

Topic: N162-109

## The Columbia Group, Inc

### Medium Voltage Direct Current (MVDC) Casualty Power

Casualty power is critical to sustainment of mission capabilities. There is currently no way to restore medium voltage direct current power to zones isolated by damage. Our technology will provide a safe, lightweight and affordable way to solve that problem. This modular system can be scaled to lower voltage direct current applications, significantly improving utility and safety. We demonstrated system technical feasibility and designed it to reduce personnel hazards while maintaining or increasing deployment speed compared to existing 450VAC systems. We bring portability and safety: a team of personnel composed of sailors of average size and strength can rig the system, in a worst case scenario, within 30 minutes. The system has safety features that do not exist in current US Navy casualty power systems.

### Technology Category Alignment:

Power Generation/Energy Conversion

Modularity

### Contact:

Padraic H. McDermott

[pmcdermott@columbiagroup.com](mailto:pmcdermott@columbiagroup.com)

(757) 376-7380

<https://www.columbiagroup.com/>

**SYSCOM:** NAVSEA

**Contract:** N68335-18-C-0207

**Booth:** 197

**Room:** FST at NAVSEA HQ

# Department of the Navy SBIR/STTR Transition Program

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NAVSEA #2019-0534

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Medium Voltage Direct Current (MVDC) Casualty Power

The Columbia Group, Inc

## WHO

**SYSCOM:** NAVSEA

**Sponsoring Program:** PMS 320 - Advanced Surface Machinery Systems

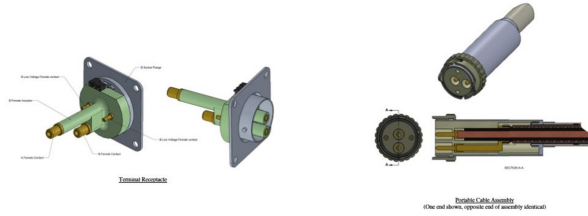
**Transition Target:** MVDC Casualty Power

**TPOC:**  
(202)781-2520

**Other transition opportunities:**

Disaster response organizations, who must provide an alternative to grid-supplied power on short notice in difficult/ hazardous environments; power systems for remote fire bases; temporary airfields; or any temporary construction; and the mining industry.

**Notes:** the Columbia Group (TCG) is a privately owned company and is well-financed. Preliminary estimates to transition this system into a "commercial ready" product include \$500K - \$1M for additional research and development (R&D), plus another \$1M - \$1.5M for branding, marketing and sales support.



Sketches developed by TCG

## WHAT

**Operational Need and Improvement:** Enable the safe provision of casualty power in shipboard environments for MVDC power systems more safely, affordably, and quickly than current alternatives in the Fleet. Be able to provide such power as well to any disaster-response organization in hazardous environments; or to remote firebases, temporary airfields, or remote construction sites; or industry partner (such as in the mining industry).

**Specifications Required:** The casualty power system is intended for MVDC systems (ref #2) with voltages between 6 kV and 18 kV and rated for a current between 300 and 500 amps. The casualty power system should interface (via a mechanism such as coded cable connectors, auxiliary conductors or fiber optic cables) with the machinery control system to enable detection of the connectivity and to limit current to below the system current rating. Delivers capability for a team of personnel composed of sailors of size and strength ranging from the 5th percentile female to the 95th percentile male to rig the system in 30 minutes or less.

**Technology Developed:** TCG's MVDC CPS Solution requires teams of personnel composed of sailors of size and strength ranging from the 5th percentile female to the 95th percentile male to rig the system. Between 3 and 4 persons will be required to carry a 75-foot portable cable, similar to existing 450VAC casualty power systems. In a worst case scenario with 150-foot portable cables, the system is capable of being rigged within 30 minutes. Our system has safety features that do not exist on current US Navy casualty power systems.

**Warfighter Value:** Casualty power is critical to mission capabilities sustainment. Methods to restore medium voltage direct current power to shipboard zones isolated from generation do not exist. Our technology is affordable, efficient, and safe, and we have proven technical feasibility. Thus is delivers a high-performance solution to the Warfighter at lower cost.

## WHEN

**Contract Number:** N68335-18-C-0207 **Ending on:** May 16, 2020

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Components Testing	Low	Successfully pass test procedure criteria.	6	October 2019
System Operating Testing	Low	Successfully pass test procedure criteria.	6	October 2019
Develop Test Reports	Low	Acceptance by PMS 320.	6	December 2019
Develop Phase II Final Design Report	Low	Acceptance by PMS 320.	6	May 2020
Develop Final Casualty Power System Specifications	Low	Acceptance by PMS 320.	6	May 2020
Develop CPS Design Practices and Criteria Manual	Low	Acceptance by PMS 320.	6	May 2020

## HOW

**Projected Business Model:** Perform design work for Government clients and commercial clients and manufacture for them. Need a manufacturing partner for LRIP and full-rate production. Upon completion of Phase II when the prototype MVDC casualty power system has been tested, refined, and proven, TCG will implement a commercialization strategy to bring the technology to market.

**Company Objectives:** Identify applications in existing Navy shipbuilding programs (e.g., scaling the technology to DDG 1000) as well as future construction programs. Identify other Government maritime, disaster relief, and commercial customers to adapt technology to their needs.

**Potential Commercial Applications:** Disaster response organizations, or similar entities who must provide an alternative to grid-supplied power on short notice and/or while operating in difficult or hazardous environments.

Remote construction sites, temporary camps or compounds, etc.

The mining industry. Mining sites are often situated in remote areas not served by municipal power distribution.

**Contact:** Padraic H. McDermott, Chief Growth Officer  
[pmcdermott@columbiagroup.com](mailto:pmcdermott@columbiagroup.com) 7573767380