Mitsubishi Electric Power Products, Inc.  
(MEPPPI)

Proposal to the  
Louisiana Public Service Commission

In Response to RFP 22-21


TO: Kimberly N. O’Brian  
Katheryn H. Bowman  
Louisiana Public Service Commission  
Office of Executive Counsel  
602 North Fifth Street (Galvez Building) (70802)  
Post Office Box 91154  
Baton Rouge, Louisiana 70821-9154

FROM: Henry Morrow

CC: Shariq Siddiqui, Don Shoup

DATE: August 25, 2022

MEPPI Contact Person: Henry Morrow  
MEPPI Approver: Shariq Siddiqui
COMPANY EXECUTIVE SUMMARY

Mitsubishi Electric Power Products, Inc. (MEPPI) is submitting this proposal in response to Louisiana Public Service Commission RFP request for an outside consultant for RFP 22-21 Docket No. I-36503, 1803 Electric Cooperative, titled “2022 Request to Initiate Integrated Resource Planning process of 1803 Electric Cooperative (1803)”, and is willing to support the Louisiana Public Service Commission Staff (“Commission” and “Staff”) in its review of the resource planning process Request For Proposal (“RFP”). This proposal is meant to meet the requirements of the RFP No. 22-21 dated August 11, 2022.

On July 29, 2022 1803 filed a request to initiate its 2022 IRP process. This was done according to Commission Order No. S-35709 which authorized 1803 Electric Cooperative to operate as a regulated public utility within Louisiana. 1803 Electric Cooperative is owned by five (5) cooperatives: Beauregard Electric Cooperative, Inc., Claiborne Electric Cooperative, Inc., Northeast Louisiana Power Cooperative, Inc., South Louisiana Electric Cooperative Association, and Washington-St. Tammany Electric Cooperative, Inc. (the Member Cooperatives) and as such the Commission has jurisdiction over 1803 pursuant to Article IV, Section 21(B) of the Louisiana Constitution.

MEPPI staff have been involved with the IRP preparation in several states and prepared to support the Commission in this case. MEPPI is familiar with the process used in the Investor-Owned Utilities instances found in Docket Nos. I-33014, I-34694 for Entergy Louisiana, LLC, Docket Nos I-33015 and I-34693 for Cleco Power LLC, and Docket Nos. I-33013 and I34715 for SWRECO. Sufficient support will also include time for the Docket completion which includes contested hearings pursuant to Event 12 of the Schedule of Events.

SECTION 1: MEPPI QUALIFICATIONS

MEPPI is qualified to assist Commission based on our familiarity with the IRP process, Louisiana utilities, MISO, and transmission planning. MEPPI is familiar with evaluating the least cost portfolio of full-requirement contracts, partial-requirement contracts, utility owned, and power purchase agreements combined to meet the load. Our staff members meet or exceed all the requirements set forth in the RFP:

1) The Commission’s IRP Rules

MEPPI staff members have extensive years of experience participating in the IRP process of investor-owned utilities, municipal and cooperative power companies and are familiar with the rules specified by the Commission.
2) The Commission’s Rules and Orders pertaining to the RFP process
MEPPI is familiar with the April 10, 2002 General Order which established a structure for
evaluating proposals for generating capacity based on a Market Based Mechanisms (MBM)
and that an RFP process be followed. The September 20, 1983 General Order is also
understood.

3) Policies related to Energy Efficiency and Distributed Generation and their applicability to
resource planning

MEPPI staff have decades of experience using production cost modeling software to
evaluate the least cost combinations of energy efficiency, distributed generation and other
supply side options within the context of resource planning.

4) Policies related to Transmission and their applicability to resource planning

MEPPI staff have experience working with the transmission planning process in several
ISOs/RTOs namely MISO, ISO-NE, PJM, SPP, and ERCOT. The experience includes
using the planning software used in the evaluation of transmission projects.

5) Principles associated with resource acquisitions, including but not limited to whether or
not a particular resource meets the utility’s need for power and whether the considered
resources are able to meet those needs.

MEPPI has extensive experience using production cost modeling software to evaluate
intermittent resources such as solar, batteries, and wind to meet the utility’s needs. The
software was used in support of filed IRPs in several states.

6) Whether or not a resource will provide reliable service at the lowest reasonable cost

MEPPI has used several different production cost modeling software to determine the least
cost resource based on lowest Present Value of Revenue Requirements (PVRR) metric

7) Resource planning methods to improve the efficiency and reliability of a utility’s power
supply operations and whether the utility is making use of any such methods

MEPPI staff participate in ISO/RTO working groups that evaluate reliability based on the
loss of load probability and have used production cost modeling software to evaluate
efficiency and reliability.
8) Public interest criteria for approval and monitoring of electric generating facility projects

MEPPI staff is familiar with the siting and permitting process for electric generating plants and participates on ISO/RTO regional working groups that work with community groups and stakeholders.

9) Rules and policies on cost recovery, including 1803’s recently approved formula rate plan

MEPPI staff have been employed by electric utilities and participated in the cost recovery process while employed there. The staff has decades of experience working on proceedings in several states. MEPPI is also familiar with Docket No. U-36268 which stipulates the recovery of costs through the 1803 Wholesale Rate Tariff (WRT), Power Cost Adjustment Clause (PCA), Fuel Cost Adjustment Clause (FCA), Formula Rate Plan (FRP), and various other schedules referred to as WRT.

10) MISO tariffs, rules and planning processes generally

MEPPI is familiar with the MISO Transmission Expansion Plan (MTEP) and has completed several studies in the area. Team members participate on several MISO working groups and are knowledgeable of the tariffs and rules.

MEPPI staff members have extensive experience preparing utility employees for direct testimony and questions before the Florida Public Service Commission (FPSC). Specific experience includes preparation of the Duke Energy Florida utility Ten Year Site Plan and response to question from the FPSC.

MEPPI offers a wide range of technical analysis and consulting services to position organizations to meet their grid planning and operation objectives. Our consulting experience includes resource interconnection studies, including feasibility and system impact studies of offshore wind, inverter-based resources, battery energy storage systems and conventional generation units, performed on behalf of regional transmission organizations (RTOs) namely MISO, ISO-NE, PJM, SPP, and ERCOT. Economic analysis and studies to determine congestion and curtailment of offshore wind units and production cost simulations to determine revenue and capacity factors of prospective generation resources. We also specialize in the integration of advanced technologies such as FACTS and HVDC, including custom model development, system controls, harmonic stability, and other specialized controls and interaction phenomena, along with their performance in the grid with traditional generation and equipment, including synchronous condensers. We are well positioned for such consulting endeavors, further supported by decades of expertise in power flow,
stability, and electromagnetic transients and related analysis in the integration of traditional grid equipment (circuit breakers, transformers, reactors, capacitors, and other line, cable, and substation related equipment) and protective equipment (such as surge arresters and protective circuit breaker characteristics) in addition to the integration of inverter-based resources.

We bring unique knowledge of industry standards, guidelines, specification, design, manufacturing, testing, validation, commissioning, simulation, and field performance to our consulting initiatives. We are an unbiased third-party consultant with all the physical and cyber security protocols in place to ensure data is protected and handled securely. Given our expertise, organization, and structure, we are contracted by Mitsubishi Electric and other OEMs, Investor-Owned Utilities, Independent System Operators, Developers, and other commercial/industrial institutions frequently.

1.1 Work Plan

MEPPI is prepared to begin work immediately upon agreement. The plan to complete the work consists of several steps.

1. Review 1803 filing – We will review the details of the filing within the context of the MBM and RFP requirements established by the Commission. That includes reviewing specific resource additions, load, natural gas and coal prices, VOM, capacity additions costs, market sales and purchases, MISO resource additions and costs, retirements, transmission contracts, etc.

2. Communicate with Staff – establish frequency of check-in meetings, briefs

3. IRP evaluation – review alternative supply options regarding costs, capacity deliverability, and risks

4. Conferences – we will attend any technical conferences required by Commission and Staff

5. Respond to questions from bidders – we will assist with any questions related to transmission, generation, and load

6. Post-Hearing requirements – MEPPI will support Staff and Commission with any briefs or discussions

As specified under section III. Period of Representation, the approximate time of the representation is 24 months.
1.2 Total Budget to Support Staff in Review of RFP and IRP

Based on estimates of a similar Docket (I-33014), MEPPi will provide the scope of services in this proposal for a total budget not to exceed $51,300 which consists of $48,800 for consulting services and $2,500 for expenses. The hourly rate for professional services is shown in Appendix B.

08/25/2022
Donald J. Shoup
General Manager, PSED
724-778-5218
Don.Shoup@meppi.com
www.meppi.com

COMPANY CREDIT INFORMATION

Name of Company: Mitsubishi Electric Power Products, Inc.

Address: Thorn Hill Industrial Park
530 Keystone Drive
Warrendale, PA 15086

Phone: 724-778-5111
724-778-5146-facsimile

Business Commenced: December 1985

DNBI Number: 15-374-7456

Number of Employees (MEPPi): Office-486
Field: 66
Shop: 304

Number of Employees (PSED): Office- 65

Principals: Tricia Breeger-President
Brian Heery-Chairman & CEO
Susan Renda- Vice President, Human Resources
John Paserba- Vice President, Power Systems Group
1.2.1 Key Project Staff

**Henry Morrow, Principal Systems Studies Engineer** Focuses on Integrated Resource Planning, responding to RFPs, asset evaluation, market price forecasting, capacity expansion, resource adequacy, ISO/RTO market design, economic evaluations of power purchase agreements

Prior to joining MEPPI, Mr. Morrow spent 14 years at Duke Energy working in the resource planning group preparing filings to the Florida Public Service Commission (FPSC) for cost recovery. The responsibilities included responding to Staff questions, completing production cost modeling results, preparing team members for direct testimony, and completing the filed Ten-Year Site Plan (TYSP). He also provided testimony support to the FPSC while working at Seminole Electric Cooperative, Inc. as a Senior Engineer.

**Shariq Siddiqui, Managing Principal Consultant** manages multiple teams of consulting engineers with a focus on Economic Analysis and Interconnection Studies in ISO New England. He has served as the secretary for stability working groups and stability task forces and as the secretary for the EIPC (Eastern Interconnection Planning Collaborative). He has led ISO efforts on maintaining dynamic, PSCAD, and short-circuit data and models. He has also led PPA (Proposed Planned Application) and MMD (Material Modification Determination) analysis, including AVR (Exciters), PSS (Power System Stabilizers), and generator rewind upgrades. He has expertise in PSS/E, ASPEN Oneliner, Power-Gem’s TARA, and ABB GridView/PROMOD software platforms.

Prior to joining MEPPI, Mr. Siddiqui spent nearly nine years at ISO New England, where he performed many different roles. He worked in Market Operations initially where he executed and approved the Day Ahead Market, monitored, and finalized Real-Time Energy Market Locational Marginal Prices (LMPs), Reserve Market Clearing Prices (RMCPs), and Regulation Clearing Prices (RCPs). He has in-depth knowledge of Market Rules. He also worked in system planning and lead interconnection studies, including wind, solar, battery energy storage, and conventional generators. He is knowledgeable in ISO New England markets, rules, and generator interconnection procedures, as well as Open Access Transmission Tariffs requirements. He frequently engaged with stakeholders and brought necessary changes to Planning Procedures, including interconnection reforms because of inverter based resources.
Saad Syed, Senior Engineer has expertise in economic analysis and generation interconnection area with over a decade of experience in power systems industry. He is proficient with Production Cost Simulations using tools such as PROMOD, PROBE and PLEXOS. He has performed economic analysis for prospective POI locations with several configurations, sensitivities and has a good understanding of the operational philosophies in terms of revenue, energy generation, curtailment, basis risk, binding constraints. He has performed congestion and curtailment analysis for offshore wind in ISO-NE to provide ISO-NE stake holders with input on future expected generation curtailments.

He has also conducted feasibility and system impact technical studies for more than 7000 MW of future offshore wind power plants which will be built off Cape Cod region in Massachusetts. He has also studied Battery Energy Storage System (BESS), solar and conventional power plants in ISO-NE footprint.

Prior to joining MEPPI, Mr. Syed worked as consultant for two years at PJM Interconnection, one year at ISO-NE, and four years at ERCOT in various departments, including EMS modeling, planning modeling, and operations support. At MEPPI, he has pioneered Power Markets, Hybrid Resource Interconnection and Economic Analysis work by leveraging his extensive knowledge of Protocols and Standards of all the Independent System Operators (ISOs) of Eastern Interconnection.

Yashaswini Venkobarao, Engineer II has expertise in performing the economic analysis of renewable generation, hybrid projects by updating and benchmarking PROMOD models. She has extensive experience in performing economic analysis on renewable generation project to evaluate the curtailment and basis risk for the projects in various ISO/RTO footprints including ERCOT, CAISO, WECC, PJM and ISO-NE. She has performed economic transmission analysis and cost benefit analysis to determine viable transmission projects options in PJM footprint. She has experience in preparing Large Generator Interconnection Application package for CAISO and WDAT Small Generator Interconnection Application Packages with load flow model, dynamic data file, reactive power capability document, single line diagram, flat and bump test results. She has performed technical data review, model development steady state, short circuit, and stability studies on the queued projects in ISO-NE footprint using software such as PSS/E and ASPEN. She has experience performing historical LMP analysis, generating heat maps using nodal LMP data and bus-level demand data using ABB’s Velocity suite.

1.2.2 Other Principal Engineers Available in Advisory Role

Scott G. Ghiocei is a managing principal consultant at MEPPI and has over 10 years of experience in analyzing power systems for power utilities, system operators, and governmental agencies in the U.S. and South Korea, including performing technical studies using power flow and dynamic simulation software packages. He has investigated transmission system reliability and stability for large-scale renewable integration.
David E. Roop is a managing principal consultant at MEPPi and has performed on-site field testing and calibration studies toward NERC MOD (Model) testing for the verification of renewable generating plant dynamic models and data. He also has experience conducting/preparing test plan development, plant personnel coordination, field testing, and dynamic model validation work related to MOD-025, MOD-026 and MOD-027 verification testing for wind farms at both the plant and individual turbine level.

Nicholas Tenza is a managing principal consultant at MEPPi and has over 13 years of experience in power system field as specializes in power factor & stability analysis and generation interconnections. He is involved with generator testing, specifically for NERC MOD 26 and MOD 27. He has a combined experience of on-site testing and in-depth knowledge of dynamic modeling. He has experience in developing test plans with the customer, supporting on-site testing, optimizing the model parameters for dynamic simulations, and creating comprehensive reports.

Adam R. Sparacino is a managing principal consultant at MEPPi and has led and contributed to insulation coordination analyses, electromagnetic transients’ analyses, frequency scan analyses, as well as analyses related to the specification, design and performance verification of power electronics equipment for transmission systems. These analyses use a variety of software, including electromagnetic transient (EMTP-RV, PSCAD/EMTDC), dynamic performance (PSS/E, PSLF), short-circuit (ASPEN) and factory acceptance/simulator testing (RSCAD, RTDS).

Adam W. Gerstmecker is a managing principal consultant at MEPPi and has led efforts performing performed stability analysis, power flow analysis, and electromagnetic transient analysis. He has also performed large scale stability studies for TPL, compliance and generation retirement, and operational stability studies to assess power system voltage and angular instability and evaluate system reinforcements.

Chad D Mazurek, P.E is a managing principal consultant at MEPPi and has performed numerous steady-state studies at the transmission level including NERC TPL compliance, short-term and long-term transmission planning, summer/winter peak operating studies, minimum “must-run” generation and generator interconnection. He has served as a Subject Matter Expert (SME) during a NERC compliance audit. Chad has several years of experience in the field of electromagnetic transient studies (EMT) and takes lead on DER interconnection studies.

1.3 Description of Production Cost Simulation Modeling and Reporting Tools
MEPPi has expertise in working with PowerGem’s PROBE LT, Hitachi Energy’s PROMOD, and Energy Exemplars production cost modeling and simulation tools.
1.4 Adherence to Anti-trust and Collusion laws
MEPPI is committed to the highest standards of business ethics and legal compliance. This commitment encompasses our relationships with customers, suppliers, and competitors and with each other as employees at every level of the organization. It is the policy of MEPPI to require strict observance of and compliance with both the letter and spirit of all laws governing the conduct of the company’s businesses. MEPPI’s employees are expected to have a general knowledge of the laws and regulations that apply to their work.

MEPPI requires all employees to complete annual “Business Ethics and Legal Compliance Policy” and “Anti-bribery Policy” trainings. These policies also impose on MEPPI employees a higher standard of ethical conduct than mere compliance with the law. In all of their dealings with others, MEPPI employees are required to exercise the highest degree of honesty and integrity.

1.5 Avoiding Conflicts of Interest
MEPPI requires all employees to complete annual “Conflict of Interest Policy”, and “Competitor Contact Policy“

SECTION 2: LIST OF REFERENCES AND CONTACT INFORMATION
Listed below are references for the MEPPI team that will be supporting VCE.

➢ Al McBride
  o Director | Transmission Services & Resource Qualification
  o ISO New England, Regional Transmission Organization
  o (413) 540-4223 (office)
  o amcbride@iso-ne.com
  o www.iso-ne.com

➢ Bhaskar Ray
  o VP of Interconnection & Development Engineering | Development
  o Qcells USA Corp.
  o (415) 305-3070
  o bhaskar.ray@qcells.com
  o www.qcellssusa.com

➢ Tim McDuffie
  o Senior Business Development Engineer, Smarter grid Solutions
Vishal Patel
- Principal Manager - Integrated System Analysis
- Southern California Edison (SCE)
- vishal.patel@sce.com
- www.sce.com

SECTION 3: CONTACT INFORMATION
For further details, questions, and clarifications, contact:

Henry Morrow
Principal Systems Studies Engineer
Power Systems Engineering Division (PSED)
Mitsubishi Electric Power Products, Inc.
530 Keystone Drive, Warrendale, PA 15086
E-mail: Henry.Morrow@meppi.com
Phone: 724-742-3497

MITSUBISHI ELECTRIC POWER PRODUCTS, INC.

Name: Henry Morrow
Date: 8/29/22
Title: Principal Systems Studies Engineer

Signature: [Signature]
HENRY MORROW
Mitsubishi Electric Power Products, Inc.
Principal Engineer, Power Systems Engineering Division

EXPERIENCE

Mr. Morrow focuses on production cost studies in support of utilities, developers, cities, and states. He has worked in the resource planning departments of utilities for over two decades performing studies in support of the Integrated Resource Planning (IRP) process, cost recovery, and determination of need.

He has performed generation capacity expansion studies to determine the least cost IRP plan given input constraints: renewable energy goals, CO2 reduction targets, energy efficiency mandates, capital cost, fuel price forecasts, emerging technology trends such as hybrid solar storage, non-capital fixed costs, and other costs related to the cost of electricity.

He has supported direct testimony and filings of staff members while employed by several utilities and consulting firms. While employed at Duke Energy as a Lead Engineer for 14 years he supported filings and testimony before the Florida Public Service Commission regarding the Commission IRP requirement the Ten-Year Site Plan. He worked on several Staff requests related to the many Duke Energy filings including providing data in the form of Present Value Revenue Requirement (PVRR) and annual cost data. While employed as a Senior Consultant at Daymark Energy Advisors he supported the consultants responsible for the firms many state regulatory organizations.

While employed as a Senior Planning Engineer at Seminole Electric Cooperative, Inc he performed production cost modeling studies to evaluate power purchase agreements, economic evaluations of plant modifications, capacity additions, and completing the filed IRP.

Employment Record

Mitsubishi Electric Power Products, Inc. 2022 - Present
Principal Systems Studies Engineer
• Completed production cost modeling studies of generating plants and systems
• Lead ISO/RTO market price forecasting services
• Grow economic consulting product offering
• Determine production cost of emerging policies such as renewable energy goals

Daymark Energy Advisors; Remote 2020 - 2022
Senior Consultant
• Completed long term forecasts of electric power markets using Aurora and PLEXOS
• Developed analysis tools to trouble shoot transmission congestion
• Developed QA tools for model inputs and outputs
• Supported business development efforts
Duke Energy; Charlotte, NC
Lead Engineer – Production Cost Modeling and Analytics
- Supported filings to the Florida Public Service Commission related to the Integrated Resource Planning (IRP) process
- Led DC power flow studies using PROMOD for batteries, solar, and circuit upgrade evaluations
- Incorporated AC power flow assumptions from PSS/E into zonal studies
- Developed Python scripts to transfer data between SQL Server and APIs

Seminole Electric Cooperative, Inc; Tampa, FL
2006 - 2007
Senior Planning Engineer – System Planning
- Analyzed capital and power purchase agreements using PROMOD and Strategist
- Completed regulatory filings related to the IRP process
- Led software data input quality assurance

Global Energy Decisions (now ABB); Atlanta, GA
2000 – 2006
Senior Consultant
- Completed forecasts of electric market prices using Planning and Risk
- Developed quality assurance test plans for production cost product offerings
- Trained users on new features of software

Texas Utilities (now Vistra Energy Corp); Dallas, TX
2000
Senior Resource Analyst
- Developed fuel requirements using PROSYM
- Analyzed power purchase agreements using PROSYM\EMSS
- Reviewed model results with plant managers and various staff

Henwood Energy Services (now ABB); Sacramento, CA
1996 - 2000
Senior Consultant
- Completed forecasts of wholesale electric prices using Prosym\EMSS
- Completed plant valuations using stochastic and deterministic methods

EDUCATION:

Master of Business Administration
- Florida State University, Tallahassee FL

Bachelor of Science in Electrical Engineering
- California State University Sacramento, Sacramento CA

PROFESSIONAL SOCIETY ACTIVITIES

Member IEEE, for Power and Energy Society
SHARIO SIDDQUI
Mitsubishi Electric Power Products, Inc.
Managing Principal Consultant, Power Systems Engineering Division

EXPERIENCE

Mr. Siddiqui manages multiple teams of consulting engineers with a focus on Economic Analysis and Interconnection Studies in ISO New England. The Economic Team supports various utilities, developers and ISOs performing congestion curtailment, risk basis analysis, LMP (location marginal price) forecasting to determine optimum point of injection for new projects as well as identifying new transmission projects. The evaluation includes storage projects as stand-alone and Hybrid projects (co-located with PV or Wind). The Interconnection Team perform feasibility and system impact studies for offshore/onshore wind, battery, solar and elective transmission upgrade projects in the queue. The study scope includes steady state, short circuit, stability and PSCAD analysis. Prior to joining MEPP, Mr. Siddiqui spent nearly nine years at ISO New England, where he performed many different roles. He worked in Market Operations initially where he executed and approved the Day Ahead Market, monitored, and finalized Real-Time Energy Market Locational Marginal Prices (LMPs), Reserve Market Clearing Prices (RMCPs), and Regulation Clearing Prices (RCPs). He has in-depth knowledge of Market Rules. He also worked in system planning and lead interconnection studies, including wind, solar, battery energy storage, and conventional generators. He is knowledgeable in ISO New England markets, rules, and generator interconnection procedures, as well as Open Access Transmission Tariffs requirements. He frequently engaged with stakeholders and brought necessary changes to Planning Procedures, including interconnection reforms because of inverter based resources.

Mr. Siddiqui has conducted load flow and stability analysis using PSS/E software for generation interconnection and retirement, renewable plant feasibility/design and integration of energy storage, evaluating system margin limits using PV/QV, shortcircuit, power factor, steady-state, and dynamic stability analysis. He has used PSS/E, ASPEN OneMiler, Power-Gem’s TARA, and ABB GridView/PROMOD software platforms.

His responsibilities have included interacting with interconnection customers, manufacturers (such as wind, solar, and battery storage vendors), Transmission Owners, operators, and ISOs. He has served as the secretary for stability working groups and stability task forces and as the secretary for the EIPC (Eastern Interconnection Planning Collaborative). He has led ISO efforts on maintaining dynamic, PSCAD, and shortcircuit data and models. He has also led PPA (Proposed Planned Application) and MMD (Material Modification Determination) analysis, including AVR (Exciters), PSS (Power System Stabilizers), and generator rewind upgrades. He has coordinated project technical modeling issues with customers and manufactures and resolved issues by providing guidance to external parties while also adhering to ISO tariff and procedure requirements. He is knowledgeable in ISO New England markets, rules, and generator interconnection procedures, as well as Open Access Transmission Tariffs requirements.
He frequently engaged with stakeholders and brought necessary changes to Planning Procedures, including interconnection reforms because of inverter based resources. He has working knowledge of FERC requirements and NERC (such as PRC, TPL, and MOD) standards, and issues regarding transmission and interconnection.

EDUCATION

*Master of Science - Power Systems Management – 2015*
- Worcester Polytechnic Institute

*Bachelor of Science - Electrical Engineering – 2007*
- Iowa State University of Science & Technology

PROFESSIONAL SOCIETY ACTIVITIES

- Member IEEE, for Power and Energy Society

AWARDS

- Dean’s honor list at Iowa State University and Worcester Polytechnic Institute for academic excellence

PROFESSIONAL TRAINING

Siemens Power System PSS®E Trainings:
- PSSC_500: Power Flow and Steady State Analysis using PSS®E
- PSSC_550: Dynamic Simulation using PSS®E
- PSSC_710: Advanced Power Flow Using PSS®E
- PSSC_510: Voltage Control and Reactive Power Planning Methods
- PSSC_650: PSS®E and Python - Integrating Workflow and Automation
- PSEC_710: Overview and Comparison between Simulation Domains (PSS®E and PSCAD)

Vendor Specific Trainings:
- VESTAS Training on Wind Turbine Modeling
- GE Energy Subsynchronous Resonance (SSR) and Torsional Interaction Training
- GE Synchronous Condensers Training ABB HVDC Training
- ABB Gridview® Training
SAAD SYED  
*Mitsubishi Electric Power Products, Inc.*  
*Senior Engineer, Power Systems Engineering Division*

**EXPERIENCE**

Saad has been with MEPPi PSED since February 2019 working in economic analysis and generation interconnection areas and has over a decade of experience in the power systems industry. Prior to joining MEPPi, he consulted for two years at PJM Interconnection, one year at ISO-NE, and four years at ERCOT in various departments, including EMS modeling, planning modeling, and operations support. At MEPPi, he has pioneered Power Markets, Hybrid Resource Interconnection and Economic Analysis work by leveraging his extensive knowledge of Protocols and Standards of all the Independent System Operators (ISOs) of Eastern Interconnection. He has built Power Markets ecosystem by interacting with various vendors such as ABB Hitachi, Power Gem, Power Analytics and by creating working datasets of historical power prices from ISOs and energy prices from U.S Energy Information Administration (EIA). He has kept up with latest industry trends by attending various technical and trade conferences in Energy Markets by Energy Systems Integration Group (ESIG) and S and P Global. He is proficient in running Production Cost Simulations using tools such as PROMOD, Probe and Plexos.

- He has performed economic evaluation study of prospective POI locations for revenue forecast and evaluated different configurations and operational philosophy in terms of revenue and annual energy generation.
- He has performed congestion and curtailment analysis for offshore wind in ISO-NE to provide ISO-NE stake holders with input on future expected generation curtailments.
- He has also conducted feasibility and system impact technical studies for more than 7000 MW of future offshore wind power plants which will be built off Cape Cod region in Massachusetts. He has also studied Battery Energy Storage System (BESS), solar and conventional power plants in ISO-NE footprint.

At PJM, Saad was responsible for supporting the EMS team to manage and update the PJM network model. Using the Information Model Manager (IMM) and Siemens Smart Grid Energy Management (SGEM) system, he modeled hundreds of substations as part of a major 69 kV expansion in the PJM footprint. He parsed EMS models in CIM format and created reports in SERC format to be used in model exchange with other Independent System Operators (ISOs). He supported tuning and synchronizing EMS models, quarterly. He used Python to identify critical breakers from thousands of substations within PJM.

At ISO-NE, he provided his expertise in Model on Demand (MOD) to create profiles for peak, shoulder, and light loads to automate load scaling and reduce turnaround time for case requests. He was responsible for modeling the ISO-NE portion of the MMWG cases.
During his four years at ERCOT, he produced biennial voltage profiles for all the generators in ERCOT, developed and created reports for wind power forecast performance, created the first Geo Magnetic Disturbance (GMD) operating plan for the ERCOT control room, and created Constraint Management Plans (CMPs) to relieve constraints in stressed systems. He also built seasonal steady state cases and short-circuit cases. He was part of the CCET Discovery Across Texas Synchrophasor Project and was responsible to present meaningful ways to use synchrophasor data for ERCOT operators in the control center. He surveyed all the generators in ERCOT to determine an aggregate alternate fuel capability for winter preparedness, to assess PRC 024 compliance of relay settings, and to assess reduced generation peak capability of thermal power plants during drought season. He also supported ERCOT to provide required power system data for FERC filings and complying with RE (Regional Entity) standards. Saad created a smart grid test bed using a Real Time Dynamic Monitoring System (RTDMS) and hardware in the loop setup of synchrophasors to gather and analyze synchrophasor data for wind control system interactions and sub harmonics, as part of his work as a Research Assistant at Texas Tech University.

EDUCATION

Master of Science in Electrical Engineering, Power Systems – 2013
- Texas Tech University

B.E. Electrical and Electronics Engineering – 2010
- Osmania University, India

PROFESSIONAL SOCIETY ACTIVITIES

- Member of IEEE

IEEE: Power & Engineering Society (PES)
SCOTT G. GHIOCEL  
*Mitsubishi Electric Power Products, Inc.*
*Managing Principal Consultant, Power Systems Engineering Division*

**EXPERIENCE**

Scott Ghiocel joined the Mitsubishi Electric Power Products, Inc. (MEPPI) Power Systems Engineering Division (PSED) in January 2015. Scott specializes in modeling, dynamics, stability, and control of transmission systems and smart grids. He has developed algorithms for voltage stability including a patented voltage stability analysis method based on an AQ-bus approach. He also designed and deployed real-time energy management software (EMS) applications for power system operations and control using synchronized phasor measurements, including state estimation, voltage stability, and reactive power dispatch using flexible AC transmission system (FACTS) controllers.

Scott has over 10 years of experience in analyzing power systems for power utilities, system operators, and governmental agencies in the U.S. and South Korea, including performing technical studies using power flow and dynamic simulation software packages. He has investigated transmission system reliability and stability for large-scale renewable integration. He has analyzed phasor measurement unit (PMU) data to identify and correct data quality issues, including the statistical reconstruction of missing measurements. He has also provided guidance on power system cybersecurity issues including attack detection and mitigation.

Scott’s research experience focused on computational techniques for power systems, including phasor data quality enhancement, voltage stability margin calculation, adaptive networked control using remote signals, power system economic dispatch, and mixed-integer optimization for reactive power dispatch.

**EDUCATION**

*Doctor of Philosophy in Electrical Engineering - May 2013*
- Rensselaer Polytechnic Institute (RPI), Troy, New York

*Masters of Science in Electrical Engineering - August 2010*
- Rensselaer Polytechnic Institute (RPI), Troy, New York

*Bachelors of Science in Electrical Engineering - December 2007*
- Rensselaer Polytechnic Institute (RPI), Troy, New York

**PROFESSIONAL SOCIETY ACTIVITIES**

- Member of the IEEE and Power Engineering Society (PES)
- Member of CIGRE (US) Next Generation Network (NGN)
- Member of the IEEE-PES Power System Stability Subcommittee
- Member of the IEEE-PES Power System Dynamic Performance Working Group on Voltage Stability
- Member of the IEEE-PES Working Group on Power Systems Dynamics Measurements
- Participant in the North American Synchrophasor Initiative (NASPI)
- Participant in the Western Electricity Coordinating Council – Model Validation Working Group (WECC - MVWG)
- Peer Reviewer for IEEE Transactions on Power Systems, Transactions on Power Delivery, and Transactions on Smart Grid

PATENTS


SELECTED JOURNAL ARTICLES

DAVID E. ROOP  
*Mitsubishi Electric Power Products, Inc.*  
*Managing Principal Consultant, Power Systems  
Engineering Division*

**EXPERIENCE**

David has been with MEPPi PSED since July 2013. Prior to joining MEPPi, he worked two summers as an intern on the team. 

David has conducted electromagnetic transient analysis using PSCAD, EMTP-RV, and ATP to simulate phenomena associated with transient recovery voltages, lightning, switching surges, and insulation coordination and has performed analyses that implemented applicable IEEE and ANSI standards. He has also performed load flow and stability work using Siemens Power Technologies’ PSS/E and GE Positive Sequence Load Flow (PSLF) simulation software for generation interconnection studies and power factor, dynamic stability, and steady state analysis. 

While with MEPPi, David worked in Japan for an extended period with MELCO (2.5 years), MEPPi’s parent company. His primary activities were focused on power electronics, including Static VAR Compensator (SVC), Modular Multi-Level Converter based Static Synchronous Compensator (MMC-STATCOM), Hybrid (SVC+STATCOM), as well as Voltage Source Converter (VSC) based MMC-HVDC efforts. His focuses included: SVC/STATCOM/HVDC system design, specification development, transient and dynamic analyses, control performance studies, feedback controller tuning, harmonic filter design, harmonic impedance and resonance analyses, main equipment specification, multi-device control interaction, integration with renewable resources (e.g., such as wind and solar), and Real Time Digital Simulation (RTDS). 

David has performed on-site field testing and calibration studies toward NERC (North American Electric Reliability Corporation) MOD (Model) testing for the verification of renewable generating plant dynamic models and data. Test plan development, plant personnel coordination, field testing, and dynamic model validation work related to MOD-025 (Real/Reactive Power Capability), MOD-026 (Plant Volt-Var Control), and MOD-027 (Active Power/Frequency Control) verification testing was conducted for wind farms at both the plant and individual turbine level. 

David has conducted load flow and stability analysis using PSS/E and PSLF software for transmission line sizing, generation interconnection and retirement, renewable plant feasibility/design and integration of energy storage, evaluating loadability limits using PV/QV, short-circuit, power factor, steady-state, and dynamic stability analysis. 

David’s interests are to provide innovation in the area of power electronics research and development, studies, design, and equipment application, based on his increasing experience in these areas to date. David looks to drive technology in both the software and hardware domains to support these efforts, including expanding upon the state-of-the-art use of RTDS in power system applications, beyond the research domain.
David looks forward to developing these efforts both domestically in the United States and internationally, where he has already spearheaded efforts for MEPPI in Europe, Latin America, Asia, and Australia. He also has aspirations of pursuing graduate work and his doctoral degree consistent with his efforts here.

EDUCATION

Bachelor of Science in Electrical Engineering - 2013  
- Virginia Polytechnic Institute and State University

Bachelor of Science in Physics - 2013  
- Radford University

PROFESSIONAL SOCIETY ACTIVITIES

- Member of the NERC PPMVTF (Power Plant Modeling and Verification Task Force) and IRPTF (Inverter-Based Resource Performance Task Force) initiatives.
- Member of the WECC (Western Electricity Coordinating Council) MVWG (Model Validation Working Group) and Contributor to the HVDCTF (High Voltage Direct Current Task Force) on VSC-HVDC Generic Dynamic Model Development.
- Member of the Mitsubishi Electric Co. (Japan) Working Group on MMC-HVDC Protection and Control Development.
- IEEE PES, PELS, and IAS
- CIGRE

AWARDS

- Certified Engineering-In-Training by the VA State Board of Engineers
- Third Place IEEE IAS Myron Zucker Undergraduate Student Design Contest, 2012
NICHOLAS TENZA  
*Mitsubishi Electric Power Products, Inc.*
*Managing Principal Consultant, Power Systems*
*Engineering Division*

**EXPERIENCE**

Nicholas has been with MEPE PSED since May 2010. Prior to joining MEPE, he worked for the team as a summer intern. Nicholas conducts a wide range of studies using the Siemens Power Technologies’ PSS/E power system simulation program. He has experience performing studies related to power factor & stability analysis and generation interconnections. Those inquires have focused on wind and solar generation interconnections, SVC/STATCOM, and large scale stability for compliance with TPL standards. In addition to PTT’s PSS/E software, Nicholas has experience with the GE Positive Sequence Load Flow (PSLF) for power system load flow and stability analysis, including the assessment of power systems to determine voltage instability and evaluate different system reinforcements. He also performs composite load modeling-related studies and determines the effects of induction motor stalling on the power system.

Nick is also involved with generator testing, specifically for NERC MOD 26 and MOD 27. Combining on-site testing and in-depth knowledge of dynamic modeling, he is able to provide dynamic modeling data that operators of electrical transmission systems can use in large scale simulations. He has experience in developing test plans with the customer, supporting on-site testing, optimizing the model parameters for dynamic simulations, and creating comprehensive reports.

Additionally, he has developed transient models using ATP, EMTP, EMTP-RV, and PSCAD to simulate the phenomena associated with transient recovery voltages, including switching surge analysis, and has performed analyses using applicable IEEE and ANSI standards.

Prior to working at MEPE, Nicholas was at Electrical Engineering Coop at Domtar (formerly Weyerhaeuser). In that position, he provided electrical engineering support to a 374,000-ton capacity paper mill, including designing electrical layouts and schematics for the installation of variable speed drives and enhancing mill efficiency.

**EDUCATION**

*Bachelor of Science in Electrical Engineering – 2010*
- University of Pittsburgh

**PROFESSIONAL SOCIETY ACTIVITIES**
- Member of the IEEE and Power Engineering Society (PES)
ADAM R. SPARACINO
Mitsubishi Electric Power Products, Inc.
Managing Principal Consultant, Power Systems Engineering Division

EXPERIENCE

Adam joined MEPPPI PSED in February 2013. He has led and contributed to insulation coordination analyses, electromagnetic transients analyses, frequency scan analyses, as well as analyses related to the specification, design and performance verification of power electronics equipment for transmission systems. These analyses use a variety of software, including electromagnetic transient (EMTP-RV, PSCAD/EMTDC), dynamic performance (PSS/E, PSLF), short-circuit (ASPEX) and factory acceptance/simulator testing (RSCAD, RTDS).

As a student, Adam’s research focused on the design, analysis and computer simulation of power electronic conversion devices, battery energy storage systems, AC/DC hybrid power systems and smart grid technologies.

EDUCATION

Master of Science in Electrical Engineering – 2012
- University of Pittsburgh

Bachelor of Science in Electrical Engineering – 2011
- University of Pittsburgh

PROFESSIONAL SOCIETY ACTIVITIES

- Member of IEEE
- IEEE: Power & Engineering Society (PES)
- IEEE: Power Electronics Society (PELS)
- Member of NERC Inverter-Based Resource Performance Task Force (IRPTF)
- Member of CIGRE

SELECTED JOURNAL ARTICLES

Grid of the Future Symposium, Kansas City MO, October 2012.
ADAM W. GERSTNECKER
*Mitsubishi Electric Power Products, Inc.*
*Managing Principal Consultant, Power Systems*
*Engineering Division*

**EXPERIENCE**

Adam joined MEPPI PSED in August 2011 after working for PSED as a summer intern. He has lead and performed stability analysis, power flow analysis, and electromagnetic transient analysis. Adam has performed stability analysis using PSS/E and PSLF software for system impact studies for generation interconnections and SVC installations. He has also performed large scale stability studies for TPL compliance and generation retirement, and operational stability studies to assess power system voltage and angular instability and evaluate system reinforcements. Additionally, Adam has performed electromagnetic studies using EMTP, EMTP-RV, and PSCAD, examining transients caused by switching lines, cables, transformers, SVC’s, capacitor banks and reactors, as well as lightning and fault clearing events to evaluate insulation strengths, including reference to applicable ANSI and IEEE standards, and equipment application design and experience.

**EDUCATION**

*Bachelor of Science in Electrical Engineering – 2011*
- Youngstown State University

**PROFESSIONAL AFFILIATIONS**

- IEEE
- IEEE Power Engineering Society (PES)
CHAD D. MAZUREK, P.E.
Mitsubishi Electric Power Products, Inc.
Managing Principal Consultant Power Systems
Engineering Division

EXPERIENCE

Chad has been with MEPP PSED since August 2018 and has a collective nine years of experience in power system studies. Prior to joining MEPP, he spent nearly seven years at Black & Veatch as a lead electrical engineer in their Power System Studies group and two years at Associated Electric Cooperative, Inc. (AECl) as a transmission planning engineer. Chad specializes in steady-state, transient stability and electromagnetic transient studies at the transmission and distribution level.

Chad has performed numerous steady-state studies at the transmission level including NERC TPL compliance, short-term and long-term transmission planning, summer/winter peak operating studies, minimum “must-run” generation and generator interconnection. He has served as a Subject Matter Expert (SME) during a NERC compliance audit, specifically with regard to the NERC TPL and FAC standards. His experience as the technical administrator of the generation interconnection studies queue at AECl has made him an authority on the FERC Pro Forma Large Generator Interconnection (LGIA) process. Chad has also performed transient stability studies such as NERC TPL compliance, model validation, and material modification studies for numerous clients.

Chad has several years of experience in the field of electromagnetic transient studies (EMT) and has performed scopes of work such as: transmission line energization (determining Minimum Approach Distance for OSHA standards), capacitor bank switching, transformer energization, transient recovery voltage (TRV), coupled line resonance (induced voltage), single-pole switching, and black start studies.

At the distribution level Chad has experience performing hosting capacity and interconnection studies for Distributed Energy Resources (DER). The scope of these studies have included steady-state analysis (thermal overloads, reverse power flow and voltage violations) time-series analysis (voltage flicker, regulator range and tap cycling), and power quality (harmonics). In addition, he has traveled overseas to train distribution engineers on these principles in a workshop environment.

Chad also has a strong background in object-oriented programming and has authored numerous python scripts to interface with and automate PSS/E and post-process results. He is proficient with the following software suites used in the field of power system studies: PSS/E, PSS/MUST, PSCAD, PSLF, E-TRAN, CYMDIST, Synergi, PSS SINCAL, ETAP, and ASPEN. Chad is a licensed professional engineer in the State of Kansas.
EDUCATION

Bachelor of Science in Electrical Engineering, Power System Analysis and Design - 2009
- Kansas State University

PROFESSIONAL TRAINING

- Siemens Power System PSS®E Trainings: PSSC_550: Dynamic Simulation using PSS®E
- CYME International: Distribution Analysis and Time-Series Analysis
SERCAN TELEKE  
*Mitsubishi Electric Power Products, Inc.*  
*Principal Engineer, Power Systems Engineering Division*

**EXPERIENCE**

Sercan Teleke joined the Mitsubishi Electric Power Products, Inc. (MEPPI) Power Systems Engineering Division in August 2020. Dr. Sercan Teleke is an expert in energy storage, solar photovoltaic (PV) systems, microgrids, renewable energy integration, power electronic applications to power systems, and power system design and analysis. He is a Professional Engineer (P.E.) licensed in California. His professional career includes consulting experience and interacting with various electric utility companies and renewable energy developers across North America, as well as manufacturing experience.

Dr. Teleke began his professional career as an Engineer for Quanta Technology in Raleigh, North Carolina. After working there for three months, he was promoted to Senior Engineer in April 2010. During his tenure, he worked on numerous projects to address smart grid implementation, renewable energy integration and electricity infrastructure challenges that various electric utility companies face in North America. His responsibilities included performing transmission system design, planning, and analysis, assessing the impact of renewable energy sources on distribution and transmission systems, and proposing solutions to mitigate renewable energy sources intermittency.

In May 2011, Dr. Teleke joined Coda Energy in Los Angeles, California. He worked there as a Grid Interface Engineer at first and then promoted to Senior Systems Engineer in June 2012. He was responsible for developing Lithium Ion battery energy storage systems from concept to manufacturing. In this role, his tasks included developing requirements and control algorithms for system master controller to achieve the highest system efficiency and reliability, defining high level system architecture, and contributing in design and testing of bidirectional DC to DC converters utilizing IGBTs.

Dr. Teleke joined Black & Veatch as a Renewable Energy Engineer in March 2013. In this role, he worked on numerous projects to address energy storage and solar PV integration challenges that various electric utility companies and renewable energy developers face around the world. His responsibilities were acting as an independent/owner’s engineer for energy storage developers and performing due diligence with focus on technology, electrical design, and power conversion systems, developing engineering, procurement, and construction technical specifications, capital cost estimates, providing bid review and support, and developing conceptual design for off-grid microgrids and technical specifications for microgrid components including solar PV system, battery energy storage system, diesel generator, and microgrid controller.
Dr. Teleke joined Eaton as a Senior Specialist in December 2015. There, his primary focus was to perform feasibility studies for microgrids and renewable energy projects. In this role, his tasks included acting as an in-house expert to resolve unique engineering challenges of microgrids and evaluate feasibility of non-traditional grid solutions to improve grid resiliency and reliability, developing preliminary/conceptual designs for microgrids and technical specifications for microgrid components including solar PV system, battery energy storage system (BESS), microturbines, reciprocating engines, and dynamic rotary uninterruptible power supply (UPS).

EDUCATION

**Doctor of Philosophy in Electrical Engineering - December 2009**
- North Carolina State University (NCSU), Raleigh, North Carolina

**Master of Science in Electric Power Engineering - November 2006**
- Chalmers University of Technology, Gothenburg, Sweden

**Bachelor of Science in Electrical and Electronics Engineering - June 2005**
- Middle East Technical University (METU), Ankara, Turkey

PROFESSIONAL SOCIETY ACTIVITIES

- Senior Member of the IEEE and Power and Energy Society (PES)
- Member of EPRI Energy Storage Integration Council (ESIC)
- Registered Professional Engineer in California

PATENTS

Qiang Fu and Sercan Teleke, “Predictive Grid Control Methods, Apparatus and Computer Program Products.” Pending.

SELECTED JOURNAL ARTICLES

- “Rule Based Control of Battery Energy Storage for Dispatching Intermittent Renewable Sources,” IEEE Transactions on Sustainable Energy, October 2010
- “Enhanced Control of Voltage Source Converters for DC Shipboard Power Systems,” Naval Engineers Journal, November 2010
- “Optimal Control of Battery Energy Storage for Wind Farm Dispatching,” IEEE Transactions on Energy Conversion, September 2010
DONALD J. SHOUP
Mitsubishi Electric Power Products, Inc.
General Manager, Power Systems Engineering Division

EXPERIENCE

Donald Shoup joined Mitsubishi Electric Power Products, Inc. (MEPPI) Power Systems Engineering Division (PSED) in July 2000. Presently, Mr. Shoup is the General Manager of the PSED and responsible for all aspects of the business. During his time at MEPPI, Mr. Shoup has led or performed over a couple hundred plus power system studies, ranging from equipment application to major system infrastructure analysis (115 kV to 550 kV). Mr. Shoup interests included power electronics application studies and he has led and performed such studies for MEPPI. Prior to joining MEPPI, Mr. Shoup was with Robicon’s (now Siemens) Research and Development Department, where he worked as an engineering assistant beginning in 1999. In July 2000, Mr. Shoup graduated with a Master of Science Degree in Electric Power Engineering from Rensselaer Polytechnic Institute (RPI) in Troy, NY.

EDUCATION

Master of Science in Electrical Engineering – 2000
- Rensselaer Polytechnic Institute

Bachelor of Science in Electrical Engineering – 1999
- Gannon University

PROFESSIONAL SOCIETY ACTIVITIES

- IEEE and Power Engineering Society (PES)
- CIGRE
- Secretary for CIGRE WG A3.19 on “Implications of Three-Phase Line Faults on Circuit Breaker Standards”
- IEEE Switchgear Committee
- IEEE-PES T&D WG on Transmission Planning Requirements for FACTS Controllers
- IEEE-PES Substation Committee/Working Group on Voltage Sourced Converters
- IEEE-PES Power System Stability Subcommittee
- IEEE-PES T&D General Systems Subcommittee/Practical Aspects of Ferroresonance WG
- IEEE Surge Protective Devices Committee
- Guide for the Application of Insulation Coordination/Revision of 1313.2-1999 WG
- IEEE PES Transactions on Power Systems and Power Delivery Paper Reviewer
- IEEE PES Session Chair at the 2002 Summer Meeting, Chicago “System Aspects of FACTS and HVDC”
- IEEE-SA (IEEE-Standards Association)
SELECTED JOURNAL ARTICLES

Billing Rates are confidential and proprietary information and should be viewed by Commission and Staff only. The billing rate by member should be redacted prior to release to the public.

**APPENDIX B**

**Billing Rates**

<table>
<thead>
<tr>
<th>Member</th>
<th>Billing Rate ($/Hr)</th>
</tr>
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<tbody>
<tr>
<td>Managing Principal Consultant</td>
<td>275</td>
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<tr>
<td>Principal Engineer</td>
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<tr>
<td>Senior Engineer</td>
<td>225</td>
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<tr>
<td>Engineer II</td>
<td>200</td>
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<tr>
<td>Engineer I</td>
<td>180</td>
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