

Let us speak about Safety Key Performance Indicators

To follow-up safety performances, the Oil & Gas industry uses a series of KPI¹, each representing the level of a pyramid (**Figure 1**):

- ✓ the base refers to "*anomalies*" which consist of a collection of small safety deviations regarding equipment, methods and human behaviors. A small leak, an unclear safety perimeter in a dangerous area, a badly filled out work permit or any unsafe individual situation are all anomalies. They will be reported daily by any person working or visiting an operational site. Even if surprising for beginners, the higher the density of anomalies² the better as much. Anomaly cards reflect the personnel's safety awareness and allow corrective actions to be taken immediately.
- ✓ the second level refers to "*near misses*" which are real incidents which do not involve any injury to personnel and/or any damage to equipment and environment,
- ✓ the third level refers to incidents generating injuries and requiring either a medical intervention (MTC – Medical Treatment Case), an adapted work environment (RWDC – Reduced Work Declared Case) or a need for the injured person to stop working (LTI -Lost Time Incidents),
- ✓ finally the top part of the pyramid refers to fatalities

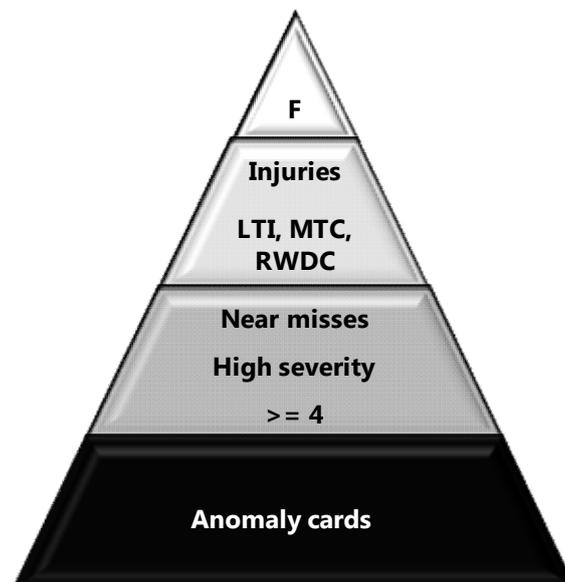


Figure 1 – Safety pyramid

¹ KPI = Key Performance Indicators

² Number of anomaly cards per million hours worked

For each level, the number of incidents is normalized by number of hours worked (hundreds of millions of hours for fatalities, per million hours for the other KPI). For levels 3 and 4 of the safety pyramid, industry has proposed three key parameters:

$$FAR (Fatal Accident Rate) = \frac{\text{Total number of fatalities}}{\text{Hundred millions hours}}$$

$$LTI_{fr} (Lost Time Incident frequency) = \frac{\text{Total number of LTI}}{\text{Million hours}}$$

$$TRIR (Total Recorded Incident Rate) = \frac{\text{Total number LTI} + \text{RWDC} + \text{MTC}}{\text{Million hours}}$$

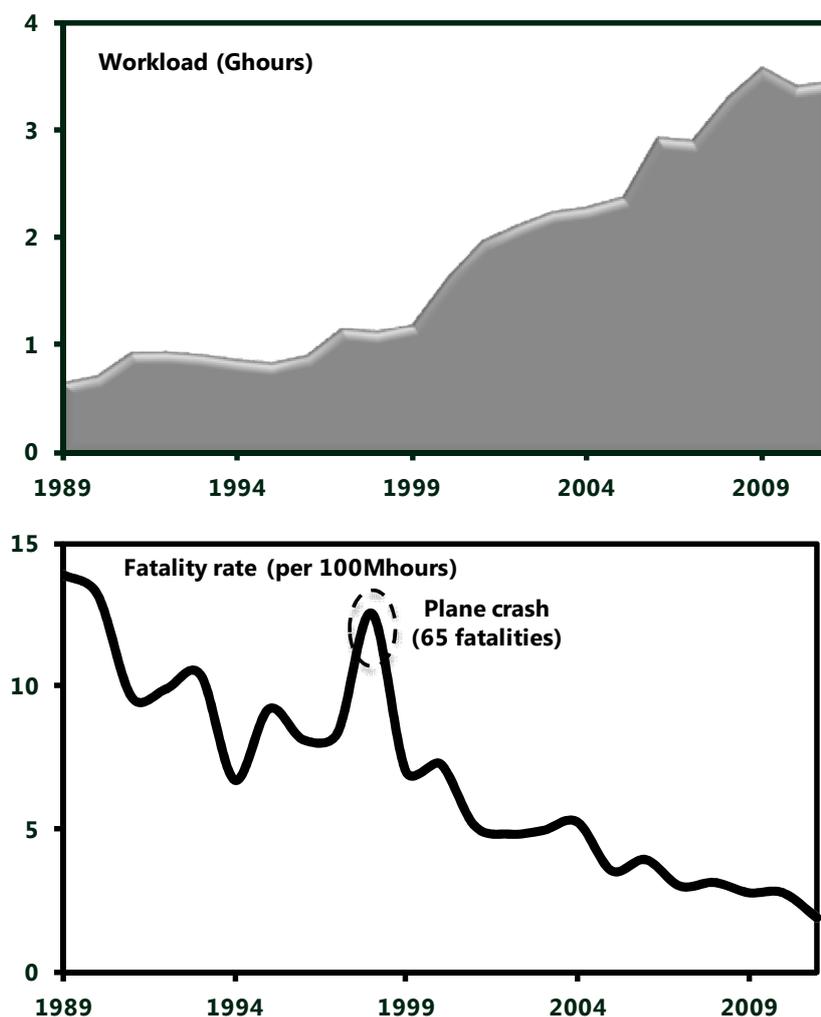


Figure 2 – Workload and Accident Fatality rate in Oil & Gas industry from 1989
(from IOGP annual reporting)

Within 2nd and 3rd levels of the safety pyramid, events (near misses, MTC/RWDC and LTI) are also classified according to their real and potential severity (level 1 low

severity, level 5 catastrophic severity). For example, a heavy package dropping onto the rig deck will be considered as a major near miss and classified with a maximum severity level (major potential consequences with possible escalation), whereas a worker slipping on a grating and breaking his leg will be an LTI with real potential 2 (Lost Time Incident but very limited consequences).

The systematic reporting of FAR and LTI started just after the Piper Alpha disaster whereas reporting of TRIR started later in 1995. Historical world safety statistics which are annually consolidated by the Internal Association of Oil & Gas Producers³ are presented in **Figure 2** and **Figure 3**.

Apart from an anomaly in 1998 (peak in fatalities following a plane crash killing 65 people in South America), FAR has been spectacularly improved over the last twenty years decreasing from 13.9 in 1989 (91 fatalities) to 1.88 in 2011 (65 fatalities). At the same time, the workload⁴ was multiplied by more than five, passing from only 0.66 billion hours in 1989 to 3.46 billion hours in 2011.

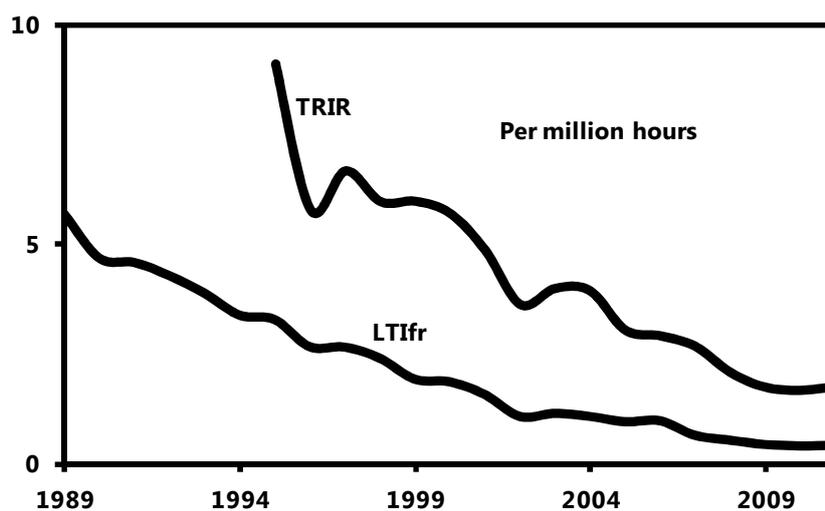
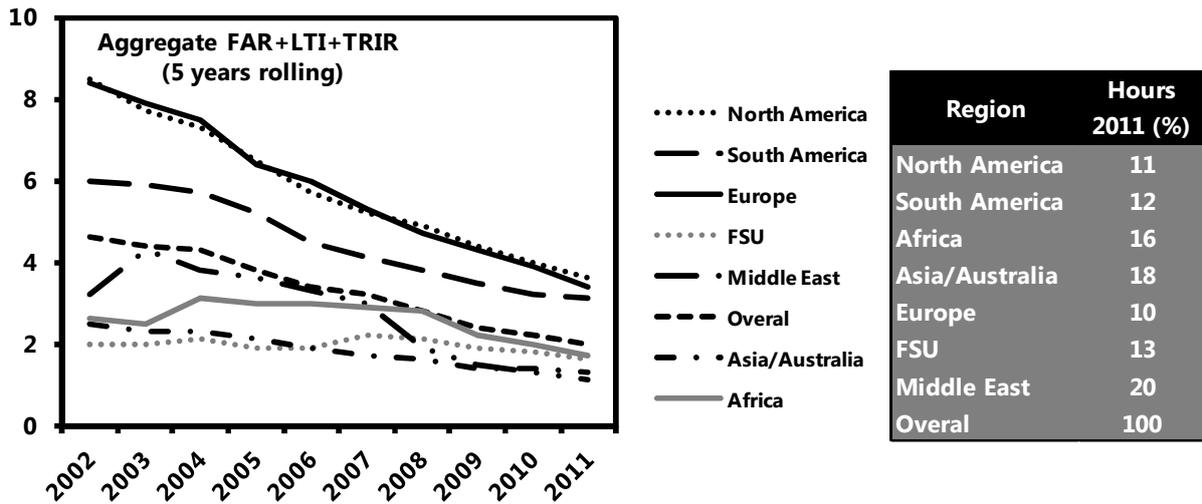


Figure 3 – LTI_{fr} and TRIR in Oil & Gas industry since 1989 (from OGP annual reporting)

The same trend applies to LTI_{fr} and TRIR. Over the period 1989 to 2011, LTI_{fr} has been reduced by a factor of 13 (from 5.7 in 1989 to 0.43 in 2011) whereas TRIR (recognized today as the major indicator to benchmark Company safety performance) was reduced by a factor of five over the period 1995 to 2011 (from 9.1 in 1995 to 1.76 in 2011). A more detailed focus based on a five-year rolling aggregate, region-by-region is presented on **Figure 4**.

³ <http://extranet.ogp.org.uk>

⁴ Workload was boosted after the oil price depression of 1999 and following the development of the first deep water projects. We will come back to this topic in Chapter V, dedicated to human resources.



**Figure 4 –2011 workload per region
Evolution of aggregate parameters since 2002 (courtesy of OGP)**

If trends are similar and show spectacular improvements over the period 2002-2011 for all regions, absolute values significantly differ. Surprisingly, the OCDE countries (Europe and North America) and South America are above the global curve (dotted line of **Figure 4**) whereas other regions (Asia, Middle East, Africa and FSU) are below the world curve. Even if the more complex and more risky production conditions prevailing in North Sea, Gulf of Mexico and deep off-shore Brazil can partly explain discrepancies, these trends also highlight a possible lack of reporting in regions where transparency is not yet current practice and where the “*culture of fear*” (i.e. in the former Soviet Union⁵ countries) still dominates.

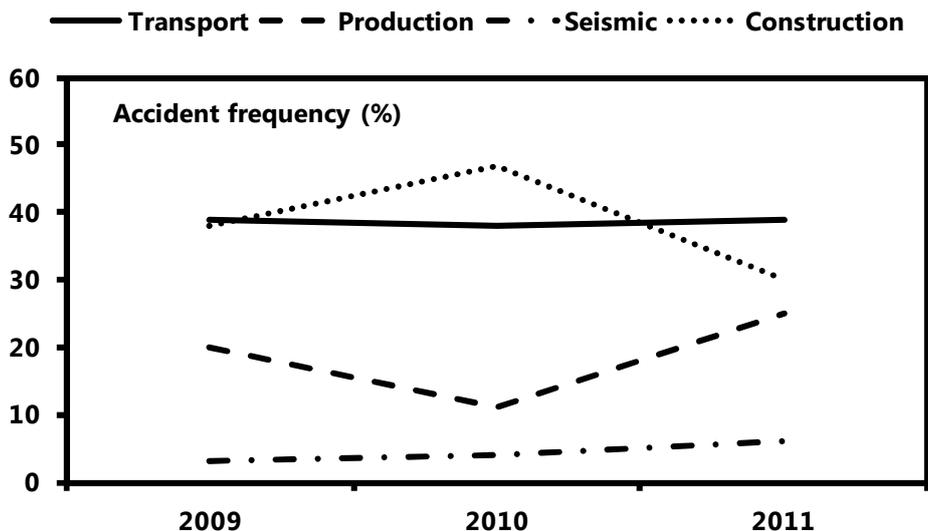


Figure 5 – Fatality frequency

⁵ In the Russian federation, each person has a “*working passport*” in which management staff write their appraisal comments. This type of practice can be easily used as a source of intimidation for future positions or promotion. It creates a climate of fear and does not encourage transparency.

Finally, if construction and production (main operations related to Oil & Gas activities) generally appear as the major source of fatalities (**Figure 5**), transport (land and air) account for 40 % of fatal incidents. This may be an additional reason that could justify the surprising safety results in OCDE countries, as the North Sea, the Gulf of Mexico and onshore US are conditioned by dense transport activities between operational base and production sites in regions where most of the time the weather creates a degraded situation.