

Needs? - driving change

Needs are the underlying driver for the adoption of technology changes when the technology solves those needs. Drilling Systems Automation (DSA) offers the opportunity to solve many needs that have been expressed by operators including (ref SPE ATW July 2012):

- ◆ Improve operational efficiency
- ◆ Reduce nonproductive time (NPT)
- ◆ Reduce well construction time significantly: 30-50%
- ◆ Deliver a quality well in the right place
- ◆ Remove people from safety critical areas
- ◆ Involve fewer people in drilling operations, recognizing shifting roles, to offset high turnover and the "big crew change"

Drilling Systems Automation offers the opportunity to solve many drilling industry problems and challenges that contribute to wasted cost where high frequency data inputs and machine control out perform human capability:

- ◆ ROP optimization & vibration management
- ◆ Well placement
- ◆ Hole cleaning, hydraulics, Real-time kick detection, surge/swab
- ◆ ECD management, MPD
- ◆ Real-time torque and drag, stuck pipe prevention
- ◆ Borehole imaging

Collaborate.

A virtual forum will be open to all utilizing an SPE based web domain for those wishing to join the discussion. Details must be e-mailed to one of the addresses below in the following format [The Skills 1 through 5 are your top skills (up to five) that you consider are relevant to participating in the Drilling Systems Automation Roadmap Virtual Forum]:

First name

Last name

Role (job title)

Organization (employer)

e-mail

Phone office

Phone cell

Location - town / city

Location - country

Member of SPE: Yes / No

Skill 1

Skill 2

Skill 3

Skill 4

Skill 5

Comments

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<http://connect.spe.org/DSARoadmap>

Foundation.

Development.

Implementation.



Drilling Systems Automation Roadmap

A cross industry initiative to guide
the development of drilling
systems automation



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Why? - a rapidly advancing technology

Automation in drilling and completion operations is coming quickly, and its rapid adoption will leave many industry players behind if they are not aware of the future it will bring. Advances in control and automation of the whole drilling and completion processes will increase improvements in safety, performance, quality, reliability, consistency and interoperability.

This progressive application of automation will also create shifts in skills and competencies, and transform the role of the driller, rig crew, and service specialists along the way. Advances in automation are being made on multiple fronts today, and many lessons are available from its adoption in other industries and the transformation it afforded in the 1990s.

Who? - committee and participants

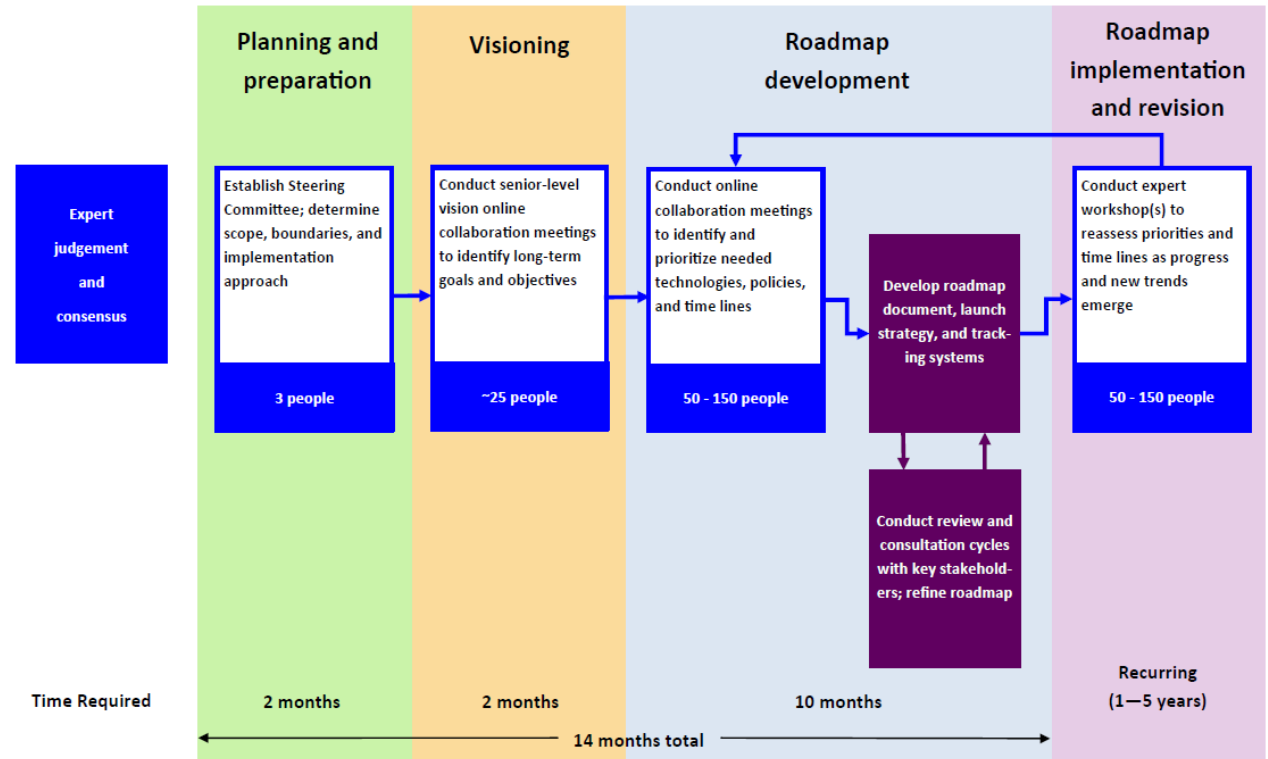
Leadership — This initiative was launched by 3 co-chairmen: Dan De Clute-Melançon (Halliburton), John de Wardt (DE WARDT AND COMPANY / SPE DSATS), Ed Tovar (InTechSys).

Committee — The committee is formed of a range of competencies required to encompass the spectrum of expertise envisaged in the roadmapping initiative including key players from brand name companies. Members: Mark Andersen (Shell), Eric Cayeux (IRIS), Clay Flannigan (SWRI), Moray Laing (SAS / SPE DSATS), Terry Loftis (Transocean / IADC ART), Robin Macmillan (NOV), John Macpherson (Baker Hughes / SPE DSATS), Bob Moran (Halliburton), Randy Mutch (Ensign), Eric van Oort (UT Austin), Jens Ingvald Ornaes (NOV), Ian Russell (KCAD / IADC ART), Russ Somers (MI Swaco), Mario Zamora (MI Swaco)

Virtual Forum — A virtual forum will enable a very large cross section of participants to view, review and provide input into the work as it progresses. Application to join on back page.

Advisors — The advisors will be specifically selected and invited into this role due to their significant standing and history in automation systems transformations. John Berra — Past Chairman Emerson Process Management

Affiliates — Multiple institutions are envisaged to become affiliates as a means to ensure a broad footprint of connectivity. Currently affiliated to SPE [DSATS], IADC [ART] and AUVSI.



What? - graphic and report

A technology roadmap is a plan that matches short-term and long-term goals with specific technology solutions to help meet those goals.

The DSA Roadmap is intended to have three major uses. It helps reach a consensus about a set of needs and the technologies required to satisfy those needs; it provides a mechanism to help forecast technology developments and it provides a framework to help plan and coordinate technology developments.

The product will be a graphic representation of the anticipated developments defined under key headings and described over multiple years into the future. A report will support the reasoning used to create the graphic.

The report will be available to benefit Oil & Gas Operators, Drilling Contractors, Service Companies, Original Equipment Manufacturers, Component Suppliers, Professional Organizations, Academia, companies outside oil and gas and Consulting Organizations.

How? - the process

The Sandia National Laboratories roadmapping process was adopted as the DSA Roadmapping Process represented in the graphic above.

Foundation (Planning & Preparation / Visioning): This includes the development of an agreed description of the Scope and Boundaries of the roadmap and the Vision for DSA toward which the roadmap is oriented.

Development: Identify the "product" Needs, critical system targets, major technology areas, technology drivers / targets, technology alternatives / time lines.