



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия



International IECEx Certification Scheme as seen by an Oil & Gas Operator.

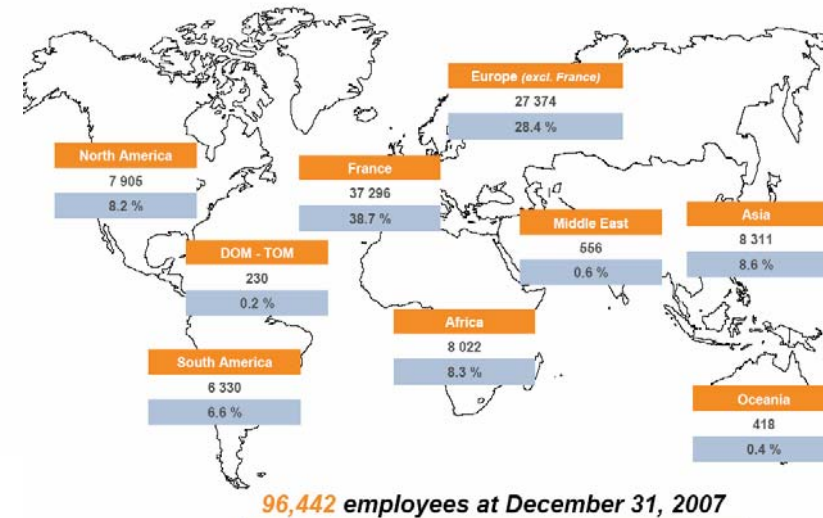
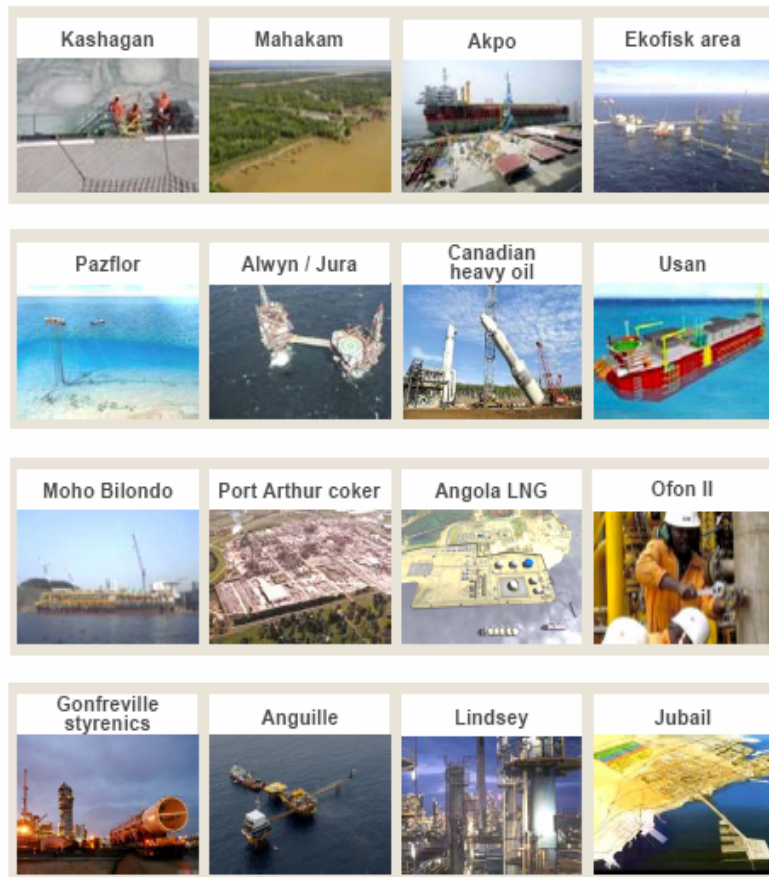
The TOTAL E&P company viewpoint

Eric MEYER

TOTAL, who we are.

Main 2008 investments(e)

(Group share)



- ❖ A global Oil & Gas company
- ❖ 4th ranked international oil major
- ❖ 96442 employees in over 130 countries
- ❖ Stock market capitalisation 118 B€_(29/7/2008)
- ❖ Adjust net income 16.7 B\$_(2007 data)
- ❖ Net cash flow 10.3 B\$_(2007 data)
- ❖ Capital Expenditure 16.1 B\$_(2007 data)
- ❖ 3 business segments (Upstream, Downstream & Chemical)

Upstream Branch

Yemen LNG (39.6%)



Qatargas II TrB (16.7%)



Angola LNG (13.6%)



NLNG T7 (15%)

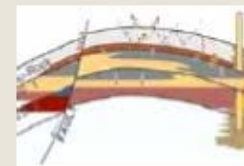
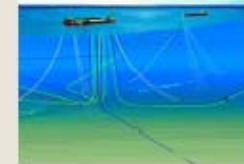


Exploration & Production :

- ❖ Daily production of 2.39 million barrel oil equivalent per day (boe) (2007 Data)
- ❖ Proved reserve 10.4 Bboe, 12 year production (year end 2007)
- ❖ Proved + probable reserve in the magnitude order of 20 Bboe, more than 20 years production.
- ❖ Capital expenditure : 9B\$
- ❖ Presence in 130 countries in the World

Gas & Power : :

- ❖ LNG plants, power plants, cogeneration
- ❖ Renewable energies (windpower, Solar, Biomass, ...)



Downstream & Chemicals Branches

DHC Normandy



Capacity : 2.4 Mt/y
Start-up end-2006

HDS Lindsey



Capacity : 1.8 Mt/y
Start-up 2009(e)

HDS Leuna



Capacity : 1 Mt/y
Start-up 2009(e)

Downstream Branch :

❖ Refining & Marketing

- Interest in 27 refineries worldwide
- 17000 service stations
- development of new projects (Jubail refinery (RSA) & Port-Arthur refinery rewamping (US))

❖ Trading & Shipping

Chemical Branch :

- ❖ Rewamping/debottlenecking & developing innovation in petrochemical
- ❖ Development new projects (Capex 2008 (e) around 1B\$)

Qapco (20%)



Capacity 0.7 Mt/y
Debottlenecking +0,2 Mt/y
Achieved end-2007

Qatofin (49%)



Construction of 1.3 Mt/y ethane cracker (Total 22%) and derivatives
Start-up 2009(e)



Pilot project for olefins conversion at Antwerp*

Pilot project « Methanol to Olefins » at Feluy

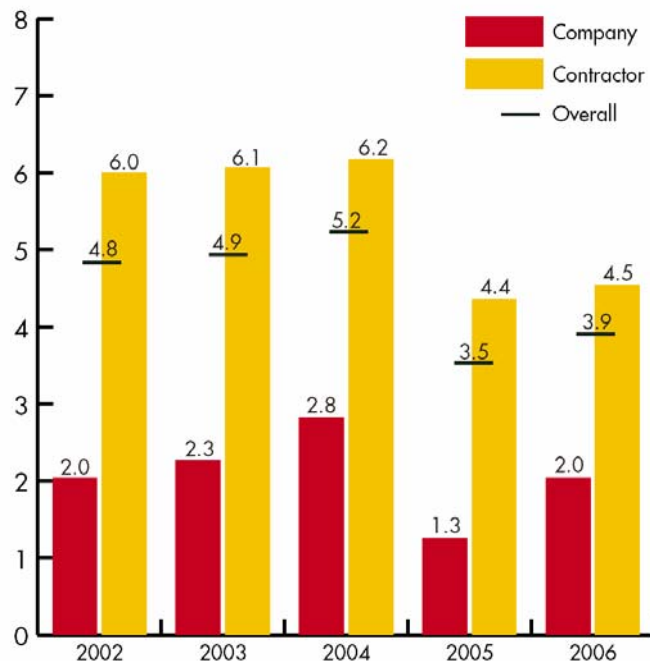
O&G Upstream Industry safety awareness

- ▶ Safety has been for years a key issue within the Oil & Gas Industry, and particularly in Upstream operations.
- ▶ Handling of oil & gas products is a potentially dangerous business.
- ▶ The O&G companies have funded an organisation with the following missions :
 - ▶ Representing the Upstream Industry to international regulatory and legislative bodies,
 - ▶ Achieving continuous improvement in Safety, health and environmental performances and in the engineering and operation of upstream ventures,
 - ▶ Promoting awareness of Corporate Social Responsibility issues within the industry and among stakeholders.
- ▶ This organisation is called the **International association of Oil & Gas Producers**, or **OGP**, and with companies such as IOCs (Shell, BP, Chevron, Total, ...) and NOCs (CNOOC, QP, PTTEP, Petrobras, ...).
- ▶ OGP edit each year various reports, and in particular the “OGP Safety Performance Indicators”, which gives the performance of the Upstream Industry.
- ▶ Following slides are extracts of the 2007 Edition (Year 2006 statistics).
- ▶ OGP (www.ogp.org.uk).



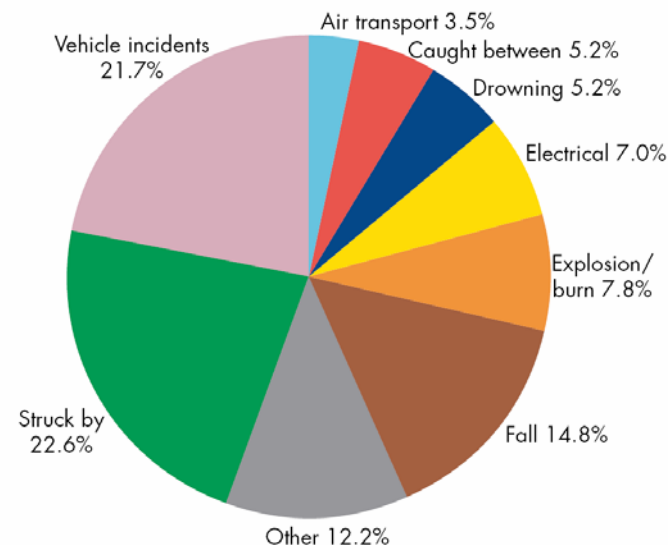
Fatal Accident Rate in Upstream industry

Fatal accident rate
per 100 million hours worked



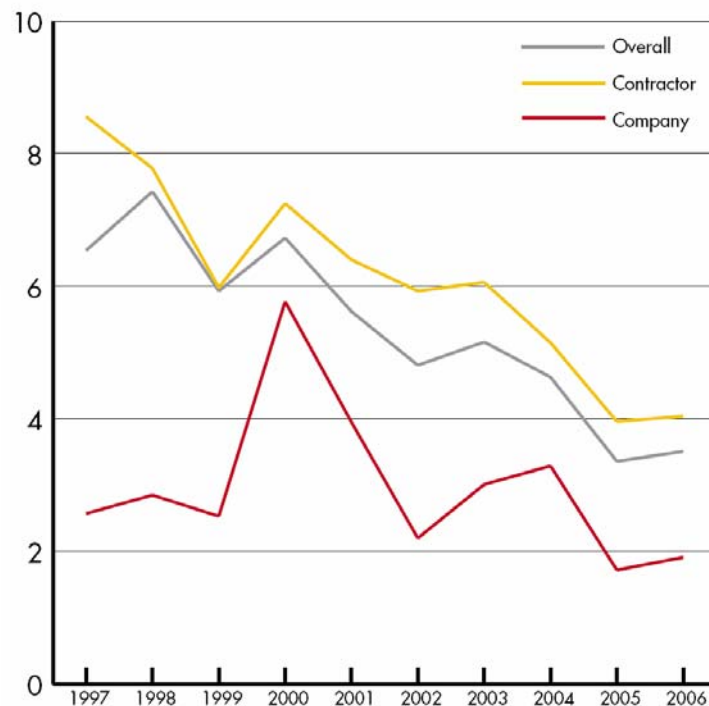
Fatality causes (excluding 'unknown')

- ❖ 15 Companies and 100 Contractors fatalities were reported in 2006, basically 37% more than reported in 2005.
- ❖ The increase in the number of fatalities is link to the 23% in crease of reported workhours.
- ❖ The 2006 FAR (Fatal Accident Rate) is 3.9 per 100 Million workhours, an 11% increase compare to 2005.

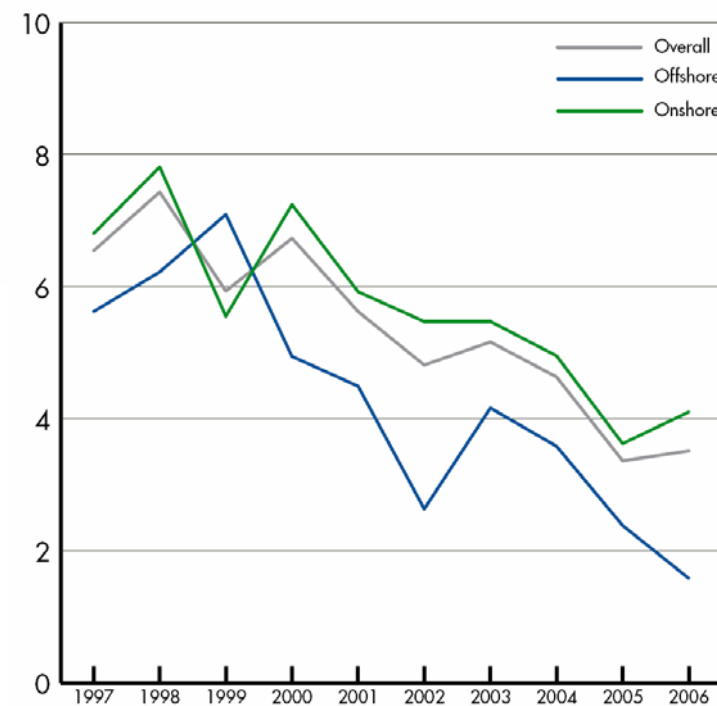


Fatal Incident Rate (FIR) repartition

Fatal incident rate - company & contractors
per 100 million hours worked



Fatal incident rate - onshore & offshore
per 100 million hours worked



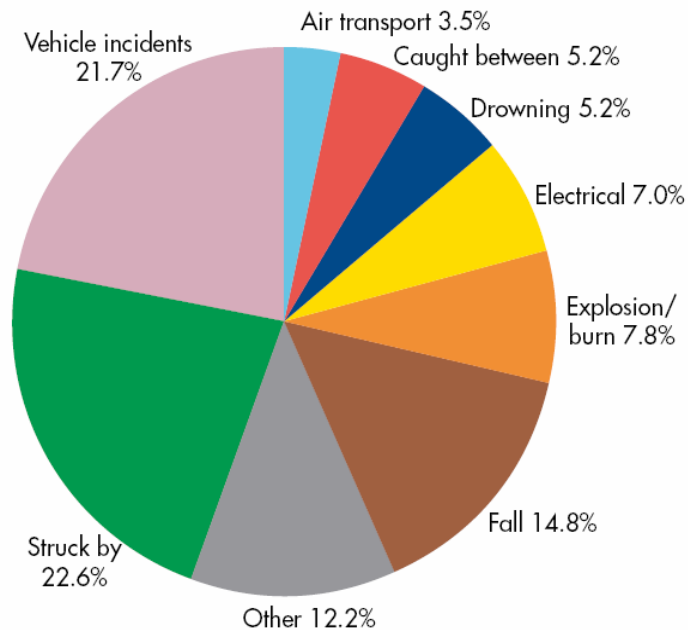
- ❖ The Company FIR is constantly lower to Contractor FIR.
- ❖ The Offshore FIR has dropped by a further 21% compared to last year and is the lowest on the record.
- ❖ FIR : Fatal Incident Rate.

Fatality causes

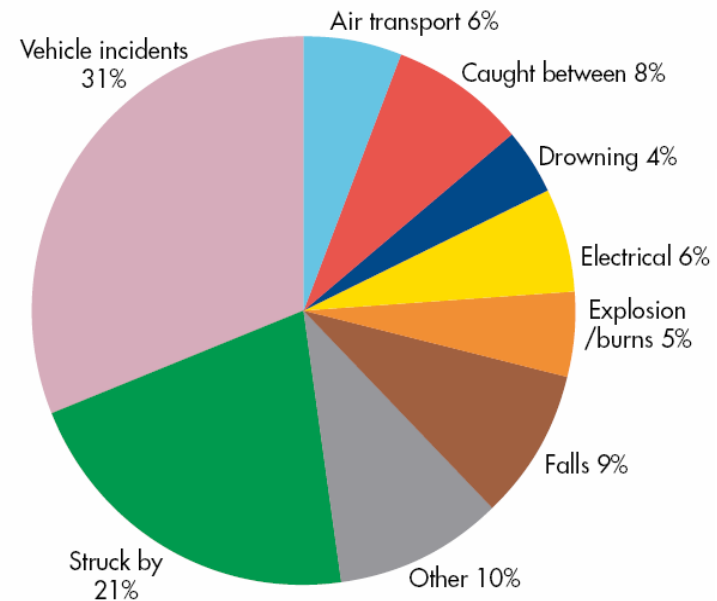
Fatality causes

% fatalities associated with each reporting category (excluding 'unknown')

2006



2001- 2005

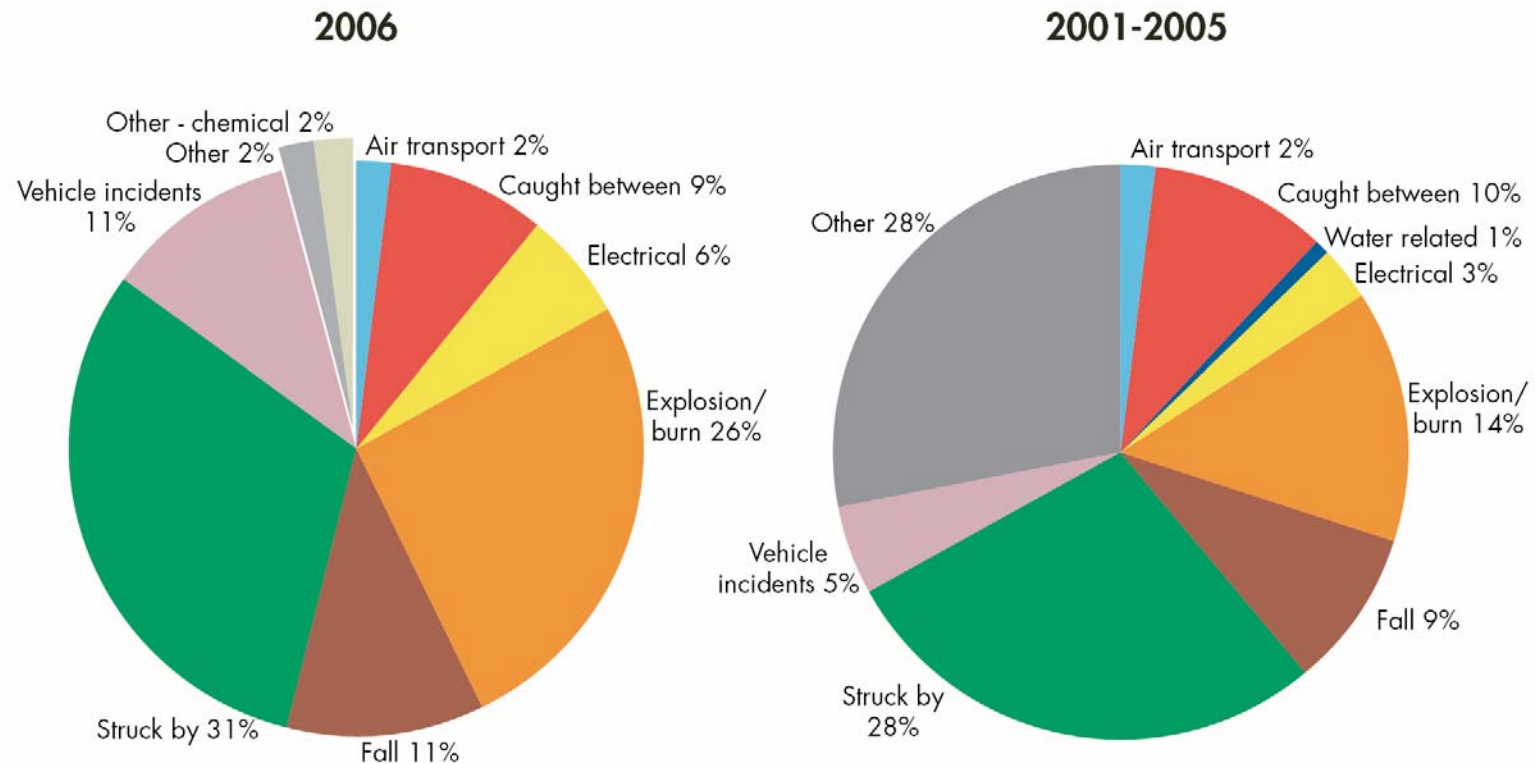


❖ In 2006, Fatalities caused by Electrical have accounted for 7% & by Explosion/burns for 7.8% compare to a rate of 6% & 5% average in the previous 5 years.

❖ Vehicle accidents and object fall remains the main causes of fatalities.

Significant incidents causes

Significant incidents by category



❖ Significant incident causes have been Electrical for 6% and 26% explosion/burns compare to an average rate of 3% and 14% on the previous 5 years.

❖ Electrical + explosion/burns have accounted for 32% of 2006 compare to 17% previously.

Safety, a core strategic Issue for the O&G industry.



Electrical and Explosion/burns have been the cause of a significant number of Fatal Accidents (15% in 2006) or Incidents (32% in 2006).

Explosive Atmospheres & Electrical

What is today status?

▶ In Europe :

- ▶ ATEX directives are mandatory :
 - ATEX 94/9/EC (“product” directive),
 - ATEX 1999/92/EC (“User” directive),
 - Both directives have been implemented in TOTAL Facilities, as applicable.
- ▶ The implementation of these directives have used a lot of time and efforts from the Industry.

▶ Outside Europe :

- ▶ Either international standards (IEC/CENELEC) are applied or local codes & standards.
- ▶ This current situation is a source of problems and concerns for worldwide companies such as the O&G Upstream Industry.

Explosive Atmospheres & Electrical TOTAL where do we stand?

- ▶ TOTAL as an Operator in the Upstream Industry does apply the following principles :
 - ▶ The local regulations, the national or international standards as well as the COMPANY rules and specifications.
 - ▶ The same level of requirements worldwide.
- ▶ TOTAL E&P requirements for Ex-equipment is as follow :
 - ▶ Application of IEC and/or CENELEC standards bearing in mind the current trend to issue harmonised standard between both organisations (cf. the Cenelec 60 079 range of standards) since the signature of Dresden agreement.
 - ▶ Other standards might be accepted on derogatory basis, but this will require formal approval from the COMPANY Technical Authority based on a corporate formal derogation procedure.
 - ▶ The equipment certificate shall be issued by an official Recognised Body.

Explosive Atmospheres

TOTAL E&P What we apply.

- ▶ In term of explosive atmospheres the world is basically split into two parts :
 - ▶ The European Union + other European states (such as Norway, switzerland) where both ATEX directives are Mandatory and are applied in COMPANY installations, as applicable.
 - ▶ Outside the European Union, no obligation to apply ATEX.
 - ▶ In North America (US/Canada), the NEC & CEC are to be applied
- ▶ After a careful analysis of the market and available products, it appears that most of the Ex-equipment have already ATEX certificates available or in progress.
- ▶ Consequently, TOTAL E&P has decided to apply the ATEX directive 94/9/EC “product” in all his facilities Worldwide.
- ▶ This has been made a Mandatory requirement through related Company General Specification.

IECEX within TOTAL E&P

- ▶ The IECEx scheme is not well known in Europe with the End-Users/Operator as far as a lot of attention have been dedicated to ATEX process.
- ▶ European Manufacturers are well aware of both schemes and they have developed double certification IECEx & ATEX in cooperation with Notified Bodies.
- ▶ Within the TOTAL Group organisation the knowledge of the IECEx scheme is still limited.
- ▶ A formal evaluation of the IECEx is currently under progress at the Group Technology Comity by the electrical team.
- ▶ A lot of effort have been already devoted to ATEX implementation, so there is some reluctance to move for a new system outside Europe for a benefit which needs to be demonstrated. However, implementation of ATEX outside Europe has as well raised some issues with local authorities in particular with regards to local contents.

What shall be done to have a safe installation in explosive atmospheres?

- ▶ There is for a safe installation of equipment in an hazardous area three main issues to be mastered :
 - ▶ The equipment and its certification versus an applicable standard,
 - ▶ The life long maintenance/repair of this equipment, and the necessity for the certificate to remain valid,
 - *For repair, End Users shall ensure that the requirements of IEC/EN 60079-17 & 19 are enforced.*
 - ▶ The skills of the people operating/working/designing in these installations are qualified and trained.
 - *For personnel skills, End Users shall ensure that designer, operator, workers & management shall be evaluated (refer to latest issue of IEC 60079-14 Annex F (Normative)).*
- ▶ The ATEX directive does not have any provision to maintain the certification of repaired equipment, and rely on Manufacturers or certification bodies to evaluate the repair shop ability to enforce the requirements of IEC/EN 60079-17 & -19..
- ▶ In O&G Industry, the Company personnel skills are normally evaluated using internal procedures.

Benefit expected from IECEx scheme (1/3)

- ▶ IECEx scheme does not allow self certification, so without consideration for the EPLs an equipment to be installed in hazardous area has to be certified by a approved Body (ExCB).
 - ▶ *ATEX directive does allow self certification for electrical equipment EPL=Gc/Dc (Category 3).*
 - ▶ Self certification is not allowed within TOTAL E&P technical referential.
- ▶ IECEx certification is based on IEC standards
 - ▶ *ATEX directive allows for any standards provided it meets the EHSR (Essential Health & Safety Requirements).*
 - ▶ One set of internationally recognised standard.
- ▶ Certificate of Conformity (CoC) delivered by ExCBs is under an electronic format which has to be accessed from secured IECEx Website.
 - ▶ *ATEX delivers only paper certificates.*
 - ▶ Electronic format reduces the risk of forgery/fraud.

Benefit expected from IECEx scheme (2/3)

- ▶ ExCBs and ExTLs appointments is based on a peer to peer review and designated criteria as described in IECEx 02 rule in chapter 11.1 and 11.2 respectively.
 - ▶ *ATEX appointments of Notified Bodies is based on the designation by a legal authority, and not a technical review by peers.*
 - ▶ The overall number of ExCBs and ExTLs is today limited and well controlled.
- ▶ Certification of Services facilities program covering repair and overall of Ex equipment based on the requirement of IECEx 03 rule.
 - ▶ *ATEX has not included Ex repairers in the directives, certification has been developed at National level by NB (Sagratex or Reparatex in France) or by Manufacturers for their equipment.*
 - ▶ Certified Ex repair Workshop will provide repaired equipment with a valid certificate.
- ▶ Certification of the persons skill is currently under development by IECEx WG12 and will allow evaluation & certification of the persons skills & competencies versus Explosive atmosphere environment.
 - ▶ *ATEX directives mentioned that people shall be competent but no assessment procedures available.*
 - ▶ IEC requires through standard IEC 60079-14 Annex F requires a regular assessment of “Knowledge, competencies & skills of Responsible persons, operatives and designers”,

Benefit expected from IECEx scheme (3/3)

- ▶ The IECEx scheme is a comprehensive system designed to take care of the complete Ex chain, i.e. :
 - the equipment,
 - the services,
 - the persons working in or for this explosive atmosphere areas.
- ▶ This systematic approach of the Ex environment will improve the level of safety and confidence in the overall chain of the installation life cycle.
- ▶ The scheme could be applied Worldwide based on the internationally recognised IEC standards with a good acceptance level in host countries.
- ▶ The scheme is already enforced as law in some countries such Australia, New Zealand & Singapore.

TOTAL E&P area of concerns on the IECEx scheme

- ▶ Will IECEx maintain a limited number of ExCBs (today already 36)? With the ATEX directive the number of NBs has drastically increased (from 22 to 60 now (Extract from EU WebSite dated 18/09/2008)) raising questions on competencies of some of them. If the number of ExCBs increases too much and too quickly, the question of competencies will be raised even if the peer review (surveillance each year and re-assessment every 5 years) is a partial answer.
- ▶ The same type of question can be as well raised on ExTLs.
- ▶ What will be the learning curves of all the actors (Engineering, Manufacturers, Repair shops, ...) after the effort and cost already spent on the ATEX scheme?
- ▶ Will the deployment speed of certified services facilities/repair shops worldwide allow End users compliance to IECEx scheme Worldwide in a near future? Ideally a repair shop nearby our O&G facilities or maintenance centres.
- ▶ Competencies assessment procedure under development shall result in a simple and easily applicable procedure, and shall as well allow certification under an electronic format for easy and secure access of workers/contracted personnel credentials.

Conclusion

- ▶ As an operator TOTAL E&P is now considering IECEx in addition of ATEX for its facilities outside Europe in order to take advantage of :
 - ▶ The IECEx Certified Equipment Program (IECEX 02) based on IEC standards for electrical equipment for hazardous area,
 - ▶ The IECEx Certified Service Facilities Program (IECEX 03) for repair & overhaul based on IEC standards for Ex certified equipment,
 - ▶ A better worldwide knowledge of IEC compare to ATEX system, which results in a better acceptability in various countries.
- ▶ The direct consequence will be the management of two different systems :
 - ▶ Europe : ATEX system,
 - ▶ Outside Europe : ATEX and IECEx systems.
- ▶ The next wishful step would be to have an harmonisation between IECEx & ATEX in order to have a single system to be applied Worldwide.

Thanks for your kind attention

Any QUESTIONS?