

# NASPI Panel Discussion: Time Synchronized Techniques to Monitor/Mitigate Inverter Effects on Power Systems

NASPI WORK GROUP MEETING APRIL 2021

## HOW DO WE MONITOR THE POWER GRID IN THE AGE OF HIGH INVERTER PENETRATION?

- Power system dynamic behavior on the power grid is relatively new territory. How can synchrophasors help us to understand this behavior?

## HOW ARE WE TO MITIGATE THIS BEHAVIOR TO ENSURE RELIABLE POWER DELIVERY IN THE RENEWABLE GRID OF THE FUTURE?

- What synchrophasor control solutions are available?



## PANELIST: Evangelos Farantatos, EPRI

Evangelos Farantatos received the Diploma in Electrical and Computer Engineering from the National Technical University of Athens, Greece, in 2006 and the M.S. and Ph.D. degrees from the Georgia Institute of Technology, Atlanta, GA, USA, in 2009 and 2012, respectively.

He is a Senior Project Manager with the Grid Operations and Planning R&D Group at EPRI, Palo Alto, CA. He is managing and leading the technical work of various R&D projects related to synchrophasor technology, power systems monitoring and control, power systems stability and dynamics, renewable energy resources modeling, grid operation, protection and control with high levels of inverter-based resources. He is a Senior Member of IEEE.



# PANELIST: Chen Wang, Dominion Energy

Chen Wang is currently with Dominion Energy as Engineer III in Electric Transmission - Engineering Analytics and Special Studies Group. His work focuses on synchrophasor data analytics and data engineering.

Chen Wang received his Ph.D. degree with specialization in Power System from Virginia Tech in 2019 and graduated from Shanghai Jiao Tong University with bachelor's and master's degrees in 2012 and 2015, respectively.





## PANELIST: Clark Stuart, GE

Stuart Clark is a Senior Power Systems engineer at GE's Centre of Excellence for Wide-Area Monitoring, Protection & Control (WAMPAC) in Edinburgh, UK; and Product Owner for GE's PhasorPoint WAMS software. Stuart is involved in innovation, R&D, delivery and consulting on WAMPAC systems; working closely with customers and across instrumentation, infrastructure and end-user applications.

As Product Owner, Stuart provides power grid domain expertise and serves as the voice of the customer in the software engineering process and to commercial and product management teams. Stuart has 10 years' experience in the electricity transmission industry and WAMS, has co-authored 9 papers and 1 patent. Stuart received his MEng degree in Electrical & Electronic Engineering from the University of Bristol in 2012, and previously worked for Scottish Power Energy Networks, in Transmission System Monitoring.



## PANELIST: Karine Hay, GE

Karine Hay is a Senior Application Engineer at GE, where she has worked within the Edinburgh-based Centre of Excellence for Wide-Area Monitoring, Protection & Control since 1998. She is involved in developing applications based on synchrophasor measurements for on-line monitoring of the power system.

Karine also focuses on analyzing power system dynamic performance based on PMU measurements. She obtained her MSc degree in 1994 and completed her PhD in Signal Processing applied to Telecommunications in 1997 from Université de Rennes, France.



# PANELIST: Sakis Meliopoulos, Georgia Tech

Sakis (A. P.) Meliopoulos obtained a Diploma in Electrical and Mechanical Engineering from the National Technical University in Athens, Greece in 1972 and a Master in EE (1974) and a Ph.D. degree (1976) from the Georgia Institute of Technology in Atlanta, Georgia, USA. He is actively involved in education and research for improved safety and electromagnetic compatibility of electric power installations, protection and control of power systems and the application of new technology in these areas.

Dr. Meliopoulos has pioneered several new analysis and design techniques for bulk power reliability analysis, safety, protection and electromagnetic compatibility of electric power systems.

Most well-known is the EPRI transmission reliability program TRELLS (now renamed TransCARE), the GPS-synchronized harmonic state measurement system for transmission systems (first (1993) wide area measurement system on NYPA), the distributed dynamic state estimation method (SuperCalibrator), the setting-less relay, and the CYMSA software (Cyber-Physical Modeling and Simulation for Situational Awareness).

Dr. Meliopoulos is a Fellow of the IEEE. He holds 3 patents, he has published three books, a chapter in the Standard Handbook for Electrical Engineers and over 400 technical papers.

