

Offshore Safety after *Macondo*: Lowering Risks through Regulation in the Gulf and Globally

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Gulf of Mexico

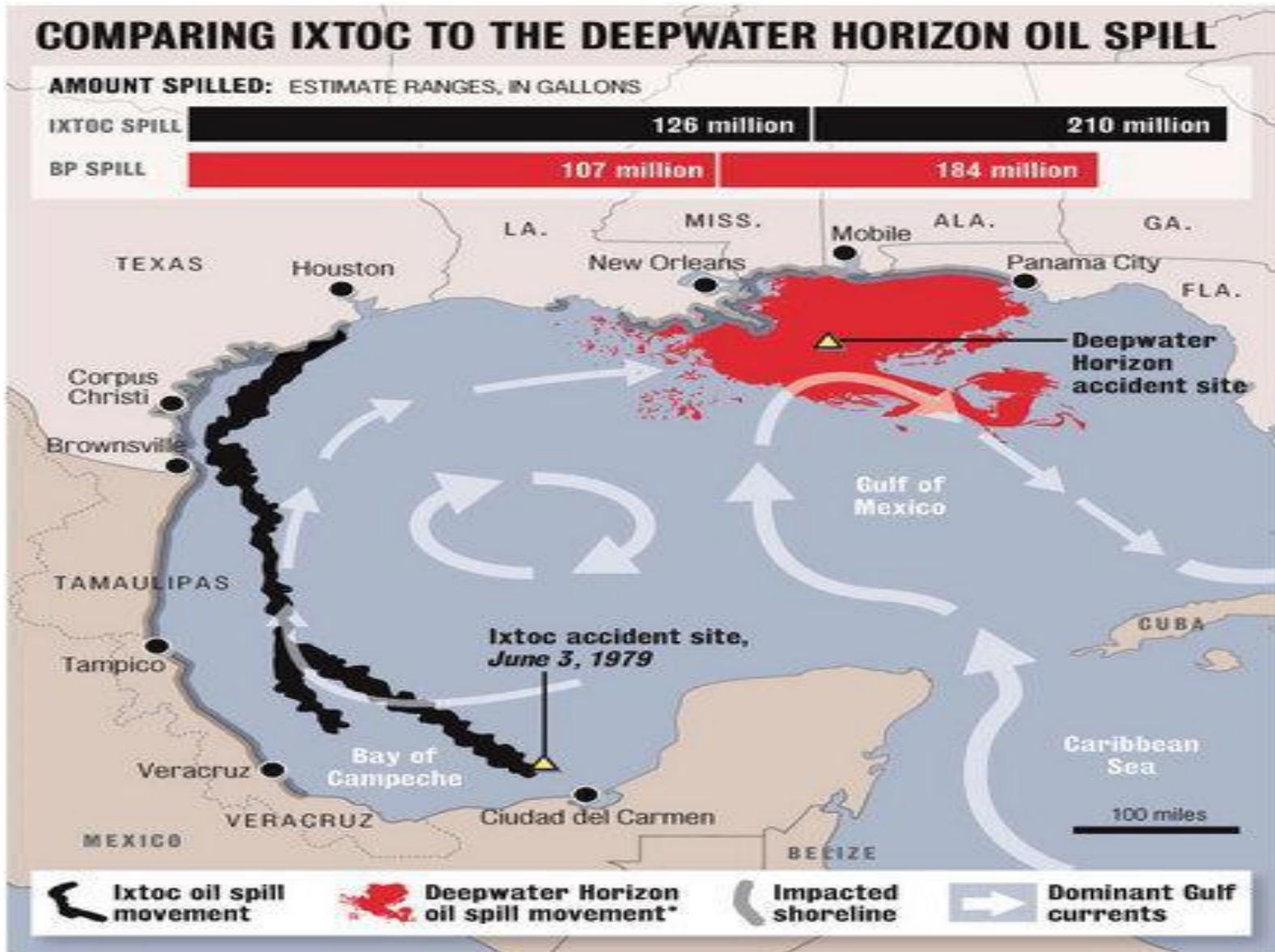




Figure 3.1 Overview of potential offshore basins with Subsea BOPs in the next 5 years

Post *Macondo* events:

- Brazil suspended Chevron's drilling until investigation of an oil spill is completed. (Nov. 24, 2011)
- China suspended ConocoPhillips operations (235 offshore wells) after a spill. Conoco offers a fund. (Sept. 8, 2011)
- Shell spill in UK North Sea (1300 barrels total) gets international attention. (Aug. 2011)

A recalibration of risks after the Gulf of Mexico spill by global regulators, media and the industry.

After *Macondo*: No new laws, but 3 changes to “business as usual”

1. **A wave of new technology:**

The 6-month Presidential moratorium on deepwater exploratory drilling in the Gulf of Mexico (GoM) forces technology change.

Examples: Entire new industry of capping stacks created. Real-time data monitoring centers now. proposed Blowout Preventer Rule (4-2015) requires two blind shear rams; was already an industry practice for deepwater drilling.

2. **Complacency is recognized as negligence.**

3. **Global “good” practices come to the U.S. Gulf of Mexico through regulations.**

1: New technology Feb. 18, 2011



MARINE WELL CONTAINMENT CO

SCULPTURE IN STEEL: Officials look over a new capping device for deep-water wells outside Trendsetter Engineering in Houston, which built the device for the Marine Well Containment Co.

Modular Capture Vessel

Off Loading Line

Shuttle Tanker

Quick Disconnect

Umbilical

Flexible Jumper

Riser

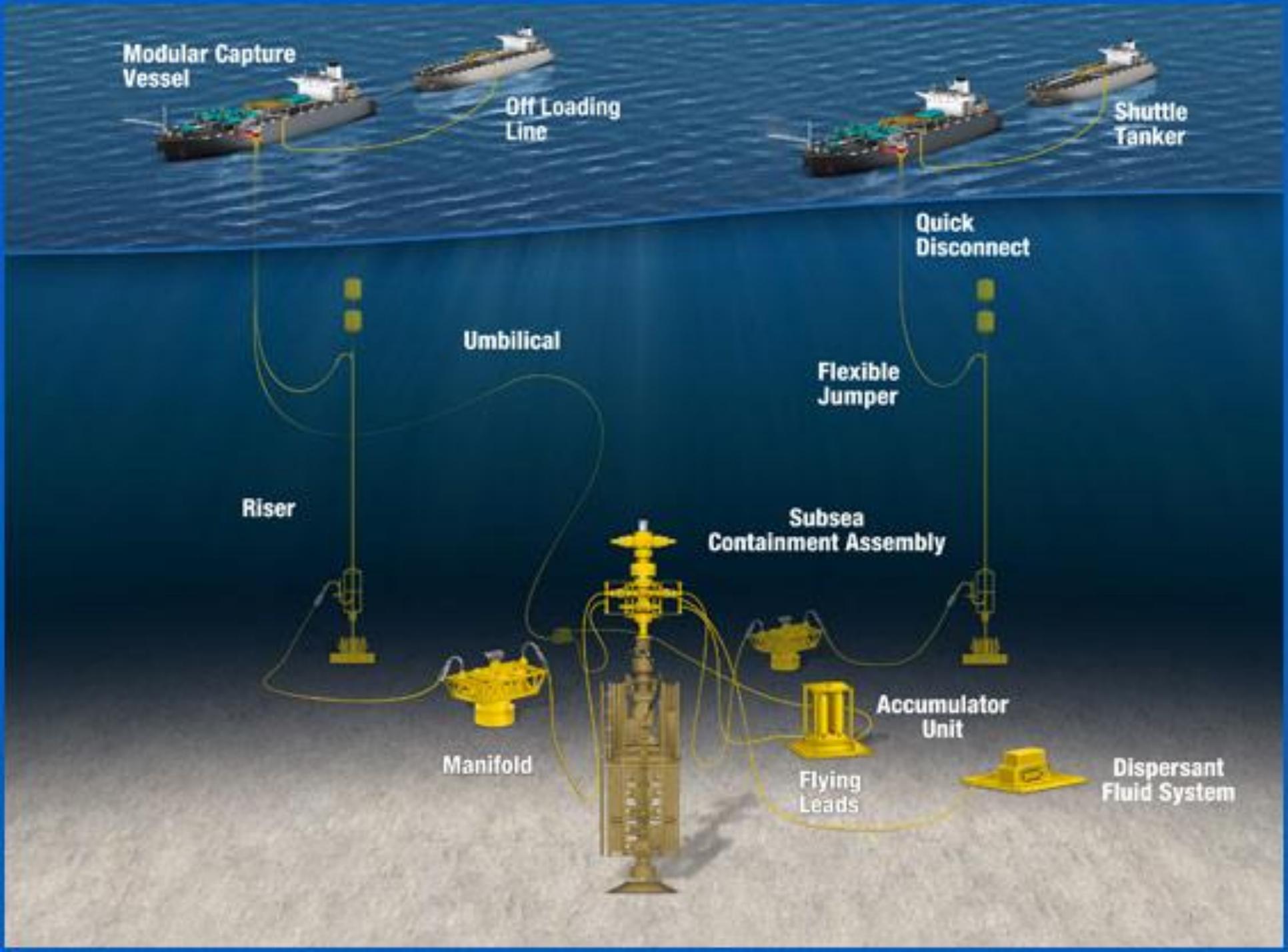
Subsea Containment Assembly

Manifold

Accumulator Unit

Flying Leads

Dispersant Fluid System



#2: Complacency as a Root Cause: Negligence

The National Commission on the DWH Spill:

“The DWH disaster exhibits the costs of a culture of complacency.”

Industry self-satisfied because no major offshore spill in Gulf had ever occurred.

Yet, many missed signals warned of rising risks.

What regulatory system can prevent complacency, ***Oil & Gas Journal*** editorial asks?

Highly probable disasters

Safety experts:

Blowouts do not happen often, but it is highly probable that they will happen. ***Complex systems migrate to a state of high risk because everyone becomes complacent. Complacency is a root cause of disasters.***

Blowouts are “**low frequency**, high consequence” events that are **very probable**.

Industry:

Blowouts are “**low probability**, high consequence” events. *43,000* wells drilled offshore without a major disaster.*

* Beware data: Only 43 deepwater, pre-Salt wells had been drilled, with high risk level, at the time of the spill.

#3. A good practice comes to US waters: The SEMS rule

- The U.S quickly adopts the SEMS rule (Safety & Environmental Management System) rule by incorporating by reference API RP 75. (U.S. regulators had even more quickly adopted API 65, the Drilling Safety Rule).
- The American Petroleum Institute (API) has two arms: lobbying and standard setting. Tension!
- The “Safety Case” regime used by the UK and Norway in the North Sea is hailed as the best regulatory regime—but does not fit US situation—we do not have an expert regulator.

Current U.S. safety institutions

1. **BSEE**--department inside the Dept of Interior.
2. **Center for Offshore Safety**—industry-funded, part of the standard-setting arm of the API.
3. Coast Guard—Dep't of Homeland Security.
4. Chemical Safety Board
5. Others: OSHA, EPA, Dept of Justice (criminal violations).
6. Ocean Energy Safety Advisory Committee-now the Ocean Energy Safety Institute.
7. Note: excellent National Academy of Sciences reports.

The US Safety Regime Today

“We are moving to an *operator-driven* safety program with BSEE oversight.”

James Watson, first Director of BSEE, 4-29-2013.

The new SEMS rules, with much input from the Center for Offshore Safety on SEMS audits, are the “operator-driven program.”

After Three Mile Island, nuclear industry forms INPO. After *Macondo*, offshore industry forms COS—the Center for Offshore Safety.

The new SEMS requirements

All operators offshore required to have a Safety & Environmental Management System (SEMS) with 13 elements by November 2011, such as:

- Hazards analysis—a facility-level risk assessment
- Management of change programs
- Safe work practices: manuals, standards, rules of conduct
- Training, including contractors
- Mechanical integrity: preventive maintenance & quality control
- Pre-start up review
- Emergency response plans
- **Audits of the SEMS program**—first one due to BSEE November 15, 2013

Added in SEMS II, June 2013: Stop Work Authority, Ultimate Work Authority; Employee Participation in safety programs; whistleblower procedures; team leader of SEMS audit must be from an external, independent, accredited Audit Service Provider.

BSEE and COS and SEMS

My conclusion: **The COS-constructed regime is the major driver moving offshore safety forward today.**

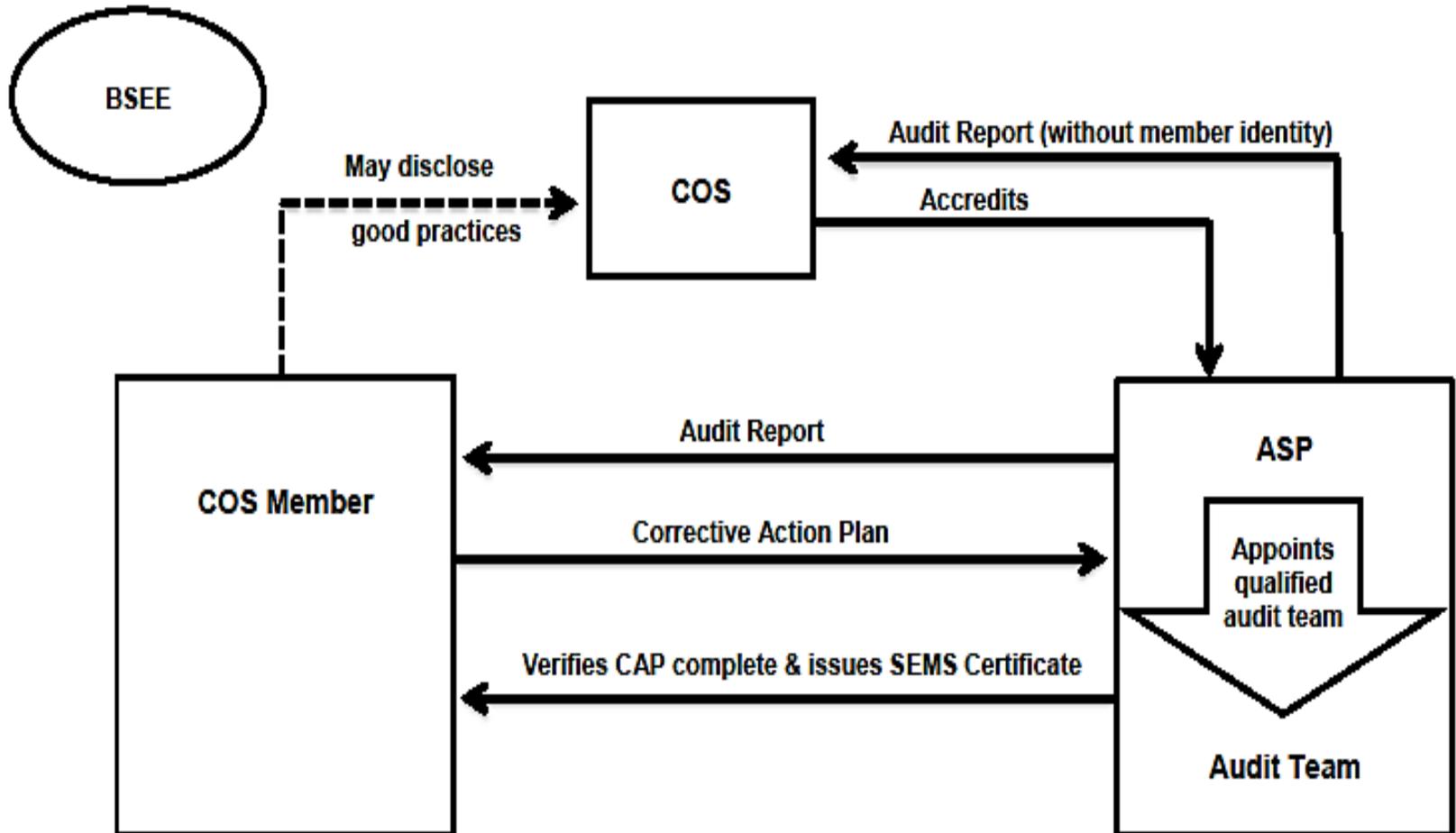
The new U.S. safety regime is almost entirely a construct of the offshore industry itself, using API RP 75 and the COS audit protocols—both of which BSEE has incorporated by reference into its regulations.

U.S. Code of Fed. Reg.

§ 250.1920 *What are the auditing requirements for my SEMS program?*

- (a) Your SEMS program must be audited by an accredited ASP according to the requirements of this subpart and **API RP 75, Section 12 (incorporated by reference as specified in § [250.198](#))**. The audit process must also meet or exceed the criteria in Sections [9.1](#) through 9.8 of **Requirements for Third-party SEMS Auditing and Certification of Deepwater Operations COS-2-03 (incorporated by reference as specified in § [250.198](#))** or its equivalent. Additionally, the audit team lead must be an employee, representative, or agent of the ASP, and must not have any affiliation with the operator. The remaining team members may be chosen from your personnel and those of the ASP. The audit must be comprehensive and include all elements of your SEMS program. It must also identify safety and environmental performance deficiencies.

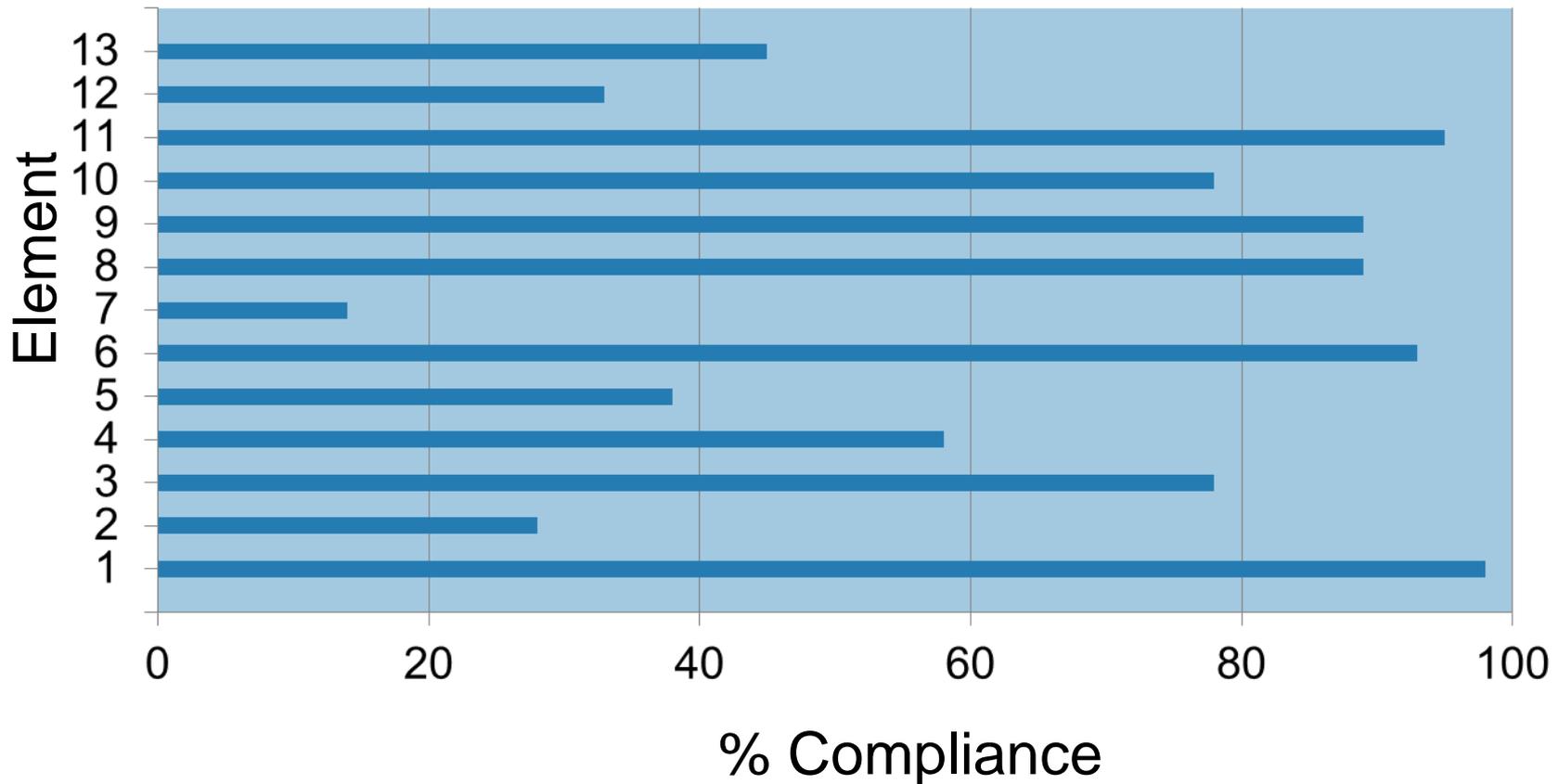
The COS Audit World: Deepwater Operators, Drilling Contractors and Service Companies



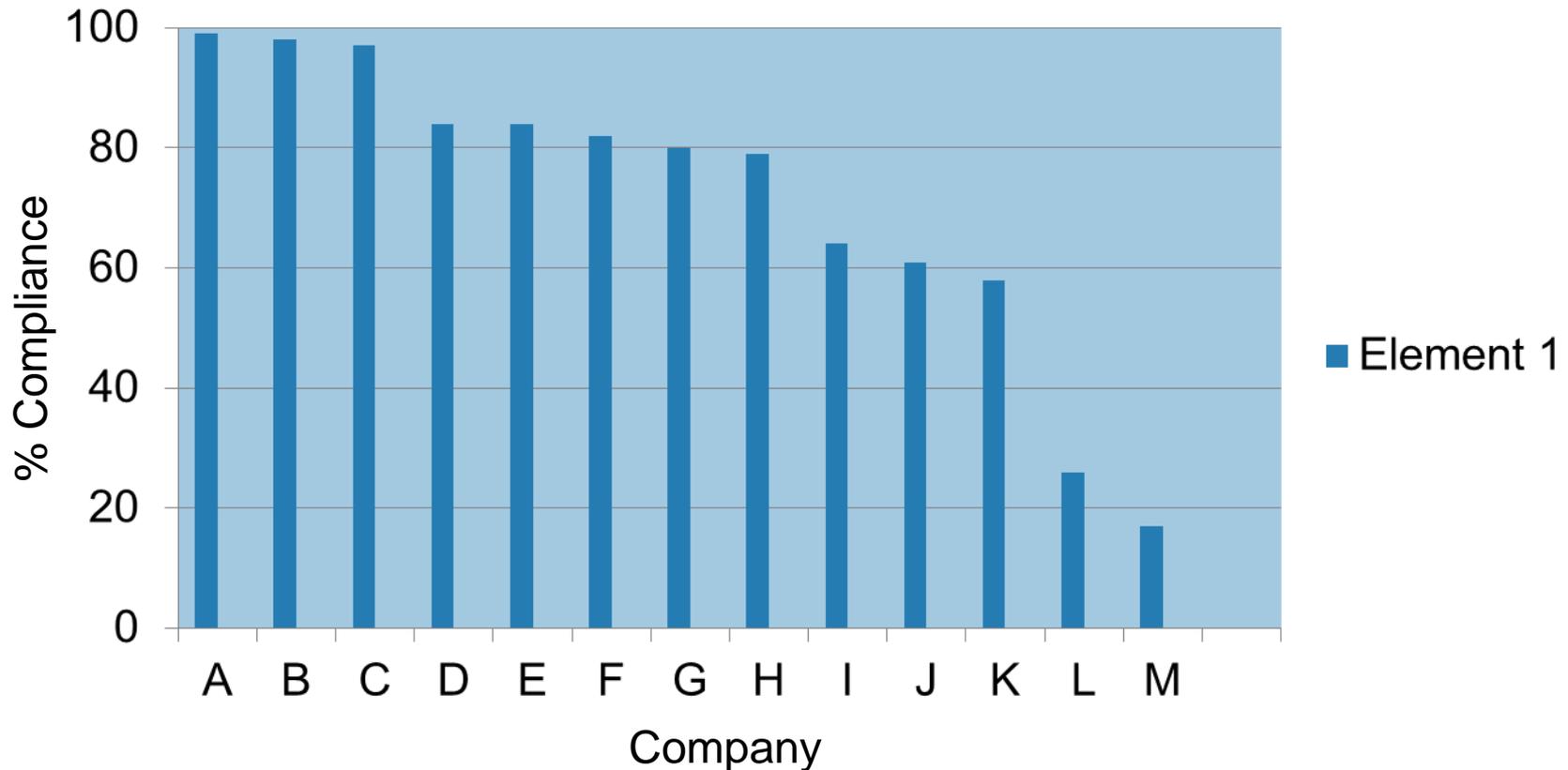
SEMS Elements Analysis



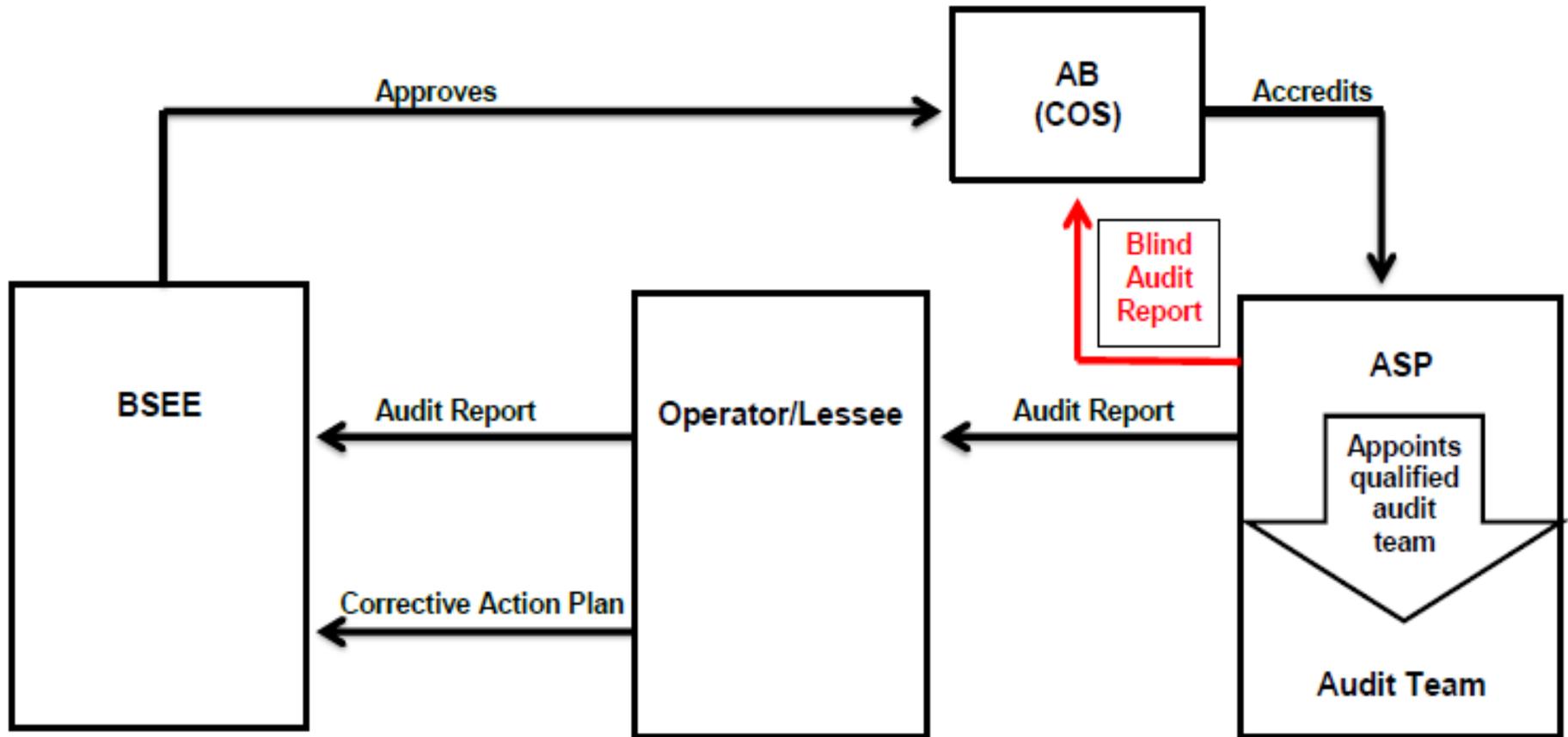
– Raw Data - % Conformance by Element



SEMS Evaluation of Results: Blind Benchmarking of Companies



The SEMS II Audit World of COS & BSEE



How does BSEE perform oversight? Very high level

1. BSEE approves the Accreditation Bodies (ABs) that then accredit the Audit Service Providers.
 - COS is the only “AB.”
 - 4 companies are qualified ASPs as of 10-1-2015.
2. BSEE can “audit the auditor’s auditor,” *i.e.*, it audits the COS’s auditing of the Audit Service Providers (ASPs) to help assure that ASP audits of companies are being done well.

Industry self-regulation thru 3PV

The SEMS II system looks like “industry self-regulation through third-party (auditor) verification (3PV).” Similar to Mexico’s adoption of 3PV environmental audits for NAFTA purposes. Industry pays for the audits; under-resourced regulators use “agents” to audit industry.

1. This reflects BSEE’s view that the operator must be primarily accountable for safety, not BSEE.
2. But: National Academy of Sciences report warned:
“An organization cannot turn over the development and monitoring of its safety program to a third party and expect the program to be effective.”

Criticisms

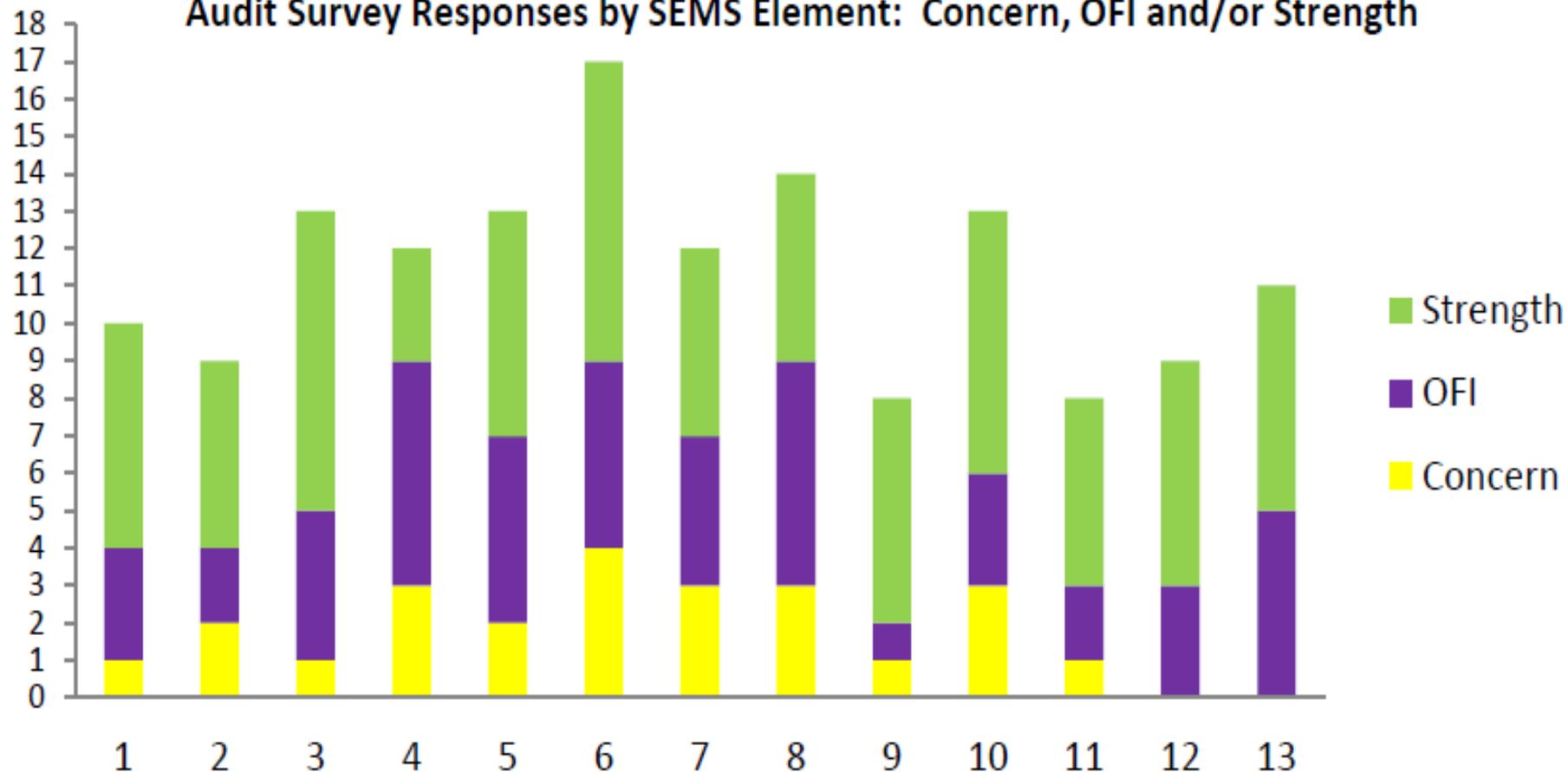
1. Too much industry self-regulation without much government oversight.
2. Too much out-sourcing of safety to third-party auditors.

Is BSEE left outside the learning loop?

COS: Beyond SEMS to Continuous Improvement

- The COS audit regime is designed to do more than allow its members to meet BSEE regulations for third-party SEMS audits.
- COS analyzes the aggregated audit data received from deepwater operators, contractors and service providers.
- In 2014, COS's first Annual Performance Report showed how useful the audit data can be.

Audit Survey Responses by SEMS Element: Concern, OFI and/or Strength



Note: The number on the horizontal axis represents the SEMS Element number.

1 – General	8 - Mechanical Integrity of Critical Equipment
2 - Safety and Environmental Information Required	9 - Pre-startup Review
3 - Hazards Analysis	10 - Emergency Response and Control
4 - Management of Change	11 - Investigation of Incidents
5 - Operating Procedures	12 - Audit of SEMS Program Elements
6 - Safe Work Practices & Contractor Selection	13 – Recordkeeping
7 - Training	

COS: Sharing good practices

- COS has a voluntary system for members to share good practices; COS members are “expected” to do this.
- COS has issued its first Annual Performance Report—with considerable useful data in it.
 - 13 deepwater operators, 6 drilling rig contractors and 5 service companies were COS members at the time the data was collected.

In sum: COS is a resource for industry members to improve. Peer education.

Two other COS projects:

1. **Safety Performance Indicators (SPIs):** This program has developed a tiered series of SPIs; COS members report incidents (tiered by severity) to COS. COS 1st Annual Report published the aggregated results.
2. **Learning From Incidents (LFI):** see COS 1st Annual Report.
 - EXAMPLE: Air hoses for welders' breathing should be physically impossible to connect to any other source of gases.

In sum:

- US operators are largely regulated using third-party auditors to verify SEMS implementation.
- The auditors are pre-qualified through the industry's Center for Offshore Safety and must use COS Audit Protocol now.
- The new BSEE regulations are largely based on API Recommended Practices.
- COS plays a key role; BSEE is not (yet) a strong regulator.
- Most global regimes in new basins will be a variant of the US SEMS regime.
- **SEMS 3 is in the works.**

Much remains to be done

1. BSEE must become a well-informed regulator.
2. COS membership is voluntary—only larger companies are members to date. Yet the COS Audit Protocols apply to all offshore operators now.
3. Use of precursor data of “near misses” is crucial.
4. How to judge whether API standards and RPs actually represent good/best practices to be accepted as regulations?

The COS/BSEE nightmare: A COS-certificated member has an accident that kills workers or releases large pollution.

Current members of COS

Owners / Operators / Leaseholders

- Anadarko *
- BHP Billiton *
- BP E&P *
- Chevron USA *
- Cobalt
- ConocoPhillips *
- Exxon Mobil *
- Hess
- Marathon
- Murphy E&P
- Shell International E&P *
- Statoil North America *
- TOTAL E&P *

* Indicates founding member

Drilling Contractors

- Diamond Offshore Drilling *
- Ensco *
- Noble Corp *
- Pacific Drilling *
- Seadrill Americas
- Transocean *

Service / Equipment Providers

- Baker Hughes *
- Cameron International *
- Halliburton *
- Oceaneering *
- PetroSkills
- Schlumberger *
- GE Oil and Gas
- United Fuel Supply
- Helmerich & Payne

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Thank you!

Questions? Comments?