Confidential Application for Special Temporary Authorization
pursuant to 5 USC § 552(b)(4) and 47 CFR §§ 0.457(d)(ii)
Submitted by:
Global Energy Transmission Corporation (FRN 0028004729)
Confirmation No. EL41170
File No. 1985-EX-ST-2018
November 28, 2018

Important Note: This STA is needed no later than January 4, 2019

Background and Summary. The instant application for Special Temporary Authorization ("Application") follows the confidential October 19, 2018 Knowledge Database ("KDB") Inquiry filed by Global Energy Transmission Corporation ("GET"),[1] a copy of which is attached as Exhibit A. As noted in the KDB Inquiry, GET has developed an M2M distant wireless power transfer system ("System"), which is intended to enable charging "on the fly" and would incorporate transmission technology that would:

- operate within the 100 kHz frequency band;
- operate at 15 output kilowatts;
- incorporate coupling for the purpose of keeping signal emissions low; and
- travel over distances of 10 meters or more.

We note that GET's KDB Inquiry includes detailed technical information that may be relevant to this Application.

In reply to GET's KDB Inquiry, OET stated:

> we think that, as proposed, the system(s) will not comply with our rules. It may be necessary to collect more data and be more specific on planned Implementations to determine [whether] a waiver application may be appropriate. We also encourage that you consider an experimental license to specifically collect more data to identify the waiver requirements.[2]

---

[1] Letter to Julius Knapp, Chief, FCC Office of Engineering and Technology, from Angela E. Giancarlo, counsel for Global Energy Transmission Corp, regarding Knowledge Database Submission from Global Energy Transmission Corp. and confidential treatment of same pursuant to 5 USC § 552(b)(4) and 47 CFR §§ 0.457(d)(ii)47580 (dated Oct. 19, 2018) ("KDB Inquiry").

[2] Email to Angela E. Giancarlo from OETECH@fcc.gov responding to KDB Inquiry; Tracking No. 832011 (dated Oct. 30, 2018).

Accordingly, GET is grateful for OET's timely consideration of the Application and stands ready to address questions or provide additional information as necessary. In addition to reviewing the technical aspects, GET respectfully requests that reviewers view this video, which shows the System powering a UAV: http://getcorp.com/technology-overview/#tab-542.

Respectfully submitted,

/s/

Angela E. Giancarlo
agiancarlo@mayerbrown.com
202-263-3305
Counsel for GET Corporation

November 28, 2018

Exhibit A

Mayer Brown LLP
1999 K Street, N.W.
Washington, DC 20006-1101
United States of America

T: +1 202 263 3000
F: +1 202 263 3300
www.mayerbrown.com

Angela Giancarlo
T: +1 202 263 3305
AGiancarlo@mayerbrown.com

October 19, 2018

Mr. Julius Knapp
Chief, Office of Engineering and Technology
Federal Communications Commission
445 Twelfth Street, NW
Washington, DC 20554

RE: Knowledge Database Submission from Global Energy Transmission Corporation—Afforded Confidential Treatment pursuant to 5 USC § 552(b)(4) and 47 CFR §§ 0.457(d)(ii)47580

Dear Mr. Knapp:

The attached Knowledge Database ("KDB") Submission submitted by Global Energy Transmission Corporation ("GET" or "the Company") constitutes material relating to an equipment authorization, which the Commission does not routinely make available for public inspection.[1] The Submission falls squarely under Section 0.457(d)(ii) of the Commission's rules,[2] which provides that "[a]pplications for equipment authorizations … and materials relating to such applications … have been accepted, or are being accepted, by the Commission on a confidential basis[.]"[3] Accordingly, the attached Submission is entitled to confidential treatment as a matter of course.

Please contact me directly with questions pertaining to this letter, the Submission, or both.

Sincerely,

Angela E. Giancarlo

Counsel for Global Energy Transmission Corporation

---

[1] *See* 47 CFR § 0.457.

[2] See id. at § 0.457(d)(ii).

[3] *Id*. The rule also states, "it is unnecessary for persons submitting such materials to submit therewith a request for non-disclosure pursuant to §0.459." *Id.*

Submitted pursuant to 5 USC § 552(b)(4) and 47 CFR §§ 0.457(d)(ii)

MAYER • BROWN

Mayer Brown LLP
1999 K Street, N.W.
Washington, DC 20006-1101
United States of America
T: +1 202 263 3000
F: +1 202 263 3300
www.mayerbrown.com
Angela E. Giancarlo
T: +1 202 263 3305
AGiancarlo@mayerbrown.com

October 19, 2018

To: Federal Communications Commission
Office of Engineering and Technology
Knowledge Database

From: Angela E. Giancarlo
Counsel for Global Energy Transmission Corporation

Subject: Machine-to-Machine ("M2M") Distant Wireless Power Transfer System

Global Energy Transmission Corporation ("GET") respectfully submits the instant knowledge database ("KDB") request[1] to the Office of Engineering and Technology ("OET") of the Federal Communications Commission ("Commission" or "FCC") for the purpose of seeking OET's guidance on the company's M2M distant wireless power transfer system ("System").[2] The GET System is intended to enable charging "on the fly" and would incorporate transmission technology that would:

- operate within the 100 kHz frequency band;
- operate at 15 output kilowatts;
- incorporate coupling for the purpose of keeping signal emissions low; and

[1] The instant KDB Submission constitutes material relating to an equipment authorization, which the Commission does not routinely make available for public inspection. *See* 47 CFR § 0.457.

[2] *See* U.S. Patent No. 9,979,239 B2 (issued May 22, 2018).

- travel over distances of 10 meters or more.

GET seeks to demonstrate the System in the U.S. beginning in January 2019[3] and therefore intends to apply in the near term for an experimental license, which would permit such activity.

Accordingly, GET hereby respectfully requests OET's input as to regulatory classification (*e.g.*, Parts 15, 18, or both), acceptable radio frequency ("RF") emission levels and any additional issues so as to facilitate timely approval of the company's forthcoming application for experimental license.

After a brief background, this request: (1) depicts and discusses the GET System's technology and examples of applications suited to utilize the GET System, (2) sets forth the GET System's proposed technical parameters, (3) provides GET's recent internal testing results, and (4) presents regulatory issues for OET's consideration. GET looks forward to an opportunity to speak, meet and closely coordinate with OET.

Background. Mobile and portable electronic devices and electrical devices—no matter their physical size or technical capabilities—rely on battery power for uninterrupted operation. Consumer demand for ever-increasing functionality creates a corresponding desire for rapid, safe and convenient charging. These devices are usually charged by wired connection to a power source; however, as envisioned by GET, placing the devices on or in

---

[3] Thereafter, GET intends to apply for an equipment certification, which would permit GET to market and sell the System in the U.S. *See* 47 CFR Part 2 Subpart J.

close proximity to charging pads that employ magnetic induction would satisfy the need for fast, easy, reliable and safe wireless charging.

GET has developed an innovative solution for larger, industrial M2M electronic devices, which transmit high-power energy. The System would be employed either inside very large industrial centers or outdoors over longer distances, and would deliver a unique capability for countless M2M applications, including Unmanned Aerial Vehicles ("UAVs") and robotics, among others. For instance, the GET System is capable of charging heavy UAVs over long distances (dozens of meters) through an easy-to-install power transmission cord; thus enabling safe, continuous and more efficient flight.

As an initial step, GET would suggest that the OET team assigned to this inquiry would benefit by viewing this video of the System powering a UAV: http://getcorp.com/technology-overview/#tab-542.

Description of the GET System. Diagrams 1, 2, 3 and 4, below, depict the GET System, as well as possible design options for various customization of the System's basic components.

Diagram 1 depicts an example of the System as configured for basic wireless power transfer to one or more devices. Possible design options include—

The *transmitter transducer* could produce a magnetic field in a power-transfer region during conduction of a transmission signal.

The *signal generator* might be configured to: electrically connect to the transmitter transducer; receive a first power signal from a power source; produce an alternating current transmission from the first power signal within the 100 kHz band; or transmit to the transmitter transducer at the same transmission frequency rate.

The one or more *power receivers* could be configured to electrically connect to one or more loads, and could include a receiver transducer and a power processor.

The *receiver transducer* could be configured to: inductively receive a time-varying magnetic flux from the transmitter transducer when the receiver transducer is located in the power-transfer area; or convert the time-varying magnetic flux to a second power signal.

The *second power signal* could be time-varying or have the same frequency rate as the transmission signal.

The *power processor* could be electrically connected to the receiver transducer or configured to convert the second power signal to a third power signal as appropriate for the respective one or more loads.

Diagram 1

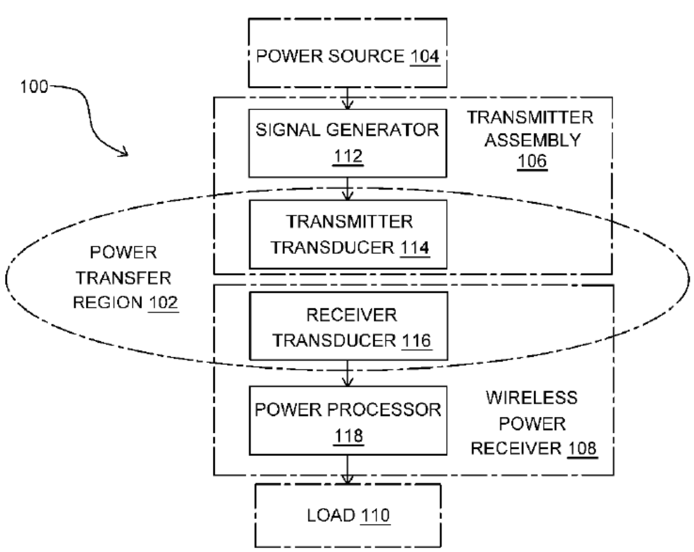
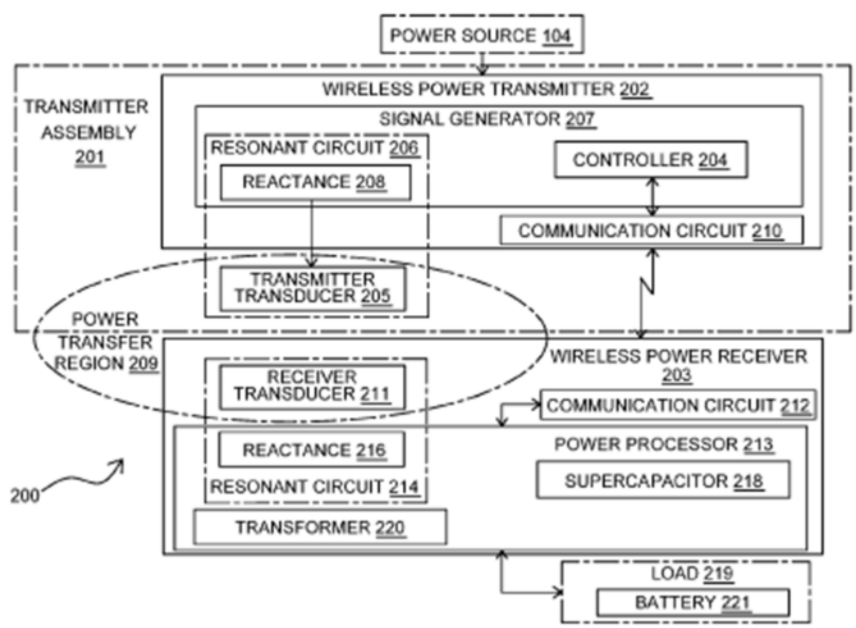


Diagram 2, below, depicts an example of an alternative configuration that would wirelessly transfer power to one or more devices. We note that the main distinction between Diagram 1 and Diagram 2 is an additional communication channel (*See* 210), which would be employed for control charging and tuning. Possible design options for this configuration include—

A first power signal could be generated by: a power source that generates an alternating current transmission signal within the 100 kHz band, which would produce a magnetic field in a power-transfer area; converting the time-varying flux of the magnetic field when the receiver transducer is located in the power-transfer area; or converting a second power signal to a third.

Diagram 2



730296253.3

Diagram 3, below, depicts an application that would wirelessly transfer power to a UAV as it passed through a power-transfer area. Possible design options include—

A *signal generator*, which would: receive a first power signal from a power source, then produce an alternating current transmission from the first power signal from within the 100 kHz band, or transmit a signal to a transmitter transducer from within the 100 kHz band.

Diagram 3

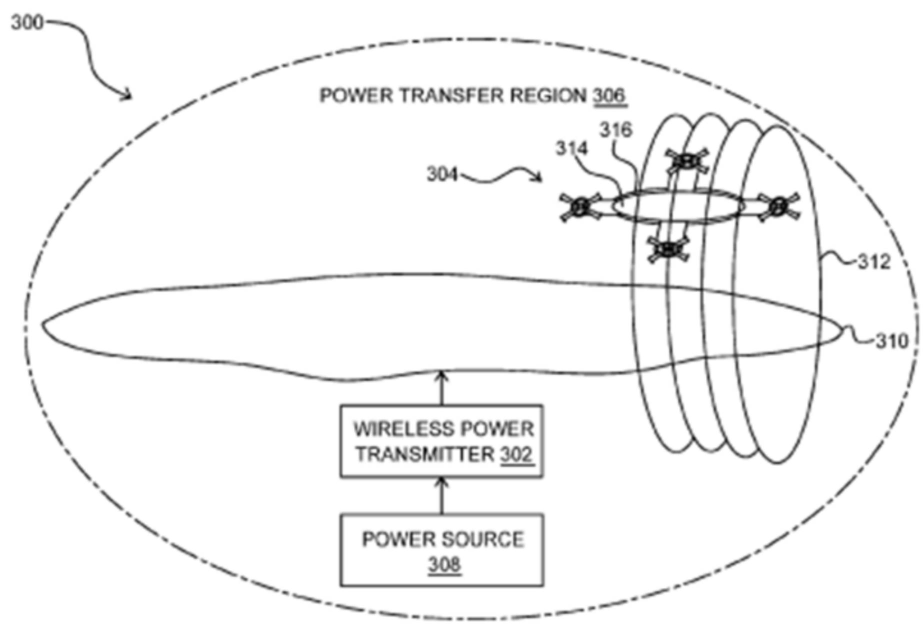
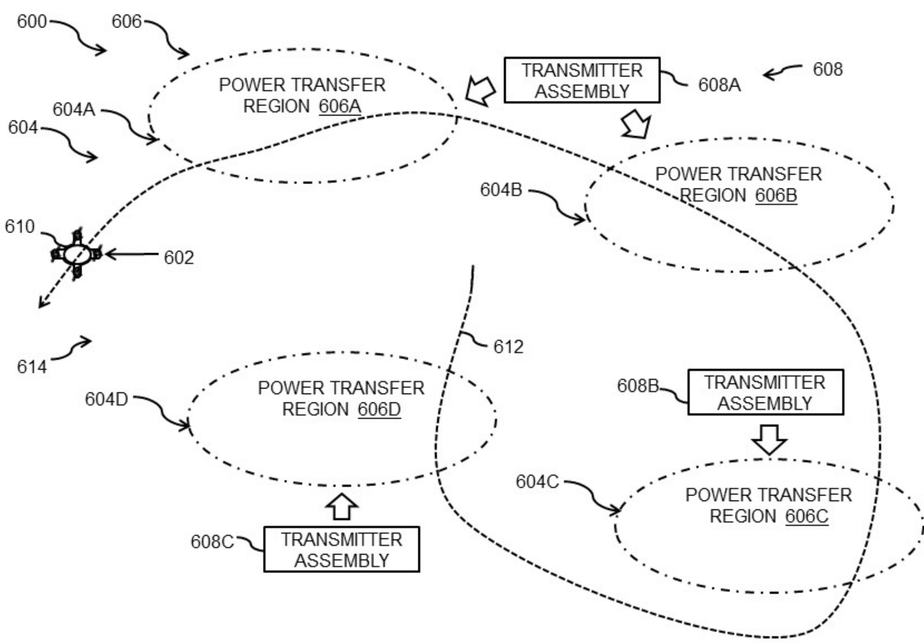


Diagram 4, below, depicts an example of distributed power-transfer regions through which a UAV, for instance, might travel. Possible design options include—

The power-transfer region could be configured to: receive from a receiver transducer a time-varying magnetic flux of one or more power receivers located in the power-transfer region; convert the time-varying magnetic flux to a time-varying first power signal from within the 100 kHz band, which would transmit to the transmitter transducer; or convert the first power signal to a second power signal suitable for the applicable electrical load.

Diagram 4



Technical Parameters. The matrix below illustrates the proposed technical parameters of the GET System.

Parameter	Range
Power level per single device	12KW—500W
Charge rate	10C
Power-region diameter	Up to 8 meters
Transmission efficiency	Up to 80 percent
Power source	Three phase, 15kW
Frequency range	100 kHz band

Internal Testing Procedures. The matrices below report the results of GET's testing procedures, which were conducted on September 4, 2018.

Distance from EUT m	Height of Antenna Position m	Frequency kHz	Measurement dB	Field Strength microV/m
5	4	110.95	6.8	6 448 890
10	4	110.96	2.2	3 797 388
30	4	110.95	-20.1	291 397
100	4	110.97	-45.3	16 013
200	4	110.96	-58.7	3 424
250	4	110.95	-66.5	1 395
300	4	110.94	-70.8	850

Distance from EUT m	Height of Antenna Position m	Frequency kHz	Measurement dB	Field strength, microV/m
5	2	110.94	-1.5	2 480 190
10	2	110.96	-8.6	1 095 179
30	2	110.95	-28.1	116 007
100	2	110.94	-57.3	4 022
200	2	110.96	-65.3	1 601
250	2	110,97	-72,9	668
300	2	110.95	-77.9	375

Regulatory Classification. The GET System presents a number regulatory issues for OET's consideration, as discussed below. As an initial matter, we note that Part 18 of the Commission's rules pertain to industrial, scientific and medical ("ISM") equipment that emits electromagnetic energy within the radio spectrum in order to prevent harmful interference to other authorized radio communication services.[4] The Commission's rules provide that ISM equipment "shall be designed and constructed in accordance with good engineering practice with sufficient shielding and filtering to provide adequate suppression of emissions" that would harmfully affect other frequencies.[5]

Against this backdrop, GET submits the following:

First, Part 18 requires that devices "generate and use RF energy locally."[6] Given that the GET System may be set up to generate power over a 10 meter distance, the system may not meet this Part 18 requirement in all cases. Thus, GET would like OET's input as to the efficacy of requesting and obtaining a waiver of Section 18.107(c) of the Commission's rules versus pursuing an alternative or modified regulatory classification

Next, Part 18 devices must also comply with the FCC's rules regarding RF exposure,[7] which varies depending on whether a device is considered mobile or portable. OET measures and evaluates exposure at the device's maximum output power[8] according to the exposure limits set forth in the Commission's rules governing radiofrequency radiation applicable to mobile and portable devices.[9] Devices that are installed to provide separation

---

[4] *See* 47 CFR § 18.101.

[5] 47 CFR § 18.109.

[6] *See* 47 CFR § 18.107(c).

[7] *See* OET May 31, 2013 Publication at 2; *see also* 47 CFR § 1.1307(c)-(d).

[8] *See* OET May 31, 2013 Publication at 2.

[9] *See* 47 CFR § 2.1091 (for mobile devices) and § 2.1093 (for portable devices).

of at least 20 cm from users and bystanders may qualify for mobile exposure conditions.[10] The GET System, when configured to power a UAV, for instance, would likely be classified as mobile. Thus, the GET System would be excluded from routine environmental evaluation for RF exposure prior to equipment authorization or use.[11]

Finally, GET notes the question of whether the System operates in a charging mode *and* a communicating mode. As to this issue, we note that Diagram 2 (above) illustrates an optional communication channel that could be used for control charging and tuning. In the example configuration, charging and communicating functions may be considered independent and thus approved under Part 18 for charging operations and Part 15 for communicating operations.[12] Or, to the extent the example configuration is considered as operating only to charge, or the charging operations and communicating operations are indistinguishable, the FCC may approve this example configuration pursuant to Part 15.[13]

Conclusion. GET seeks OET's view as to whether GET may require a waiver of any of the Commission's rule(s); whether modifications would be advisable to meet compliance requirements; and next steps. We look forward to actively and cooperatively engaging with the OET team to devise the optimal path for timely grant of applications for experimental license (near term) and equipment authorization (longer term).

---

[10] *See* OET May 31, 2013 Publication at 3. In such cases, applicants are responsible for determining minimum distances for compliance for the intended use and installation of the device based on evaluation of either specific absorption rate (SAR), field strength or power density, whichever is most appropriate. See 47 CFR § 2.1091(d)(4).

[11] *See* id. at § (c)(3).

[12] *See id*.

[13] *See* OET May 30, 2013 Publication at 1.

Respectfully submitted,

Angela E. Giancarlo

Angela E. Giancarlo
Counsel for Global Energy Transmission Corporation

October 19, 2018