



Standards Oversight Council (SOC)

Developing effective technical standards that protect Wisconsin's natural resources

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1072 Horizontal Directional Drilling Standard Team

MEETING NOTES

Thursday, January 16, 2020 ▲ 9:30am – 3:00pm ▲

Lee Sherman Dreyfus State Office Building, 141 NW Barstow Street, Room 151, Waukesha WI 53188

9:30 Welcome & Introductions (Kate, Team)

Goal: Welcome, review meeting objective, and review and approve 12/9/19 draft meeting notes.

Attendance:

Kate Brunner; Kim Gonzalez (Team Leader); John Edwardson, (remote); Brad Eifert; Matt Fehler; Mike Hackel; Elliott Mergen; Lance Newman; Ann Nye; Geri Rademacher; and Abby Williamson.

Absences:

Susan Knabe, Dana Halverson

Guests:

Robin Clysdale from Stantec – remote presentation at 10:30 am

Team agrees to finalize the draft 12/9 minutes as drafted. Kate will post online as final in a couple days.

Action Items from last meeting (12/9). Homework assignments all completed. We'll hear from some team members in presentations today and we'll use the flow charts and decision tool samples from Ann. No action items remained open

Design and Engineering Presentation

Mid-size Electrical Project (Matt at We Energies)

Fiber optic example (Dana at Alliant) unable to attend

FERC Projects (Stantec)

Goal: Summary of design and engineering aspects of HDD from three perspectives.

At our last meeting we identified the design and engineering topics we'd want to understand better. We have two presenters of this information (Dana was scheduled but unable to make it):

1. **Matt from We Energies** will discuss mostly small (up to 8" product, and below 1,500' in length) to medium/large (over 8", and up to 3,000' in length) sized gas designs. He'll discuss applications related to gas and electric. He'll also identify differences for fiber optic in Dana's absence.

2. **Robin Clysdale from Stantec** will be joining us remotely to review new technologies and several recent case studies from MN and WI (design through construction) for larger HDDs.

At our previous team meeting, the following design/engineering questions were identified from the breakout groups. These issues were provided to the presenters for guidance:

- Design differences with type of utility and project size
- Use of existing soil maps and nearby boring information
- Limitations of product pipe (or other material pulled through)
- At what point, and who decides what site spec info in plan?
- Who decides # soil borings, depth, when and if needed?
- Who makes decision if HDD is an option or requirement? (tech std assumes HDD already selected)
- New technologies
- Case studies:
 - Example from a larger FERC project (plan and profile dwgs)
 - Example from a smaller non-FERC elect. project
 - Example from fiber optic project

Presentation by Matt from We Energies – Key points from the presentation and team discussion:

- We Energies looks at the HDD feasibility regardless of cost, though cost comes into play later in the decision-making process.
- Site characterization is important to design - both surface and subsurface conditions.
- Surface conditions includes things like drill rig layout, product layout, topography, temp or perm easements, existing utilities, existing infrastructure (roads, railroads, buildings), future developments.
 - Existing utilities not always confirmed during design of smaller projects, but We does this now to avoid unknowns during construction.
- Subsurface conditions include soil conditions through geotech investigation – technical feasibility and things like drill bits, reamers, drill fluid additives.
 - The timing of geotech can vary a lot based on project needs. Bigger or more complicated projects they'd want some information early like even 3 years in advance to ID preferred route and alternate route.

- Geotech is often phases: use of existing borings in vicinity or some limited work first, then a more complete investigation specific to the design (e.g. boring location and depth aligned with HDD plan).
- Geotech done by the utility, not the contractor. Contractor would bid larger job based on geotech investigation.
- In urban areas they have more prep work since there are more limits to relocation (such as traffic, other utilities, structures). In rural areas, they can move more easily with fewer conflicts.
- General guideline for design is to have the path as straight and short as possible. They design to minimize frac out risk.
- Minimum depth takes into account soil and risk of inadvertent returns. We has a standard minimum depth below wetlands and they tend to prefer deeper than their internal standard. They also go out a little further for additional protection. Their minimum depth also varies for electric vs. gas.
- Drill equipment is often the limiting factor (for We projects). Their pipe and cable can bend but the drill rod can't.
- "Smaller drills" would be 8 inches or less product size, and this work typically wouldn't include a profile.
- Larger drills or higher risk project, they develop a more detailed design and profile. Plan set is more detailed including erosion control, entry and exit angles, where borings were taken.
- They have a plan in place for frac out for all projects, just in case. Smaller projects follow a generic plan and larger projects have site-specific plan.
- Contractor needs to have erosion control and frac out response materials on site during work.
- Different pipe/conduit materials have different properties limiting pullback (bending stresses, pull stress, splicing [manholes needed?]).
- Documentation can be paper field logs, digital tracking, or drill machine automatic logging that can be downloaded.

Presentation by Robin from Stantec – Key points from the presentation and team discussion:

- HDD is part of a larger family of trenchless technologies.
- Preliminary design, then they often need to go through contingency re-design. Redesign may be due to things like new surface or subsurface information, or landowner requests. Reality may get in the way of the ideal design.

- Geophysics investigation, like electrical resistivity tomography (to eval soil type or groundwater) or seismic (to eval bedrock). Geophysics can help interpolate information between geotech borings or otherwise gain subsurface information (like karst features) without drilling or other disturbance. Geophysics is helpful information but doesn't replace geotechnical information.
- FERC has more specific requirements/recommendations for wetland crossings including both design phase and closer to construction (from the contractor).

Risk Extremes

Goal: Discuss appropriate activities for the extremes of each of the three risk factors (size, geology, resource). Agree on what constitutes the maximum and minimum risk.

At our last meeting, the team briefly discussed developing a matrix or flow chart or other similar tool to break down the activities that might be necessary based on a project's specific size and sensitivity.

As a reminder, the following three groups of project-specific issues were developed at a previous meeting. Team clarifies the definitions as well.

1. **Size** – borehole diameter, bore length, bore volume, flow rate of fluid;
2. **Geology** – soil type, bedrock type, karst features, contaminated soil in project area; and
3. **Resources** – wetland type and quality, surface water use (fishing, recreation, etc.), threatened/endangered resources, cultural resources, wells, dikes.

We'll ultimately need to draw some defining lines in the middle ground; but first the team identifies the extremes: What are the **Maximum Risk** vs. **Minimum Risk** situations in HDD projects?

Maximum	<-- Risk -->	Minimum
Large <i>Larger diameter (>24") OR Longer distance (>1,500 ft)</i>	Size	Small <i>Smaller diameter (<8") AND Shorter distance (<550 feet; 1 rack) Residential service</i>
Challenging <i>Variable consistency Gravel, cobbles or boulders Karst Unknowns</i>	Geology	Amenable <i>Uniform consistency Cohesive soils (silts and clays)</i>
Many <i>Close proximity to higher quality wetland/waterway</i>	Resources	Few/None <i>None nearby</i>
<i>High quality, species, ERW, ORW SWDV ASNRI layer (trout, threatened, end.), priority Along route Along route Higher quality, NHI wetland communities Listed Along route Along route</i>	<i>Water quality Waterways Wetlands Wetland quality/type Threatened Endangered Cultural resources Conveyance</i>	<i>Low quality for wildlife. Not used for recreation. None nearby None nearby None nearby None nearby None nearby None nearby</i>

Some other points of the discussion:

- Each size pipe and type of pipe have a MINIMUM distance too, based on how deep it is - how it could curve.
- Size could be product diameter and length, though team also considered adjusting to be overall volume of fluid. Combinations of short length and larger diameter, or long but smaller diameter may be problematic when it comes to decisions on risk. This may be reconsidered as our team discussions continue.
- DNR’s surface water data viewer (SWDV) identifies higher quality waterway designation (like ORW, ERW, ASNRI designation). Information is readily available online.

- HDD in the vicinity of wells and dikes – standard could reference other regs and program requirements. Kim will look into DNR requirements for setback distances and any dike restrictions.
- Depth below a resource may need discussion by team at a later date.

Appropriate Practices

Goal: Discuss appropriate activities for the extremes of each risk factor (size, geology, resource). Include items that are standard practice in the industry.

Team discusses what types of activities are undertaken in completion of HDD. These wouldn't be for all projects, just some situations; a future exercise will be to identify when these activities are appropriate.

The activities identified by the team are:

- Site investigation
 - desktop survey – proximity to wetland/waterway resource, water quality, NRCS soil survey
 - site walk-through
 - geotechnical investigation – existing data, soil borings,
 - wetland identification/delineation
 - field water quality survey
 - geophysical investigation
- Planning
 - Frac Out/Spill Plan
 - Generic plan vs site-specific plan
 - include communication plan
 - Contingency Plan (separate plan?)
 - Staging plan
 - Plan and profile details
 - Annular Pressure Curve (APC) - for higher risk, more complex projects, FERC projects

- Construction phase
 - Pre-construction meeting
 - Monitoring
 - Recordkeeping

The meeting concludes before we complete this discussion. Activities to include in future discussion could include documentation and reporting.

Team members should get in touch with Kate between meetings if you have additional ideas of activities to consider for this list of practices.

Communicating Expectations

Goal: Discuss ideas for how to communicate which practices are appropriate based on level of risk. Should all three factors be combined, or remain separate, or should there be limited combination of factors?

In order to more fully discuss the risk extremes for HDD and the types of activities needed for different risks, this topic was postponed for later discussion at the next meeting.

Plan of Action (Kate, Kim)

Goal: Review Action Items and agenda items for next meeting (February 13, 2020).

Action Items:

1. Kate – prepare draft meeting notes with Kim, then send to full team for review and comment. Notes from today's meeting will be approved by the team at the next meeting (Feb. 13, 2020).
2. Kate and Kim – prepare next meeting agenda and share with team by Feb. 6, 2020.
3. Kate – share presentation slides with the team.
4. Kim – look into existing DNR requirements for drilling in close proximity to wells and dikes, to be used for appropriate citations as needed in the standard text.
5. Team - get in touch with Kate if you have additional ideas of activities to consider for the list of engineering practices. Kate and Kim will talk after the meeting and identify other potential assignments for the team.

Possible next agenda topics

1. Complete list of activities performed to design and perform HDD.

2. Identify practices appropriate to the max and min for each of the 3 risk factors.
3. Clarify the lines of maximum and minimum and identify whether medium risk is appropriate.
4. Develop a communication tool (matrix, flow chart, etc.) to combine the 3 risk factors and risk level for each (max, min, and possibly medium level(s)).

Future team meetings will be 9:30 am to 3:00 pm at the following dates and locations (also in calendar invitations):

Feb 13, 2020 – Waukesha – WisDOT (same address as 1/16 mtg, different side of building)

March 31, 2020 (note: this is new date, rescheduled from Mar. 17) – Portage – Columbia Co. office building

Apr 22, 2020 – Portage – Columbia Co. office building

May 14, 2020 – Stevens Point – Schmeckle Nature Preserve

June 18, 2020 – Stevens Point – Schmeckle Nature Preserve

July 16, 2020 – Madison – UW Extension Dane Co.

Aug 13, 2020 – Madison – UW Extension Dane Co.

3:00 End