

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION,)	
)	DOCKETS UE-170033 and
Complainant,)	UG-170034 (Consolidated)
)	
v.)	
)	
PUGET SOUND ENERGY)	
)	
Respondent.)	
_____)	

EXHIBIT NO. BGM-10
COMPANY RESPONSE TO ICNU DATA REQUEST NO. 91
AND ATTACHMENT B (LESSONS LEARNED)

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

**Dockets UE-170033 and UG-170034
Puget Sound Energy
2017 General Rate Case**

ICNU DATA REQUEST NO. 091

ICNU DATA REQUEST NO. 091:

Reference PSE's response to ICNU DR 040, Document No. 13 in the attachment (Project Implementation Plan Dec. 2013). Appendix H of this document identifies a "Lessons Learned Document" to be prepared as a post-closing item. Please provide this document. If no such document exists, please explain why.

Response:

Please see Attachment A to Puget Sound Energy's ("PSE") Response to ICNU Data Request No. 091, which is the summary of a meeting held on July 16, 2012 following the substation, switch yard and distribution project completion. Please see Attachment B to PSE Response to ICNU Data Request No. 091, which is the summary of a meeting in 2014 following the easement acquisition for the transmission line.

**ATTACHMENT B to PSE's Response to
ICNU Data Request No. 091**

ARDMORE LESSONS LEARNED MEETING**DATE: July 16, 2012****TIME: 11:30 to 13:30****LOCATION: EST-05 Quinault Room****ATTENDEES:**

Randy Walls	Ron Tornquist	Pete Maxwell
Celeste Keller-Frimodig	Tony Pagano	Sharon Williams
Lynn Thompson	Jens Nedrud	Elaine Babby
Ed Wilson (telephone)	Mark Petilla	Reid Shibata

Introduction

Purpose of discussion is to record constructive comments regarding development, construction and initial operation of the Ardmore Substation.

Project Summary

- ◆ Combined switching and distribution substation
- ◆ 2 twin metal clad switchgear units
- ◆ 2 25-MVA DY transformers
- ◆ 1 Modular Protection and Control (MPAC)
- ◆ Gas Insulated Switchgear (GIS)
- ◆ Duct and vaults for 24 distribution circuits including 12,600 feet of new trench
- ◆ Transmission line modifications including new 4 steel poles and new section of line
- ◆ Removal of existing substation and tap and sale of property (future)

Current Status

Substantially complete and in service.

Main Points of Lessons Learned Discussion:

- 1) Collaborative process with municipalities at the beginning of project resulted in a positive working relationship with quick turnaround for permits throughout project.
- 2) Municipalities like Redmond and Bellevue require additional engineering resources on PSE side to maintain timely interaction with their engineering staff.
- 3) When sourcing complex equipment such as GIS from non-English speaking countries allow more time for communication and review to ensure understanding prior to installation. Have manufacture review civil drawings.
- 4) Point of Contract for engineering needs to be clarified to resolve construction issues.
- 5) When there is a possibility of weather delays PSE needs to get a team to formulate a plan to avoid current and future issues. Don't forget the extra process

for wet-weather construction if the grading permit did not include working after the start of the wet season.

- 6) Need a means, such as a checklist to determine when Potelco work should be bid rather than unit work, which are not applicable to urban areas.
- 7) Use a lab with all relays represented to work our control schemes in advance.
- 8) Have manufacturer review civil drawing to ensure no issues with installing their equipment.
- 9) Use of coded materials average unit cost not applicable to special design control house or switchgear.
- 10) Managing local inspectors important to avoid inappropriate inspections of equipment.
- 11) Need to replace contractor's superintendent of project manager if not competent of cause of project delays.

General Summary of project:

Well Thought Out

Challenging

Not as difficult as could have been

Not complete yet, 2 distribution circuits left, Punch list still outstanding

Discussion by Discipline

1) Planning/Project Scope-

Overall good concept –Scheduling / Estimating- Schedule was defined in last 2 years of project.

Commissioning schedule was well planned.

Need base line schedule to hold contractor accountable.

Project Controls needs to know how to better track detailed schedule from contractor.

Sub Ops and Engineering need to agree on a plan.

2) Real Estate-

Issues with not having a clear title and the adverse rights issue from the neighbors caused problems.

Should have taken more time to talk with neighbors and ascertained that there were potential problems with use of site by adjacent landowners.

3) Government Relations –

Collaborative process a model for other such projects. Jurisdictions really liked this approach to the project and it started a positive working relationship.

4) Permitting –

Government Relations laid base for permitting by explaining need and building support. Had a good team from City of Redmond to work with and pre-negotiated conditions prior to turning in the application (using the city “PREP” process). Specifically requested the city Project Manager to ensure we had their “A” team.

Redmond was very pleased with what was submitted. Quick processing and very fast turn around for permits due to collaboration.

The distribution feeders created additional effort and coordination that PSE had to support. The jurisdiction views this as part of the major project, but it’s treated internally as separate Potelco work that PSE does not have direct control over. This creates confusion and takes additional PSE resources to keep on track. The Potelco work needs to be better coordinated on substation projects.

5) Community Outreach-

Project was nearly appealed but good legal counsel helped dismissed appeal with minimal delay.

6) Civil Engineering –

Preparation process and interaction with Redmond City engineers allowed a good design.

Does takes full time engineering to develop the preparation process.

More effort is needed with cities like Redmond to deal with their requirements.

PSE needs to ensure good interaction between PSE civil engineer and City, especially with Redmond and Bellevue.

QA/QC was rushed on engineering. For GIS structure should have the manufacturer review PSE civil drawings.

Had some issues with foundation design that could have been avoided if such a review could have occurred.

7) Electrical Engineering –

Project was a new type of design and could be considered almost like a design / build project.

Minor amount of issues due to close interaction between engineering and vendors.

PSE engineering and crews did a good job and got experience with GIS equipment.

Regarding GIS - Language issues on German manufactured GIS caused some issues and require more communication with manufacturers like this. Should have manufacturer for such electrical assemblies review PSE civil drawings. There were some issues with foundation design that could have been avoided if such a review could have occurred.

Also had a new metal clad design, trip to the factory was crucial (Power Com). To avoid additional unnecessary inspections it was required that inspections occur at Nelson Trucking rather than on site. Transformer delivery required coordination with Turner.

Erection of the tent was a critical issue. Had to overlay outline of tent carefully and consider protection of important electrical equipment (such transformer bushings) during erection and deconstruction of tent.

The issue of cost acquisition for large piece of property vs. space to use during construction was mentioned but since the property alternatives were limited

8) Controls and Protection Engineering –

Recommend a lab so can work out schemes in advance. Ardmore caused an evolution in that there were several new items not brought about in standard change process. This standard change process should now be incorporated into standards.

Too much R&D was done during installation. Crews were not ready for some changes that occurred. There were no hard point inputs.

Design Safety Committee will issue a checklist and solicit input on how components are laid out and designed based on details in the design. This would have been good task to perform during execution of this project.

There was good interaction between engineering and relay techs with several on site meetings and teamwork to go through drawings and control schemes in the field as well.

9) Distribution and Transmission Engineering

Distribution:

The design of the distribution system was a good one. However cost to install feeders in street was a major issue. One item learned is to not assume unit costs can be applied to urban areas. There should be triggers that would change what may be considered a unit cost to bid work. If there was a checklist that would present salient questions this could trigger a unit job to move to bid work.

Obtaining proper Right of Way and Easements for Distribution was done late but was successful. Need land rights review to ensure all vaults have easements? Should have land rights review for all distribution on such projects, The vault work outside ROW also triggered additional last-minute permit issues with both cities, requiring rush grading and tree removal permits.

Transmission:

Transmission Engineering must be more flexible, however did have good engineering support from Vu.

Had to have substation engineering cross over to transmission engineering in order to get project done.

Sight distance issues on deadends must be identified early and addressed during design. There is confusion within PSE Engineering as to where the responsibility falls to address the sight distance impacts associated with placing large steel poles near driveways and cross streets, causing last minute design changes that may not be easy or quick to make.

10) Telecommunications

Fiber to transformers was missed in original design added to campus fiber plan. Overall the process went well for fiber.

Scada Design: The project utilized a new class of Scada. More dedicated personnel needed for technicians.

Should have put up test lab earlier. Lab should have all relays represented, not just one or two. This would help resolve issues early.

Technical issue with Icon LTC – once a day at 10:47 substation loses communication for 60 seconds and will get an alarm from LTC. Not sure why.

Need to test a new device 3-4 weeks before put in on software.

Design for protection scheme was late, in April.

Virtual port would have been useful but it was not working at Ardmore.

Issues with new firmware set – the SEL devices could not communicate with each other. There was a time synch issues. There were 700 to 800 points so the process

time was large, but the values don't change so this was not efficient. Only need about 30 points.

11) Materials Procurement

Procurement occurred before site location was resolved. Used the same vendor for previous two GIS assemblies.

Making design decisions before the property acquisition is resolved is risky.

There were issues with the firewall color.

Coded material costs for Ardmore metalclads were not accurate. Actual cost of equipment purchased needs to be considered rather than average unit cost.

Work with TES on field inspections.

When purchasing new equipment all parties should be aware that the equipment is new and be keep informed of recent manufacturer developments.

Managing local inspectors important. The control house was inspected in Nelson Trucking yard, not at substation. Need to have inspections occur for specific structures outside substation to avoid project delays. Preferable would be a standard design and/or inspection back at plant.

Line up witness test for new equipment.

Should consider installation of castor wheels in metal clad.

12) Security

Card readers installed too far from road. (Not in best location relative to gate).

Security not factored into metal clad. Does each metalclad need its own card reader?

Consider pre-wiring security system in MPAC

13) Contract / Bid Process

There is a team working on refining the contract / bid process.

Look at contractors more closely for substation bids.

Have better design review with CM involvement on project.

Make sure design review happens,

14) Vegetation Management and Landscaping

Confusion on who is responsible for landscaping, Vegetation Management or Engineering? Vegetation Management did have some involvement during design.

Consider use of Thorny plants for security, such as to deter climbing walls or fences.

15) Construction Management

The Project Manager and Contract Manager need to discuss all issues privately without contractor present, then present to contractor once resolved internally.

Point of Contact for design was confusing for construction management.

Hold contractor accountable to meet all obligations of the contract.

Providing favors, such as an additional laydown area, can result in additional issues for PSE and should be carefully considered.

Notify the contractor early that they will be back charged for all PSE time spent fixing their errors. Most projects don't have errors of this magnitude, when a pattern develops of constant errors PSE needs to back charge for all PSE time related to correction of errors.

When there is a possibility of delay due to weather PSE needs to quickly formulate a plan to deal with weather related issues. A team should be formed to consider options (shut down job, change materials, etc) Delay charges can be substantial.

If the contractor's project manager or superintendent is not performing their job per our expectations a firm notification should be given. If performance still does not improve PSE should pursue replacement of contractor's representatives.

Track schedule actual relative to baseline schedule to clearly identify and document issues and when they occurred.

Need more stringent drawing review prior to release to contractor.

16) Testing and Commissioning

Test plan is important, need to develop a good detailed plan.

Security issues during work by PSE crews.

Consider use of cell phone camera.

Use cell phone system during construction.

17) Project Management

Good interface between Project Management and Construction Management.

Require support from others to provide communication of project status to upper management.

PSE crews and on-site contractor remained productive, on schedule and without interference despite constraints of small site.

Need good communication with all discipline to ensure interface required for tight site.

END OF MEETING