

Research Partnership to Secure Energy for America

Technical Forum

July 22, 2010

9:00 – 4:00

Research and Technology Needs for Deepwater Development Addressing Oil Recovery and Effective Cleanup of Oil Spills

Breakout Session Wrap-ups

Summary Charts

Preventive Technologies

Chart 1

2 votes: Loss circulation – avoid

4 votes: Baseline current practices
(define failure – “release of HC”)
Database

11 votes: Automate the control of well

3 votes: better sensors

- Intervention

1 vote: minimize human interv

EQUIPMENT

5 votes: Better BOP eq. – redundancy

14 votes: Better cementing monitoring

7 votes: Methods to measure annular psi

2 votes: Shape memory alloys (Boyd)

5 votes: Improved ROVs – better intervention

1 vote: Rotate casing while cementing

13 votes: Early gas detection in wellbore

Chart 2

- Probabilistic models for - ?

4 votes: Integrated behavioral training

11 votes: better pore pressure ahead

1 vote: Seismic w.d.

20 votes: Integrated risk assessment

(Zenon) – include human element (:. Schwarz)

Better standards fro software + monitoring sensors

2 votes: Root cause analysis – faster data

Software for risk assessment

12 votes: managed psi drilling – better sensors

14 votes: Adapt control systems from other industry

Chart 3

- 5 votes: Address aging offshore infrastructure – improved inst.
- 2 votes: better hole cleaning/hole cleaning –
 Detect efficiency – Rotate casing
- Difference in deepwater vs shallow
 - Identify
- Better standards
- Organized safety reviews like NASA
- 2 votes: Engage “Old Timers” – corporate memory
- 13 votes: Reliability based well designs – MMS
 (probabilistic)

Chart 4

- 9 votes: Improved Sensors (grouped)
- 1 vote: Develop a sensible real time monitoring system for critical wells where selected data is required to be sent to a 3rd party system for continuous monitoring and possible intervention
- Automated Intervention (No Human in the Loop Systems): In an era when we can send spacecraft to Mars with no human in the loop – we should be able to autonomously prevent accidents with computer controlled systems.
- 9 votes: Underground blowout (UGBO) and prevention from cratering
 Better understanding to stop breaching to the sea floor during top-kill procedure
- Remote monitoring and controls using sensors + software + processes for early detection of “potential” failures

Chart 5

Summary

Well Ops – M/C

- (11) pore psi monitoring (ahead of bit) –s.w.d.
- (11) managed psi drilling
- (14) better cement monitoring
- (15) gas detection in wellbore early
- (11) adapting control systems from other industries
- (15) automatic well control

Software – Modeling

- (21) integrated risk assessment
- ☆(4) BMP – databasing – but include bad practices
- (13) reliability based well designs
 Behavior training
 Automatic drilling

Equipment

- ROV improvement
- Shaped metal alloys
- Improved sensors
- (5) Better BOP
- (9) Underground blowout M/C

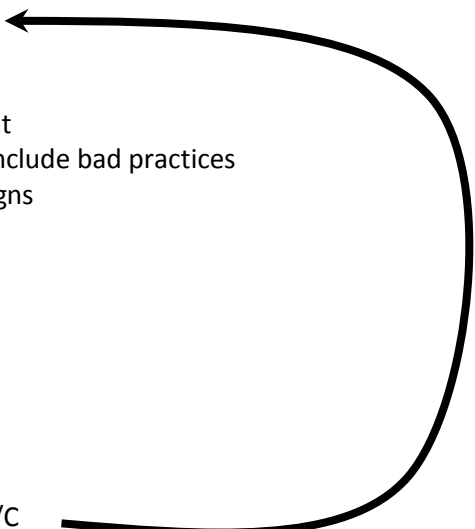


Chart 6

Discussion

Training

- MMS – Audit (results in a measureable outcome)

Integrity engineering (look back studies)

- Aging risers
- Reliability

Training M.o.C.: Cross cutting



HTHP – materials + sensors

NTSB for business

Affinity Group for a “P+I” club

Like U.K. P+I Club for tanker fleets

- Includes incident reports

Response Technologies

Chart 1

Response Frame

- Surveillance
 - source measurements (flow rate, droplet size)
 - plume tracking (surface & subsurface)
 - Biological surveillance
- Containment & Collection
 - Booms, dams, collection domes
 - Skimmers, burning, dispersants
- Onshore remediation & cleanup
 - Dispersants, bioremediation, physical removal
 - Animal rehab
- Well Control/Intervention

Subsurface intervention, e.g. relief wells, cementing, etc.

Chart 2

Possible Response Projects

- Develop lessons learned regarding use of remote sensing (include gap analysis, possible new tech.)
- Improve surface recovery in the open ocean; make it more weather resistant especially for the Loop (30% occurrence)
- Understand how bottom-injected dispersant affects the volume of surface & submerged oil. (NOAA may be doing this)
- Develop tool to allow Incident Command to evaluate trade-offs between dispersant, & subsurface & surface oil volumes
- Improve efficiency of tracking underwater plume, e.g. gliders equipped with fluorometer capable of 3km depth (Helton advocated this during his Congressional testimony)
- Better ways to measure flow rate of oil & gas from the well

- Better ways to remotely assess well casing integrity
- Better ways to deliver nutrients subsurface to increase bioremediation
- Improved methods of applying dispersants (from Short, Oceana)

Chart 3

Response R&D, Ranking

Topic	Votes
Flow rate measurement	10
Improved subsurface surveillance measurements	10
Improved skimmers	9
Define containment & capacity requirements	4
Look at combining collection & intervention, i.e. collect while re-entering the well bore and then plug	4
Have something pre-installed in the well bore that could be used to stop flow in an emergency	4
Improve top kill	3
Bioremediation improvements	2

Ecosystems

Chart 1

1. Synthesis of knowledge –
Linkages, baseline, habitat
Types → Ecosys Services
2. Monitoring needs/data
3. Modeling/understanding how impacts on ecosystems affect production of services
4. Evaluation of response options on ecosys services.

7 votes: Environmental Monitoring

Increase atmospheric & ocean monitoring on platforms of opportunity (e.g. ships, rigs, etc.)

5 votes: Identification & Quantification of Ecosystem Services from each habitat type

5 votes: Baseline Surveys → Pew Trust funded ‘Census of Marine life’ on all environments

i.e. – Seafloor, mid-water, sea surface, barrier islands, marshes, beaches (sand + rock)

4 votes: Model validation + initialization with met data. Many models for ocean circulation – no one does well in all environments.

Gaps – aging satellites + reliance on European satellites.