Exhibit: General Application Letter

Purpose: Address Form 442 Question 7: Experimentation Description

Federal Communications Commission

Experimental Radio Service

Subject: Application for Radio Station Authorization under Part 5 of FCC Rules - Experimental Radio Service.

Ref: 0416-EX-PL-2015 (Current Project)

Ref: 0213-EX-ML-2011 / Call Sing WD2XSZ (Previously Renewed Permit and License for similar project)

Ref: 0213-EX-RR-2008 / Call Sign WD2XSZ (Previously Approved Permit and License for similar project)

This request is for a Radio Station Authorization under Part 5 of FFC for an Experimental Radio Service (Other than Broadcasting).

The purpose of this authorization is to perform HF radio transmission using a WERA system. The WERA system is a shore based remote sensing system used to monitor ocean surface currents, waves and wind direction. The system is based on short radio wave radar technology. It emits vertically polarized electromagnetic wave that is coupled to the conductive ocean surface. The purpose of this experiment is to carry out ocean current and wave measurements in the marine environment using the principle of the Bragg phenomenon as it applies to EM waves coupled with Ocean waves. EM waves are emitted and the backscattered signal is recorded. Beam forming techniques are used to identify the azimuth and range of Doppler shift of the return signal. This Doppler shift is resolved as function of space and it is attributed to surface currents.

Two stations will be operated located on Caswell Beach, NC and Georgetown, SC (as per the applications details / geographical coordinates). Each station can provide radial components of ocean currents. Post processing of the radial data will allow the estimation of full 2-D surface current vectors capable to resolve the state of the ocean surface.

Each station will be transmitting once every hour for a period of 14min (centered on the hour).

Equipment Description and Principle of Operation: Reference the **System Exhibit** for equipment information and Principle of Operation

The specific objectives sought to be accomplished: This test allows monitoring of the marine environment and allow identification of the western boundary of the Gulf Stream. The objectives are: (i) to use this technology to identify changes in the nearshore ocean circulation attributed to the effects of the Gulf Stream; (ii) analyze the signal (clutter) for remotely resolving ocean wave parameters; (iii) provide surface current values to the public

How the program of experimentation has a reasonable promise of contribution to the development, extension, expansion or utilization of the radio art, or is along line not already investigated.

The experimentation utilizes radio art to provide methods for identifying and resolving major scientific and societal needs including ocean circulation and particle tracking (oil spills, assisting search and rescue). The methods and processed data are available in the public domain. These systems are the only ones to be operated in the area of Long Bay, SC covering the particular geographical region.

Name and Address of Applicant: George Voulgaris, Department of Earth & Ocean Sciences, University of South Carolina, Columbia, SC, 29208.

Field Generation and Monitoring Test Equipment: Reference the **System Exhibit** for equipment information.

Frequency Bands and Power: Reference the Antenna Exhibit for further supplemental information on test frequency, modulation, and Effective Radiated Power (ERP).

Should you require additional information please contact George Voulgaris at 803-777-2549 or Email gvoulagris@geol.sc.edu