

**From:** "Waples, Scott" <scott.waples@avistacorp.com>  
**To:** Dana Reedy <Dana.Reedy@nwpp.org>, Cliff Perigo <ccp7@comcast.net>, BartJones <bart\_jones@transcanada.com>, Bill Hosie <bill\_hosie@transcanada.com>, Ken Tate <ken\_tate@transcanada.com>, Neil Brausen <neil.brausen@aeso.ca>, <benmorris@astound.net>, "Kopczynski, Don" <Don.Kopczynski@avistacorp.com>, "Groce, Ed" <ed.groce@avistacorp.com>, "Kinney, Scott J" <Scott.Kinney@avistacorp.com>, Paul Choudhury <paul.choudhury@bctc.com>, Rohan Soulsby <rohan.soulsby@bctc.com>, Phil Park <phil.park@bctransco.com>, Anders Johnson <aljohnson@bpa.gov>, Brian Silverstein <bilverstein@bpa.gov>, Kendall Rydell <karydell@bpa.gov>, Kyle Kohne <krkohne@bpa.gov>, Mike Kreipe <mjkreipe@bpa.gov>, Ravi Aggarwal <rkaggarwal@bpa.gov>, Rebecca Berdahl <rmberdahl@bpa.gov>, <paul.steckley@brookfieldpower.com>, <MasonT@bv.com>, Armie Perez <aperez@caiso.com>, <PDidsayabutra@caiso.com>, <RColgan@calpine.com>, ChadBowman <chad.bowman@chelanpud.org>, <ANarang@ClipperWind.com>, Rhonda Peters <rpeters@clipperwind.com>, <tamra@co.umatilla.or.us>, Peter Blood <pblood@columbiaenergypartners.com>, <Dettmer@columbiagrid.org>, MarvLandauer <landauer@columbiagrid.org>, Jeff Miller <miller@columbiagrid.org>, <sienkiewicz@columbiagrid.org>, Sharon Helms <sharon.helms@comprehensivepower.org>, Jeffrey Durocher <jdurocher@ene.com>, <jeffmorris@energyhorizonllc.com>, <JNadolski@entrix.com>, <rwilliams@entrix.com>, <shirley@eshbachconsulting.com>, <RJenkins@FirstSolar.com>, Ken Che <kche@gcpud.org>, <chuppert@globalenergy.com>, <dmooy@globalenergy.com>, Randall Hardy <rhardy@hardyenergy.com>, Rich Bayless <rbaylesscps@hevanet.com>, DavidAngell <daveangell@idahopower.com>, Orlando Ciniglio <ociniglio@idahopower.com>, Roger Grim <rgrim@idahopower.com>, <ehg@karnopp.com>, <lwillick@lspower.com>, <SPENCERT@MID.ORG>, <bgriess@navigantconsulting.com>, <dlarsen@navigantconsulting.com>, ChuckStigers <chuck.stigers@northwestern.com>, John Leland <john.leland@northwestern.com>, Wallace Gibson <wgibson@nwcouncil.org>, GaryKeenan <gary.keenan@nwpp.org>, Jerry Rust <Jerry.Rust@nwpp.org>, Bill Shemley <bill.shemley@pacificcorp.com>, Darrell Gerrard <darrell.gerrard@pacificcorp.com>, Tom Tjoelker <tom.tjoelker@pacificcorp.com>, Bangalore Vijayraghavan <bxv6@pge.com>, <cah9@pge.com>, Jason Yan <jay2@pge.com>, Marina Kantor <mjko@pge.com>, Steve Metague <sjmd@pge.com>, Sherman Chen <SWC1@pge.com>, <cece.coleman@pgn.com>, Frank Afranji <frank.afranji@pgn.com>, Jeff Newby <jeff.newby@pgn.com>, Jim Eden <jim.eden@pgn.com>, Mike Mikolaitis <mike.mikolaitis@pgn.com>, PhilipAugustin <philip.augustin@pgn.com>, Richard Goddard <richard.goddard@pgn.com>, Doug Robinson <doug.d.robinson@powerex.com>, GlenTang <glen.tang@powerex.com>, Sara Badiei <sara.badiei@powerex.com>, ChrisReese <chris.reese@pse.com>, Hugh Nguyen <hugh.nguyen@pse.com>, Jason Yedinak <jason.yedinak@pse.com>, Joe Seabrook <joe.seabrook@pse.com>, <michael.sidiropoulos@res-americas.com>, Cameron Yourkowski <cameron@rnp.org>, <mme@rumla.com>, <claus.sutor@saetowers.com>, <michael.miller@saetowers.com>, <dana.cabbell@sce.com>, <vishal.patel@sce.com>, <Rodlenfest@seabreezepower.com>, Bud Krogh <ekrogh@serv.net>, John Martinsen <jdmartinsen@snopud.com>, <robert.kondziolka@srpnet.com>, Matthew Muldoon <matt.muldoon@state.or.us>, Elroy Switlshoff <elroys@telus.net>, <omartino@tgnyc.com>, <karustisc@thirdplanetwind.com>, <simonse@thirdplanetwind.com>, E JohnTompkins <ejt@trmc.com>, <amy.komatsuzaki@tteci.com>, <bairbanks@upcwind.com>, <melissa.a.mcdevitt@us.abb.com>, <william.quaintance@us.abb.com>, <willie.wong@us.abb.com>, <BenWilliams@useconsulting.com>, <danwood@useconsulting.com>, <harlowpeter@useconsulting.com>, <petermackin@useconsulting.com>, <RonDaschmans@useconsulting.com>, <jms313@verizon.net>, <steven.a.wallace@verizon.net>, <sanchez@wapa.gov>, <Tobias@wapa.gov>, <jay@wecc.biz>, <j\_manion@wspower.com>, "Juj,Hardev S - TO-DITT2" <hsjuj@bpa.gov>  
**Date:** 3/26/2009 6:18:40 AM  
**Subject:** TCWG Conference Call Agenda and Materials

Gentlepersons:

Below is the "final" agenda for the TCWG conference call this morning.  
Mr. Tjoelker has sent instructions to call into the phone bridge in a

previous email.

We have a very full agenda, and I'm looking forward to moving the ball yet again!

Agenda Items:

Introduction and Roll Call

Waples / Reedy

Process Update: PCC presentation

Angell

"Supersizing" Projects

Waples / Angell / Tjoelker / Juj

Assignment of who will produce the study plan template

Angell

NEO Update

Morris et. al

Resources for Phase II (see attachment)

Park

Status of subgroup formation- has anyone started this yet, and if not, timelines? Subgroup Chairs

Project Updates: Who is where in the process?

All y'all

Next meeting and Adjourn

Waples

Lunch

On your own!

Scott A. Waples

Chief, Transmission and Distribution Planning

Avista Corporation

Spokane, Washington

**TCWG CONFERENCE CALL**  
**March 26, 2009**  
**PARTICIPANTS LIST**

Anders Johnson -- BPA  
Ben Morris  
Bill Shemley - PAC  
Cliff Perigo -- TransCanada  
Dana Reedy -- NWPP  
Darrell Gerrard -- PacifiCorp  
Dave Angell -- IPC  
E. John Tompkins -- SeaBreeze  
Elroy Switlishoff  
Hugh Nguyen -- PSE  
Jason Yan -- PG&E  
Joe Seabrook -- Puget  
Kyle R Kohne -- BPA  
Larry Tobias -- WAPA  
Marina Kantor -- PG&E  
Marv Landauer -- Columbia Grid  
Matthew Muldoon -- Oregon PUC  
Neil Brausen -- AESO  
Phil Park -- BCTC  
Philip Augustin -- PGE  
Rebecca Berdahl -- BPA PS  
Rod Lenfest -- Sea Breeze  
Scott Waples -- Avista  
Sherman Chen -- PG&E  
Steven Wallace -- NTTG  
Tom Tjoelker -- PacifiCorp  
Monte Meredith  
Rikin Shah - NWMT  
Stephen Tran - BCTC

## Resources for Phase 2 Studies

### I. Introduction

The WECC Procedures for Project Rating Review do not permit the use of “fictitious devices or elements”. However, the Procedure also recognizes that studies may be based on planned facilities, but the rating may be used only when those planned facilities are in-service. Appendix A, section A-5, page 85 provides the following discussion.

#### **A-5 Fictitious Elements**

WECC has established the principle that fictitious elements are not to be used in either simultaneous or non-simultaneous rating studies. **The concept of prohibiting fictitious elements does not pertain to planned facilities, i.e., those facilities that are expected to be in-service at the time represented in the rating study. Planned facilities may be used to obtain an Accepted Rating however, that rating may only be used when those facilities are in-service.** If there are changes to the planned facility's project plan or schedule, then the section on Monitoring Project Progress in Regional Planning Project Rating Review Process (Part 2B of this document) will apply as if the change was made to the facility being rated. It may be required to repeat or update the requirements for Phase 2 of the rating process. **For example, a company that is building a new transmission line may use rating studies that include a future generator. If the generator is delayed, it may be necessary to repeat the rating studies to obtain a new Accepted Rating without the generator and/or to establish the Accepted Rating at the new in-service date of the generator.** Fictitious elements are facilities or operation procedures used in rating studies that are modeled unrealistically or that do not exist. Examples of fictitious elements are:

- Generators (e.g., a generator that does not exist **at time of rating**)
- Load (e.g., unrealistic load conditions)
- Lines (e.g., change to the impedance of a line)
- Phase shifters (e.g., unplanned phase shifter or operation beyond its physical capability)
- Shunt elements (e.g., add a non-existent SVC)
- Series elements (e.g., add unplanned series capacitors to a line)
- Opening/switching lines (e.g., open a line that is normally closed)
- Remedial action schemes (e.g., institute a scheme with no agreement from the provider)

Fictitious elements may change and distort study results. At one extreme, fictitious elements may have little or no effect on the resultant ratings, and thus need not be represented. At the other extreme, they may grossly exaggerate the capability of the path being rated, either in terms of ability to meet the performance criteria or to increase the flow limit of the path. Because the intent of

the rating process is to develop an Accepted Rating that can be used in operation, it is necessary to reject the use of fictitious elements in rating studies. The Accepted Rating that is granted by the rating process can only be used when all facilities that were represented in the rating studies are in-service. The prohibition against the use of fictitious elements does not apply to reporting of Latent Capacity. Because the determination and reporting of Latent Capacity is strictly for information purposes, the owners may model the system in whatever manner they choose. (Emphasis added.)

## II.     Issues

Project Rating Review studies coordinated by TCWG includes projects with in-service dates extending out to 2015. Some TCWG project capacities go beyond planning for known or committed resources, providing additional capacity for short lead time resources that may only now be in the conceptual stages but can be brought on line by 2015. The rating initiatives for these projects are attempting to get around the problem that transmission lines have longer lead times than resources and have planning for transmission lines completed to reduce delays to resource development. Also, individual TCWG coordinated project ratings may be interdependent. Delay or cancellation of a planned project of another sponsor may mean that remaining projects cannot be operated at their Accepted Rating.

The foregoing raises two issues:

- (i)           What are acceptable realistic elements to be included in these 2015 timeframe rating studies?
- (ii)          If an element that meets the criteria as a realistic element for studies is delayed or cancelled, how might this affect Accepted Ratings.

## III.     Realistic Generation

The Rating Process states that fictitious generation is generation that does not exist “at the time of rating”. This is ambiguous as to whether “at the time of rating” means at the time of the rating study being done or at the time of implementation of the Accepted Rating. The Rating Process states that an Accepted Rating is at risk due to failure to complete the plan of service. Conceivably, planned generation can be included in the plan of service.

It has been proposed to TCWG that realistic generation elements to include in Phase 2 studies would include:

1. Existing generation.

2. Generation reported in WECC's SIGADD report.
3. Generation in transmission queues

There are some issues with WECC's SIGADD report. As of 6 March 2009, the January 2008 report is still under review and has not been published. This report will be based on 2007 data. When it is completed and posted, it will be in the WECC member only area, requiring a WECC login ID to access a copy. Therefore, it is not a public report. While the SIGADD report is not yet published, the WECC 2008 Power Supply Assessment Report was published in September 2008. This Report indicates significant reliance on thermal resources, with less than is needed to support the transfers being proposed in the TCWG studies.

However, there was not consensus that other identified generation could be included. Some transmission projects may fall well short of the resources required for rating studies with out additional categories of resources. The following options are identified:

Option 1: Project sponsors submit lists of resources to WECC for the SIGADDS report sufficient to provide resources for their projects. Rationale: This would meet the above criteria. Disadvantages: 1. If SIGADDS is used for other purposes, this may be misleading for those other purposes. 2. There appears to be a significant turn around time for publication. 3. It is not a public report.

Option 2: Project sponsors are permitted to include any resources they are aware of. The project sponsor submitting the report would be described by location, size, and fuel type, sufficiently detailed to track whether the plan of service has been met. Rationale: Section A-5 appears to be concerned that project sponsors do not go too far in assuming elements that may not materialize, cautioning that Accepted Ratings may only be used when planned facilities are in-service. Project sponsors are aware of the requirements to maintain Phase 3 status. The process does not need to place restrictions on what project sponsors may assume, only that the Accepted Rating is dependant on the assumptions. Disadvantage: Some projects may be relying on the ratings of other projects in Phase 2, including their plan of service (which include these resources), to achieve a rating. Sponsors of these projects may not have enough information to assess the risks of relying on resources submitted by other projects.

Option 3: Project sponsors are permitted to include resources that are identified in public reports including a discussion of the resource potential, development timeframe, and evidence of feasibility. The project sponsor would describe each resource by location, size, and fuel type, sufficiently detailed to track whether the plan of service has been met. Rationale: Section A-5 appears to be concerned that project sponsors do not go too far in assuming elements that may not materialize, cautioning that Accepted Ratings may only be used when planned facilities are in-service. Project sponsors will have more information about resource assumptions for other projects than will be provided in Option 2. Disadvantage: Some projects may be relying on the ratings of other projects in Phase

2, including their plan of service (which include these resources), to achieve a rating. However, this option does give more information than Option 2.

Option 4: No other resources are permitted. Rationale: Provides the most assurance to Project Review Groups that effort put into project rating review will produce a rating that will be implemented with minimal restudy in Phase 3. Disadvantage: Some projects may not have sufficient resources to study desired non-simultaneous and simultaneous capacities for the proposed facilities. This may lead to undesirable downsizing of transmission projects to integrate only short term resources or studies being delayed until resources can be firmed up. Ultimately, delays in transmission developments may impact resource developments.

Recommendation: TCWG recommends Option 3 and will coordinate studies on this basis. Project sponsors using a different option and wishing to coordinate their project through TCWG will report their resource assumptions for discussion at TCWG. Project sponsors will identify the source of information for each resource – i.e. SIGADDS, transmission queues, public reports, etc.

#### IV. Delay, Cancellation, or Changes to Resources Potentially Affecting Ratings

TCWG anticipates that some of the projects it is coordinating may be impacted by changes in resource developments as projects proceed through Phase 2 and during Phase 3. Resources that Accepted Ratings are based on may be delayed, cancelled or replaced with other resources. Also, modeling assumptions may ultimately prove to be incorrect, such as different machine models or customer interconnection facilities. Many resources assumed for the 2015 time horizon have a shorter development lead time than the major transmission lines required to deliver output power to the load centres. In fact, development of some resources may not even commence until after transmission projects have completed Phase 2 and provided evidence that these projects are doable. Although these resources are not part of the transmission project sponsor's plan of service, the project Accepted Rating depends on them, so they should logically be treated the same as if they were part of the plan of service.

The WECC Procedure states that an Accepted Rating status may be lost if a delay in meeting any project milestones by 12 months or more occurs or if a change in the project's plan of service adversely impacts the Accepted Rating. The Procedure provides for the Project Review Group to determine if the project status will revert back to Phase 2 with a Planned Rating or remain in Phase 3 with an Accepted Rating.

The role of TCWG in Phase 3, if it has one, has not been discussed. Nevertheless, to facilitate Phase 2 studies and give assurance to project sponsors that Phase 2 studies can be brought to a close and that the Accepted Ratings obtained at the end of Phase 2 will continue to be valid will continue to be valid, TCWG recommends the following criteria for Project Review Groups during Phase 2 and monitoring status in Phase 3.

1. TCWG anticipates that actual resources that support the Planned and/or Accepted rating may change from those assumed at the beginning of Phase 2. Projects may vary by location, size, simulation models (e.g. wind). Project sponsors will be able to continue through Phase 2 with initial resource assumptions as long as replacement resources would have similar impacts on the system as those that were modeled in the Phase 2 studies. Further, project sponsors will be able to maintain Phase 3 status (Accepted Ratings) while making substitutions of resources and models as long as the replacement resources and models would have similar impacts on the system as those that were modeled in the Phase 2 studies.
2. TCWG anticipates that all resources assumed in Phase 2 for service in 2015 may not be on line at the time that the transmission projects are energized. During Phase 3, project sponsors will be given latitude to submit schedules for bringing projects on and these schedules may span several years. Project sponsors will be able maintain Phase 3 status (Accepted Ratings) by providing evidence that progress is being made as provided for Phase 2 in the WECC Procedure.
3. The WECC Procedures for Project Rating Review recognizes the Operating Transfer Capability Policy Committee role for determining operating limits. WECC's OTC Policy Committee Path Selection and Study Guidelines require comprehensive studies of seasonal OTCs and require new paths to go through this process. TCWG recommends that for projects for which the full resource compliment has not been developed or modeling assumptions have changed, that the OTCPC study process can be used to "phase in" the rating or review the rating for substitutions of resources and different modeling assumptions, as necessary, to maintain Phase 3 status and an Accepted Rating. This phase in or review would be treated as seasonal operating studies. No additional "rating studies" would be required.
4. A transmission project will remain in Phase 3 until sufficient resources have been developed and OTC studies based on new modeling assumptions have been approved.
5. Sponsors of future transmission projects are provided the opportunity within the WECC Procedure to request benchmarking of Accepted Ratings. Therefore, Project Review Groups of projects in Phase 3 need not challenge whether a Phase 3 rating is still valid, as there is already a WECC Procedure component to allow those potentially affected to undertake this challenge.

TCWG believes that these guidelines are all adequately provided for within the WECC Procedures for Project Rating Review and has embarked on coordination of Phase 2 studies on the basis of these guidelines.

Draft by Phil Park  
24 March 2009

**From:** "Angell, Dave" <DAngell@idahopower.com>  
**To:** "Tjoelker, Tom" <Tom.Tjoelker@Pacifcorp.com>, "Cliff Perigo" <ccp7@comcast.net>, "Bart Jones" <bart\_jones@transcanada.com>, "Bill Hosie" <bill\_hosie@transcanada.com>, "Ken Tate" <ken\_tate@transcanada.com>, "Neil Brausen" <neil.brausen@aeso.ca>, "benmorris@astound.net" <benmorris@astound.net>, "Don.Kopczynski@avistacorp.com" <Don.Kopczynski@avistacorp.com>, "Edward Groce" <ed.groce@avistacorp.com>, "Scott Kinney" <scott.kinney@avistacorp.com>, "Scott Waples" <scott.waples@avistacorp.com>, "Paul Choudhury" <paul.choudhury@bctc.com>, "Rohan Soulsby" <rohan.soulsby@bctc.com>, "Phil Park" <phil.park@bctransco.com>, "Anders Johnson" <aljohnson@bpa.gov>, "Brian Silverstein" <bilverstein@bpa.gov>, "Kendall Rydell" <karydell@bpa.gov>, "Kyle Kohne" <krkohne@bpa.gov>, "Mike Kreipe" <mjkreipe@bpa.gov>, "Ravi Aggarwal" <rkaggarwal@bpa.gov>, "Rebecca Berdahl" <remberdahl@bpa.gov>, "paul.steckley@brookfieldpower.com" <paul.steckley@brookfieldpower.com>, "MasonT@bv.com" <MasonT@bv.com>, "Armie Perez" <aperez@caiso.com>, "PDidsayabutra@caiso.com" <PDidsayabutra@caiso.com>, "RColgan@calpine.com" <RColgan@calpine.com>, "Chad Bowman" <chad.bowman@chelanpud.org>, "ANarang@ClipperWind.com" <ANarang@ClipperWind.com>, "Rhonda Peters" <rpeters@ClipperWind.com>, "tamra@co.umatilla.or.us" <tamra@co.umatilla.or.us>, "Peter Blood" <pblood@columbiaenergypartners.com>, "Dettmer@columbiagrid.org" <Dettmer@columbiagrid.org>, "Marv Landauer" <landauer@columbiagrid.org>, "Jeff Miller" <miller@columbiagrid.org>, "sienkiewicz@columbiagrid.org" <sienkiewicz@columbiagrid.org>, "Sharon Helms" <sharon.helms@comprehensivepower.org>, "Jeffrey Durocher" <jdurocher@ene.com>, "jeffmorris@energyhorizonllc.com" <jeffmorris@energyhorizonllc.com>, "JNadolski@entrinx.com" <JNadolski@entrinx.com>, "rwilliams@entrinx.com" <rwilliams@entrinx.com>, "shirley@eshbachconsulting.com" <shirley@eshbachconsulting.com>, "RJenkins@FirstSolar.com" <RJenkins@FirstSolar.com>, "Ken Che" <kche@gcpud.org>, "chuppert@globalenergy.com" <chuppert@globalenergy.com>, "dmooy@globalenergy.com" <dmooy@globalenergy.com>, "Randall Hardy" <rhardy@hardyenergy.com>, "Rich Bayless" <rbaylesscps@hevanet.com>, "Ciniglio, Orlando" <OCiniglio@idahopower.com>, "Grim, Roger" <RGrim@idahopower.com>, "ehg@karnopp.com" <ehg@karnopp.com>, "lwillick@lspower.com" <lwillick@lspower.com>, "SPENCERT@MID.ORG" <SPENCERT@MID.ORG>, "bgriess@navigantconsulting.com" <bgriess@navigantconsulting.com>, "dlarsen@navigantconsulting.com" <dlarsen@navigantconsulting.com>, "Chuck Stigers" <chuck.stigers@northwestern.com>, "Wallace Gibson" <wgibson@nwcouncil.org>, "Gary Keenan" <gary.keenan@nwpp.org>, "Jerry Rust" <Jerry.Rust@nwpp.org>, "Shemley, Bill" <Bill.Shemley@PacifiCorp.com>, "Gerrard, Darrell" <Darrell.Gerrard@Pacifcorp.com>, "Bangalore Vijayraghavan" <bvx6@pge.com>, "cah9@pge.com" <cah9@pge.com>, "Jason Yan" <jay2@pge.com>, "Marina Kantor" <mjko@pge.com>, "Steve Metague" <sjmd@pge.com>, "Sherman Chen" <SWC1@pge.com>, "cece.coleman@pgn.com" <cece.coleman@pgn.com>, "Frank Afranji" <frank.afranji@pgn.com>, "Jeff Newby" <jeff.newby@pgn.com>, "Jim Eden" <jim.eden@pgn.com>, "Mike Mikolaitis" <mike.mikolaitis@pgn.com>, "Philip Augustin" <philip.augustin@pgn.com>, "Richard Goddard" <richard.goddard@pgn.com>, "Doug Robinson" <doug.d.robinson@powerex.com>, "Glen Tang" <glen.tang@powerex.com>, "Sara Badiei" <sara.badiei@powerex.com>, "Chris Reese" <chris.reese@pse.com>, "Hugh Nguyen" <hugh.nguyen@pse.com>, "Jason Yedinak" <jason.yedinak@pse.com>, "Joe Seabrook" <joe.seabrook@pse.com>, "michael.sidiropoulos@res-americas.com" <michael.sidiropoulos@res-americas.com>, "Cameron Yourkowski" <cameron@rnp.org>, "mme@rumla.com" <mme@rumla.com>, "claus.sutor@saetowers.com" <claus.sutor@saetowers.com>, "michael.miller@saetowers.com" <michael.miller@saetowers.com>, "dana.cabbell@sce.com" <dana.cabbell@sce.com>, "vishal.patel@sce.com" <vishal.patel@sce.com>, "Rodlenfest@seabreezepower.com" <Rodlenfest@seabreezepower.com>, "Bud Krogh" <ekrogh@serv.net>, "John Martinsen" <jdmartinsen@snopud.com>, "robert.kondziolka@srpnet.com" <robert.kondziolka@srpnet.com>  
**Date:** 3/26/2009 9:35:04 AM  
**Subject:** RE: TCWG Conference Call in number for March Conference Call

1. Please identify what impacts specific Western Electricity Coordinating Council (WECC) and North American Electric Reliability Corporation (NERC) reliability standards have on the proposed end-points, capacity and timing for this project.

2. Please clarify what impact B2H has on grid reliability:
  - a. From an Oregon perspective.
  - b. From a northwest U.S. and larger perspective.
  
3. Please provide the relevant IPCo analyses, along with any additional studies or analysis, on the current relative capacities, line losses, anticipated ratings, substation costs and costs per mile and per project (with and without right of way costs), from Hemingway to Boardman for the following alternative transmission scenarios:
  - a. 230 kV single circuit;
  - b. 230 kV double circuit;
  - c. 500 kV single circuit;
  - d. 2 single circuit 500 kV lines on separate rights of way;
  - e. 500 kV double circuit; and
  - f. 765 kV single circuit transmission
  
9. Please share the results of both non-simultaneous and simultaneous power flow studies for 500 kV single circuit, 500 kV double circuit and 765 kV single circuit line sizes from Hemingway to Boardman. If studies have not yet been completed, when does the company anticipate that the studies will be completed and provided to the OPUC?
  
10. Please describe the transmission technology currently proposed and what alternatives were considered for line composition, tower design, communications and data controls.

-----Original Appointment-----

From: Tjoelker, Tom [mailto:Tom.Tjoelker@Pacifcorp.com]

Sent: Friday, March 13, 2009 11:43 AM

To: Cliff Perigo; Bart Jones; Bill Hosie; Ken Tate; Neil Brausen; benmorris@astound.net; Don.Kopczynski@avistacorp.com; Edward Groce; Scott Kinney; Scott Waples; Paul Choudhury; Rohan Soulsby; Phil Park; Anders Johnson; Brian Silverstein; Kendall Rydell; Kyle Kohne; Mike Kreipe; Ravi Aggarwal; Rebecca Berdahl; paul.steckley@brookfieldpower.com; MasonT@bv.com; Armie Perez; PDidsayabutra@caiso.com; RColgan@calpine.com; Chad Bowman; ANarang@ClipperWind.com; Rhonda Peters; tamra@co.umatilla.or.us; Peter Blood; Dettmer@columbiagrid.org; Marv Landauer; Jeff Miller; sienkiewicz@columbiagrid.org; Sharon Helms; Jeffrey Durocher; jeffmorris@energyhorizonllc.com; JNadolski@entrinx.com; rwilliams@entrinx.com; shirley@eshbachconsulting.com; RJenkins@FirstSolar.com; Ken Che; chuppert@globalenergy.com; dmooy@globalenergy.com; Randall Hardy; Rich Bayless; Angell, Dave; Ciniglio, Orlando; Grim, Roger; ehg@karnopp.com; lwillick@lspower.com; SPENCERT@MID.ORG; bgriess@navigantconsulting.com; dlarsen@navigantconsulting.com; Chuck Stigers; Wallace Gibson; Gary Keenan; Jerry Rust; Shemley, Bill; Gerrard, Darrell; Bangalore Vijayraghavan; cah9@pge.com; Jason Yan; Marina Kantor; Steve Metague; Sherman Chen; cece.coleman@pgn.com; Frank Afranji; Jeff Newby; Jim Eden; Mike Mikolaitis; Philip Augustin; Richard Goddard; Doug Robinson; Glen Tang; Sara Badiei; Chris Reese; Hugh Nguyen; Jason Yedinak; Joe Seabrook; michael.sidiropoulos@res-americas.com; Cameron Yourkowski; mme@rumla.com; claus.sutor@saetowers.com; michael.miller@saetowers.com; dana.cabbell@sce.com; vishal.patel@sce.com; Rodlenfest@seabreezepower.com; Bud Krogh; John Martinsen; robert.kondziolka@srpnet.com; Matthew Muldoon; Elroy Switliff; omartino@tgpnyc.com; karustisc@thirdplanetwind.com; simonse@thirdplanetwind.com; E John Tompkins; amy.komatsuzaki@tteci.com; bfairbanks@upcwind.com; melissa.a.mcdevitt@us.abb.com; william.quaintance@us.abb.com; willie.wong@us.abb.com; BenWilliams@useconsulting.com; danwood@useconsulting.com; harlowpeterson@useconsulting.com; petermackin@useconsulting.com; RonDaschmans@useconsulting.com; jms313@verizon.net; steven.a.wallace@verizon.net; sanchez@wapa.gov; Tobias@wapa.gov; jay@wecc.biz; j\_manion@wspower.com; Dana Reedy  
 Subject: TCWG Conference Call in number for March Conference Call  
 When: Thursday, March 26, 2009 10:00 AM-12:30 PM (GMT-07:00) Mountain Time (US & Canada).