Managing Surface Location Uncertainty

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Harry Wilson

BAKER HUGHES

Example of Service Company Process

- Software
- Procedure

Determining the Uncertainty

1. Ask the Operator
2. Doesn’t know? - Ask Rig Positioning/Land Survey company
3. Doesn’t know? - Ask what survey method was used
4. Doesn’t know? - Use conservative default
5. Operator doesn’t like it? – Return to step 1

Determining the Uncertainty

- Operator's rig positioning spec isn't what we want
  - Refers to nominal position

Determining the Uncertainty – Survey Method

Onshore

Method		Horizontal Uncertainty (1 sigma)
Transit satellite on rig	Single point	16.4 feet
	Translocation	1.6 feet
GPS satellite on rig	Differential (pre 1999)	8.2 feet
	Differential (post 1999)	3.3 feet
	Post processed	1.6 feet
Theodolite / EDM traverse		3.3 feet

Offshore

Method		Horizontal Uncertainty (1 sigma)
Transit satellite on rig	Single point	24.6 feet
	Translocation	8.2 feet
GPS satellite on rig	Differential (pre 1999)	8.2 feet
	Differential (post 1999)	3.3 feet
	Post processed	1.6 feet
	Relative kinematic position	0.3 feet
Radio navigation	Pulse/8	49.2 feet
	Syledis	13.1 feet
	Miniranger, Trisponder	8.2 feet

Determining the Uncertainty – Default Values

Facility location uncertainty at 1 standard deviation

Horizontal 6.096 meters

Vertical 0.9144 meters

Slot location uncertainty to 1 standard deviation

Horizontal 0.6096 meters Vertical 0.3048 meters

Alternative Default

- Zero
- Much more popular!

Application Logic – Automated in Software

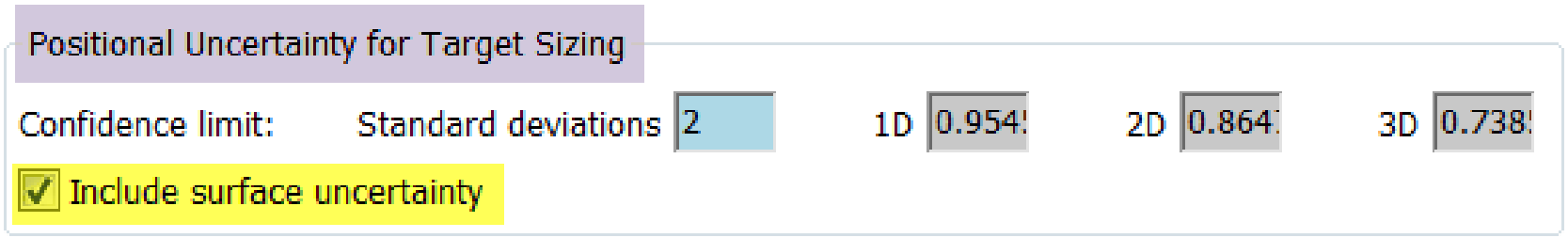
- Target Sizing
  - Facility and Slot (RSS'd)
- Collision Avoidance
  - Offset from same Facility – Slot only
  - Offset from different Facility - Facility and Slot (RSS'd)

Application Logic – Automated in Software

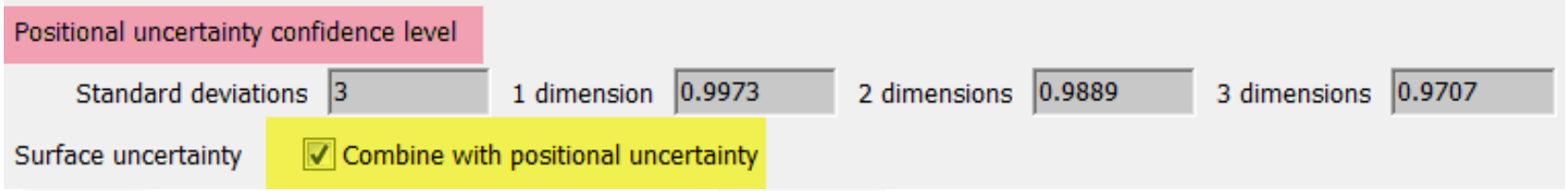
- Possible conflict with infrastructure naming convention
- May require compromise
- Compromise must not undermine location uncertainty logic

Include or Exclude?

- Target Sizing – Recommend



- Collision Avoidance – Insist on



Summary

- Mostly low significance, but sometimes high significance
  - Therefore should be properly managed - routinely
- Complicated by variety of situations
  - Not all infrastructure was surveyed with latest spec GPS
  - Complicated by offset measurement
- Relative uncertainty must be correctly described
- Facilities naming convention may have to be modified to accommodate relative uncertainty logic