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## ABSTRACT SUMMARY

### Author information

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### Title, content, keywords, and sessions

**Title:** Large Scale System Using Pulsed Electric Fields as an Invasive Fish Barrier

**Body:** Invasive species have become a global issue, as plants and animals are transported around the globe and introduced to ecosystems without natural predators or controls. One of these invasive species is the Asian Carp, which has infested the Mississippi river in the USA, and threatens the Great Lakes. To prevent migration of this invasive species into the Great Lakes, the US Army Corp of Engineers has built and operated two demonstration barriers using pulsed electric fields for a number of years. These barriers, installed in the Chicago Sanitary and Ship Canal downstream of Chicago, are designed to block Asian Carp from crossing from the Mississippi river into Lake Superior through one of the known connections between the two bodies of water. As a result of the performance of these demonstration barriers, Diversified Technologies, Inc. was recently awarded a subcontract from exp Federal, under a prime contract from the US Army Corps of Engineers, to build the large pulsers required for a permanent barrier near Chicago, IL. This barrier uses bi-polar pulses driving an array of electrodes crossing the Chicago Sanitary and Ship Canal. The goal of this system is to create an electric field across the canal, from the bottom to the surface and shore to shore, sufficient to dissuade the Asian carp from crossing the field, and swimming upstream to Lake Superior. The electric field requirements are designed to prevent even small fish from transiting the barrier. This field must also operate continuously, even in the presence of barges and ships transiting the canal. Two pulsers are planned, with the first in construction now. Each pulser includes: • 4.5 MW, +/- 4 kV DC power supply, with voltage regulation; • 4 MJ capacitor bank, which stores energy for the pulses; • Solid State pulse switches, which produce currents up to 30 kA with a frequency of up to 100 Hz, and pulsewidths of 1 – 1,000 milliseconds; • Mechanical output reversing switch, allowing the pulse polarity on the electrodes to be reversed. This paper will provide details on the design and intended operation of this pulser, which will be the largest known PEF system in the world when completed. This effort is funded under US Army Corps of Engineers contract W912P6-18-C-0021 with exp Federal.

**Keywords:** barrier; fish; pulser; invasive.

**Session(s):**

Symposium on Bio and Food Electrotechnologies (BFE) [special]

### Classification

Subject area	Topic	
Environmental applications	Other	✓
Pulsed-power devices, facilities and apparatus for Plasma and PEF treatment	Large-scale processing and treatment facilities	✓
Technology	Low electric fields	✓

### Other data

Inquiry	Opted for
Please indicate your preferred type of presentation	Oral
If selected for Poster, willingness to participate in interactive poster session	Yes
Applying for Student / Early Career Investigator Award <small>Note: Early Career Investigators must be either under the age of 35 or within 5 years of receiving their doctoral degree (i.e. M.D., Ph.D., etc.) and working in the field of electroporation and pulsed electric fields in biology, medicine and food &amp; environmental technologies.</small>	No
Invitation letter for Visa required (presenting author)	No