



FRONTLINES

FOREST RESIDENTS OPPOSING NEW TRANSMISSION LINES

The Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, D.C. 20426
Electronic filing of five (5) pages

March 1, 2019

Subject: Comments by Forest Residents Opposing New Transmission Lines Regarding the "Study 34b: Phase Shifting Transformer Study" Filed by the Nevada Hydro Company

Reference: The Nevada Hydro Company's "Study 34b: Phase Shifting Transformer Study" Filed February 21, 2019 in Docket P-14227.
Comments on Nevada Hydro Company's Proposed Phase Shifters Filed by Forest Residents Opposing New Transmission Lines on February 22, 2019.

Dear Secretary Bose;

On February 21, 2019, the Nevada Hydro Company ("TNHC") filed a "Phase Shifting Transformer Study 34b" ("Study") in response to a request for additional information ("Request") issued by the Federal Energy Regulatory Commission ("Commission") on January 22, 2019. TNHC's "Phase Shifting Transformer Study 34b" was made publicly available in the Commission's "e-library" shortly after Forest Residents Opposing New Transmission Lines ("FRONTLINES") filed comments on February 22, 2019 that address TNHC's proposed phase shifting transformers. FRONTLINES has reviewed TNHC's "Phase Shifting Transformer Study 34b" and notes that it substantiates every concern that was raised in FRONTLINES' comments filed February 22, 2019, including:

- The phase shifters will not prevent the flow of non-LEAPS (i.e. "grid") power on the "closed" SCE/SDGE interconnect that TNHC seeks to construct with the LEAPS Project.
- The "closed" SCE/SDGE interconnect will impede the proper function of LEAPS.
- The "closed" SCE/SDGE interconnect is not a necessary element of the LEAPS Project.

As set forth below, TNHC's Study affirms FRONTLINES' contention that the SCE/SDGE interconnection element of the LEAPS project will carry non-LEAPS power despite the operation of phase shifting transformers. Correspondingly, neither the phase shifters nor the SCE/SDGE interconnect qualify as project "primary" facilities pursuant to the Federal Powers Act ("FPA"), and neither can be included in the LEAPS license.

THE PHASE SHIFTERS WILL NOT PREVENT THE FLOW OF NON-LEAPS ("GRID") POWER ON THE "CLOSED" SCE/SDGE INTERCONNECT.

TNHC's Study reveals that the two "closed" connections to SCE and SDGE that TNHC proposes via the SCE/SDGE interconnect portion of LEAPS will carry non-LEAPS ("grid") power in two different ways. First, the Study states that, though the phase shifters have a "broad control range", they are not "linearly continuous" and instead have "discrete phase shift positions". As a result, it takes several minutes to reposition the phase shift angles to "bring the net flows back into line with the desired output/input to LEAPS" [see page 2 of the Study]. In plain English, this means that the phase shifters are not nimble and they take time to adjust to changing grid conditions. As a result, and while the phase shifters are being adjusted, non-LEAPS ("GRID") power flows will occur because "net flows" will not match the "LEAPS input/output".

Second, the power flow analysis results reported in Attachment 2 of the Study conclusively demonstrate that non-LEAPS ("grid") power transfers will occur in a majority of the scenarios studied. The power flow analyses include ten different transmission grid operating scenarios and for each operating scenario, various LEAPS operating modes are considered (LEAPS off, LEAPS power delivery to SCE or SDGE, and LEAPS pumping from SCE or SDGE). Though the power flow results provided in Attachment 2 are incomplete¹ and disordered², they do reveal that non-LEAPS ("grid") power will flow between the SCE and SDGE systems if LEAPS includes a "closed" SCE/SDGE interconnect. As indicated in Table 1, the projected non-LEAPS power flows can be quite high (up to 44 MW).

¹ Some grid scenarios omit LEAPS operating modes. For example, the scenario involving an "N-1 Contingency" loss of the Valley-Alberhill 500 kV line under the "Low Renewables Output Case" reports the "LEAPS Pumping From the North" mode twice but does not report a "LEAPS Pumping From the South" mode. Also, the "N-1-1 Contingency" scenario under the "Low Renewables Output Case" only addresses two LEAPS operating modes (LEAPS power "off" and LEAPS power delivery to SDGE).

² The power flows result reported in Attachment 2 for the "LEAPS Delivery North" operating mode in the scenario involving an "N-1 Contingency" loss of the Serrano-Alberhill 500 kV line under the "Low Renewables Output" case is actually labeled "High Renewables Output", so it is not clear if this result was either mis-labeled or inadvertently placed in the wrong section. Similarly, four of the five LEAPS operating modes reported for the scenario involving an "N-1 Contingency" loss of the ECO-Miguel 500-kV line under the "Low Renewables Output" case are actually labeled "High Renewables Output", so it is also not clear if these results were either mis-labeled or inadvertently placed in the wrong section.

Table 1. List of Grid Operating Scenarios and LEAPS Modes that Result in Non-LEAPS Power Flows on the SCE/SDGE Interconnect.

Grid Scenario	LEAPS Operating Mode	Non-LEAPS Power Flow
SDGE High renewables No contingencies	OFF	10 MW from SCE to SDGE
	LEAPS generation to SDGE	4 MW from SCE to SDGE
SDGE High renewables N-1 contingency: Serrano-Alberhill	OFF	24 MW from SCE to SDGE
	LEAPS generation to SDGE	5 MW from SCE to SDGE
SDGE High renewables N-1 contingency: Valley -Alberhill	OFF	15 MW from SCE to SDGE
	LEAPS generation to SCE	6 MW from SDGE to SCE
	LEAPS generation to SDGE	3 MW from SCE to SDGE
	LEAPS Pumping from SCE	5 MW from SCE to SDGE
	LEAPS Pumping from SDGE	12 MW from SDGE to SCE
SDGE High renewables N-1 contingency: Eco-Miguel	OFF	29 MW to SCE from SDGE
	LEAPS generation to SCE	30 MW from SDGE to SCE
	LEAPS generation to SDGE	18 MW from SCE to SDGE
	LEAPS Pumping from SCE	15 MW from SCE to SDGE
SDGE High renewables N-1-1 contingency: Eco-Miguel followed by Ocotillo - Suncrest	OFF	15 MW from SCE to SDGE
	LEAPS generation to SDGE	18 MW from SCE to SDGE
SDGE Low renewables No contingencies	OFF	30 MW from SCE to SDGE
	LEAPS generation to SDGE	22 MW from SCE to SDGE
	LEAPS pumping from SCE	14 MW from SCE to SDGE
	LEAPS pumping from SDGE	44 MW from SDGE to SCE
SDGE Low renewables N-1 contingency: Serrano-Alberhill	OFF	20 MW from SDGE to SCE
	LEAPS generation to SDGE	10 MW to SDGE from SCE
	LEAPS pumping from SCE	10 MW from SCE to SDGE
	LEAPS "reduced" pumping from SDGE	17 MW from SDGE to SCE
SDGE Low renewables N-1 contingency: Valley - Alberhill	OFF	13 MW from SCE to SDGE
	LEAPS Pumping from SCE	15 MW from SCE to SDGE
SDGE Low renewables N-1 contingency: ECO - Miguel	OFF*	23 MW from SDGE to SCE
	LEAPS generation to SDGE *	37 MW from SCE to SDGE
	Pumping from SCE*	30 MW from SCE to SDGE

* The system flow maps for these scenarios are labeled "High Renewables", but they are included in the "low Renewables" scenario portion of Attachment 2 of the Study.

TNHC's own Study results clearly prove that the phase shifters will not prevent the flow of non-LEAPS power on the "closed" SCE/SDGE interconnect that TNHC seeks to "bootstrap" from the LEAPS project. Therefore, the FPA precludes the inclusion of either the phase shifters or the SCE/SDGE interconnect in the LEAPS license.

THE "CLOSED" SCE/SDGE INTERCONNECT IMPEDES PROPER FUNCTION OF LEAPS.

The Study identifies several scenarios in which LEAPS operation is impeded and even prevented *because* of the "closed" SCE/SDGE interconnection that TNHC seeks to bootstrap with the LEAPS license. For instance, in the "N-1-1 Contingency" scenario involving the loss of the Eco-Miguel and the Ocotillo-Suncrest 500 kV lines under the "Low Renewables Output Case", the Study states that LEAPS generation could be delivered north to SCE, but doing so is "not considered wise" [page 5]. It is not clear what "not considered wise" actually means because TNHC has failed to provide the power flow results from this scenario in the Study. However, it is clear from what is stated on page 5 of the Study that configuring LEAPS with two "closed" connections to both SCE and SDGE will prevent LEAPS power from being delivered to SCE territory during contingency events in SDGE's territory. The Study also reports that the delivery of pumping power from SDGE to recharge the LEAPS upper reservoir will be impeded by a contingency on the Serrano-Alberhill 500 kV line in SCE's territory [Page 6].

Both these scenarios reveal that it is the SCE/SDGE interconnect itself which limits or precludes the operation LEAPS under certain circumstances. On this basis alone, the Commission should roundly reject the SCE/SDGE interconnect element of TNHC's LEAPS License application because it poses an impediment to LEAPS operations and even prevents LEAPS power delivery to market in a manner that utterly controverts the FPA.

THE "CLOSED" SCE/SDGE INTERCONNECT IS NOT A NECESSARY ELEMENT OF LEAPS.

According to the Study, there are five possible LEAPS system modes:

- 1) LEAPS is turned "off"
- 2) LEAPS generation is delivered to SCE
- 3) LEAPS generation is delivered to SDGE
- 4) LEAPS pumping is served by SCE
- 5) LEAPS pumping is served by SDGE

According to these five system modes, LEAPS operations depend only on one "closed" grid connection at any given time: During power delivery to, and pumping from, SDGE, LEAPS will rely solely on the single SDGE connection, and during power delivery to, and pumping

from, SCE, LEAPS will rely solely on the single SCE connection. This *fact* substantiates FRONTLINES' contention that LEAPS operation requires only one "closed" connection to the CAISO grid, and it conclusively proves that the two "closed" grid connections to SCE and SDGE proposed by TNHC are not necessary to deliver LEAPS power to market. In fact (and as explained previously) constructing LEAPS with two "closed" SCE and SDGE connections can even impede LEAPS operation and prevent the delivery of LEAPS generation to the grid. Therefore, the Commission is statutorily barred by the FPA from approving LEAPS if it includes the two "closed" grid connections comprising the SCE/SDGE interconnect³. By extension, and because phase shifters are only relevant to the SCE/SDGE interconnect, the FPA also prevents the Commission from approving LEAPS if it includes phase shifters.

CONCLUSION

The "Phase Shifting Transformer Study 34b" filed by TNHC on February 21, 2019 provides conclusive proof that configuring LEAPS with two "closed" connections to SCE and SDGE and phase shifting transformers is contrary to every aspect of the Federal Powers Act because together these elements: 1) will cause non-LEAPS power to flow on LEAPS-licensed facilities; 2) will impede LEAPS system operations and in some instances even prevent the delivery of LEAPS power to market; and 3) are not necessary to deliver all of the LEAPS power to market because LEAPS power can be delivered via a single "closed" connection to either SCE or SDGE. Correspondingly, including the phase shifters and a "closed" SCE/SDGE interconnection in the LEAPS license is precluded by the FPA and lies beyond the Commission's hydroelectric licensing scope.

Sincerely,

/S/ Jacqueline Ayer

Jacqueline Ayer

On behalf of FRONTLINES

cc: James Fargo, FERC Office of Energy Projects [James.Fargo@ferc.gov]

³ The FPA authorizes the Commission to license only "project primary" facilities that are shown to be "necessary to get all of the project power to market" [Page B-4 of the FEIS issued by the Commission in Docket P-11858: <https://elibrary.ferc.gov/IDMWS/common/OpenNat.asp?fileID=11239494>]. Because LEAPS power can be delivered to market without two "closed" grid connection facilities in the SCE and SDGE territories, the Commission cannot find that such facilities to be project "primary" and thus warrant inclusion in the LEAPS License. More importantly, TNHC's own Study shows that configuring LEAPS with two "closed" SCE and SDGE connections actually impedes LEAPS operation and inhibits the delivery of LEAPS power to market. Thus, the inclusion of two "closed" SCE and SDGE connections in the LEAPS License is utterly contrary to the both the intent and the statutory language of the FPA.