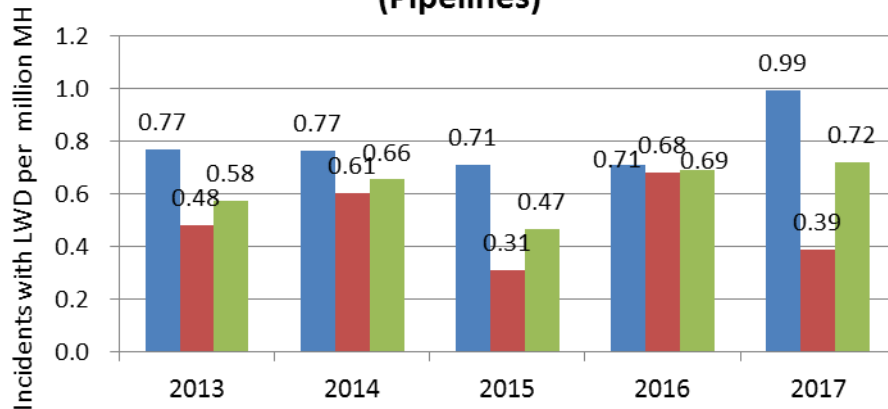
## Total incidents' rate (Pipelines)



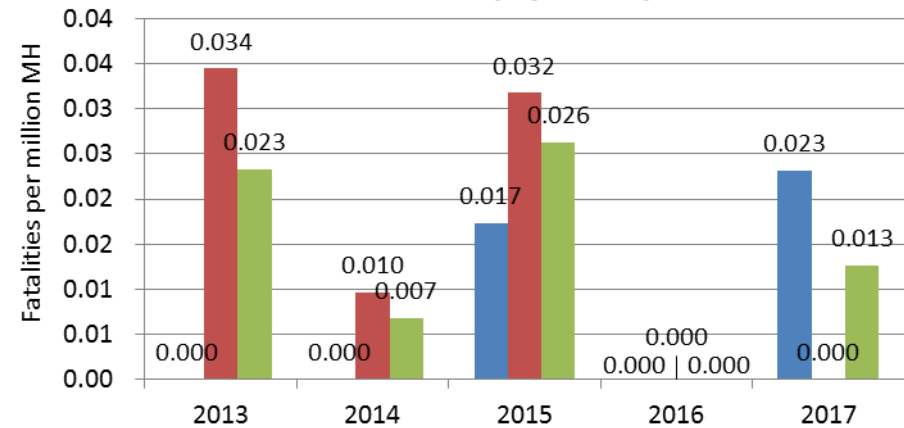
## Incidents' gravity rate (Pipelines)



## Incidents' frequency rate with lost workdays (Pipelines)



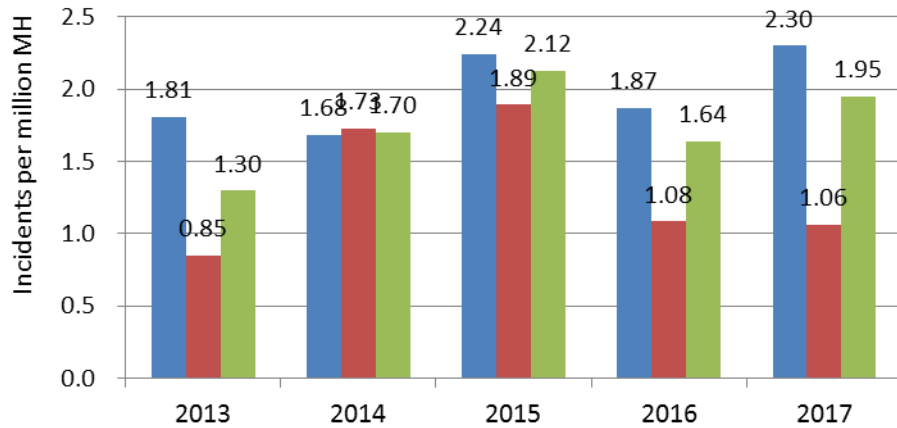
## Fatalities' rate (Pipelines)



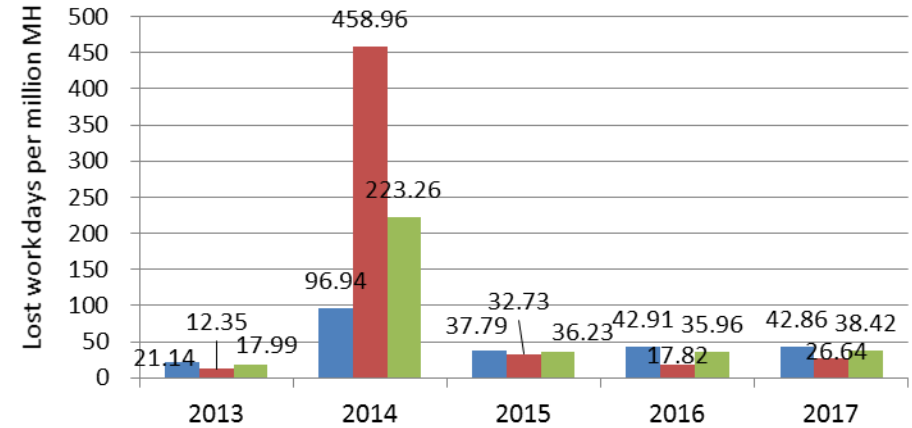
Company Contractors Combined

# Reactive Indicators (Distribution)

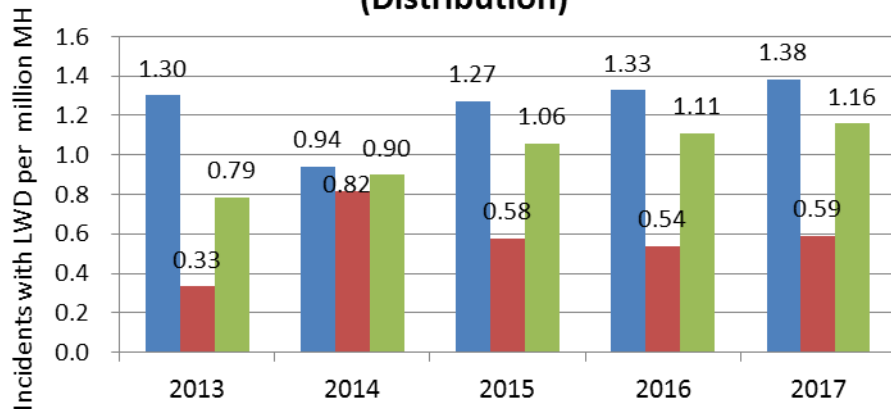
## Total incidents' rate (Distribution)



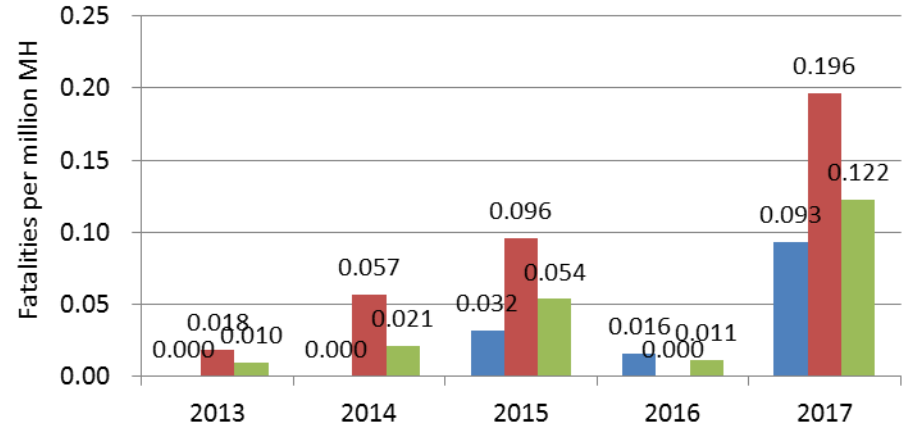
## Incidents gravitys' rate (Distribution)



## Incidents' frecuency rate with lost work days (Distribution)

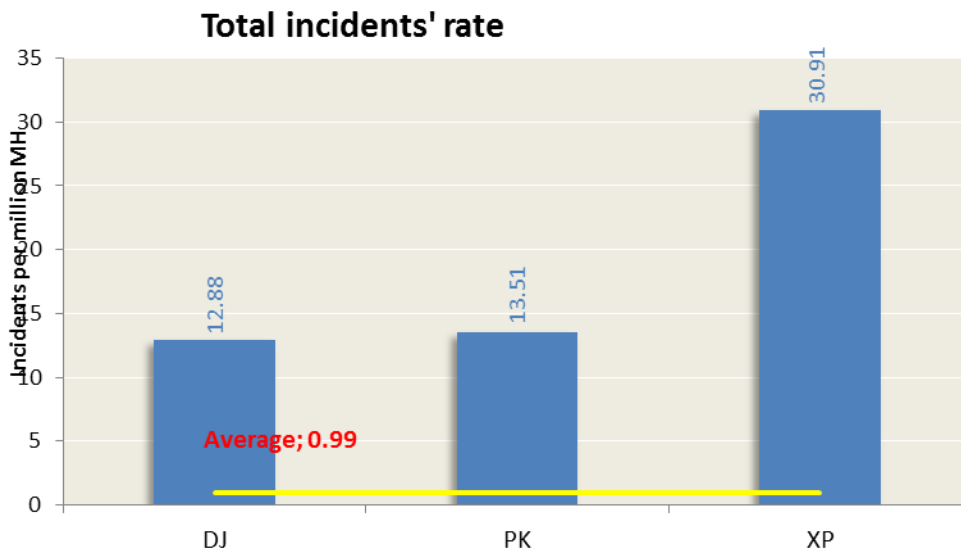
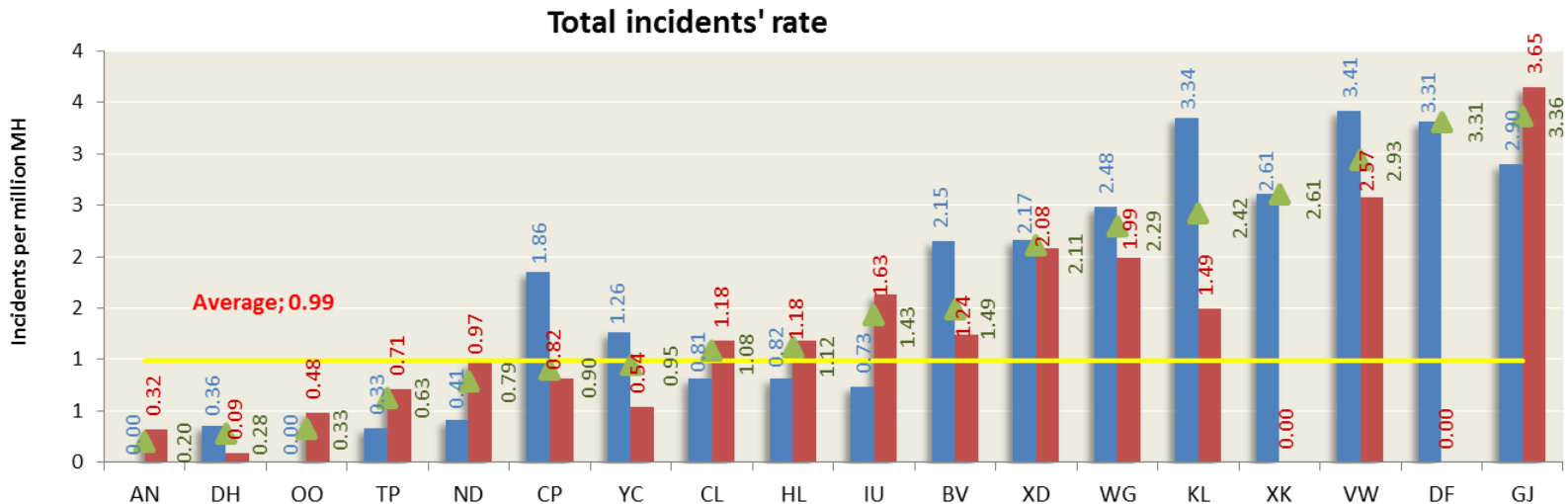


## Fatalities' rate (Distribution)



Company Contractors Combined

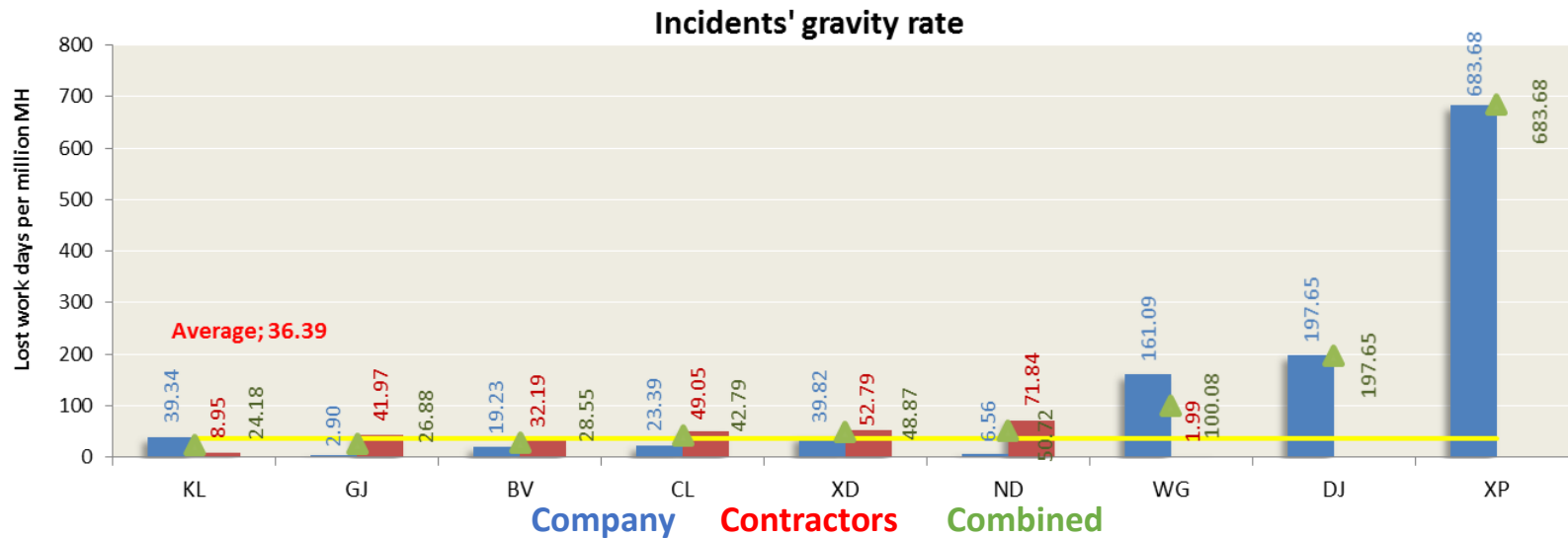
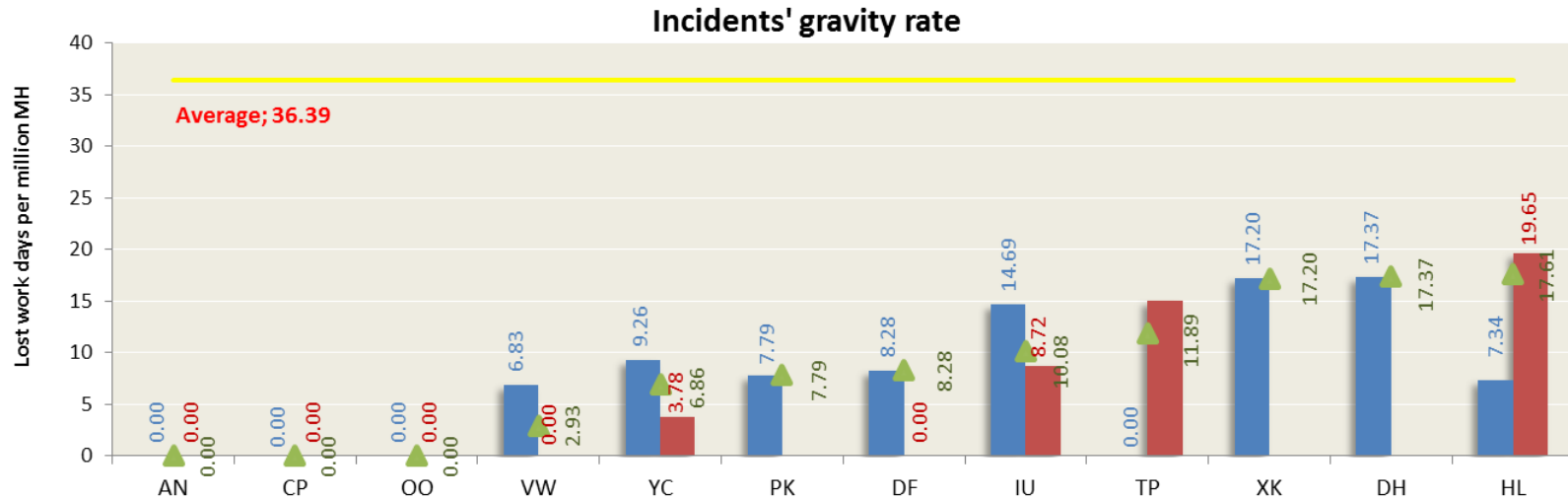
# Total Incidents' Rate by Company (total)



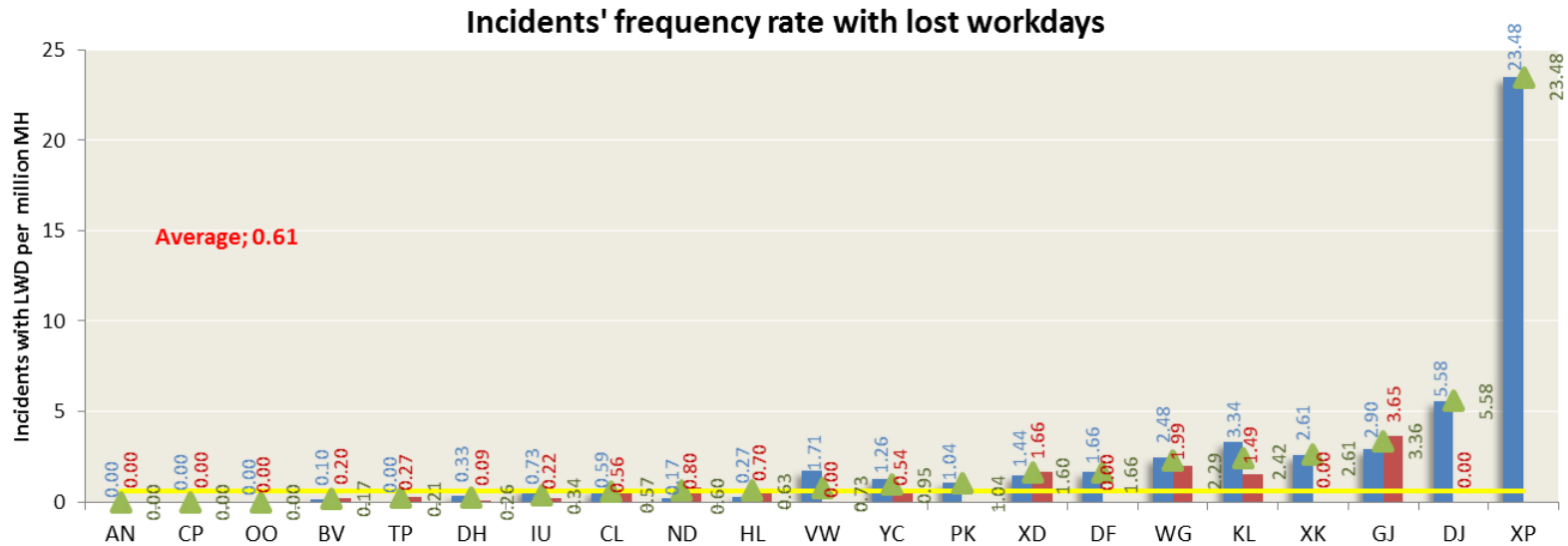
- The lowest incidents' rate was 0.20, while the highest was 30.91
- The average recordable incidents per million hours worked is 0.99.
- Two graphs are shown due to a matter of scale

Company Contractors Combined

# Incidents' gravity rate by company (total)



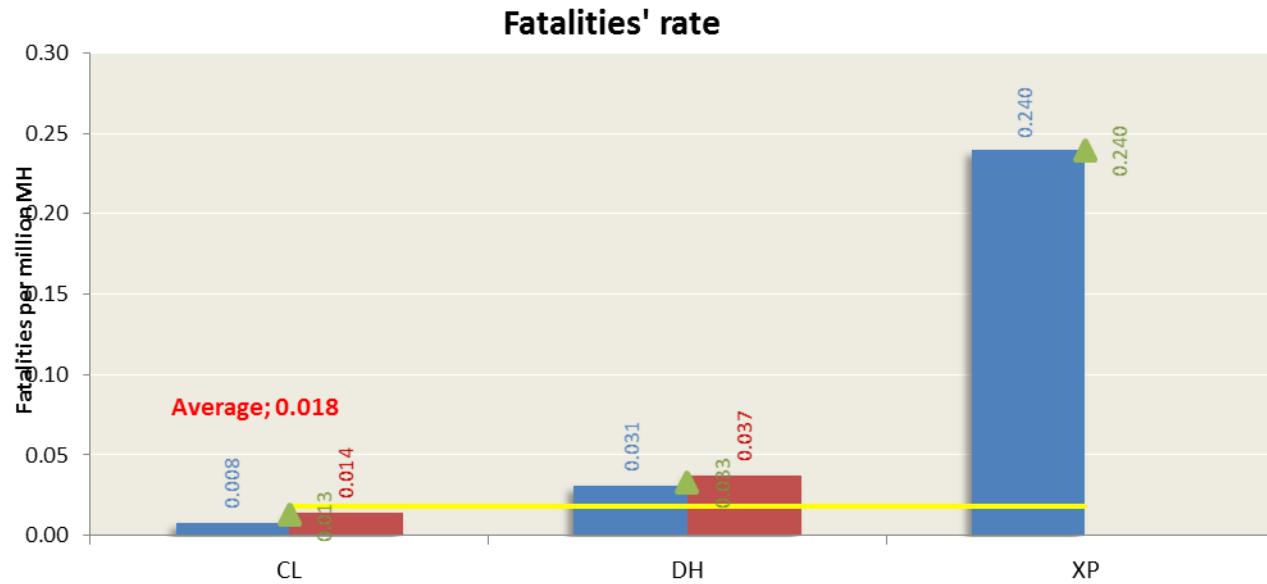
# Incidents' frequency rate with lost workdays by company (total)



- The average frequency of incidents with lost workdays was 0.61 per million hours worked.
- The series shows high dispersion, varying from a minimum of 0 up to a maximum of 23.48

Company Contractors Combined

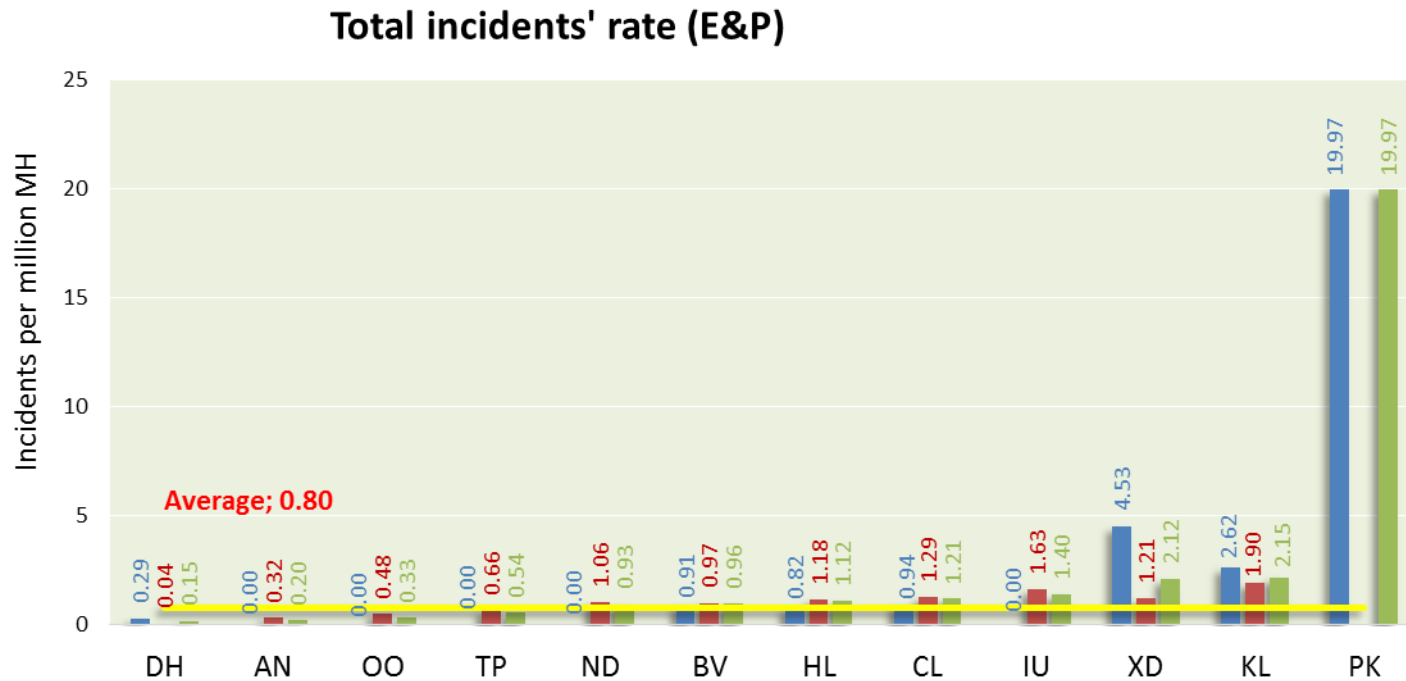
# Fatalities' rate by company (total)



- While the rate of fatalities doubled between 2016 and 2017, only 3 out of 21 reporting companies showed fatalities in 2017.
- The average fatalities per million hours worked was 0.018
- A similar amount of fatal incidents were reported in 2017 compared to 2016. However, 4 incidents involving multiple fatalities were reported in 2017, while in 2016 it was only 1.

Company   Contractors   Combined

# Total incidents' rate by company (E&P)

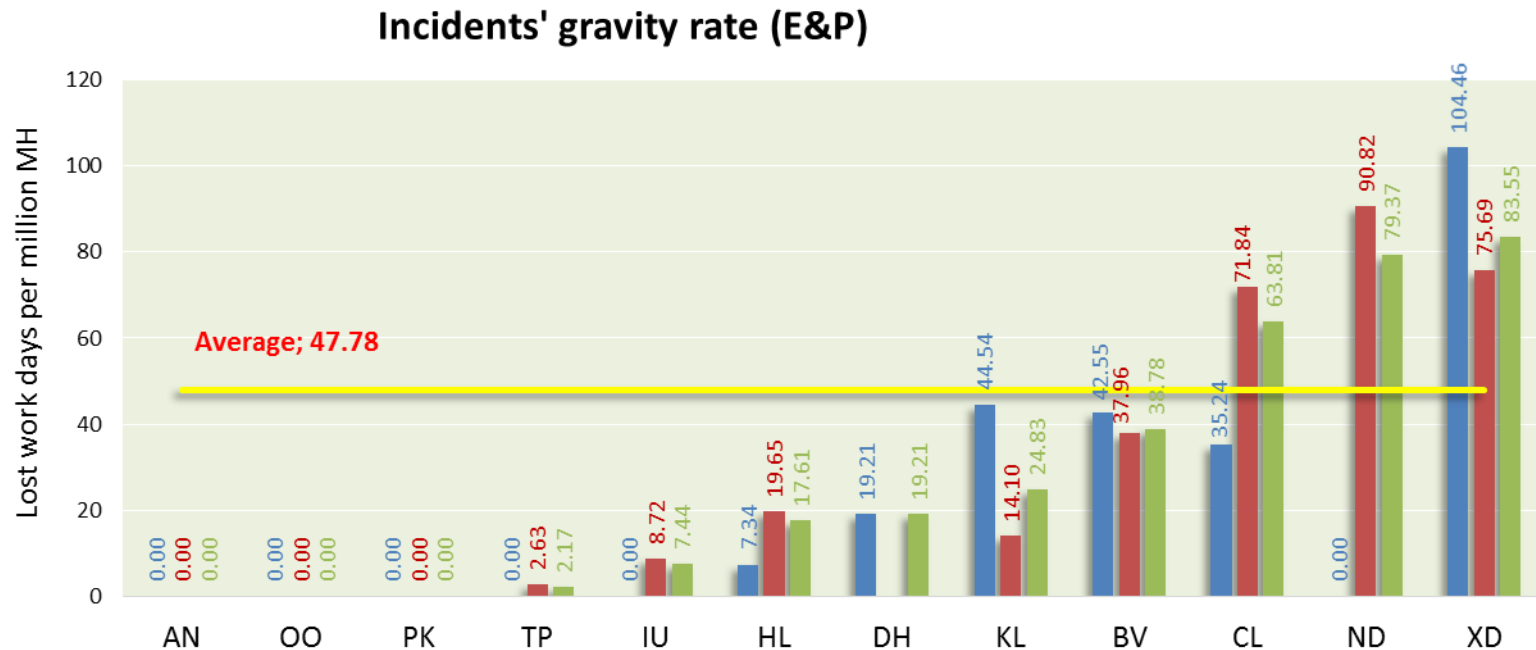


- The incidents' average in E&P was 0.80. For Company workers was 0.72 and for contractors 0.84.

Company Contractors Combined



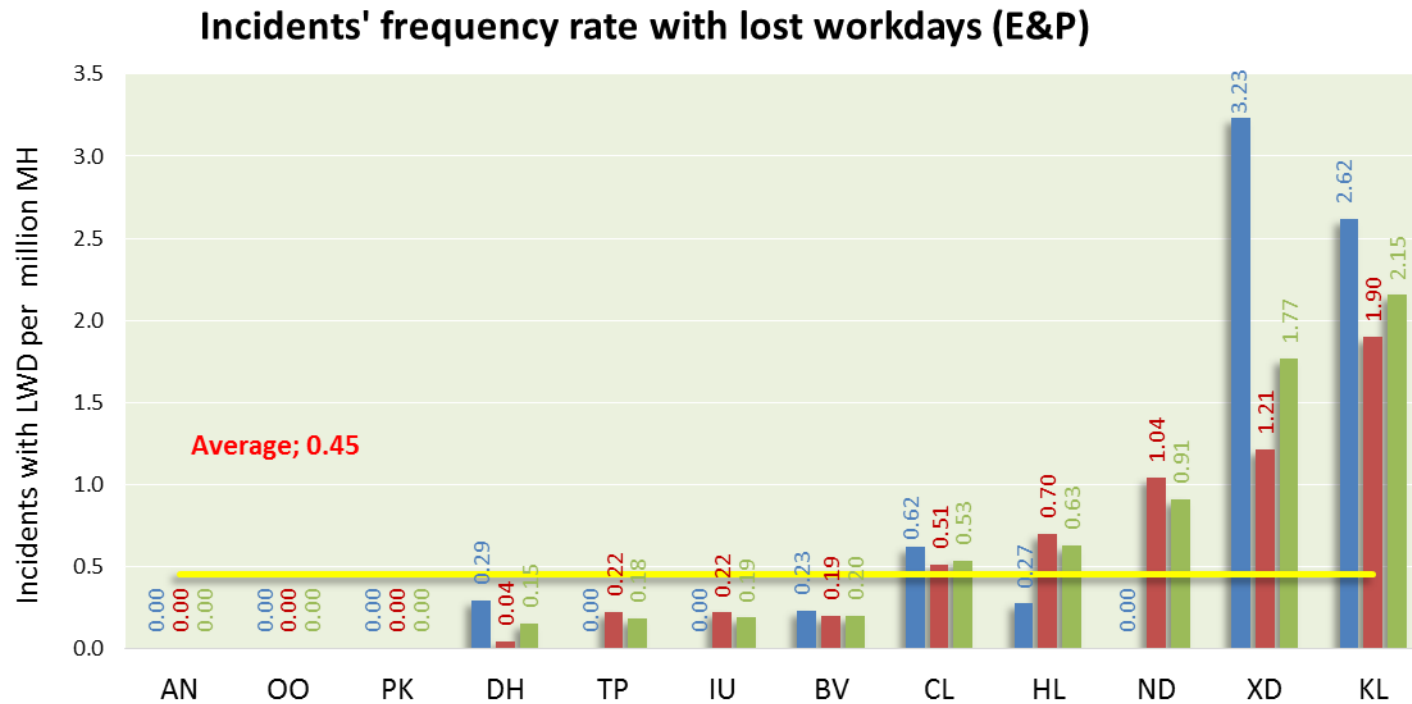
# Incidents' gravity rate by company (E&P)



- The average gravity rate in E&P was 47.78
- There is a large gap between company workers and contractors. For company workers the rate was 23.65 and for contractors 62.33

Company Contractors Combined

# Incidents' frequency rate with lost workdays by company (E&P)



- The average incidents frequency rate with lost workdays in E&P was 0.45.
- There are not significant differences between company workers (0.44) and contractors (0.45) in this indicator

Company Contractors Combined

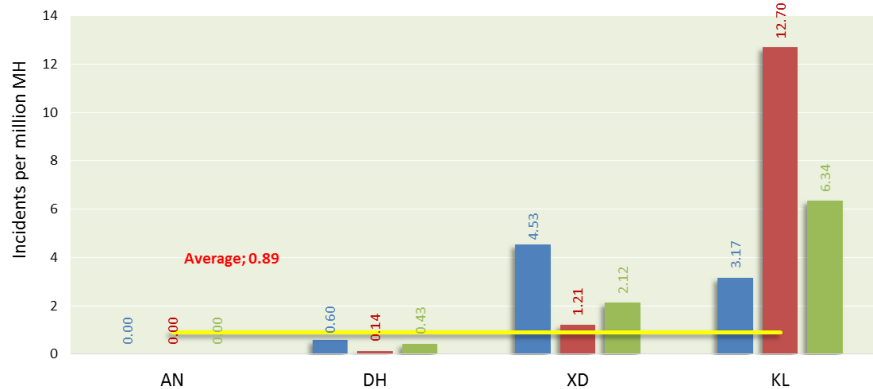
## Fatalities' rate by company (E&P)

- Only one company reported fatalities in E&P, showing an average of 0.02 fatalities per million hours worked (contractors); 0.00 (company) and 0.01 (combined)
- A total amount of 2 fatalities of contractors workers were reported, and none of company workers.

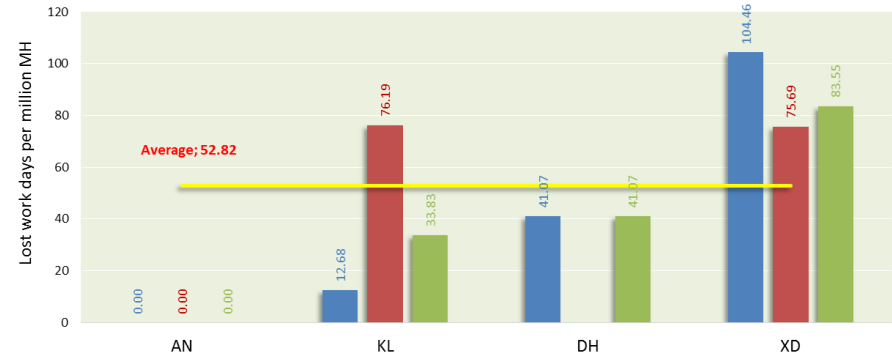
# Reactive Indicators (E&P Offshore)

Category	Function	# workers	# incidents TIR	MH TIR	# days IGR	MH GRAV	# incidents LWDC	MH LWDC	# incidents FAT	MH FAT	TIR	GRAV	LWDC	FAT
Company	E&P	9,480	31	29,000	1,359	29,000	27	29,000	0	29,000	1.07	46.86	0.93	0.000
Contractors	E&P	8,873	16	23,685	647	8,979	16	23,685	0	23,685	0.68	72.06	0.68	0.000
Combined	E&P	<b>18,353</b>	<b>47</b>	<b>52,685</b>	<b>2,006</b>	<b>37,979</b>	<b>43</b>	<b>52,685</b>	<b>0</b>	<b>52,685</b>	<b>0.89</b>	<b>52.82</b>	<b>0.82</b>	<b>0.000</b>

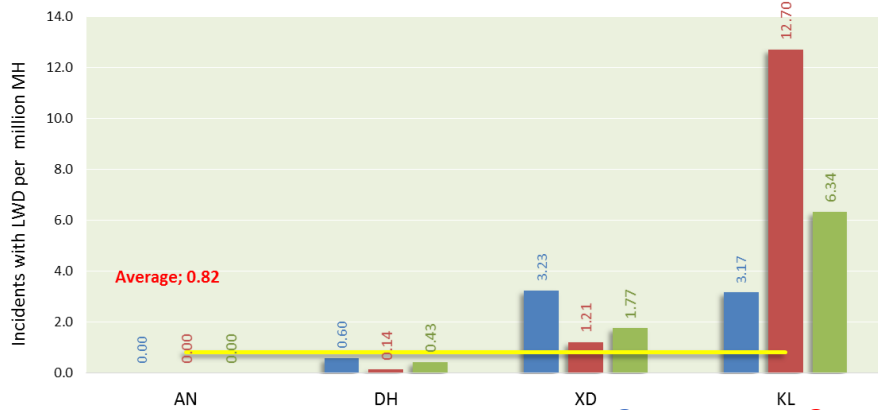
Total incidents' rate (E&P offshore)



Incidents' gravity rate (E&P offshore)



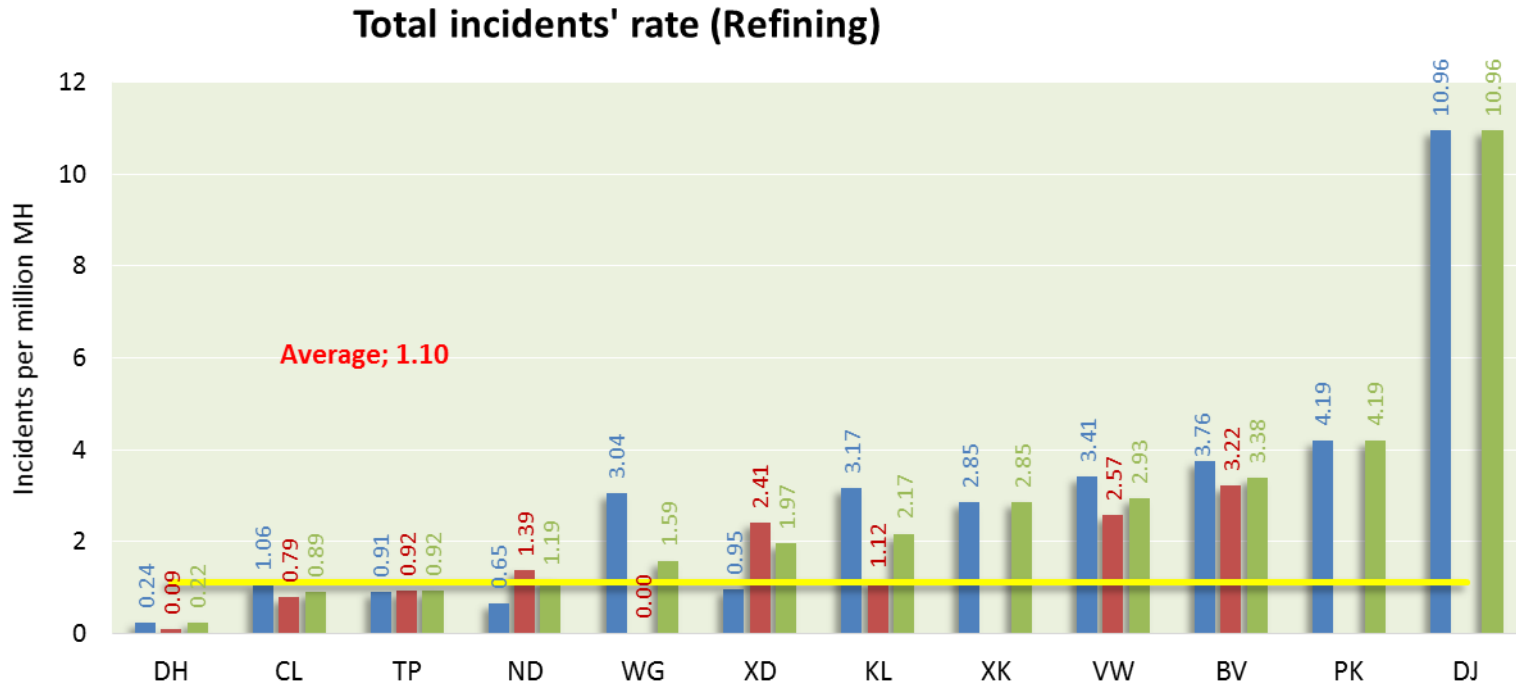
Incidents' frequency rate with lost workdays (E&P offshore)



- Only 4 companies submitted information for E&P offshore. A total amount of 52.7 millions hours worked were reported. Therefore it cannot be considered as a benchmarking for the industry as a whole.

Company    Contractors    Combined

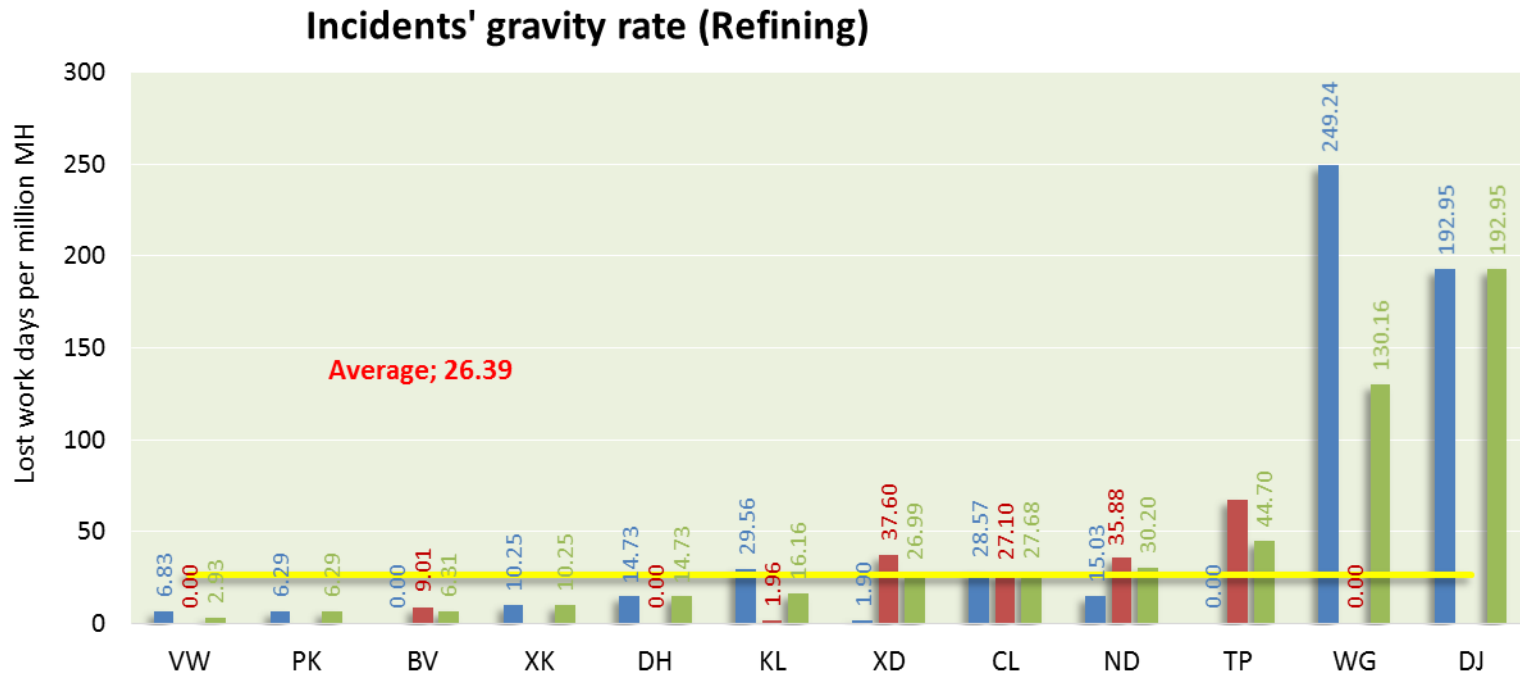
# Total incidents' rate (Refining)



- The total incidents' average per million hours worked was 1.10.
- This indicator doesn't show significant differences between company workers (1.13) and contractors (1.07), being only slightly lower for the last.

Company Contractors Combined

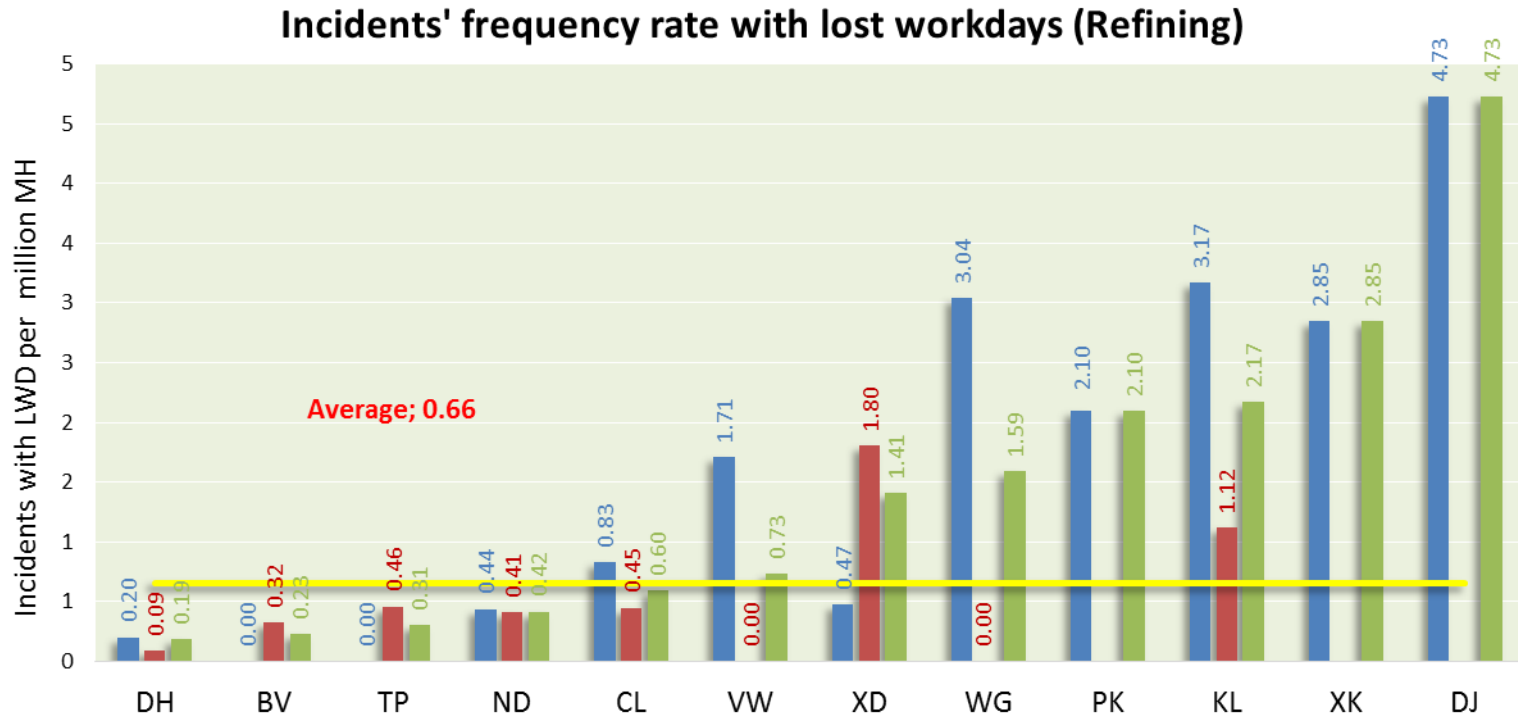
# Incidents gravity rate by Company (Refining)



- The average incidents' gravity rate in refining was 26.39 lost workdays per million hours worked.
- It is a historically low rate, being 29% below the 2016 rate and 45% below the 5 years average.
- The indicator was 24.93 for company workers and 28.67 for contractors.

Company Contractors Combined

# Incident's frequency rate with lost workdays (Refining)



- The average frequency rate with lost workdays was 0.66
- It is a historically low rate, being 29% below the previous year and 45% below the 5 years average.
- The indicator for company workers was 0.72 and for contractors 0.57.

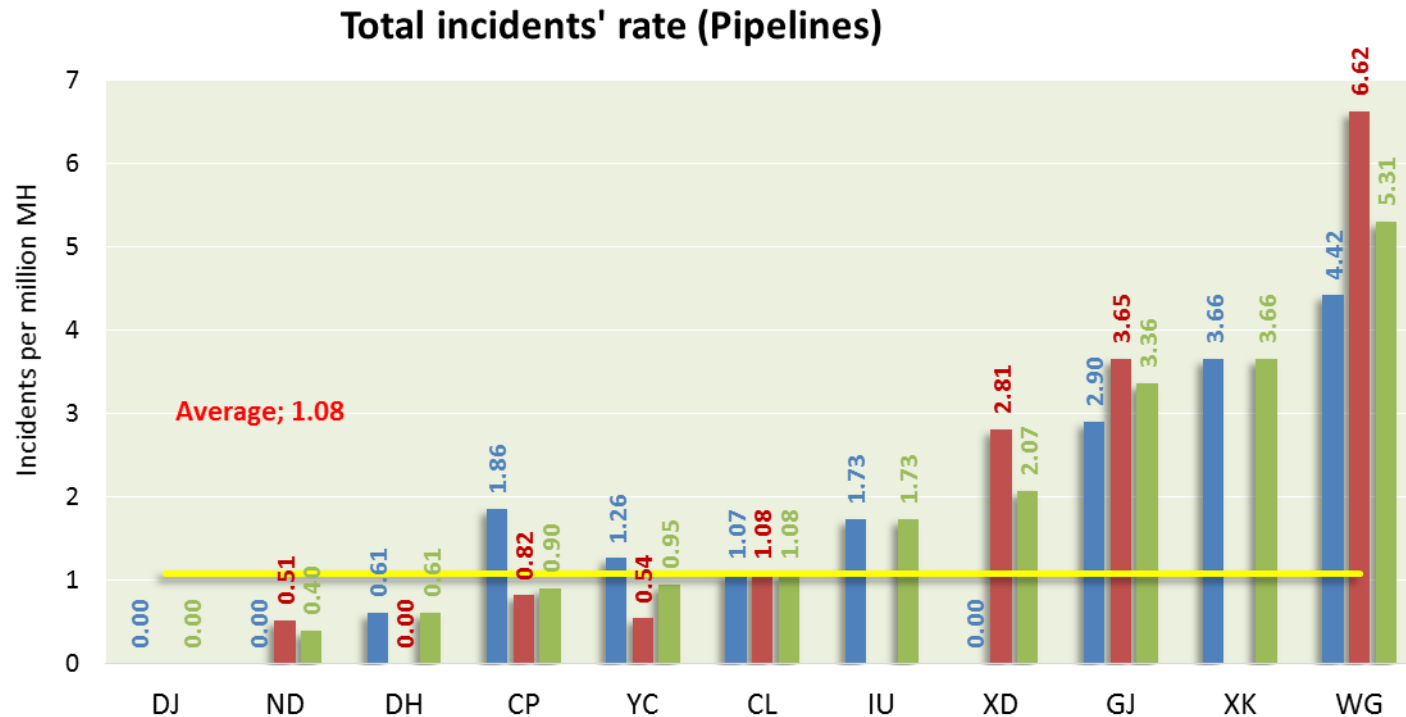
Company   
 Contractors   
 Combined

## Fatalities' rate by company (Refining)

- Two companies reported fatalities in refining.
- There were 4 fatalities, all of them corresponding to company workers.
- Company DH: 0,043 (company) y 0,037 (total)
- Company CL: 0,033 (company) y 0,013 (total)



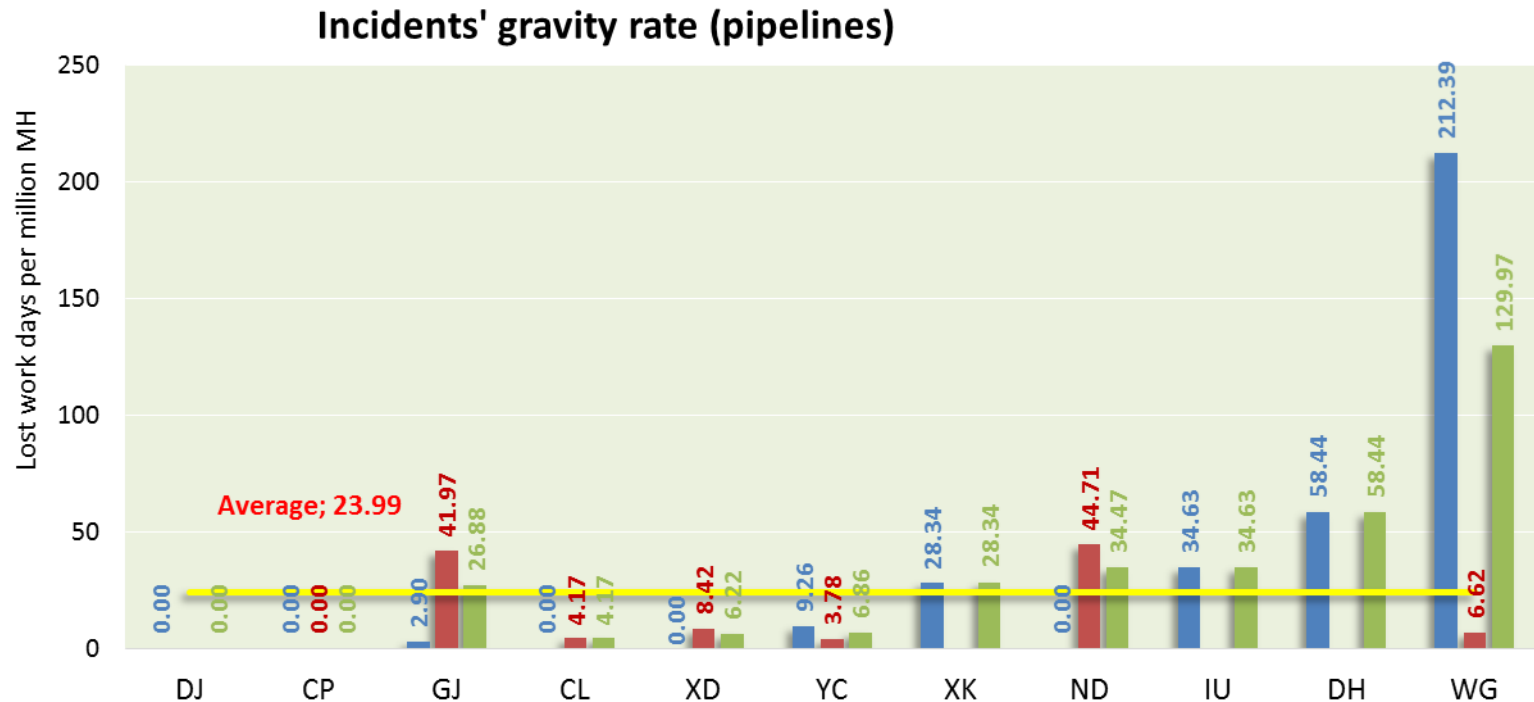
# Total Incidents' rate by company (Pipelines)



- The total incidents' rate average in pipelines was 1.08 per million hours worked. For company workers was 1.13 and for contractors 1.01.

Company Contractors Combined

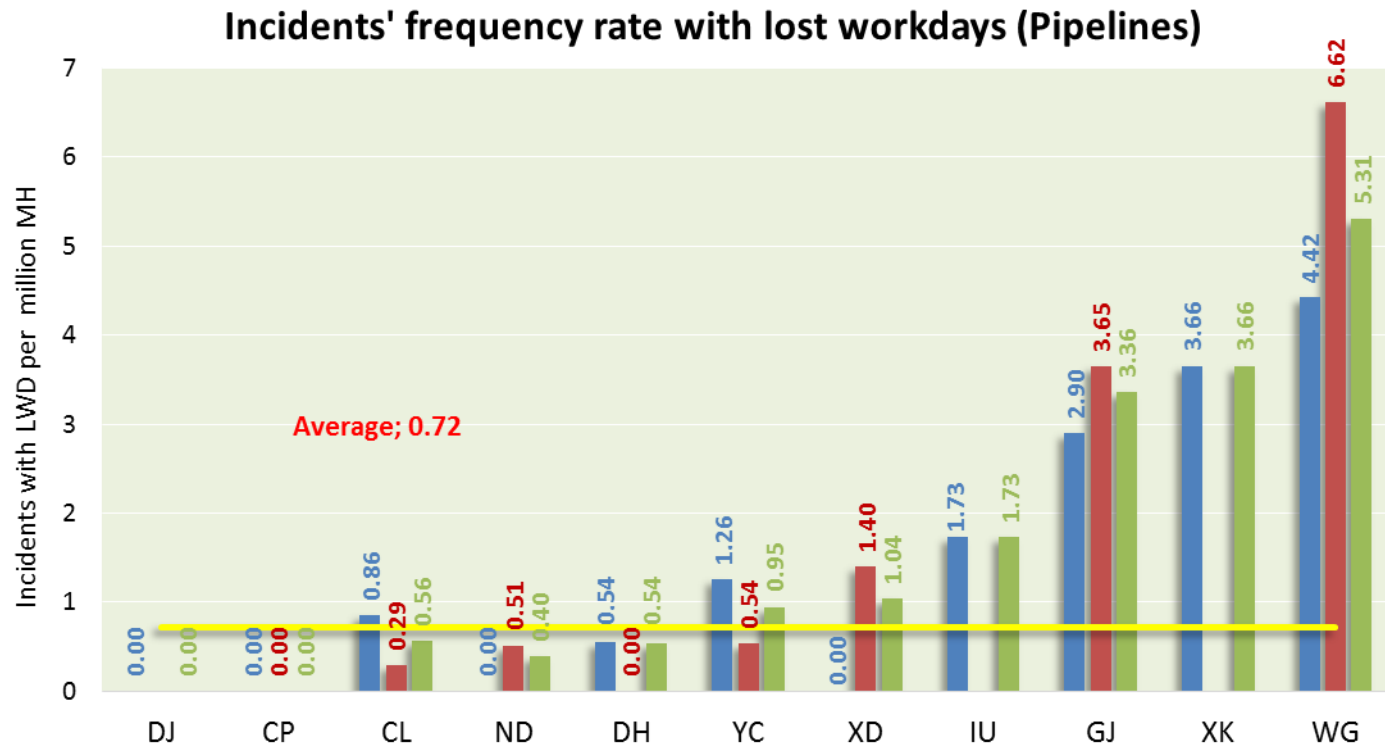
# Incidents' gravity rate by Company (Pipelines)



- Incidents' gravity rate in pipelines was 23.99 incidents per million hours worked. This figure is around the average of the last 5 years.
- This rate was much higher for company workers (43.14) than contractors (10.76)

Company Contractors Combined

# Incidents' frequency rate with lost workdays (Pipelines)



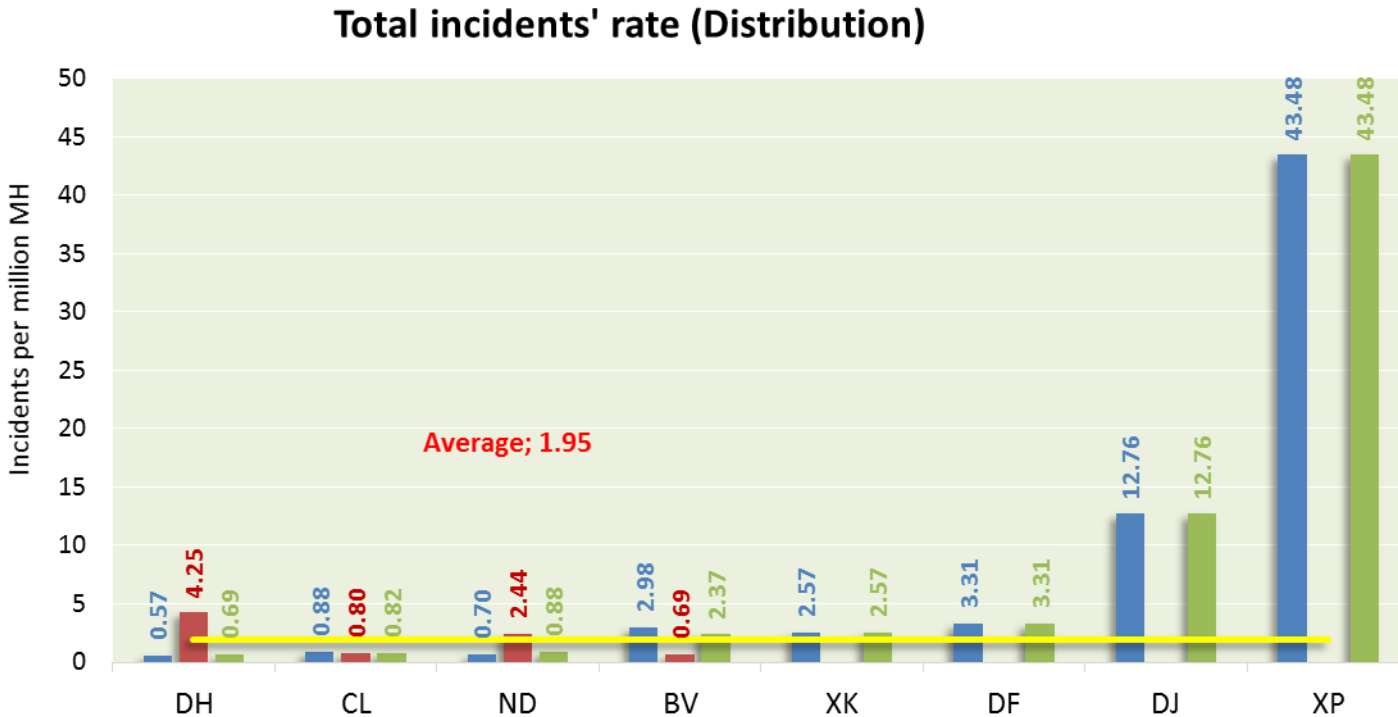
- The average incidents' frequency rate with lost workdays was 0.72 per million hours worked.
- As it happens with the gravity rate for this function, this indicator is much higher for company workers (0.99) than contractors (0.39)

Company Contractors Combined

## Fatalities' rate by company (pipelines)

- Only 1 fatality was reported in pipelines. It was a company worker.
- Only the company DH reported fatalities in pipelines. The average was 0.068 fatalities per million hours worked.

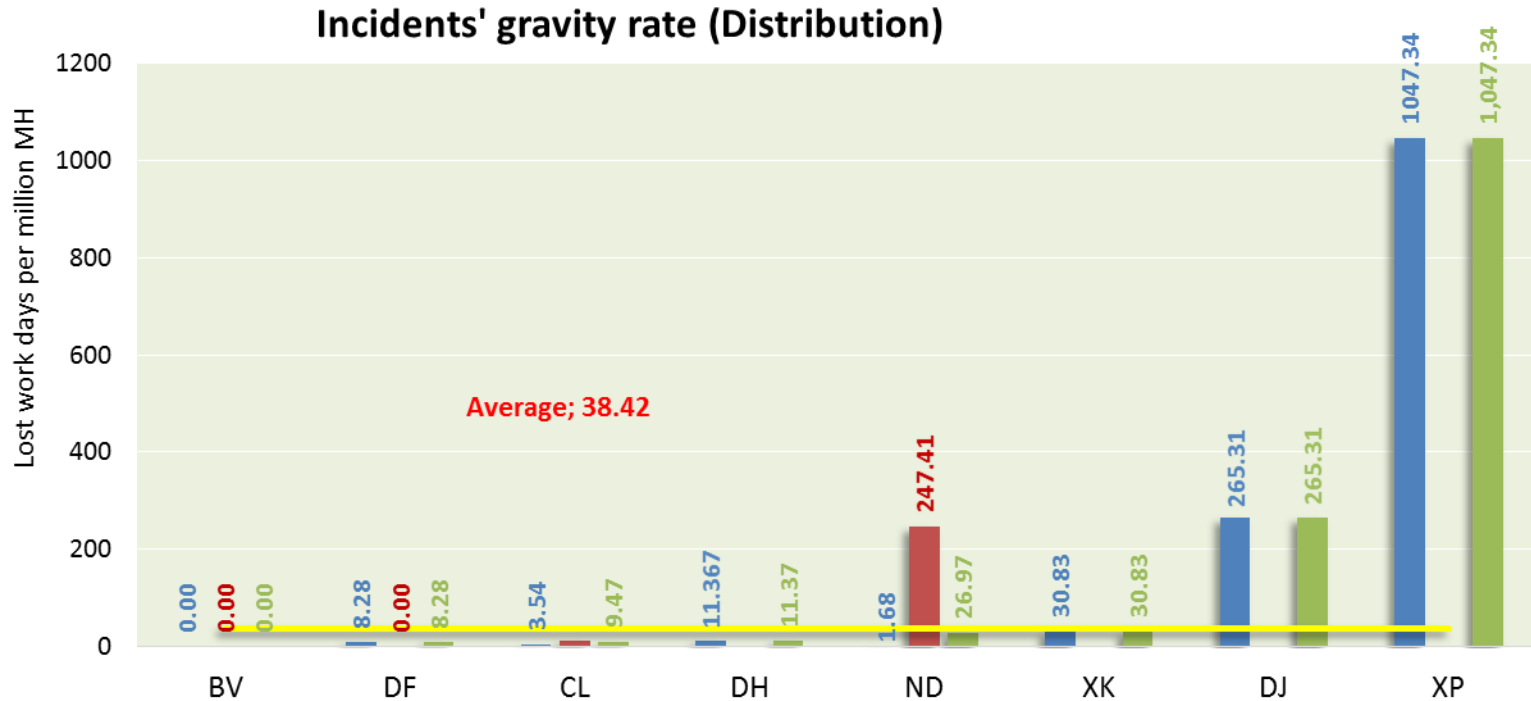
# Total incidents' rate by Company (Distribution)



- Total incidents' average in Distribution was 1.95 per million hours worked
- The rate was 2.30 for company workers and 1.06 for contractors.

Company Contractors Combined

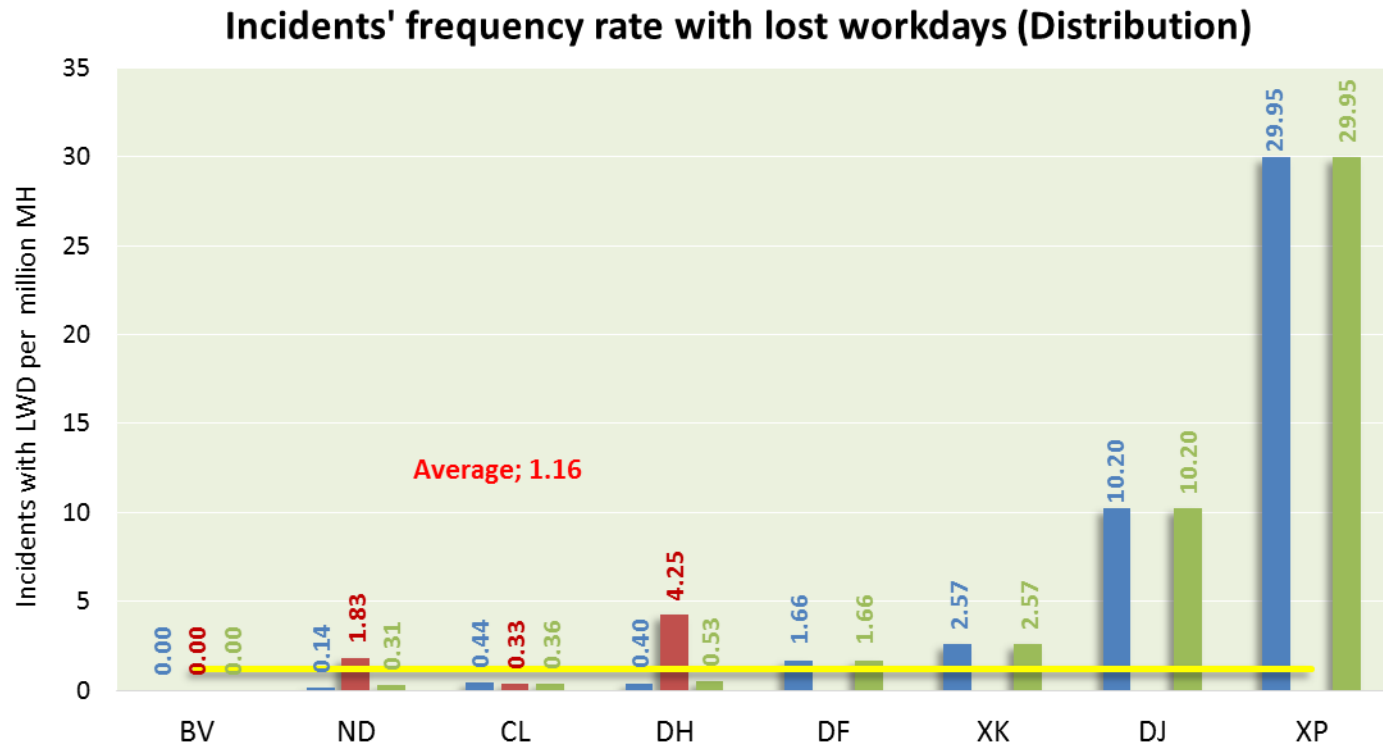
# Incidents' gravity rate by company (Distribution)



- Incidents' gravity rate for Distribution was 38.42 lost workdays per million hours worked
- There is a high dispersion, with two companies well above the rest.

Company   Contractors   Combined

# Incidents' frequency rate with lost workdays (Distribution)



- Incidents' frequency rate with lost workdays was 1.16 per million hours worked.
- The rate was 1.38 for company workers and 0.59 for contractors.

Company Contractors Combined

## Fatalities' rate by company (Distribution)

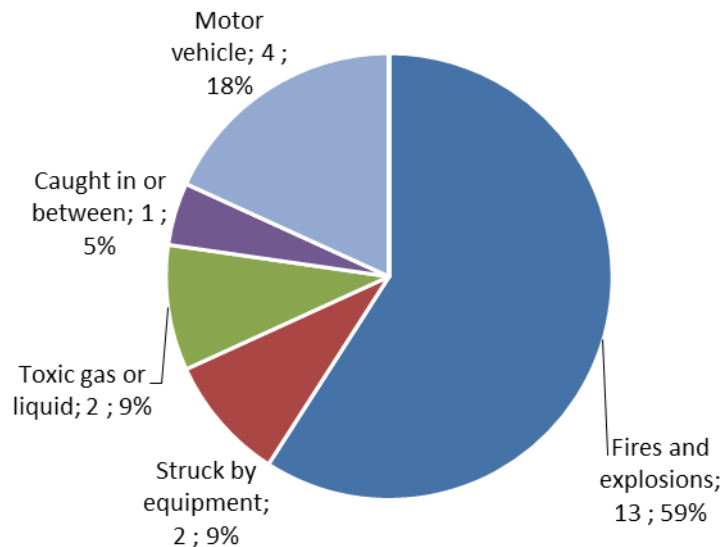
- 4 fatal incidents (3 of them involving multiple fatalities) and 11 fatalities were reported in Distribution.
- 6 of them were company workers and 5 were contractors.
- The company DH showed a rate of 4.25 fatalities per million hours worked in contractors, 0.17 in company workers and 0.30 combined.



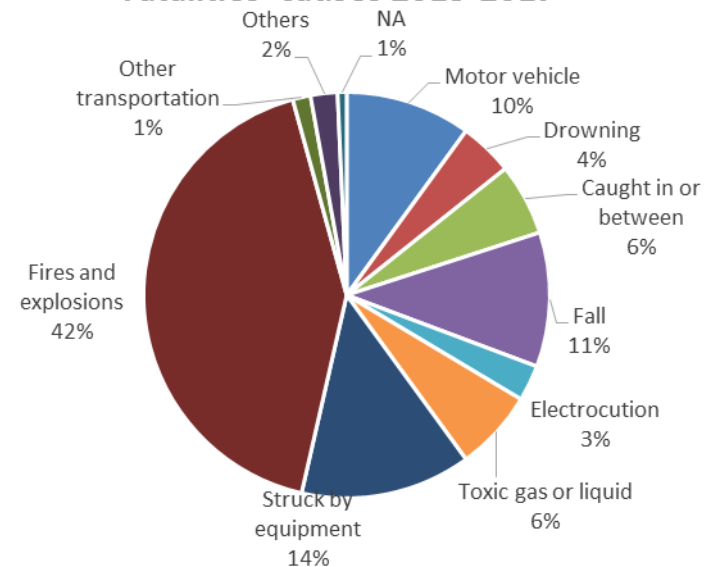
# Fatalities

- 22 fatalities and 13 fatal incidents were reported in 2017
- 12 fatalities correspond to company workers and 10 to contractors
- In most cases (13 cases; 59%) the cause was “fires and explosions”
- In the last 5 years, fires and explosions was thae main fatalities' cause with 59 fatalities (42% of total), followed by “struck by equipment” (14%), “fall” (11%) and “land transportation” (10%)
- This reinforces the need to work on process safety

## Fatalities' causes 2017



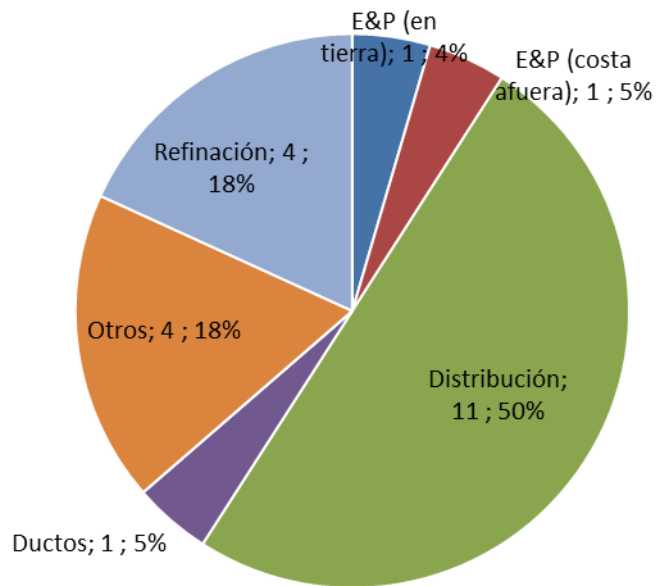
## Fatalities' causes 2013-2017



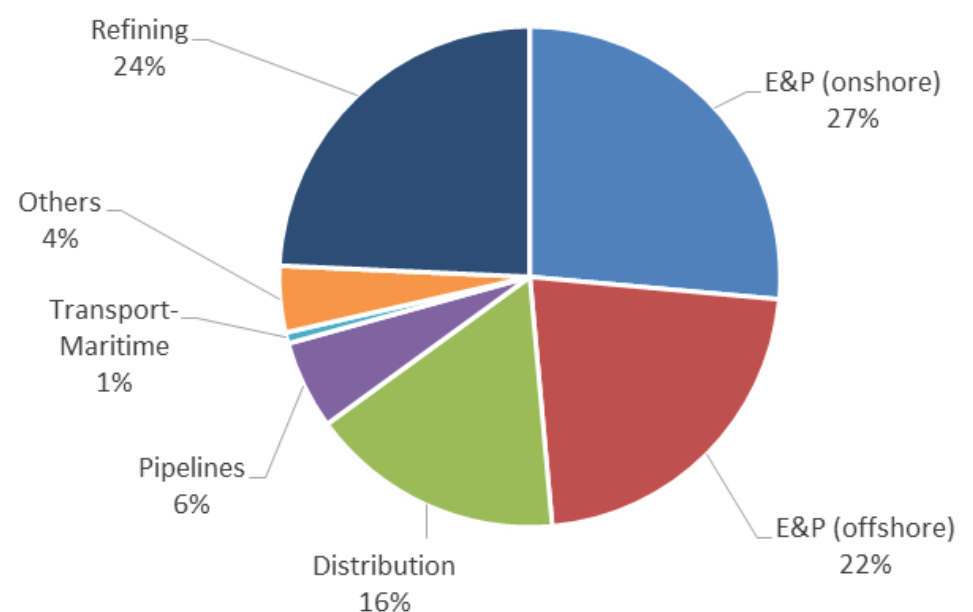
# Fatalities by Function

- In 2017, Distribution was the function which reported the most amount of fatalities (11). This derived from 4 incidents, 3 of them involving multiple fatalities.
- However, in the last 5 years, 49% of fatalities were reported in E&P and 24% in refining.

**Fatalities by function**



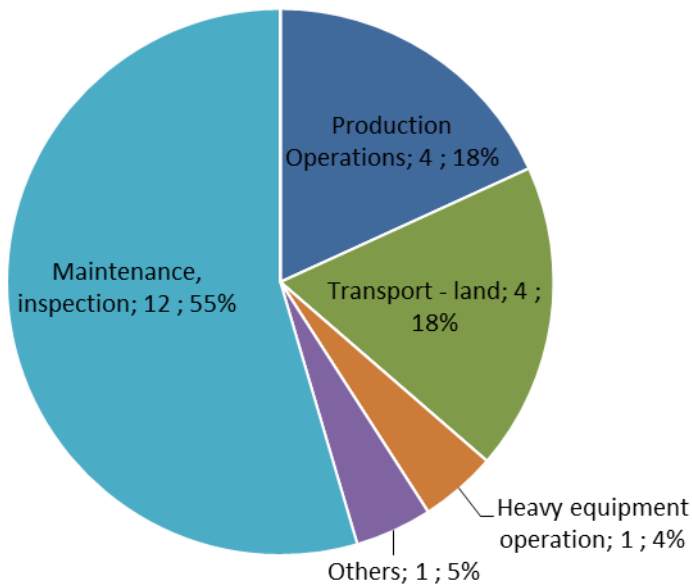
**Fatalidades por Función 2013-2017**



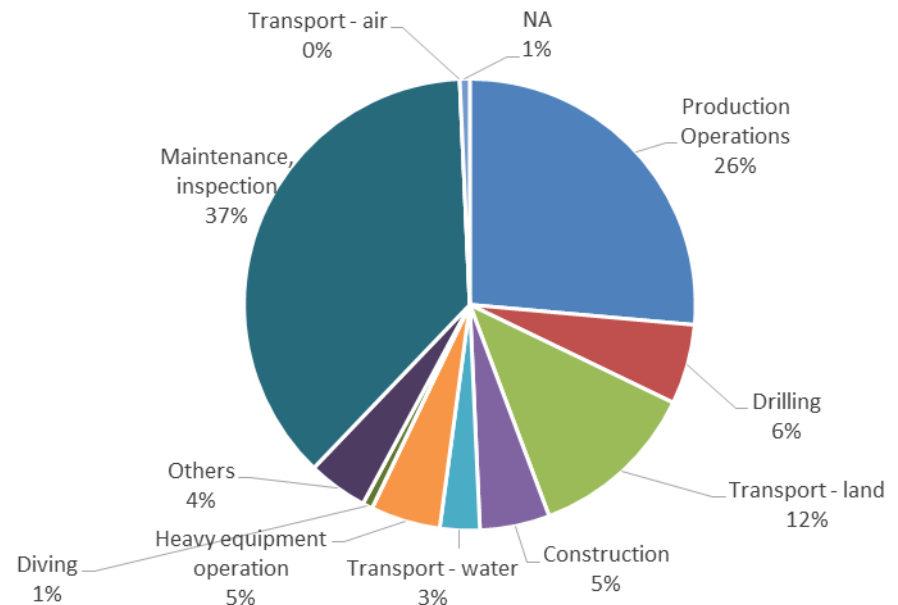
# Fatalities by type of activity

- Regarding fatalities by type of activity, the one that reported the most was “inspection and maintenance” (12 cases, 55%), followed by “operations” and “land transportation” (4 cases and 18% each)
- Incidents by type of activity followed the historical trend. In the last 5 years the activities that caused the most fatalities was “inspection and maintenance (37%), operations (26%) and land transportation (12%)

**Fatalities by activity**

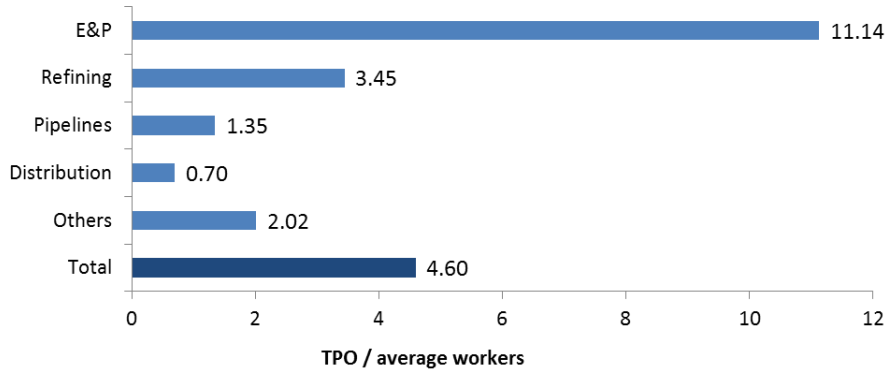


**Fatalidades por Tipo de Actividad 2013-2017**

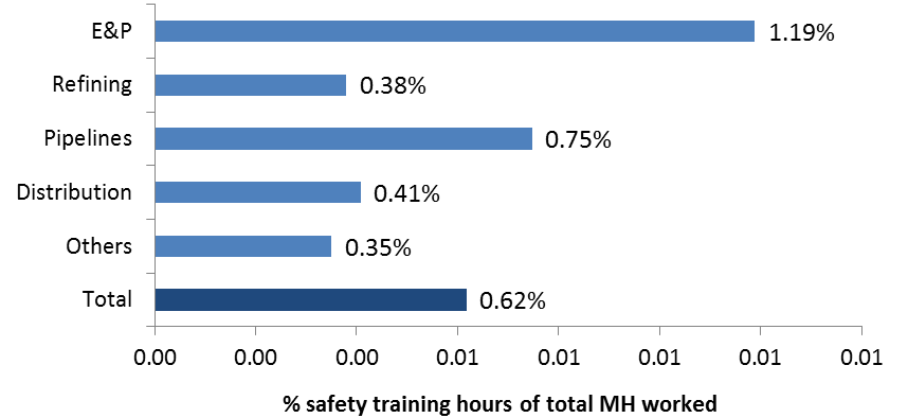


# Proactive Indicators

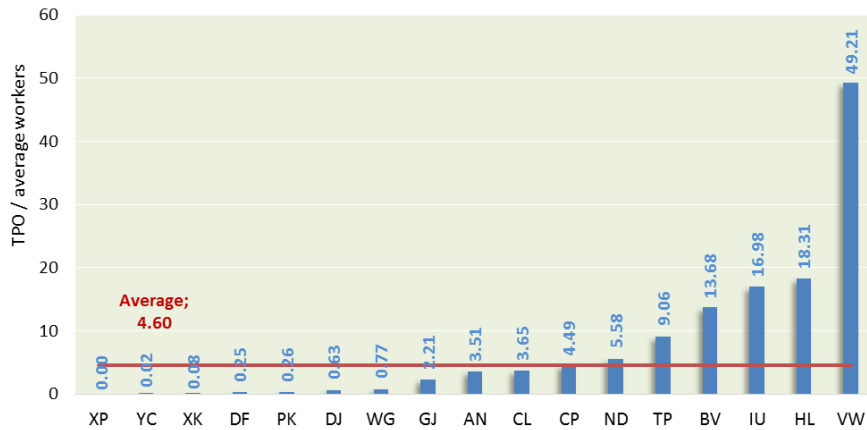
### Task Planned Observations



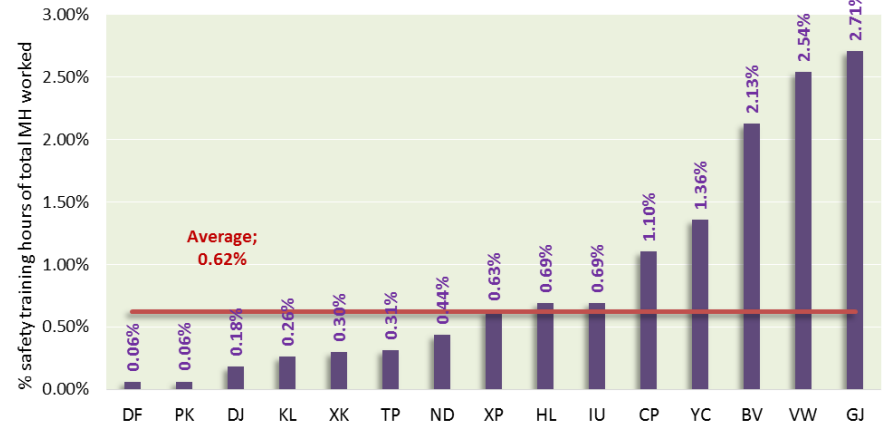
### Safety training intensity



### Task Planned Observations



### Safety training intensity



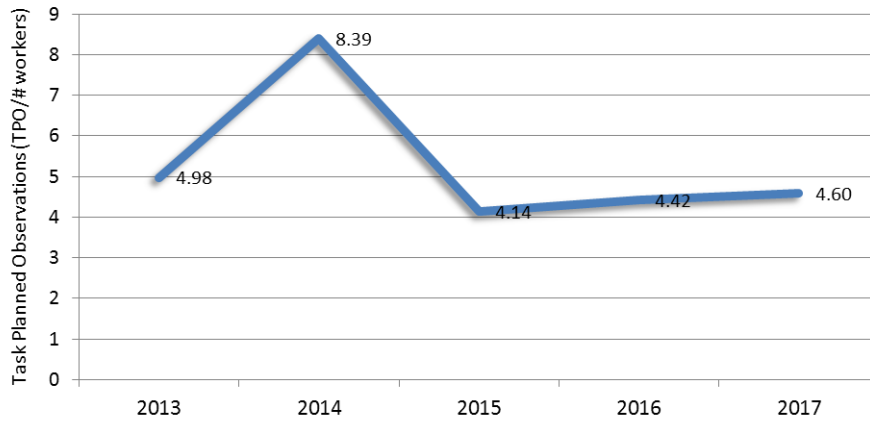
# Indicadores Proactivos

Task Planned Observations (company)													
Function	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
E&P	1.83	1.07	1.28	1.01	4.87	1.45	3.12	8.69	7.76	17.98	6.39	8.87	11.14
Refining	2.21	0.99	1.60	2.51	7.05	15.93	5.22	4.06	5.36	6.69	4.71	4.61	3.45
Pipelines	1.18	1.59	0.92	1.25	2.42	3.81	1.98	2.05	2.56	4.16	2.97	2.53	1.35
Distribution	2.63	1.36	1.38	1.64	1.24	1.01	1.88	2.02	2.29	1.07	4.45	0.88	0.70
Others	0.28	1.44	0.57	1.41	3.23	1.29	2.19	2.56	2.98	2.64	2.16	1.99	2.02
<b>Total</b>	<b>1.96</b>	<b>1.15</b>	<b>1.12</b>	<b>1.35</b>	<b>3.93</b>	<b>3.70</b>	<b>3.27</b>	<b>4.59</b>	<b>4.98</b>	<b>8.39</b>	<b>4.14</b>	<b>4.42</b>	<b>4.60</b>

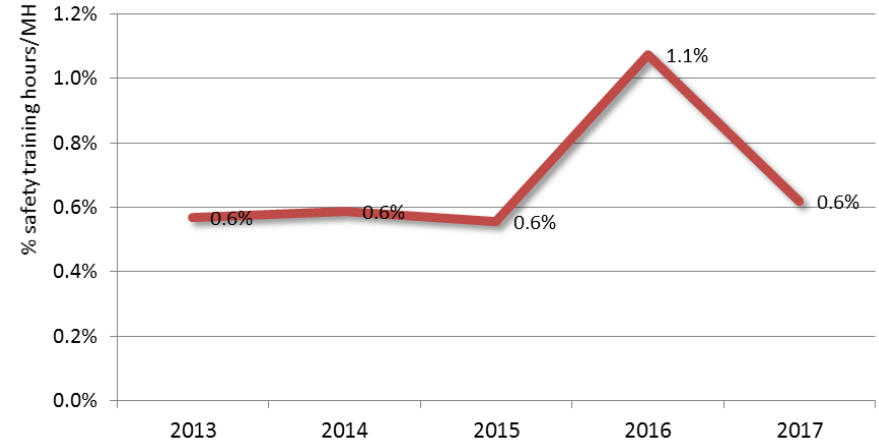
Safety Training Intensity (company)													
Function	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
E&P	0.6%	0.2%	0.2%	0.1%	0.1%	0.3%	0.3%	0.3%	0.5%	0.6%	0.4%	2.3%	1.2%
Refining	0.3%	0.3%	0.2%	0.2%	0.3%	0.8%	0.4%	0.6%	0.8%	0.8%	0.7%	0.8%	0.4%
Pipelines	0.1%	2.5%	1.2%	1.7%	0.2%	2.5%	1.0%	0.4%	1.0%	0.9%	1.3%	1.1%	0.7%
Distribution	0.1%	0.1%	0.1%	1.1%	0.1%	0.2%	0.2%	0.3%	0.6%	0.6%	0.4%	0.5%	0.4%
Others	0.2%	0.1%	0.0%	0.1%	0.3%	0.3%	0.2%	0.4%	0.6%	0.2%	0.3%	0.6%	0.4%
<b>Total</b>	<b>0.4%</b>	<b>0.2%</b>	<b>0.2%</b>	<b>0.2%</b>	<b>0.2%</b>	<b>0.5%</b>	<b>0.3%</b>	<b>0.4%</b>	<b>0.6%</b>	<b>0.6%</b>	<b>0.6%</b>	<b>1.1%</b>	<b>0.6%</b>

# Proactive Indicators

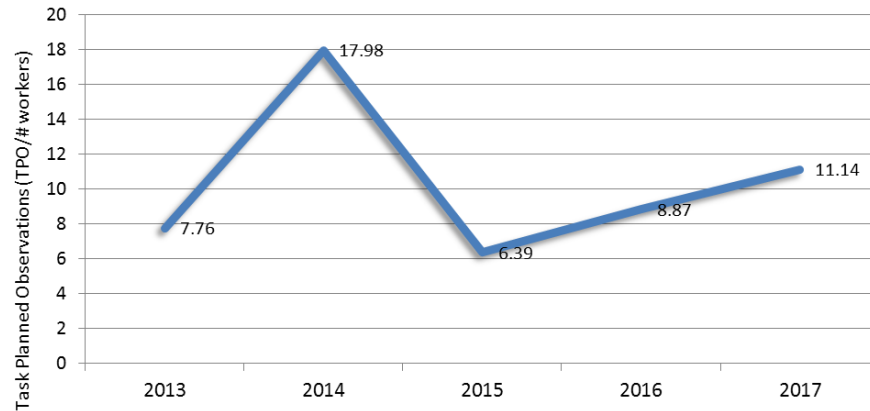
### Task Planned Observations (total)



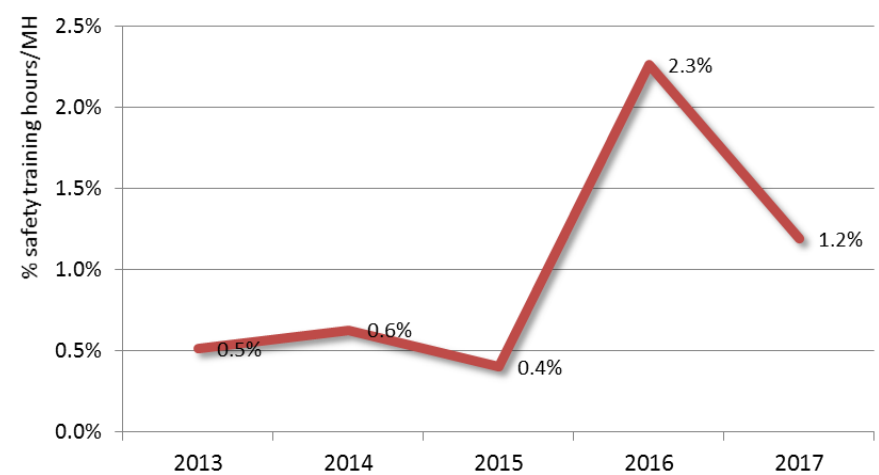
### Safety Training Intensity (total)



### Task Planned Observations (E&P)

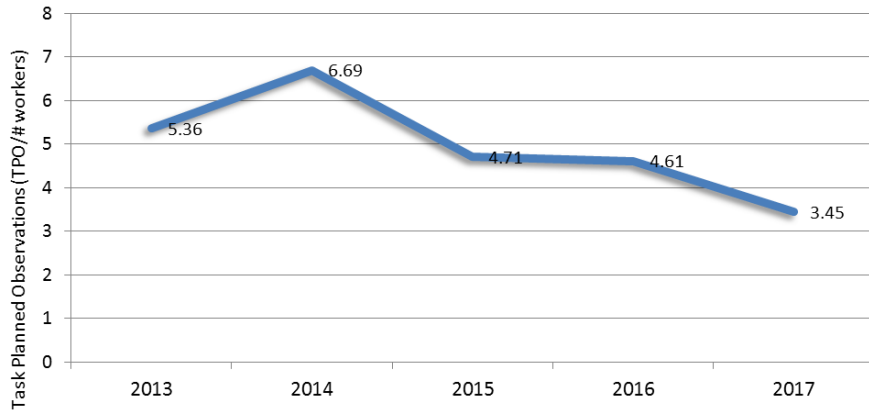


### Safety Training Intensity (E&P)

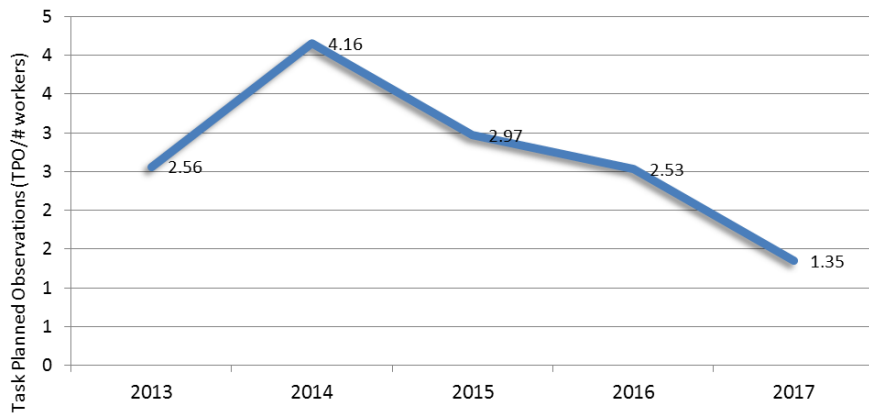


# Proactive Indicators

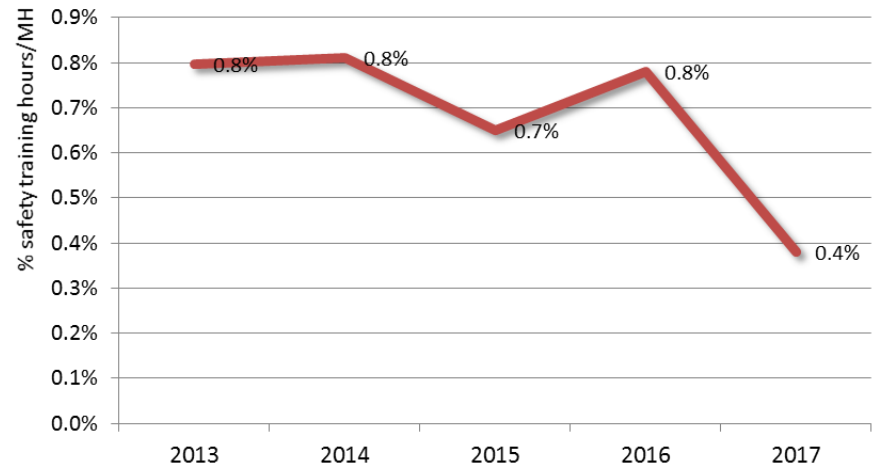
### Task Planned Observations (Refining)



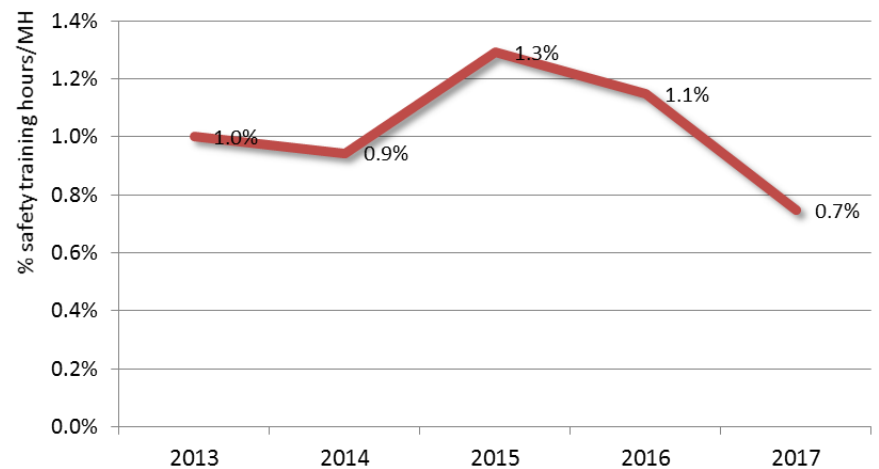
### Task Planned Observations (Pipelines)



### Safety Training Intensity (Refining)

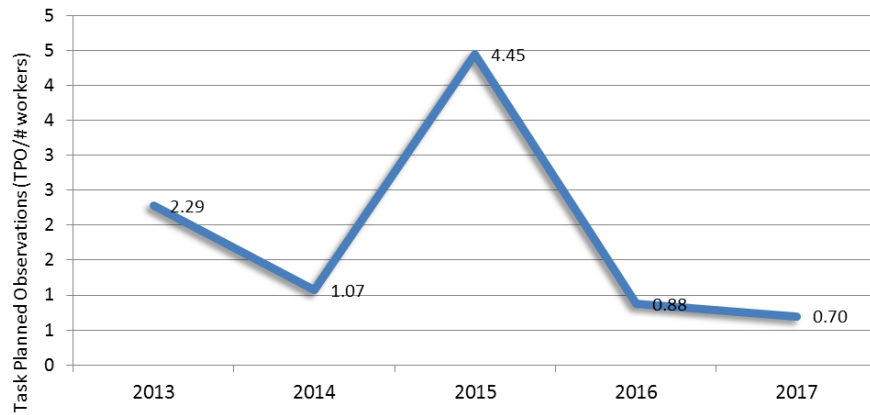


### Safety Training Intensity (Pipelines)

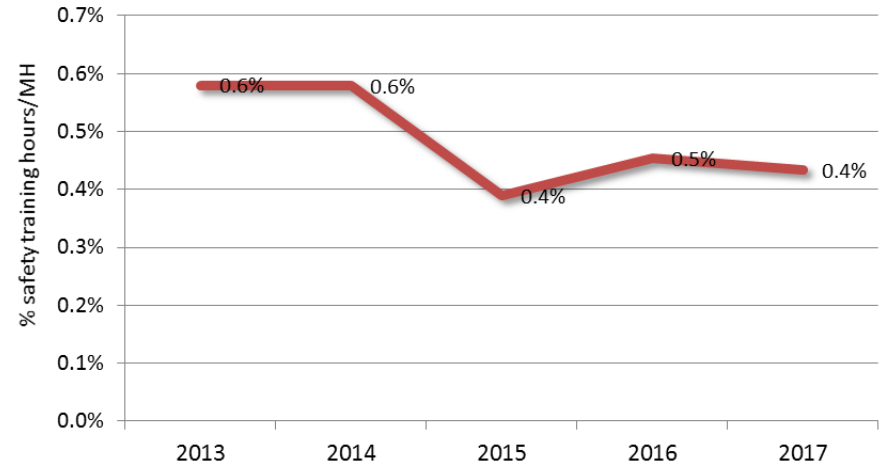


# Proactive Indicators

## Task Planned Observations (Distribution)



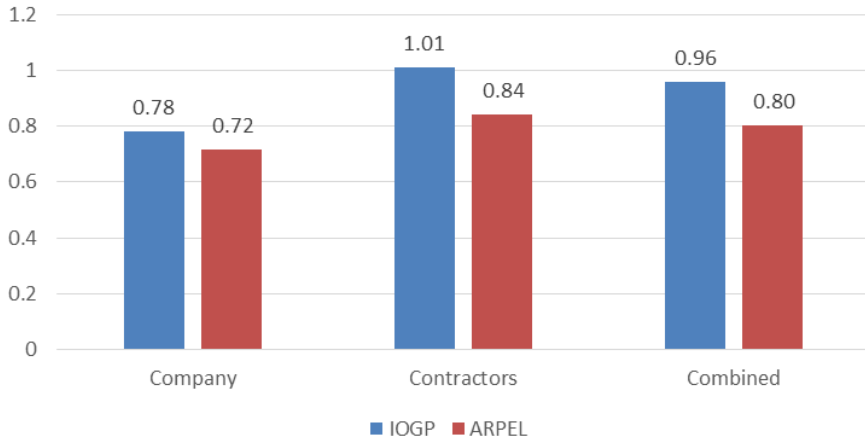
## Safety Training Intensity (Distribution)



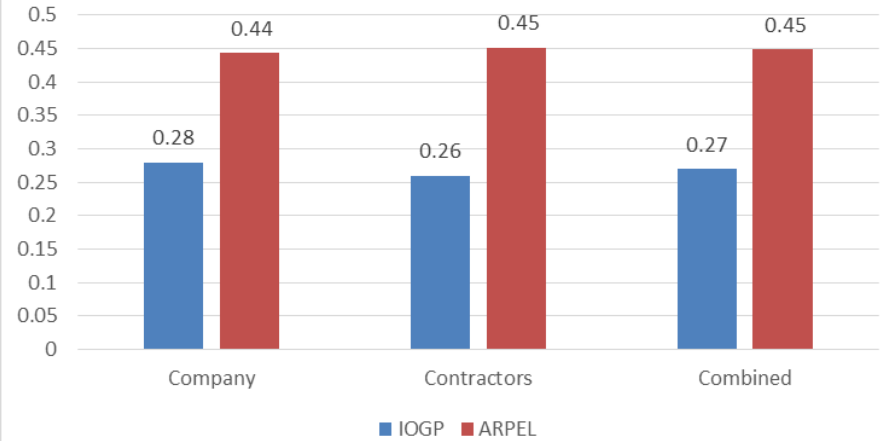


# Comparison ARPEL/IOGP (E&P)

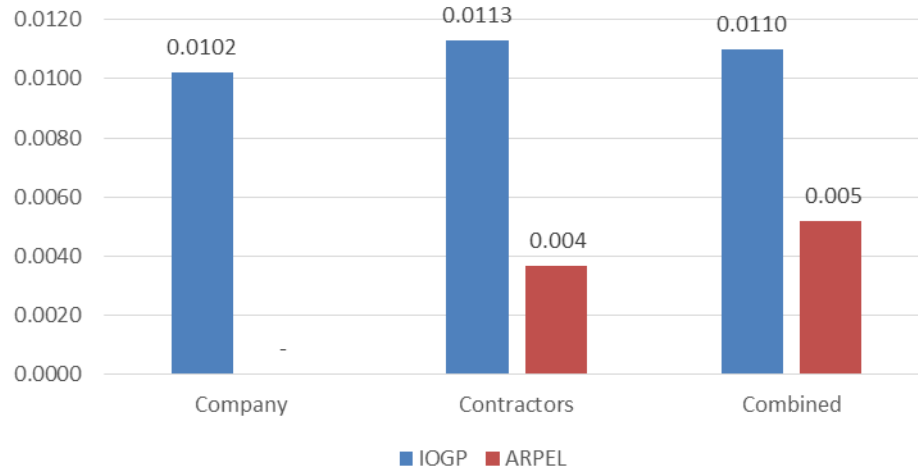
### Recordable Cases



### Cases with lost workdays



### Fatalities



# Annex: Global Indicators

## Globals

Category	Function	# workers	# incidents TIR	MH TIR	# days IGR	MH GRAV	# incidents LWDC	MH LWDC	# incidents FAT	MH FAT	TIR	GRAV	LWDC	FAT
Company	E&P	68,035	115	160,286	3,790	160,286	71	160,286	0	160,286	0.72	23.65	0.44	0.000
Company	Refining	54,548	140	124,378	3,101	124,378	90	124,378	4	124,378	1.13	24.93	0.72	0.032
Company	Pipelines	20,334	49	43,253	1,062	24,618	43	43,253	1	43,253	1.13	43.14	0.99	0.023
Company	Transport-Maritime	8,610	29	9,597	480	9,597	21	9,597	0	9,597	3.02	50.02	2.19	0.000
Company	Distribution	30,868	148	64,366	2,759	64,366	89	64,366	6	64,366	2.30	42.86	1.38	0.093
Company	Others	72,203	97	158,825	2,517	158,825	90	158,825	1	158,825	0.61	15.85	0.57	0.006
Company	Total	<b>254,598</b>	<b>578</b>	<b>560,705</b>	<b>13,709</b>	<b>542,070</b>	<b>404</b>	<b>560,705</b>	<b>12</b>	<b>560,705</b>	<b>1.03</b>	<b>25.29</b>	<b>0.72</b>	<b>0.021</b>
			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				
Category	Function	# workers	# incidents TIR	MH TIR	# days IGR	MH GRAV	# incidents LWDC	MH LWDC	# incidents FAT	MH FAT	TIR	GRAV	LWDC	FAT
Contractors	E&P	156,049	322	385,520	16,569	265,811	174	385,520	2	385,520	0.84	62.33	0.45	0.005
Contractors	Refining	42,100	97	90,239	2,270	79,175	51	90,239	0	90,239	1.07	28.67	0.57	0.000
Contractors	Pipelines	18,422	36	35,714	383	35,608	14	35,714	0	35,714	1.01	10.76	0.39	0.000
Contractors	Transport-Maritime	0	0	0	0	0	0	0	0	0	NA	NA	NA	NA
Contractors	Distribution	13,199	27	25,461	647	24,284	15	25,461	5	25,461	1.06	26.64	0.59	0.196
Contractors	Others	69,590	167	138,636	5,854	136,513	96	138,636	3	138,636	1.20	42.88	0.69	0.022
Contractors	Total	<b>299,360</b>	<b>649</b>	<b>675,570</b>	<b>25,723</b>	<b>541,391</b>	<b>350</b>	<b>675,570</b>	<b>10</b>	<b>675,570</b>	<b>0.96</b>	<b>47.51</b>	<b>0.52</b>	<b>0.015</b>
			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				
Category	Function	# workers	# incidents TIR	MH TIR	# days IGR	MH GRAV	# incidents LWDC	MH LWDC	# incidents FAT	MH FAT	TIR	GRAV	LWDC	FAT
Combined	E&P	224,084	437	545,806	20,359	426,097	245	545,806	2	545,806	0.80	47.78	0.45	0.004
Combined	Refining	96,648	237	214,617	5,371	203,553	141	214,617	4	214,617	1.10	26.39	0.66	0.019
Combined	Pipelines	38,756	85	78,967	1,445	60,226	57	78,967	1	78,967	1.08	23.99	0.72	0.013
Combined	Transport-Maritime	8,610	29	9,597	480	9,597	21	9,597	0	9,597	3.02	50.02	2.19	0.000
Combined	Distribution	44,067	175	89,827	3,406	88,650	104	89,827	11	89,827	1.95	38.42	1.16	0.122
Combined	Others	141,793	264	297,461	8,371	295,338	186	297,461	4	297,461	0.89	28.34	0.63	0.013
Combined	Total	<b>553,957</b>	<b>1,227</b>	<b>1,236,275</b>	<b>39,432</b>	<b>1,083,461</b>	<b>754</b>	<b>1,236,275</b>	<b>22</b>	<b>1,236,275</b>	<b>0.99</b>	<b>36.39</b>	<b>0.61</b>	<b>0.018</b>

## Offshore

Category	Function	# workers	# incidents TIR	MH TIR	# days IGR	MH GRAV	# incidents LWDC	MH LWDC	# incidents FAT	MH FAT	TIR	GRAV	LWDC	FAT
Company	E&P	9,480	31	29,000	1,359	29,000	27	29,000	0	29,000	1.07	46.86	0.93	0.000
Contractors	E&P	8,873	16	23,685	647	8,979	16	23,685	0	23,685	0.68	72.06	0.68	0.000
Combined	E&P	<b>18,353</b>	<b>47</b>	<b>52,685</b>	<b>2,006</b>	<b>37,979</b>	<b>43</b>	<b>52,685</b>	<b>0</b>	<b>52,685</b>	<b>0.89</b>	<b>52.82</b>	<b>0.82</b>	<b>0.000</b>

# Annex: Global Indicators

## Proactive indicators

Category	Function	# OPT	# workers TPO	# HFS (miles)	# HH FS	OPT	HFS
Company	E&P	323,019	29,002	287.8	24,206	11.14	1.19%
Company	Refining	77,935	22,620	76.1	20,031	3.45	0.38%
Company	Pipelines	18,117	13,397	62.0	8,304	1.35	0.75%
Company	Transport-Maritime	11	54	0.5	110	0.20	0.43%
Company	Distribution	9,514	13,649	92.2	22,565	0.70	0.41%
Company	Others	52,159	25,867	70.0	19,970	2.02	0.35%
Company	Total	<b>480,755</b>	<b>104,589</b>	<b>589</b>	<b>95,186</b>	<b>4.60</b>	<b>0.62%</b>



**Regional Headquarters:**

Av. Luis A. de Herrera 1248. WTC. Tower 2. 7<sup>th</sup> Floor. Of. 717.  
CP 11300. Montevideo, Uruguay  
Ph: (+598) 2623-6993 | [info@arpel.org.uy](mailto:info@arpel.org.uy)



BENCHMARKING

# Safety Benchmarking in the Oil and Gas Industry in Latin America and the Caribbean (2017 data)

