



Safety benchmarking in the oil and gas industry in Latin America and the Caribbean

2014 Statistics for ARPEL Member Companies



REGIONAL ASSOCIATION OF OIL, GAS AND BIOFUELS SECTOR COMPANIES IN
LATIN AMERICA AND THE CARIBBEAN



ARPEL REPORT

Safety benchmarking in the oil and gas industry in Latin America and the Caribbean

2014 Statistics for ARPEL Member Companies

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Report on Safety Benchmarking in the Oil and Industry for Latin America and the Caribbean - 2014
Statistics for ARPEL Member Companies
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The present report was prepared upon request of ARPEL and its Environment, Health and Safety Committee, by Camila Morales, Project Coordinator - ARPEL

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1. EXECUTIVE SUMMARY

This 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), broken down by business line (E&P, refining, pipelines, distribution and others) and by category (company and contractors), and also including historical data since 2002.

Scope:

For 2014, 21 companies detailed below shared their data, with a total coverage of 965 thousands employees and 2,222 million hours worked.

ANCAP – CHEVRON – ECOPETROL – ENAP – EP PETROECUADOR – EQUIÓN – HUNTOIL – OCENSA – PCJ – PEMEX – PETROAMAZONAS EP – PETROBRAS – PETROPERU – PETROTRIN – PLUSPETROL – RECOPE – REPSOL – STAATSOLIE – TECPETROL – YPF – YPFB

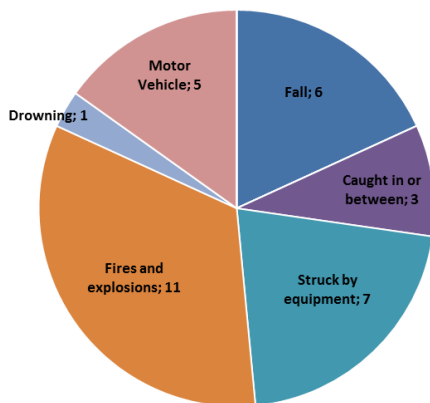
Reactive indicators:

Indicator	2012	2013	variation
Total incident rate	1.895	1.740	● -8%
Gravity rate	42.983	89.356	● 108%
Incidents w/LWD rate	0.760	0.839	● 10%
Fatalities rate	0.012	0.015	● 29%

Although the total incident rate continues to decline, registering in 2014 the lowest level since ARPEL began compiling statistics, the remaining reactive indicators analyzed in this report show an increase over those recorded in 2013,

highlighting the increase of 108% of lost work days per million hours worked.

Fatalities:



During 2014, 33 fatalities were registered representing a rate of 0,015 fatalities per million man-hours worked.

"Fires and Explosions" continues being the main cause of mortality since ARPEL began to keep records in 2001, representing in 2014 the 33% of the total of the fatalities for this year.

ARPEL's incident Database

In order to prevent and reduce fatal and high potential incidents that happen every year in the industry, ARPEL has a space for the exchange of information, only for members in its web page (www.arpel.org), in which you can see in detail the conditions, causes, failures, and lessons learned from safety incidents that have been recorded in the industry from 2010 to date.

The tool also includes an "Interactive Reports" section where statistics of fatal incidents in recent years are available. Fatal incidents may be viewed per year, per function, cause and type of activity.



2. INDICATORS (methodological note)

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** =
$$\frac{\text{Total number of safety training hours}}{\text{Hours worked (in millions)}} * 100$$

For further information on the indicators or definitions, please refer to the User Manual (6th edition 2012) or the glossary provided at the end of this Report.

Para más información sobre los indicadores o definiciones se debe consultar el Manual de Usuario (6ª edición 2012) o el glosario que se proporciona al final de este Informe.

Not all companies report data for the calculation of all the rates, either because they do not have the information in the required breakdown, or simply because the requested information does not apply to the company in question. The indicators are calculated with the data reported for each particular indicator, so the basis of calculation vary depending on the number of companies that have reported their data correctly for each particular indicator.

Overall data of the companies is shown, broken down by category (company/contractors), for all the controlled operations of the companies in Latin America and the Caribbean. Proactive indicators are calculated only for company employees.

In all cases, an analysis by business line and comparisons between companies is made.



3. SCOPE OF THE INFORMATION

As shown in the following table, 21 ARPEL member companies shared their 2014 safety data for this report.

Companies						
ANCAP	ENAP	HUNTOIL	PEMEX	PETROPERÚ	RECOPE	TECPETROL
CHEVRON	EP PETROECUADOR	OCENSA	PETROAMAZONAS EP	PETROTRIN	REPSOL	YPF
ECOPETROL	EQUIÓN	PCJ	PETROBRAS	PLUSPETROL	STAATSOLIE	YPFB

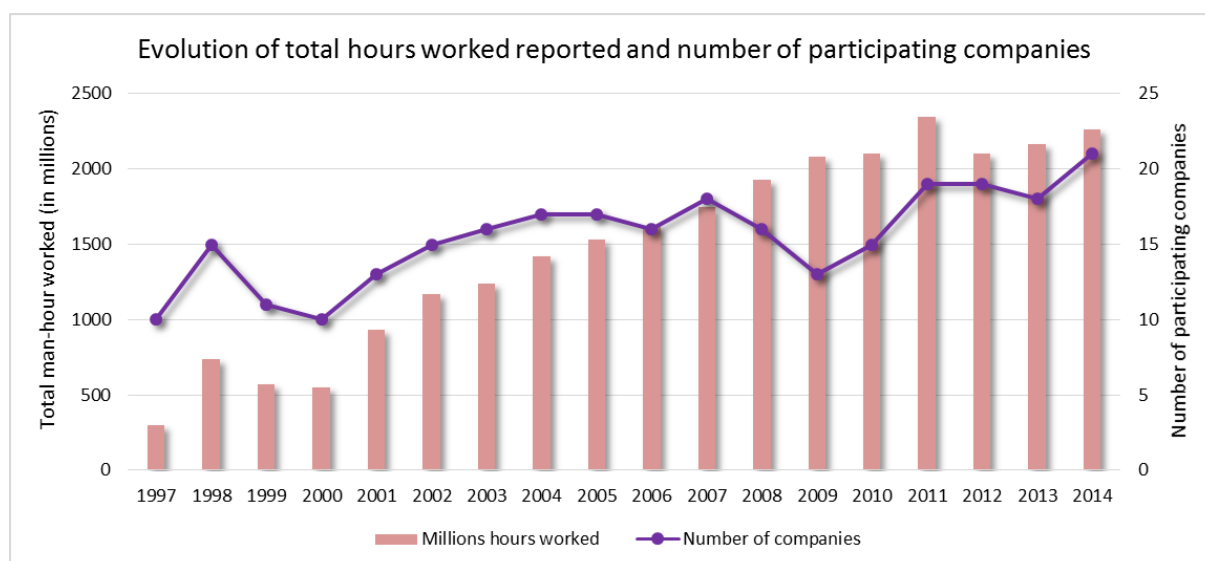
The following table shows the total number of employees and man-hours reported this year for this report.

A total of 965 thousands employees and 2,222 million hours were considered in this report, achieving a high representativeness of the oil and gas industry in Latin America and the Caribbean.

Function	# Companies	Company		Contractors		Total	
		Employees	MH	Employees	MH	Employees	MH
E&P	14	104.382	234.779	293.296	759.728	397.678	994.507
Refining	13	73.219	170.439	49.833	114.458	123.052	284.897
Pipelines	10	20.475	44.342	44.995	103.455	65.470	147.797
"Transport - maritime"	3	9.463	15.901	3.613	1.358	13.076	17.259
Distribution	8	26.906	59.375	18.583	35.320	45.489	94.695
Other	11	84.618	185.280	235.542	497.958	320.160	683.238
Total	21	319.063	710.116	645.862	1.512.277	964.925	2.222.392

MH: Man Hours worked

The data on maritime transportation are considered only in the total as there are not enough companies for an exclusive benchmarking of this business line. The data on the business line “others” is considered in the global data but a particular analysis is not made due to the heterogeneity of the activities included in that line.

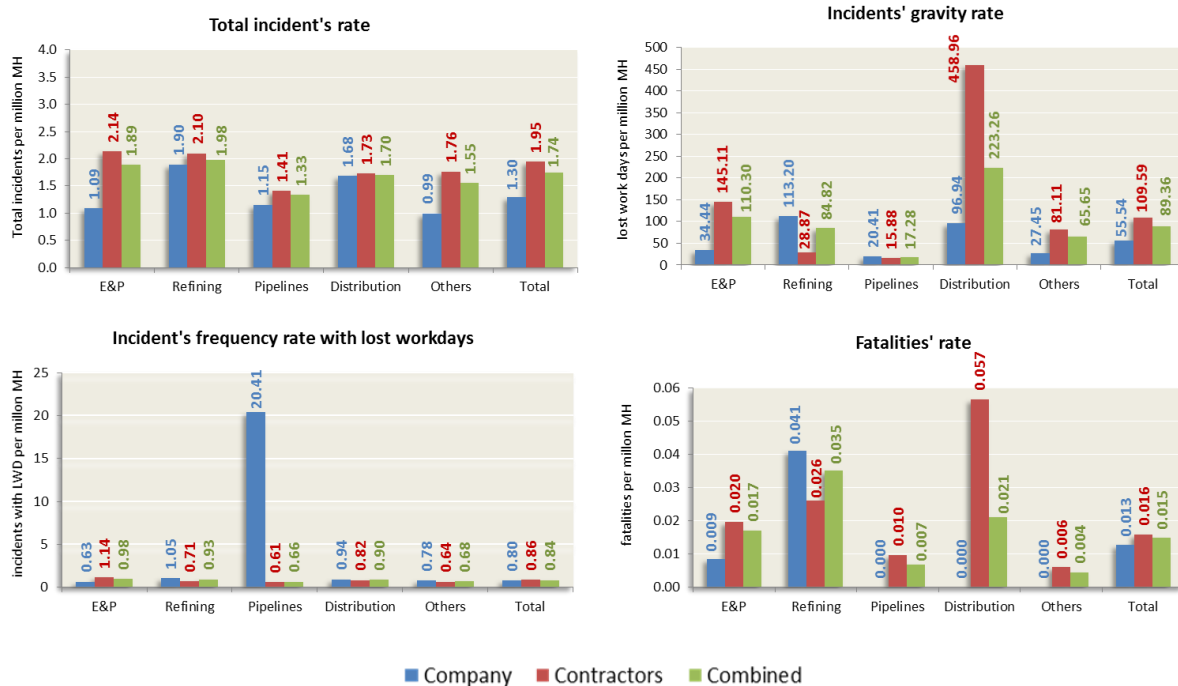




4. RESULTS

4.1. Overall results

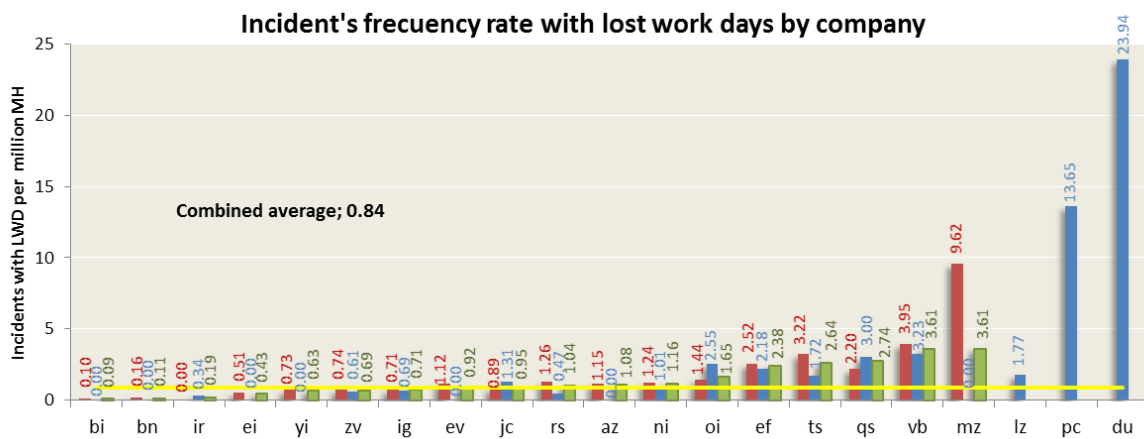
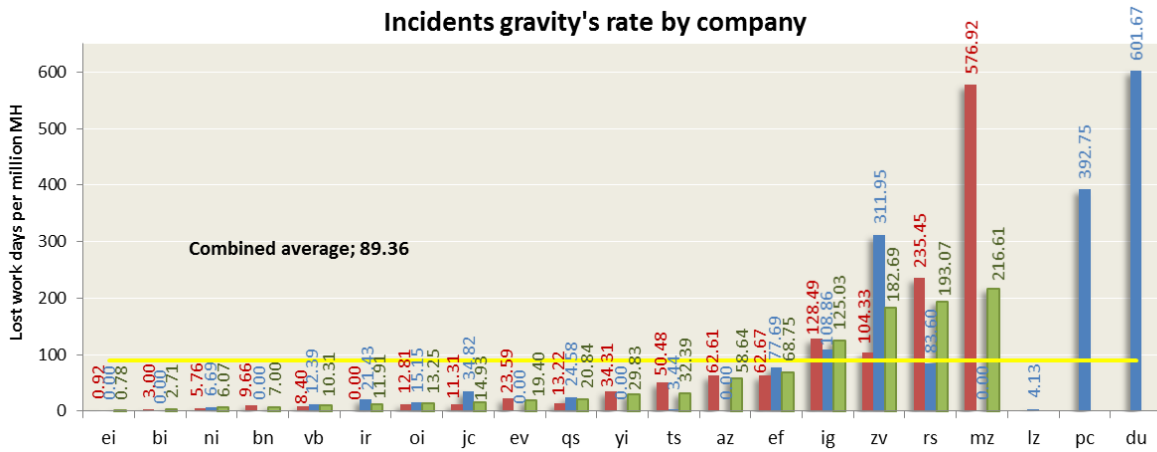
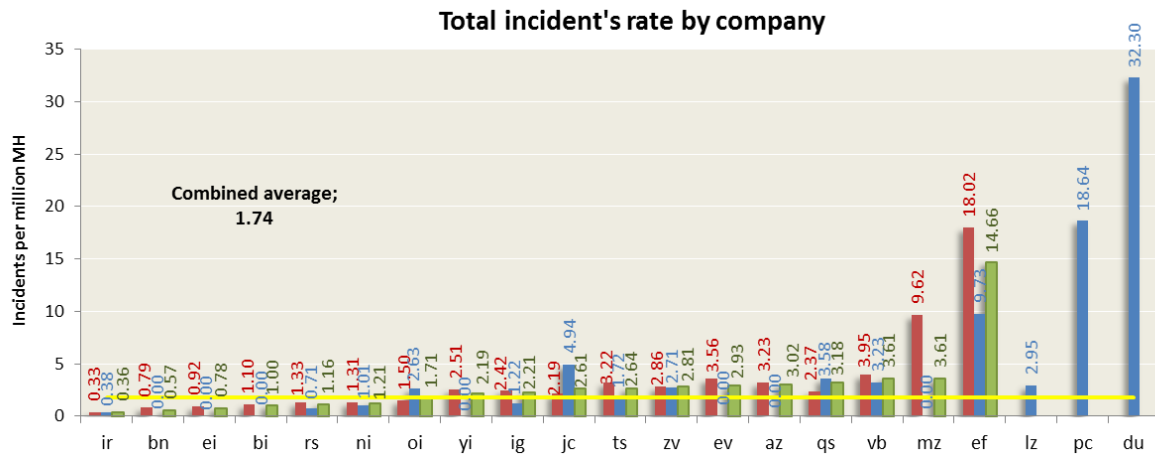
Below are the 2014 overall results for the four reactive indicators by business line and then by company.

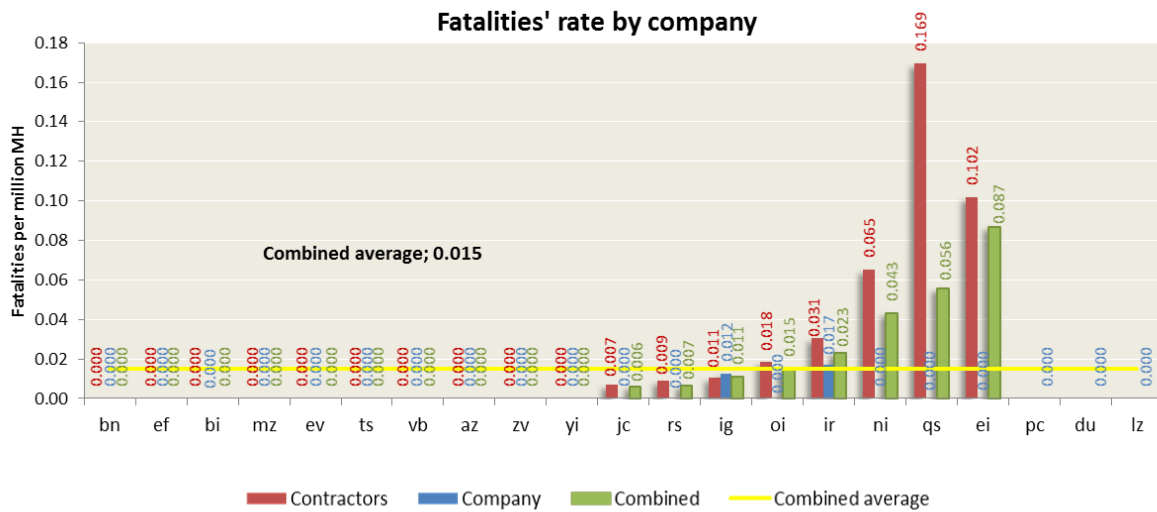


Refining was the business line with more incidents per million hours worked (1.98) and the biggest fatalities rate (0.035), distribution was the function the highest number of lost workdays -gravity- (223.26) while E&P was the business line with the biggest incident's frequency rate with lost workdays (0.98).

Following there is a breakdown by business line of the reactive indicators, sorted by descending order according to the combined average of each company (company + contractors).

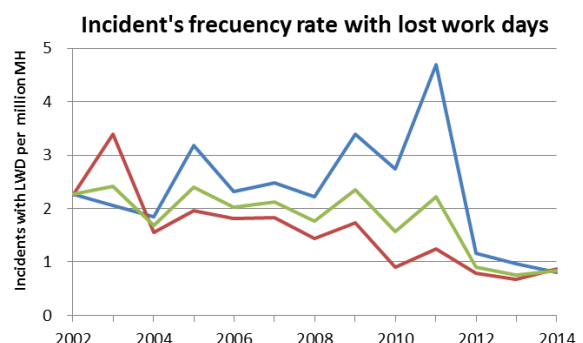
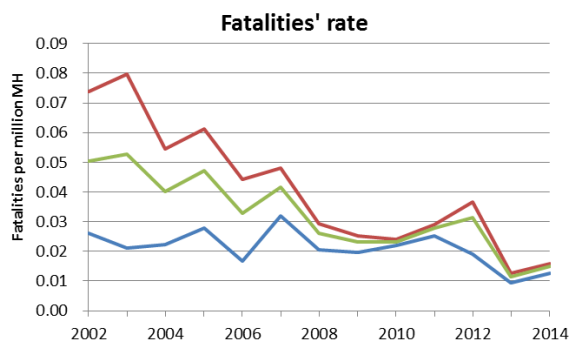
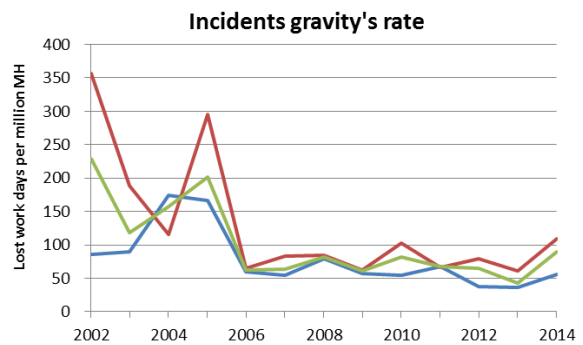
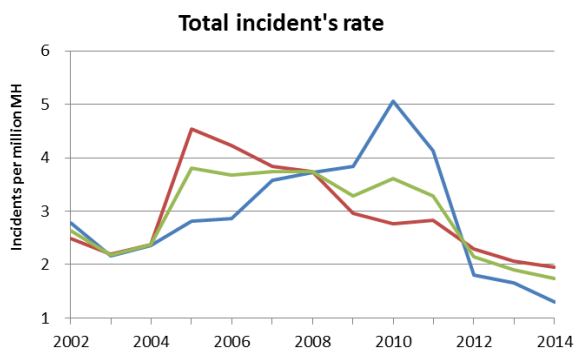
The combined indicator is only possible to be calculated for those companies that report their company data for their employees and contractors, so for those companies that shared only the information for company employees, only the company indicator is plotted and it will not be ordered along with the combined indicators.





4.1.1. Evolution of reactive indicators

The following four graphs show the evolution of reactive indicators since 2002.



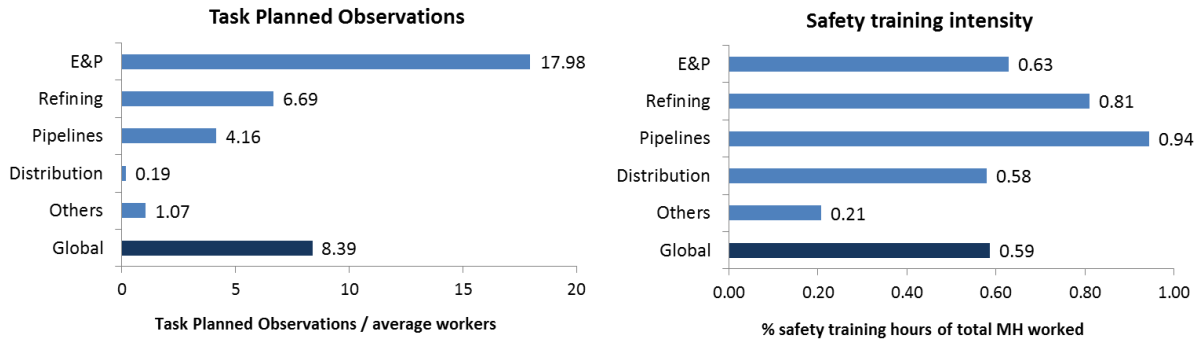
Legend: Company (blue), Contractors (red), Combined (green)



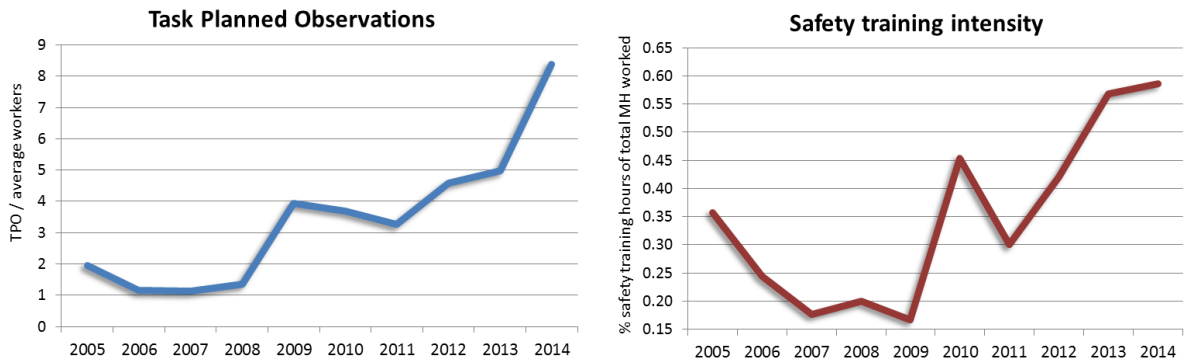
4.1.2. Proactive indicators

Finally, the proactive indicators are shown by business line (4.1.2), their global evolution since 2005 (4.1.2.1) and a comparison between companies for 2014 (4.1.2.2).

Both indicators recorded an increasing trend, which is desirable since it shows a growth in preventive measures such as training and task observation actions.



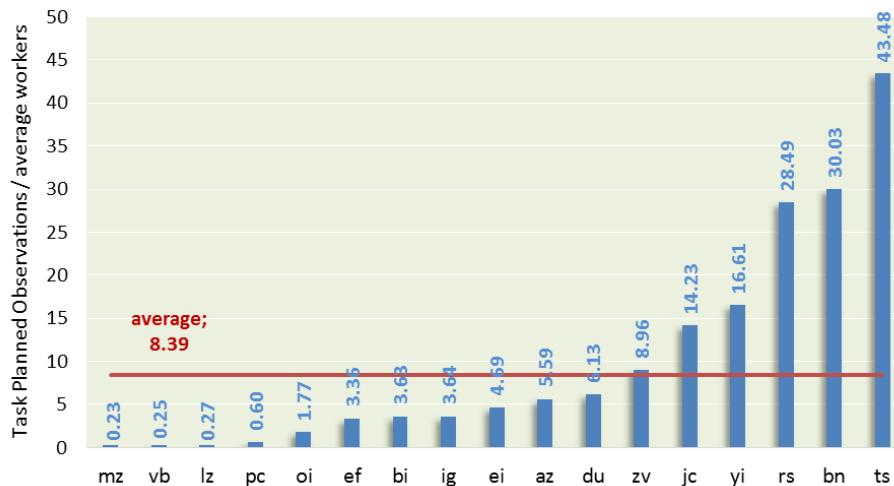
4.1.3. Evolution of proactive indicators



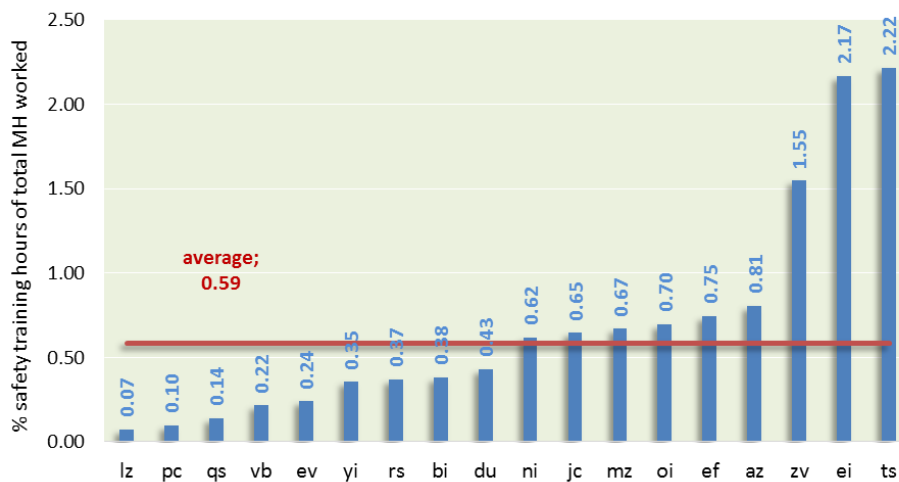


4.1.4. Proactive indicators by company

Task Planned Observations



Safety training intensity



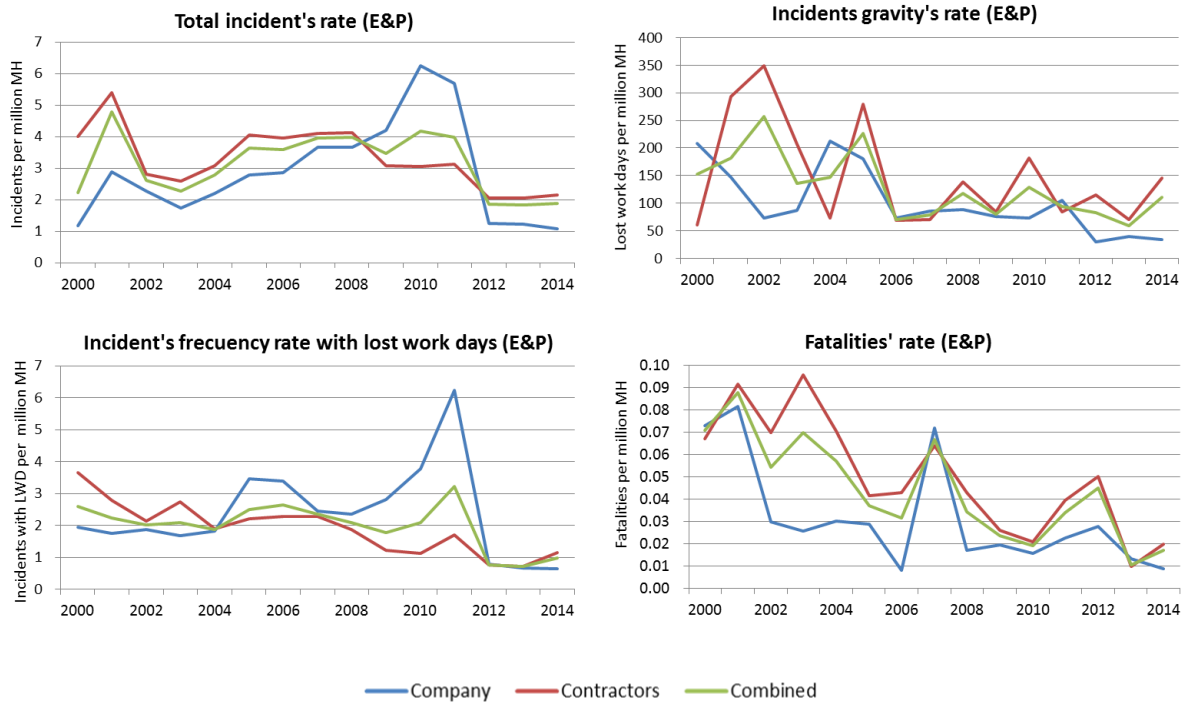
4.2. Exploration and Production

Below is the evolution of the reactive indicators (4.2.1), a comparison between companies for the year 2014 (4.2.2), as well as the causes of fatalities of ARPEL for the function E&P (4.2.3). Finally, in section 4.2.4, a historical evolution of proactive indicators for the mentioned business line is presented.

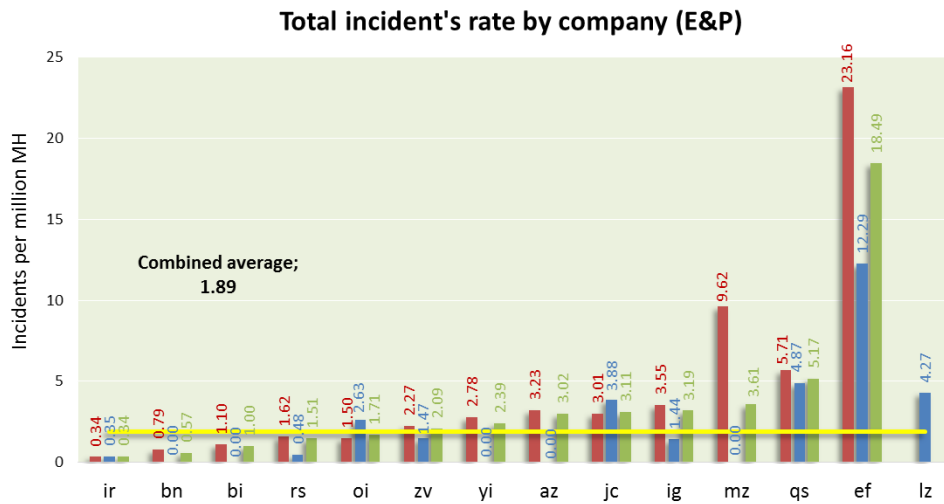
E&P total data includes offshore operations, in sections 4.2.4 and 4.2.5 there is an analysis of the historical evolution and comparisons between companies of the reactive indicators only for E&P offshore.



4.2.1. Evolution of proactive indicators (E&P total)

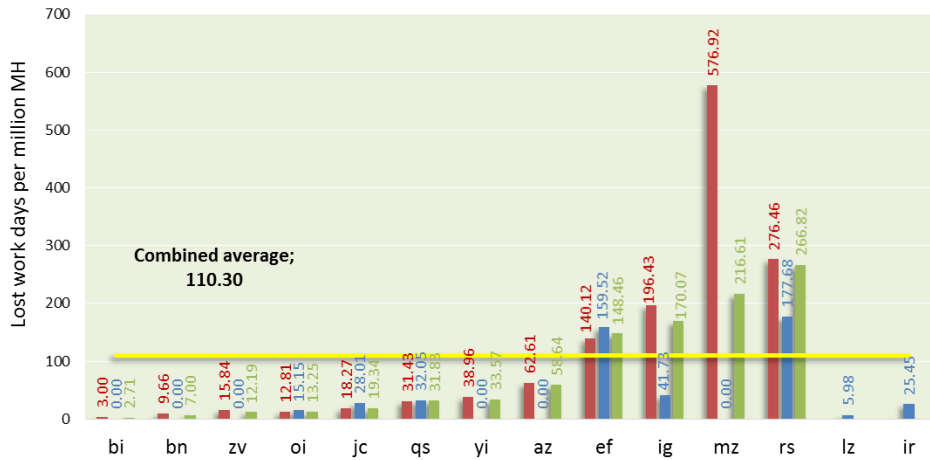


4.2.2. Reactive indicators by company (E&P total)

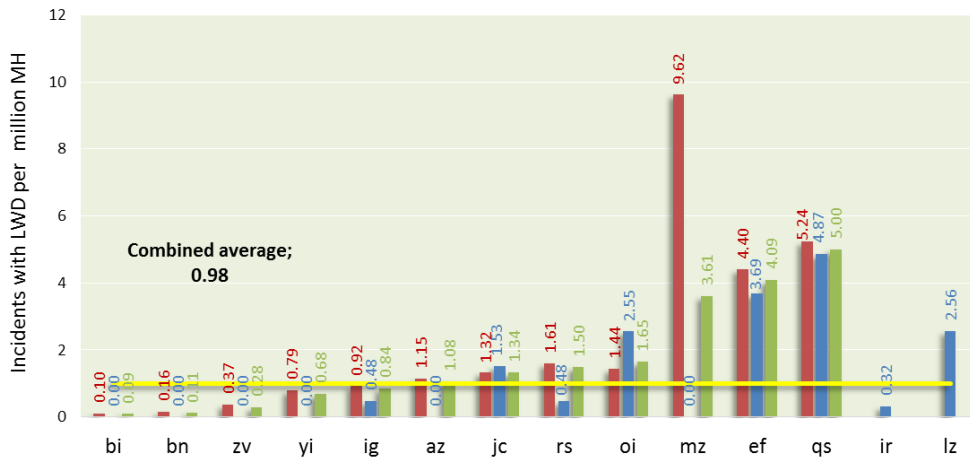




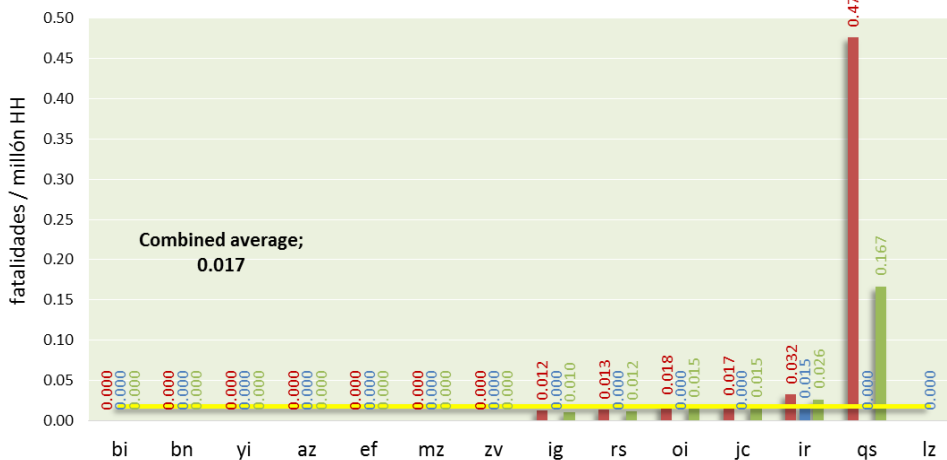
Incidents gravity's rate by company (E&P)



Incident's frequency rate with lost work days by company (E&P)



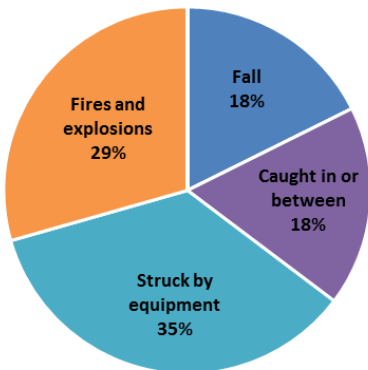
Fatalities' rate by company (E&P)



Contratistas Compañía Combinado Promedio Combinado

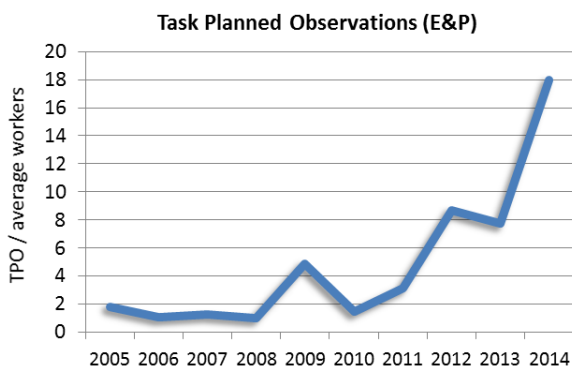


More than the 50% of the fatalities reported in 2014 by ARPEL member companies occurred in E&P. Below, a graph that show the causes of fatalities is presented.

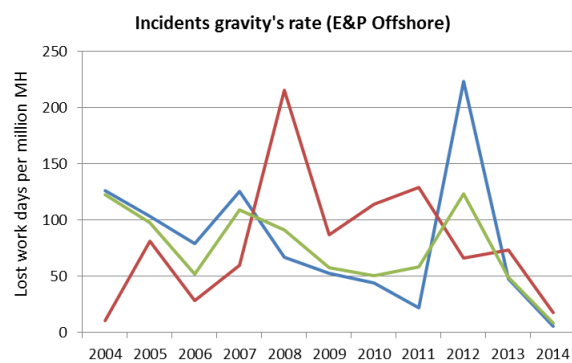
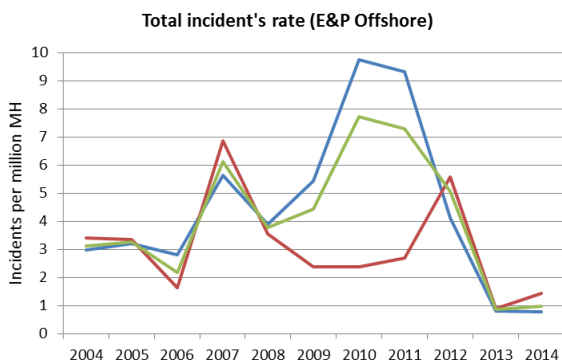


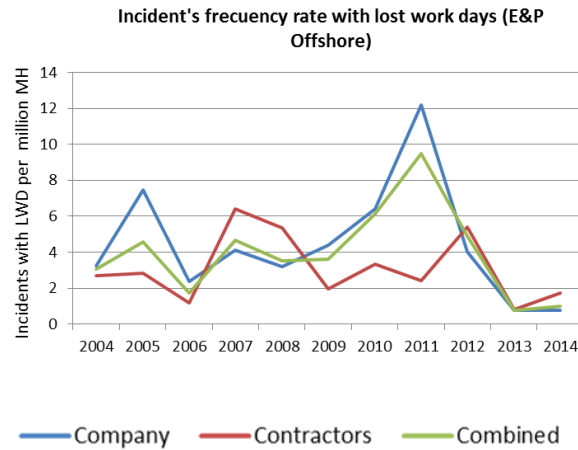
The causes of the fatalities presented by ARPEL member companies in the function E&P were “Struck by equipment”, “Fires and explosions”, “Fall” and “Caught in or between”. “Struck by equipment” was the main cause of fatality with the 35% of the total, follow by “Fires and Explosions” with the 29%.

4.2.3. Proactive indicators (E&P total)

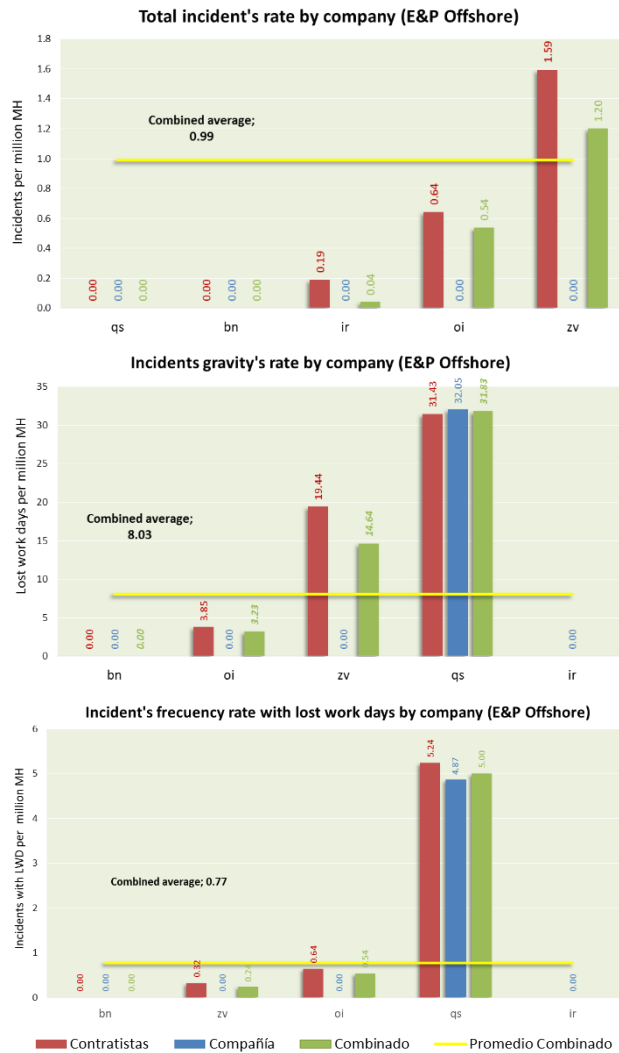


4.2.4. Reactive indicators E&P (offshore)





4.2.5. Reactives indicators by company E&P (offshore)¹



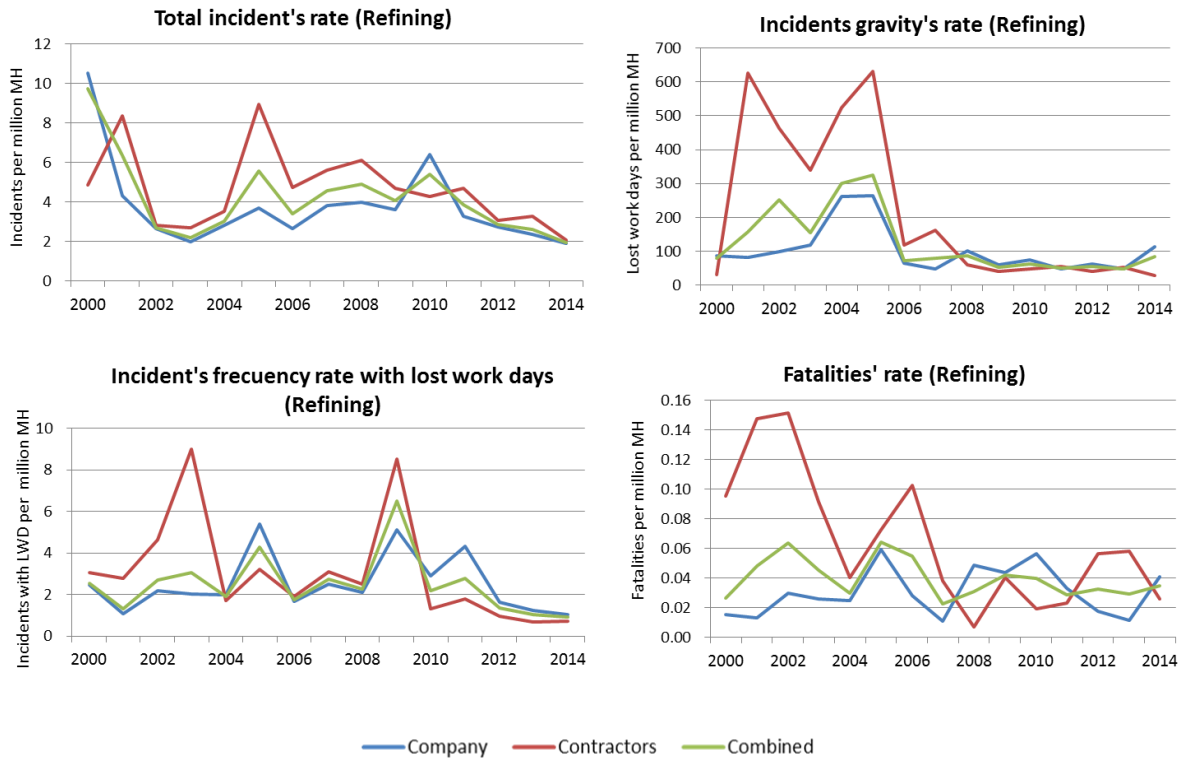
¹ Although a fatality in E&P offshore was registered, the necessary information to calculate the average fatalities rate for this business line was not provided since the company where the fatality occurred did not report its number of E&P offshore men hours.



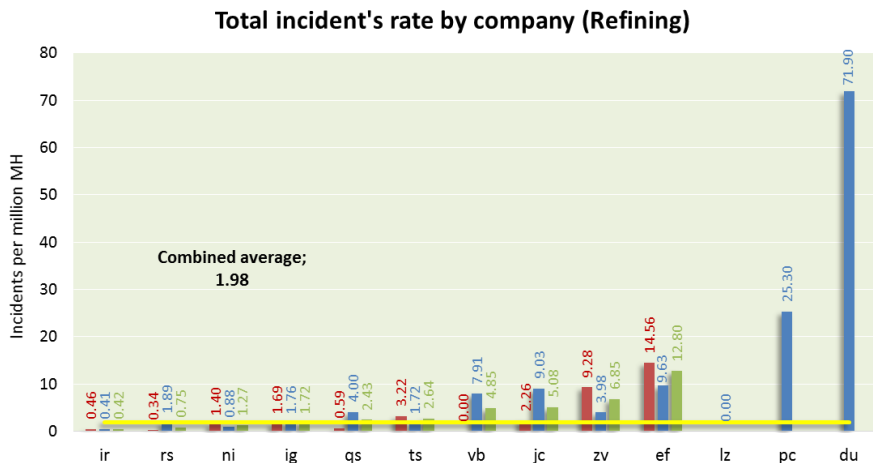
4.3. Refining

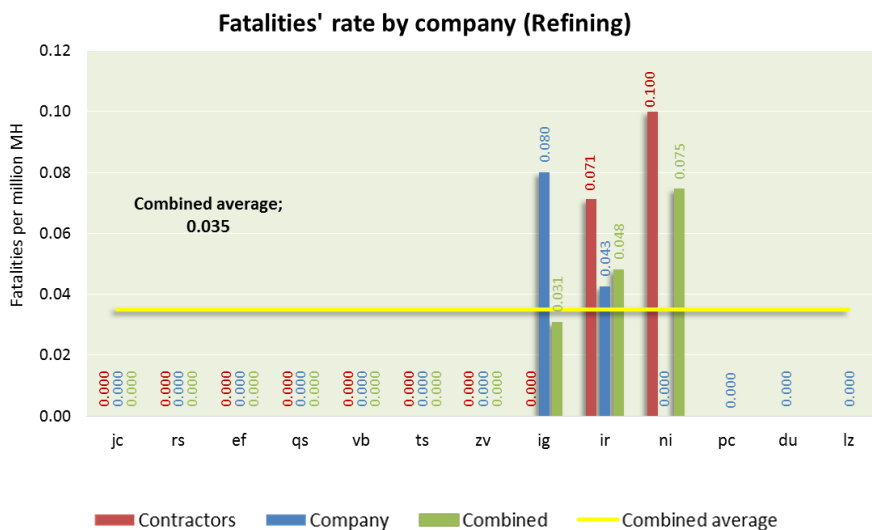
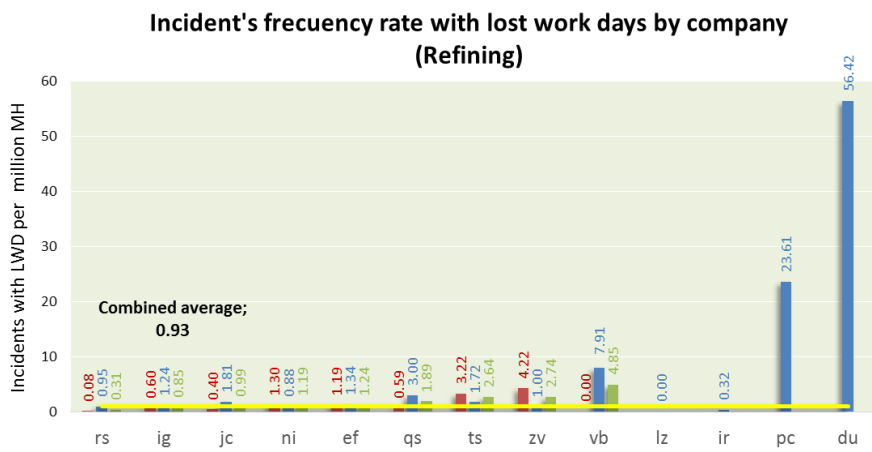
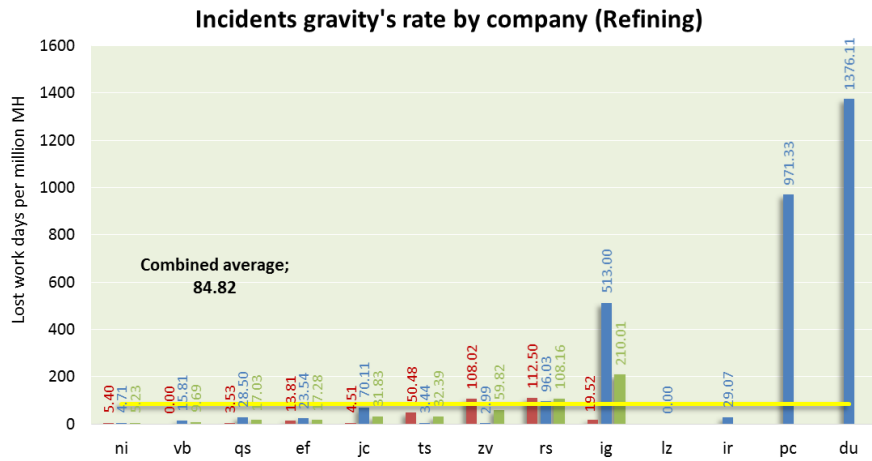
Below is the historical evolution of the reactive indicators (4.3.1), a comparison between companies for the year 2014 (4.3.2) and a historical evolution of proactive indicators (4.3.3) for the business line Refining.

4.3.1. Evolution of reactive indicators



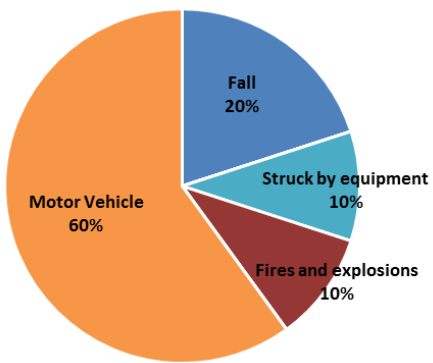
4.3.2. Reactive indicators by company





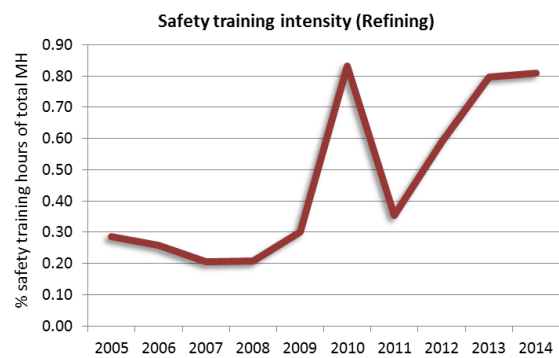
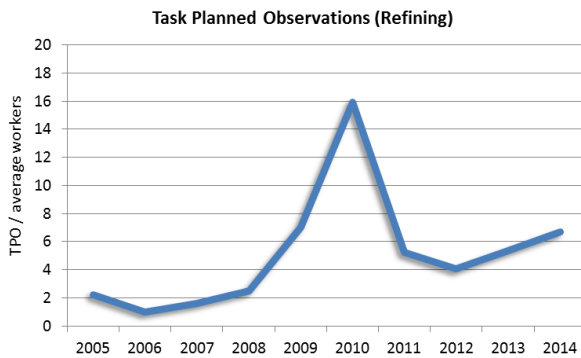
Contractors Company Combined Combined average

The 30% of the fatalities reported in 2014 by ARPEL member companies occurred in Refining. The graph showed in the left presents the causes of these fatalities.



The causes of the fatalities in Refining were “Struck by equipment”, “Fires and explosions”, “Fall” and “Motor Vehicle” being the last one, the only difference with the causes of fatalities in E&P. “Fires and explosions” was the main cause of fatality with the 60% of the total, follow by “Fall” with the 20%.

4.3.3. Proactive indicators



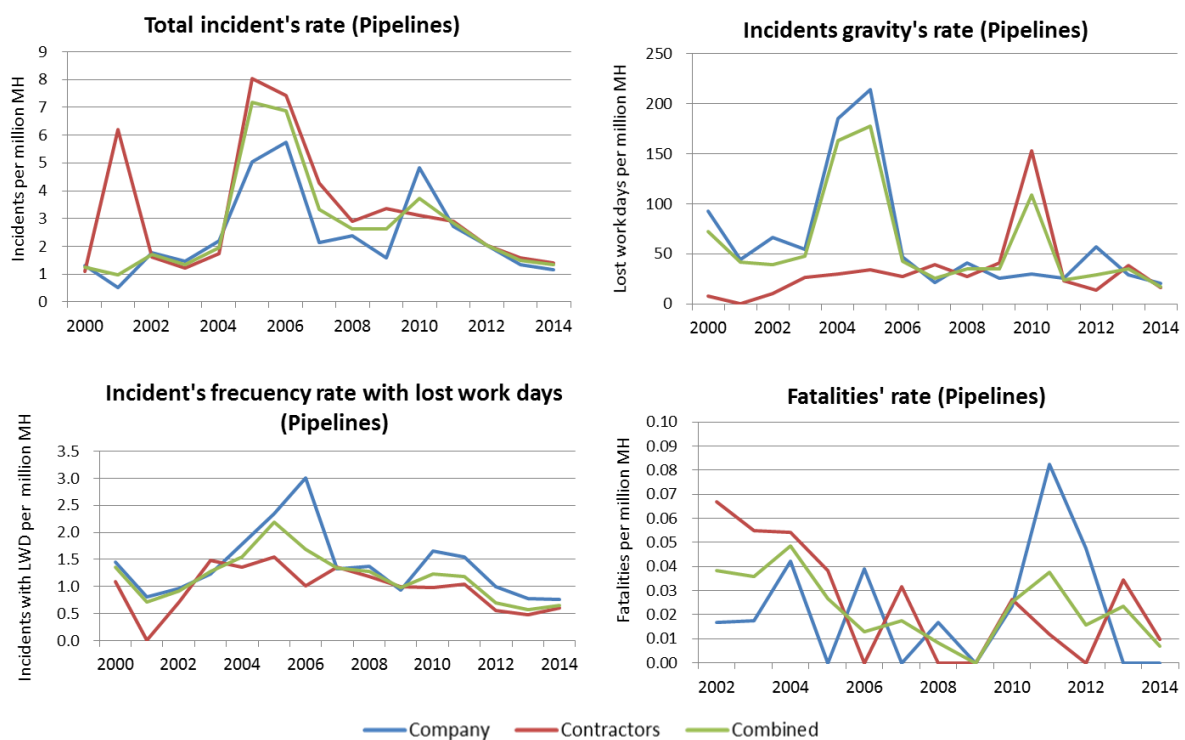


4.4. Pipelines

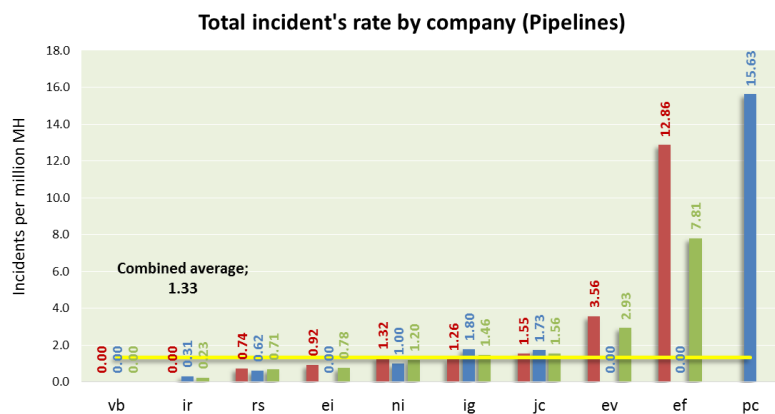
Below is the historical evolution of the reactive indicators (4.4.1), a comparison between companies for the year 2014 (4.4.2) and the historical evolution of proactive indicators (4.4.3) for the business line Pipelines.

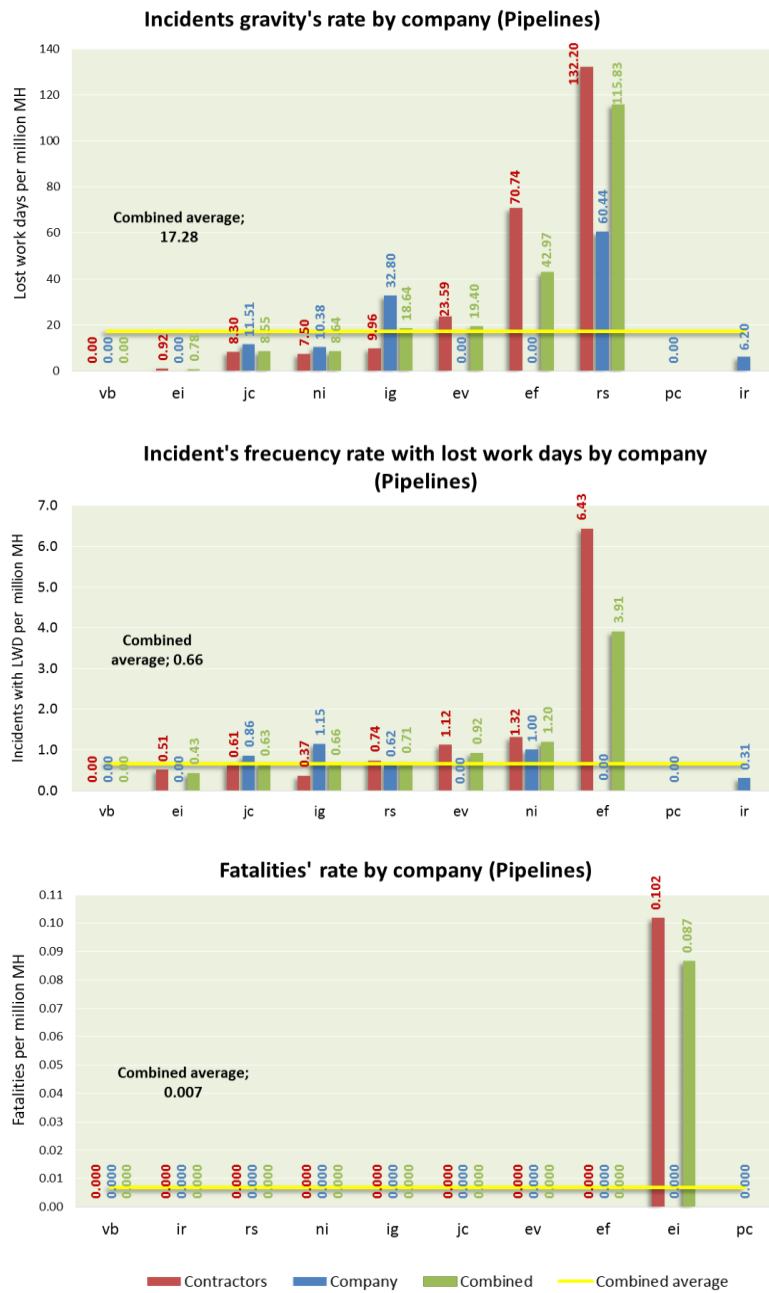
The data includes the information reported in "transport – pipelines for liquids", "transport – pipelines for gases" and "transport – pipelines not separated". The data prior to 2009 correspond only to "transport - pipelines for liquids."

4.4.1. Reactive indicators

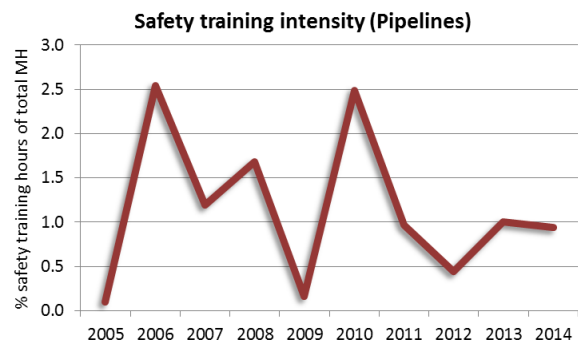
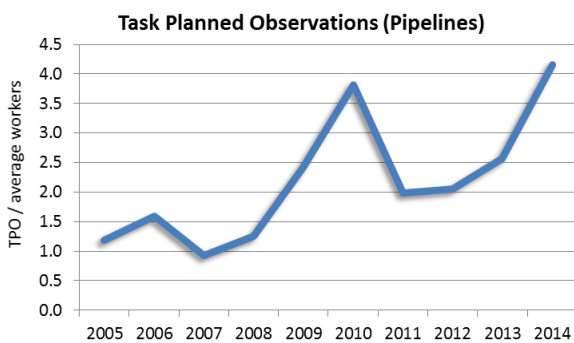


4.4.2. Reactive indicators by company





4.4.3. Proactive indicators

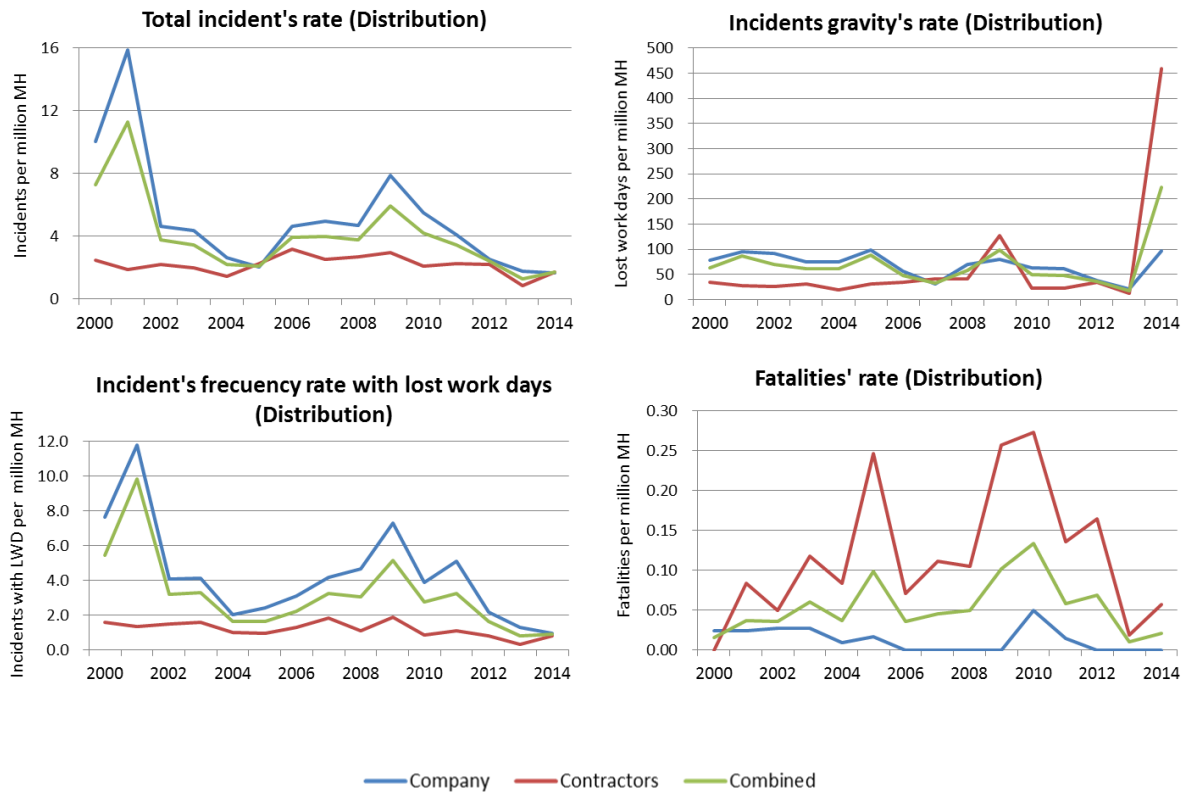




4.5. Distribution

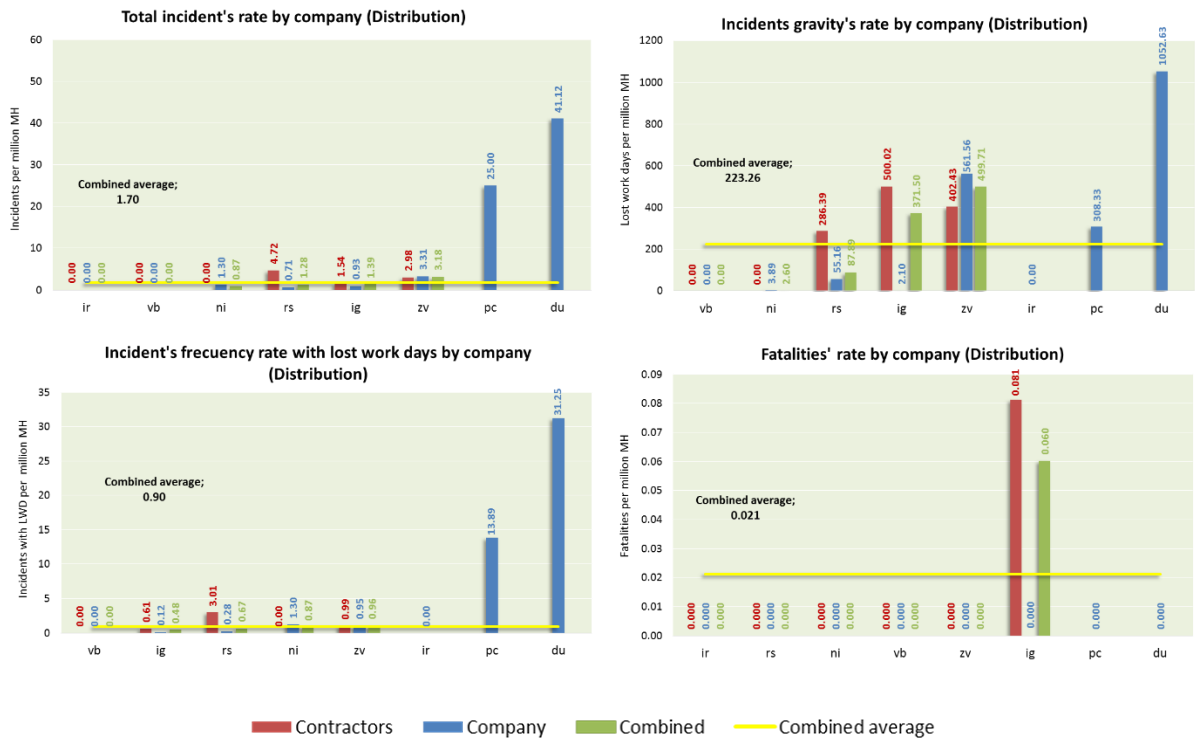
Below is the historical evolution of the reactive indicators (4.5.1), a comparison between companies for the year 2014 (4.5.2) and a historical evolution of proactive indicators (4.5.3) for the business line Distribution.

4.5.1. Reactive indicators

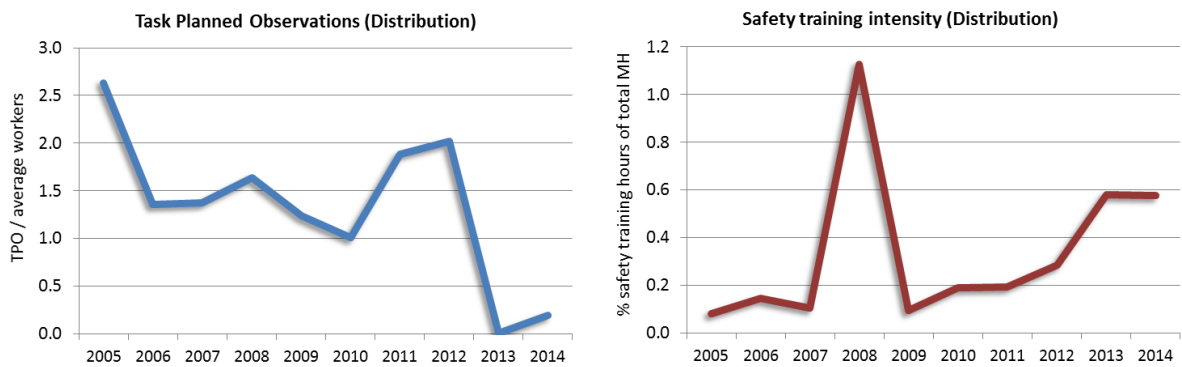




4.5.2. Reactive indicators by company



4.5.3. Proactive indicators





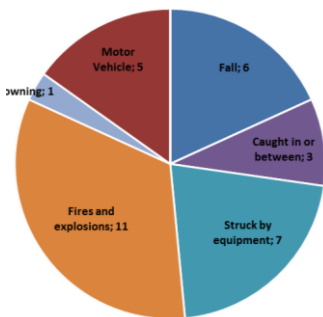
5. CAUSES OF FATALITIES

This chapter presents an analysis of the fatalities reported in 2014 by companies and contractors, providing a breakdown by cause, type of activity and function. In turn, it presents a historical comparative analysis of the causes of fatalities reported from 2001 to date.

In 2014, a total of 33 fatalities were reported, corresponding to 0.015 fatalities per million hours worked, representing an increase of 29% compared to the last year. The main cause of fatalities in 2014 was Fires and Explosions, which is also the main historical cause of fatalities since data has been collected (2001).

5.1. Fatalities by cause

The pie chart shows the causes of fatalities reported for 2014.



As it can be seen the main cause of fatalities was “fires and explosions” with 11 cases, which represents 33% of the fatal incidents in 2014. The second cause was “struck by equipment” with 7 incidents and 21% of the total.

The table below in the right shows the causes of fatalities registered from 2001 to 2014.

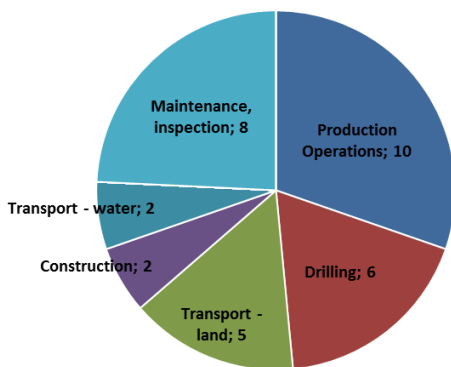
Cause	# fat	%
Fires and explosions	154	21%
Motor Vehicle	111	15%
Struck by equipment	111	15%
Fall	77	10%
Caught in or between	61	8%
Drowning	58	8%
Electrocution	52	7%
Toxic gas or liquid	39	5%
Other transportation	36	5%
Other	37	5%
ndd	1	0%
Total	737	100%

As it can be appreciated, 704 fatalities have been registered during this period of 14 years a total of 737 fatalities has occurred. The 21% of them corresponds to fires and explosions, followed by motor vehicles accidents and struck by equipment, both with 15% of the total fatal incidents.

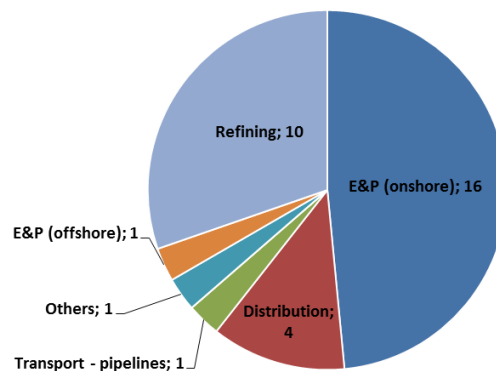
5.2. Fatalities by type of activity and business line

In 2014, Operations was the activity that recorded more fatalities (10 cases), while E&P was the most affected business line with 17 fatalities, 16 of them onshore and 1 offshore.

Fatalities by activities



Fatalities by function





6. GLOSSARY OF TERMS

Case involving lost workdays

All non-fatal cases that result in the worker being away from work at least one business day after the day of the injury or disease. The day on which the worker goes home before the end of his workday is not considered in this item. Fatalities, as well as restricted labor activity days are excluded, since they are recorded separately.

Case involving restricted workdays

All non-fatal cases implying days of restricted activity of the usual tasks after the day of the injury or disease. Fatalities must be excluded.

Case involving medical treatment

All treatment cases of injuries / diseases administered by doctors, registered professionals or non-medical personnel. The medical treatment does not include first aids (one single treatment and the following observation of scratches, cuts, burns, splinters, and other episodes without gravity that generally do not require medical attention) even if a doctor or a registered professional provides them.

Company worker

Any person employed by the reporting company or included in its payroll.

Contractor

Any person directly involved in the execution of an assigned work for the reporting company, according to a contract.

Number of days away from work

The total number of days (consecutive or not) after the day when the injury or disease occurred, on which the workers involved (according to the definition of case involving lost workdays) should have worked but did not, as a result of the occupational injury or disease, until the day they get back to work. The day the person starts to work is excluded. Weekends and holidays are included, even if the employee was not scheduled to work.

This definition has to be distinguished from 'cases with lost work days' which include those incidents that generated lost work days –the number of incidents, not the number of days- and which is used to calculate the 'frequency of incidents with lost work days'

Recordable case - disease

Any occupational incident resulting from a disease (according to the provided classification by the legislation/regulation [if applicable] of the country where the company reports its activities). Occupational diseases resulting in fatalities are included.

Recordable case - fatality

A fatality resulting from an occupational injury or disease. The fatality should be loaded to the year in which the injury occurred or the occupational disease was recorded.

Recordable case - injury

Any occupational incident resulting in an injury (according to the provided classification by the legislation/regulation [if applicable] of the country where the company reports its activities). Occupational injuries resulting in fatalities are included.

Recordable cases - total

The sum of Recordable cases – Injury, Recordable cases – Disease and Recordable cases – Fatalities.



Tasks planned observations (TPO)

"Tasks planned observations" (TPO) are safety observations performed according to a systematic method. They constitute a recorded visual analysis in which the sequence of tasks, maneuvers and operations required to obtain a certain result of the service which is pre-established within the company, is studied by well trained and qualified personnel. The referred study includes hazard identification and risk management during normal task performance and comprises observations of immediate and basic aspects as well as systematic ones. Observations are recorded in a pre-established form according to a given procedure to determine all deviations that result in an increased probability of any human resources or material loss.

Worked hours

Hours worked by both the company workers and contractors' workers (separately recorded).

Work relatedness

An injury or disease is to be considered to be work-related if an event or exposure in the work environment caused or contributed to the resulting condition or significantly aggravated a pre-existing injury or disease. Work-relatedness is defined for injuries and diseases resulting from events or exposures occurred in the work environment, defining the work environment as the physical place where one or more employees work or are present due to work reasons. The work environment includes not only physical locations, but also the equipment or materials used by the employee during the course of his/her work.



7. ANNEXES

7.1. 2014 Data

2014 Company Data

Function	Average # of employees	Hours worked (thousands)	Injuries	Illnesses	Fatalities	Total	Cases of Lost Workdays	Number of days away from work	Reactive indicators			
									Total	Gravity	Cases of Lost Workdays	Fatalities' rate
E&P offshore*	9,113	24,710	19	0	0	19	19	125	0.769	5.059	0.769	0.000
E&P Total	104,382	234,779	241	12	2	255	149	8,086	1.086	34.441	0.635	0.009
Refining	73,219	170,439	261	55	7	323	179	19,293	1.895	113.196	1.050	0.041
Pipelines	20,475	44,342	50	1	0	51	34	905	1.150	20.410	0.767	0.000
Transport-Maritime	9,463	15,901	7	0	0	7	5	315	0.440	19.810	0.314	0.000
Distribution	26,906	59,375	100	0	0	100	56	5,756	1.684	96.943	0.943	0.000
Others	84,618	185,280	177	7	0	184	145	5,086	0.993	27.450	0.783	0.000
Total	319,063	710,116	836	75	9	920	568	39,441	1.296	55.542	0.800	0.013

*Since the total men hours for E&P offshore was not provided, the indicators for this business line are calculated based on the data of the companies that shared their statistics.

2014 Contractors Data

Function	Average # of employees	Hours worked (thousands)	Injuries	Illnesses	Fatalities	Total	Cases of Lost Workdays	Number of days away from work	Reactive indicators			
									Total	Gravity	Cases of Lost Workdays	Fatalities' rate
E&P offshore*	4,043	12,670	18	0	0	18	13	133	1.421	17.915	1.751	0.000
E&P Total	293,296	759,728	1,606	2	15	1,623	585	74,239	2.136	145.110	1.143	0.020
Refining	49,833	114,458	237	0	3	240	61	2,495	2.097	28.868	0.706	0.026
Pipelines	44,995	103,455	145	0	1	146	60	1,572	1.411	15.882	0.606	0.010
Transport-Maritime	3,613	1,358	0	0	0	0	0	0	0.000	0.000	0.000	0.000
Distribution	18,583	35,320	59	0	2	61	26	14,605	1.727	458.961	0.817	0.057
Others	235,542	497,958	875	0	3	878	291	37,130	1.763	81.113	0.636	0.006
Total	645,862	1,512,277	2,922	2	24	2,948	1,023	130,041	1.949	109.592	0.862	0.016

*Since the total men hours for E&P offshore was not provided, the indicators for this business line are calculated based on the data of the companies that shared their statistics.

** Gravity and Cases of Lost Workdays are calculated with the following values of man hours worked (in thousands): E&P offshore - 7.424 / E&P total - 511.606 / Refining -86.427 / Pipelines - 98.979 / Distribution - 31.822 / Others - 457.758 // Total - 1.186.592.

2014 Combined Data

Function	Average # of employees	Hours worked (thousands)	Injuries	Illnesses	Fatalities	Total	Cases of Lost Workdays	Number of days away from work	Reactive indicators			
									Total	Gravity	Cases of Lost Workdays	Fatalities' rate
E&P offshore*	13,156	37,380	37	0	0	37	32	258	0.990	8.029	0.996	0.000
E&P Total	397,678	994,507	1,847	14	17	1,878	734	82,325	1.888	110.298	0.983	0.017
Refining	123,052	284,897	498	55	10	563	240	21,788	1.976	84.822	0.934	0.035
Pipelines	65,470	147,797	195	1	1	197	94	2,477	1.333	17.283	0.656	0.007
Transport-Maritime	13,076	17,259	7	0	0	7	5	315	0.406	19.810	0.314	0.000
Distribution	45,489	94,695	159	0	2	161	82	20,361	1.700	223.265	0.899	0.021
Others	320,160	683,238	1,052	7	3	1,062	436	42,216	1.554	65.651	0.678	0.004
Total	964,925	2,222,392	3,758	77	33	3,868	1,591	169,482	1.740	89.356	0.839	0.015

*Since the total men hours for E&P offshore was not provided, the indicators for this business line are calculated based on the data of the companies that shared their statistics.

** Gravity and Cases of Lost Workdays are calculated with the following values of man hours worked (in thousands): E&P offshore - 32.134 / E&P total - 746.385 / Refining -256.866 / Pipelines - 143.321 / Transport-maritime - 15.901 / Distributio - 91.197 / Others - 643.038 // Total - 1.896.707

7.2. Proactive indicators

Function	Average # of employees	Hours worked (thousands)	OPT	HFS	Proactive indicators	
					Task Planned Observations	Safety Training
E&P Total	43,666	45,462	784,898	285,688	17.98	0.63
Refining	21,167	28,161	141,685	228,151	6.69	0.81
Pipelines	12,907	11,265	53,667	106,355	4.16	0.94
Transport-Maritime	98	196	19	41	0.19	0.02
Distribution	13,772	23,711	14,683	137,150	1.07	0.58
Others	39,385	31,438	104,162	64,983	2.64	0.21
Total	130,995	140,233	1,099,114	822,367	8.39	0.59



7.3. Historical data

7.3.1. Reactive indicators

Function	Indicator	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
E&P																	
E&P	Company	Total	1.167	2.875	2.266	1.742	2.202	2.779	2.865	3.663	3.648	4.184	6.234	5.680	1.254	1.220	1.086
E&P	Contractors	Total	3.989	5.379	2.818	2.597	3.070	4.060	3.946	4.092	4.134	3.083	3.038	3.127	2.050	2.051	2.136
E&P	Combined	Total	2.231	4.770	2.602	2.281	2.780	3.626	3.592	3.947	3.971	3.467	4.179	3.978	1.860	1.842	1.888
E&P	Company	Gravity	208.443	146.415	73.670	87.668	212.756	180.887	72.838	85.257	88.789	76.137	73.580	105.415	29.288	39.774	34.441
E&P	Contractors	Gravity	61.042	293.985	349.365	206.421	73.007	280.109	69.254	70.599	138.690	84.558	181.485	84.949	114.791	70.629	145.110
E&P	Combined	Gravity	152.856	182.395	256.546	135.954	147.310	226.574	70.764	78.978	117.956	80.649	129.142	94.096	83.200	59.193	110.298
E&P	Company	Lost Workdays	1.937	1.754	1.858	1.674	1.829	3.447	3.385	2.446	2.355	2.813	3.775	6.234	0.776	0.675	0.635
E&P	Contractors	Lost Workdays	3.654	2.779	2.133	2.746	1.893	2.210	2.289	2.289	1.878	1.224	1.131	1.705	0.760	0.720	1.143
E&P	Combined	Lost Workdays	2.585	2.238	2.009	2.094	1.872	2.497	2.650	2.354	2.076	1.777	2.082	3.217	0.764	0.709	0.983
E&P	Company	Fatalities	0.073	0.081	0.030	0.026	0.030	0.029	0.008	0.072	0.017	0.019	0.016	0.023	0.028	0.013	0.009
E&P	Contractors	Fatalities	0.067	0.092	0.070	0.096	0.070	0.041	0.043	0.064	0.043	0.026	0.021	0.040	0.050	0.010	0.020
E&P	Combined	Fatalities	0.071	0.088	0.054	0.070	0.057	0.037	0.031	0.067	0.034	0.024	0.019	0.034	0.045	0.010	0.017
Refining																	
Refining	Company	Total	10.543	4.337	2.667	1.999	2.815	3.719	2.660	3.822	4.000	3.642	6.398	3.294	2.752	2.368	1.895
Refining	Contractors	Total	4.872	8.356	2.832	2.699	3.523	8.967	4.741	5.613	6.118	4.706	4.272	4.699	3.080	3.294	2.097
Refining	Combined	Total	9.748	6.368	2.713	2.209	3.036	5.585	3.402	4.568	4.904	4.080	5.434	3.876	2.879	2.627	1.976
Refining	Company	Gravity	87.293	81.486	99.711	118.139	262.201	263.005	64.077	47.367	101.506	60.388	73.248	48.707	61.117	47.402	113.196
Refining	Contractors	Gravity	31.669	626.472	463.375	339.274	525.086	630.935	118.871	160.858	60.941	40.412	46.484	55.182	41.469	52.112	28.868
Refining	Combined	Gravity	79.491	156.027	252.275	153.953	301.468	325.390	72.034	78.747	85.394	52.660	61.542	51.075	54.945	48.872	84.822
Refining	Company	Lost Workdays	2.447	1.092	2.186	2.029	2.001	5.394	1.654	2.518	2.095	5.110	2.909	4.345	1.623	1.234	1.050
Refining	Contractors	Lost Workdays	3.057	2.788	4.638	8.981	1.707	3.206	1.897	3.085	2.497	8.543	1.299	1.789	0.967	0.676	0.706
Refining	Combined	Lost Workdays	2.532	1.333	2.682	3.038	1.906	4.292	1.738	2.743	2.255	6.523	2.170	2.786	1.369	1.023	0.934
Refining	Company	Fatalities	0.016	0.013	0.030	0.026	0.025	0.060	0.028	0.011	0.049	0.044	0.057	0.033	0.018	0.012	0.041
Refining	Contractors	Fatalities	0.096	0.148	0.151	0.091	0.041	0.073	0.103	0.038	0.007	0.040	0.020	0.023	0.056	0.058	0.026
Refining	Combined	Fatalities	0.027	0.048	0.064	0.045	0.030	0.064	0.055	0.022	0.031	0.042	0.040	0.029	0.033	0.029	0.035
Pipelines																	
Pipelines	Company	Total	1.319	0.529	1.786	1.475	2.192	5.042	5.744	2.143	2.380	1.590	4.811	2.716	2.036	1.346	1.150
Pipelines	Contractors	Total	1.093	6.215	1.631	1.225	1.754	8.042	7.431	4.261	2.893	3.351	3.123	2.891	2.043	1.574	1.411
Pipelines	Combined	Total	1.265	0.975	1.719	1.353	1.956	7.169	6.877	3.321	2.635	2.632	3.730	2.827	2.041	1.500	1.333
Pipelines	Company	Gravity	92.626	44.051	66.453	54.432	185.335	214.104	46.918	21.505	41.120	25.910	29.977	25.393	57.342	28.740	20.410
Pipelines	Contractors	Gravity	8.153	0.000	10.192	26.136	29.478	33.931	27.681	38.982	27.730	40.909	152.685	22.808	14.090	38.364	15.882
Pipelines	Combined	Gravity	72.450	41.816	39.440	48.044	163.410	177.237	42.433	26.016	34.572	34.787	108.580	23.778	28.623	35.186	17.283
Pipelines	Company	Lost Workdays	1.451	0.815	0.967	1.239	1.782	2.348	3.000	1.330	1.381	0.941	1.656	1.541	0.994	0.769	0.767
Pipelines	Contractors	Lost Workdays	1.093	0.000	0.718	1.480	1.356	1.550	1.008	1.353	1.182	1.004	0.978	1.051	0.552	0.483	0.606
Pipelines	Combined	Lost Workdays	1.365	0.707	0.920	1.276	1.549	2.185	1.694	1.343	1.284	0.978	1.237	1.191	0.699	0.575	0.656
Pipelines	Company	Fatalities	0.026	0.000	0.017	0.018	0.042	0.000	0.039	0.000	0.017	0.000	0.024	0.082	0.047	0.000	0.000
Pipelines	Contractors	Fatalities	0.336	0.396	0.067	0.055	0.054	0.038	0.000	0.032	0.000	0.000	0.026	0.012	0.000	0.034	0.010
Pipelines	Combined	Fatalities	0.100	0.056	0.038	0.036	0.049	0.027	0.013	0.018	0.008	0.000	0.025	0.038	0.016	0.023	0.007
Distribution																	
Distribution	Company	Total	10.013	15.857	4.642	4.364	2.617	2.024	4.662	4.985	4.700	7.881	5.485	4.081	2.540	1.806	1.684
Distribution	Contractors	Total	2.483	1.867	2.203	1.991	1.439	2.266	3.162	2.530	2.691	2.970	2.104	2.289	2.234	0.850	1.727
Distribution	Combined	Total	7.268	11.296	3.773	3.467	2.189	2.110	3.917	3.987	3.771	5.934	4.211	3.446	2.412	1.297	1.700
Distribution	Company	Gravity	78.701	95.350	92.071	74.798	74.511	98.448	56.815	30.489	69.055	79.820	62.334	60.666	37.623	21.143	96.943
Distribution	Contractors	Gravity	33.557	28.241	26.401	31.468	19.532	30.793	34.618	40.859	40.878	127.176	22.337	23.255	34.973	12.347	458.961
Distribution	Combined	Gravity	62.248	85.829	70.102	61.742	62.087	87.951	47.456	33.278	57.873	97.948	49.745	48.087	36.606	17.987	223.265
Distribution	Company	Lost Workdays	7.640	11.789	4.089	4.117	2.006	2.420	3.119	4.149	4.664	7.287	3.882	5.115	2.187	1.302	0.943
Distribution	Contractors	Lost Workdays	1.572	1.339	1.497	1.601	1.004	0.946	1.314	1.811	1.093	1.880	0.881	1.092	0.821	0.333	0.817
Distribution	Combined	Lost Workdays	5.429	9.830	3.184	3.292	1.642	1.634	2.223	3.246	3.066	5.143	2.750	3.252	1.617	0.786	0.899
Distribution	Company	Fatalities	0.024	0.024	0.027	0.027	0.010	0.016	0.000	0.000	0.000	0.000	0.050	0.015	0.000	0.000	0.000
Distribution	Contractors	Fatalities	0.000	0.084	0.049	0.117	0.084	0.247	0.071	0.111	0.105	0.257	0.273	0.136	0.164	0.018	0.057
Distribution	Combined	Fatalities	0.015	0.037	0.035	0.060	0.036	0.098	0.035	0.045	0.050	0.101	0.134	0.058	0.069	0.010	0.021
Others																	
Others	Company	Total	1.030	6.879	3.441	2.011	1.784	1.880	2.235	2.903	3.701	2.403	2.350	2.180	1.402	1.669	0.993
Others	Contractors	Total	0.046	2.775	1.877	1.573	1.050	3.425	3.959	2.767	2.530	2.323	2.217	2.033	2.501	2.176	1.763
Others	Combined	Total	0.559	4.318	2.441	1.718	1.320	2.933	3.368	2.807	2.846	2.340	2.253	2.066	2.277	2.039	1.554
Others	Company	Gravity	30.757	59.755	80.054	62.328	70.119	58.436	28.131	29.100	48.379	17.594	16.696	26.965	21.655	28.111	27.450
Others	Contractors	Gravity	0.000	40.308	749.648	206.377	13.799	83.378	84.504	19.148	42.262	48.340	57.390	62.079	73.495	63.372	81.113
Others	Combined	Gravity	16.039	84.015	406.346	80.217	67.041	59.707	31.010	28.035	44.011	41.326	46.015	53.944	62.411	56.163	65.651
Others	Company	Lost Workdays	1.724	2.755	2.652	1.756	1.499	1.648	1.013	2.100	1.525	1.384	0.871	2.213	1.091	1.178	0.783
Others	Contractors	Lost Workdays	2.428	3.521	1.619	5.919	1.050	0.852	0.907	0.769	0.601	0.546	0.583	0.803	0.840	0.671	0.636
Others	Combined	Lost Workdays	2.061	3.144	2.262	2.071	1.212	1.241	0.943	1.195	0.865	0.728	0.660	1.022	0.891	0.773	0.678
Others	Company	Fatalities	0.000	0.035	0.014	0.000	0.009	0.000	0.009	0.008	0.000	0.007	0.005	0.013	0.000	0.000	0.000
Others	Contractors	Fatalities	0.046	0.051	0.054	0.041	0.020	0.045	0.019	0.020	0.011	0.004	0.011	0.013	0.014	0.004	0.006
Others	Combined	Fatalities	0.022	0.044	0.040	0.028	0.016	0.031	0.015	0.016	0.008	0.005	0.010	0.013	0.012	0.003	0.004
Total																	
Total	Company	Total	5.320	5.319	2.784	2.167	2.351	2.811	2.869	3.579	3.723	3.835	5.061	4.130	1.805	1.658	1.296
Total	Contractors	Total	2.709	5.462	2.484	2.196	2.381	4.542	4.232	3.842	3.748	2.967	2.772	2.828	2.297	2.071	1.949
Total	Combined	Total	4.494	5.415	2.632	2.183	2.368	3.808	3.671	3.738	3.738	3.287	3.609	3.291	2.149	1.895	1.740
Total	Company	Gravity	119.188	101.406	85.615	89.572	174.093	166.014	60.290	54.950	78.952	57.608	54.537	68.018	38.087	36.546	55.542
Total	Contractors	Gravity	34.963	320.162	356.408	188.257	115.214	295.429	65.242	83.563	84.600	62.625	102.874	66.155			



7.3.2. Reactive indicators (E&P Offshore)

Indicator	Category	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	Company	2.03	2.98	3.20	2.79	5.64	3.90	5.43	9.75	9.31	4.123	0.810	0.769
Total	Contractors	1.46	3.40	3.35	1.62	6.86	3.55	2.39	2.38	2.68	5.586	0.893	1.421
Total	Combined	1.73	3.11	3.27	2.17	6.13	3.77	4.43	7.72	7.29	5.053	0.849	0.990
Gravity	Company	114.22	126.48	103.24	79.26	125.55	66.57	52.69	43.74	22.06	223.027	47.365	5.059
Gravity	Contractors	11.29	10.58	81.04	28.58	59.84	215.16	87.12	113.89	129.24	65.938	73.474	17.915
Gravity	Combined	110.27	122.46	97.37	52.12	108.88	91.38	57.73	50.36	58.06	123.142	49.240	8.029
Lost Workdays	Company	1.97	3.25	7.44	2.36	4.10	3.18	4.41	6.41	12.19	4.022	0.767	0.769
Lost Workdays	Contractors	1.03	2.71	2.85	1.20	6.39	5.36	1.95	3.32	2.44	5.413	0.813	1.751
Lost Workdays	Combined	1.93	3.07	4.58	1.74	4.68	3.55	3.60	6.12	9.49	4.907	0.789	0.996
Fatalities	Company	0.06	0.02	0.00	0.00	0.19	0.00	0.00	0.01	0.01	0.000	0.014	0.000
Fatalities	Contractors	0.09	0.17	0.04	0.01	0.61	0.03	0.03	0.04	0.03	0.000	0.000	0.000
Fatalities	Combined	0.08	0.07	0.02	0.01	0.36	0.01	0.01	0.02	0.02	0.000	0.008	0.000

7.3.3. Proactive indicators

Task Planned Observations Indicator (Company)											
Function	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
E&P	1.83	1.07	1.28	1.01	4.87	1.45	3.12	8.69	7.76	17.98	
Refining	2.21	0.99	1.60	2.51	7.05	15.93	5.22	4.06	5.36	6.69	
Pipelines	1.18	1.59	0.92	1.25	2.42	3.81	1.98	2.05	2.56	4.16	
Distribution	2.63	1.36	1.38	1.64	1.24	1.01	1.88	2.02	0.01	0.19	
Others	0.28	1.44	0.57	1.41	3.23	1.29	2.19	2.56	2.29	1.07	
Global	1.96	1.15	1.12	1.35	3.93	3.70	3.27	4.59	4.98	8.39	

Safety Training Intensity (Company)											
Function	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
E&P	0.62	0.21	0.22	0.14	0.10	0.32	0.30	0.29	0.51	0.63	
Refining	0.29	0.26	0.21	0.21	0.30	0.83	0.35	0.59	0.80	0.81	
Pipelines	0.10	2.54	1.19	1.68	0.16	2.49	0.97	0.45	1.00	0.94	
Distribution	0.08	0.15	0.10	1.13	0.10	0.19	0.19	0.28	0.58	0.58	
Others	0.19	0.11	0.02	0.10	0.26	0.32	0.18	0.44	0.62	0.21	
Global	0.36	0.24	0.18	0.20	0.17	0.45	0.30	0.42	0.57	0.59	



8. REFERENCES

1. ARPEL User's Manual – Safety benchmarking in the oil and gas industry in Latin America and the Caribbean – 6^a Edition, 2012. ARPEL.
2. ARPEL's members companies' safety statistics

Regional Association of Oil, Gas and Biofuels Sector Companies in Latin America and the Caribbean

ARPEL is a non-profit association gathering companies and institutions of the oil, gas and biofuels sector in Latin America and the Caribbean. It was founded in 1965 as a vehicle for cooperation and mutual assistance between companies in the sector, with the primary purpose of actively promoting industry integration and competitive growth and the sustainable energy development in the region. Its membership represents over 90% of the upstream and downstream activities in the region, and includes national, international and independent oil companies, providers of technology, goods and services to the industry value chain, and other national and international institutions in the industry.

Mission

To promote the integration, growth, operational excellence and effective socio-environmental performance of the industry in the region, facilitating the dialogue, cooperation, development of synergies among players as well as the shared creation of value among members through the exchange and expansion of collective knowledge.

Vision

To be an institution of reference in the consolidation of the oil and gas industry, furthering the provision of reliable and safe energy that meets the growing regional energy demand in a sustainable manner.

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