Y9.GEH1.3 Development of SiC Low Voltage SST for GEH Testbed
Dr. Radha Sree Krishna Moorthy, Siyuan Chen, M. A. Awal, Dr. Wensong Yu, Dr. Iqbal Husain

Overview
- **Background**
  - Single SST Operation
    - Maintain all residential loads as long as any energy source is present, i.e. grid or DESD or DRER & isolate loads from disturbance on grid side
    - Ensure smooth transition between grid-tied and islanded modes of operation
    - Enable real and reactive power dispatch capability on demand from DGI
  - Multi-SST Operation
    - Facilitate power sharing capability between different SSTs at off-grid condition & smooth islanding and grid connecting capability

**Objectives**
- **Single SST Operation**
  - Easily scalable and modular configuration with bidirectional power flow capability
  - Each port is designed with protection circuitry for protection against internal and external faults
  - Includes soft start circuit to protect the SST during power up
  - Customized forced air cooling for modules & inductors
  - Grid connecting/islanding switch
  - Water proof enclosure

**Control Hierarchy**
- **Hardware Prototype**
  - Gate driving circuit and the interfacing board
  - Power stage with protection circuits
  - Customized inductor mounting with wind channel for forced air cooling

**Impacts**
- Address the challenges and issues with the operation and control of multiport converters with bidirectional power flow capability at all ports
- Establishes a fully functional microgrid testbed for demonstrating grid connected and islanded modes of operation and intelligent power and energy management algorithms
- Provides a platform for testing the resilience and robustness of various control algorithms like passivity based control.