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April 10, 2014

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
Mail Code: DHAC, PJ-12
888 First Street, N.E.
Washington, D.C. 20426

**RE: Priest Rapids Hydroelectric Project No. 2114-217
License Compliance Filing – Article 411 Transmission Line Avian Collision Protection Plan
2013 Annual Report**

Dear Secretary Bose,

Public Utility District No. 2 of Grant County, Washington (Grant PUD) respectfully submits to the Federal Energy Commission Regulatory Commission (FERC) its 2013 Transmission Line Avian Collision Protection Plan Annual Report.

On April 15, 2010, Grant PUD filed its Transmission Line Avian Collision Protection Plan (Plan) with FERC. On August 24, 2010, FERC issued an approving and modifying Order. Per the Plan, Grant PUD is required to install bird flight diverters (BFDs) upon ten transmission line spans from 2011 – 2015, conduct avian surveys from 2011 – 2016 and every fifteen years thereafter, and provide annual reports to the U.S. Fish and Wildlife Service (USFWS), Washington Department of Fish and Wildlife (WDFW) and FERC by April 17 of each reporting year.

The Plan identified ten transmission line spans located within five different transmission line corridors for avian interaction studies and line marking. In 2010, Grant PUD proposed to install BFDs all on these transmission line spans to be in accordance with the guidelines set forth in “Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006,” by the Edison Electric Institute and the Avian Power Line Interaction Committee (APLIC), or as such publication may be updated from time to time. In 2012, APLIC updated its suggested practices.

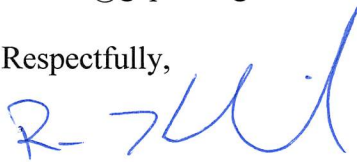
In review of the APLIC publication released in 2012 (APLIC 2012), Grant PUD determined that that two of its three Midway transmission line spans were in accordance with the APLIC 2012 guidelines. The Midway transmission line spans are the interior spans of a five-span transmission line cluster thereby reducing avian collision potential due to the line configuration. As a result, Grant PUD proposed to its consulting parties – USFWS and WDFW – to not install BFDs on the two Midway transmission line spans. In addition, Grant PUD proposed to remove the overhead ground wires on one de-energized span, which will also reduce avian collision potential. Discussion of these proposals occurred over a number of

occasions with the consulting parties; formal approval for these proposals were sought and received during the consulting parties review of the 2012 annual report in which the proposal was included. The USFWS and WDFW concurred with both of Grant PUD's proposals. On December 23, 2013, Grant PUD submitted an amendment request to FERC for License Article 411 be modified to reflect the agency-approved and APLIC-compliant avian collision minimization options for the four transmission line spans previously identified in the 2010 FERC Order.

Grant PUD will continue to install BFDs as outlined in the Plan: Columbia/Moses Coulee - 2014, and the one remaining Midway - 2015.

FERC staff with any questions should contact Tom Dresser at 509-754-5088, ext. 2312 or by email at tdresse@gcpud.org.

Respectfully,



Ross Hendrick
License Compliance Manager

Enclosures: Final 2013 Transmission Line Avian Collision Protection Plan Report

Cc: Jessica Gonzales, USFWS
Steve Lewis, USFWS
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**Priest Rapids Project – FERC No. 2114
Transmission Line Collision Protection Plan**

2013 Annual Report

License Article 411

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Environmental Assessment Services, LLC
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For:

Public Utility District No. 2 of Grant County, Washington

April 2014

Executive Summary

On August 24, 2010, the Federal Energy Regulatory Commission (FERC) issued the order modifying and approving the Transmission Line Avian Collision Protection Plan (Plan) pursuant to Article 411 of the license for the Priest Rapids Project No. 2114 (Project). Per FERC's approval of the Plan, Public Utility District No. 2 of Grant County, Washington (Grant PUD) is required to insure that 10 of its transmission line spans are compliant with the guidelines set forth in "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006" or an updated publication. In 2010, Grant PUD proposed to install bird flight diverters (BFDs) upon ten transmission line spans within five transmission line corridors from 2011–2015, conduct avian surveys from 2011–2016 and every 15 years thereafter, and provide annual reports to the U.S. Fish and Wildlife Service, Washington Department of Fish and Wildlife, and FERC by April 17 of each report year.

Pursuant to the Plan, Grant PUD scheduled the installation of BFDs upon the overhead ground wires (OHGW) at the following corridors and years: 1) South Moran Slough (2011), 2) North Moran Slough (2012), 3) Wanapum Switchyard (2013), 4) Wanapum-Columbia/Moses Coulee (2014), and Midway/Columbia River downriver from Priest Rapids Dam (2015). Grant PUD has installed BFDs upon all three spans at South Moran South in 2011, the one span at North Moran Slough in 2012, and the one span at the Wanapum Switchyard in 2013.

Avian surveys were conducted at the five transmission line corridors. The surveys recorded data in three categories: 1) Site Information, 2) Avian Location Type, and 3) Avian Interaction Survey to incorporate information within 0.25 miles of the transmission lines. The Wanapum-Columbia/Moses Coulee transmission line corridor was the only raptor location, and the site was characterized as having a high number (>10) of ledges and alcoves on the cliffs with intermittent updrafts present on warm sunny days. The South Moran Slough, North Moran Slough, Wanapum Switchyard, and the Midway/Columbia River corridors were all characterized as waterfowl locations which had open water, nesting habitat, and brood cover.

A total of 60 avian interaction surveys were conducted during 2013 at the five transmission line corridors and recorded a total of 3,657 birds. Sixty-one different bird species were identified during 2013; however, only one species observed during 2013 had a state and/or federal Threatened or Endangered species listing.

A comparison of bird flight behavior data were assessed at the South Moran Slough and North Moran Slough corridors because of the availability of pre-BFD installation and post-BFD installation bird behavior data. Statistical comparisons were conducted where sample sizes and degrees of freedom were sufficient to allow a two-tailed Student's t-Test ($\alpha \leq 0.05$) to examine if bird behavior patterns differed between pre-BFD-installed and post-BFD-installed transmission line spans. At South Moran Slough no significant differences were found in any of the statistical comparisons. The low number of pre-BFD data at this site may have limited the ability to make clear statistical inferences about changes in bird behavior there. At the North Moran Slough site, there was a significant difference in the flight behavior of the wading bird species after the BFDs were installed.

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1.0 Introduction

On August 24, 2010, the Federal Energy Regulatory Commission (FERC) issued the order modifying and approving the Transmission Line Avian Collision Protection Plan (Plan) pursuant to Article 411 of the license for the Priest Rapids Project No. 2114 (Project)¹. FERC's approval of the Article 411 requires the Public Utility District No. 2 of Grant County, Washington (Grant PUD) to be required to insure that 10 of its transmission line spans are compliant with the guidelines set forth in "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006" or an updated publication. In 2010, Grant PUD proposed to install bird flight diverters (BFDs) upon ten transmission line spans within five transmission line corridors from 2011–2015, conduct avian surveys from 2011–2016 and every 15 years thereafter, and provide annual reports to the U.S. Fish and Wildlife Service (USFWS), Washington Department of Fish and Wildlife (WDFW), and FERC by April 17 of each report year.

In 2001, Grant PUD assessed the potential for avian collisions with its transmission system. Avian surveys were conducted at a total of 28 transmission line corridors and included substations and switchyards (Framatome ANP 2003). In general, the primary source of birds collisions within the transmission system are birds colliding with the overhead ground wires (OHGW), and the installation of BFDs upon the OHGWs have reduced bird collisions in the range of 57-89% (Koops and De Jong 1982; Koops 1987).

Within the approved Plan, Grant PUD will mark five 230 kV transmission line corridors with BFDs. Grant PUD will install BFDs upon OHGW and any guy wires associated with the ten transmission line spans within the five transmission line corridors. It is not necessary to mark the transmission lines (T-lines); because, the 230 kV T-lines have a line diameter equal to or greater than one inch in diameter (APLIC 1994). Additionally, most BFDs and devices cannot be installed on energized conductors with voltages over 230 kV (APLIC 1994).

2.0 Materials and Methods

2.1 Bird Flight Diverter Installation

Pursuant to the Plan, Grant PUD scheduled the BFD installation upon the OHGW at the following corridors and years: 1) South Moran Slough (2011), 2) North Moran Slough (2012), 3) Wanapum Switchyard (2013), 4) Wanapum-Columbia/Moses Coulee (2014), and Midway/Columbia River downriver from Priest Rapids Dam (2015). All outages were scheduled to occur during the months of September and October for the marking years.

2.2 Avian Surveys

Pursuant to the approved Plan, avian surveys were conducted at the five corridors (South Moran Slough, North Moran Slough, Wanapum Switchyard, Wanapum-Columbia/Moses Coulee, and Midway/Columbia River downriver from Priest Rapids Dam). The transmission line corridor surveys recorded data in three categories: 1) Site Information, 2) Avian Location Type, and 3) Avian Interaction Survey to incorporate information within 0.25 miles of the transmission lines. See Appendix A for the datasheets used to record the data.

¹ 132 FERC ¶ 62,127 (2010)

2.2.1 Site Information Data

The Site Information included the following data:

- Date
- Surveyor
- Site Name
- Survey Period: Spring Migration (February–March); Nesting (April–May); Summer (July–August); Fall/Winter (Mid-September–November)
- Day Time Period: AM (survey started at civil twilight), Mid-Day, PM (survey concluded at civil twilight)
- Survey Start Time
- Survey End Time
- Bird Flight Diverter Status (Installed or Not Installed)
- Raptor Perches (Present/Absent)
- Large Migratory Flights (Present/Absent)
- Geographic Funnel (Present/Absent). River valleys and canyons are examples of geographic funnels.

2.2.2 Avian Location Types

The Avian Location Types were classified at Raptor Locations or Waterfowl Locations. Raptor Locations noted the presence of ledges and alcoves on cliffs as not applicable (N/A), Low (0-5), Moderate (6-10), or High (>10). The presence or absence of updrafts and thermals were also recorded for Raptor Locations.

Waterfowl Locations Types recorded data on open water, nesting habitat, and brood cover. Open water data were recorded as present or absent. Nesting habitat data were recorded as present or absent during the nesting survey period only. Nesting habitat data were not applicable during the other survey periods. Brood cover data were recorded as present or absent during the Nesting and Summer Survey Periods. Brood cover data were not applicable during the other survey periods.

2.2.3 Avian Interaction Survey Data

The avian interaction survey collected data within 0.25 miles of the transmission line spans. The avian interaction survey recorded data for observation time, bird category, number of birds, listing status, vertical plane interaction, weather, and behavior. The survey time lengths were two hours during the nesting, summer, and fall/winter survey periods and three hours for the spring migration survey period. Observation time was recorded as military time. Bird categories were recorded as the following: A) Birds of Prey, B) Waterfowl, C) Wading Birds (herons), D) Shorebirds (plovers, sandpipers), E) Aerialists (pelicans, gulls, terns), F) Fowl-Like Birds, G) Passerine (songbirds), H) Misc. Non-Passerine Birds (doves, swifts, hummingbirds, woodpeckers, nightjars, kingfishers). Listing status included any state or federal listing status for the particular bird species. The vertical plane interaction data were recorded as the following: N/A (Did Not Intersect T-Line), 0–10 ft., 11–25 ft., 26–50 ft., 51–100 ft., >101 ft. and

additionally the distance was specific to birds flying in the following four vertical zones: 1) N/A (Did Not Intersect T-Line), 2) below transmission lines, 3) between transmission lines and OHGWs, and 4) above OHGWs. Weather included notes relating to cloud cover, precipitation, wind speed. Behavior data were recorded as Unaltered Flight, Flight Among Wires, Altered Flight, Abrupt Altered Flight, Flushed, Perched on Tower, Perched on Wire, Perched on Other, On Water/Ground (Table 1; Framatome ANP 2003).

Table 1 A description of the behavior data recorded during avian interaction surveys.

Unaltered Flight	Flight above or below (but not among) the transmission lines that includes no observable alterations in flight altitude, direction, speed or other flight characteristic that could be construed as a response to the transmission line structures, wires, or OHGW.
Flight Among Lines	Flight between transmission line wires, OHGW, or both that exhibited no observable alterations in flight altitude, direction, speed or other flight characteristic that could be construed as a response to the transmission line structures, wires, or OHGW.
Altered Flight	Any change in flight altitude, direction, speed, or other flight characteristic in apparent response to a transmission line structure, wire, or OHGW. The behavior occurs as the bird approaches the structure, wire or OHGW giving the individual the time necessary to make a relatively minor flight adjustment and avoid the structure.
Abrupt Altered Flight	Any change in flight altitude, direction, speed, or other flight characteristic in apparent response to a transmission line structure, wire, or OHGW occurring in very close proximity to a transmission line structure and involving a rapid and/or major flight adjustment to avoid the structure.
Flushed	Rapid take off from vegetative cover, water, or ground that was construed as being a direct result of disturbance (usually by the observer, but also including passing vehicles).
Perched on Tower	Perching on any transmission line tower, OHGW support, or structure that supports a wire, including those associated with a substation or switchyard.
Perched on Wire	Perching on any wire associated with the transmission line, substations, or switchyards, or adjacent distribution lines including OHGW or support (guy) wires.
Perched on Other	Perching on vegetation, fences or posts, autos and other machinery, cliffs, distribution poles, or any other man-made structures.
On Water/Ground	Stationary or moving on the ground, or on water (e.g., loafing, foraging on the surface, diving, or swimming).

3.0 Results and Discussion

3.1 Bird Flight Diverter Installation

BFDs installation upon the OHGW's at the North Moran Slough was completed on November 9, 2012. A complete list of BFD installation progress is presented in Table 2.

Table 2 The bird flight diverter installation completion dates for transmission line corridors.

Date of Completion	Span of BFD Installation	Corridor
8/30/2011	Priest Rapids - Midway 230kV Line #3 between Structures #211 and #212	S. Moran Slough
9/12/2011	Priest Rapids - Midway 230kV Line #1 between Structures #11 and #12	S. Moran Slough
10/10/2011	Priest Rapids - Midway 230kV Line #2 between Structures #111 and #112	S. Moran Slough
11/9/2012	Priest Rapids 230kV Line between Structures #76 and #77	N. Moran Slough
9/30/2013	Priest Rapids - Midway 230kV Line #2 between Structures #1 and #2	WAN Switchyard

3.2 Avian Surveys

3.2.1 Site Information Data & Avian Location Types

The five transmission line corridors were characterized by site information and avian location descriptions. The transmission line corridor site information data of avian location type, raptor perch presence/absence, geographic funnel presence/absence, and large migratory flight presence/absence were presented in Table 3. The Wanapum-Columbia/Moses Coulee transmission line corridor was the only raptor location, and the site was characterized as having a high number (>10) of ledges and alcoves on the cliffs with intermittent updrafts present on warm sunny days. The South Moran Slough, North Moran Slough, Wanapum Switchyard, and the Midway/Columbia River corridors were all characterized as waterfowl locations. The waterfowl site characterization presence/absence data of open water, nesting habitat, and brood cover were presented in Table 4, Table 5, and Table 6, respectively. The surveys conducted during 2013 were presented for all five transmission line corridors survey sites with respect to the survey season and daytime period as shown in Table 7. During 2013, the spring migration surveys were performed between February 07 and March 15, the nesting season surveys were conducted between May 17 and May 30, the summer season surveys were conducted between July 11 and August 21, and the fall/winter season surveys were conducted between September 20 and October 24 (Table 7).

Table 3 The avian location type and site descriptive data of raptor perches, geographic funnel, and large migratory flights for the five transmission line corridors.

Corridor	Avian Location Type	Raptor Perches	Geographic Funnel	Large Migratory Flights
South Moran Slough	Waterfowl	Present	Absent	Absent
North Moran Slough	Waterfowl	Present	Absent	Absent
Wanapum Switchyard	Waterfowl	Absent	Absent	Absent
Wanapum-Columbia/Moses Coulee	Raptor	Present	Present	Absent
Midway/Columbia River downriver from Priest Rapids Dam	Waterfowl	Absent	Present	Absent

Table 4 The open water habitat waterfowl characterization data for the four waterfowl transmission line corridors.

Corridor	Open Water			
	Spring Migration	Nesting	Summer	Fall/Winter
South Moran Slough	Present	Present	Present	Present
North Moran Slough	Present	Present	Present	Present
Wanapum Switchyard	Present	Present	Absent	Absent
Midway/Columbia River downriver from Priest Rapids Dam	Present	Present	Present	Present

Table 5 The nesting habitat characterization data for the four waterfowl transmission line corridors.

Corridor	Nesting Habitat			
	Spring Migration	Nesting	Summer	Fall/Winter
South Moran Slough	N/A	Present	N/A	N/A
North Moran Slough	N/A	Present	N/A	N/A
Wanapum Switchyard	N/A	Present	N/A	N/A
Midway/Columbia River downriver from Priest Rapids Dam	N/A	Present	N/A	N/A

Table 6 The brood cover habitat characterization data for the four waterfowl transmission line corridors.

Corridor	Brood Cover			
	Spring Migration	Nesting	Summer	Fall/Winter
South Moran Slough	N/A	Present	Present	N/A
North Moran Slough	N/A	Present	Present	N/A
Wanapum Switchyard	N/A	Present	Present	N/A
Midway/Columbia River downriver from Priest Rapids Dam	N/A	Present	Present	N/A

Table 7 The dates during 2013 that avian surveys were conducted at the five transmission line corridors with respect to survey period and daytime period.

Survey Period	Corridor	AM	Mid-Day	PM
Spring Migration	South Moran Slough	02/13/13	02/13/13	02/07/13
	North Moran Slough	02/07/13	02/07/13	02/13/13
	Wanapum Switchyard	3/1/2013	3/1/2013	2/28/2013
	Wanapum-Columbia	3/8/2013	3/7/2013	3/7/2013
	Midway	02/22/13	02/22/13	3/15/2013
Nesting	South Moran Slough	5/31/2013	5/19/2013	5/30/2013
	North Moran Slough	5/27/2013	5/18/2013	5/19/2013
	Wanapum Switchyard	5/19/2013	5/17/2013	5/18/2013
	Wanapum-Columbia	5/28/2013	5/19/2013	5/27/2013
	Midway	5/17/2013	5/17/2013	5/17/2013
Summer	South Moran Slough	7/18/2013	7/11/2013	7/24/2013
	North Moran Slough	8/1/2013	7/18/2013	7/30/2013
	Wanapum Switchyard	8/8/2013	7/18/2013	8/7/2013
	Wanapum-Columbia	8/15/2013	8/15/2013	8/21/2013
	Midway	7/11/2013	7/11/2013	7/23/2013
Fall/Winter	South Moran Slough	10/9/2013	9/20/2013	10/17/2013
	North Moran Slough	10/11/2013	10/3/2013	10/11/2013
	Wanapum Switchyard	10/17/2013	10/3/2013	10/23/2013
	Wanapum-Columbia	10/24/2013	10/16/2013	10/16/2013
	Midway	9/20/2013	9/20/2013	10/9/2013

3.2.2 Avian Interaction Surveys

A total of 60 avian interaction surveys were conducted during 2013 at the five transmission line corridors. Sixty-one different bird species were identified during 2013, and their state and federal listing statuses is presented in Table 8. Only the American white pelican (*Pelecanus erythrorhynchos*) was the only species observed that currently has state and/or federal Threatened or Endangered species listing status (Table 8). A total of 3,657 birds were enumerated during the 2013 surveys. The bird counts were presented by site (Table 9) and survey period (Table 10). Passerine species continue to be most abundant species for each site. In 2013, the most abundant bird species observed were red-winged blackbirds. Red-tailed hawks were the most abundant bird of prey species. Mallards were the most abundant waterfowl species. Gull species were the most abundant aerialists in 2013. Northern flickers were the most common miscellaneous non-passerine miscellaneous bird species.

The bird interaction behavior data were presented by the bird categories with respect to their flight across the transmission lines (i.e., above the OHGW, between OHGW and the T-Lines, or below T-Lines). The majority of birds flying above the OHGW were waterfowl species while the majority of birds flying between or under the OHGW and T-lines were passerine species (Table 11).

Of the 3,657 observations made during 2013, no bird collisions were documented, and only two abruptly altered flight behaviors were observed. The abruptly altered flight observations occurred at the Midway transmission line crossings. The bird species that demonstrated the abruptly altered flight was the American white pelican.

A statistical comparison of altered and unaltered bird flight behavior data were assessed at the South Moran Slough and North Moran Slough sites because of the availability of pre-BFD installation and post-BFD installation bird behavior data (Table 13, Table 14). Statistical comparisons were conducted where sample sizes and degrees of freedom allowed a two-tailed Student's t-Test ($\alpha \leq 0.05$) to be performed to examine if bird behavior rates differed between pre-BFD-installed and post-BFD-installed transmission line spans. Values used in comparison were generated by calculating the percentage of the selected behavior (altered and unaltered) out of total number of behavior observations recorded for each bird category for each season. The T-tests were conducted when there was at least one observation for a given bird category and there were at least three seasons of pre-BFD and post-BFD installation periods (Table 15).

No differences in bird behavior could be detected at the South Moran Slough site. Birds of prey (i.e., raptors) and passerine birds (i.e., songbirds) are reported to have the keenest sight of all birds, and they can resolve details at distances 2.5-3 times the distance that humans can (Gill 2007). No differences in the pre-BFD-installed and post-BFD-installed behavior data could reveal that the birds of prey already observed the OHGWs prior to BFD installation. It is acknowledged that there were only three seasons of pre-BFD data available for this comparison which may influence analytical results. It is also possible that cluster span configurations, such as the South Moran Slough corridor three-span cluster, increase the visibility of the wires (APLIC 2012). As a result, the installation of BFDs at clustered-span corridors likely does little to reduce collision potential for bird species with excellent vision that most likely observed the wires prior to BFD installation. It is also likely that waterfowl behaviors at this site may have been influenced by hunting activities. Shotgun shells were frequently observed at this site by the surveyors. This type of human activity may decrease the use of this area by waterfowl and wading bird species.

At the North Moran Slough site, there was a significant difference detected in the unaltered flight behavior of wading birds. There were no significant differences found in the other bird categories. The two-tailed Student's t-Test ($\alpha \leq 0.05$) for unaltered flight in wading birds resulted in a p-value of 0.016, indicating that there was a significant difference in flight behaviors before and after the BFDs were installed (Table 14). A decrease in the frequency of unaltered flights for larger birds, such as herons, suggests that the BFDs are increasing the visual profile of the static wires and as a result, the birds are altering their flight in order to avoid the lines. Results in this case not only demonstrate the effectiveness of BFDs to reduce avian collisions with transmission lines, but enhance our overall understanding of environmental management protection practices and strategies.

Statistical comparisons for the Wanapum Switchyard site are planned to be conducted for the 2014 annual report (Table 15).

Table 8 A list of species identified during the avian interaction surveys with their state and federal listing statuses.

Bird Category	Species	State Listing Status	Federal Listing Status
Birds of Prey	American Kestrel		
	Bald Eagle	Sensitive	Species of Concern
	Golden Eagle	Candidate	
	Merlin		
	Misc. Falcon		
	Northern Harrier		
	Osprey		
	Prairie Falcon		
Waterfowl	Red-Tailed Hawk		
	Bufflehead		
	Canada Goose		
	Common Goldeneye		
	Common Loon		
	Common Merganser		
	American Coot		
	Double-Crested Cormorant		
	Eared Grebe		
	Gadwall		
	Green-Winged Teal		
	Mallard		
	Northern Shoveler		
	Pied-Billed Grebe		
	Northern Pintail		
	Red-Winged Blackbird		
	Scaup		
	Unknown		
Western Grebe	Candidate		
American Wigeon			
Wood Duck			
Wading Birds	Great Egret		
	Great Blue Heron		
	Night Heron		
Shorebirds	Dunlin		
	Killdeer		
Aerialists	American White Pelican	Endangered	
	California Gull		
	Misc. Gull		
	Ring-Billed Gull		
Fowl-Like Birds	California Quail		
	Ring-Necked Pheasant		

Passerine Birds	Brewers Blackbird		
	Brown-Headed Cowbird		
	Common Yellow Throat		
	American Crow		
	Dark-Eyed Junco		
	American Goldfinch		
	House Finch		
	House Sparrow		
	Lawrence Goldfinch		
	Magpie		
	Western Meadowlark		
	Northern Shrike		
	Common Raven		
	Red-Winged Blackbird		
	American Robin		
	European Starling		
	Unknown		
	Misc. Blackbird		
	Western Kingbird		
	White-Crowned Sparrow		
Barn Swallow			
Cliff Swallow			
Misc. Swallow			
Misc. Non-Passerine Birds	Eurasian Collared Dove		
	Rock Dove (Pigeon)		
	Belted Kingfisher		
	Mourning Dove		
	Common Nighthawk		
	Northern Flicker		

Table 9 A list of bird species and the number birds enumerated at each transmission line corridor during 2013.

Bird Category	Species	Midway	North Moran Slough	South Moran Slough	Wanapum Switchyard	Wanapum-Columbia	Grand Total
Birds of Prey	American Kestrel			1	9	1	11
	Bald Eagle	6	2				8
	Cooper's Hawk		4				4
	non-buteo raptor spp					1	1
	Northern Harrier		3	8	2		13
	Osprey		2	1			3
	Red-Tailed Hawk		2		5	8	15
Waterfowl	American Coot			106			106
	American Wigeon	4		19			23
	Bufflehead	8		5			13
	Canada Goose	31	85	5	3		124
	Common Goldeneye	34		5			39
	Common Merganser	20					20
	Double-Crested Cormorant	4	4				8
	Eared Grebe	1					1
	Mallard	498	102	35	3		638
	Northern Pintail			4			4
	Pied-Billed Grebe			11			11
	Redhead			4			4
	Ring-Necked Duck			11			11
	Wood Duck			1			1
Wading Birds	Black-Crowned Night Heron	5	5	4			14
	Great Blue Heron	13	8	10			31
	Great Egret	1					1
Shorebirds	Dunlin		1				1
Aerialists	American White Pelican	43	5	3			51
	Misc. Gull	50	4				54
	Ring-Billed Gull	1					1
Fowl-like Birds	California Quail			14			14
Passerine Birds	American Crow	78	1				79
	American Goldfinch					22	22
	American Robin	10	4	3	9	28	54
	Barn Swallow		11	76			87
	Black-Billed Magpie	67	49	17	67	1	201
	Brown-Headed Cowbird	3					3
	Bullock's Oriole	2					2
	Cassin's Finch				4		4
	Cliff Swallow	28	31	65		53	177
	Common Raven	22	2	4	5	11	44
	Dark-Eyed Junco	6					6
	Eastern Kingbird	1	1				2
	European Starling	23	26	35	55	28	167

	Horned Lark		1		12		13
	House Finch		7	6	5	57	75
	Lark Sparrow	1	4	1	2		8
	Loggerhead Shrike				1		1
	Misc. Sparrow			20		1	21
	Misc. Swallow				1		1
	Northern Shrike				2		2
	Red-Winged Blackbird	122	279	642	202		1245
	Sage Sparrow			1			1
	Unknown		1			7	8
	Western Kingbird	2	8	8	4		22
	Western Meadowlark	6	4	4	5		19
	White-Crowned Sparrow	2	10	5	11	14	42
	Yellow-Rumped Warbler	4		4		18	26
Non-Passerine Misc	Belted Kingfisher			1			1
	Common Nighthawk		9	3			12
	Mourning Dove			2	6	3	11
	Northern Flicker	5	5	6	26	14	56
	Rock Dove (Pigeon)				20		20
Grand Total		1101	680	1150	459	267	3657

Table 10 A list of bird species and the number of birds enumerated during each survey period during 2013.

Bird Category	Species	Nesting	Spring Migration	Summer	Fall/Winter	Grand Total
Birds of Prey	American Kestrel	3	8			11
	Bald Eagle	1	7			8
	Cooper's Hawk				4	4
	non-buteo raptor spp			1		1
	Northern Harrier	4	9			13
	Osprey	2		1		3
	Red-Tailed Hawk	4	9		2	15
Waterfowl	American Coot	1	97		8	106
	American Wigeon		19	4		23
	Bufflehead		13			13
	Canada Goose	27	71	19	7	124
	Common Goldeneye	8	31			39
	Common Merganser	20				20
	Double-Crested Cormorant	4	4			8
	Eared Grebe	1				1
	Mallard	46	491	57	44	638
	Northern Pintail	4				4
	Pied-Billed Grebe	5			6	11
	Redhead	4				4
	Ring-Necked Duck		11			11
	Wood Duck			1		1
Wading Birds	Black-Crowned Night Heron	2	1	5	6	14
	Great Blue Heron	12	1	16	2	31
	Great Egret	1				1
Shorebirds	Dunlin				1	1
Aerialists	American White Pelican	35		16		51
	Misc. Gull	6	2	7	39	54
	Ring-Billed Gull				1	1
Fowl-like Birds	California Quail	2			12	14
Passerine Birds	American Crow	24	53	1	1	79
	American Goldfinch			22		22
	American Robin	27	6	4	17	54
	Barn Swallow	14		63	10	87
	Black-Billed Magpie	79	54	20	48	201
	Brown-Headed Cowbird	3				3
	Bullock's Oriole			2		2
	Cassin's Finch	4				4
	Cliff Swallow	116		61		177
	Common Raven	22	2	11	9	44
	Dark-Eyed Junco		3		3	6
	Eastern Kingbird			2		2
	European Starling	20	14	30	103	167
	Horned Lark			9	4	13

	House Finch	25		8	42	75
	Lark Sparrow			6	2	8
	Loggerhead Shrike			1		1
	Misc. Sparrow		20	1		21
	Misc. Swallow			1		1
	Northern Shrike	2				2
	Red-Winged Blackbird	180	413	368	284	1245
	Sage Sparrow	1				1
	Unknown	8				8
	Western Kingbird	12		10		22
	Western Meadowlark	11	1	3	4	19
	White-Crowned Sparrow		5		37	42
	Yellow-Rumped Warbler				26	26
Non-Passerine Misc	Belted Kingfisher				1	1
	Common Nighthawk			12		12
	Mourning Dove	8		3		11
	Northern Flicker	9	18	1	28	56
	Rock Dove (Pigeon)				20	20
Grand Total		757	1363	766	771	3657

Table 11 The flight distribution of birds intersecting the transmission line spans presented by bird category during 2013.

	Verticle Plane (ft)	Birds of Prey	Waterfowl	Wading Birds	Shorebirds	Aerialists	Fowl-like Birds	Passerine Birds	Non-Passerine Misc	Grand Total
Above OHGW	>101	6	509			2		2		519
	0-10	1						46		47
	11-25	1	17	1		2		44		65
	26-50	1	18	4		13		107		143
	51-100	2	107	12		30		8	23	182
	N/A	3								3
Above OHGW Total		14	651	17		47		207	23	959
Below T-Lines	>101		57	5		11		38	1	112
	0-10	5	1					34		40
	11-25	6	5	5		2		148	11	177
	26-50	2	21	7	1	3		391	17	442
	51-100	2	117	9		28	12	398	31	597
	N/A							4	3	7
Below T-Lines Total		15	201	26	1	44	12	1013	63	1375
Between T-Lines & OHGW	0-10	9				2		417	3	431
	11-25		4	1				141		146
	26-50							17		17
Between T-Lines & OHGW Total		9	4	1		2		575	3	594
N/A	>101		5							5
	0-10	2						311	1	314
	N/A	15	142	2		13	2	226	10	410
N/A Total		17	147	2		13	2	537	11	729
Grand Total		55	1003	46	1	106	14	2332	100	3657

Table 12 The flight behavior of birds intersecting the transmission line spans presented by bird category during 2013.

Bird Category	Abrupt Altered Flight	Altered Flight	Flight Among Wires	Flushed	On Ground	On Water	Perched on Other	Perched on Tower	Perched on Wire	Unaltered Flight	Grand Total
Birds of Prey		8	1	1			10	4	3	28	55
Waterfowl		86		1		269	14			633	1003
Wading Birds		10		2		5	7			22	46
Shorebirds										1	1
Aerialists	5	9				29				63	106
Fowl-like Birds				1	12		1				14
Passerine Birds		153	434	7	80	14	356	171	297	820	2332
Non-Passerine Misc		2	3		3		39	13	3	37	100
Grand Total	5	268	438	12	95	317	427	188	303	1604	3657

Table 13 A comparison of pre-BFD installation and post-BFD installation bird flight behavior data at South Moran Slough (2011 through 2013).

S.M.S. Summary	Pre-BFD				Post-BFD				t-Test Summary					
	# Seasons	# Alt.	# Unalt.	Total Obs.	# Seasons	# Alt.	# Unalt.	Total Obs.	P (T<=t) two-tail (Altered)	d.f.	Significant ($\alpha \leq 0.05$)	P (T<=t) two-tail (Unaltered)	d.f.	Significant ($\alpha \leq 0.05$)
A: Birds of Prey	3	2	8	20	9	7	11	27	0.96	5	no	0.77	4	no
B: Waterfowl	3	6	43	110	9	19	108	402	0.35	8	no	0.64	3	no
C: Wading Birds	3	1	7	8	9	11	21	44	0.51	2	no	0.55	3	no
D: Shorebirds	3	0	1	3	9	0	1	1						
E: Aerialists	3	0	2	2	9	1	15	16				0.85	3	no
F: Fowl-Like Birds	3	0	0	0	9	0	0	0						
G: Passerine Birds	3	14	309	2004	9	79	1007	2893	0.57	10	no	0.17	10	no
H: Non-Passerine Misc	3	0	19	30	9	3	49	68				0.46	9	no
Total	3	23	389	2177	9	120	1212	3451						

Table 14 A comparison of pre-BFD installation and post-BFD installation bird flight behavior data at North Moran Slough (2012 through 2013).

N.M.S. Summary	Pre-BFD				Post-BFD				t-Test Summary					
	# Seasons	# Alt.	# Unalt.	Total Obs.	# Seasons	# Alt.	# Unalt.	Total Obs.	P (T<=t) two-tail (Altered)	df	Significant ($\alpha \leq 0.05$)	P (T<=t) two-tail (Unaltered)	d.f.	Significant ($\alpha \leq 0.05$)
A: Birds of Prey	7	0	30	43	5	0	8	15				0.49	8	no
B: Waterfowl	7	40	468	530	5	73	595	678	0.88	9	no	0.42	10	no
C: Wading Birds	7	7	44	53	5	8	4	13	0.06	4	no	0.02	10	yes
D: Shorebirds	7	0	7	8	5	0	1	1						
E: Aerialists	7	3	30	38	5	2	7	9	0.68	4	no	0.12	7	no
F: Fowl-Like Birds	7	0	0	0	5	0	0	0						
G: Passerine Birds	7	21	676	2728	5	32	274	710	0.37	4	no	0.11	8	no
H: Non-Passerine Misc	7	0	21	23	5	0	7	16						
Total	7	71	1276	3423	5	115	896	1442						

Table 15 Seasons of available data for 2013 statistical comparison.

Site	# Seasons of Pre-BFD data	# Seasons of Post-BFD data	Installation Year	Statistical Comparison
South Moran Slough	3	9	2011	2013
North Moran Slough	7	5	2012	2013
Wanapum Switchyard	12	1	2013	Scheduled for 2014
Wanapum-Columbia	12	0	Scheduled for 2014	Scheduled for 2015
Midway	12	0	Scheduled for 2015	Scheduled for 2016

4.0 License Article 411 Amendment

Grant PUD’s Transmission Line Avian Collision Protection Plan identified ten transmission line spans located within five different transmission line corridors for avian interaction studies and line marking. In 2010, Grant PUD proposed to install BFDs all on these transmission line spans to be in accordance with the guidelines set forth in “Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006,” by the Edison Electric Institute and the Avian Power Line Interaction Committee (APLIC), or as such publication may be updated from time to time. In 2012, APLIC updated its suggested practices.

In review of the APLIC publication released in 2012 (APLIC 2012), Grant PUD determined that two of its three Midway transmission line spans were in accordance with the APLIC 2012 guidelines. The Midway transmission line spans are the interior spans of a five-span transmission line cluster thereby reducing avian collision potential due to the line configuration. As a result, Grant PUD proposed to its consulting parties USFWS and WDFW, to not install BFDs on the two Midway transmission line spans. In addition, Grant PUD proposed to remove the overhead ground wires on one de-energized span, which will also reduce avian collision potential. Discussion of these proposals occurred over a number of occasions with the consulting parties; formal approval for these proposals was sought and received during the consulting parties review of the 2012 annual report in which the proposal was included. The USFWS and WDFW concurred with both of Grant PUD’s proposals. On December 23, 2013, Grant PUD submitted an amendment request to FERC for License Article 411 be modified to reflect the agency-approved and APLIC-compliant avian collision minimization options for the four transmission line spans previously identified in the 2010 FERC Order (Appendix B).

Grant PUD will continue to install BFDs as outlined in the Plan: Columbia/Moses Coulee - 2014, and the one remaining Midway - 2015.

List of Literature

- Avian Power Line Interaction Committee (APLIC). 1994. Mitigating Bird Collisions with Power Lines: The State of the Art in 1994. Edison Electric Institute. Washington, D.C.
- APLIC. 2012. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Edison Electric Institute. Washington, D.C.
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- Gill, F.B. 2007. Ornithology. Third Edition. W.H. Freeman and Company. New York, NY.
- Koops, F.B. 1987. Collision victims of high-tension lines in the Netherlands and effects of marking. KEMA Report 01282-MOB 86-3048.
- Koops, F.B., and J. de Jong. 1982. Vermindering van draadslachtoffers door markering van hoogspanningsleidingen in de omgeving van Heerenveen (Reducing the number of bird collisions by marking high-voltage lines in the Heerenveen area). *Overdruk uit: Elektrotechniek* 60(12):641–646. (Translation provided for readers benefit).
- Martin, G.R. 2011. Understanding bird collisions with man-made objects: a sensory ecology approach. *The International Journal of Avian Science IBIS* 153:239-254.
- Martin, G.R., and J.M. Shaw. 2010. Bird collisions with power lines: failing to see the way ahead? *Biological Conservation* 143:2,395-2,702.

Appendix A
Article 411 Survey Forms

Article 411 Transmission Line Collision Protection Plan Survey
Site Description Survey Form

Date: _____

Surveyor: _____

- Site:** Wanapum – Columbia (Span 1)
Type D1 Towers,
3 T-Lines
2 OHGW's
- North Moran Slough (Span 3)
Type TR1 & Tangent A1 Towers,
3 T-Lines
2 OHGW's
- Priest – Midway (Span 5, 7, and 9)
Type B2 Special Towers,
3 T-Lines/Span
2 OHGW's/Span

- Wanapum Switchyard (Span 2)
Type A2 Tangent & DS Towers,
3 T-Lines
2 OHGW's
- South Moran Slough (Span 4, 6, and 8)
Type A1 Tangent Towers,
3 T-Lines/Span
1 OHGW/Span
- Midway – Frenchman (Span 10)
Type SC Special Towers,
3 T-Lines
2 OHGW's

Survey Period

- Spring Migration (Feb – Mar) Nesting (April – May)
 Summer (July – Aug) Fall/Winter (Mid-Sept – Nov)

Day Time Period

- AM Mid-Day PM

Start Time: _____ End Time: _____

Bird Flight Diverters Installed?

- Yes No

Miscellaneous Information (Presence/Absence)

- Raptor Perches
 Large Migratory Flights
 Geographic Funnel (i.e., Canyons/Valleys)

Avian Location Type:

- Raptor Location Type
- Ledges & Alcoves on Cliffs
 N/A
 Low (0-5)
 Moderate (6-10)
 High (>10)
- Updrafts/Thermals
 Present Absent

- Waterfowl Location Type
- Open Water
 Present Absent
- Nesting Habitat (Nesting Survey Only)
 Present Absent N/A
- Brood Cover (Nesting/Summer Survey)
 Present Absent N/A

Page __ of __

Appendix B
Grant PUD's December 23, 2013 License Amendment Request for License Article 411

VIA ELECTRONIC FILING

December 23, 2013

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
Mail Code: DHAC, PJ-12
888 First Street, N.E.
Washington, D.C. 20426

**RE: Priest Rapids Hydroelectric Project No. 2114 License Amendment Filing – Article 411 –
Transmission Line Avian Collision Protection Plan**

Dear Secretary Bose,

Public Utility District No. 2 of Grant County, WA (Grant PUD) respectfully submits the following request for license amendment to Article 411 (*Transmission Line Avian Collision Protection Plan*) of the Priest Rapids Hydroelectric Project License, in response to the guidelines set forth in an updated publication by the Avian Power Line Interaction Committee (APLIC) to reduce avian collisions with power lines. The following information provides a general overview of Article 411 and details related to the requested amendment.

Overview

Article 411 of Grant PUD's Priest Rapids Hydroelectric Project License required Grant PUD to file for Federal Energy Regulatory Commission (FERC) approval a Transmission Line Avian Collision Protection Plan (Plan) to protect waterfowl and raptors from colliding with Project transmission lines. The Plan was prepared after consultation with the U.S. Fish and Wildlife Service (USFWS) and the Washington Department of Fish and Wildlife (WDFW), and on August 24, 2010, FERC issued an Order¹ modifying and approving the Plan. In accordance with the Plan, Grant PUD has installed power line identifiers, or bird flight diverters (BFDs) upon the overhead ground wires (OHGW) at the following corridors and years: 1) South Moran Slough (2011), 2) North Moran Slough (2012), 3) Wanapum Switchyard (2013), 4) Wanapum-Columbia/Moses Coulee (scheduled for 2014), and Midway/Columbia River downriver from Priest Rapids Dam (scheduled for 2015). Grant PUD has also conducted avian surveys at the aforementioned transmission line corridors, in accordance with the Plan, since 2011 (Grant PUD 2012 and 2013), and has provided these annual reports to USFWS, WDFW, and FERC.

In the 2010 FERC Order, FERC stated modifications to the transmission lines must be in accordance with the guidelines set forth in APLIC's "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006" or an updated publication. In October 2012, APLIC released an updated publication titled, "Reducing Avian Collisions with Power Lines: The State of the Art in 2012" (APLIC 2012).

¹ 132 FERC ¶ 62,127 (2010)

Discussion

Grant PUD is requesting an amendment to Article 411 in response to the guidelines set forth in an updated publication by APLIC to reduce avian collisions with power lines. In the State of the Art 2012 publication, APLIC provided numerous approaches to reduce avian collisions with power lines and be in accordance with APLIC’s guidelines. The Midway corridor has eight transmission lines spans that are configured in a five-span cluster and a three-span cluster. Within the five-span cluster, Grant PUD owns the two interior transmission spans (i.e., Priest Rapids – Midway 230kV Line #2 (Tower #678), and Priest Rapids – Midway 230kV Line #1 (Tower #41); see Figure 1).

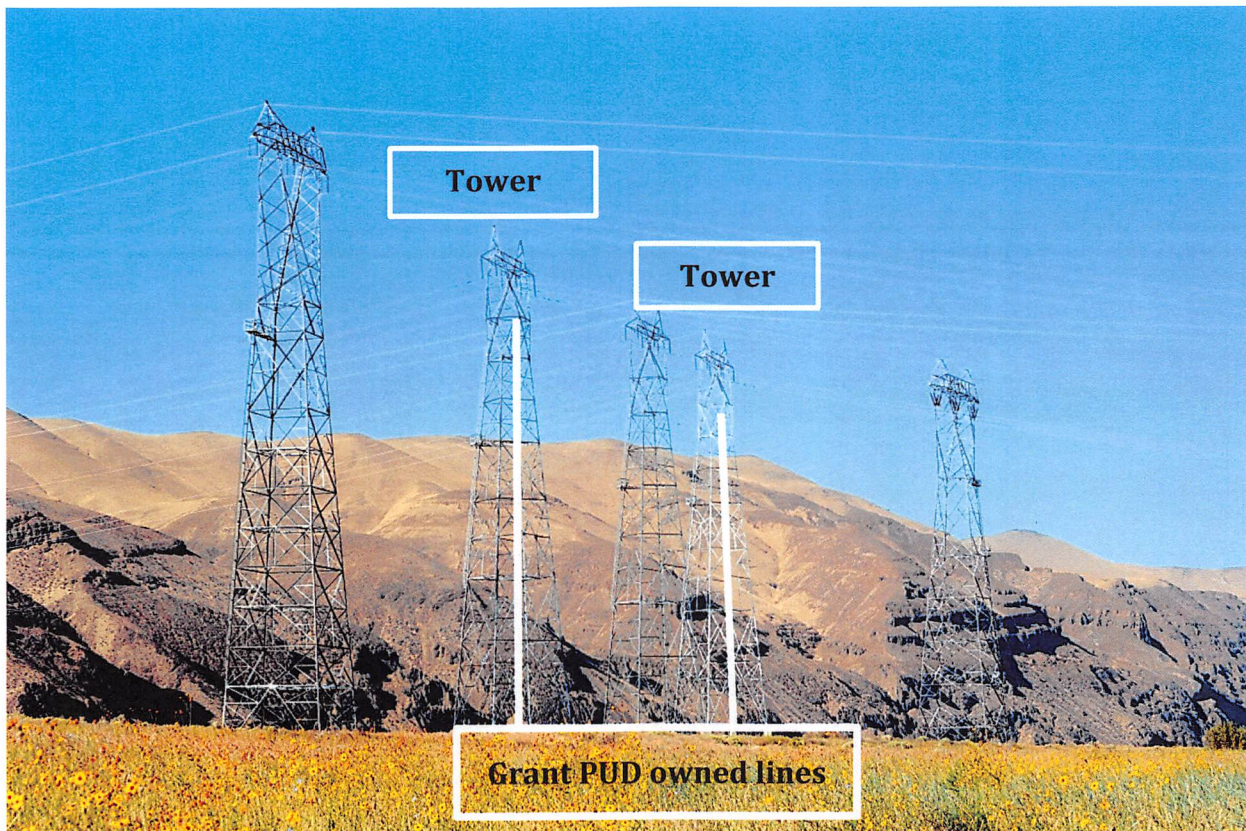


Figure 1 The five-span transmission line cluster at Midway with Priest Rapids – Midway 230kV Line #2 (Tower #678) and Priest Rapids – Midway 230kV Line (Tower #41).

In the 2010 FERC Order, the two lines shown in Figure 1 were identified, scheduled, and ordered to have BFDs installed upon the OHGWs in 2015. However, based on APLIC (2012), these two Midway spans currently meet the criteria to be considered compliant with the 2012 APLIC reduced-collision guidelines; because, the transmission lines were constructed within a reduced-risk cluster configuration and these two spans are interior spans within the five-span cluster. When transmission lines are built to run parallel and in close proximity to each other, collisions risks are minimized because the resulting network of wires is confined to a smaller area and the lines are more visible to birds (APLIC 2012; see Figure 2). As a result, birds only have to make one ascent and descent to cross transmission lines constructed in this cluster configuration. The five-span transmission line cluster at Midway also has its transmission lines at similar heights thereby making these lines in accordance with the APLIC (2012) guidelines. Grant PUD examined all the bird flight behavior data collected at Midway from 2011-2012, which showed that 14.3% of herons and 16.0% of aerialists were already altering their flight behavior at Midway (Grant PUD 2013). Altered

flight behavior can imply that the birds are physically seeing the transmission lines and altering their flight pattern in response to the clustered transmission line corridors.

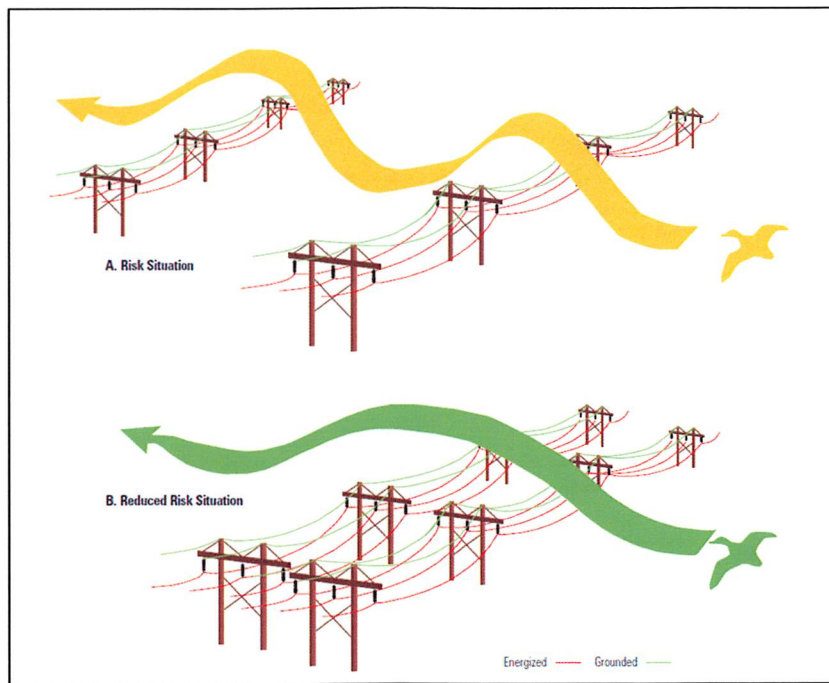


Figure 2 Reduced collision risk options by clustering lines in one right-of-way (APLIC 2012).

At the three-span transmission line cluster, Grant PUD owns two of the three spans (i.e., the middle span [Midway – Frenchman Hills 230kV line (Tower #682)], and a downriver span [Priest Rapids – Midway 230kV Line #2 (Tower #144)]; see Figure 3).

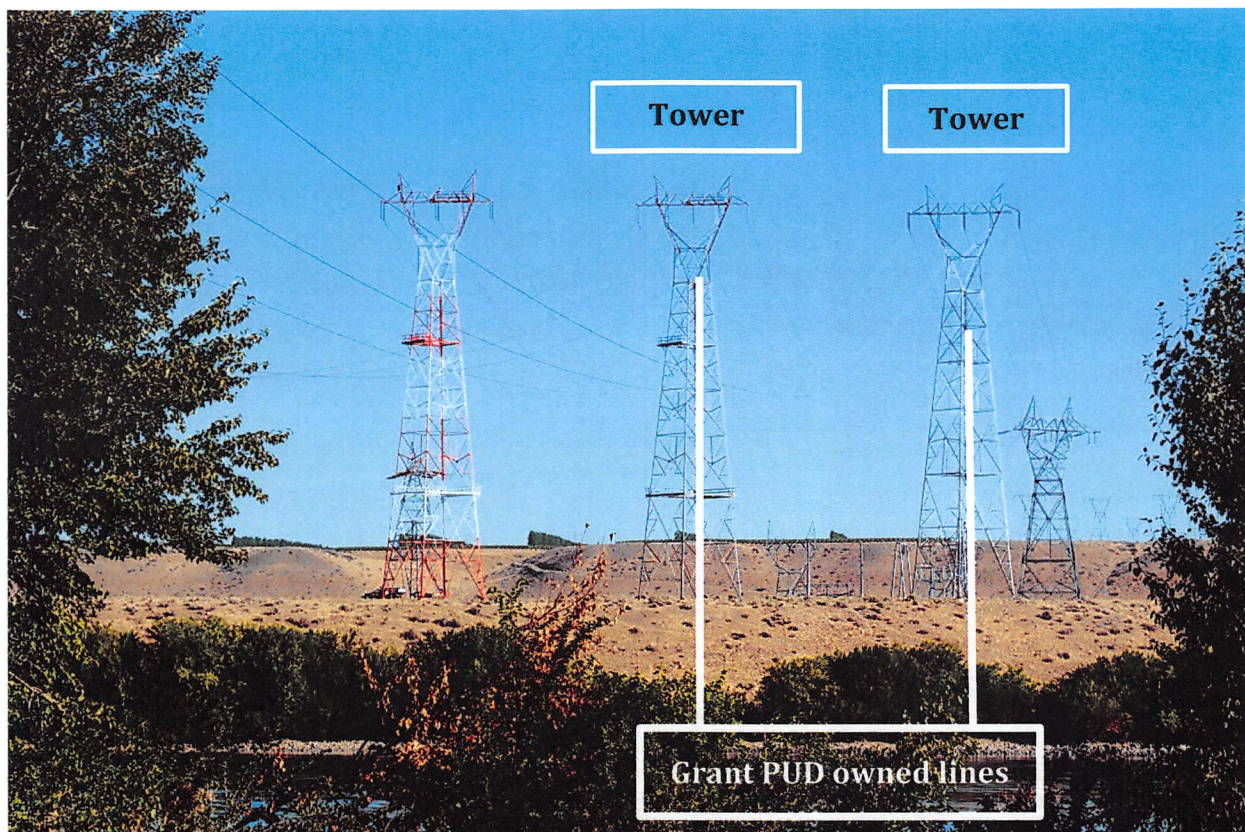


Figure 3 The three-span transmission line cluster at Midway with Midway – Frenchman Hills 230kV line (Tower #682) and Priest Rapids – Midway 230kV Line #2 (Tower #144).

The middle transmission line span within this three-span cluster is no longer energized, and in Chapter 5 (Minimizing Collision Risks) of APLIC (2012), the removal of the OHGWs is another option utilities can implement to be in accordance with APLIC guidelines. Based upon the APLIC (2012) guidelines, removing the OHGWs is a valid approach to reduce avian collision potential. Because this transmission line is not energized and not connected to the transmission grid or any substations, Grant PUD can remove the OHGWs and be in accordance with APLIC guidelines to reduce avian collisions on this span. Grant PUD believes marking the OHGWs upon the furthest downriver span with BFDs remains the best approach to be compliant with the 2012 APLIC reduced-collision guidelines.

Consultation

On March 20, 2013, Grant PUD submitted the Priest Rapids Project – FERC No. 2114 Transmission Line Collision Protection Plan 2012 Annual Report for License Article 411 to USFWS and WDFW for review and comment in response to a newly released 2012 publication by APLIC titled, “Reducing Avian Collisions with Power Lines: The State of the Art in 2012.” The USFWS submitted its comments on March 26, 2013, and WDFW submitted its comments on April 11, 2013. The USFWS and WDFW both agreed that Grant PUD’s collision minimization proposals were in accordance with APLIC (2012), and the 2012 Article 411 report was filed with FERC on April 16, 2013. The 2012 Article 411 report, with USFWS and WDFW comments related to the new APLIC guidelines, is included with this filing for reference.

Amendment Request

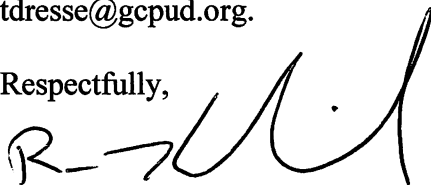
Based on the information presented above, Grant PUD requests that the Transmission Line Collision Protection Plan for License Article 411 be modified to reflect the agency-approved and APLIC-compliant avian collision minimization options for the four transmission line spans previously identified in the 2010 FERC Order (Table 1). Grant PUD also requests that the implementation of the collision minimization options presented in Table 1 maintain the original schedule within the 2010 FERC Order (i.e., implementation to be completed by 2015).

Table 1 Agency-approved avian collision minimization options for Grant PUD’s four transmission line spans at the Midway crossing

Midway Spans Identified for Reduced Collision	Collision Minimization Options
Priest Rapids – Midway 230kV Line #2 between Structures #144 and #145	Install Bird Flight Diverters upon OHGWs
Midway – Frenchman Hills 230kV line between Structures #681 and #682	Remove Shield Wires/Overhead Ground Wires
Priest Rapids – Midway 230kV Line #2 between Structures #679 and #678	APLIC Compliant Line: Reduced Risk Clustering/Inside Line
Priest Rapids – Midway 230kV Line #1 between Structures #40 and #41	APLIC Compliant Line: Reduced Risk Clustering/Inside Line

Commission staff with any questions should contact Tom Dresser at 509-754-5088, ext. 2312 or at tdresse@gcpud.org.

Respectfully,



Ross Hendrick
Manager, License Compliance and Implementation Services

Cc: Mailing list
NR Records

Enclosures: Article 411 Transmission Line Avian Collision Protection Plan 2012 Annual Report

Literature Cited

- APLIC. 2012. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Edison Electric Institute. Washington, D.C.
- Grant PUD. 2012. Article 411 Transmission Line Avian Collision Protection Plan 2011 Annual Report. April 3, 2012.
- Grant PUD. 2013. Article 411 Transmission Line Avian Collision Protection Plan 2012 Annual Report. April 16, 2013.