Exhibit No.:
Issue(s): *Modifications to CCN Conditions*
Witness: *Claire M. Eubanks, PE*
Sponsoring Party: *MoPSC Staff*
Type of Exhibit: *Rebuttal Testimony*
Case No.: *EA-2023-0017*
Date Testimony Prepared: *April 19, 2023*

MISSOURI PUBLIC SERVICE COMMISSION

INDUSTRY ANALYSIS DIVISION

ENGINEERING ANALYSIS DEPARTMENT

REBUTTAL TESTIMONY

OF

CLAIRE M. EUBANKS, PE

GRAIN BELT EXPRESS, LLC

CASE NO. EA-2023-0017

Jefferson City, Missouri
April 2023

**** Denotes Highly Confidential - **Competitive** Information ****
*** Denotes Highly Confidential Information ***

TABLE OF CONTENTS OF

REBUTTAL TESTIMONY OF

CLAIRE M. EUBANKS, PE

GRAIN BELT EXPRESS, LLC

CASE NO. EA-2023-0017

REBUTTAL TESTIMONY OF

CLAIRE M. EUBANKS, PE

GRAIN BELT EXPRESS, LLC

CASE NO. EA-2023-0017

Q. Please state your name and business address.

A. My name is Claire M. Eubanks and my business address is Missouri Public Service Commission, P.O. Box 360, Jefferson City, Missouri, 65102.

Q. By whom are you employed and in what capacity?

A. I am employed by the Missouri Public Service Commission ("Commission") as the Manager of the Engineering Analysis Department of the Industry Analysis Division.

Q. Would you please describe your educational background and work experience?

A. A list of the cases in which I have filed testimony and my credentials can be found in Schedule CME-r1.

EXECUTIVE SUMMARY

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my testimony is to respond to Grain Belt Express, LLC ("GBE" or "GBX") witness Mr. Kevin Chandler regarding the proposed modifications to the original Certificate of Convenience and Necessity ("CCN") conditions and GBE witness Mr. Anthony Petti regarding High Voltage Direct Current ("HVDC") as a black-start resource and his testimony and accompanying Guidehouse Report titled *Grain Belt Express (GBX): Resilience and Reliability Values*.

MODIFICATIONS TO CCN CONDITIONS

Q. GBE is, with its application for the Tiger Connector, requesting modifications of several conditions the Commission ordered in the CCN granted in EA-2016-0358. What are the conditions?

A. There are three CCN conditions that GBE is seeking to modify:

- Financing Condition: A requirement that GBE fully finance the entire multistate project before installing transmission facilities on easement properties in Missouri;[1]
- Ordered paragraph 5: A requirement that GBE will return possession of an easement acquired by means of eminent domain if GBE does not obtain the necessary financial commitments within five years of the date such easement rights are recorded; and
- Ordered paragraph 8: Modifications to the Landowner Protocols.

Q. In addition to the modification to CCN conditions are there other modifications to the proposed project?

A. Yes. In its application, GBE proposes to move the location of the converter station from Ralls County, Missouri to Monroe County, Missouri. From the converter station, the 40-mile AC Tiger Connector will connect to two points of interconnection, the existing McCredie substation and the proposed Burns substation.[2] Staff witness Alan J. Bax discusses the modifications in more detail.

[1] Ordered paragraph 2 refers to Exhibit 206, *Conditions Agreed to by Grain Belt Express Clean Line, LLC and The Staff of the Missouri Public Service Commission*. Staff and GBE agreed to a financing condition in paragraph I.1. of Exhibit 206.
[2] The subject of Ameren Missouri's CCN request in EA-2023-0226.

Modification to Financing Condition

Q. With regards to the CCN condition to fully finance the project before installing transmission facilities on easements in Missouri, what is GBE's position in this case?

A. GBE proposes to modify the previously ordered financing condition to allow it to construct the project in two phases. In GBE witness Shashank Sane's Direct Testimony, he states that phasing allows customers in Missouri to have the benefits of southwestern Kansas solar sooner:

> Additionally, since 2019, the cost of solar development has continued to decline and the solar resources in southwestern Kansas have been shown to be highly complementary to both wind delivered across Grain Belt Express as well as solar constructed locally in Missouri. With the Amended Project, customers in Missouri will have greater access to these benefits than under the Certificated Project and be able to realize those benefits sooner through a phased construction approach.

Q. Please describe the Phases proposed in this case.

A. Phase 1 includes a HVDC line that begins in Ford County, Kansas and will interconnect at a proposed converter station in Monroe County, Missouri. Phase 1 includes the Tiger Connector, an approximately 40-mile AC line from the proposed Monroe converter station to the existing McCredie substation and future Burns substation.

Q. Does Staff support the modification to allow for construction on easements prior to the entire project being fully financed?

A. No, not at this time. In EA-2016-0358, GBE noted three major issues there may be in actually constructing the line: customers, construction costs, and financing.[3] Ensuring GBE fully finances the entire project before constructing on easements is a landowner

[3] Transcript Volume 10, pages 259-261.

protection. The condition does not limit GBE's ability to negotiate voluntary easements before being fully financed but rather requires the project to be fully financed before construction occurs. As discussed in the testimony of Staff witness Seoung Joun Won, PhD, GBE is financially capable of undertaking the project. Further, Illinois has recently approved the GBE portion of the project in Illinois. Therefore, it appears that a modification of this condition is not warranted. Staff witness Michael L. Stahlman further discusses the phased approach as it relates to the economic feasibility assumptions, and later in my testimony I discuss phasing as it relates to the Guidehouse study assumptions.

Modification to Ordered Paragraph 5

Q. GBE requests modification of the timeline for returning easements if the necessary financial commitments are not received within five years to seven, please explain this proposed modification.

A. GBE witness Chandler asserts that this change is warranted because of the statutory change from House Bill 2005 ("HB 2005"):

> For fairness and consistency, and in deference to the General Assembly, the Commission should modify the condition at Ordering Paragraph 5 to re-place "five years" with "seven years."

Q. Please explain HB 2005.

A. HB 2005 repeals and replaces certain sections related to eminent domain for certain utilities.

- Section 523.010.1.8. clarifies that the authority for an electrical corporation to condemn property for constructing electric plant subject to the granting of a CCN by the Commission shall not extend to merchant transmission lines except in certain instances. HB 2005's amendments also requires that the line has a substation or converter station located in Missouri capable of delivering an

amount of its electrical capacity to electrical customers in Missouri greater than or equal to the proportionate number of miles of line that passes through Missouri.

- Section 523.025 discusses the returning of involuntary easements by means of eminent domain when an electrical corporation does not obtain financial commitments to construct within seven years.
- Section 523.039.2. sets the valuation of agricultural or horticultural property in eminent domain proceedings as 150% of fair market value as determined by the court.
- Section 523.040.1.4. relates to the appointment of a commissioner to eminent domain proceedings who has been engaged in farming in the county where the property is situated.
- Section 523.256.(3) relates to good faith negotiations, including for condemnation of agricultural or horticultural property, for the construction of an electrical transmission line designed to transmit electricity at 345 kV or greater. HB 2005 requires that the total compensation package offered be no lower than the amount reflected in an appraisal performed by a state-licensed or state-certified appraiser multiplied by 150%.

Q. What is Staff's recommendation regarding the requested modification to Ordered paragraph 5?

A. Staff recommends the Commission reject GBE's request to modify this condition as the effective date of this statute is August 28, 2022 and GBE chose to file its application on August 24, 2022.[4] GBE is not seeking to apply all applicable aspects of HB 2005 to the Tiger Connector and Phase 2 of the project. The Commission ordered the condition

[4] *See* Section 523.010.1.8, RSMo.

contained in paragraph 5 recognizing that it protects affected landowners. The Commission in its discussion on public interest noted that "[m]any of the landowners' concerns will be addressed through carefully considered conditions placed on the CCN." At this time, the only justification presented by GBE is deference to the General Assembly. However, HB 2005 has multiple provisions that relate to ordered conditions that GBE has not sought to include. Therefore as an alternate recommendation, Staff recommends all previously ordered conditions be modified to be consistent with HB 2005. To include the provisions of HB 2005 that benefit GBE without including all provisions would be contrary to the public interest.

Q. What is the proportionate number of miles of the line that passes through the state of Missouri?

A. GBE's application indicates that the HVDC portion of the line is 800-miles with 214 miles in Missouri; however, this does not appear to include the 40-mile Tiger Connector that is contemplated to be part of Phase 1. The proportion of Missouri line-miles to the entirety of the project is 30% (254 miles/ 840 miles).

Q. What proportion of line capacity is capable of being delivered to electrical customers in the state through the proposed convertor station?

A. The total rated line capacity is 5,000 MW and the design of the convertor station is 2,500 MW; however, the design size of the convertor station is not the same as what the line is capable of delivering to electrical customers in the state. Staff witness Shawn E. Lange, PE discusses the cost of upgrades to the Ameren Missouri system to ensure delivery capability at the point of interconnection. At this point in time, GBE has a signed interconnection agreement with AECI for injection rights of approximately 1,000 MW at a point of interconnection at the McCredie substation (20% of the line capacity). Additionally, GBE has requested injection

rights to enable the interconnection of 1,500 MW into the Midcontinent Independent System Operator, Inc. ("MISO") system. If MISO approves the request with 1,500 MW of injection rights, the proportion of the combined injection rights into AECI and MISO would be greater than the proportion of Missouri line-miles.

Q. Please provide the language of the previously ordered conditions that are related to HB 2005.

A. The previously ordered CCN conditions that relate to HB 2005 include:

> If Grain Belt Express Clean Line LLC acquires any involuntary easement in Missouri by means of eminent domain proceedings ("easement") and does not obtain the financial commitments referred to in Section I(1) and Section I(1)(a) of the Conditions Agreed to by Grain Belt Express and Staff (Exhibit 206) within five years of the date that such easement rights are recorded with the appropriate county recorder of deeds, Grain Belt Express Clean Line LLC shall return possession of the easement to the fee simple title holder ("title holder") within 60 days and cause the dissolution of the easement to be recorded with the county recorder of deeds. In the event of such a return of the easement to the title holder, no reimbursement of any payment made by Grain Belt Express Clean Line LLC to the title holder shall be due.[5]
>
> Grain Belt Express Clean Line LLC shall comply with the Missouri Landowner Protocol, including, but not limited to, a code of conduct and the Missouri Agricultural Mitigation Impact Protocol, and incorporate the terms and obligations of the Missouri Landowner Protocol into any easement agreements with Missouri landowners.[6]
>
> Grain Belt Express Clean Line LLC shall construct the proposed Missouri converter station to be capable of the actual delivery of 500 MW of wind power to the converter station.[7]

Q. Please provide Staff's alternative recommendation to apply HB 2005 modifications to all previously ordered CCN conditions.

[5] Commission Report and Order on Remand page 51, paragraph 5.
[6] Commission Report and Order on Remand page 52, paragraph 8.
[7] Commission Report and Order on Remand page 53, paragraph 10.

A. Staff recommends as an alternate to GBE's recommendation to modify the relevant conditions as follows:

> If Grain Belt Express Clean Line LLC acquires any involuntary easement in Missouri by means of eminent domain proceedings ("easement") and does not obtain the financial commitments referred to in Section I(1) and Section I(1)(a) of the Conditions Agreed to by Grain Belt Express and Staff (Exhibit 206) within ~~**five**~~ **seven** years of the date that such easement rights are recorded with the appropriate county recorder of deeds, Grain Belt Express Clean Line LLC shall return possession of the easement to the fee simple title holder ("title holder") within 60 days and cause the dissolution of the easement to be recorded with the county recorder of deeds. In the event of such a return of the easement to the title holder, no reimbursement of any payment made by Grain Belt Express Clean Line LLC to the title holder shall be due.
>
> Grain Belt Express Clean Line LLC shall comply with the Missouri Landowner Protocol, including, but not limited to, a code of conduct and the Missouri Agricultural Mitigation Impact Protocol, and incorporate the terms and obligations of the Missouri Landowner Protocol **as revised to incorporate House Bill 2005** into any all easement agreements with Missouri landowners.
>
> Grain Belt Express Clean Line LLC shall construct the proposed Missouri converter station to be capable of ~~500 MW the converter station~~ **delivering an amount of its electrical capacity to electrical customers in Missouri that is greater than or equal to the proportionate number of miles of the line that pass through Missouri**.

Modification to Ordered Paragraph 8

Q. Mr. Chandler recommends modifications to the Missouri Landowner Protocols, a condition from the existing CCN. Please explain the proposed modifications.

A. Mr. Chandler included a redline version of the Missouri Landowner Protocols in his Direct Testimony as Schedule KC-5.[8] The major change is to clarify the structure of easement payments for the AC Tiger Connector as compared to the HVDC portion of the

[8] Filed in EFIS on August 31, 2022 (EFIS Item No. 24).

project. As discussed above, GBE proposes the easement payments be structured differently for the Tiger Connector such that the Tiger Connector easements would be 150% of fair market value as contemplated in HB 2005, with agricultural impact payments but no structure payments. In comparison, easements for the HVDC portion of the project would receive 110% fair market value, agricultural impact payments, and structure payments (annual and one-time payments).

Q. On page 15, lines 18-21, Mr. Chandler argues that the Tiger Connector will primarily utilize monopoles whereas the HVDC line will primarily use lattice structures; therefore, the structure payment is more valuable for the HVDC landowners. Do you agree?

A. No. While in a literal sense the structure payments for monopole structures are less than the lattice structures, the relevant question for the Commission to consider is whether the 150% easement payment makes up for the removal the structure payment. GBE's proposed revisions to the Missouri Landowner Protocols will result in Tiger Connector landowners not receiving payments for structures (regardless as to whether the structure is lattice or monopole). Currently landowners have the option of selecting either a one-time payment or annual payment depending on the structure type:

Type of Structure	One-Time Payment	Annual Payment
Monopole or Lattice Mast Structure	$6,000	$500
Lattice Structure	$18,000	$1,500

The structure payments can be significant portion of the total compensation package for individual landowners. The Commission considered landowner compensation in EA-2016-0358 in its discussion on public interest.[9]

[9] Report and Order on Remand, page 46.

Q. Does Staff have any other concerns with the proposal regarding the compensation package for Tiger Connector landowners?

A. Yes. On page 14, lines 11-17, Mr. Chandler discusses an option for landowners to receive the easement payment as an annual payment; however, that option is not included in the existing Landowner Protocols or the proposed revisions in KC-5.

GUIDEHOUSE REPORT

Q. On page 6, lines 10-19, Mr. Petti describes the Guidehouse report which is purported to study the value the project could reasonably generate to the benefit of electric utility customers. What specific benefits does Mr. Petti claim the project can bring?

A. Mr. Petti claims the following benefits of the project:

- Mitigation of high energy prices during extreme weather events;
- Avoided loss of load benefits;
- Reduced local resource adequacy procurement obligations;
- Hedges against future capacity procurement needs;
- Influence Planning Resource Auction prices;
- Value of system restoration capabilities; and
- HVDC resource reliability.

Q. How did Guidehouse calculate the value of mitigating high energy prices during extreme weather events?

A. Guidehouse assumed certain transfer capabilities between regions and utilized the estimation of energy savings per additional GW of transmission capacity as provided below:[10]

[10] Staff notes there appears to be errors in the table as the AECI-SPP transfer capability is listed as both a West-East and East-West flow.

Table 5: Project Injection Capacities

Total Line Rating	Flow Direction	Origin ISO/RTO	Receiving ISO/RTO	Capacity (GW)
5GW	West-East	SPP	MISO	1.50
	West-East	SPP	AECI	1.00
	West-East	SPP	PJM	2.50
	West-East	MISO	PJM	1.50
	West-East	AECI	SPP	1.00
	East-West	PJM	MISO	1.50
	East-West	PJM	AECI	1.00
	East-West	MISO	SPP	1.50
	East-West	AECI	SPP	1.00
	East-West	PJM	SPP	2.50

Next, during certain extreme weather events, Guidehouse utilized publically reported values from Grid Services, LLC to calculate the following assumed savings from certain storm events:

Table 6: Incremental Value of Project Transfer Capabilities During Recent Storm Events

Extreme Weather Event (Interregional Transfers)	Savings per additional GW transmission capacity ($M)[11] [A]	GBX Injection Capacity (GW) [B]	GBX Savings ($M) [A] x [B] = [C]
Winter Storm Uri, February 2021			
PJM to SPP South	$129.00	2.50	$322.5
Northeast "Bomb Cyclone" cold snap, December 2017-January 2018			
MISO to PJM	$38.00	1.50	$57.00
Northeast "polar vortex", January 2014			
MISO to PJM	$17.00	1.50	$25.50
Midwest "polar vortex", January 30, 2019-February 1, 2019			
PJM to MISO / MISO to PJM	$2.40	Not Applicable	$2.40[12]
	Total Savings Generated by GBX		**$407.40**

Q. Does Staff agree with the savings presented in table 5 above?

A. No. Staff is concerned that scenarios presented above assume the project will be operated bi-directionally. For example, multiple scenarios are assuming withdraws from MISO yet MISO has stated:

> Invenergy's proposal in MISO is centered on Injection Rights and is for the unidirectional flow only. Essentially, Invenergy has only requested to operate the GBX Line as a long generator lead line.[11]

In other words, GBE, a wholly-owned subsidiary of Invenergy Transmission LLC ("Invenergy"), has assumed bidirectional flows throughout its application and that assumption has been carried through to the Guidehouse study but is inconsistent to its requests to MISO. Without the capability for bidirectional flows, the values relied on are overstated and thus over-inflates the potential savings. Further, GBE states in response to Staff Data Request No. 0054 in part that:

> Although system capacity from eastern points to western points on the Grain Belt assets has not yet been requested, Grain Belt is planning to undertake the incremental investment to allow for bi-directional operation when the demand exists in the future. Generally, opportunities could include scenarios where excess generation within the MISO and/or PJM markets could be moved across the Grain Belt assets to benefit the SPP market. This would include times when the electric system is stressed due to weather extremes (high summer temperatures or significant winter storms like Uri or Elliott). During these times of higher electric system stress, energy can be shared from one or more markets to help the system in need to avoid higher system costs or load shedding if the emergency is extreme.

[11] EL-22-0083 Answer of the Midcontinent Independent System Operator, Inc. page 6.

As GBE explains above, it has not requested or undertaken the incremental investment needed to allow for bi-directional operations. Additionally, Invenergy has requested FERC investigate ways to allow interregional merchant HVDC to offer a reliability product as a means to compensate interregional merchant HVDC for reliability benefits.[12] A future reliability product could potentially provide compensation to GBE but could also present costs to Missouri customers. While a reliability product would require approval by FERC, the Commission should be aware that the project would no longer follow a shipper's pay model.

Q. On pages 19-21, Guidehouse utilizes MISO's Value of Lost Load (VOLL) calculation methodology to calculate the potential benefits of the Project to MISO load resource zones (LRZ) 4-7. What observations can Staff provide regarding these assumptions?

A. While Staff does not have major concerns with the MISO's VOLL calculation methodology and assumptions, or the assumption that the Project will provide benefits to the MISO LRZs, Staff is concerned that the Guidehouse study does not consider the benefits of already approved MISO long-range transmission plant (LRTP) projects. Staff witness Shawn E. Lange, PE further discusses the MISO LRTP in his rebuttal testimony.

Q. On page 22, the Guidehouse Study discusses deferred or mitigated generation capacity investment. Do the expected benefits presented contemplate phasing?

A. No. The Guidehouse Study states that the resource adequacy needs of regions can be met by either generation within the region or import capability into the region. However, the values provided in the Guidehouse Study assumes full construction of the project rather than a phased approach as is currently before the Commission (i.e. import capability into PJM). Further, at this time, the only known contract that would result in injection into Missouri is the

[12] AD-22-13-000. *Request for Technical Conference of Invenergy Transmission LLC.*

200 MW MJMEUC contract. *** [redacted] *** **** [redacted] ****

Q. On page 23, the Guidehouse Study discusses the Project as a hedge against future capacity procurement needs noting the acceleration of coal-plant retirements due to economics. Are the examples of coal-plant retirements in Missouri related to economics?

A. No. The upcoming Missouri planned retirements include an end-of-life retirement and in the case of Rush Island, a retirement stemming from environmental litigation. The approval of this project does not necessarily hedge against future capacity needs for Missouri because there is no requirement that utilities in Missouri procure future capacity from the project. In other words, the Commission may in this case approve the project and in other cases approve the capacity additions of its rate-regulated utilities.

Q. On page 30, the Guidehouse Study discusses the assumption the project would alleviate the approximately 1,230 MW capacity shortfall driving the observed 2022/2023 auction prices in MISO. Does Staff agree it is a reasonable assumption?

A. Only if the project is actually delivering capacity from resources other than solely wind and solar. Ultimately, alleviating the capacity shortfall depends on the generating resources that are interconnected onto the project. It is Staff's understanding that GBX will not

be able to limit interconnections to wind and solar only. However, according to the Application "[t]he primary objective of the Amended Project is the same as that of the Certificated Project: to transport … high-capacity factor wind and solar resources, to the electricity markets in Missouri and Illinois and other states located within or adjacent to the MISO and PJM grids."[13]

MISO, for example, accredits capacity by resource type:

Resource type	Assumed accreditation	Impacted Seasonally
Nuclear	95%	No
Coal	90%	Small
Gas	90%	Small
Battery	87.5%	No
Solar	35%	Yes
Wind	16.6%	Yes

While in a general sense, the wind resources available in Kansas may have a higher capacity factor than those in the east, the accredited capacity of wind and solar is lower than other resources. In other words, either storage or thermal resources are still needed to alleviate the capacity shortfall driving the 2022/2023 PRA results.

Further, there are other drivers to the higher 2022/2023 PRA results. For example, Ameren Missouri discussed the impact its 8-month long Callaway outage had on its ability to qualify capacity in the PRA in a recent presentation to the Commission and that qualified capacity would be lower for the next two-years.[14]

Q. On page 34, the Guidehouse Study discusses the value of system restoration capabilities. Are additional steps needed to enable system restoration capabilities?

[13] Application in EA-2023-0017 Paragraph 41.
[14] EO-2022-0215 August 17, 2022 Transcript page 7, line 23 through page 8, line 13.

A. Yes. I provide additional context regarding system restoration capabilities in the next section of my testimony.

Q. Is Staff aware of any additional studies completed on Invenergy's behalf?

A. Yes. On April 3, 2023, Invenergy filed supplemental information with FERC in its complaint against MISO (EL22-83-000). Staff has requested the non-public version of the submission. ICF's model was not to demonstrate the reliability impacts of the project on MISO's Reference Case[15] but rather to review the modeling that led to MISO's Tranche 1 portfolio and overlay the impact from the GBX project. Staff witness Shawn E. Lange, PE discusses MISO's Long Range Transmission Plan and Tranche 1 projects.

Q. Overall what is Staff's recommendation regarding the Guidehouse Study?

A. Staff recommends the Commission not rely on the specific values in the Guidehouse Study in any Report and Order issued in this case other than perhaps to guide directionally the general benefits of the project.

BLACK START CAPABILITY

Q. What is a black-start resource?

A. Typically, a black start resource is a generating unit that can restore electricity to the grid without an outside electrical supply. Individual generating units are started individually and gradually to re-form an interconnected system.

Q. On page 11, lines 16-19 of Mr. Petti's Direct Testimony he presents the concept that the Voltage Source Converters ("VSC") proposed for the project, as presented in this case,

[15] Affidavit of Himali Parmar in EL22-83-000, paragraph 57.

have the potential for use as a black-start resource. Is the use of the Project as a black-start resource a guarantee?

A. No. There are additional studies that will be required for the VSCs to be designated as a black-start resource. The project will need to be integrated into a Transmission Operator's ("TO") system restoration plan and approved by its Reliability Coordinator. Each TO would need to perform studies to verify the project is capable of meeting the relevant NERC standards. GBE would also be required to enter into a black-start resource agreement with the relevant TO. Additional detail on the process is contained in GBE's response to Staff Data Request No. 0043, attached as Schedule CME-d2.

Q. Should the Commission rely on the possibility that the project could be designated as a system restoration resource in its finding on the Tartan criteria of need?

A. No. At this time, there is no indication that the project will be designated as such for any TO in Missouri.

Q. Should the Commission order any conditions related to the project being designated as a system restoration resource in a CCN grated in this case?

A. Yes. Staff recommends the Commission order GBE to provide notice to Staff that the project has been designated as a system restoration resource if that designation occurs in the future.

Q. Please summarize the recommendations from your testimony above.

A. Staff recommends that the Commission reject GBE's request to apply portions of HB 2005 to the Project. Alternatively, Staff recommends modifying three previously ordered conditions to align with House Bill 2005:

> If Grain Belt Express Clean Line LLC acquires any involuntary easement in Missouri by means of eminent domain proceedings

("easement") and does not obtain the financial commitments referred to in Section I(1) and Section I(1)(a) of the Conditions Agreed to by Grain Belt Express and Staff (Exhibit 206) within ~~**five**~~ **seven** years of the date that such easement rights are recorded with the appropriate county recorder of deeds, Grain Belt Express Clean Line LLC shall return possession of the easement to the fee simple title holder ("title holder") within 60 days and cause the dissolution of the easement to be recorded with the county recorder of deeds. In the event of such a return of the easement to the title holder, no reimbursement of any payment made by Grain Belt Express Clean Line LLC to the title holder shall be due.

Grain Belt Express Clean Line LLC shall comply with the Missouri Landowner Protocol, including, but not limited to, a code of conduct and the Missouri Agricultural Mitigation Impact Protocol, and incorporate the terms and obligations of the Missouri Landowner Protocol **as revised to incorporate House Bill 2005** into any all easement agreements with Missouri landowners.

Grain Belt Express Clean Line LLC shall construct the proposed Missouri converter station to be capable of ~~500 MW the converter station~~ **delivering an amount of its electrical capacity to electrical customers in Missouri that is greater than or equal to the proportionate number of miles of the line that pass through Missouri**.

Staff recommends the Commission not rely on the specific values in the Guidehouse Study in any Report and Order issued in this case other than perhaps to guide directionally the general benefits of the project.

Finally, Staff recommends the Commission include a new condition to require GBE to provide notice to Staff that the project has been designated as a system restoration resource if that designation occurs in the future.

Q. Does this conclude your rebuttal testimony?

A. Yes it does.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of the Application of Grain Belt Express LLC for an Amendment to its Certificate of Convenience and Necessity Authorizing it to Construct, Own, Operate, Control, Manage, and Maintain a High Voltage, Direct Current Transmission Line and Associated Converter Station	)))))))	Case No. EA-2023-0017

AFFIDAVIT OF CLAIRE M. EUBANKS, PE

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW CLAIRE M. EUBANKS, PE and on her oath declares that she is of sound mind and lawful age; that she contributed to the foregoing *Rebuttal Testimony of Claire M. Eubanks, PE*; and that the same is true and correct according to her best knowledge and belief.

Further the Affiant sayeth not.

Claire M Eubanks
CLAIRE M. EUBANKS, PE

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 19th day of April 2023.

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: April 04, 2025
Commission Number: 12412070

D Suzie Mankin
Notary Public

CLAIRE M. EUBANKS, PE

PRESENT POSITION:

I am the Manager of the Engineering Analysis Department, Industry Analysis Division of the Missouri Public Service Commission.

EDUCATIONAL BACKGROUND AND WORK EXPERIENCE:

I received my Bachelor of Science degree in Environmental Engineering from the University of Missouri – Rolla, now Missouri University of Science and Technology, in May 2006. I am a licensed professional engineer in the states of Missouri and Arkansas. Immediately after graduating from UMR, I began my career with Aquaterra Environmental Solutions, Inc., now SCS Aquaterra, an engineering consulting firm based in Overland Park, Kansas. During my time with Aquaterra, I worked on various engineering projects related to the design, construction oversight, and environmental compliance of solid waste landfills. I began my employment with the Commission in November 2012 and was promoted to my current position in April 2020.

Currently, I am the co-chair of the NARUC Staff subcommittee on Electric Reliability & Resilience.

CASE HISTORY:

Case Number	Utility	Type	Issue
EA-2012-0281	Ameren	Rebuttal	Certificate of Convenience and Necessity
EC-2013-0379 EC-2013-0380	KCP&L KCP&L GMO	Rebuttal	RES Compliance
EO-2013-0458	Empire	Memorandum	RES Compliance Plan & Report
EO-2013-0462	Ameren	Memorandum	RES Compliance Report
EO-2013-0503	Ameren	Memorandum	RES Compliance Plan
EO-2013-0504	KCPL	Memorandum	RES Compliance Plan & Report
EO-2013-0505	GMO	Memorandum	RES Compliance Plan & Report
ET-2014-0059	KCP&L GMO	Rebuttal	RES Retail Rate Impact
ET-2014-0071	KCP&L	Rebuttal	RES Retail Rate Impact
ET-2014-0085	Ameren	Rebuttal	RES Retail Rate Impact
ER-2014-0258	Ameren	Cost of Service Report, Surrebuttal	RES, In-Service

Case Number	Utility	Type	Issue
EO-2014-0151	KCP&L GMO	Memorandum	RESRAM
EO-2014-0357	Electric	Memorandum	Solar Rebates Payments
EO-2014-0287	KCPL	Memorandum	RES Compliance Plan
EO-2014-0288	GMO	Memorandum	RES Compliance Plan
EO-2014-0289	KCPL	Memorandum	RES Compliance Report
EO-2014-0290	GMO	Memorandum	RES Compliance Plan
ER-2014-0370	KCP&L	Cost of Service Report	RES
EX-2014-0352	N/A	Live Comments	RES rulemaking
EC-2015-0155	GMO	Memorandum	Solar Rebate Complaint
EO-2015-0260	Empire	Memorandum	RES Compliance Plan & Report
EO-2015-0263	KCPL	Memorandum	RES Compliance Report
EO-2015-0264	GMO	Memorandum	RES Compliance Report
EO-2015-0265	KCPL	Memorandum	RES Compliance Plan
EO-2015-0266	GMO	Memorandum	RES Compliance Plan
EO-2015-0267	Ameren	Memorandum	RES Compliance Plan & Report
EO-2015-0252	GMO	Staff Report	Integrated Resource Plan – Renewable Energy Standard
EO-2015-0254	KCPL	Staff Report	Integrated Resource Plan – Renewable Energy Standard
EA-2015-0256	KCP&L GMO	Live Testimony	Greenwood Solar CCN
EO-2015-0279	Empire	Memorandum	RES Compliance Plan & Report
ET-2016-0185	KCP&L	Memorandum	Solar Rebate Tariff Suspension
EO-2016-0280	KCPL	Memorandum	RES Compliance Report
EO-2016-0281	GMO	Memorandum	RES Compliance Report
EO-2016-0282	KCPL	Memorandum	RES Compliance Plan
EO-2016-0283	GMO	Memorandum	RES Compliance Plan
EO-2016-0284	Ameren	Memorandum	RES Compliance Plan & Report
ER-2016-0023	Empire	Report	RES
ER-2016-0156	KCP&L GMO	Rebuttal	RESRAM Prudence Review

Case Number	Utility	Type	Issue
EA-2016-0208	Ameren	Rebuttal	Certificate of Convenience and Necessity
ER-2016-0285	KCPL	Cost of Service Report	In-Service, Greenwood Solar
ER-2016-0179	Ameren	Rebuttal	In-Service, Labadie Landfill
EW-2017-0245	Electric	Report	Working Case on Emerging Issues in Utility Regulation
EO-2017-0268	Ameren	Memorandum	RES Compliance Plan & Report
EO-2017-0269	KCPL	Memorandum	RES Compliance Report
EO-2017-0271	KCPL	Memorandum	RES Compliance Plan
GR-2017-0215 & GR-2017-0216	Spire	Rebuttal & Surrebuttal	CHP for Critical Infrastructure
GR-2018-0013	Liberty Utilities (Midstates Natural Gas)	Rebuttal	CHP Outreach Initiative for Critical Infrastructure Resiliency
EO-2018-0287	Ameren	Memorandum	RES Compliance Plan & Report
EO-2018-0288	KCPL	Memorandum	RES Compliance Report
EO-2018-0290	KCPL	Memorandum	RES Compliance Plan
EA-2016-0207	Ameren	Memorandum	Certificate of Convenience and Necessity
ER-2018-0146	GMO	Cost of Service Report	RESRAM Prudence Review
ER-2018-0145 ER-2018-0146	KCPL GMO	Class Cost of Service Report, Rebuttal	Solar Subscription Pilot Rider, Standby Service Rider
EA-2018-0202	Ameren	Staff Report	Certificate of Convenience and Necessity
EE-2019-0076	Ameren	Memorandum	Variance Request – Reliability Reporting
EA-2019-0021	Ameren	Staff Report	Certificate of Convenience and Necessity
EA-2019-0010	Empire	Staff Report	Certificate of Convenience and Necessity
EX-2019-0050	N/A	Live Comments	Renewable Energy Standard

Case Number	Utility	Type	Issue
EO-2019-0315	KCPL	Memorandum in Response to Commission Questions	Renewable Energy Standard
EO-2019-0316	GMO	Memorandum	Renewable Energy Standard
EO-2019-0317	KCPL	Memorandum in Response to Commission Questions	Renewable Energy Standard
EO-2019-0318	GMO	Memorandum	Renewable Energy Standard
ER-2019-0335	Ameren	Cost of Service Report	Renewable Energy Standard, In-Service Criteria
EA-2019-0371	Ameren	Staff Report	Certificate of Convenience and Necessity
EO-2020-0329	Evergy Missouri Metro	Memorandum	Renewable Energy Standard
EO-2020-0330	Evergy Missouri West	Memorandum	Renewable Energy Standard
EE-2021-0237	Evergy Missouri Metro	Memorandum	Cogeneration Tariff
EE-2021-0238	Evergy Missouri West	Memorandum	Cogeneration Tariff
EE-2021-0180	Ameren Missouri	Memorandum	Electric Meter Variance
ET-2021-0151 and 0269	Evergy	Memorandum, Rebuttal Report	Transportation Electrification
AO-2021-0264	Various	Staff Report	February 2021 Cold Weather Event
EW-2021-0104	n/a	Staff Report	RTO Membership
EW-2021-0077	n/a	Staff Report	FERC Order 2222
EO-2021-0339	Evergy Missouri West	Memorandum	Territorial Agreement
GR-2021-0108	Spire	Rebuttal	Automated Meter Reading Opt-out Tariff
EA-2021-0087	ATXI	Rebuttal Report	Certificate of Convenience and Necessity
ER-2021-0240	Ameren Missouri	Cost of Service Report Rebuttal	In-Service Bat Mitigation

Case Number	Utility	Type	Issue
ER-2021-0312	Empire	Cost of Service Report	Construction Audit – Engineering Review, In-service
EO-2022-0061	Evergy Missouri West	Surrebuttal	Special Rate/ Renewable Energy Standard
EA-2022-0099	ATXI	Rebuttal	Certificate of Convenience and Necessity
ER-2022-0129	Evergy Missouri West	Direct Rebuttal	Advanced Metering Infrastructure, Reliability, Transmission & Distribution Investment, PISA reporting, Misc. Tariff issues
ER-2022-0130	Evergy Missouri Metro	Direct Rebuttal Surrebuttal/True-Up	Advanced Metering Infrastructure, Reliability, Transmission & Distribution Investment, PISA reporting, Misc. Tariff issues
EE-2022-0329	Ameren Missouri	Memorandum	Variance Request
GR-2022-0179	Spire Missouri	Direct Rebuttal	Metering Infrastructure
ER-2022-0337	Ameren Missouri	Direct, Rebuttal, Surrebuttal/True-Up Direct, True-up Rebuttal	Rush Island High Prairie Smart Energy Plan
EA-2022-0328	Evergy Missouri West	Rebuttal	Certificate of Convenience and Necessity

Missouri Public Service Commission
Data Request

Data Request No.:	0043
Company Name:	Grain Belt Express, LLC-Investor (Electric)
Case/Tracking No.:	EA-2023-0017
Date Requested:	2/27/2023
Issue:	General Information & Miscellaneous - RTO Issues
Requested From:	Andrew Schulte
Requested By:	Kevin Thompson
Brief Description:	Black Start Resource

Description: Refer to Page 11, lines 16-19 of Anthony Petti's Direct Testimony discussing the Voltage Source Converter type HVDC converters and the potential for use as a black-start resource. Please describe and document the process for designating the Project as a system restoration tool for SPP, AECI, MISO, and PJM. Please address each system separately. Requested by: Claire Eubanks (Claire.Eubanks@psc.mo.gov)

Due Date: 3/19/2023

RESPONSE:

In order for the Project to be designated a blackstart resource it must be integrated into a Transmission Operator's (TO) system restoration plan and approved by its Reliability Coordinator. Each respective TO develops a system restoration plan in accordance with the requirements set forth in the North American Electric Reliability Corporation (NERC) Emergency and Preparedness and Operations (EOP) Standard 005-3. The purpose of a TO's system restoration plan is to restore service following a disturbance(s) to the Bulk Electric System (BES) and the use of blackstart resources is required to restore a shutdown area.[1] EOP-005-3 outlines universal requirements, measures, and compliance standards to be included in the restoration plans of TO's located within the territories of SPP, AECI, MISO and PJM. The scope of the Project as proposed meets NERC's definition of BES asset (100kV or greater) and the integration of the Project into the SPP, AECI, MISO and PJM systems will prompt regional TOs to consider the impacts of the Project with respect to the following sections of EOP-005-3:

(1) Requirement 3: Each Transmission Operator shall review its restoration plan and submit it to its Reliability Coordinator annually on a mutually agreed, predetermined schedule

(2) Requirement 4.2: Each Transmission Operator shall submit its revised restoration plan to its Reliability Coordinator for approval, when the revision would change its ability to implement its restoration plan. . . prior to implementing a planned permanent BES modification subject to its Reliability Coordinator approval requirements per EOP-006.

[1] NERC EOP-005-3. https://www.nerc.com/pa/Stand/Reliability%20Standards/EOP-005-3.pdf

These mandated annual system restoration plan reviews require TOs to take planned BES modifications, including the Project, into account and determine if the modification will impact (either positively or negatively) the ability to implement an existing system restoration plan. If this annual review does identify the Project as having system restoration value, operating processes and criteria would be developed through formal engineering studies and a blackstart resource agreement or arrangement would be established. With respect to engineering studies, each TO would need to perform steady state and dynamic simulations (documented with power flow outputs) to verify the Project is capable of closing to a dead bus and meets all three requirements of section R6 of EOP-005-03.

6.1 Capability of Blackstart Resources to meet the Real and Reactive Power requirements of the Cranking Paths and the dynamic capability to supply initial Loads.
6.2 The location and magnitude of Loads required to control voltages and frequency within acceptable operating limits.
6.3 The capability of generating resources required to control voltages and frequency within acceptable operating limits.

Assuming the engineering studies confirm the Project's system restoration value and recommend that the Project's planned VSC HVDC converter stations be incorporated into a revised restoration plan, the next step in the process of designating the Project as a system restoration resource is to for the Project owner to enter into a blackstart resource agreement with the respective TO which would include terms of service including, but not limited to, testing requirements, operations protocols, and training programs.

Notwithstanding the above, several systems have adopted unique system restoration and blackstart conditions as part of their respective tariffs. Any unique system specific blackstart process requirements would also be applicable to the Project in order for it to be designated as a system restoration resource. These system specific requirements are summarized in Table 1. If met, the Project would be designated a blackstart resource and added to a system(s) emergency operations plan.

Table 1: Blackstart Requirements and Conditions by ISO/RTO

System	Requirement, Measure or Compliance Standard
SPP[2] [3]	No specific blackstart requirements, measures or compliance standards beyond mentions in Emergency Operating Plans and GIA/GIP proforma agreements which note that "System restoration and black start shall be considered Emergency Conditions; provided, that Interconnection Customer is not obligated by the Interim Generator Interconnection Agreement, to possess black start capability."
AECI[4]	No specific blackstart requirements, measures or compliance standards publicly published by AECI. However, a proforma Generator Interconnection Agreement and Generator Interconnection Procedures indicate that generators are not obligated to provide blackstart service but should assist if available.
MISO[5]	Meet Blackstart Service requirements outlined in MISO Business Practice Manual (BPM) 022 – Blackstart Service which include, but are not limited to: • Blackstart unit must meet requirements of Schedule 33 of MISO Tariff which include meeting NERC blackstart criteria (EOP-005-03), inclusion into a TO system restoration plan, execute a minimum 3 year blackstart agreement term and perform maintain periodic testing. • A Blackstart Unit Owner must be a Tariff Customer in order to qualify for payments under the Tariff • Per Schedule 33, file to establish or revise its annual cost-based revenue requirement for the provision of Blackstart Service
PJM[6]	The Project must meet Black Start Service requirements outlined in PJM Open Access Transmission Tariff (OATT) Business Practice Manual (BPM) 022 – Blackstart Service which include, but are not limited to: • "Black Start Service" shall mean the capability of generating units to start without an outside electrical supply or the demonstrated ability of a generating unit with a high operating factor (subject to Transmission

[2] SPP Emergency Operations Plan, September 27, 2022. https://www.spp.org/documents/67848/spp%20ba%20emergency%20operating%20plan%20v8.1.pdsf

[3] SPP Attachment V. GENERATOR INTERCONNECTION PROCEDURES (GIP) including GENERATOR INTERCONNECTION AGREEMENT (GIA). December 1 2020. https://opsportal.spp.org/documents/studies/SPP%20Tariff%20Attachment%20V%20Generator%20Interconnection%20Procedures.pdf

[4] AECI GIP. February 2 2009. http://www.oatioasis.com/AECI/AECIdocs/AECI_Generation_Interconnection_Procedure_(2009-06-08).pdf

[5] MISO BPM 022. *Blackstart Service.* March 07, 2023.

[6] PJM OATT. https://agreements.pjm.com/oatt/4406. Schedule 6A.

	Provider concurrence) to automatically remain operating at reduced levels when disconnected from the grid. • Black Start Unit must be capable of maintaining frequency and voltage under varying load. • Black Start Unit must be able to maintain rated output for a period of time identified by each Transmission Owner's system restoration requirements, in conjunction with the Transmission Provider. • Requests for new Black Start Service revenue requirements must be submitted to the Market Monitoring Unit for review and analysis, with supporting data and documentation, pursuant to Tariff, Attachment M–Appendix, section III and the PJM Manuals

VERIFICATION OF RESPONSE

The response provided to the foregoing Data Request has been collected from various sources at Grain Belt Express, LLC and affiliated companies, and are true and accurate to the best of my knowledge and belief.

Signed: */s/ Anthony Petti*
Anthony Petti
Guidehouse, Inc.