

FPSOs in the Gulf of Mexico

Environmental & Regulatory Considerations

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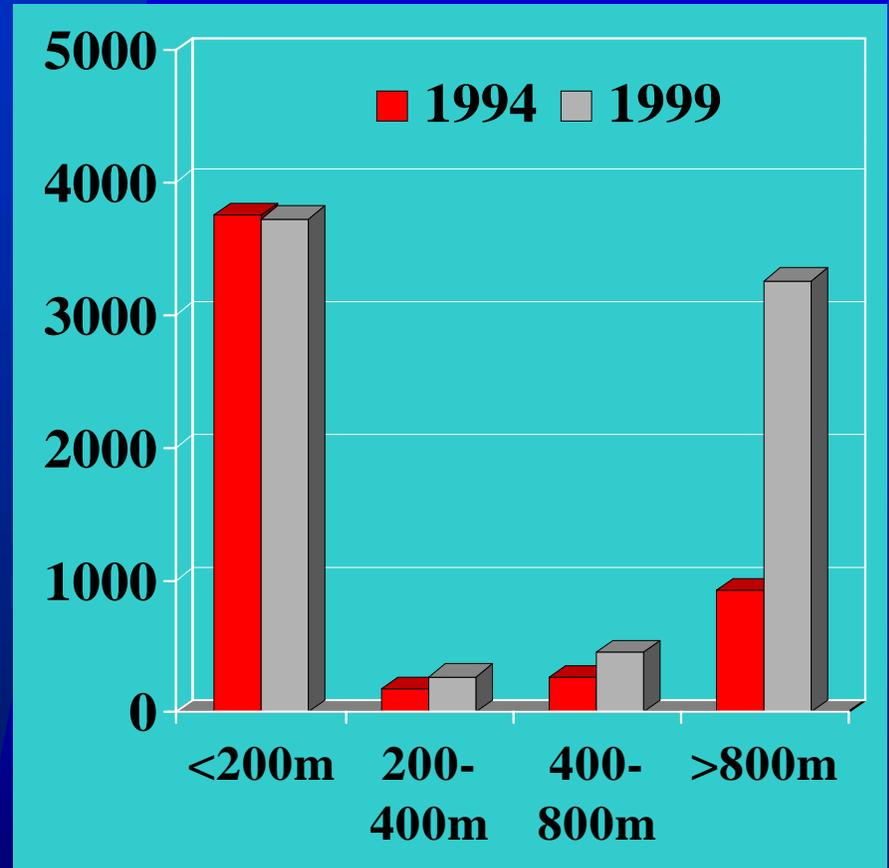
Offshore Technology Conference - May 3, 2000

MMS as a Resource Manager

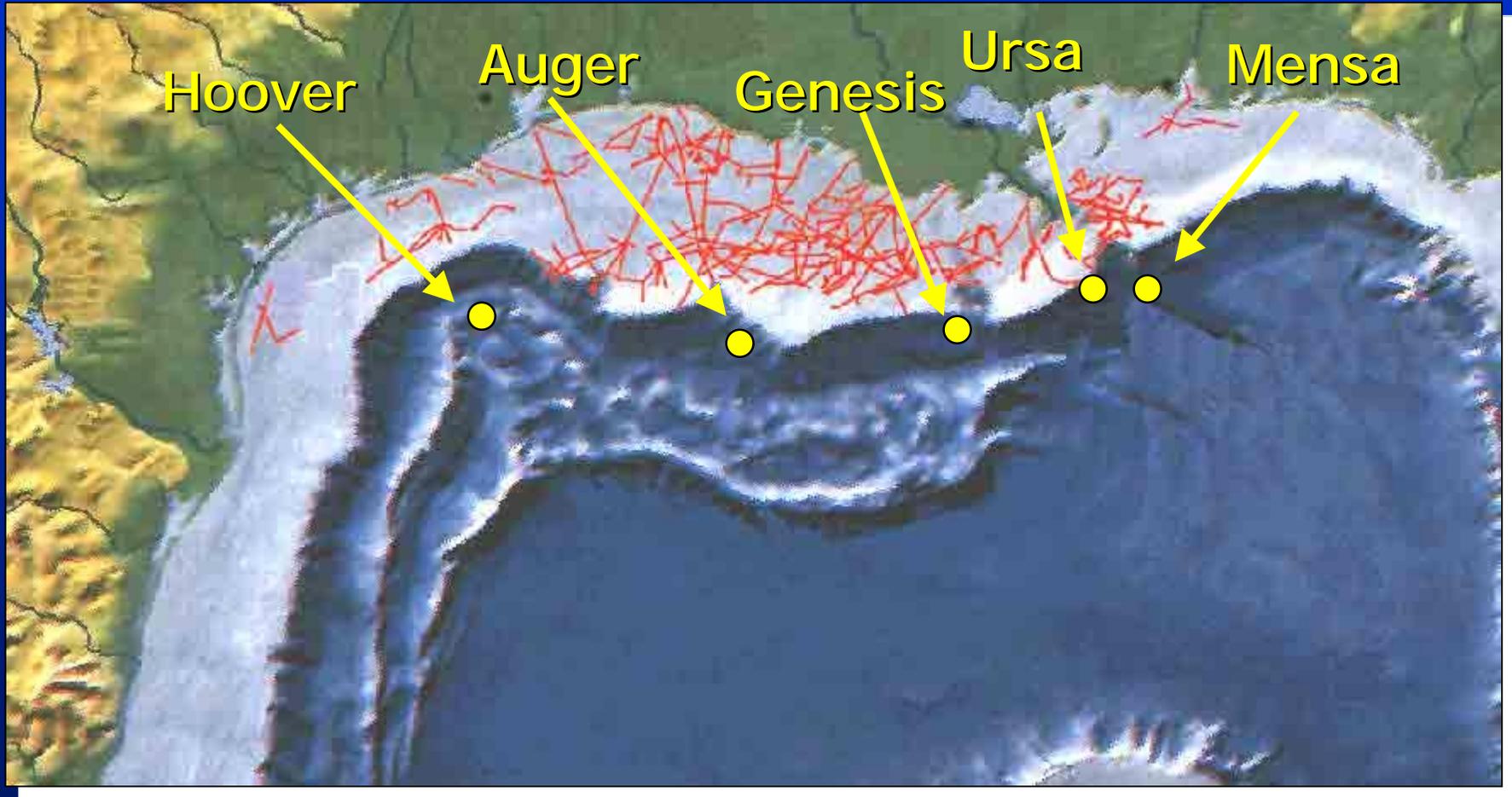
- ◆ Goal — recognized as a global pacesetter
- ◆ Manager vs. regulator — a part of solution
- ◆ Core responsibility — safe operations & environmental protection

Deepwater GOM

- ◆ >50% GOM oil
- ◆ >20% GOM natural gas
- ◆ By 2001, 65% total GOM production
- ◆ >7,700 leases
 - 40% in WD>900m
- ◆ WD>400 meters
 - 1994: 1,200 leases
 - 1999: 3,715 leases



Technology & Infrastructure



FPSO - Floating Production, Storage, and Offloading System

Graphic courtesy of INTEC

FPSOs in the U.S. GOM

◆ MMS Focus

- Environmental Impact Study
- Comparative Risk Study
- Current regulations
- Future regulations

Environmental Impact Statement

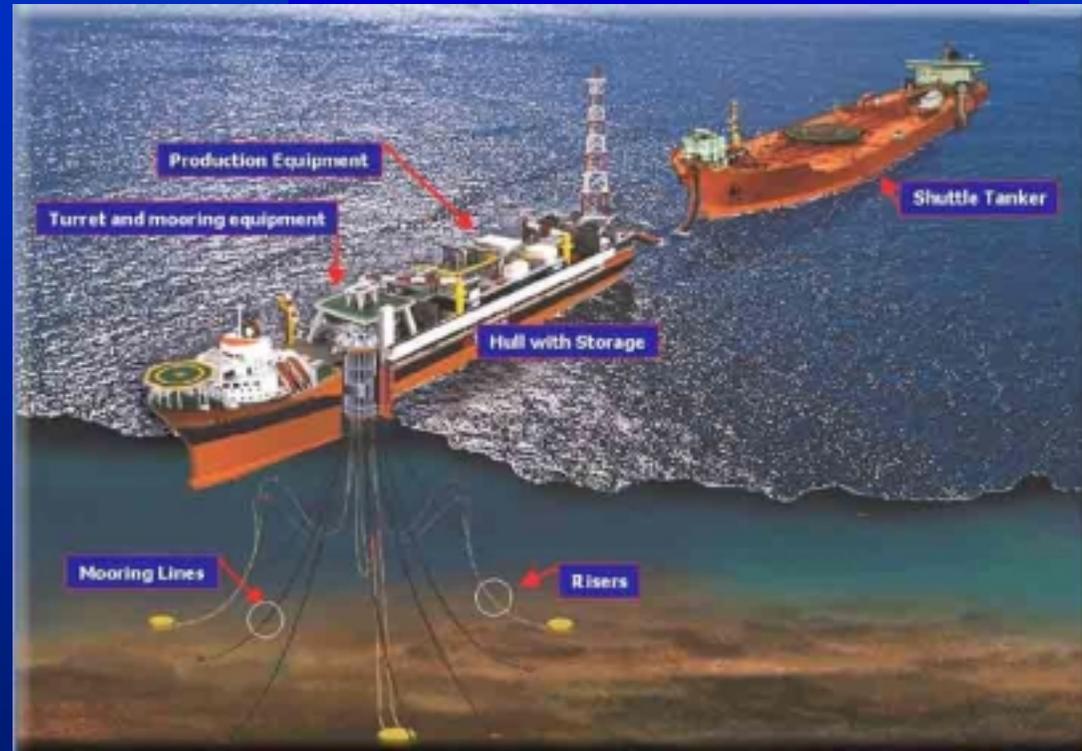
- ◆ In 1998 MMS said - *" . . . we need to be assured that using FPSO technology does not increase the general risk to the environment over other alternatives."*
- ◆ Risk of oil spill and potential impacts
- ◆ EIS funded by Deepstar
- ◆ EIS is only one step

EIS Timeline

- ◆ Early June 2000 - MMS approves Draft EIS
- ◆ Late June 2000 - Draft EIS released
- ◆ July-August 2000 - Public Hearings
- ◆ November 2000 - Final EIS released
- ◆ January 2001 - Record of Decision

Configuration Analyzed in EIS

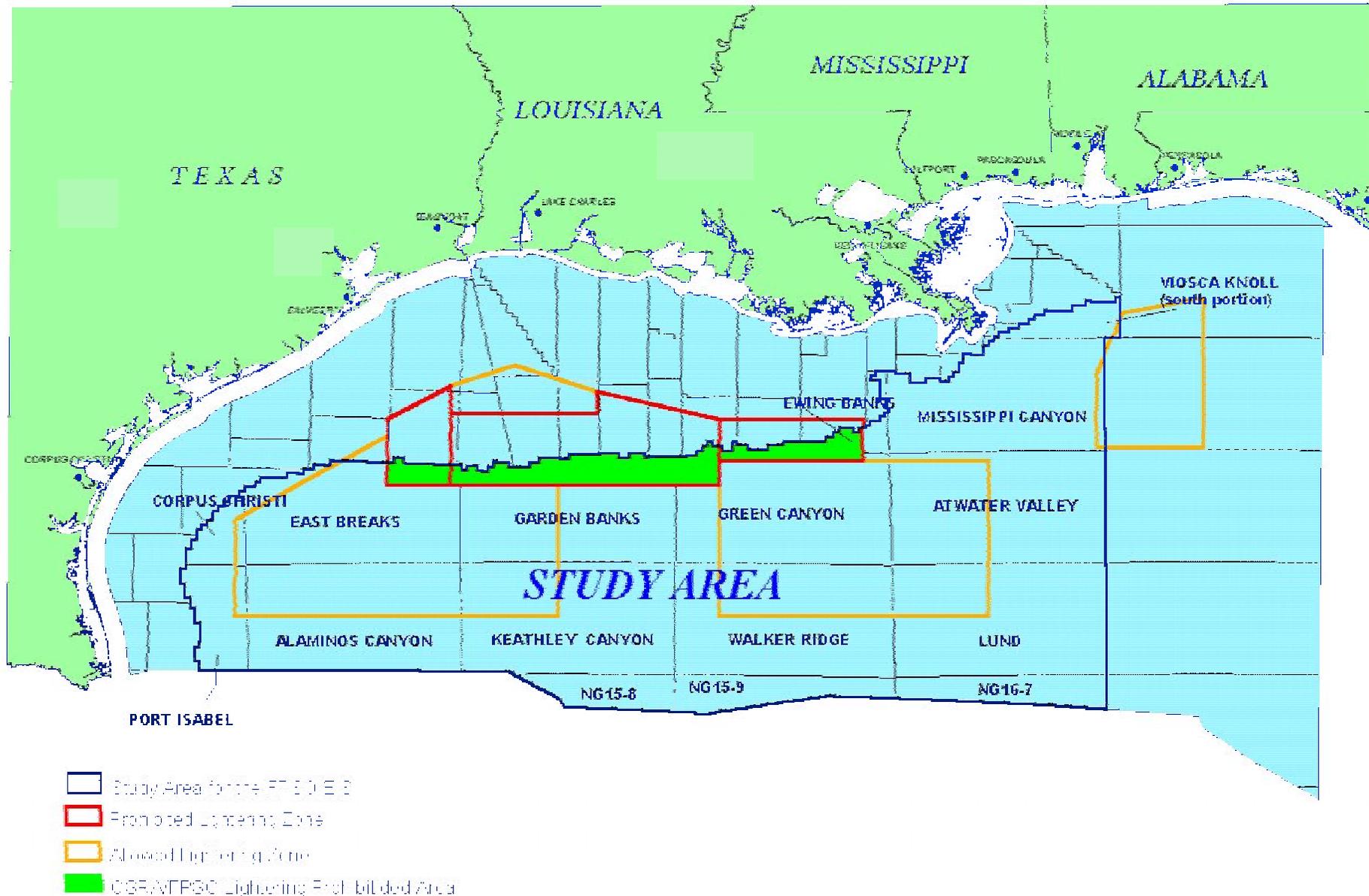
- ◆ 1 MMbbl oil storage
- ◆ Processing
 - up to 300 MBOPD
 - up to 300 MMCFGPD
- ◆ Multi-well subsea cluster(s)
- ◆ Transport
 - 500,000 bbl shuttle tankers
 - natural gas pipeline



Alternatives considered in EIS

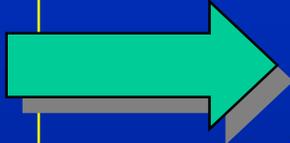
- ◆ A - Approve general concept of using FPSOs in deepwater areas of Central & Western GOM
- ◆ B - Approve general concept with geographic & operational restrictions or conditions
- ◆ C - General concept neither approved nor disapproved at this time

EIS Study Area



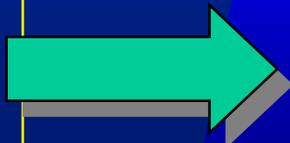
EIS - only the first step

Application Filed
Within the Bounds
Investigated in EIS



Prepare Site-Specific
Environmental
Assessment (EA)

Application Filed
Outside the Bounds
Investigated in EIS



Prepare specific EA
May need another EIS

Comparative Risk Study

- ◆ Risk of FPSO compared to a TLP, Spar, and fixed platform
- ◆ OTRC, EQE, DeepStar, MMS
- ◆ Project Update
 - Phase I: System definitions completed
 - Phase II: Events and Outcomes completed
 - Phase III: Quantitative Risk Analysis
- ◆ Completed by December 2000

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

How will MMS use the CRA?

- ◆ Factored into decision process
- ◆ Will help MMS understand contributions of FPSO subsystems
- ◆ Will assist in evaluating risk mitigation options
- ◆ Methodology provides basis for MMS and industry to evaluate new and evolving technologies

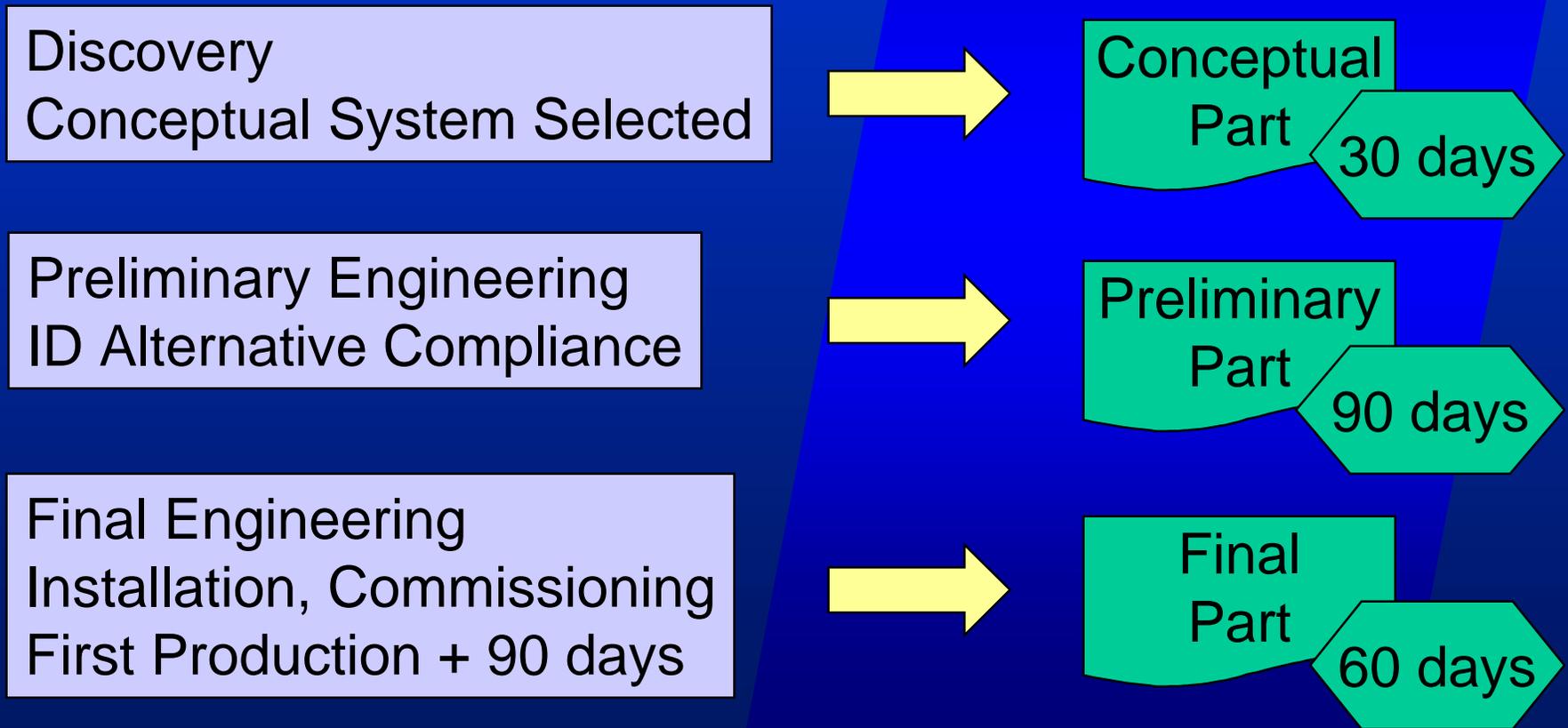
Current MMS Position

- ◆ No decision has been made
 - finish EIS and CRA
- ◆ No long term flaring
- ◆ No reinjection without a commitment to produce later

Current Regulations

- ◆ MMS requires Deepwater Operations Plan (DWOP)
 - 3 Parts - conceptual, preliminary, final
 - Early dialogue - focus on “total system”
 - MMS approval prior to major money commitment
 - List alternative compliance and departures
- ◆ Avoid unnecessary regulatory rewrites

DWOP Timing



Other Existing Authorities

- ◆ Development Operations Coordination Document (DOCD)
 - describes development intentions
 - public input; NEPA review
- ◆ Conservation Review
 - NTL 98-14N: “Conservation Information”
- ◆ Production Safety System Review
 - safety devices; operation; testing; maintenance

Future Regulations

- ◆ Amend certified verification process to cover floating production systems
 - covers the design, fabrication, installation, use and maintenance of FPSOs
- ◆ Amend requirements for installation of Platforms and Structures
- ◆ Reference industry standards

Development & Production Plans

- ◆ Amend plan submittal requirements
- ◆ Incorporate DWOP
- ◆ Hazard analysis
- ◆ Operations curtailment
- ◆ Conservation review
 - full development
 - premature abandonment



May Adopt Industry Standards

- ◆ [API RP 2FPS](#) - Planning, Design, and Construction of Floating Production Systems
- ◆ [API RP 14J](#) - Design and Hazards Analysis for Offshore Production Facilities
- ◆ [API RP 2RD](#) - Design of Marine Risers for Floating Production Systems and TLP's

International Safety Initiatives

- ◆ Oil Companies International Marine Forum
 - standard setting group; input to IMO
 - equivalent to combination of OOC and API
- ◆ Shuttle Tanker Operation Guidelines
 - “Offshore Loading Safety Guideline”
 - “Risk Minimization Guideline for Shuttle Tankers at Offshore Facilities”
 - U.S. Coast Guard (USCG)

FPSO Regulatory Model

Initiatives considered for adoption (guidelines, industry standards, policies, review strategies, API RPs, etc.)

**MMS; USCG; Industry
Iterative Process**

MMS Regulatory Strategy
for FPSOs in the GOM

Interaction with USCG

◆ Memorandum of Understanding

- MMS and USCG responsibilities
 - additional work needed for FPSOs
- Table of Responsibilities part of detailed implementation plan
 - identify standards and regulations
 - determine where changes or enhancements needed

◆ Ongoing dialogue with USCG

Timing of Key FPSO Initiatives

Regulatory Initiative

Target Completion

- | | |
|--------------------------|---------------|
| ◆ Plan requirements | June 2000 |
| ◆ Platforms & structures | August 2000 |
| ◆ Adopt API RP 2FPS | November 2000 |
| ◆ EIS-ROD; CRA | January 2001 |

◆ Safe Offshore Operations

- Our safety goal is to ensure incident free minerals exploration and development on Federal Offshore Leases

◆ Environmental Protection

- Our environmental responsibilities are to ensure that all activities on the OCS are conducted with appropriate environmental protection and impact mitigation