

# DHANABAL MANI, MBA

## Director - Electrical Infrastructure, Protection & Digital Grid Engineering

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IEEE Senior Member | CIGRE Member | Stevie Awards Judge | Ph.D. in Global Leadership (In Progress)

### PROFESSIONAL PROFILE

Engineering and technology leader with 25 years of experience spanning high-voltage substations, power-system protection, IEC 61850 digital substations, relay testing and commissioning, engineering software, product validation, utility modernization, and global technical leadership. Career progression from field testing and commissioning through ABB protection-platform validation and utility commissioning to global engineering/software leadership at Megger. Field experience includes generator, transformer, line, busbar, reactor, feeder, and motor protection across utility, power-generation, steel, industrial, and infrastructure sites.

### CORE EXPERTISE

Power System Protection | HV/MV Substations | Testing & Commissioning | IEC 61850 | Digital Substations | FAT/SAT | Relay Application & Validation | Generator Protection | Transformer Protection | Distance & Line Differential Protection | Busbar Protection | Reactor Protection | Motor Protection | SCADA Integration | GOOSE / Sampled Values | Protection Automation | Cloud-Based Testing | Digital Twins | Engineering Software | Utility Modernization | Global Engineering Leadership

### SELECTED CAREER HIGHLIGHTS

- Commissioned India's first 400 kV IEC 61850 digital substation at Bina, Madhya Pradesh, and commissioned more than five 400/220 kV IEC 61850 substations during a concentrated field-delivery period.
- Retrofitted more than 50 220/110 kV transmission-feeder protection schemes from legacy MM3V/SSR3V schemes to REL511 distance protection without line shutdown or line maloperation.
- Led and supported protection commissioning for generators, transformers, transmission lines, reactors, busbars, feeders, motors, switchgear, CTs/PTs, and station automation systems.
- Coordinated ABB global protection-platform validation across Sweden, Switzerland, Finland, and India.
- Led global engineering/software initiatives at Megger supporting protection testing, automation, cloud-enabled testing, digital-twin workflows, and utility modernization; current resume records \$15M+ revenue impact.
- Recognized technical contributor and speaker at IEEE, CIGRE, PAC World, NETA/PowerTest, GCC Power, and other industry forums.

### PROFESSIONAL EXPERIENCE

#### MEGGER GROUP | Dallas, Texas | 2012-Present

##### Director, Relay Software Development | 2020-Present

- Lead global engineering initiatives for software and automation solutions supporting protection systems used in critical electrical infrastructure.
- Provide technical leadership for protection, IEC 61850, digital-substation, relay-testing, cloud-based testing, digital-twin, and engineering-automation initiatives.
- Act as technical advisor to utility clients across North America, the Middle East, and Asia; current resume cites major modernization work including Georgia Power and Saudi Electric initiatives.
- Lead cross-functional engineering teams across regions and represent the organization in IEEE, CIGRE, PAC World, and related technical forums.

##### Earlier Megger Group Engineering / Applications Development Responsibilities

- Developed and validated PowerDB/AVTS relay-test modules and supported SMRT firmware/product validation for relay test systems including SMRT36, SMRT33, SMRT410, SMRT36D and MPRT 8445.
- Built custom automated test modules for protection IEDs applied on networks up to 765 kV; contributed to differential-protection test modules and application guides.
- Contributed to the ERTS Auto Recloser Test Kit and engineering circuit design.
- Supported international technical and sales teams across South Africa, India, Thailand, Indonesia, Taiwan, South Korea, Malaysia, Singapore, France, the Middle East, and North America.
- Application exposure included SEL 451/451A/587/300G/287V/487V/351A/751A/311L/311C/351/321/421/351R/651R/411L/587Z; GE SR745/SR489/SR469/SR269+/SR369/D60/B30/M60/T60 and legacy relays; ABB RET670/REL670/REF630/Synchroact 5; Alstom/Areva MiCOM P442/P642/P643; Siemens 7SA522/7UT613/7VE/7UM62; and Basler BE1 series.

#### MEGGER INDIA LTD | Mumbai, India | 2009-2012 | Application & Technical Manager

- Led relay-test application, technical, sales, tendering, demonstration, and post-sale support across India and Southeast Asia.
- Current career record documents approximately 1000% year-over-year growth in relay test kit sales and expanded adoption among Siemens, ABB, GE, SEL, Alstom and other customers.
- Supported SMRT, MPRT 8430, Sverker 780, Freja 300 and Freja 306 platforms.
- Provided regional support across Singapore, Malaysia, Brunei, Indonesia, Thailand, Bhutan, Bangladesh, Myanmar, Nepal, and Sri Lanka.

#### ABB LTD | Vasteras, Sweden | 2008-2009 | Common Platform Test Coordinator

- Coordinated software, hardware, firmware, and IED validation for ABB's Common Platform project.
- Developed and coordinated specifications and test activities for relay application configurations, software components, hardware modules, and testing modules.
- Coordinated project teams in Sweden, Switzerland, Finland, and India and reported validation status to management.

**ABB INDIA LTD | Bangalore, India | 2005-2009 | Commissioning Engineer / Service Coordinator**

- Tested, commissioned, configured, troubleshot, and integrated electromechanical, static, and numerical protection systems with substation automation systems.
- Performed customer training, fault analysis, commissioning-procedure preparation, FAT/SAT support, energization support, and as-built documentation.
- Worked with protection products from ABB, Siemens, Alstom, GE, SEL, Easun, C&S, Ashida, JVS and others.

**ABB INDIA - MAJOR CUSTOMER & COMMISSIONING SITE EXPERIENCE**

**Hindustan Zinc Ltd - 1 x 80 MW Captive Power Plant, Chanderia, Rajasthan** - Testing and pre-commissioning of generator overall differential and line protection schemes; retrofit, testing and commissioning of numerical busbar protection using REB670.

**Tata Power Company Ltd - Trombay, Maharashtra** - Retrofit, testing and commissioning of the 500 MW unit generator protection scheme using numerical protection relays.

**Kadamparai Pumped Storage Power Plant - Attakatti, Tamil Nadu - 4 x 100 MW** - Resolved issues associated with 100% stator earth-fault protection on all four generators.

**Power Grid Corporation of India Ltd (PGCIL) - Tirunelveli, Tamil Nadu** - Testing and pre-commissioning of 400 kV (3 diameters) and 220 kV (10 bays) switching substation: feeder control terminals, numerical line, transformer, reactor and busbar protection; IEC 61850 substation-automation coordination.

**PGCIL - Fatehabad, Haryana** - Testing and pre-commissioning of 400 kV (3 diameters) and 220 kV (8 bays) switching substation with feeder control, line, transformer, reactor and busbar protection; IEC 61850 SAS coordination.

**PGCIL - Bareilly, Uttar Pradesh** - Testing and commissioning of 400 kV switching substation (5 diameters), including feeder control terminals, numerical line, reactor and busbar protection; IEC 61850 SAS commissioning.

**PGCIL - Ballia, Uttar Pradesh** - Testing and commissioning of 400 kV switching substation (4 diameters), including feeder control terminals, numerical line, reactor and busbar protection; IEC 61850 SAS commissioning.

**PGCIL - Bina, Madhya Pradesh** - Commissioning of complete 400 kV switching substation (5 diameters), including feeder control terminals, numerical line, reactor and busbar protection and IEC 61850 station automation. Career record identifies Bina as India's first 400 kV IEC 61850 substation commissioned by the author as ABB commissioning engineer.

**Bhutan Power Corporation Ltd - Thimphu, Bhutan** - Retrofit, testing and commissioning of REB500 numerical busbar protection.

**Maharashtra State Electricity Board / Enercon Ltd - Bambarwadi, Maharashtra** - Commissioning of complete 132/33 kV substation (8 bays), including line, transformer, busbar and feeder protection, IED/SCADA station control, and as-built drawings.

**Jayaprakash Associates Ltd - Vishnu Prayag, Uttarakhand - 4 x 100 MW Hydro / 400 kV GIS** - Commissioned two 100 MW generator protection systems plus 400 kV numerical line and busbar protection in a double-busbar GIS installation.

**RBN Sugar Mills Ltd - Uttarakhand - 14.5 MW Thermal Power Station** - Commissioned 14.5 MW numerical generator protection using REM543.

**Hindustan Zinc Ltd - 2 x 77 MW Captive Power Plant, Chanderia, Rajasthan** - Commissioned 7 bays covering generator, 132 kV line, transformer and static bus protection; remote relay parameterization using SMS tools and as-built documentation.

**Hindustan Zinc Ltd - 132 kV NZP Substation, Chanderia, Rajasthan** - Commissioned 15 bays of numerical line, transformer and static bus protection; remote parameterization and as-built documentation.

**PGCIL - 400 kV Substation, Raipur, Chhattisgarh** - Commissioned numerical line protection on a breaker-and-a-half arrangement; remote parameterization and as-built preparation.

**NTPC - 400 kV Substation, Dadri, Uttar Pradesh** - Retrofitted numerical line protection using RAZFE; parameterized relays using CAP540.

**KPTCL - Karnataka - REL511 Transmission Feeder Retrofit Program** - Retrofitted, tested and commissioned REL511 distance protection at 220/110 kV class substations without line shutdown: Davangere (14 relays), Hubli (10), Ambewadi (4), Gowribidhanur (4), Yerandahalli (2), Lingasugur (2), Raichur (4), Gulbarga (12), and Peenya (1).

**Jindal Stainless Steel Ltd - 220/66 kV Substation, Jajpur, Odisha** - Commissioned 17 bays in a three-bus system covering numerical line, transformer and bus protection; prepared as-built drawings.

**Punjab State Electricity Board - 132 kV Substation, Jalandhar, Punjab** - Commissioned RET670 numerical transformer protection.

**Durgapur Steel Plant - 33 kV Substation, Durgapur, West Bengal** - Commissioned RADSS static busbar protection for extension bays.

**PGCIL - 132 kV Substation, Rajker, Bihar** - Commissioned numerical line protection.

**Aarti Steels Ltd - Cuttack, Odisha** - Commissioned numerical line protection and static transformer protection.

**Tata Steel Ltd - Tatanagar, Jharkhand** - Commissioned protection for two 5 MW generators using static and Combiflex relays.

**Jindal Steels Ltd - Raigarh, Chhattisgarh** - Commissioned numerical transformer protection for a 50 MVA transformer.

**PGCIL - 400/220 kV Substation, Hiriya, Karnataka** - Pre-commissioning testing of 400 kV numerical line protection.

**PGCIL - 400 kV Substation, Kolhapur, Maharashtra** - Pre-commissioning testing of 400 kV reactor protection schemes and relays.

**KPTCL - 400/220/66/11 kV Substation, Guttur, Karnataka** - Commissioned 400 kV line protection scheme and relay.

**West Bengal State Electricity Board - 400/220 kV Substation, Arambag, West Bengal** - Commissioned 400 kV line protection and performed remote-PC relay parameterization using SMS tools.

**NALCO - 220 kV Substation, Angul, Odisha** - Troubleshot 220 kV busbar protection and integrated ABB numerical transformer protection relay communications with Siemens SCADA.

**MSEB - 400/220 kV Substation, Nagthane, Maharashtra** - Troubleshot 220 kV busbar protection on a three-bus system.

**ABB PROTECTION RELAY / ENGINEERING TOOL EXPERIENCE**

- Feeder protection & control: REF543-5, REX521, REJ523, REJ525, Combiflex relays, REC670.
- Line protection: LZ96, RAZOA, REL511, REL521, REL531, REL316, RAKZB, REL670, Siemens SIPROTEC.
- Line differential: REL551, REF542+, RED670.

- Transformer protection: RADSB, RADHD, RET521, RET316, RET541-5, RET670, SPACOM.
- Busbar protection: RADSS, RADHA, REB500, REB670.
- Generator protection: Combiflex, REG316/216, REM543.
- Configuration / engineering tools: CAP535, CAP540, CAP316, CAP505, CAP501, REBWIN, REBCON, PCM600, SMS510.
- Test equipment exposure: Megger, Omicron CMC256/356, Doble, TURH/TURE and related secondary-injection platforms.

## EARLY FIELD EXPERIENCE - INEL POWER SYSTEM ENGINEERS PVT LTD | Chennai, India | 2001-2005

### Testing & Commissioning Engineer

**Karnataka Power Generating Station - Sharavathi, Karnataka** - Retrofitted, tested and commissioned a 110 kV line-protection panel with EPAC distance relay on behalf of Alstom.

**Arunachalam Sugars Ltd - 110/11 kV Substation, Thiruvannamalai, Tamil Nadu** - Retrofitted and tested MiCOM P341 numerical generator protection on behalf of Alstom.

**NLC Thermal Power Plant - Neyveli, Tamil Nadu** - Tested and commissioned 40 motor-protection relays on 11 kV and 6.6 kV systems on behalf of Alstom.

**Vizag Steel Plant - Visakhapatnam, Andhra Pradesh** - Tested and commissioned MiCOM P220 numerical motor protection for 3.2 MW and 5 MW motors on behalf of Alstom.

**MMS Power Plant (P) Ltd - Nagapattinam, Tamil Nadu** - Pre-commissioning testing of 110/11 kV substation.

**TVS Motor Company Ltd - Kadakola, Karnataka** - Complete pre-commissioning testing of 11/0.415 kV substation on behalf of Siemens.

**Hitech City - Hyderabad, Andhra Pradesh** - Testing and commissioning of 33/0.415 kV substation with Siemens control and relay panels.

**Almatti Hydroelectric Power Plant - Almatti, Karnataka** - Pre-commissioning testing of 11 kV switchgear panels, cables and relay panels on behalf of L&T.

**Jindal Vijayanagar Steel Ltd - Toranagallu, Karnataka** - Pre-commissioning testing of 110/11 kV switchgear, control and relay panels on behalf of Siemens.

### Maintenance Testing Assignments

**Indian Additives Ltd - Manali, Chennai** - Maintenance testing of protection relays in 11 kV and 415 V relay panels.

**Ruchi Health Foods Ltd - Uthukottai, Chennai** - Maintenance testing of CTs/PTs in 33/11 kV switchyard and relays in 11 kV and 415 V switchgear panels.

**Nelcast Ltd - Ponneri, Chennai** - Maintenance testing of CTs/PTs in 33/11 kV switchyard and relays in 11 kV and 415 V switchgear panels.

**Rajasthan Atomic Power Station - Kota, Rajasthan** - Maintenance testing of transformers and circuit breakers in 6.6 kV switchgear panels.

**Tamil Nadu Petrochemicals Ltd - Manali, Chennai** - Maintenance testing of 110/6.6 kV transformer.

**Reserve Bank of India - Chennai** - Maintenance testing of relays and capacitors in 415 V panels.

**Indian Oil Corporation Ltd (IOCL) - Korukkupet, Chennai** - Maintenance testing of relays, energy meters and circuit breakers in 11 kV and 415 V switchgear and relay panels.

## CUSTOMER TRAINING EXPERIENCE

**Hindustan Zinc Ltd - Chanderia, Rajasthan** - Training on REL511, REX521, REJ525, REJ523, SPAD346C, SPAJ140C, REL551, RET316, ARGUS2, RADHD, RADHA and SMS510.

**Maharashtra State Electricity Board - Sangli, Maharashtra** - Training on REF543, REX521, RET541, REL511, REB500 and SCADA.

**Karnataka Power Transmission Corporation Ltd - Karnataka** - Training on REL511 and RET316.

**Jayaprakash Associates Ltd - Vishnu Prayag, Uttarakhand** - Training on REL521, RET316, REG216, REG316 and REB500.

## EDUCATION

- Ph.D. in Global Leadership - Columbia International University - In Progress, expected 2027
- MBA, International Business Management - Texas A&M University-Corpus Christi - 2024
- Post Graduate Diploma, Data Science & Business Analytics - The University of Texas at Austin - 2021
- Post Graduate Diploma, Energy Management & Energy Audit - Annamalai University - 2011
- Bachelor of Engineering, Electrical & Electronics Engineering - Kongu Engineering College - 2001
- Diploma, Electrical & Electronic Engineering - Sakthi Institute of Technology - 1998

## PROFESSIONAL AFFILIATIONS

- IEEE Senior Member
- CIGRE Member
- Stevie Awards Judge

## SELECTED PUBLICATIONS & TECHNICAL PRESENTATIONS

- 2024 - "LPITs in High Voltage Switchgear and Field-testing of Relay Protection with LPIT Inputs," CIGRE Paris Session, B5 Protection & Automation, Paper ID 10419.
- 2024 - "Cloud-Based End-to-End Testing of Line Differential Relays: A Novel Single-End Controlled Approach," GCC Power.
- 2023 - "Cloud-based End-to-End Testing of Line Differential Elements," Texas A&M IEEE Conference, College Station.
- 2017 - "Protection Challenges in Commissioning a 132 kV Transformer with On-Load Tap Changer: A Case Study and Analysis," PAC World, Raleigh.
- 2017 - "Limitations of Playing High Magnitude Faults using COMTRADE Records: A Case Study," PowerTest / NETA.

- 2017 - "Lessons Learned While Retrofitting Stator Ground Fault Protection in Pumped Storage Hydroelectric Power Plant," PAC World, Wroclaw, Poland.
- 2016 - "Influence of Circuit Breaker Maintenance Tests on Busbar Differential Protection Scheme," PAC World, Raleigh.
- 2016 - "Lessons Learned from a 400 kV Busbar Misoperation Utilizing the IEC 61850 Standard," NETA World / PAC World.
- 2014 - "Experience in Commissioning a 400 kV High Voltage Reactor with the IEC 61850 Standard," SASAP ESKOM, Johannesburg, South Africa.
- 2014 - "Importance of Harmonic Blocking in Generator Differential Protection," PAC World, Raleigh.
- 2010 - "Testing Ethernet Networks on GOOSE Tripping," CBIP 5th International Conference, Delhi, India.
- "Approximating a Power Swing and Out-of-Step Condition for Field Testing," presented at multiple PAC World conferences.

## **LANGUAGES**

English - Fluent | Tamil - Fluent | Hindi - Intermediate