Mauritania – a model response planning process

Chinguetti Project – An Operator's Perspective

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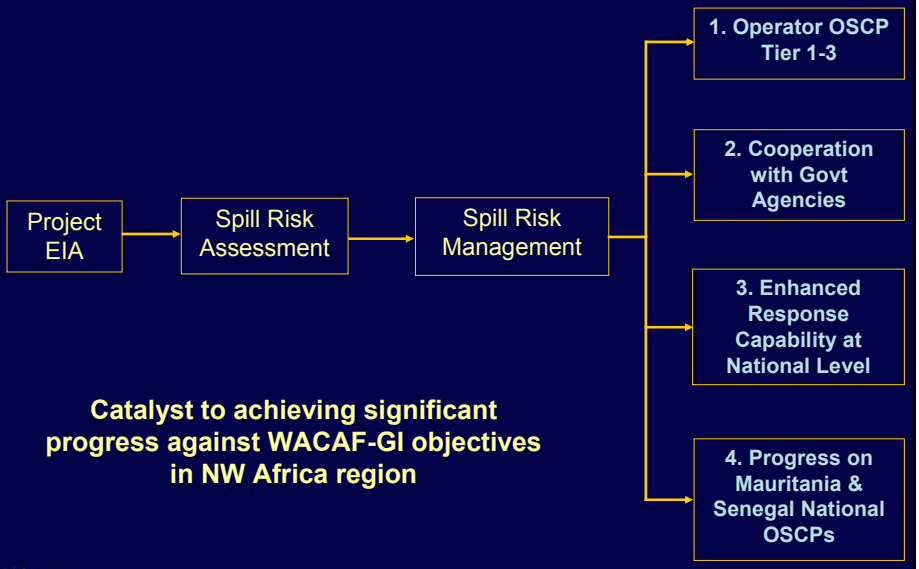
Interspill 2006

Overview

- Process & outcomes
- WACAF GI – role for IMO/IPIECA/Industry
- Woodside background & activities in Mauritania
- Development of OSCP
  - Environmental impact assessment
  - Spill risk assessment
  - Spill risk management

Process & outcomes



Catalyst to achieving significant progress against WACAF-GI objectives in NW Africa region

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WACAF GI (1) – principles

GI - Partnership between IMO & IPIECA to:

- Encourage & promote co-operation and partnership with shipping & oil industry
- Assist countries in developing national structure for dealing with oil spills through mobilization of external assistance & industry support at national / regional levels
- Encourage ratification & implementation on OPRC and conventions relating to liability & compensation

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WACAF GI (2) – opportunities in NW Africa region

Increase level of preparedness at Government level:

- International Conventions
  - Mauritania & Senegal have not ratified CLC & FUND 92
- National contingency plans
  - Neither country has National OSCPs in force
- Identification of Competent National Authority
- Improve cross border co-operation
- Improve levels of training and equipment

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Woodside

- Australia's largest publicly traded oil & gas exploration and production company
- Assets, projects, development opportunities and exploration interests in Australia, Asia, Africa & US
- Sales of liquefied natural gas, natural gas, crude oil, condensate & liquid petroleum gas
- Formed in 1954, HQ in Perth, Western Australia. More than 3000 staff, listed on the ASX (WPL)

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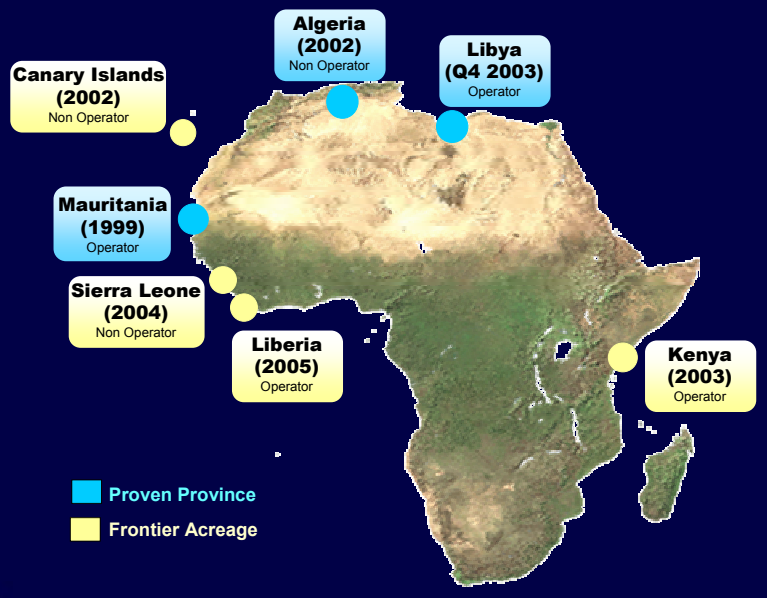
Woodside in Africa



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Woodside in Mauritania

- Operator of 6 PSCs covering 5 offshore blocks & 2 onshore blocks
- Chinguetti oil field discovered 2001
- Other discoveries under evaluation (Tiof, Banda, Tevét, Labeidna)
- 15% equity (non-operator) in Block 7

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Chinguetti project (1)

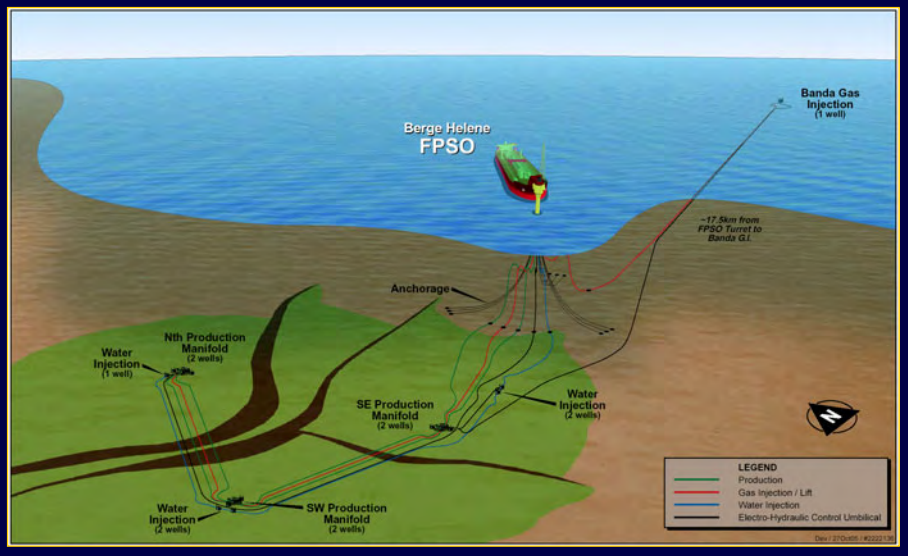
- Woodside-operated Chinguetti oilfield located ~ 90km west of Nouakchott, in 800m water depth
- First oil production Feb 2006, field life ~10 years, peak production ~75,000 barrels a day
- Oil produced through subsea wells to an FPSO (*Berge Helene*) permanently moored (turret) over the field
- Oil periodically offloaded to trading tankers

Chinguetti project (2)

Participating interests in the Chinguetti field:

Woodside group companies	47.4%
Hardman Chinguetti Production Pty. Ltd.	19.0%
Société Mauritanienne des Hydrocarbures	12.0%
Mauritanian Holdings B.V. (BG group)	10.2%
Premier Oil group companies	8.1%
ROC Oil group companies	3.3%

Chinguetti project (3)



Chinguetti environmental impact statement

- Explains the Project, outlines environmental effects, describes management measures
- Focuses on five key environmental hazards

1. Accidental oil spills
2. Produced water discharges
3. Drilling discharges
4. Fisheries interactions
5. GHG emissions

Regional values & sensitivities (1)

- Commercially-important demersal and pelagic fish in coastal and offshore waters
- Up to 32 cetacean species
- Several species of marine turtles and nesting areas
- Diverse populations of migratory and resident waterbirds and seabirds
- Deep-water seafloor features - carbonate mud mounds & underwater canyons

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Regional values & sensitivities (2)

- Population of Mediterranean monk seals
- Seagrass beds and remnant mangroves
- Marine and coastal wetlands and bird habitats within declared protected areas and reserves
- Bird habitats in coastal wetlands and lagoons
- Major industrial and artisanal fisheries

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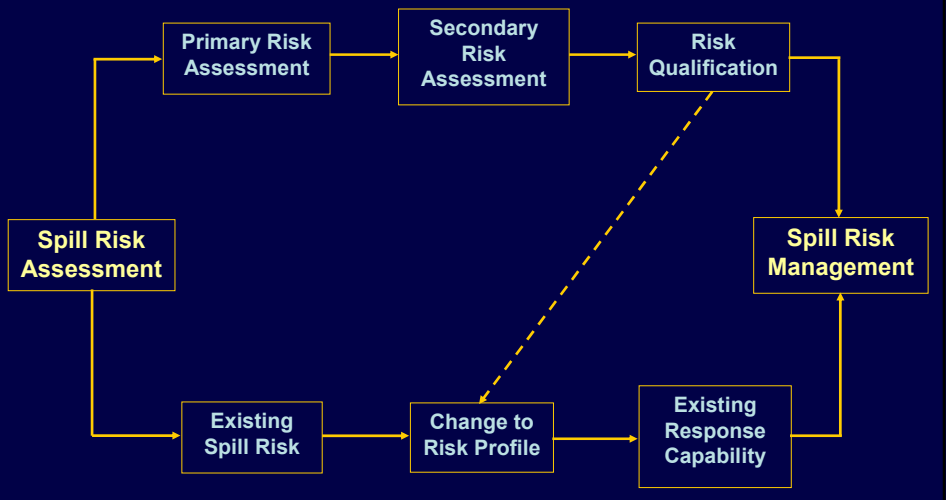
Spill risk assessment



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Spill modelling

- HYDROMAP + OILMAP + SIMAP
- Determination of a range of oil spill scenarios, including surface and seabed releases
- Model outputs provide information on expected probabilities of oiling and minimum potential time before exposure
- Model outputs represent “conditional probabilities”
- Single trajectory plots vs stochastic modelling

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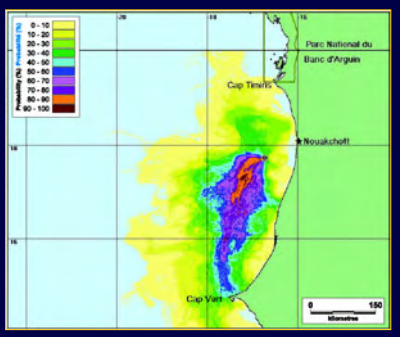
Single trajectory plots vs stochastic modelling



- Risks of misinterpretation of probability contours from stochastic modelling

Probability results

Season	Minimum time to shore (hours)	Maximum time to shore (hours)	Maximum oil to reach shore (bbls) (% of release)	Conditional probability of some oil arriving at the coast within 14 days (%)	Combined probability over 10 year field life (%)
Summer	28	>336*	32,060 (22.9%)	84	0.2
Autumn	44	>336*	4,452 (3.2%)	86	0.2
Winter	78	>336*	9,114 (6.5%)	94	0.2
Spring	48	>336*	11,648 (8.3%)	84	0.2

- Conditional probabilities do not take into account:
  - Likelihood of spill will occur in the first place
  - Any response measures to eliminate / minimize consequences

Modelling validation

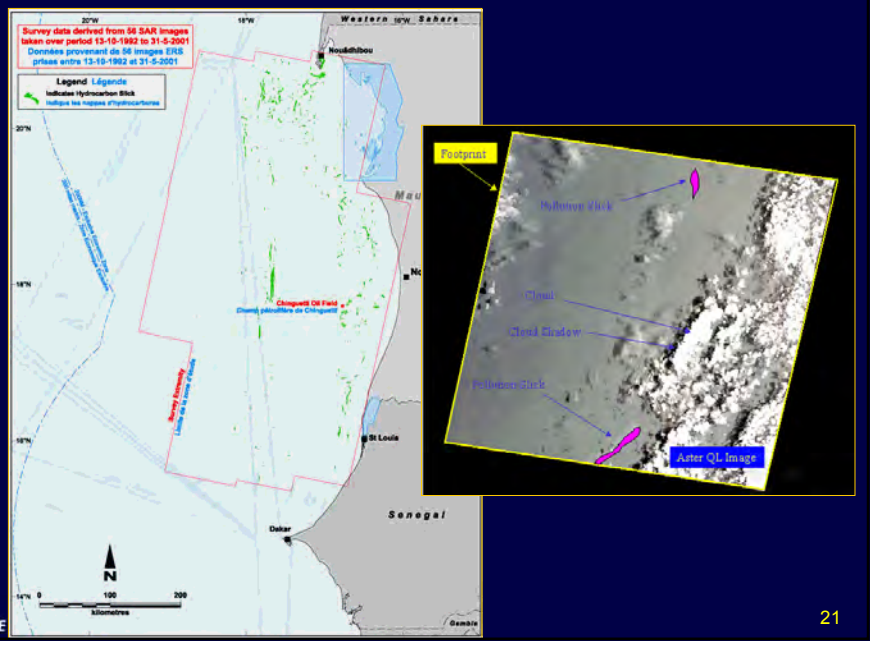
- Deployment of 12 satellite-tracked drifter buoys over 12 month period

Existing spill risk (1)

Vessel Type	No of Transits (2000–2002)	Crude Oil Quantity (Tonnes)	Crude Oil Quantity Yearly Average (Tonnes)	Average Crude Oil Quantity per Transit (Tonnes)
Bulk oil (SH)	10	1,118,000	372,667	111,800
Bulk oil (DH)	54	5,745,000	1,254,667	106,389
Crude oil tanker (SH)	505	72,171,344	24,057,115	142,914
Crude oil tanker (DH)	629	92,916,604	30,972,201	147,721
Non-specific tanker	16	2,425,382	808,461	151,586
Ore/oil	5	1,233,347	411,116	246,669
Product tanker (SH)	21	1,282,678	427,559	61,080
Product tanker (DH)	7	433,385	144,462	61,912
Chemical/oil tanker (DH)	1	80,000	26,667	80,000
Total	**1248**	**177,405,750**	**58,474,915**	**123,341**

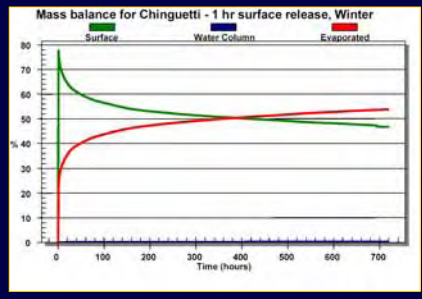
- Chinguetti Project will add ~3.3 million tonnes per annum (average), or ~5.7% by volume, at peak production

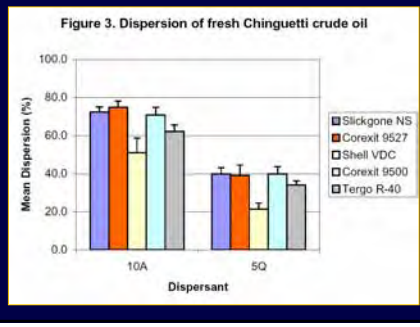
Existing spill risk (2)



Chinguetti oil properties

- Assessment of environmental consequences of spills based on:
  - Local & regional values and sensitivities
  - Oil spill modelling
  - Oil properties: potential for natural evaporation and dispersion
  - Weathering testing
  - Ecotoxicity testing
  - Dispersability testing



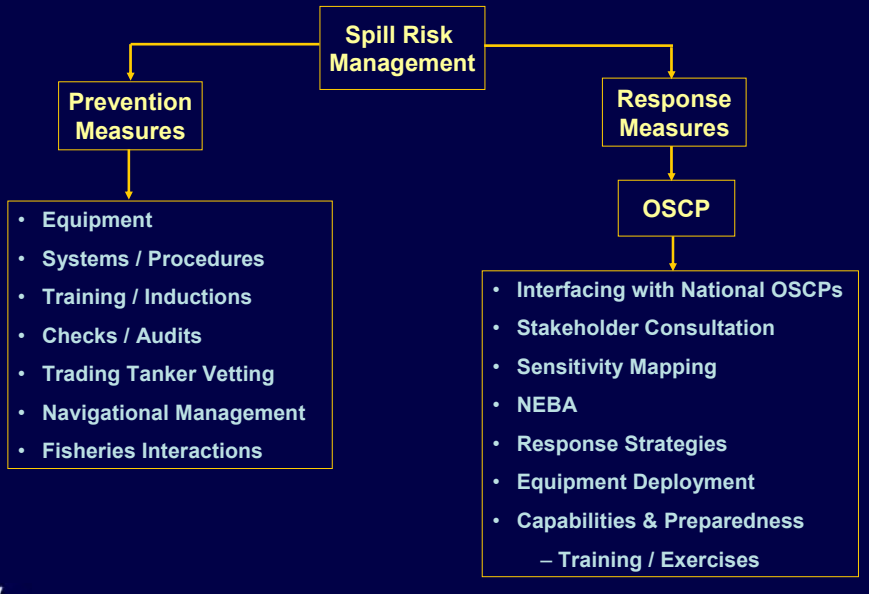


Spill risk assessment outcomes

Environmental Hazard	Hazard sub-category	Likelihood	Environmental consequence	Risk
Oil Spills	1,000-10,000 bbls	Possible to Unlikely	Minor to Slight	Medium to Low
	10,000-100,000 bbls	Unlikely to Remote	Moderate to Minor	Medium to Low
	100,000-500,000bbls	Unlikely (well blowout) Highly Unlikely to Remote (other hazards)	Major to Moderate Major to Moderate	High to Medium (well blowout) Medium to Low (other hazards)

- Most oil spill risk in Medium to Low categories, except for hypothetical development well blowout (High to Medium)

Spill risk management



Oil spill contingency plan

- EIS identified need for effective measures to respond to oil spills under framework of an OSCP
- Woodside drilling operations since 2001 covered by existing OSCP
- Decision taken to develop new OSCP based on changing oil spill risk profile (commencement of production)
- Oil Spill Response Ltd contracted to write new OSCP

Spill response strategies

Key elements that were considered in developing response strategies:

- Requirements relating to Mauritanian draft national OSCP (POLMAR)
- Need for capacity building to develop national spill response capability under POLMAR
- Concerns & issues arising from stakeholder engagement
- Trans-boundary spill risk
- Evaluation of most appropriate spill response techniques

OSCP (1) – structure

PLAN

1. Purpose & Scope of Plan
2. Initial Action Procedures
3. Spill Assessment
4. Response Strategies
5. Organisation & Management
6. Response Equipment
7. Contact Details
8. Forms

HANDBOOK

1. Introduction
2. Summary of Legislation
3. Operational Risk Assessment
4. Response Techniques
5. Oil Weathering & Fate
6. Environmental Sensitivities & Impacts
7. Tier 3 Logistics
8. Forms
9. Oil Spill Training & Exercises

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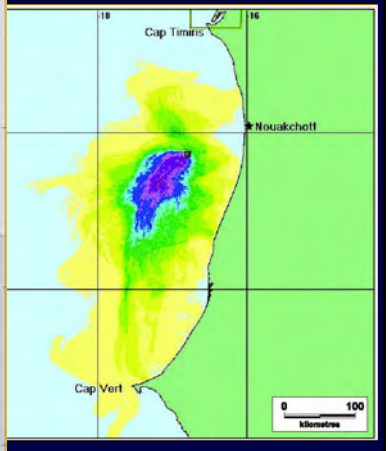
OSCP (2) – equipment stockpiles



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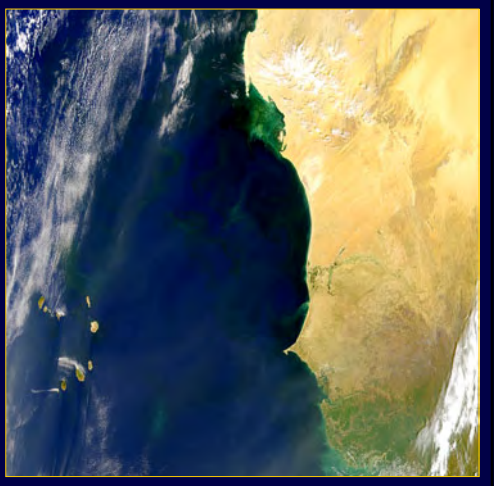
OSCP (3) – 2006 activities

- Sensitivity mapping of coastline (LandSat; ASTER; QuickBird)
- Decision support mechanism for chemical dispersant application (NEBA process)
- Training & deployment exercises
- Audits



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Key outcomes

- Chinguetti Project response capability established for Tier 1-3 spills consistent with industry best practice & IPIECA guidelines
- Cooperation with Govt agencies in Mauritania & Senegal
- Mauritania national oil spill response capacity enhanced with additional equipment & trained personnel
- Progress on Mauritania and Senegal draft national OSCPs. More work needed on interfaces

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Acknowledgements

- Government of the Islamic Republic of Mauritania
- Mauritania Joint Venture Participants:

  Hardman Resources
  Société Mauritanienne des Hydrocarbures
  BG Group
  Premier Oil
  Roc Oil
- OSRL
- IPIECA
- IMO

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