March 13, 2012

In reply refer to: TPP/OPP-3

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Subject: BPA 2012 Annual Progress Report

In accordance with the WECC Progress Report Policies and Procedures, the attached document is Bonneville Power Administration’s 2012 Annual Progress Report. Feel free to contact me at (360) 619-6855 if you have any questions or concerns.

Sincerely,

[Signature]

Berhanu Tesema  
TSS Representative

Attachment

cc: Technical Studies Subcommittee
Bonneville Power Administration

2012 ANNUAL PROGRESS REPORT

Fred Ojima
Bonneville Power Administration
March 13, 2012
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I. Transmission Projects

A. I-5 Corridor Reinforcement Project

Background

This project addresses the portion of the transmission system along the I-5 Corridor, in the vicinity of Southwest Washington and Northwest Oregon. This load service area includes the cities of Portland, Oregon and Vancouver, Washington, which include high concentrations of industrial, commercial, and residential load. The generating resources serving this area are a mix of hydro and thermal plants.

Within this load service area several internal paths are monitored to ensure the system is operated safely within its thermal and voltage stability limits. The paths are: South of Napavine, South of Allston, and Keeler-Pearl. The highest loading on these paths occurs during peak summer load conditions combined with high north to south transfers through the transmission system. This pattern occurs several times each summer. Under these conditions, outages of any of the critical 500 kV lines between Paul and Pearl Substations could result in overloads on the underlying 230 kV and 115 kV facilities operated in parallel with the main grid. BPA employs a remedial action scheme (RAS) to mitigate these overloads, however the RAS has reached a level that is considered to be the upper limit for safe operation. With the existing congestion on the transmission system in this area, a large amount of RAS being utilized to mitigate critical contingencies, and continued requests for new generation interconnection or firm transmission which affect the path, transmission reinforcement is needed.

This reinforcement project targets the portion of the I-5 Corridor transmission system between Centralia, Washington and Oregon City, Oregon.

Description

The project consists of a new 500 kV line between a new substation in Troutdale Oregon and a new 500 kV Substation in the vicinity of Castle Rock, Washington. The 500 kV substation in Troutdale Oregon will have three positions initially – one for the new line, one to connect with the existing Troutdale 500/230 kV transformer bank, and one for the existing Troutdale-Ostrander 500 kV line.

The plan would also require constructing a new 500 kV Substation in the vicinity of Castle Rock and looping-in the existing Paul-Allston 500 kV line No.1.

The project is projected to increase capacity by approximately 1100 to 1400 MW on the South of Allston path.

Status

The I-5 Corridor Reinforcement project is presently undergoing Environmental analysis (the NEPA process). This is expected to take up to 3 years to complete. Design, procurement of materials, and construction is expected to take an additional 3 years. The total lead time for the project from start to energization would be approximately 6 years. Once the project is completed the facilities would be owned by BPA. The projected in-service date is 2016-2018.

Contacts
B. Little Goose Reinforcement Project

Background

Under the 2008 Network Open Season (NOS), BPA received signed Precedent Transmission Service Agreements (PTSA) for long-term firm transmission service totaling 1190 MW that impact the 500kV transmission system between Lower Granite and Little Goose substations, including 1100 MW related to new wind generation facilities. This includes 343 MW of wind generation that is scheduled for completion in February 2012. This project is planned to provide requested transmission service and generation interconnection.

Stress on the Lower Snake Area transmission system is highest during spring off-peak load periods when the following conditions are most likely to coincide:

- High generation on Snake River hydro projects due to Spring and early Summer runoff
- High transfers from Montana to the Northwest, including high output at Western Montana Hydro plants
- High wind generation in SE Washington, including existing projects connected at 230kV and below.
- High transfers from Idaho to the Northwest
- Low local load in SE Washington

The limiting outage is the loss of two parallel 500 kV lines between Little Goose and Lower Monumental. Constructing the proposed Central Ferry – Lower Monumental 500 kV line will help relieve the system stress described above.

Description

This new 500 kV transmission line would be 38 miles long, starting at the new Central Ferry Substation and ending at the existing Lower Monumental Substation. The new Central Ferry 500 kV substation was completed in January 2012 and accommodates interconnection of new Wind generation projects. One of the existing Lower Granite - Little Goose 500 kV lines will be looped in initially. The second line will need to be looped in once more generation is interconnected beyond the 343 MW. The project also includes a shunt reactor (300 MVAR @ 550 kV base) at Central Ferry and line re-terminations at Lower Monumental.

Status

In February 2009, BPA announced that it would begin a NEPA review as a result of its 2008 Network Open Season. BPA has issued a Final Environmental Impact Statement (EIS) which describes the proposed project and the environmental effects expected from construction, operation, and maintenance of the transmission line.
At this time, the Central Ferry-Lower Monumental 500 kV line energization date has been delayed beyond the Summer 2013 time frame that was reported last year. BPA is in the process of determining a new energization date.

Studies

The project was planned to meet NERC/WECC Planning Standards in response to transmission and interconnection requests. Technical studies were completed by BPA in the 2008 Network Open Season Cluster Study. Consultation occurred with PacifiCorp and Avista in autumn 2008, as these utilities also have proposed transmission projects in SE Washington. All parties agreed that there wasn’t one joint project that could acceptably meet the combined transmission needs.

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C. Lower Valley Area Reinforcement Project
   (Joint project with PacifiCorp and Lower Valley Energy)

Background

A 345/161-kV transformer at PacifiCorp’s (PAC) Goshen Substation currently serves the Lower Valley area. Three transmission lines serve load out of Goshen. The Goshen-Drummond 161-kV line serves mostly Fall River loads and provides back-up service to Lower Valley. The Goshen-Swan Valley 161-kV line serves most of the Lower Valley load. The Goshen-Palisades 115-kV line serves the Palisades Generating Plant and some Lower Valley load.

BPA constructed a second Swan Valley-Teton line in 2000 and upgraded the Goshen-Drummond line to 161-kV in 2002. These upgrades increased the reliability of the Fall River system and helped support load growth in the Jackson Hole area, but did little to support the southern part of Lower Valley’s system. Capacitor banks have been installed at Targhee, Tincup, Teton, and Madison Way.

Description

PAC has constructed a new 345/138-kV Three Mile Knoll Substation a couple of miles north of their existing Caribou switching station. This new substation includes a new 345-kV interconnection with Idaho Power. Idaho Power’s Bridger-Goshen 345-kV line is looped into the new Three Mile Knoll 345/138-kV Substation which includes two new 345/138-kV, 650 MVA transformers.

BPA will construct an adjacent Hooper Springs 200 MVA 138/115-kV Substation.

The Original Plan was to construct a 20-mile double circuit 115-kV transmission line to bisect Lower Valley’s Lanes-Creek-Valley 115-kV line and create two new lines, Hooper Springs-Lanes Creek and Hooper Springs-Valley. As discussed in the “Status” paragraph below, the original plan of service is currently being reviewed and may be changed somewhat to avoid risks caused by adjacent superfund sites.

BPA has installed a 115 kV 30 MVAR shunt capacitors near Drummond.

Status

The Hooper Springs Project connects to PacifiCorp’s 345/138-kV Three Mile Knoll substation that loops into Idaho Power’s 345-kV Bridger-Goshen transmission line. At this time PacifiCorp has constructed and energized the new Three Mile Knoll Substation. An Environmental Impact Statement for the 20-mile double circuit transmission line from the Lower Valley system to the new Hooper Springs substation showed that the planned line route crossed several current and possible future super-fund sites. Building a transmission line through such sites has been deemed a high risk venture. For this reason, BPA is researching other line routes and plans of service to solve area problems. The original time-line projected the project to be completed and energized by fall 2008; however that schedule has been postponed. It will take several years to develop a reasonable plan of service that will be acceptable to all parties (BPA, Lower Valley Energy, and PacifiCorp). Lower Valley Energy has implemented an under voltage load shedding plan that will preserve system reliability for outage conditions through at least the 2016-2018 time frame. The projected in-service date is fall of 2014.
BPA Transmission Planning has determined that the single contingency loss of the Palisades-Snake River 115kV line could cause low voltages, thermal overloads, and possible voltage instability in the LVE/FREC load area.

Based on the current load forecast, an outage of the Palisades-Snake River 115 kV line could cause voltages as low as 0.91 per unit and possible voltage instability, as well as loading Lower Valley’s Teton-Wilson 115kV line to 100% of its thermal rating, by this 2012/2013 winter season. The same outage could cause loading of 100% of its thermal rating on BPA’s Palisades-Swan Valley 115kV line by summer 2015.

In winter, BPA experience voltage levels low enough to risk voltage instability and possible system collapse, which could shed up to 258 MW (based on actual loading January 2010) in the event of the listed critical line or transformer contingencies. This load level is a composite of both LVE and FREC loads. Without a solution, BPA will fail to comply with NERC Reliability Standard TPL-002-0b; System Performance Following Loss of a single BES (Bulk Electrical System) Element (Category B), Table 1. Category B, Numbers 2 and 3 (Transmission Circuit or Transformer). Refer to Attachment 1 TPL-002-0b.

This project was presented to the Infrastructure Technical Review Committee (ITRC) in October 2004. The ITRC draws on individuals who are also members of the Northwest Power Pool (NWPP) Transmission Planning Committee (TPC) and the Operating Committee (OC). The ITRC supported BPA’s findings and recommendations. This project is planned to meet the NERC/WECC Planning Standards.

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D. West of McNary Reinforcement (WOMR) Project

Background

In 2001, Bonneville Power Administration – Transmission Services (BPA-TS) received a number of interconnection and long-term firm transmission service requests for natural gas fired generation projects in the Lower Snake River and McNary areas. These generation requests included the Starbuck Project (1,200MW) between Little Goose and Lower Monumental, the Wallula Project (1,300MW) between Lower Monumental and McNary, and the Wanapa Project (1,300MW) at McNary. These projects were interconnecting into the 500 kV transmission systems. Impact studies and facility studies were completed in 2001 for the Starbuck and Wallula Projects and in 2004 for the Wanapa Project. Studies showed that the existing transfer capability across the West of McNary (WOM) and West of Slatt (WOS) paths were fully utilized and system expansion would be required. The McNary-John Day 500 kV line was identified as a requirement to provide firm transmission service to these proposed generation projects. Studies also showed that the increased transfer capability brought by the proposed McNary-John Day 500 kV line could not be fully utilized due to the increased flow across the West of John Day (WOJ) path. However, these proposed generation projects did not materialize causing construction of the McNary – John Day 500 kV line to be delayed to a later date.

In 2008, BPA-TS received numerous transmission service requests across the West of McNary (WOM) and West of Slatt (WOS) paths. A large number of new wind generators are being proposed around McNary, Slatt and John Day substations in Southeast Washington and Northeast Oregon areas. These projects will be interconnected at the 115 kV, 230 kV and 500 kV voltage levels. The existing transfer capacity across WOM and WOS flow gates is fully utilized and the McNary area transmission system is severely constrained. The purpose of WOMR is to increase the transfer capability across the West of McNary (WOM), West of Slatt (WOS) and West of John Day (WOJ) paths that will enable BPA to provide transmission service for proposed renewable energy from the McNary area to Northwest (NW) load centers west of the Cascade Mountains, to the California-Oregon (COI) AC Intertie and the Pacific DC Intertie (PDCI). WOMR is one of multiple BPA projects being developed using BPA’s Network Open Season (NOS) marketing model. The NOS model requires customers who have signed BPA’s Precedent Transmission Service Agreement (PTSA) to take transmission service if BPA can build the Project at the current transmission rate. In April 2008, BPA conducted the first Network Open Season (NOS) process to respond to transmission service requests from these generators for access to BPA’s transmission system. During this process BPA received requests for an amount of transmission capacity significant enough to require the McNary-John Day (WOMR Group 1) and Big Eddy - Knight (WOMR Group 2) 500 kV transmission lines to be built.

In addition to the increasing WOM/WOS/WOJ TTC, WOMR Group 2 addresses reliability issues of the transmission system:

- Approximately 600 MW of additional transfer capability is gained across North of John Day path by redistributing the flow across North of John Day cut plane and reducing reactive losses.
- Provides stronger support to Portland load service area resulting in about 200 MW capacity gain for West of Cascades South path during winter load conditions.
**Description**

The West of McNary Reinforcement (WOMR) project has two groups of projects

WOMR Group 1 includes:

i. A new 79 miles McNary-John Day 500-kV line
ii. McNary-Ross 345-kV line sag upgrade
iii. Big Eddy-Ostrander 500-kV line sag upgrade
iv. John Day-Big Eddy 500 kV No. 2 line re-conductor (approximately 3 miles)
v. 230-kV shunt capacitor addition at Jones Canyon (2, 28.8 MVAR groups)
vi. West of McNary Reinforcement Jones Canyon RAS addition for the loss of 500 kV connections at McNary including the McNary 500/230 kV transformer outage

WOMR Group 2 includes:

i.) A new station called Knight (formerly known as Station Z), which is located near Goldendale, Washington at about tower 73/1(on the BPA Wautoma-Ostrander 500 kV line).
ii.) A new 28 mile, 500 kV transmission line connecting BPA's Big Eddy 500 kV substation located just east of The Dalles, Oregon to Knight station.
iii.) Wautoma - Ostrander 500-kV line sag upgrade.
iv.) Wautoma 500 kV shunt reactor (300 MVar @ 550 kV base)

The final EIS for WOMR Group 2 was released in accordance with the National Environmental Policy Act (NEPA) on July 15, 2011. The Record of Decision (ROD) was signed on September 9th, 2011.

**Status**

WOMR Group 1 – Construction completed.
- New McNary – John Day 500 kV Line. The McNary – John Day 500 kV line (About 79 miles) project is built and was in-service on January 24, 2012
- Big Eddy – Ostrander 500 kV line. Upgrade the line to 100°C Maximum Operating Temperature. This project was done in February 2012.
- McNary – Ross 345 kV line. Upgrade the line to 70°C (1270 Amps) rating. This project was done in February 2012.
- John Day – Big Eddy No.2 500 kV line. Re-conductor three sections totaling 2.93 miles of 2.5 inches conductor with Chukar or equivalent The re-conductor was complete and the line was in-service on January 24, 2012

WOMR Group 2 - Under construction
A new station called Knight (formerly known as Station Z), which is located near Goldendale, Washington at about tower 73/1(on the BPA Wautoma-Ostrander 500 kV line). The projected in-service date is March, 2013

A new 28 mile, 500 kV transmission line connecting BPA’s Big Eddy 500 kV substation located just east of The Dalles, Oregon to Knight substation. The projected in-service date is March, 2013

Wautoma - Ostrander 500-kV line sag upgrade. The projected in-service date is year 2011

Wautoma 500 kV shunt reactor (300 MVar @ 550 kV base). The projected in-service date is November 30, 2014

Studies

The project was planned to meet NERC/WECC Planning Standards in response to transmission service requests. Technical and Network Open Season cluster studies were completed by BPA in the 2008. The West of McNary Reinforcement completed the WECC Regional Planning Project Review in February 2008. In accordance with the WECC Over review of Policies and Procedure for Regional Planning Project Review, Project Rating Review, and Progress Reports, BPA completed a Phase 1 Review for WOMR projects and submitted a request for the project to achieve a Phase 2 status on August 10, 2009.

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E. Other Transmission Projects

<table>
<thead>
<tr>
<th>Facility</th>
<th>Projected In-Service Date</th>
</tr>
</thead>
</table>
II. Generation Interconnection Projects

The following generation projects have executed or are in the process of executing a Large Generation Interconnection Agreement (LGIA) with BPA. Technical interconnection studies can be obtained by signing a Non-Disclosure Agreement with BPA. To request a copy of the study, please email the following information; name, title, company, mailing address, and telephone number to studyrequest@bpa.gov. BPA Transmission Services will then contact you with the Non-Disclosure requirements. Upon approval, a copy of the study will be provided.

<table>
<thead>
<tr>
<th>POI/ GI #</th>
<th>Project Name</th>
<th>MW</th>
<th>Proposed Energization Date</th>
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<tbody>
<tr>
<td>GI-118, 291</td>
<td>South Hurlburt Horseshoe Bend Wind</td>
<td>266 MW</td>
<td>March 2012</td>
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<td>GI-284</td>
<td>Lower Snake River Wind Phase 1</td>
<td>250 MW</td>
<td>February 2012</td>
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<td>GI-285</td>
<td>Lower Snake River Wind Phase 2</td>
<td>91 MW</td>
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<tr>
<td>GI-122, 208, 222</td>
<td>Windy Flats 3</td>
<td>100 MW</td>
<td>June 2012</td>
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<tr>
<td>G0099-2</td>
<td>Golden Hills</td>
<td>200 MW</td>
<td>October 2013</td>
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III. Generation Projects Interconnected in 2011

For the purpose of inclusion in the WECC Annual Progress Report, new wind generation facilities are shown as part of BPA’s interconnected inventory after the date of initial synchronization. In some cases, this is before the plants are generating more than half their nameplate capacity.

<table>
<thead>
<tr>
<th>POI/ GI #</th>
<th>Project Name</th>
<th>MW</th>
<th>Energization Date</th>
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<tr>
<td>Slatt 500/230 kV Substation</td>
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<td>GI-118, 291</td>
<td>North Hurlburt Wind</td>
<td>266</td>
<td>12/1/2011</td>
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<td>Rock Creek 500/230kV Substation</td>
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<td>GI-203, 204</td>
<td>Juniper Canyon</td>
<td>150</td>
<td>2/11/2011</td>
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</table>
IV. Waiver of “Significant Transmission Project” Status

The two projects listed below are needed to serve and to increase local load reliability. They are not expected to have significant impacts on the operation of the Western Interconnect System. Thus, BPA requests waiver of “Significant Transmission Project” status for the purpose of the Project Coordination Review Process.

A. Ponderosa 500/230kV Transformer Addition

This project improves load service reliability to the Central Oregon area. It addresses violations caused by loss of the existing Ponderosa 500/230 kV transformer #1. The existing Ponderosa 500/230 kV transformer #1 is a major source to the Central Oregon area. Loss of this transformer results low voltages in the Redmond, Bend (Pilot Butte) and La Pine areas as well as thermal overloads on the 230 kV system between Round Butte, Redmond, and Pilot Butte. Eventually, this outage could result in voltage collapse in the area. The addition of a new 500/230 kV transformer in the area was studied and it was determined that the most optimal location for the new transformer is at Ponderosa substation. Additionally, completion of this project is necessary to accommodate transmission service requests for a new data center load in the Prineville area.

The plan of service is to install a second 700 MVA 500/230 kV transformer at Ponderosa substation. A 230 kV Air Insulated Substation (AIS) bus will be developed north of the existing Ponderosa 230 kV Gas Insulated Substation (GIS) bus. The high side of the new Ponderosa 500/230 kV transformer will tap the Grizzly – Captain Jack 500 kV line with a high side breaker and the low side will terminate into the new 230 kV AIS bus. A high side breaker will be added to the existing Ponderosa transformer which taps the Grizzly – Summer Lake 500 kV line and terminates into the existing 230 kV GIS bus. This project has been approved for funding and is expected to be completed by June 2013.

This project has no significant impact on the operation of the WECC interconnected electric system. It is needed to address load service to the Central Oregon area. Coordination during the study phase of this project occurred between BPA and PAC and will continue to occur during construction of the project.

B. Raver 500/230kV Transformer Addition

The plan of service is to install a 1300MVA transformer at Raver substation. A new 230kV substation will be developed adjacent to the existing 500kV substation. The high side of the new transformer will terminate at Raver 500kV. The Tacoma-Raver #1 and #2 500kV lines are currently jumpered together and operated as double circuit 500kV for about 10 miles from Raver until it reaches Covington substation. The corridor for both circuits runs adjacent to Covington 230kV station and in the same corridor as the Raver-Covington #1 and #2 500kV circuits. The project will reconfigure the Tacoma-Raver 500kV lines by removing jumpers and re-terminating the Tacoma-Raver #2 circuit into Covington 230kV and Raver 230kV substations. The Tacoma-Raver #2 line will be renamed and operated as the Raver-Covington #3 230kV line. The plan of service also requires reconfiguring the Covington 230kV bus, adding a new sectionalizing breaker and 2 bus tie breakers.

This project is primarily for load service to Tacoma and Covington substations and has no significant impact to the WECC transmission system. It has been studied as part of a sub-regional Puget Sound Area Study team through Columbia Grid.
V. Transmission Projects Completed, On-Hold or Cancelled

The following projects have been listed in previous BPA Annual Progress Reports. Presently, for projects on-hold or cancelled, BPA has no plans to move forward with these projects until one of the following occur (1) project funding becomes available for projects associated with transmission service requests associated with generation interconnection or (2) load growth supports the construction of load service projects.

Completed

A. California Oregon Intertie 4800 Project
B. Southwest Oregon Coast Reinforcement Project (Rogue SVC)

On-Hold