**6th External TAG Meeting**

**Date & time:** 11/17/2016, 09:00 AM – 10:38 AM

**Location:** WebEx from Kennewick GO

**Presenters:** Mark Sellers-Vaughn, Brian Robertson & Devin McGreal

**In attendance**: Mark Sellers-Vaughn, Brian Robertson, Devin McGreal, Mike Parvinen, Jennifer Gross, Pam Archer, Brian Hoyle, Eric Wood, Carolyn Stone

**Called in**: Garret Senger, Marty Saldivar - NWP, Ed Finklea, Kary Burin, Kathi Scanlan, David Nightingale, Jeremy Twitchell, Monica Cowlishaw & Bruce Folsom.

**Minutes by**: Carolyn P Stone

Mark began the meeting by welcoming everyone. The purpose of today’s meeting, he explained, is to expand on how Sendout is used. On Monday there will be a “live configuration” of Sendout.

Mark then went through introductions and asked Garret Senger if he had anything to say before the meeting. Garret said he appreciated this meeting being set up and mentioned that the IRP deadline is coming up. He thanked the IRP group for following up on comments.

Mark then went over the Agenda including what the Sendout is, its history, methodology, simulation examples, results/solves and conclusion.

*Presentation #1* – Mark Sellers-Vaughn

**What is Sendout?**

* Slide 3 explains that the Sendout is a “Resource Optimization Model” which develops portfolios. It is powerful & complex. A 20 year “horizon” is used.
* Slide 4 – Sendout uses a “Linear Programming Approach”.
* Our knowledge and experience is needed along with the results of Sendout to decide the best solution for CNG.

**History**

* Slide 5 shows a progression of configuration changes made to Sendout over time. In 2004 the configuration was simplified compared to today.
* In 2016 the configuration is improved by adding load citygate station, rate schedule & zonal parameters.
* Slide 6 shows a table with history of IRP solves – at a high level. Mark stated that the “takeaway” from this slide is that the principal solves are consistently “incremental supply” and the resources to move the supply needed and added storage in Oregon, not Washington.

**Question**: Mark Asked Kathi Scanlan if Staff would like an expansion of these slides on historical solves from Sendout as an Appendix? If so, which Appendix would you like us to use or should we build a new one?

**Answer:** Kathi stated yes this would be good in an Appendix and it should be a NEW one.

*Presentation #2* – Brian Robertson

**Current Methodology**

* Brian Robertson started his presentation by showing us on Slide 11 the Current Methodology Flow Chart.
* The first two red boxes show all the required inputs. The Demand Forecast Model is used here.
* Brian discussed the different types of supplies in SENDOUT; base, fixed, winter base, day supply, and Peak.
* Slide 26 – Storage:
  + Shows JP and Plymouth and contracts associated with those storage locations.
  + The storage targets are by Tariff.
  + Total withdrawal per day is 56K from JP and 78K from Plymouth.

**Question**: David Nightingale asked if CNG owned the storage or it was contracted.

**Answer:** Mark responded that the storage is leased. Cascade owns no storage facilities.

* Slide 27 shows a storage example including the associated contracts for Jackson Prairie (JP).
* Slide 28 – Shows how storage is modeled in Sendout. The inputs are the capacity and max per day allowed along with the storage % targets for June, August & September, 2017.
* Slide 29 – Brian discussed transportation.
* D1 Rate is a reservation Rate. The transportation rate is per Dth, to move the gas.
* Slide 31 – Shows a transport example. There is a constraint at Kemmerer that is not shown in this example.
* Slide 32 – How the transport example shown looks in Sendout.
* Slide 33 – Explains how Cascade has more delivery than receipt rights, 457K Dth of delivery, 360K of receipt. This allows flexibility! Slide 34, shows an example of that flexibility and Slide 35 shows how it looks when you do not have flexibility.
* Slide 36 – Brian explains the flexibility of Cascade’s transportation contracts.
* Slide 42 – shows demand behind the gate. Brian explained that CNG is trying to get as granular as possible. CNG is now forecasting by Rate Schedule. There is a DSM by gate complication though because some towns are served by different pipelines. This year Climate zone was added.
* Slide 43 - Discusses how demand is forecasted for NWP and GTN and the associated inputs.
* Slide 44 - Shows a demand example using Zone 11.
* Slide 45 - Shows a demand example modeled in Sendout.
* Slide 46 – Discusses Weather inputs for Sendout. The Monte Carlo uses mean, standard deviation and max/min. Historical data used from 1986 – 2015.
* Slide 47 - Shows the weather example using the Monte Carlo simulation.

*Presentation #3* – Devin McGreal

**Results/Analysis**

* Slide 48 - Shows the Current Methodology flow chart. All inputs put into Sendout in an “as is case” and Sendout tells where there are deficiencies, using Zone, Citygate, etc. Deficiencies refer to “unserved demand” - see box 4 of flow chart.
* When Sendout resolves, not every option is taken. If solutions not satisfactory, change inputs and test again to try and get the optimal solve for the resource portfolio.
* Results as is:
  + All contracts go through 20 years
  + Optimal Portfolio to eliminate deficiencies at the lowest cost!
  + Sendout finds a mix of resources which = “Expected Scenario”
* Slide 50 shows load centers with potential peak day unserved demand from the “As Is Scenario” from 2017 through 2036.
* Slide 51 shows the incremental resources recommended by Sendout to serve demand Ex: Acquire GTN capacity of 20.472 in 10 years.

**Question**: Kathy asked about Bend, Wenatchee & Yakima in 2017 on Slide 51, what’s going on there?

**Answer**: Mark stated that existing capacity within the zone may not be sufficient. We could get short-term capacity until we get long-term in place.

**Question**: David Nightingale asked why DSM (Demand Side Management) was not mentioned here as a resource option?

**Answer**: Mark explained that DSM is a resource, but it is not in this slide. It will be in the coming slides. It **is** part of the optimal portfolio solution!

* Slide 52 - Shows detail on the incremental resources selected for Transport, including using Starr Road when needed.
* Slide 53 - Discusses the Yakima Satellite LNG Plant use. It allows 5,000 per day that to be used elsewhere.

**Question**: Kathy Scanlan asked if the Yakima LNG Plant is a “new build”?

**Answer**: Mark explained that CNG is working with their engineering department to confirm this project. It is a low cost alternative. We should know more by spring of next year. We need a consultant’s help. It is a substantial cost to build but the same as the expense of a Yakima lateral expansion.

**Question**: David Nightingale then asked for transparency regarding the estimated costs.

**Answer**: Mark explained that CNG will share that information with the group, but it is not going in the IRP because it is confidential to the public. We can share cost “ranges” with the public but not specific prices.

* Slide 54 - Shows the resource “stack” impact
* The gray and yellow bars show current contracts, the brown shows the “solve” for 2017, 18 & 19.
* Slide 55 - shows the expected scenario where the unserved demand is satisfied until 2036 through stochastic & deterministic analysis, assuming average weather.

**Question**: David Nightingale stated that Devin used the expression Expected Case/Expected Scenario synonymously, are they the same?

**Answer**: Devin said:

***Expected Case*** = the Portfolio we are suing,

***Expected Scenario*** = shows the range of conditions in the Portfolio

***\*\**** NO they are not the same.

* Concluding with Slide 56 - Shows the deficiency details of the “solve” recommended by Sendout.

**Question:** Kathi Scanlan asked if the deficiencies in 2017 are the “As Is” case.

**Answer**: Mark answered “Yes”. Each time we there is a shortfall or deficiency we will label which case it is.

**Question**: Kathi Scanlan asked if the IRP group can provide a table of quantities for Slide 54, DSM quantities.

**Answer**: Devin said “Absolutely”.

**Question**: David Nightingale asked how long it takes to run Sendout?

**Answer**: Mark stated that a “deterministic run” takes 10 minutes. A run of Monte Carlo takes 10 hours.

**Question**: Kathy Scanlan asked for a spreadsheet list of inputs for a deterministic run of the model.

**Answer**: Devin said that the group is going to go through all the screens on Monday.

**Question**: David Nightingale said he wants a list of the inputs.

**Answer**: Brian Robertson stated that there are 70 to 80 transport contract inputs and asks if examples of those are OK? Mark stated that Monday the group will walk Staff through live Sendout scenarios and do a deterministic run and discuss the output.

**Question**: Kathi Scanlan asked if they could get the price ranges discussed earlier.

**Answer**: Mark said “Yes!”

Garrett gave thanks to the group and said it was helpful information today and he looks forward to Monday’s presentation.

Bruce Folsom pointed out some numbers involved in the compilation of the data for the IRP as follows:

* 27 People with eyes on the IRP
* 14 Writers involved
* 7 Departments involved

This is a LOT of work going on! Bruce thanks CNG leadership for allocating the resources necessary to this project!

Mark thanked everyone for attending and will see Staff on Monday!