

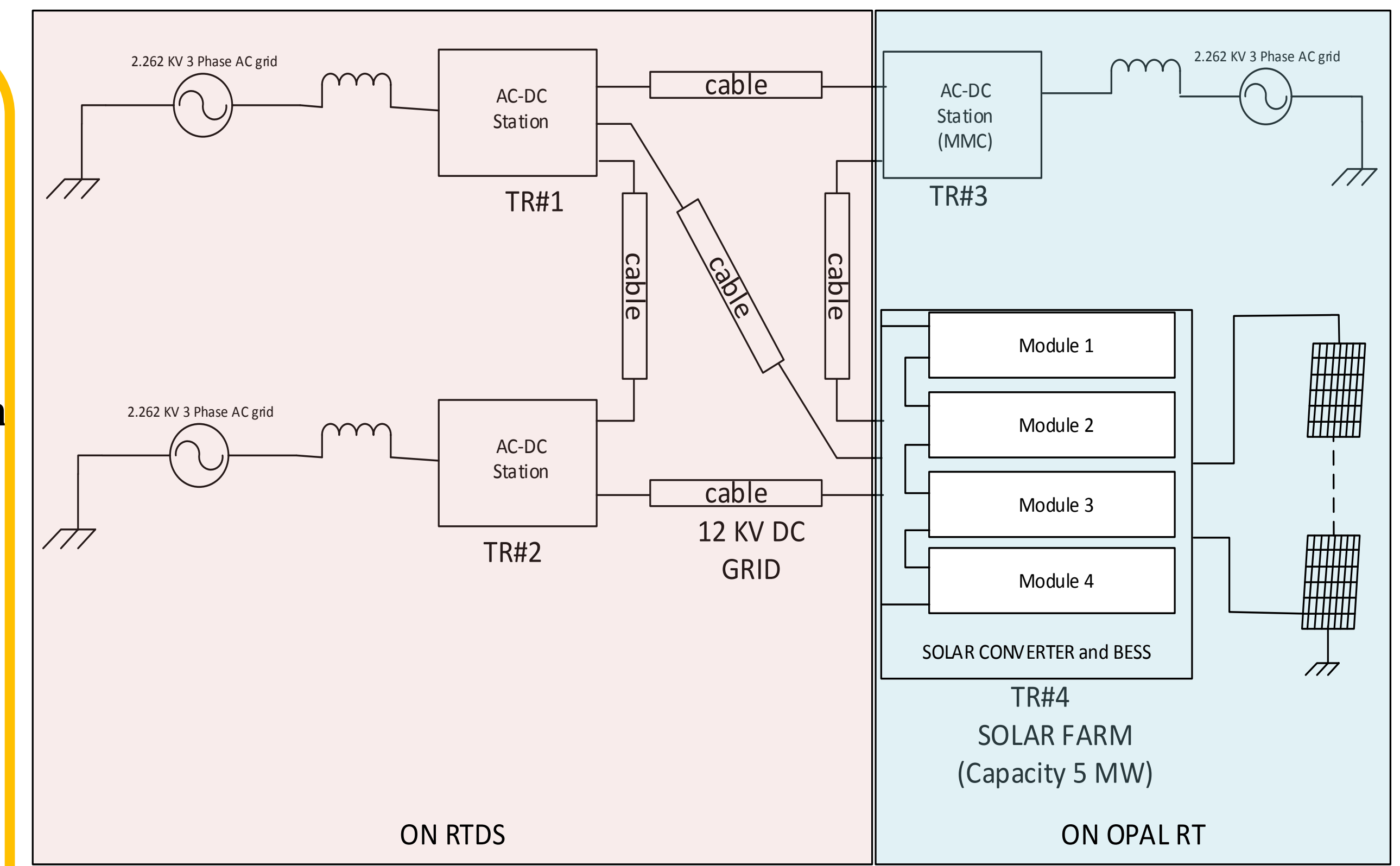
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Objectives

Recently Multi-terminal DC (MTDC) systems have received more attention in the power transmission areas. Development of modular structured power converter topologies has now enabled the power converter technology to attain high voltage high power rating. This prompted a change in the HVDC technology based on Voltage Source Converters.

ADVANTAGES:

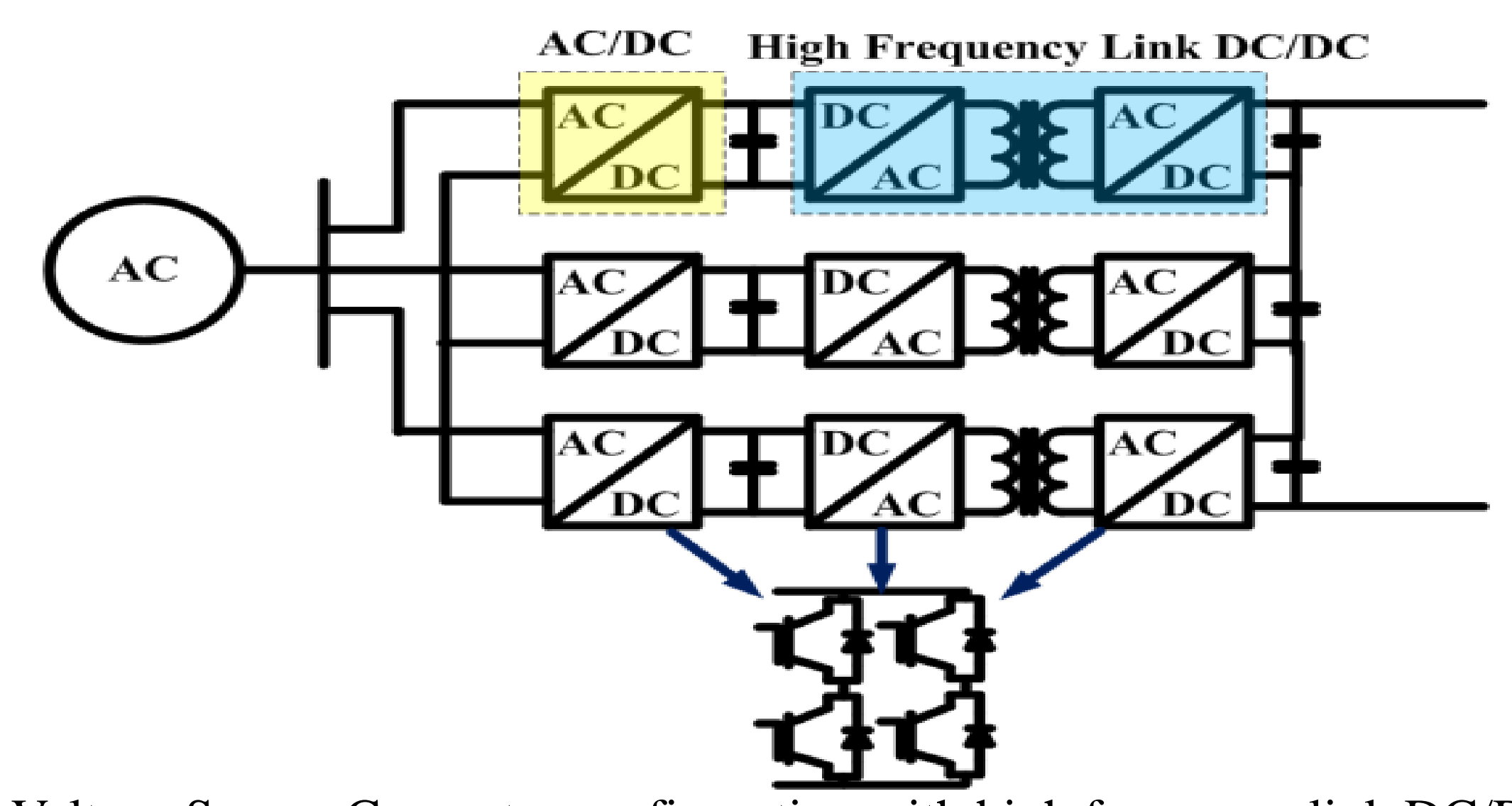
- ❖ For long distance power transmission HVDC yields more economical performance compared to an Equivalent AC system.
- ❖ Voltage Source Converter based terminals can provide flexibility in terms of active and reactive power Requirements for the AC grid.



4-Terminal MVDC System

Challenges / Features

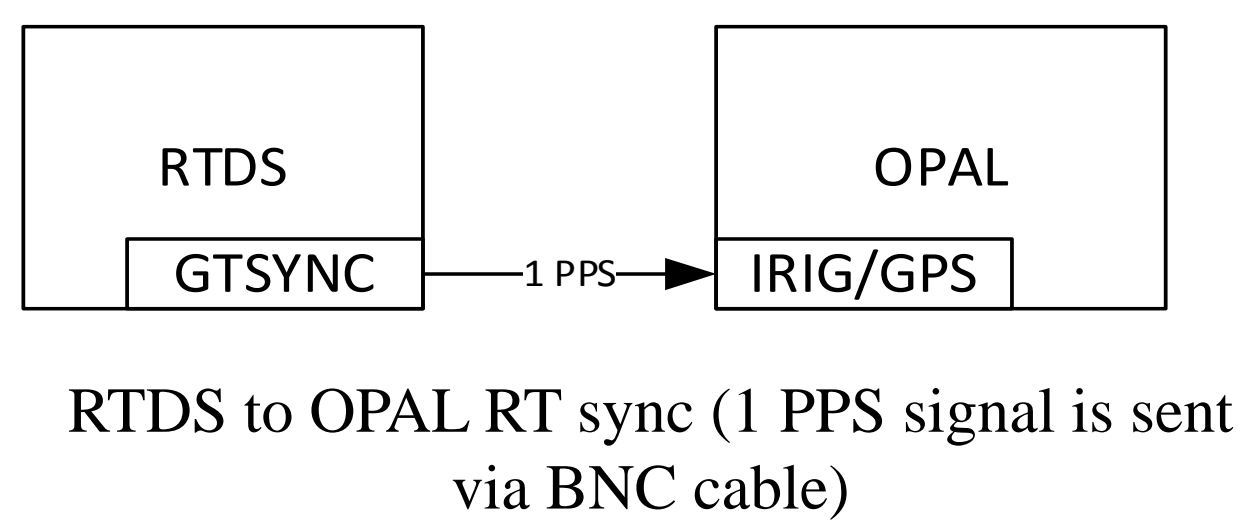
- From the system control point of view it is imperative that the MTDC system control as well as the individual terminal controls are validated.
- Real time simulation platforms such as RTDS, OPAL RT gives a good platform to Validate the control of the system.
- But as the system keeps getting bigger the computation requirements goes high.
- Therefore interconnection between tow real time simulation platforms will provide flexibility in terms of system expansion.



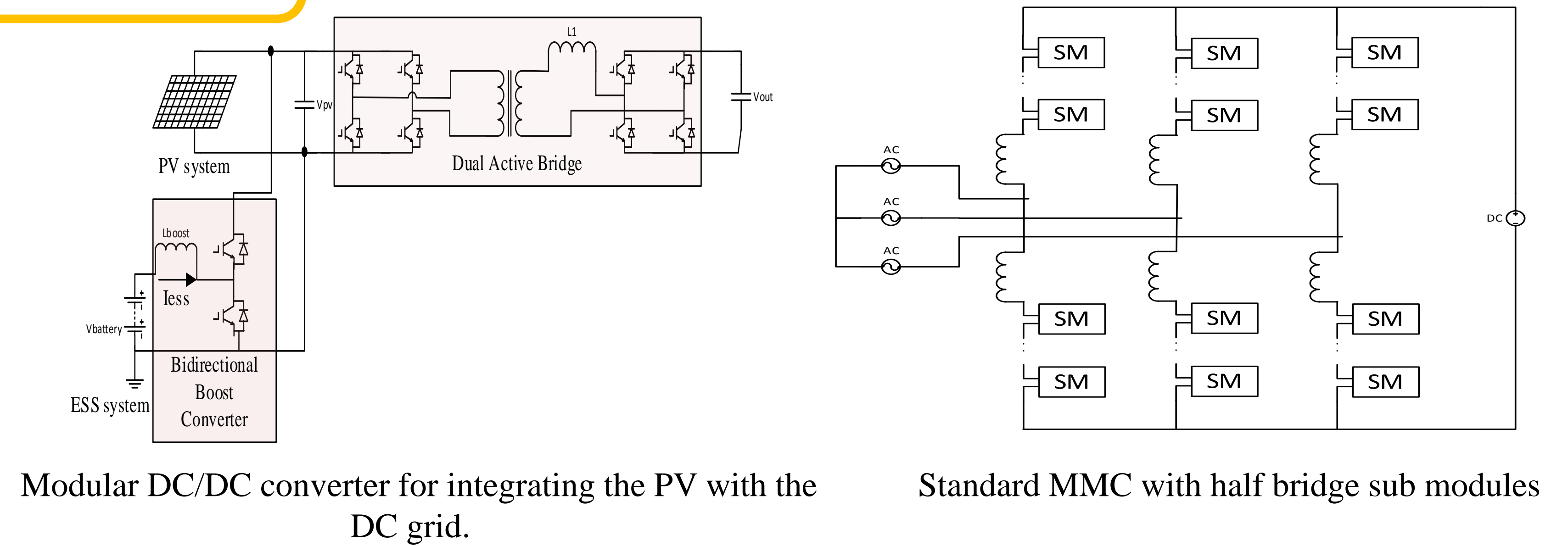
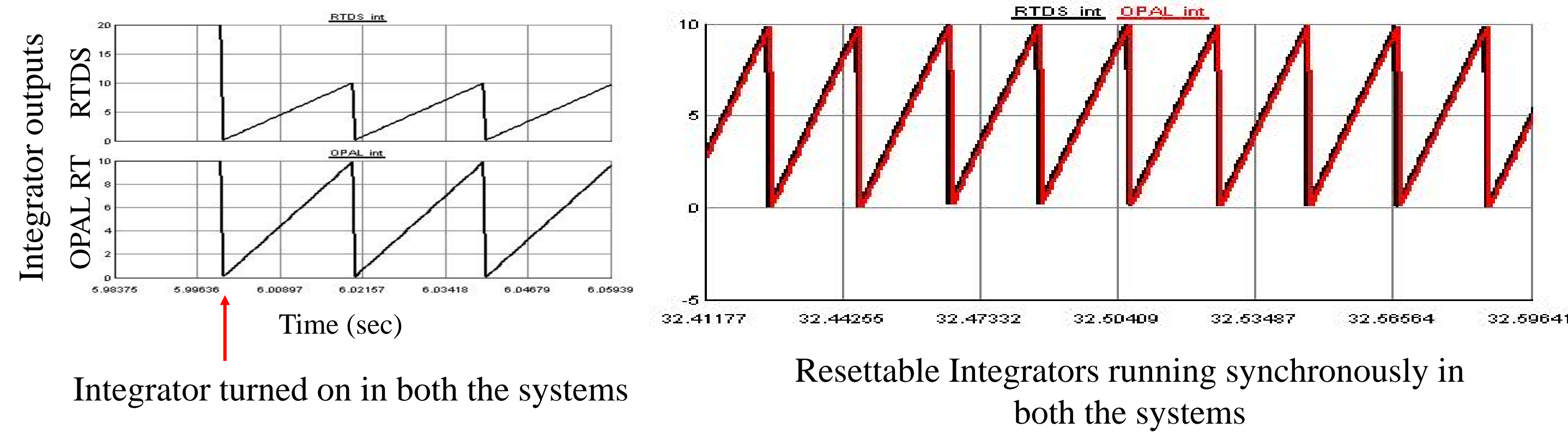
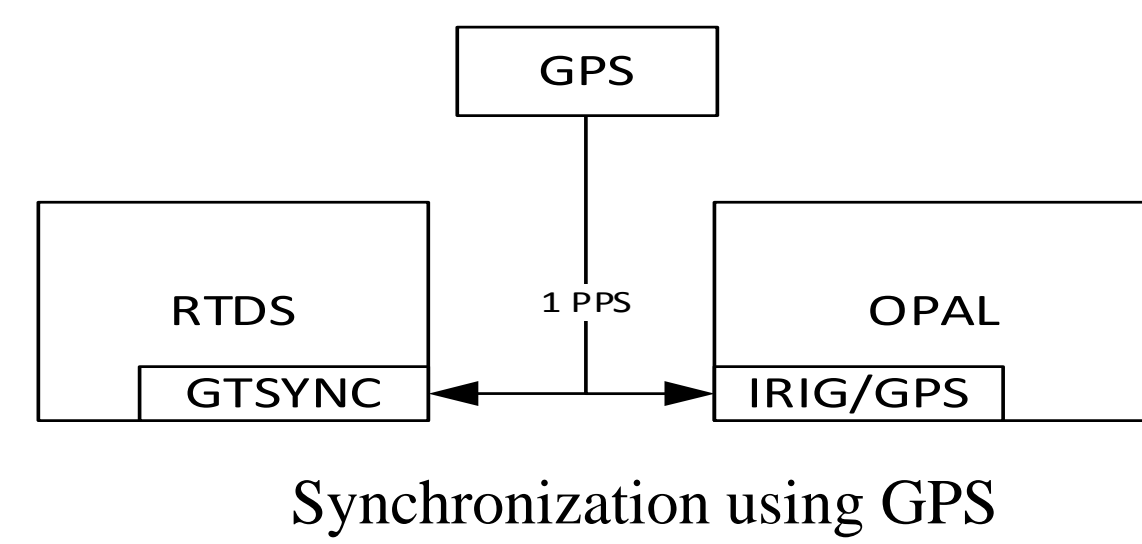
Voltage Source Converter configuration with high frequency link DC/DC converter

Synchronization Technique

Point to Point synchronization.



Global synchronization using GPS



Modular DC/DC converter for integrating the PV with the DC grid.

Standard MMC with half bridge sub modules

Simulator Platform Setup

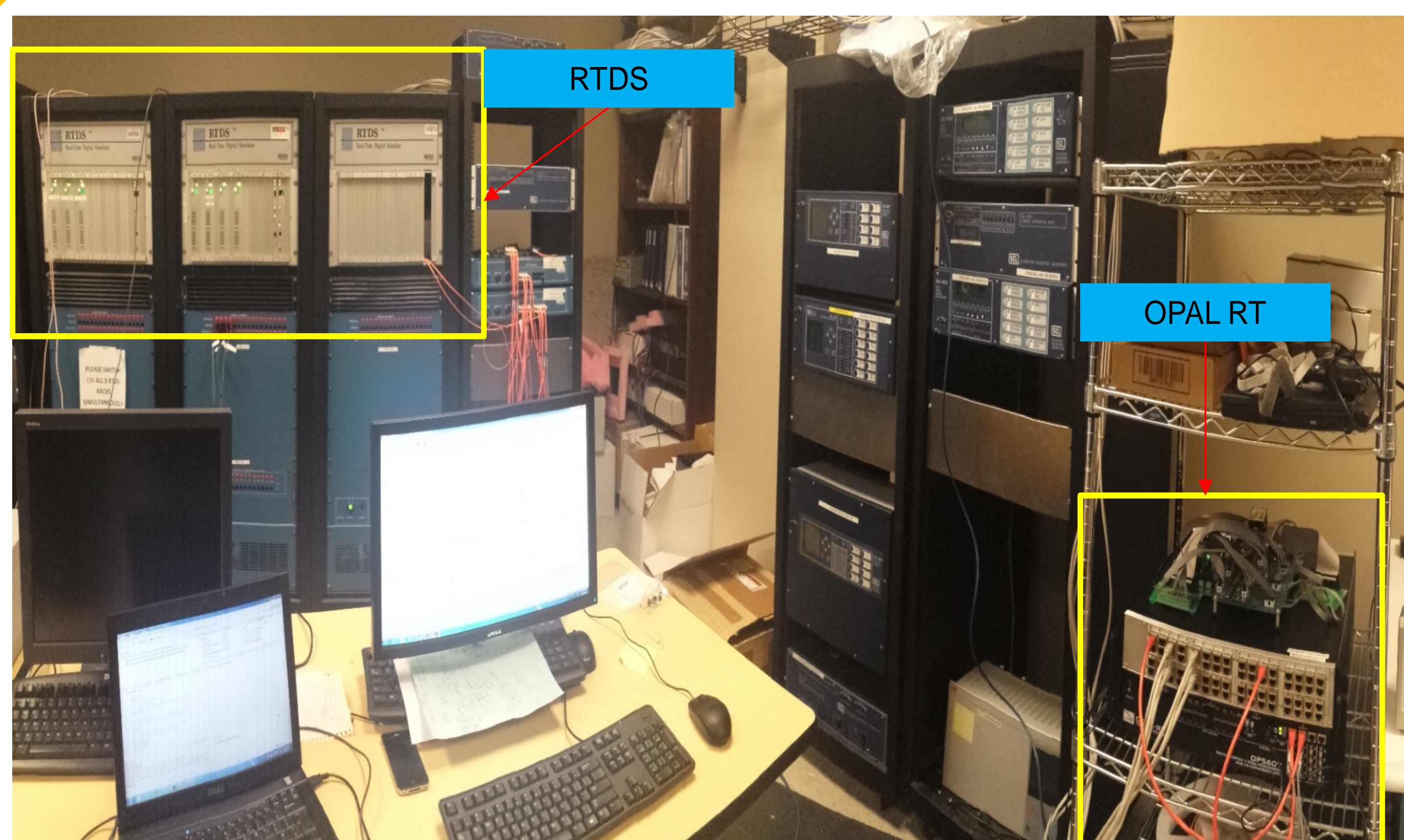
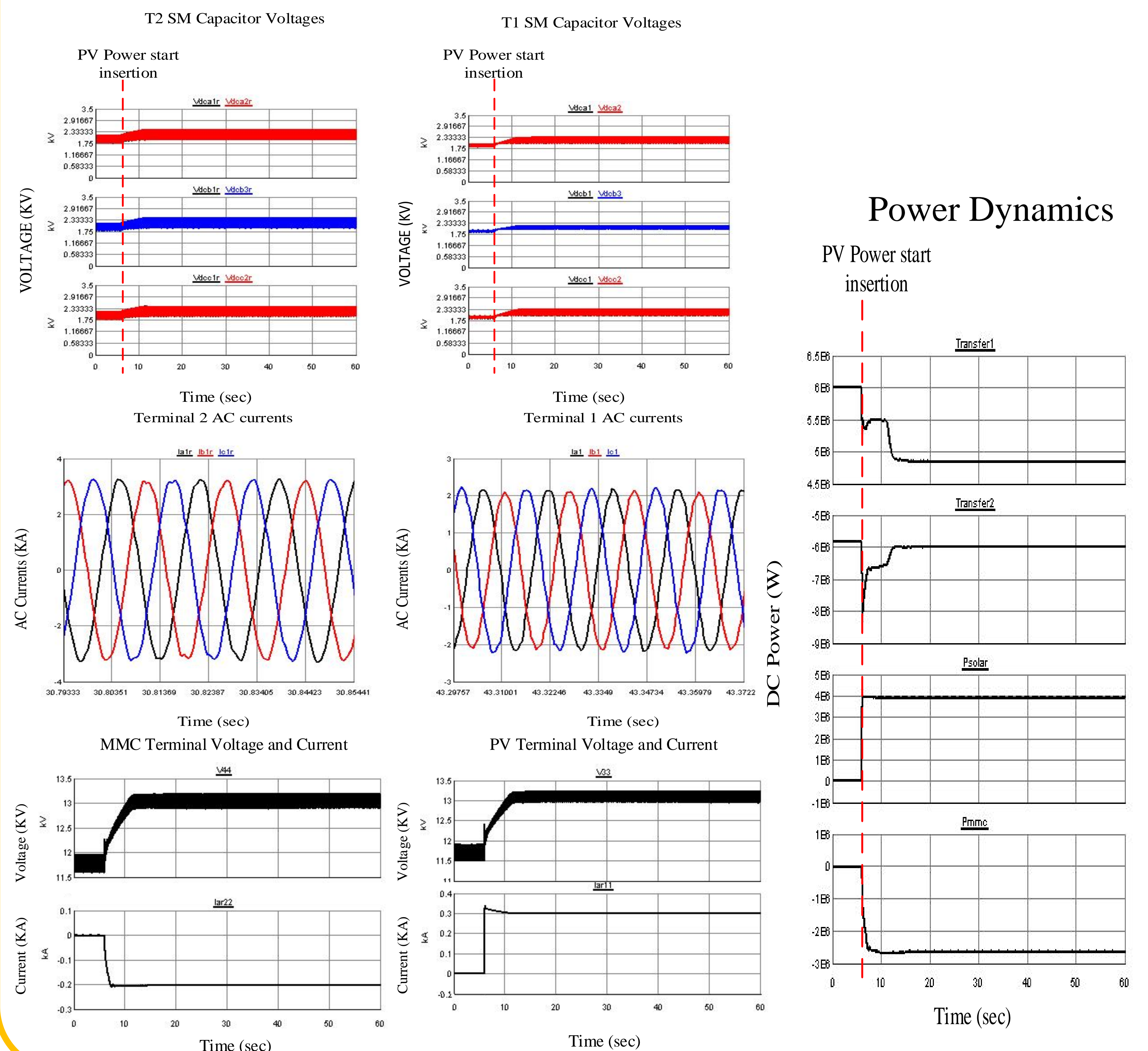


Figure 2: RTDS and OPAL RT interconnected system set up

4 Terminal MTDC System Dynamic Performance



Power Dynamics

