Status of Regulatory System for use of FPSO's in the GOM

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March 13, 2001

INTSOK
Houston, Texas

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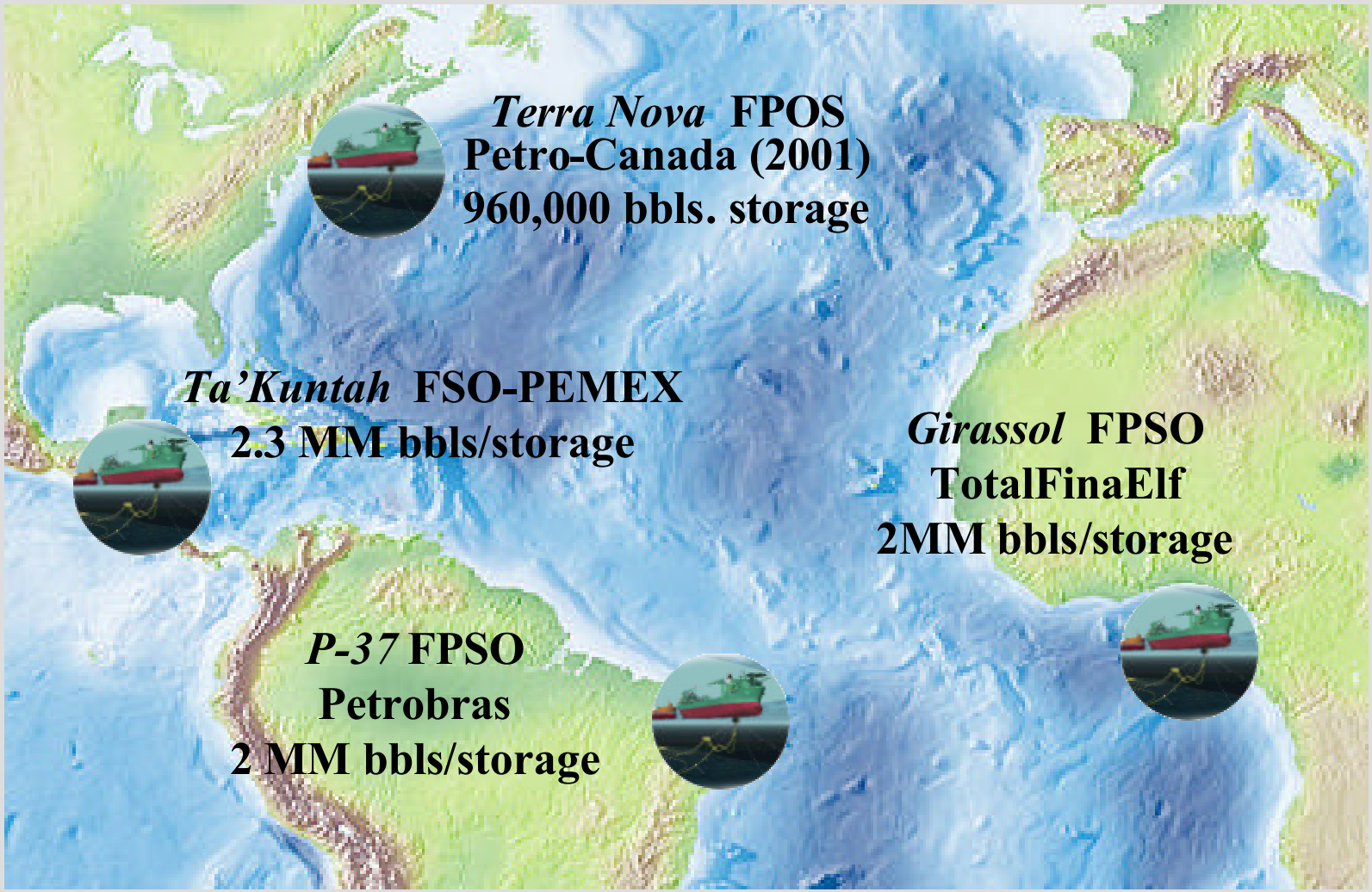
Overview
New FPSO's



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Focus Today

I. Background on Gulf of Mexico

II. Background on FPSO's

III. FPSO Regulatory System in the Gulf

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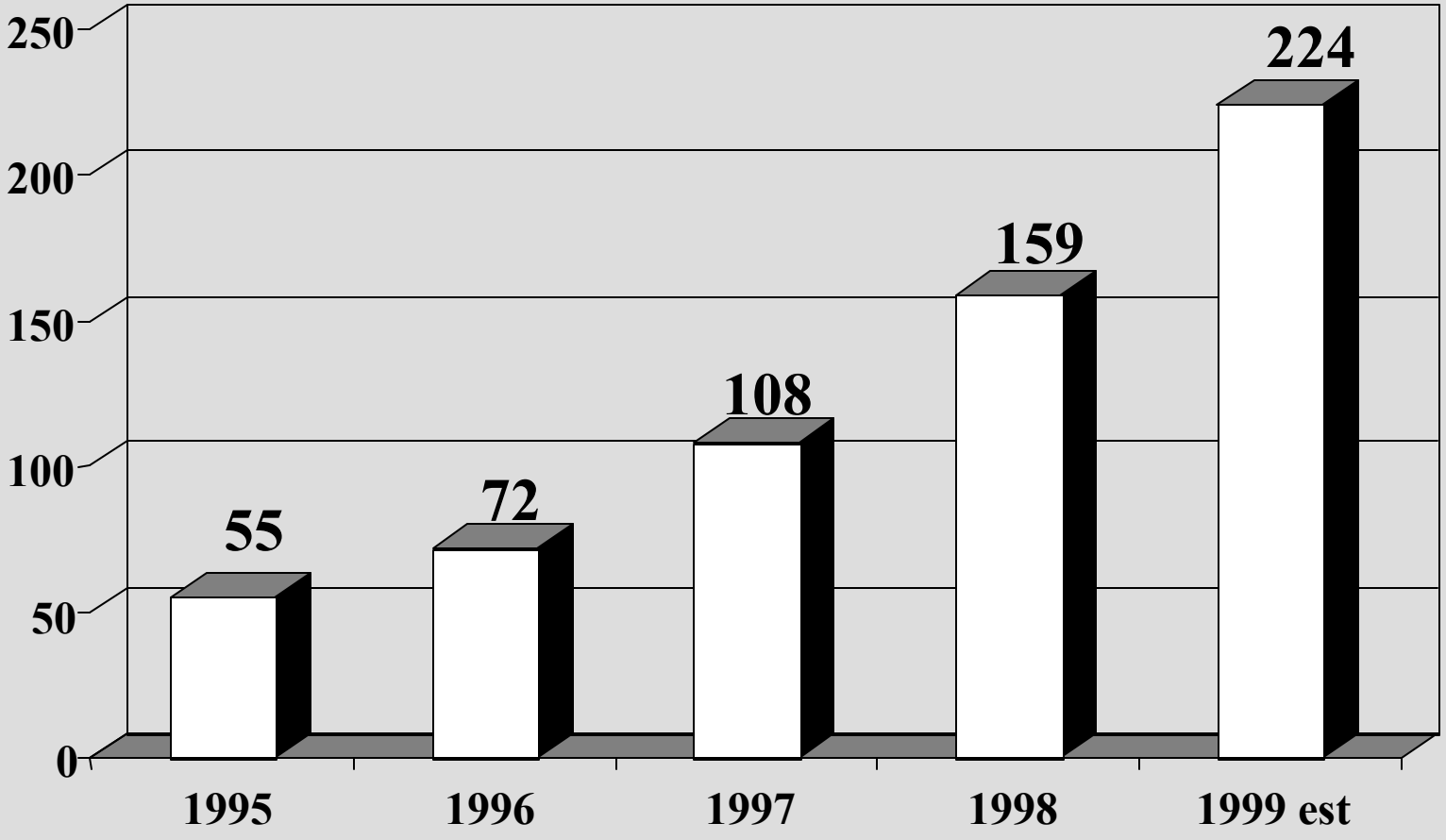
I. Background on Gulf of Mexico

Gulf of Mexico Deepwater Oil Production



Deepwater = 1000 ft. +

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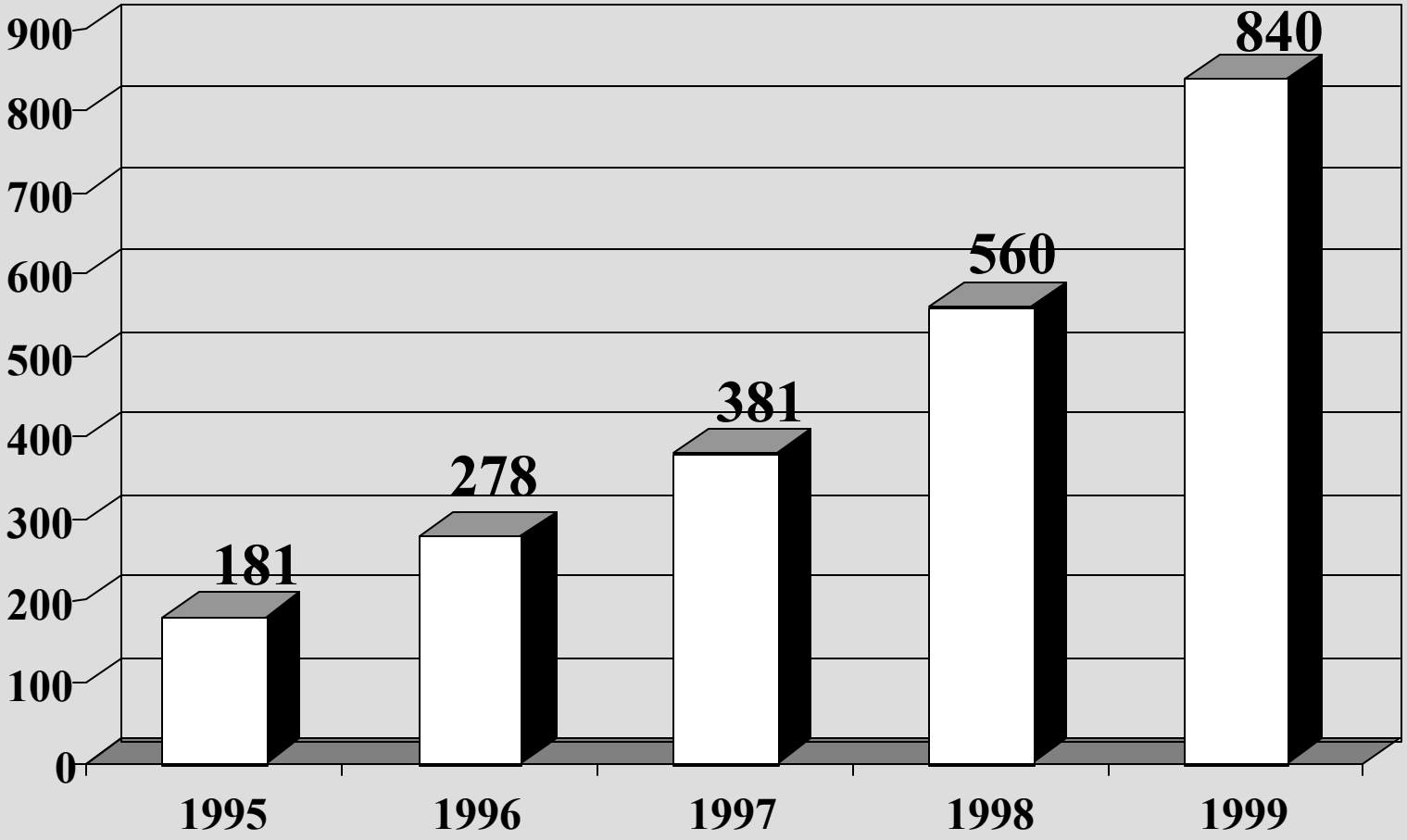
Gulf of Mexico Deepwater Gas Production



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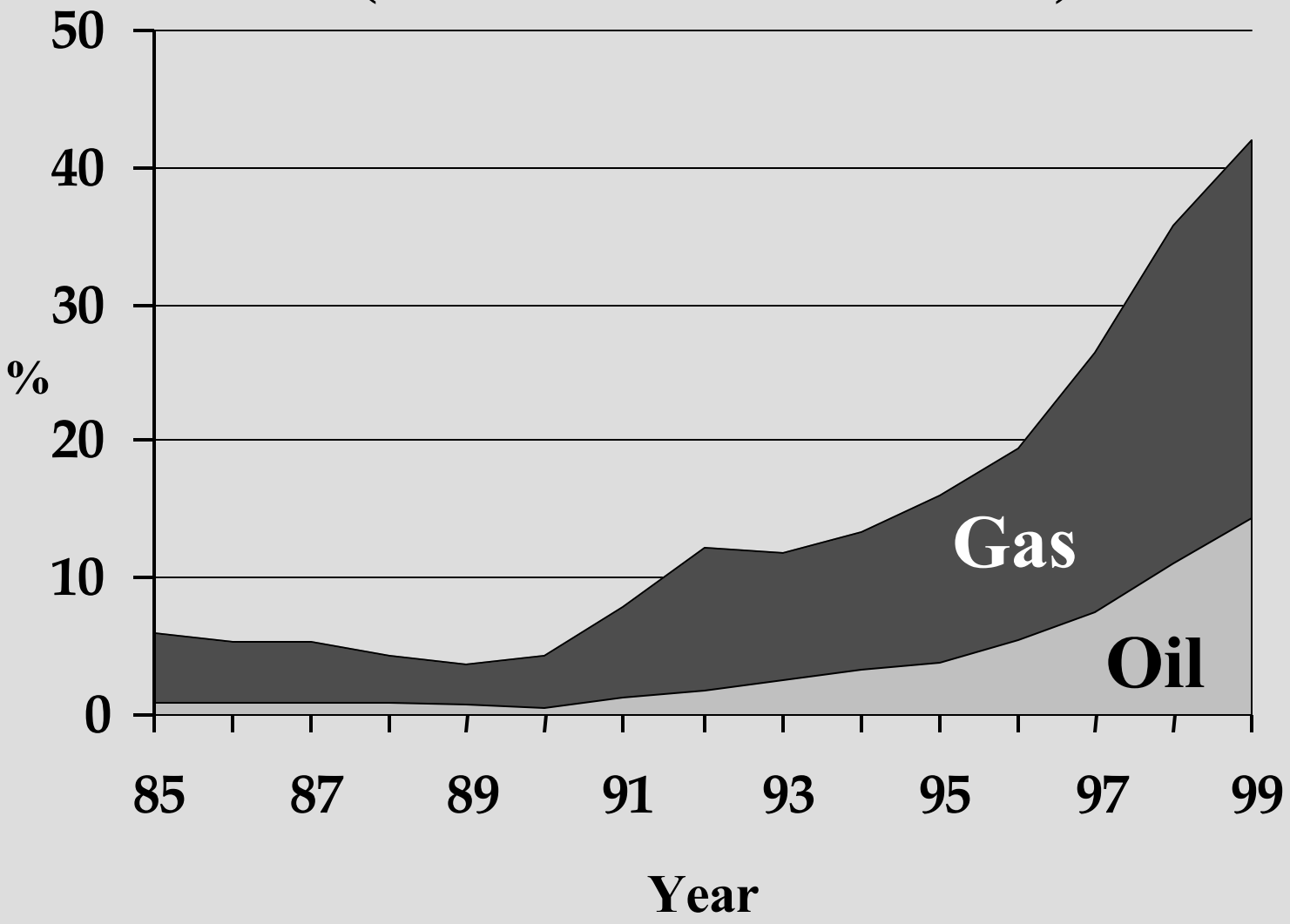
GOM OCS Deepwater Production

(% of total Gulf of Mexico)



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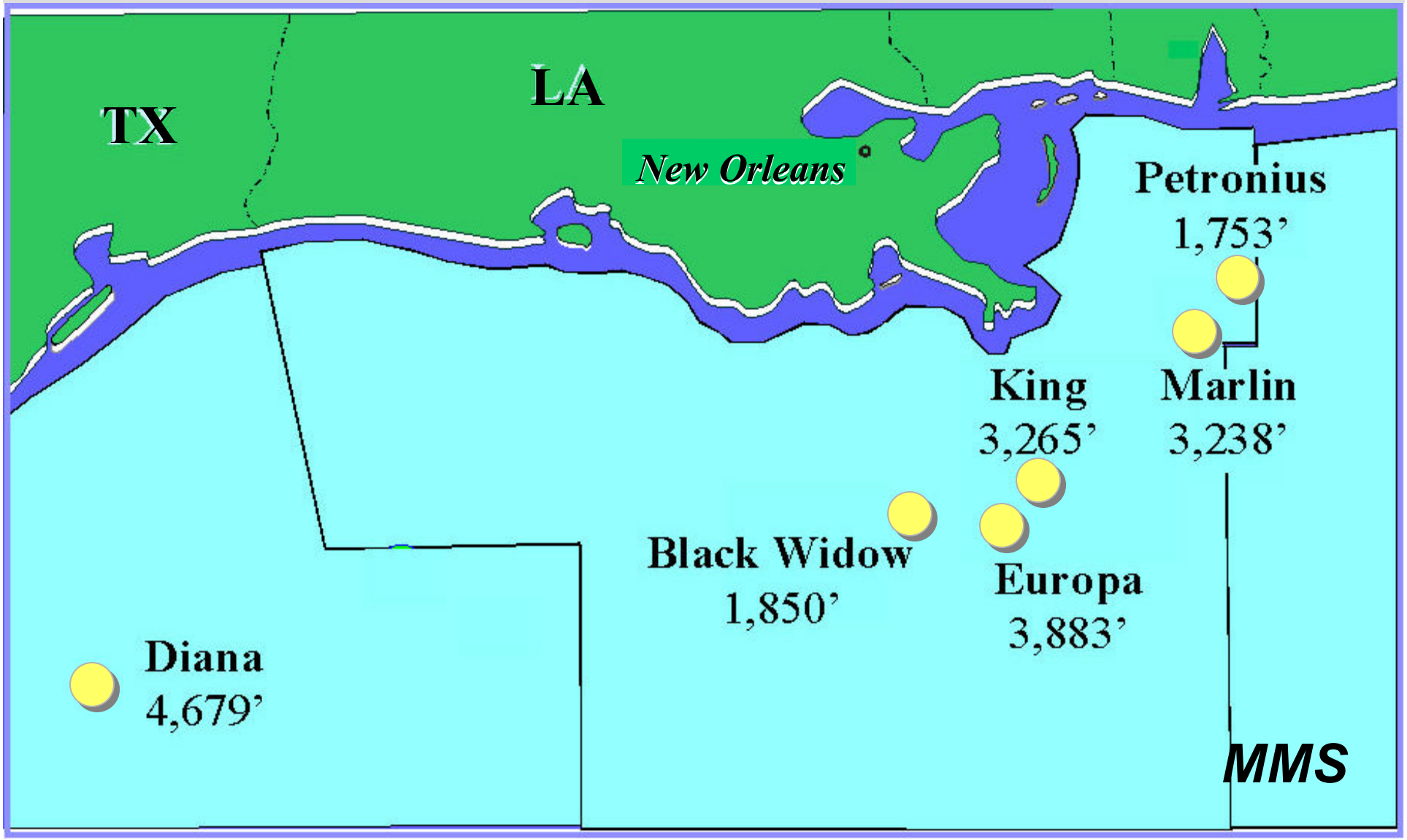
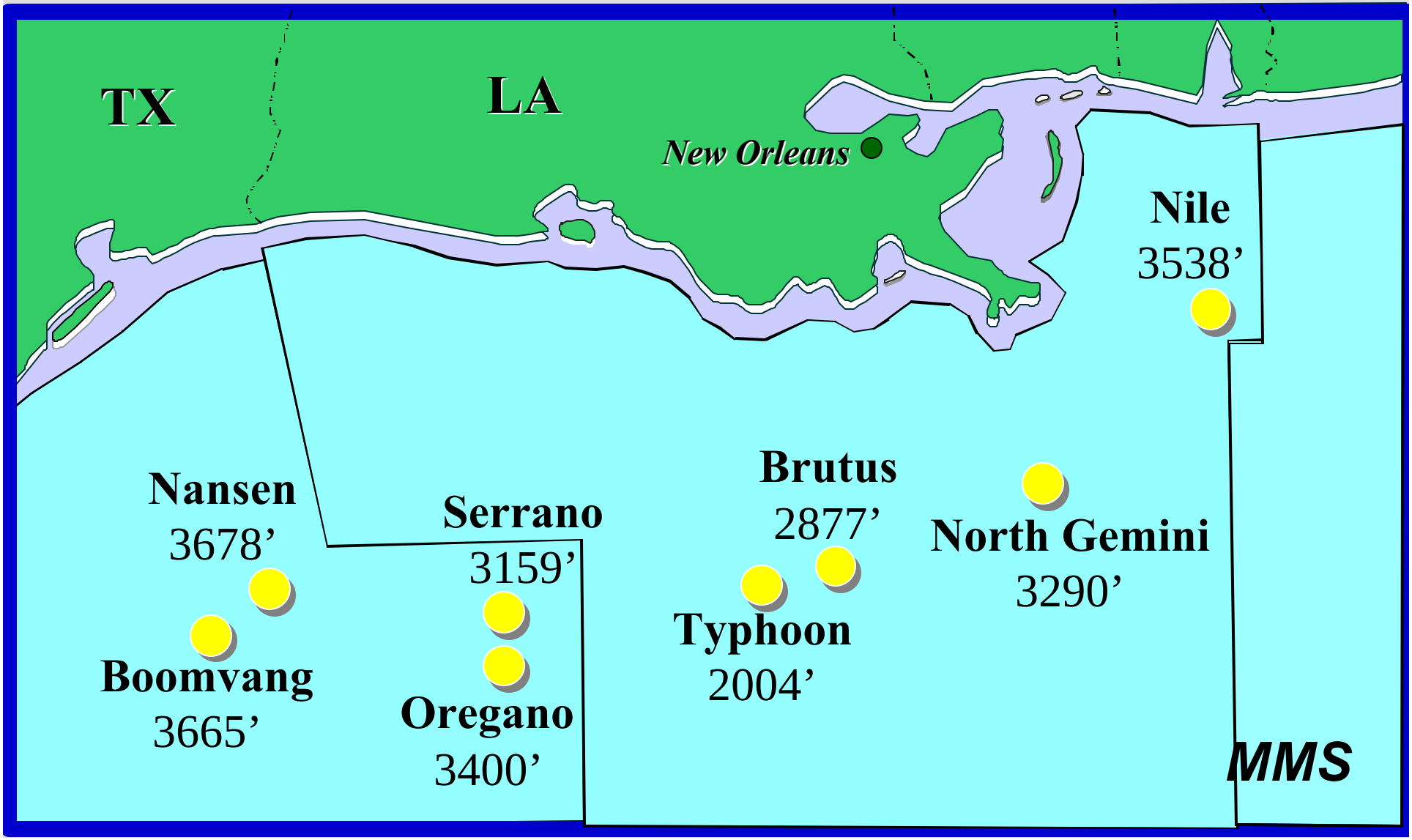
Deepwater Startups 2000



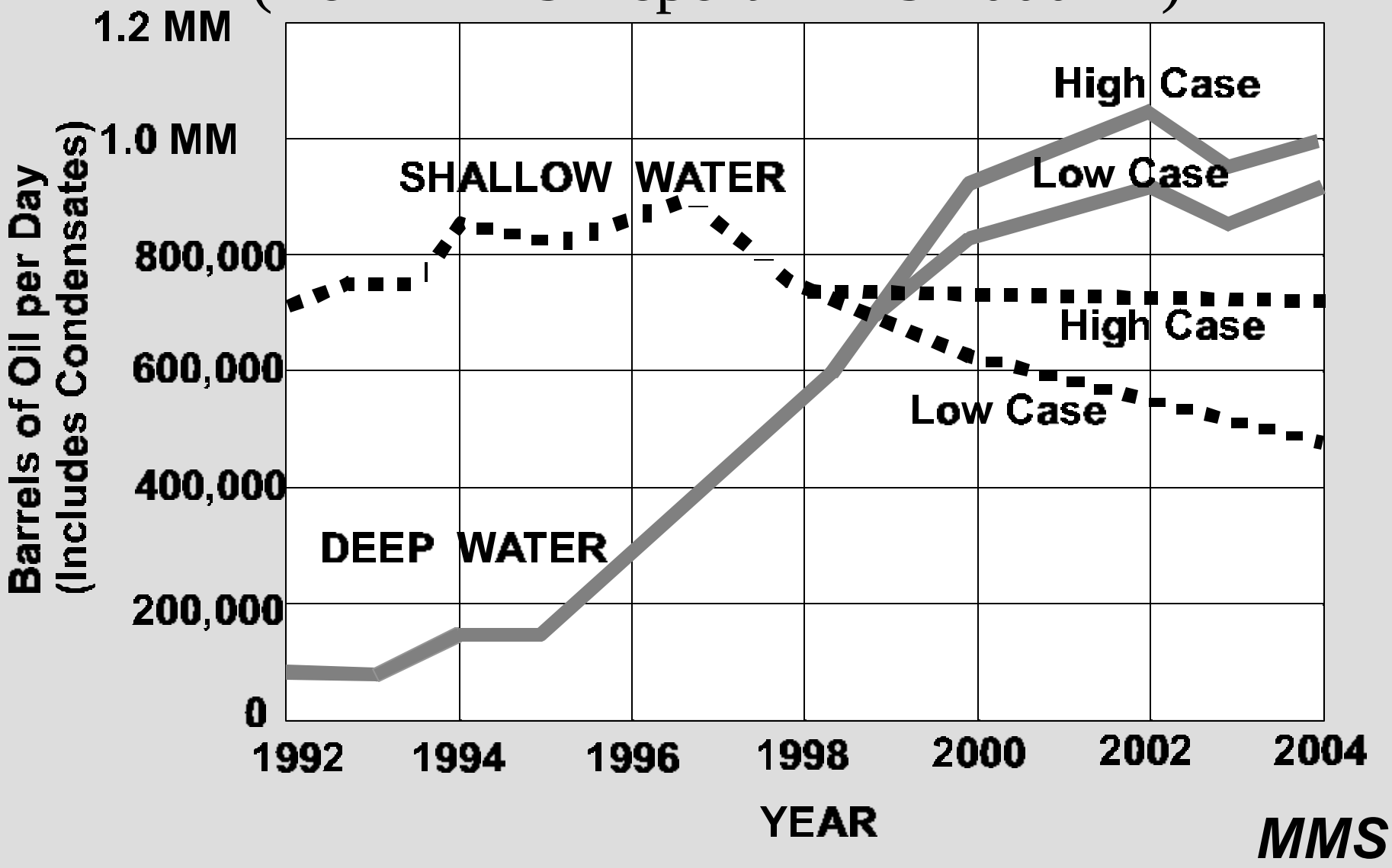
Deepwater Startups 2001-02

(expected)



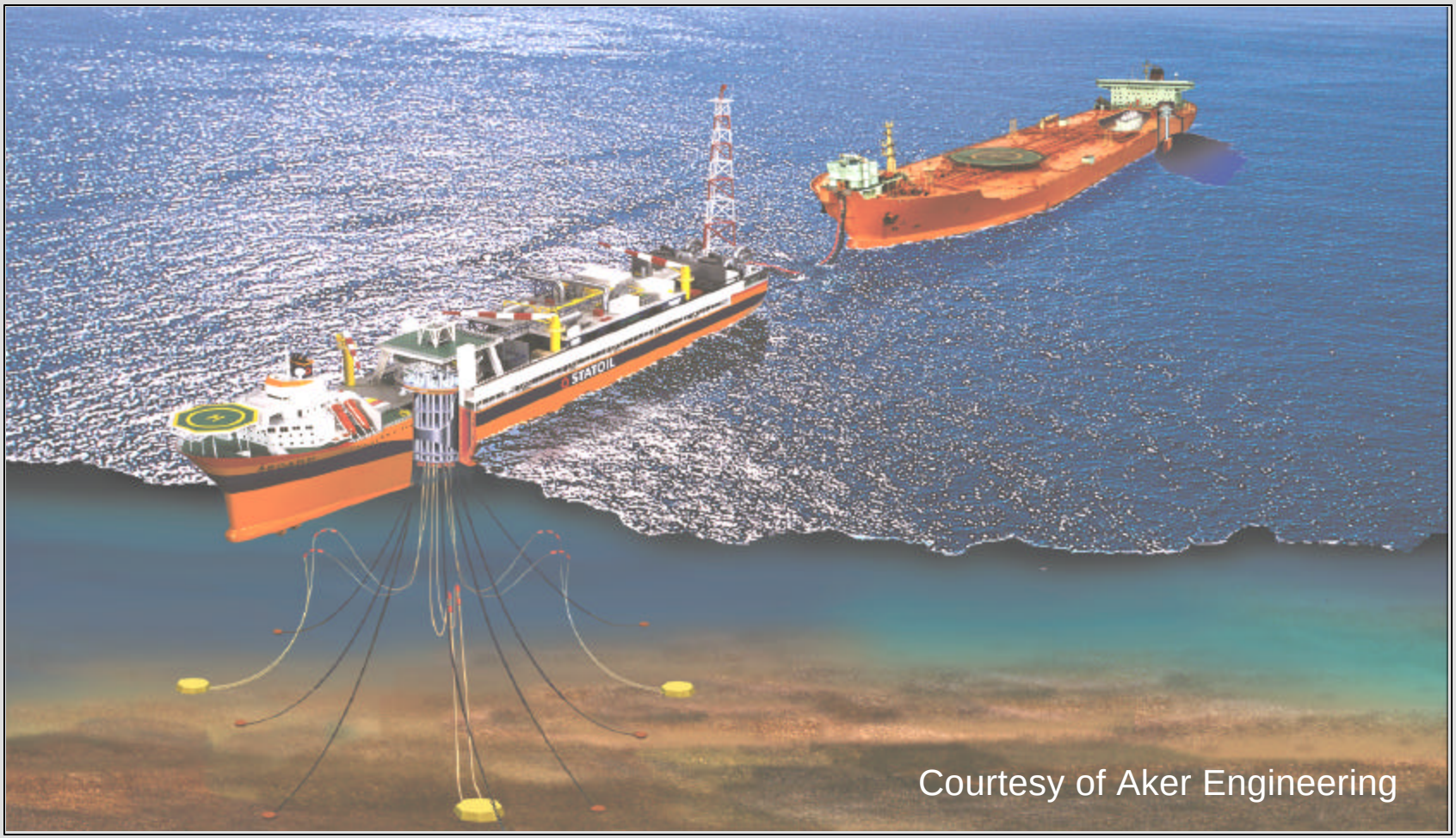
GOM OCS Production Projection

(from MMS Report MMS 2000-12)



II. Background on FPSO's

Floating Production, Storage, and Offloading System



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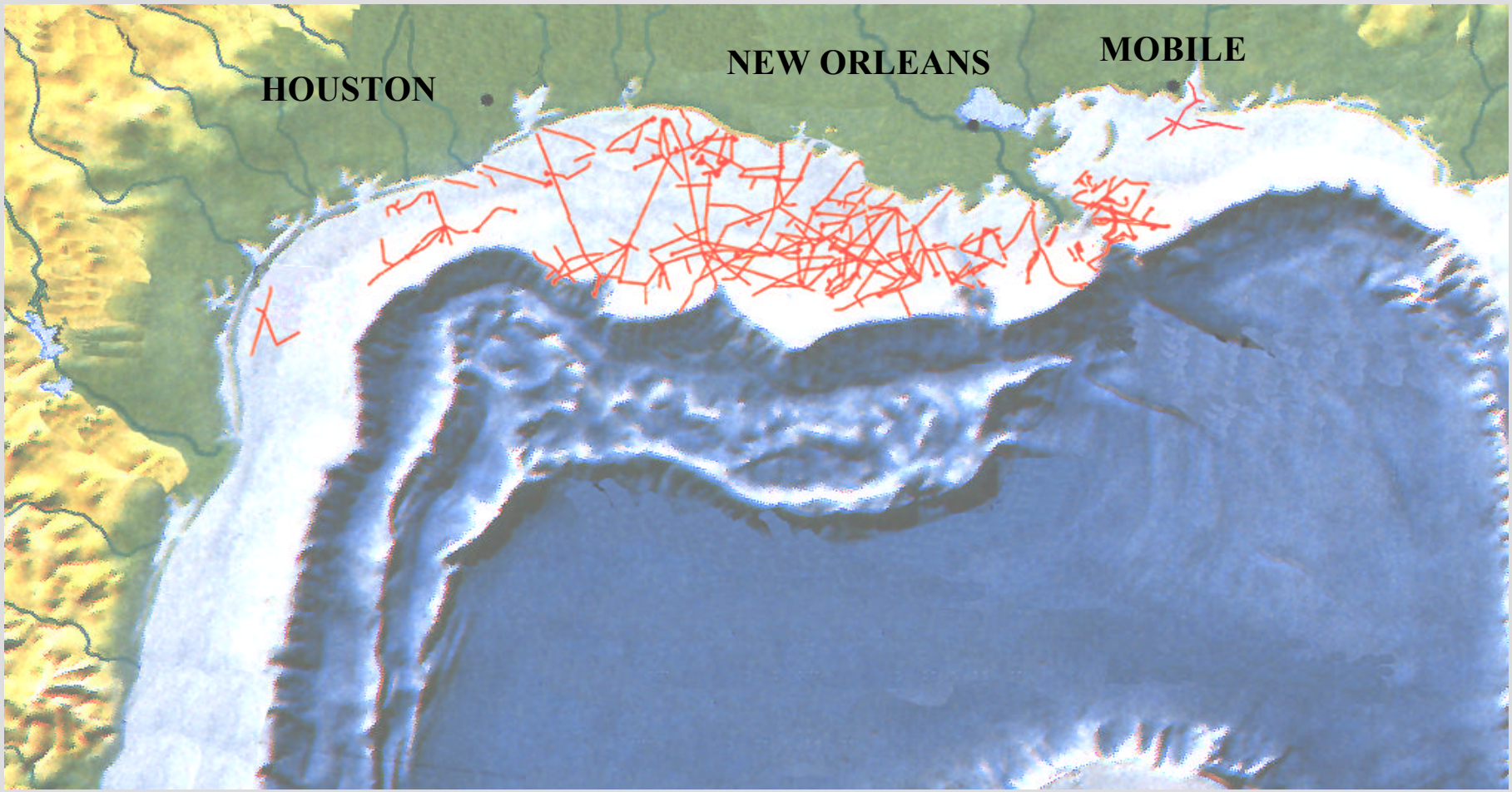
Pipeline Infrastructure
the Historic Transportation System (1999)



Graphic courtesy of INTEC

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MMS Position Regarding FPSOs

- 3 Workshops starting in 1997
- OTC 8768; OTC 10701
  - "MMS will need to be assured that the use of [FPSO] technology does not increase the general risk to the environment over other alternatives"
- Ongoing dialogue
  - JIP's; discussions of concerns and strategy
  - Adequacy of regulatory programs?
- No long term flaring; no reinjection without commitment to produce later - MMS position

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FPSO Issues

- Environmental
  - current understanding of level of effects
  - EIS - disclosure; risk vs. risk perception?
- Conservation
  - gas disposition - flaring; reinjection
  - metering; commingling; premature abandonment; full development
- Technical

FPSO Configuration Analyzed in EIS

- 1MM bbl oil storage
- Processing
  - Up to 300,000 BOPD
  - Up to 300MM CFGPD
- Multi-well subsea cluster(s)
- Transport
  - 500,000 bbl shuttle tankers
  - Gas pipeline

Graphic courtesy of Aker Engineering

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Draft FPSO EIS Released/ Public Hearings Held

- Draft EIS (MMS 2000-051) made available to the public during August 2000
- The draft EIS found:
  - site-specific impacts are essentially the same as with other deepwater development and production systems, and
  - risk are comparable with those from other deepwater systems / pipelines

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Draft FPSO EIS Released/ Public Hearings Held

- “Base Case” evaluated a permanently moored, double hulled, ship-shaped FPSO that can store 1 million barrels of crude oil
- Public hearings were held at select sites throughout the Gulf Coast during September 2000
- Final EIS - February 2001
- Record of Decision - March 2001

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Alternatives in FPSO EIS

- Alternative A - Approve general concept of using FPSO's in deepwater areas of Central & Western GOM Planning Areas
- Alternative B - Approve general concept with geographic & operational restrictions or conditions
- Alternative C - No Action

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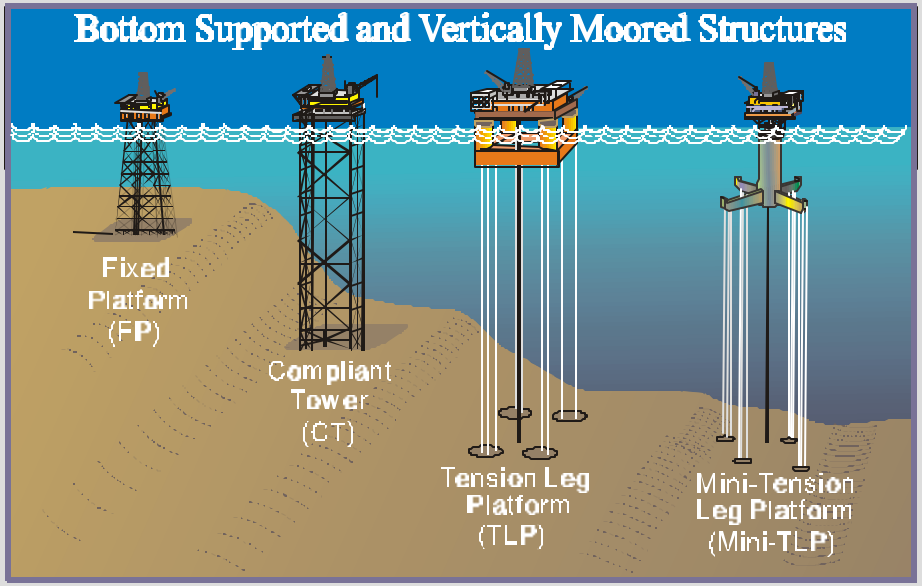
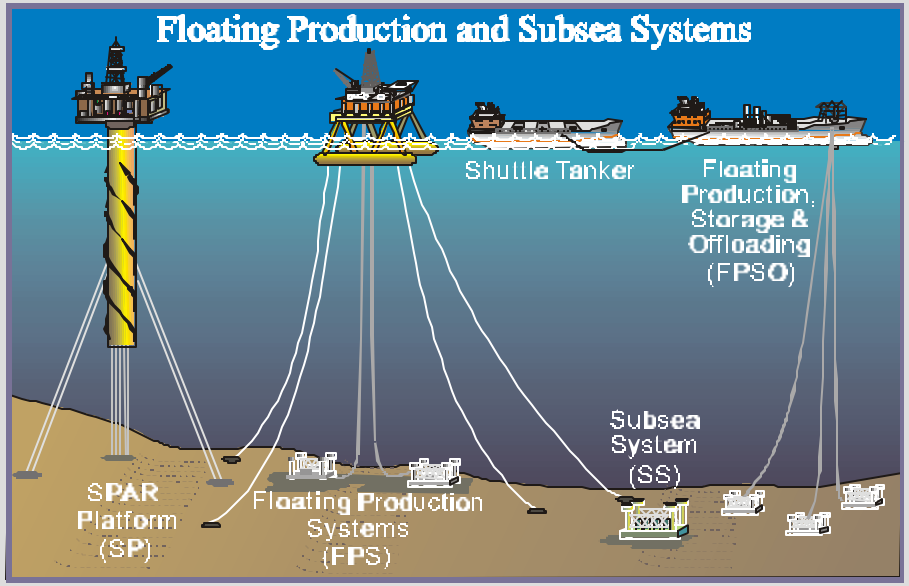
EIS Findings

- FPSO-unique spills account for 5% of total
- Potential for localized impacts
- Some potential for emissions-related impacts
  - VK, northern MC areas impacting Breton Wilderness Area
- Comparable risks
    - "FPSO and shuttle tanker risk are comparable to the existing deepwater production structure and oil pipeline risks…the net gain in risk would be negligible"

Why a CRA?
Critical Risk Assessment





- Risk Assessment of an FPSO in GOM (Bechtel ‘99)
- Consistent, objective study of overall system risks
- Existing deepwater systems provide known risks
  - designed/operated under existing standards & regulations
  - exhibit satisfactory operating experience

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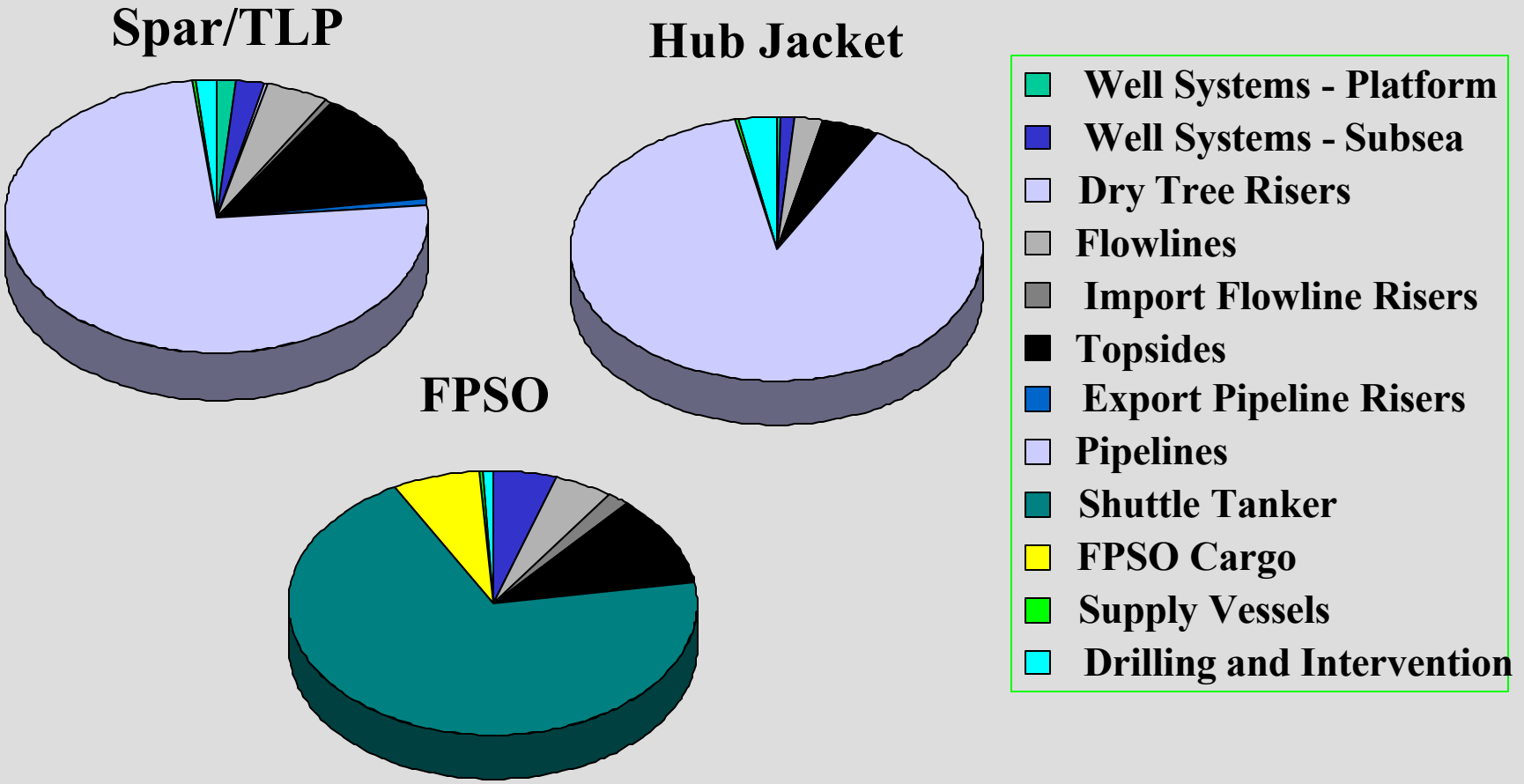
CRA Risk Measures

Risk	Measure	Unit
Human Safety	Total Fatalities	# of Fatalities
Environment (Chronic)	Total Volume Release	BBLs of Oil
Environment (Acute)	Max. Volume of Oil Release in Single Event	BBLs of Oil

Total Spill Risk Contributors



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CRA Conclusions

- No significant difference in fatality risks
- No significant difference in oil-spill risks
- Average total volume of oil spilled is dominated by rare, large volume event
- In all systems studied, the transportation system is highest contribution to overall spill risk
- High degree of uncertainty attributed to limited performance data for deepwater
- Final Report issued in January 2001; available on the web

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III. FPSO Regulatory System in the Gulf

III. FPSO Regulatory System in the Gulf

A. Existing Regulatory Framework

B. New Regulations coming

C. Industry Standards

D. Interface with Coast Guard

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Existing Framework
What Happens After the EIS

Application Filed
Within the Bounds
Investigated in EIS

Prepare a Site-Specific EA

Application Filed
Outside the Bounds
Investigated in EIS

Prepare another EIS? May do an EA first?

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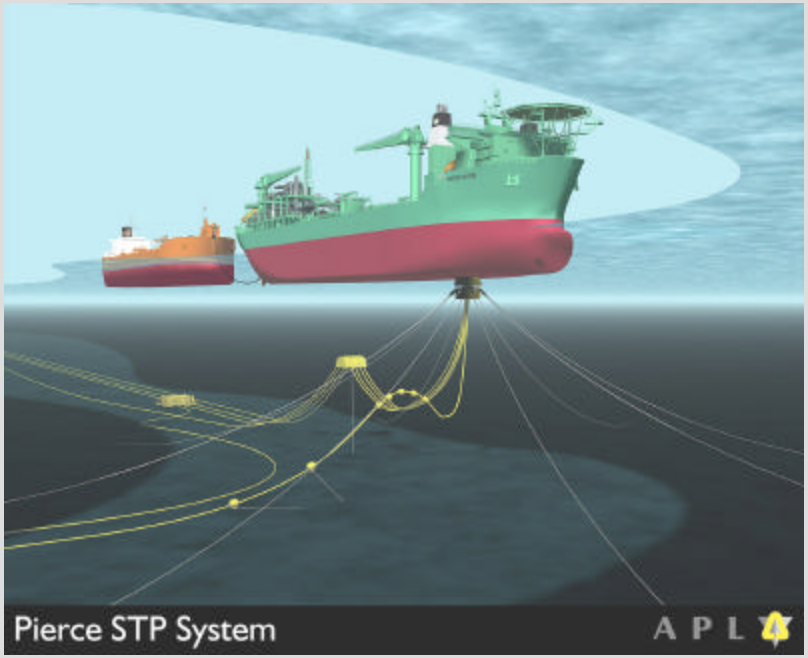
Existing Regulatory Framework

1. Development Operations Coordination Document
   - Development intentions
   - Public input; environmental
   - Conservation Review
2. Other existing plans, permits, submittals
3. Deepwater Operations Plan



Graphic courtesy of APL Inc.

Thus:

Capability exists for review of FPSO-based development

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Existing Framework
DWOP Strategy

- Deep Water Operations Plan
  - Conceptual, Preliminary, Final Parts
  - Guideline - Industry/MMS effort
- Goal is Early dialogue; focus on “total system”
  - MMS approval prior to major $$ commitments
  - Alternative compliance and departures
- Avoid unnecessary regulatory rewrites
  - Best Available and Safest Technology

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Existing Framework
DWOP Timing

Company Thinking	MMS Requirements
Discovery Conceptual System Selected	Conceptual Part — 30 days
Preliminary Engineering ID Alternative Compliance	Preliminary Part — 90 days
First Production + 90 days	Final Part — 60 days

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MMS Will Propose Subpart B Enhancements (Subpart B of 30 CFR 250 regs.)

- Subpart B - Plan submittal requirements

1. Incorporate DWOP
2. Curtailment of operations planning
3. Hazards analysis
4. Conservation review
   - full development
   - premature abandonment

Photo courtesy of Bluewater Offshore

MMS Will Propose Subpart I Enhancements

- Existing Platforms and Structures - design, fabrication, installation, use, inspection, and maintenance
  - Application process; verification program; certified verification agents; fixed platforms only
- Rewrite
  - Fixed and floating production facilities
  - Streamline review process
  - Industry benefit through use of industry standards
    - RP 2FPS; RP 2A (WSD); expanded role of CVA

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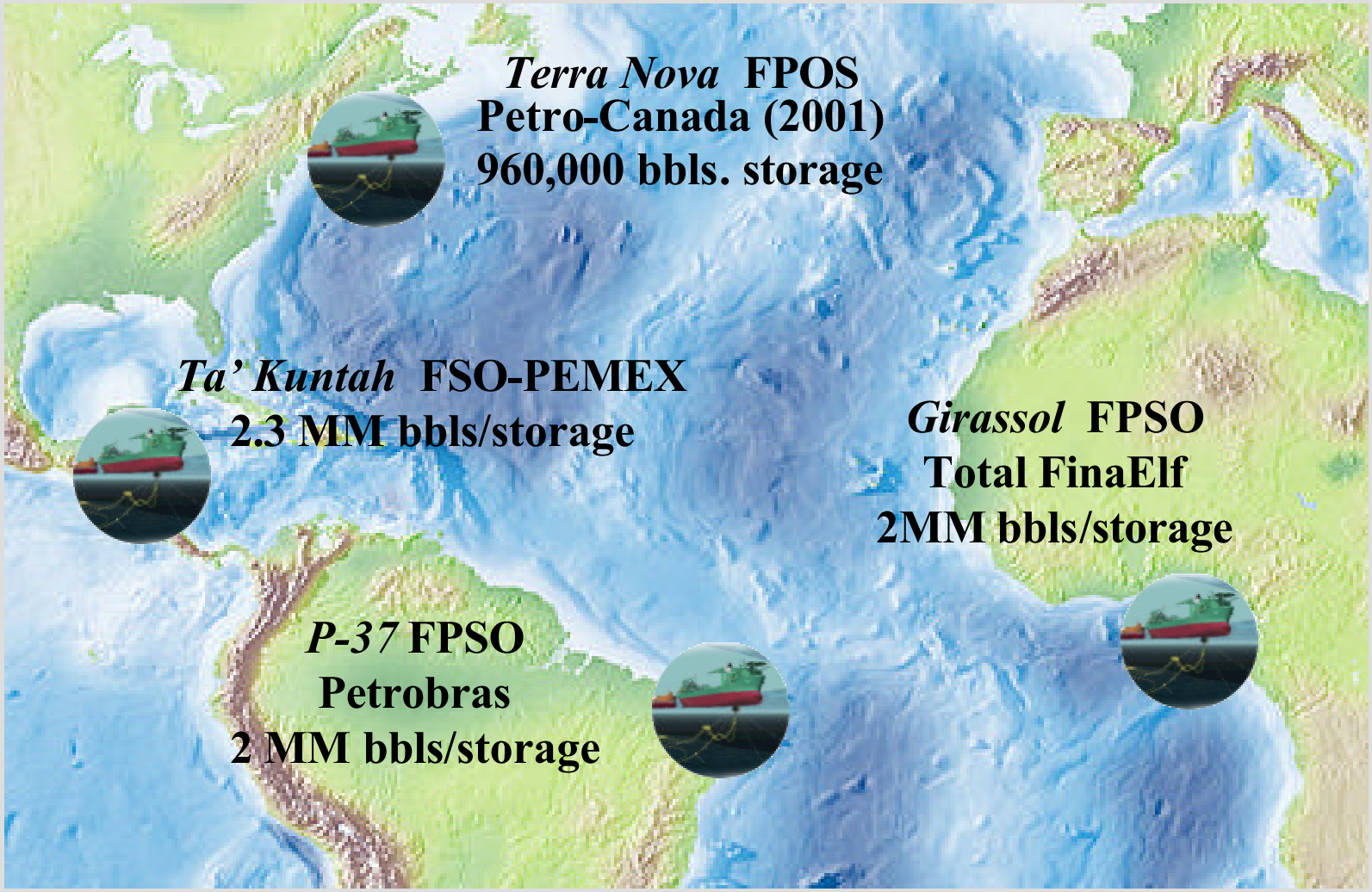
MMS has Drawn on International Experience with FPSO's



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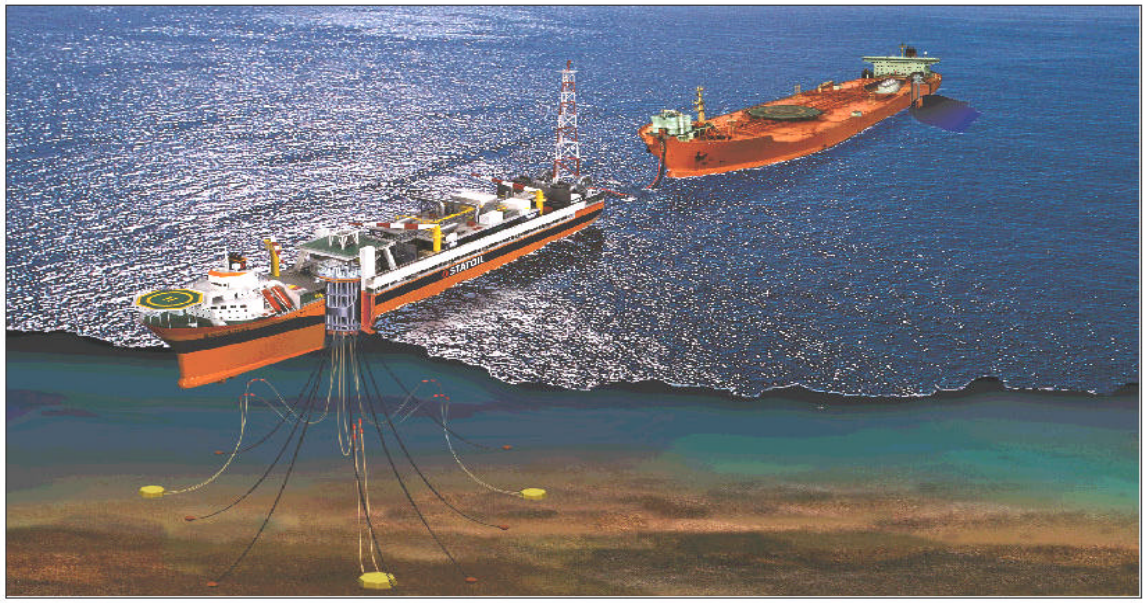
Industry Standards To Be Used in Subpart I

- API RP 2FPS - *Planning, Design, and Construction of Floating Production Systems*
- API RP 2RD - *Design of Marine Risers for Floating Production Systems and TLP's*
- API RP 2SK - *Design and Analysis of Stationkeeping Systems*
- API RP 2SM - *Synthetic Fiber Rope Moorings*
- API RP 14J - *Hazard Analysis for Offshore Production Facilities*

Interface with USCG

- Memorandum of Understanding
  - Effective 12/16/98
- Implementation
  - Identifying standards and regulations
  - Determine where changes or enhancements needed to table of responsibilities
  - Clear jurisdictions; component level
- Active and ongoing dialogue with USCG

Conclusion
FPSO's in the U.S. GOM?



- EIS, CRA, and Regulatory Framework published
  - cooperative effort key to successful completion
- MMS/USCG jurisdictions ongoing
- Record of Decision - March 2001
- FPS "Rule" - Subpart I - final in November 2001 ?

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