Project Risks: A Client’s Perspective
Mission statement:

- Safety first
- Reduce time from discovery to first production
- Reduce development costs
- Deliver major projects
Development division: the scope

Concept development & Project construction

Prospect

Preliminary

Pre-project

Conceptual

Basic Eng.

Detailed Engineering

Call For Tender

Construction

Reservoir monitoring & Technological support

EOR**

* SOR: Statement of Requirements
** EOR: Enhanced Oil Recovery

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TOTAL E&P Referential

- **Objectives**
  - Decline HSE within the organization
  - Ensure our overall performance
  - Share a common culture

- **4 level structure**
  - Level 0 – Corporate documents (above E&P)
  - Level 1 – Organization Charters, E&P Directives
  - Level 2 – Company Rules and General Specs
  - Level 3 – Guidelines and Manuals

- **E&P Technical standards (level 2 & 3)**
  - Company Rules define the doctrine of the E&P disciplines
  - General Specifications express our requirements
  - Guidelines and Manuals disseminate TOTAL know-how in all E&P entities

- **Derogation process in place for specific situations**

- **Associated processes certified ISO 9001**
HSE at every stage of development

**Safety engineering**

- Design safe facilities
  - Risk reduction measures of each identified hazard to an acceptable level

- Initiate process at conceptual stage until hand-over to operations
  - Safety concept dossier
  - Hazards’ identification and analysis
  - Technological risk assessment

- Verify with a strong audit system
  - Safety Processes and Operability Technical review (SPOT)
  - Project Technical Review (PTR)

**Safety at work**

- E&P HSE management system (MAESTRO)
  - Robust referential and internal audit process applicable to any project

- Relationship with contractors

- Human factor and behavior initiatives

- Total Group’s Golden rules

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Safety at Work: Total’s golden Rules

1. **High-risk situations**
   - **R则are**
   - Do not start up or shut down equipment or installations without using the appropriate, written operating procedures.

2. **Traffic: Machinery/Vehicles/ Cyclists/Pedestrians**
   - Do not exceed the speed limit.

3. **Body mechanics and tools**
   - Do not carry out work if you do not have the right tools for the job and the environment.

4. **Protective equipment**
   - Do not access installations or perform work without wearing general or task-specific PPE.

5. **Work permits**
   - Do not perform work without a valid work permit.

6. **Lifting**
   - Do not walk or stand under a load while lifting is taking place.

7. **Work on powered systems**
   - Do not perform work without checking that the power and product supply has been rendered inoperative.

8. **Confined spaces**
   - Do not enter a confined space until isolation has been verified and the atmosphere checked.

9. **Excavation work**
   - Do not perform excavation work without a valid work permit comprising a map of all underground hazards.

10. **Work at height**
    - Do not work at height without a safety harness when there is no collective protective equipment.

11. **Change management**
    - Do not make any technical or organizational changes without prior authorization.

12. **Simultaneous operations or co-activities**
    - Do not perform any simultaneous operations or co-activities without a prior inspection.

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TOTAL Development division: the key figures

Typical scope (2011)

- 34 conceptual studies
- 25 pre-project studies
- 70 Million man-hours supervised
- $10 Billion spent on operated projects

- 800 head office personnel
  (Reservoir, Engineering, Project, Technology)
- 2,250 project personnel
- 12 major* operated projects under construction
- 8 major projects delivered since 2005
  - Dalia, Rosa, Moho Bilondo, Dolphin (in JV), Akpo, Yemen LNG (in JV), Pazflor and Usan
- 9 more major projects on stream before 2015
  - GirRI, CLOV, Laggan Tormore, Tempa Rossa, OML 58 Upgrade, Anguille rdypt, Kharyaga Ph.3, Ofon Ph.2, West Franklin Ph.2

* Major: investment 100% > $1 Billion
Delivering projects through an efficient management

Despite increased complexity and local content, Total has established a track record of on-time on-budget projects

* variation between start-up and sanctioned figures for projects with CAPEX (100%) > 400 M$

** CERA Upstream Capital Costs Index, base 100 in 2000
Creating value through innovative designs

- **Long-distance multi-phase transportation**
  - Dunbar, Dolphin, Laggan-Tormore

- **HP/HT* production and infill drilling**
  - 1,100 bars and 190°C on Elgin Franklin
  - 1,150 bars and 215°C on West Franklin

- **Subsea processing**
  - Pazflor, GirRI, CLOV, Kaombo

- **FPSO** **hulls for processing crude**
  - Pazflor, Usan, CLOV: topsides weight reduction

- **FLNG*** design (2.5 Mt/y to 4.0 Mt/y) developed based on extensive experience in FPSOs, FPUs and LNG plants

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* HP/HT: High Pressure, High Temperature  
** FPSO: Floating Production Storage & Offloading  
*** FLNG: Floating LNG  

**More efficient designs for future growth**
ED Mission: Choose the right concept
(ED: Development Engineering)

- **Evaluate** growth opportunities
- **Appraise** development potential
- **Select** best concept for development
- **Define** concept for sanction

**Prospect Study**
- Notional development scheme
- Preliminary cost & planning

**Preliminary Study**
- Appraisal requirements
- Preliminary scheme
- Development feasibility cost & planning

**Conceptual Study**
- Screening alternatives
- Confirmation of feasibility
- Concept selection: cost, planning & economics

**Pre-project Study**
- Basis of design
- Key parameters definition (SOR*)
- Facilities and wells description
- Project execution principles
- Cost, planning & economics

**Basic engineering**
- Hand-over to project team

* SOR: Statement of Requirements
Development Engineering Challenges

- Select and define a development scheme for the whole life of field (20+ years)
  - Introduce safety embedded in the design
  - Standardize as much as possible
  - Innovate whenever necessary

- Estimate reliable cost & planning, in a constantly changing market environment

- Anticipate future phases of the development
PJC Mission:
(PJC: Projects and Construction)

- Refine the design to prepare competitive call for tenders
- Negotiate the contracts and secure EPC* lump sum whenever possible
- Supervise EPC contractors to reach safety and quality objectives
- Deliver the project until operation hand-over at production start-up

* EPC: Engineering, Procurement and Construction
Projects & Construction Challenges

- HSE: a relentless effort
- Monitoring cost and schedule
- Ensuring quality during construction
- Managing the implementation of new technology
- Meeting increasing expectations of local content

**Key figures:**
- 70 Millions hours on DGEP and contractor yards
- $10+ Billion spent on operated projects each year
TEC Mission: A “high TEC” support to TOTAL E&P

(TEC: Technologies)

- High level technical assistance to development studies, projects and operations
- Technical audits & definition of remedial plans
- Coordination & representation of E&P in various industrial bodies
- Significant involvement in R&D activities
  - Technical supports
  - Qualification of new technologies
- Technical qualification of vendors and suppliers

240 Specialists covering over 15 disciplines
From design to trouble shooting of producing facilities
Development challenges: Deliver safer and faster

- Safety and Environment: priority and commitment
- Create value through innovative and safe designs
- Increasing complexity and local content requirements

New organization in place to manage the complete project
  - Reinforce reservoir management to maximize value of development
  - Reduce development costs
  - Produce more from enhanced facilities
  - Deliver efficient and effective project management
2015 production growth fueled by more than 25 project start-ups

- 2013-15
- 2012
- 2011

Laggan Tormore, Islay, Ekofisk, Kashagan, Termokarstovoye, Sulige, West Franklin Ph2, Tempa Rossa, Halfaya, Utica, OML 58 up., Usan, Ikike, Pazflor, Ofon 2, Anguille Redev, CLOV, Angola LNG, Bongot South, South Mahakam, GLNG

2015 production from new start-ups

- ~600 kboe/d

2013-15 start-ups

2011-12 start-ups

Other

OECD

Africa

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Industry leader in deep offshore

- Exploration
- Planned FID / Under development
- Producing

Laggan / Tormore

10% of 2011 production
~20% of Upstream results

Deep offshore production kboe/d

- Tahiti
- Egin
- Akpo
- Bonga
- Moho Bilondo
- Usan
- Moho North
- CLOV
- Girassol / Jasmim / Rosa
- Dalia
- Pazflor
- Block 32
- Block 14

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Russia: access to giant resources through partnerships

**Shtokman (25%)**
- Joint Dev Co: SDAG
- Gazprom 51%
- Capacity Ph.1: 410 kboe/d
- LNG: 7.5 Mt/y
- FID targeted in 2012

**Yamal LNG (20%)**
- Novatek 51%, operator
- Capacity: 450 kboe/d
- LNG: 15 Mt/y
- FID targeted in 2013

**Kharyaga (40%)**
- PSA signed in 1995
- Capacity: 30 kb/d
- Phase 3 in progress

**Novatek (14.09%)**
- Plan to increase stake
- 13% of domestic gas market
- Gas production 2011: ~1 Mboe/d

**Khvalinskoye (17%)**
- HoA signed with KMG
- Lukoil 50%, operator
- KazMunaiGas 25%
- Capacity: 140 kboe/d
- FID: December 2011

**Termokarstovoye (49%)**
- Novatek 51%
- Capacity: 70 kboe/d
- FID: December 2011

Producing assets  Pre-FID projects  HoA
Australia: developing new major production pole

**Ichthys (24%)**
- 8.4 Mt/y of LNG, ~100 kb/d of condensates, ~1.6 Mt/y of LPG
- Marketing of all LNG completed
- FID: January 2012
- Start-up: end-2016(e)

**GLNG (27.5%)**
- 7.2 Mt/y of LNG
- Buyers: Petronas 3.5 Mt/y, Kogas 3.5 Mt/y
- FID: January 2011
- Start-up: 2015(e)

**Alignment with the global E&P growth strategy**: LNG, unconventional, strategic partnerships, OECD
- LNG sold on Asian markets, indexed to JCC
- 10 exploration permits in the Northwest Shelf including 4 operated
- Systematically evaluating and addressing environmental issues

**Total’s Production**
- Reserves*: >1 Bboe (Total share)
- ~20-year plateau

*initial proved and probable reserves, Total estimates
Canada: developing strong base to grow production

- Diversified portfolio of long-plateau projects
- 15 BC$ investment over next 10 years, Total share
- Strong commitment to CSR

Total’s positions in Canada

- **Fort Hills (39.2%)**
  - Reserves*: ~3.4 Bb
  - Capacity: 160 kb/d
  - Start-up: 2016(e)

- **Northern Lights (50%)**
  - Under study

- **Voyageur upgrader (49%)**
  - Throughput capacity: 250 kb/d
  - Start-up: 2017(e)

- **Joslyn (38.25%)**
  - Reserves*: ~2.5 Bb
  - Capacity: 200 kb/d (Ph.1&2)
  - Start-up Ph.1: 2017-2018(e)

- **Surmont (50%)**
  - Reserves*: ~2.6 Bb
  - Production: 27 kb/d
  - Capacity Ph.1&2: 130 kb/d
  - Start-up Ph.2: 2015(e)

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**Long-term cash and leverage to oil prices**

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The level and the nature of the risks evolve with the progress of the project.
Risk Management Process

Steps in risk management

1. **Identify**
   - Determine project objectives

2. **Rate**

3. **Classify**

4. **Define action plans**

5. **Manage**

Results:
- Confidence level
- Duration sensitivity
- Criticality index
- Cruciality (Sensitivity x Criticality)

Qualitative analysis

Quantitative analysis

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Schedule Risk Analysis

**8all Away Distribution**

**First Oil distribution**

20 - 1st OIL with Oligocene ONLY (all risers installed) - Finish Date
The DALIA Field
Pazflor Subsea Separation System
Pazflor Subsea Separation System
Usan, Nigeria
Ichthys, Australia
Yamal LNG, Russia
Concluding remarks

Historically our main risks have been costs and planning overruns.

HSE risks have moved to the forefront.

But our main risk these days is probably the loss of quality! This may have tremendous negative results on a Project.

The Referential developed by TOTAL over the years is meant to preserve Quality (rules/specifications/guidelines etc).

However this can only be achieved if a good understanding and alignment is achieved with our Contractors; and further on with their subcontractors and vendors.

Hence the final performance is very much in YOUR hands!!
Thank You for your attention
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