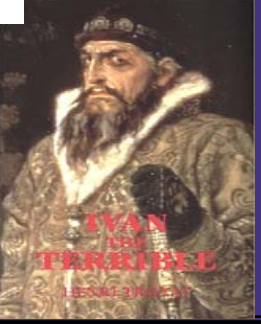
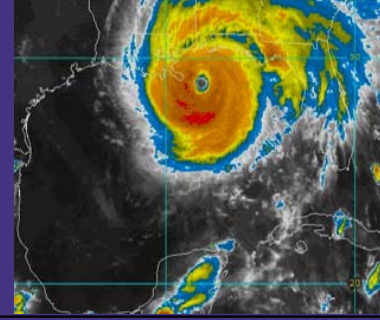
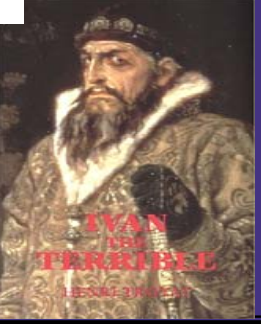


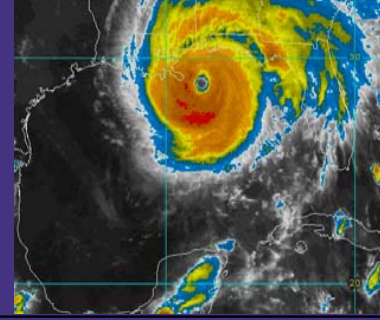


Proposed MODU Mooring JIP

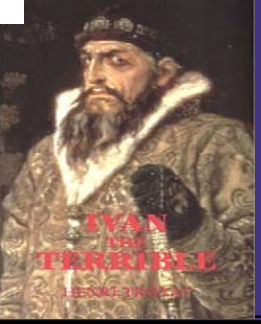
Hurricane Readiness & Recovery Conference



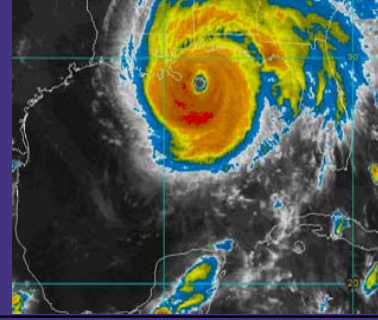
AGENDA



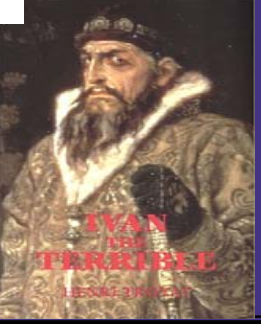
- Operating Philosophy & Historical Performance in GOM
- Genesis of the Proposed JIP
- Scope of Work Developed by Planning Committee
- Path Forward



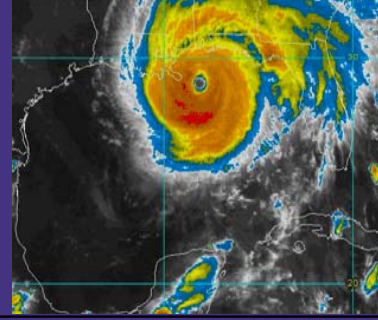
GOM Historical MODU Performance



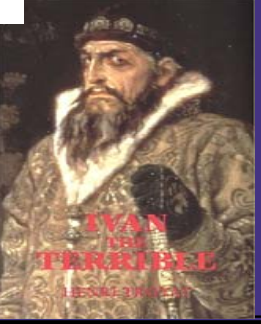
- During 13 years of operations, only 3 storms have caused mooring failures.
- Storms since 1992 resulting in MODU mooring failures.
  - Andrew (1992); Category 4 Offshore & 3 at Landfall.
    - » 2 Rigs Broke Loose
  - Lili (2002); Category 4 Offshore and 2 at Landfall.
    - » 1 Rig Broke Loose
  - Ivan (2004); Category 4 Offshore and 3 at Landfall.
    - » 4 Rigs Broke Loose



GOM Operating Philosophy

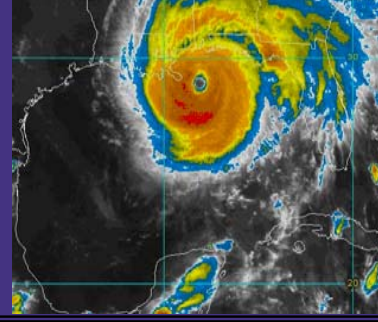


- ***Safety Procedures during Hurricane Season:***
  - Protect human life:
    - » Evacuate Drilling and Production Facilities.
  - Minimize Pollution Risks:
    - » Secure wells on drilling rigs and shut wells in below mudline on production facilities.
    - » Pipelines shut in where necessary.
- ***Minimize Business Interruption:***
  - Design moorings to meet or exceed API 2SK criteria.
  - Perform risk analysis when mooring near infrastructure.
  - Common techniques used to minimize risk.
    - » High hold anchors utilized when mooring near pipelines.
    - » Utilization of suction piles.
    - » Utilization of synthetic mooring systems.



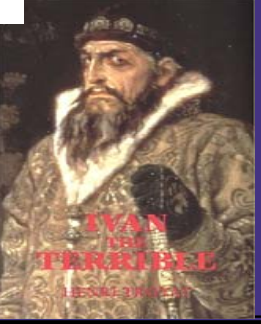
GOM .vs. North Sea

Operational Considerations

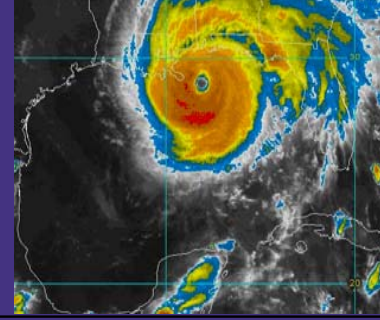


- **GOM Philosophy:**
  - Evacuate Drilling & Production Facilities.
    - » Protect Human Life.
  - Secure wells.
    - » Reduce pollution risk.
- Hurricane intensity has high variability.
- Aerial distribution of maximum wind & wave is more localized.
- Storm track and resulting direction of environmental forces are less predictable than North Sea.

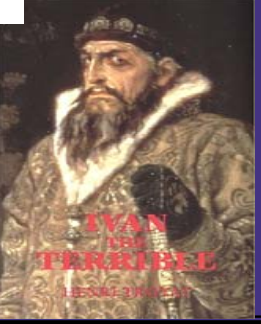
- **North Sea Philosophy:**
  - Facilities not evacuated.
  - Active winching if possible.
  - Thruster assist.
- Storm intensity is more predictable.
- Storm patterns are less random.
- Extreme Winter Storm < Extreme Hurricane



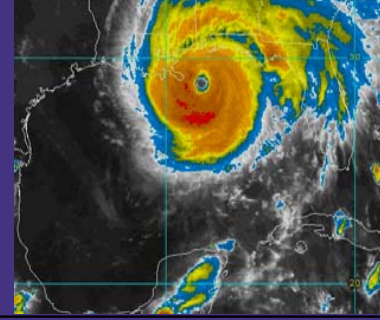
Conclusion



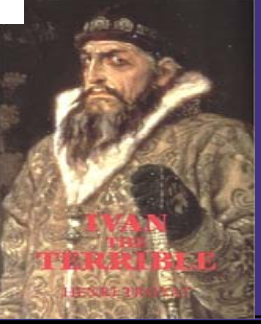
- **Current practice & industry standard code has produced an acceptable level of risk.**
  - Few mooring failures in the GOM.
  - The industry has had years of successful operations in the GOM.
- **Industry has been innovative in developing new methods which provide adequate moorings in deeper waters.**
  - As deeper water opportunities challenge mooring limits, it will be necessary to quantify risk using scientific methods.
- **Expansion of GOM deepwater infrastructure will require additional risk management tools.**



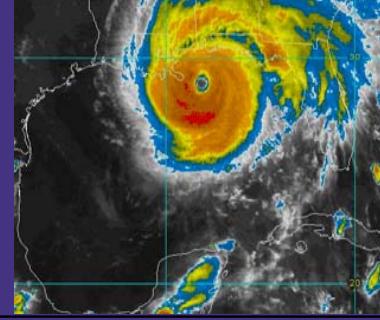
Genesis of Proposed JIP



OOC presents – Ivan findings to MMS	10-March-05
Industry JIP Kick Off Meeting; -MMS Attended	06-April-05
JIP Planning Committee Meeting	26-April-05
Update OOC Membership on Proposed JIP	01-June-05
Final JIP Planning Committee Meeting	02-June-05
JIP – RFP Introduced to Contractors	13-June-05
Proposals Received by Planning Committee	13-July-05

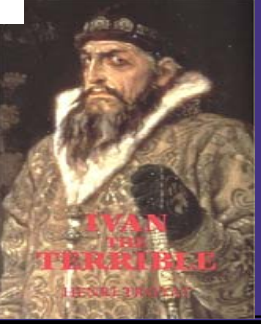


JIP Planning Committee

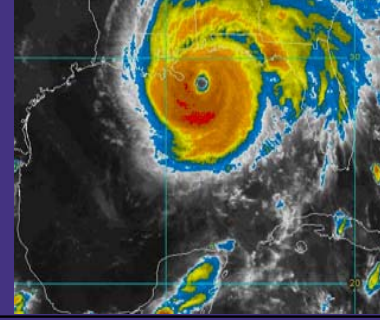


Craig Castille	Dominion (OOC)
Dave Loeb	Shell
Greg Walz	BP
David Smith, Nelson Tears & John Heideman	ExxonMobil
Charlie Theriot	Marathon
Jenifer Tule	Kerr McGee
David Wisch & Kai Tung Ma	Chevron
Darrel Pelley & Riddle Steddum	Transocean
Scott Marks & Jitendra Prasad	Noble Drilling
Karl Sellers & Rodney Eads	Diamond Offshore
Momen Wishahy	Global SantaFe
Alan Quintero	Atwood Oceanics
Fred Hefren & Glen Woltam	MMS

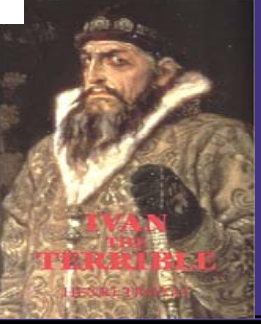
Tom Kwan (DTCEL/API) & Evan Zimmerman (Delmar) participated in Planning Committee activities until work scope established.



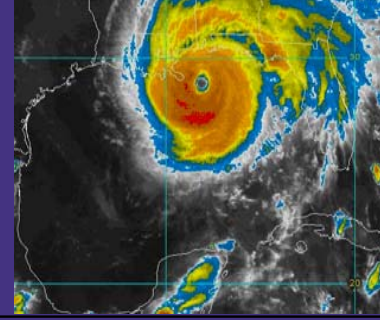
Proposed JIP Study Objectives



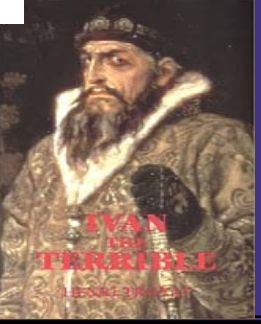
- **Task 1; Metocean**
  - Establish baseline USGOM Deepwater Metocean Criteria.
    - » > 600’ WD
    - » For Hurricanes (Tropical Revolving Storms)
      - 5, 10, 25, 50 & 100 Year Return Periods
    - » Empirical relationships for wind, wave and current.
      - Joint Directional Probabilities.
    - » Will utilize GOM ISO Draft as Starting Point



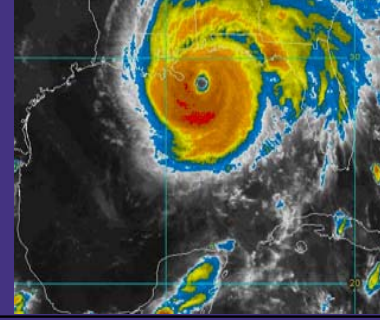
Proposed JIP Study Objectives



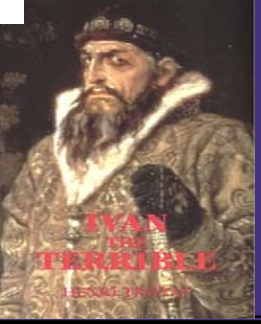
- **Task 2; Historical Reliability**
  - Assess MODU Mooring Failures from 1985 - 2004.
    - » Categorize causes of failure.
    - » Categorize resulting damage to surrounding equipment.
  - Determine FOS on mooring components using Hindcast Environments.
  - Determine mooring reliability for study period.
    - » All moored MODUs in operation.
    - » MODUs impacted by 5, 10, 25, 50 & 100 RP Storms.



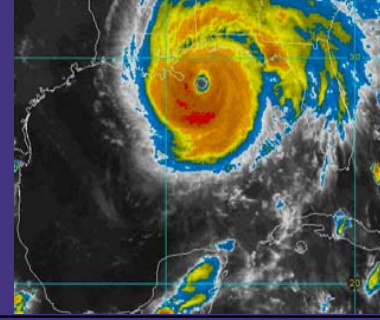
Proposed JIP Study Objectives



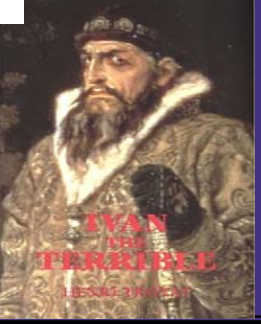
- Task 3; Calibration Study
  - Deterministic FOS Study for Fleet Cross Section of Semi-submersibles.
    - » Water Depth and Spread Type Matrix
    - » Intact and 1-Line Damage with Collinear Environment.
  - Evaluate the reliability of existing code of practice using directional environmental data.
    - » Based upon deterministic study above and various Return Period Storms defined in Task 1.



Proposed JIP Study Objectives



- Task 4; Comprehensive Risk Assessment
  - Conditional Probabilities of Mooring Failure and Surface and/or Subsea Damage.
  - Develop a risk ranking method or matrix to summarize results.
  - Outline workflow for risk assessment so it can be updated as GOM infrastructure changes.
  - Assess consequential damages caused by collisions between typical MODUs and GOM Deepwater Production Facilities.



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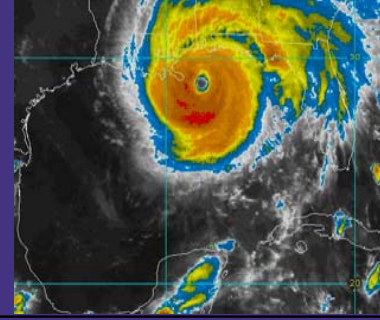
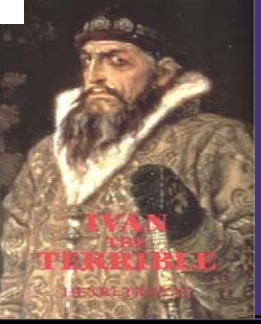
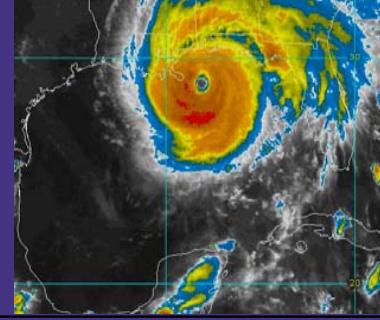


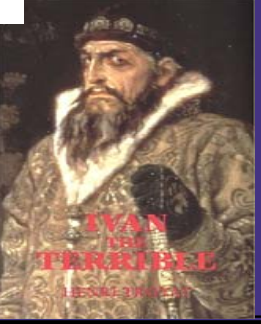
- Task 5; Recommendation to API Committee 2
  - Appropriate recommendations to API-RP-2SK Subcommittee.



Proposals Tendered



- ABS – Joint Proposal — John Stiff
  - Energo Engineering, Inc.
  - ORTC; (Offshore Risk & Technology Consulting)
  - MCOT; (Metocean, Coastal & Offshore Technologies)
  - Delmar Systems
  - OceanWeather
- DNV — Craig Colby
  - OceanWeather, Inc.
- DTCEL – Joint Proposal — Tom Kwan
  - Energo Engineering, Inc.
  - ORTC; (Offshore Risk & Technology Consulting)
  - MCOT; (Metocean, Coastal & Offshore Technologies)



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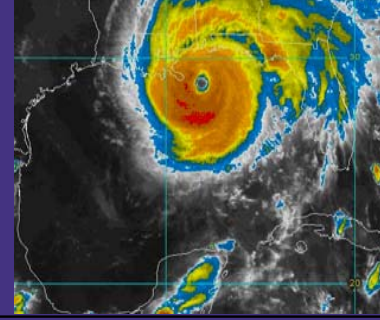
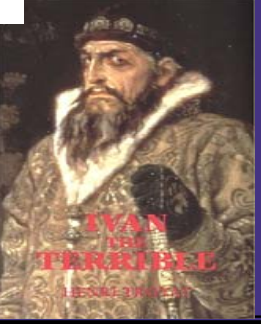
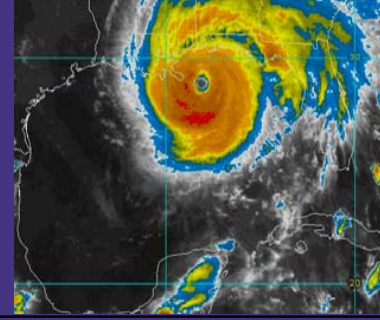


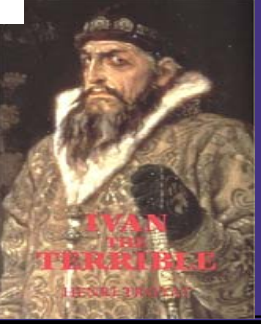
- Granherne (A Halliburton Company) — Richard D'Souza
  - ORTC – Malcolm Sharples
  - University of Texas Austin
  - OceanWeather, Inc.
  - MCOT
- Noble Denton — Dr. Bader Diab
  - OceanWeather, Inc
- Sea Engineering — Dr. Pieter Wybro
  - Ken Schaudt – Metocean via OceanWeather
  - ORTC – Malcolm Sharples
  - Energo, Engineering Inc.



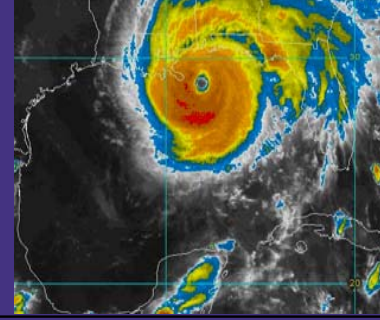
Path Forward for JIP



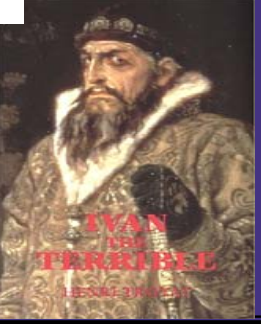
Proposal Review by JIP Planning Committee	August, 2005
Select JIP General Contractor	August, 2005
Secure Funding	3rd Qtr, 2005
Begin Work on JIP	4th Qtr, 2005
Conclude Work on JIP	3rd Qtr - 2006
Present Findings to API 2SK Work Group	4th Qtr - 2006



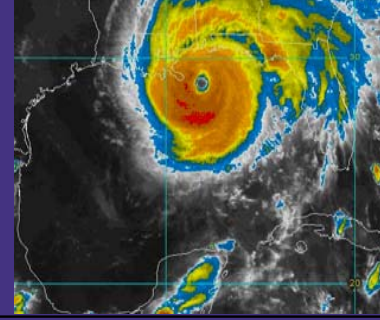
JIP Funding



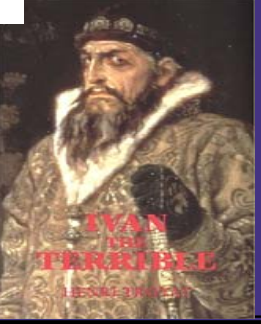
- Funding will be from;
  - Drilling Contractors.
  - Operating Companies.
  - Service & Supply Sector.
- OOC – Has & will support efforts, however will not contribute to funding.
- MMS – Is supportive of efforts and has funded ORTC to review incidents.
  - MMS will participate, but will not fund beyond white paper awarded to ORTC.

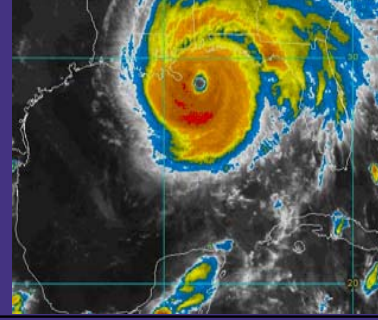


Funding Model



- Companies funding JIP will form the;
  - "JIP Steering Committee".
- Will have three levels of participation in Steering Committee;
  - Tier 1: Funding with Voting Rights
  - Tier 2: Funding with No Voting Rights
  - Tier 3: No funding or voting rights.
    - » Participation encouraged by Industry; MMS & USCG
- Currently have information on JIP at OOC Website;
  - www.offshoreoperators.com
- Planning Committee RFP (Scope of Work) is available along with funding structure.
- If interested, contact myself or log into OOC Website.





THANK YOU!

Questions?