API RP 78 Overview

RECOMMENDED PRACTICES FOR WELLBORE POSITIONING

Why are we doing this?

The OWSG committee recognized a need for a comprehensive body of work that defined a minimum standard and formed a subcommittee address.

As this evolved it was realized that this was a significant not only for the operators but all that worked in the field of surveying.

To ensure **inclusiveness** the OWSG subcommittee decided this would be best managed under a standards organization – API was chosen.

Overview

Discuss high level of what it means to be an API section

What is the Purpose and Scope of the proposed RP

More details of the proposed sections

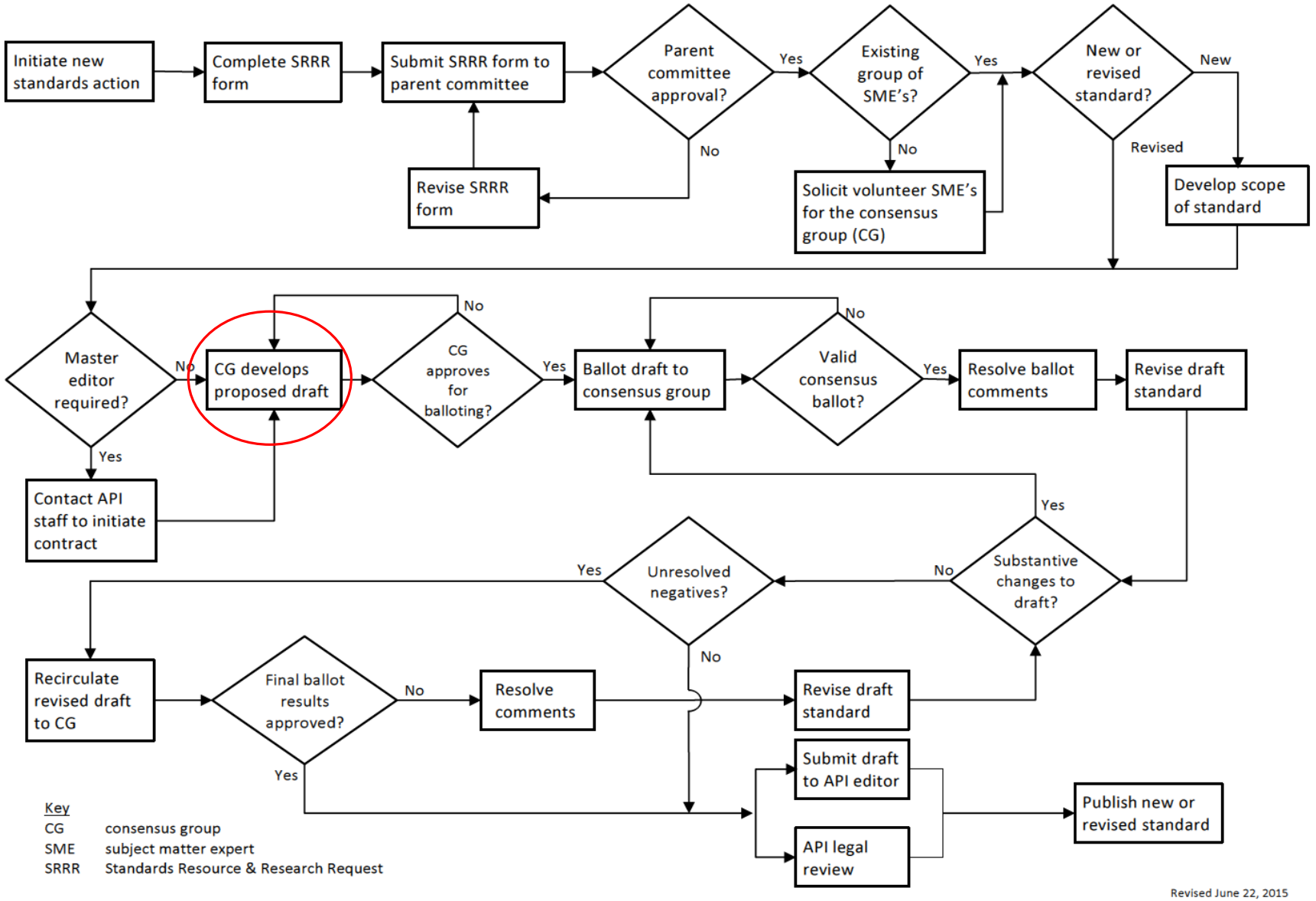
The recommended path forward to manage the task at hand

Who to contact with in API if you would like to participate

The next engagement

API RP publication process

Process for creating an API Standard/RP



Who can participate?

Anyone

This includes (but is not limited to):

Operators/ Manufactures

Service Providers

Academics

Regulators

Professional Associations: e.g. IADD, SPE, AADE

Anyone with a general interest

Who can vote?

Those who participate in the creation of the document

- One vote per company

API RP 78
Scope and Purpose

MINIMUM GUIDELINE FOR OPERATIONS THAT ARE CONSIDERED MAINSTREAM IN INDUSTRY AND IN PRACTICE

Purpose

The purpose of this Recommend Practice is to provide a framework and minimum guidance for the planning, acquisition, quality assurance, storage, and use of wellbore position data for the well lifecycle. This includes the assessment of well objectives as they pertain to collision assessment and reserves targeting.

Scope

This recommended practice covers the effective representation of the trajectory; e.g., position measurement, trajectory calculation, rendering and presentation, uncertainty calculation and use with respect to other wells.

This recommended practice is **not** designed provide a method for determining the most accurate position, only a position that is properly represented by a mathematical error model that considers both the tool type and the environment that it was run.

Note: Remediation is beyond the scope of this document

Scope (Cont)

This recommended practice will include:

Methodologies for assessing well position objectives

Recommended planning processes to achieve well positioning objectives

Recommendation for database integrity and minimum software functional requirements

Methods for managing and calculating wellbore proximity in relation to HSE and Economic risk

Quality assurance processes utilized before, during, and following surveying operations

Guidelines for assignment of position uncertainty models in accordance to data quality and field acceptance criteria

Utilization of conventional industry methodologies for trajectory interpolation and mathematical processing as it pertains to wellbore surveying

Guidelines for maps, visual renderings, and other deliverables

Scope (Cont)

Examples of what the recommended practice will **not** include:

Advanced geomatics, earth sciences (i.e., magnetics and gravity estimations), non-mainstream surveying techniques, emerging survey correction mathematical theory, positional uncertainty model derivation or developments, and directional drilling principles may be mentioned as they pertain to wellbore surveying but are not defined or addressed in detail.

Managing the task

"HERDING CATS IS AN UNDERSTATEMENT"

Path to Publication

Initial steering committee creates the outline of content

Outline is used to build the straw man

Straw man is built out with some content (80/20 rule)

Each section is sent out for review to focused subcommittees for review, content, and comment

All sections are returned to the initial steering committee for compiling

Creation of the reviewing steering committee

Internal review by steering committee and unofficial comments integrated

Sent out to formal comment

Comments reconciled

Out for balloting

Timeline to Publication

~~Initial steering committee creates the outline of content~~ (Completed)

~~Outline is used to build the straw man~~ (Completed)

Straw man is built out with some content (80/20 rule) (In-progress)

Each section is sent out for review to focused subcommittees for review, content, and comment (Next 30-90 days)

All sections are returned to the initial steering committee for compiling (Next 60 to 120 days)

Creation of the reviewing steering committee (TBD)

Internal review by steering committee and unofficial comments integrated (TBD)

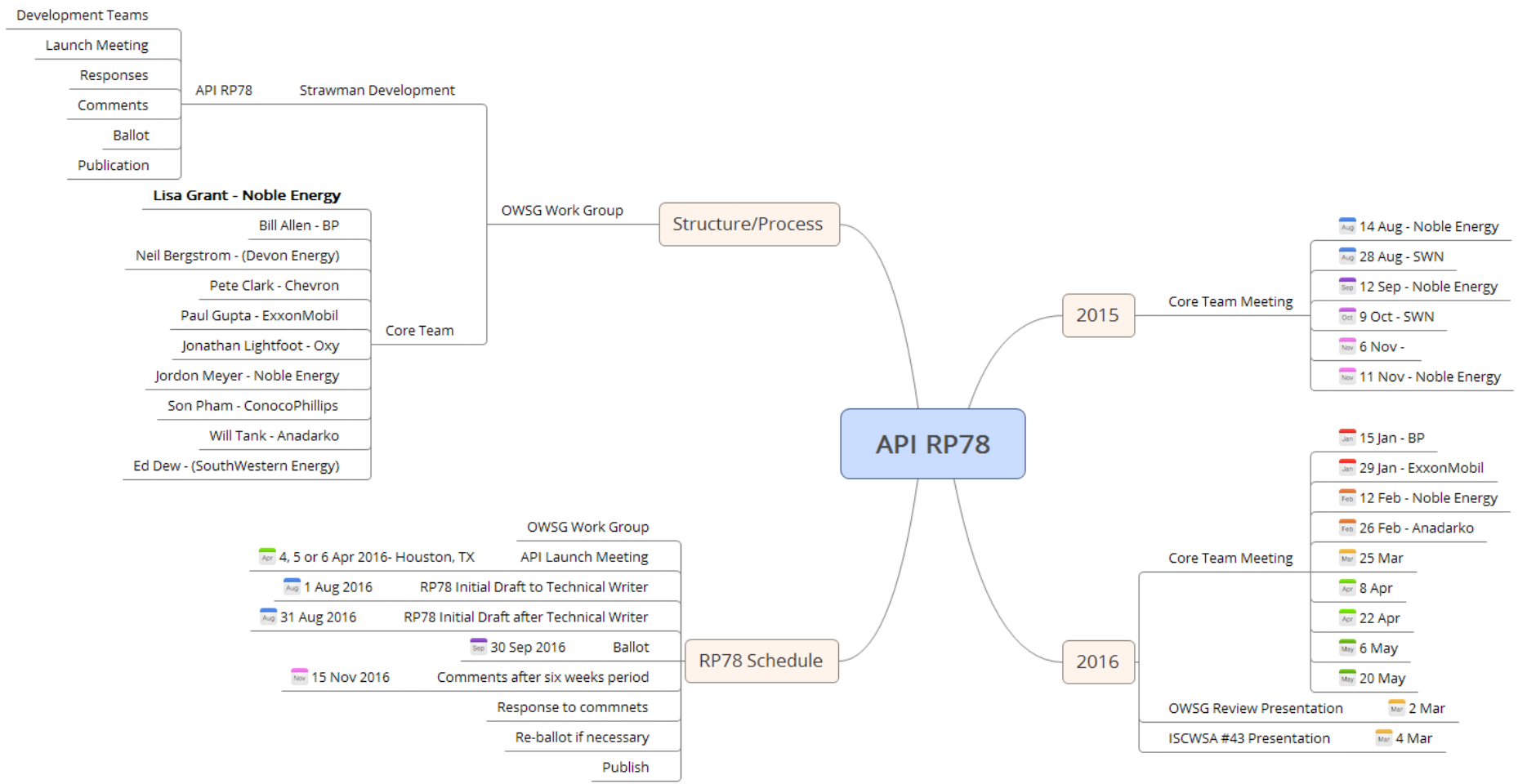
Out for comment (August 2016)

Comments reconciled / Draft revised

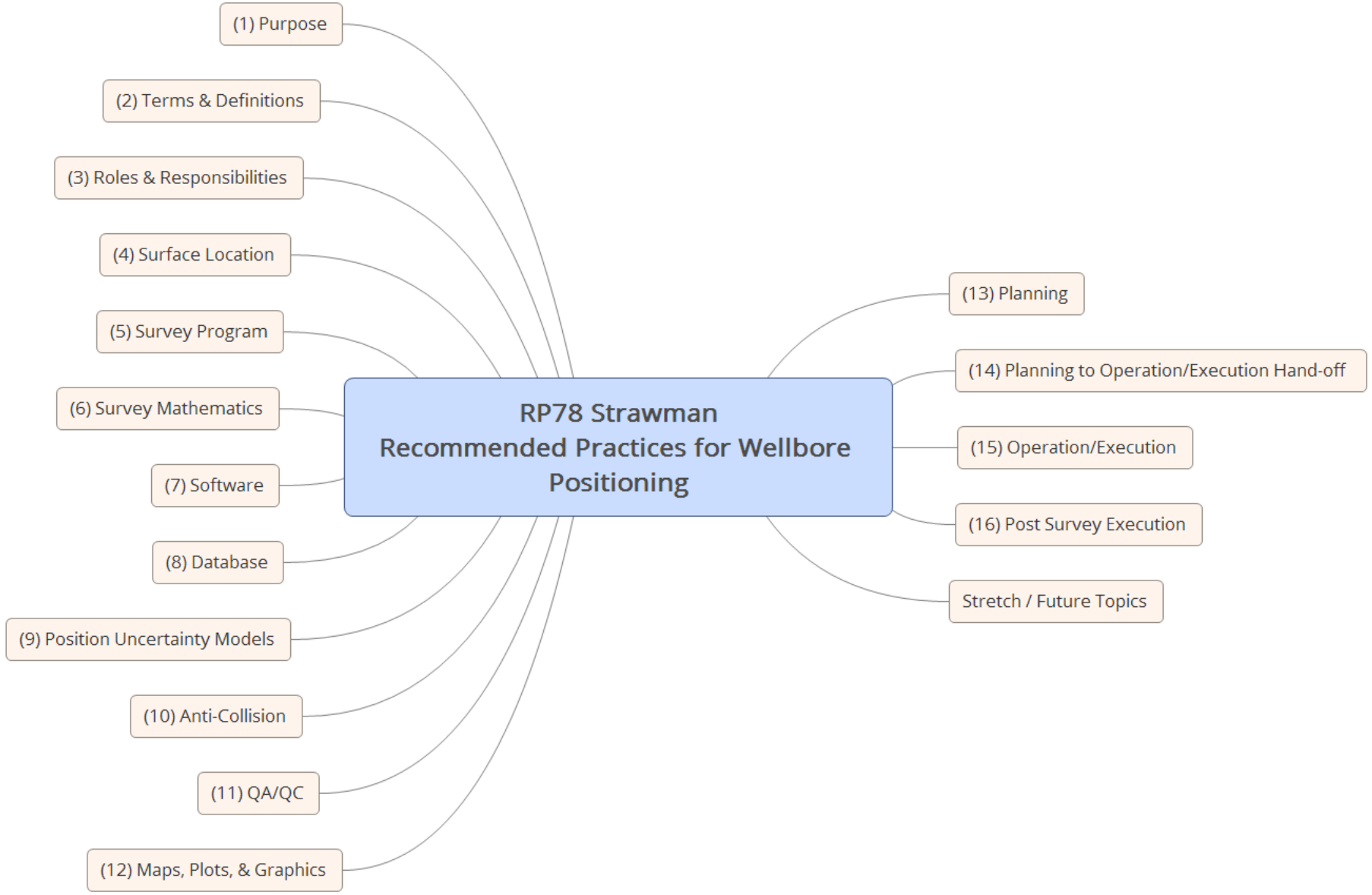
Out for balloting

The Outline/Strawman

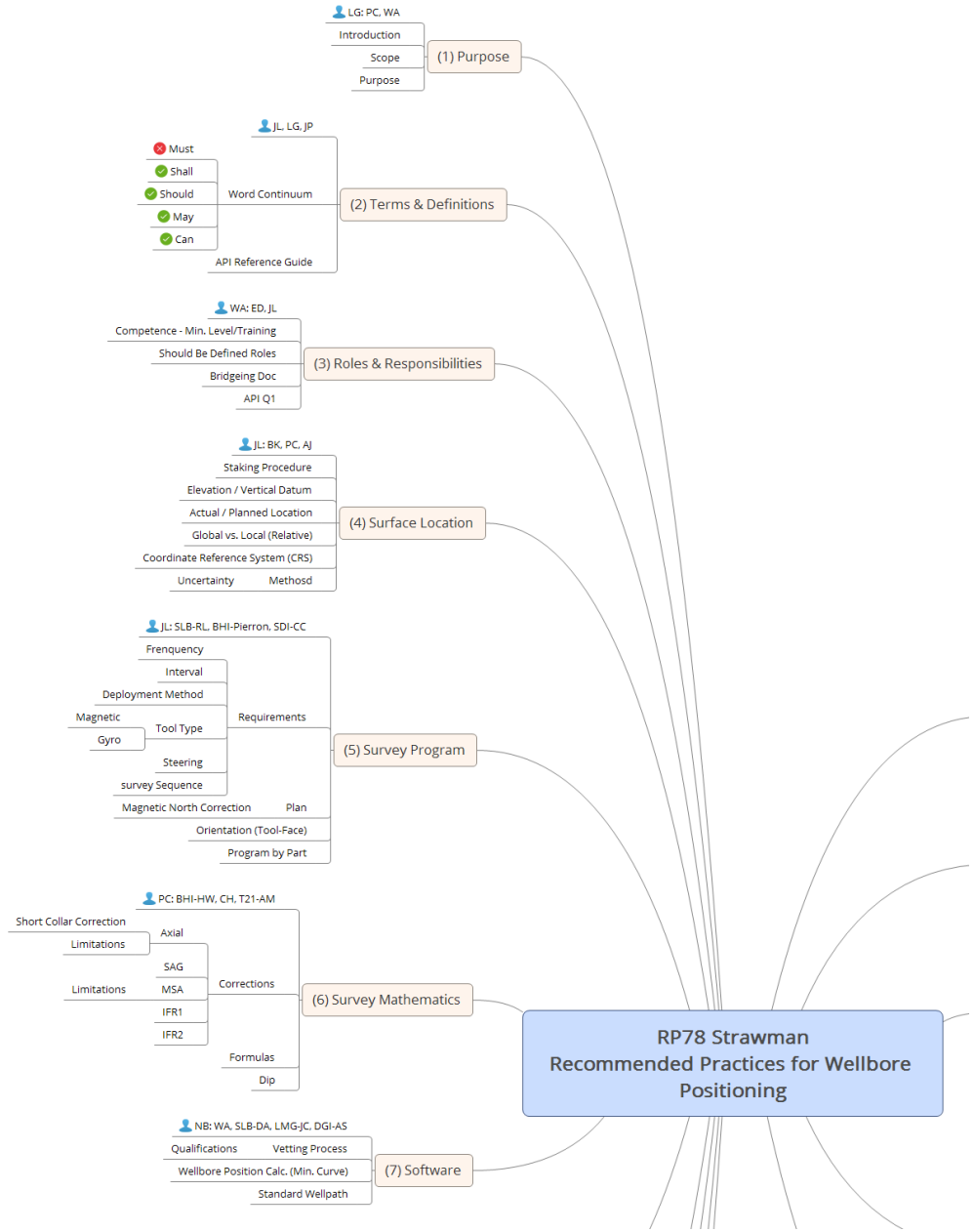
Outline


API RP78
Structure/Process
OWSG Work Group
Strawman Development
API RP78
Development Teams
Launch Meeting
Responses
Comments
Ballot
Publication
Core Team
Lisa Grant - Noble Energy
Bill Allen - BP
Neil Bergstrom - (Devon Energy)
Pete Clark - Chevron
Paul Gupta - ExxonMobil
Jonathan Lightfoot - Oxy
Jordon Meyer - Noble Energy
Son Pham - ConocoPhillips
Will Tank - Anadarko
Ed Dew - (SouthWestern Energy)
RP78 Schedule
OWSG Work Group
4, 5 or 6 Apr 2016- Houston, TX
API Launch Meeting
1 Aug 2016
RP78 Initial Draft to Technical Writer
31 Aug 2016
RP78 Initial Draft after Technical Writer
30 Sep 2016
Ballot
15 Nov 2016
Comments after six weeks period
Response to commnets
Re-ballot if necessary
Publish
2015
Core Team Meeting
14 Aug - Noble Energy
28 Aug - SWN
12 Sep - Noble Energy
9 Oct - SWN
6 Nov -
11 Nov - Noble Energy
2016
Core Team Meeting
15 Jan - BP
29 Jan - ExxonMobil
12 Feb - Noble Energy
26 Feb - Anadarko
25 Mar
8 Apr
22 Apr
6 May
20 May
OWSG Review Presentation
2 Mar
ISCWSA #43 Presentation
4 Mar

Outline


RP78 Strawman
Recommended Practices for Wellbore Positioning
(1) Purpose
(2) Terms & Definitions
(3) Roles & Responsibilities
(4) Surface Location
(5) Survey Program
(6) Survey Mathematics
(7) Software
(8) Database
(9) Position Uncertainty Models
(10) Anti-Collision
(11) QA/QC
(12) Maps, Plots, & Graphics
(13) Planning
(14) Planning to Operation/Execution Hand-off
(15) Operation/Execution
(16) Post Survey Execution
Stretch / Future Topics

Outline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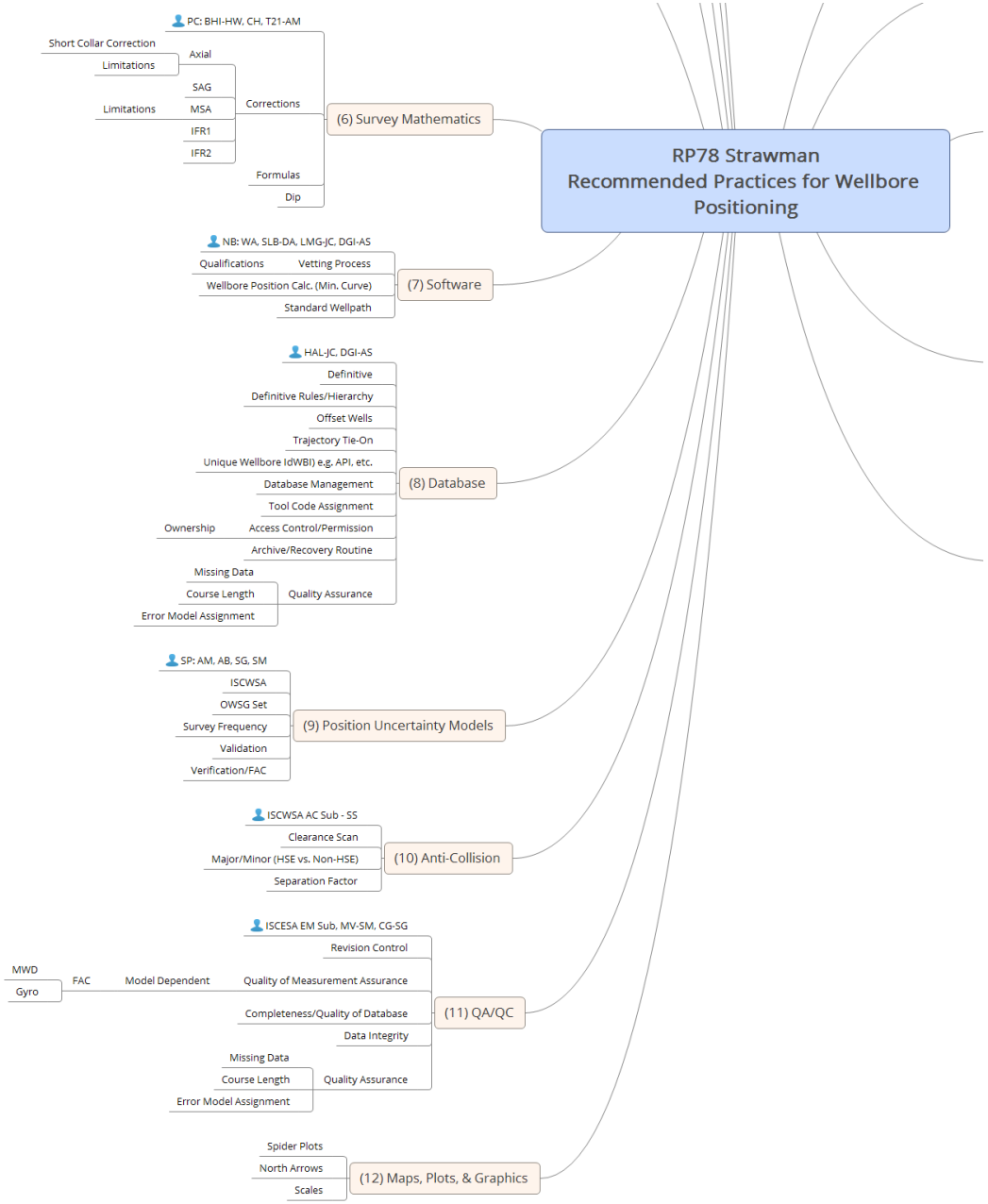
(1) Purpose
LG: PC, WA
Introduction
Scope
Purpose
(2) Terms & Definitions
JL, LG, JP
Must
Shall
Should
May
Can
Word Continuum
API Reference Guide
(3) Roles & Responsibilities
WA: ED, JL
Competence - Min. Level/Training
Should Be Defined Roles
Bridgeing Doc
API Q1
(4) Surface Location
JL: BK, PC, AJ
Staking Procedure
Elevation / Vertical Datum
Actual / Planned Location
Global vs. Local (Relative)
Coordinate Reference System (CRS)
Uncertainty
Methosd
(5) Survey Program
JL: SLB-RL, BHI-Pierron, SDI-CC
Frenquency
Interval
Deployment Method
Magnetic
Gyro
Tool Type
Steering
survey Sequence
Requirements
Magnetic North Correction
Orientation (Tool-Face)
Program by Part
Plan
(6) Survey Mathematics
PC: BHI-HW, CH, T21-AM
Short Collar Correction
Limitations
Axial
SAG
Limitations
MSA
IFR1
IFR2
Corrections
Formulas
Dip
(7) Software
NB: WA, SLB-DA, LMG-JC, DGI-AS
Qualifications
Vetting Process
Wellbore Position Calc. (Min. Curve)
Standard Wellpath

Outline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HAL-JC, DGI-AS
Definitive
Definitive Rules/Hierarchy
Offset Wells
Trajectory Tie-On
Unique Wellbore IdWBI) e.g. API, etc.
Database Management
Tool Code Assignment
Ownership
Access Control/Permission
Archive/Recovery Routine
Missing Data
Course Length
Quality Assurance
Error Model Assignment
(9) Position Uncertainty Models
SP: AM, AB, SG, SM
ISCWSA
OWSG Set
Survey Frequency
Validation
Verification/FAC
(10) Anti-Collision
ISCWSA AC Sub - SS
Clearance Scan
Major/Minor (HSE vs. Non-HSE)
Separation Factor
(11) QA/QC
ISCESA EM Sub, MV-SM, CG-SG
Revision Control
MWD
Gyro
FAC
Model Dependent
Quality of Measurement Assurance
Completeness/Quality of Database
Data Integrity
Missing Data
Course Length
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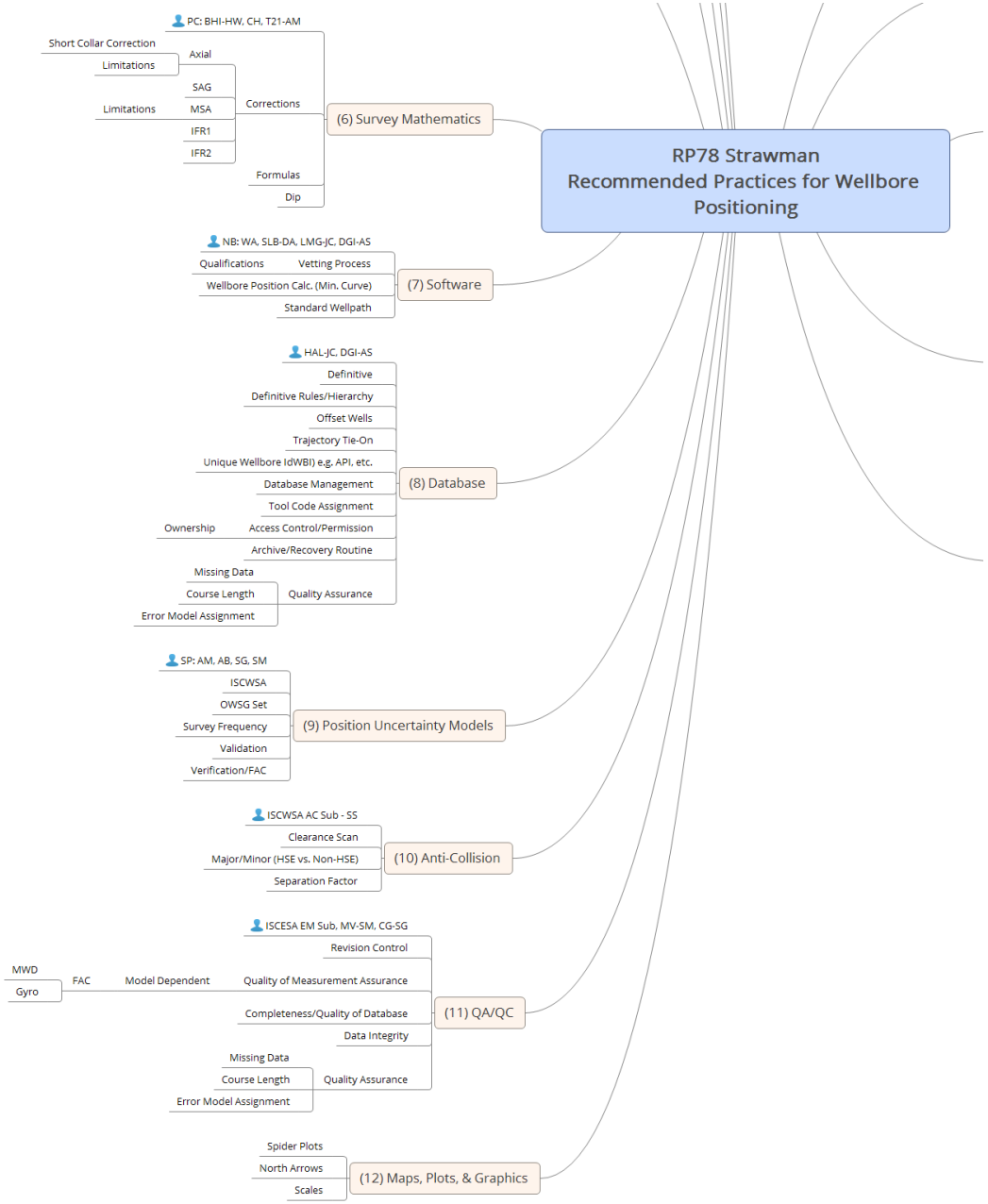
Error Model Assignment
(12) Maps, Plots, & Graphics
Spider Plots
North Arrows
Scales

Outline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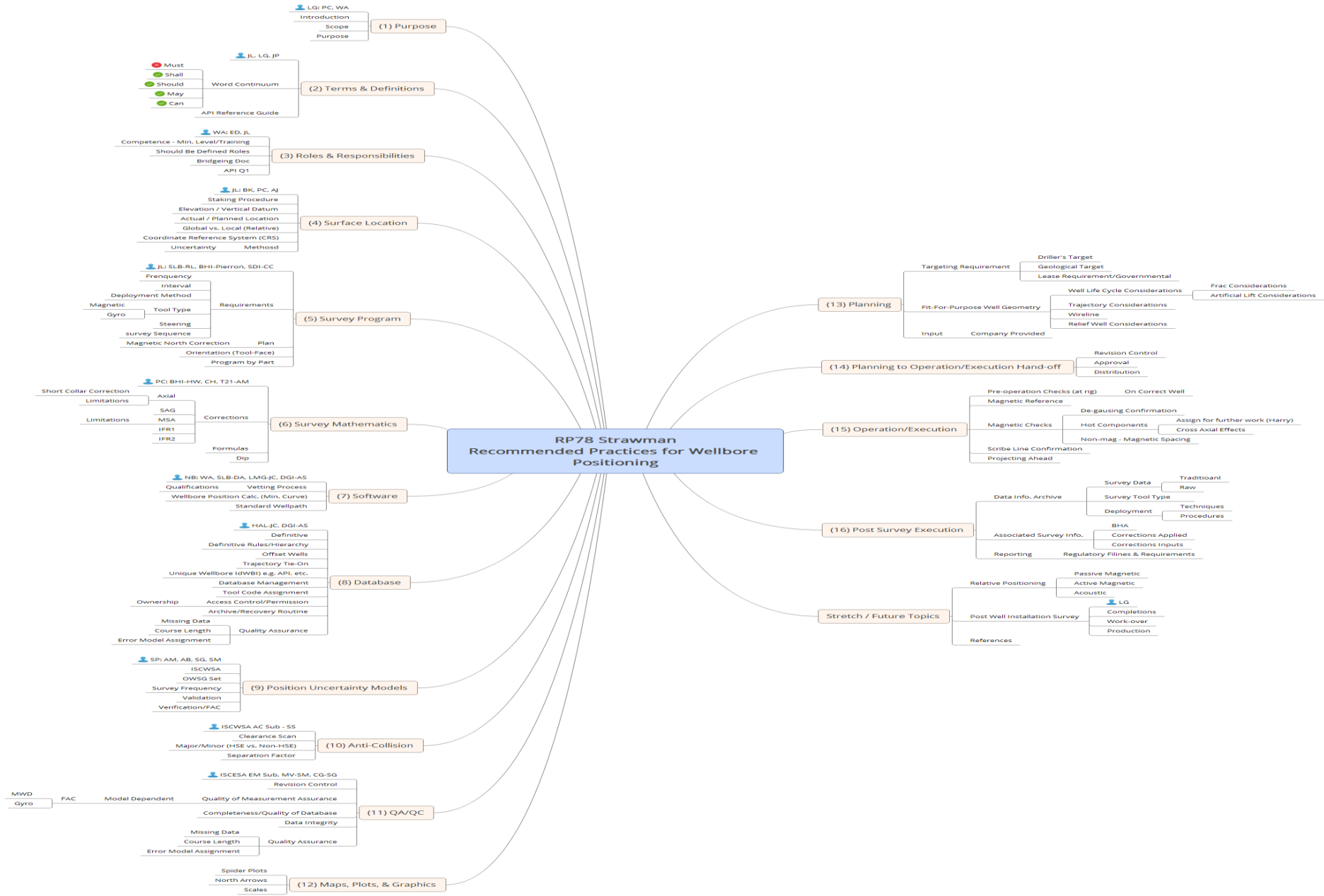
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Targeting Requirement
Driller's Target
Geological Target
Lease Requirement/Governmental
Fit-For-Purpose Well Geometry
Well Life Cycle Considerations
Frac Considerations
Artificial Lift Considerations
Trajectory Considerations
Wireline
Relief Well Considerations
Input
Company Provided
(14) Planning to Operation/Execution Hand-off
Revision Control
Approval
Distribution
(15) Operation/Execution
Pre-operation Checks (at rig)
On Correct Well
Magnetic Reference
Magnetic Checks
De-gausing Confirmation
Hot Components
Assign for further work (Harry)
Cross Axial Effects
Non-mag - Magnetic Spacing
Scribe Line Confirmation
Projecting Ahead
(16) Post Survey Execution
Data Info. Archive
Survey Data
Traditioanl
Raw
Survey Tool Type
Deployment
Techniques
Procedures
Associated Survey Info.
BHA
Corrections Applied
Corrections Inputs
Reporting
Regulatory Filines & Requirements
Stretch / Future Topics
Relative Positioning
Passive Magnetic
Active Magnetic
Acoustic
Post Well Installation Survey
LG
Completions
Work-over
Production
References

Creation of Subcommittees

THESE WOULD LOGICALLY BE BUILT OUT OF THE “SECTIONS” OR “TOPIC”

Subcommittees

Members:

- A member of the initial steering committee (or delegate)
- SMEs
- Others that have an interest or passions

Function:

- Add content to the strawman section assigned to that subcommittee
- Ensure the section is technically correct
- Return the section to the steering committee to be compiled in the larger document

Examples of Subcomittees; Survey Program, Database Creation, Survey Math, QA/QC

Comment Review Steering Committee

Comment Review Steering Committee

Members:

- Members of the initial steering committee
- Members of Industry that have been actively involved, ideally a minimum of one from each subcommittee

Function:

- To reconcile comments

NOTE: Only one ballot per company and voting is allowed if there is active participation in the standard creation process. Comments are allowed from all interested parties.

References

The RP 78 is not met to replace the work already completed

Reference include but are not limited to:

- The Introduction to Wellbore Positioning E-Book
- Collision Avoidance Workgroup practices and guidance documents
- Error Model Workgroup practices and guidance documents
- Other ISCSWA work products and guidance documents
- Collection of SPE Papers

Participation / Next Steps

Send an Email to Roland Goodman @ Goodmanr@api.org

API grounding meeting is planned for the week of April 4th either the 5th, 6th, 7th If you are interested in attending please send a note ASAP so the size of venue can be selected.