Collaboration for improved decision making in drilling
CODIO - A Demo 2000 and industry funded project

Agenda

- IO Background and History in ConocoPhillips
- Challenges in drilling operations, today and in the near future
- How has IO improved the situation, what are the remaining gaps
- The role of information technology in supporting IO processes
- The CODIO solution for collaboration and decision making
IO Background and History in ConocoPhillips

Challenges in drilling operations, today and in the near future

- People and organisations
  - Diverse workforce - Physically and geographically dispersed
  - Demographics and generation gap
  - More people involved in decisions
  - Regulatory pressure
  - HSE expectations
  - Knowledge sharing
  - Resistance to change

- Process
  - Standards
  - Communications

- Technology
  - Dependent on robust IT infrastructure
  - Connections – between companies – interfaces
  - Security
  - Data quality concerns

- Others
  - High NPT
  - High costs on the NCS
  - Drilling complexity
  - Remoteness – example in the Arctic
How has IO improved the situation, what are the remaining gaps

- Value creation well documented for IO on the NCS
  - Improved use of data and information
  - Improved planning and preparation
  - Improved communication and collaboration
  - Improved decision making
  - Improved contractor involvement
  - Improved regularity and efficiency
  - Improved predictability
- IO value potential still high
  - Collaboration and communication
    - Situational awareness
  - Integration of functions and companies
  - Data quality concerns
  - Documentation/Visualization of decision making process
  - Knowledge sharing
  - Training and education
    - Cross company
    - Use of Simulators
    - Universities and Academia
  - Costs and high NPT still a challenge on the NCS
  - Business models – more work to be done
  - Industry demographics are still here
The role of information technology in supporting IO processes

- IT is already an indispensable part of IO – but has more to offer!
- IT for data integration and visualization
- IT for improved awareness and collaboration
- IT for faster and better decision making
- IT for work process support and compliance

CODIO - The operational context
CODIO - Scoping of the solution
COllaborative Decision making in IO

- **Applicability area.** Focus on collaboration and decision making needed to resolve “Problems detected” in drilling operations
- **Collaboration support.** Facilitate and support informal and light-weight collaboration between actors in problem resolution
- **Relevant information.** Bring forth and present relevant information for problem resolution, suppress irrelevant information
- **Decision support.** Implement a flexible “Assess-Decide-Act” framework for decision support
- **Knowledge management.** Each problem episode, whether successfully resolved or not, may result in a lesson learned
- **Rich visualization.** Use visualization to maximal effect in the users’ interactions with CODIO

CODIO - Data integration and visualization

- High-level dashboard for monitoring – status “at-a-glance”
- Trend visualization and performance KPIs
- Data streams from multiple sources streamed to role-based portals
- Traffic light indicators and alert messages

**Alert:** We are behind budget due to low ROP (Rate of Penetration)
CODIO - Improved awareness and collaboration

- Common workspaces for sharing and communicating
- Discussion boards and micro-blogging
- Immediate access to standard communication tools
- Drill-down to problem boards

I believe the reason for low ROP is that we hit a layer of stringers. Let’s create a problem board.

CODIO - Faster and better decision making

- Collaborative analysis of nature of the problem
- Access to specialized analysis tools
- Exploration of decision alternatives
- Formal decision models – decision trees with uncertainty handling

Let’s run through the decision model to see if we should trip out and change bit, or just drill on.
CODIO - Work process support and compliance

- Work processes defined in management system
- Important for regulatory and safety reasons
- "Executable" work processes to ensure compliance
- Help to follow defined workflow
- Active task guidance

Ok, in order to trip out and change the bit we need to follow this work process. Let's ask for guidance!

CODIO – Embedded in Microsoft SharePoint 2010

- Industry standard platform for collaboration and information sharing
- Integration with "everyday tools" for mail, tasks, calendars, etc.
- "Web parts" for extensions and custom tailoring
- Access to databases and tools
- Standard features for search, document management, authentication, security, ..
- Standardized browser-based look-and-feel
Where are we headed - Automation and intelligence

Today

Execution support for routine tasks
Collaboration tools, check lists, "wizards", on-line procedure manuals, workflow systems
Manual

Automation

Decision support for complex tasks
Collaborative decision tools, diagnostic aids, semi-automatic planning and coordination
Complex

Autonomous problem solving and optimization
Automatic situation assessment, reasoning, action planning and execution, autonomous agents

2015++

Next 5-10 years

Next 5-10 years

Automation of routine pre-planned tasks
Event-driven work processes, rule-based systems, Web service integration, process automation

ConocoPhillips

Thank you for your attention!