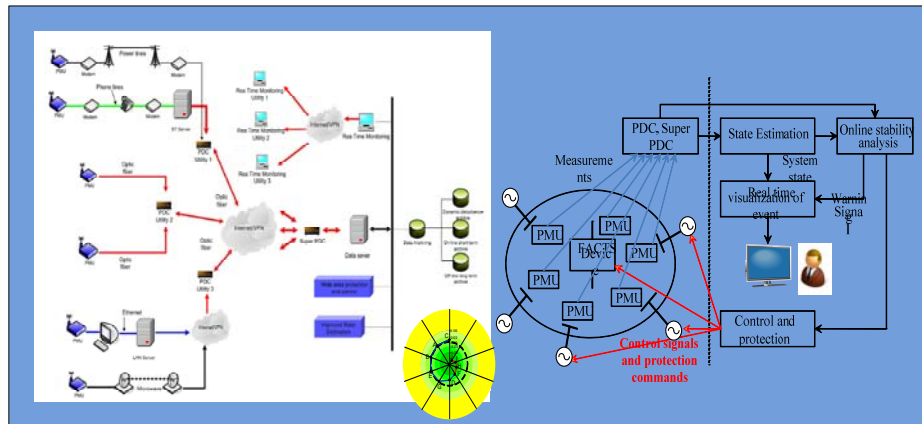


# Evolution of EMS Control Centers and Synchrophasor Measurements at Control Centers

12<sup>th</sup> of September 2014

One day workshop organised by the IEEE Sri Lanka Section, IEEE PES Sri Lanka Chapter and IEEE GOLD Sri Lanka



This course will cover....

- The primary functions of a modern EMS
- Impact of growth of microgrids, renewables and distributed generation on the EMS
- Phasor Measurement Units (PMUs) and synchrophasor measurements
- Integration of synchrophasor PMU data
- Wide Area Monitoring (WAMS)
- Practical examples of utilities where such advanced tools are deployed

**IEEE Sri Lanka Section**



## About the topic

Energy Management Systems (EMS) have been deployed for decades at utility control centers to monitor and manage the electricity grid in real-time. Today these EMS capabilities are poised to be enhanced quite dramatically with growth of synchrophasor PMU measurements. This tutorial will describe:

- The history and evolution of the EMS from its digital genesis in the 1970's.
- The primary functions of a modern EMS:
  - Generation management
  - Transmission management
  - SCADA
  - Training Simulator
  - Electricity Markets
- Emerging new industry drivers
- Emerging new technology trends
- Impact of growth of microgrids, renewables and distributed generation on the EMS
- Growth of Phasor Measurement Units (PMUs) and synchrophasor measurements worldwide
- Wide Area Monitoring (WAMS)
  - Situational Awareness tools
- The EMS for the future grid
  - Integration of synchrophasor PMU data
  - Monitoring grid dynamics
  - Island detection and restoration tools.
  - Big Data Analysis
  - Fast forensic analysis
  - Training for grid dynamics
  - Advanced visualization tools
  - Providing grid operators with "actionable information" for prompt decision-making
  - Practical examples of utilities where such advanced tools are deployed.
- India's major investment in synchrophasors and wide area monitoring systems – to mitigate future blackouts
- Concluding thoughts on the challenges and opportunities to manage the future grid

## Who should attend?

This workshop is ideal for practicing engineers from telecommunication, electrical power and mobile utilities and industry. Anyone passionate about identifying new opportunities in the power grid is welcome to attend this course.

## Speakers Profile

### Dr. Jay Giri, Alstom Grid, USA



Jay is Director of Power Systems Technology and Strategic Initiatives at Alstom Grid's NMS business in Redmond, Washington. He leads a team of power system engineers who deliver market applications and synchrophasor/phasor measurement unit (PMU) applications to control centers. He is a liaison for university research activities and an affiliate professor at the University of Washington.

In 1978, Jay and 11 other engineers co-founded Energy System Computer Applications (ESCA). In 2010, ESCA became part of Alstom Grid (then Cegelec). Jay designed and implemented the original software for the ESCA automatic generation control (AGC) and dispatcher training simulator (DTS) power system simulation functions. Today the Alstom AGC controls over 50% of North American generation as well as generation in many other countries, and the Alstom DTS is one of the predominant simulators used by control centers worldwide.

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## Programme

<b>12.30 – 13.00</b>	<b>Registration</b>
<b>13.00 – 13.15</b>	<b>Short note about the IEEE DLP - Prof. J.B. Ekanayake, IEE PES Chapter Chair</b>
<b>13.15 – 14.00</b>	<b>Evolution of EMS Control Centers - Managing the future Smart Grid</b> <b>Dr. Jay Giri</b>
<b>14.00 – 14.15</b>	<b>About IEEE and a membership drive – Dr. Jayathu</b>
<b>14.15 – 14.30</b>	<b>Tea</b>
<b>14.30 – 15.15</b>	<b>Synchrophasor Measurements at Control Centers</b> <b>Dr. Jay Giri</b>
<b>15.15 – 15.30</b>	<b>Discussion and close of the session</b>

Programme may be subject to changes

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