MUHAMMAD IMRAN NASIR, MIET, Sr. Electrical Engineer, BGC, Shell Iraq
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EXPERIENCE OVERVIEW AND CAREER OBJECTIVE

Senior Electrical Engineer with more than 23 years of wide-ranging experience in Electrical Operation, Maintenance, Engineering, Testing / Commissioning, Design review/approval, of electrical systems with multifaceted career of working with world's leading Oil&Gas, Petrochemical and Power Producing companies.

Led and performed key responsibilities including but not limited to Senior Electrical Authority (SEA), Electrical duty holder (SAEP-DH), Site Subject Matter Expert for Power Generation & Distribution, ENMCS and Protection system. Site focal point for Electrical Safety rules improvements and learning from incidents.

Technical Authority and responsible; for Design review & Approval, for area electrical maintenance/engineering concerns, to identify reliability requirements for GTL plant assets, to establish/maintain adequate reliability centered maintenance program to maximize value of assets.

Seeking a challenging position with a dynamic organization, in order to utilize effective skills and collaborative experience in achieving organizational objectives of delivering best in class, safe & reliable electrical engineering and maintenance support to the site.

I have enjoyed a progressively (from Frontline Maintenance to Lead Engineer) responsible maintenance and engineering career with Shell as well as other reputed Oil&Gas and power producing companies. Most recently, I have:

- Led Technical Assurance of PAS&ENMCS (PMS) upgrade project at Pearl GTL; a really challenging job implemented safely & flawlessly in collaboration with P&T, QPH, site instrument & electrical team, Operations and vendor specialists. Just completed the online PMS cutover with site power generation & distribution in manual operation, plant at full production.
- Led Power Export increase initiative to consume excess HOG including detailed analysis (including studies, developed excel data profiles/analysis tool) of site loading conditions, power generation capacity review, control system response, system disturbances review, grid protection & operating experience. A staircase of opportunities to deliver zero HOG flaring was identified by a multi-disciplinary team working together. Actions included the export of excess power generated from HOG to Qatar's power grid. This resulted in a reduction of operational HOG flaring to zero. Emissions were reduced by 0.66 million tons of CO2 per annum. Complex throughput was increased without a further increase in HOG flaring, increasing revenue by $millions. Team received Shell CEO HSSE&SP recognition Award for outstanding achievement.
- Selected by VP Pearl GTL and Engineering Manager to play a key role in 4-member Pearl GTL Organization Health Review (OHR) team with Shell Operational Excellence consultants. OHR was carried out following famous *McKinsey* methodology undertaking a variety of data-gathering methods, including leadership interviews (up to country chair, EVP and LT interviews), focus groups and a dedicated Organizational Health survey; which measured the specific management practices that drive performance outcomes and blockers. Analyzed and used Health check results to improve 'organization health' and ultimately our performance. Worked together with Pearl Leadership Team based on health review findings/analysis to formulate new Vision & Strategy for Pearl GTL.
- Led Pearl Arc flash initial assessment as SME. Carried out detailed examination of Arc Flash risk, assessment of containment methods used for HV/LV Switchgear, and latest techniques to minimize consequence based on experience and application of company DEPs and International Standards.
- Conducted Electrical Safety Audits at site, highlighted gaps with supporting safety requirements. Developed procedures, strategies, safe methods of electrical isolation and work. Established detailed ESR Training packs for training of electrical personnel. Coaching and practical demonstrations for new joiner electrical engineers/Sr. electrical engineers, coaching and electrical authorization assessments (up to highest level/SAEP) as SAEP-Duty Holder. Site focal point for organization of regular site wide electrical safety meetings to proactively improve electrical safety at site.
- Active sharing of knowledge and learning from experience regarding Electrical protection, power generation and distribution issues through SIGN, EGKSW, discussions with P&T and other sites.

In addition, I have performed key role as Pride in Production (site behavioral development program) Super Coach for whole engineering department and role modeled demonstration of key PiP behaviors to deliver Safe & reliable engineering performance at site and to coach engineering staff to deliver their best potential.

HSSE & PROFESSIONAL TRAININGS AND CERTIFICATIONS

- Trained, assessed and certified for HSSE critical position (OTE-2) to Prepare, Plan and Apply HSSE critical skills to carryout HSSE critical activities and to ensure performance assurance of safety critical elements through HEMP, Bow-tie analysis, risk assessment and performance standards.
- Trained and certified by Baseefa – ASA for Ex equipment installation, inspection and maintenance in line with IEC 60079 requirements.
- CompEx Training & Certification for Selection, Installation and Inspection of Ex equipment in Hazardous Areas in line with ATEX/IEC 60079 requirements.
- Trained and certified as Incident & Injury Free (IIF) Leader/ Trainer, Supervision under Life Critical Activities.
- Institute of Leadership Management (ILM) Leadership Course – Gold award.
- Trained and certified by Saudi Aramco in carrying out JSA. Carried out JSA for HV/LV equipment (up to 230KV) for PM, testing/commissioning activities and live plant modifications.
- Supply Market Analysis Training by Anklesaria group.
- Contract Holder training from Qatar Shell GTL.
- Attended Ex Applications Management Course (M184) by Shell in KL, Malaysia. One week course for Hazardous area classification and Ex Applications Management in Oil&Gas facilities.
- Attended Managing Safely course by Institute of occupational safety and health (IOSH) UK during previous employment, for certification of Risk assessment and safety Inspections. Carried out +100 Risk assessments as Certified Risk Assessor/team lead for Electrical Tasks, electrical areas and Generic Equipment. Identified safe methods of work for complex tasks i.e. Troubleshooting of 500KV GIS Circuit Breakers, SF6 filling in Live 500KV GIS compartments, Replacement of 380MVA Transformer Oil Coolers and Transformer Tank Internal Inspection etc.).
- Trained and certified as Kelvin Topset - Incident Investigator. Shell RCA Training.
- Attended Electrical Engineering II (M282) by Shell, Rijswijk, Netherlands. Two weeks engineering course for senior electrical engineers.
- Attended Electrical Protection (M280) by Alstom UK. Two weeks Protection engineering course for electrical protection engineers.
- Computer trainings, use and competence in MS Office, SAP, MAXIMO, Q4w CAMM. Equipment software as Disturbance Evaluation (REVAL), ABB RE* family, Multilin SR family, GE Enervista, GE URPC, ABB Station monitoring system SMS-BASE, ENMCS (800xA, AC800M), IMCS, Microscada, PULSAR, OMICRON CMC, FREJA, SCOPE METER (FLUKE), Metro Ohm Test Manager, Dobble m4100 Insulation Analyzer, Thermo cam FLIR E45.
- Configuration and Testing of Generator, Transformer and Line Protection relays by ABB, GE, Alstom, Siemens and ISCOSA.
- Testing of Protection relays with CMC 356 by Omicron.
- Maintenance and troubleshooting of HV/LV VSDS by ABB and Siemens.
- Maintenance of O/L Tap changers type VIII□350 and RMIIIY600 by MR (Germany).

PROFESSIONAL SKILLS AND CAPABILITIES

- Demonstration of excellent leadership and coaching skills including role as IIF Leader during Pearl Project, Pride in Production Super Coach for Engineering Department in order to accelerate engineering team performance by acting as a PiP role model and developing PiP/Leadership behaviours among team.
- Business reporting, Human Resource Management & Development, Training & Recruitment, IDP / GPA Development, Staff Competence Assessment and management through HR Online.
- Ability to work under pressure and collaborate with stakeholder to troubleshoot complex issues and complex and highly integrated Pearl GTL plant.
- Investigation and analysis of complicated electrical problems through use of experience, collaboration with other disciplines and analytical skills. Condition monitoring, document management, asset management, failure & root cause analysis, solution development/ranking based on Shell & external experience, DEPs & Standards, data/history analysis and best practices.
- Adaptability to multinational environment with wide exposure and experience of working across cultures and customs.
- Senior Authorised Electrical Person (SAEP–DH) for site and responsible for Electrical Safety management and assessment of company and contractor electrical staff for electrical authorisation to Operate and maintain HV/LV Electrical equipment. Responsible for issuance/acceptance of Electrical Safety documents (EPTW/SFT/LOA/EIC).
- Electrical authority (SAEP-DH) for design, review and approval of HV/LV temporary electrical supplies including review of cable sizing, VD/SC calculations and protection coordination.
- Project specifications preparation/review/approval in line with company and International Standards, SAT/FAT witness and acceptance, inspection and survey of Electrical installations, substation equipment, Switchgear and protection schemes in compliance with company standards and international standards including ANSI/IEEE, NFPA, ATEX, API, IEC, and British standards. Electrical system energization readiness check, review and acceptance of Electrical System Completion manuals & handover documentation.
- Focal point / contract holder for spare parts, vendors and support services including ABB Switchboards, LOHER drives, Gutor UPS Systems and electrical test equipments. Development of Scope of Work for support services contract considering equipment failure rate, install base and CM/PM requirements. Cost estimation, technical review, evaluation and approval of schedule of rates and tenders.
- T&I, Commissioning, scheme verification and Maintenance of Switchgear and Protection system in Refineries, Power Plant, NGL plants, GTL Plant, Gas and Oil Exploration/producing/Separating Facilities, Oil and Gas well areas.
- Preparation, review, approval of comprehensive Turnaround scope for large electrical systems; and safe, flawless and efficient execution of HV/LV scope.
- Review of HV/LV protection schemes. Evaluation of relay/protection function requirements. Protection Coordination review and Application in line with company and International standards. Analysis and review of Relay settings, characteristics and fault level. Relay setting calculation, power plotting and implementation.
- Maintenance, Inspection, Audits, Commissioning and testing of Electrical Installations and apparatus in hazard classified areas. Evaluation and selection of Ex equipment in line with IEC60079 and IP Code 1/15. Certified Ex Inspector from Baseefa and CompEx.
- Planning and Management of Spares. Identification, specification and evaluation of electrical materials for projects/plant modifications as per Shell DEPs, Aramco material specification and procurement procedures. Technical Authority for review of material technical specifications, evaluation and approval of spares and BOM.

PROFESSIONAL EXPERIENCE

BGC, Shell Iraq (May 2018 to present)

Currently performing a key role as Discipline Lead Electrical, Technical Authority and Senior Electrical Authority (Electrical safety Rules) in BGC Electrical Engineering Team.

Key achievements:

- Setup of Electrical Safety organization at BGC to ensure effective training, assessment and authorization of staff involved in electrical work.
- Setup of electrical technical services and specialized maintenance contracts
- Setup of BGC Ex inspection and rehabilitation program
- Setup of BGC power system rehabilitation and rejuvenation program to improve safety and reliability of power distribution systems at BGC facilities
- Setup of BGC Maintenance reference plan, computerized maintenance program including development of PM strategies

Qatar Shell GTL, Qatar (May 2009-May 2018)

Performed a key role as Sr. Electrical (Power Generation & Distribution) Engineer, SAEP Duty Holder and TA authority for Electrical team of world's largest gas to liquid plant.

Key achievements:

ELECTRICAL & PROCESS SAFETY

- Established detailed ESR Training packs for training of electrical personnel after analyzing site equipment, electrical system, switching methods and competence needs of site staff. Developed practical orientation program to ensure understanding with electrical safety systems. Carried out practical demonstrations for new joiner electrical engineers / Sr. electrical engineers, coaching and electrical authorization assessments (up to highest level/SAEP) as SAEP-Duty Holder.
- Site focal point for organization of regular site wide electrical safety meetings (comprising 50~100 site wide participants), facilitation and delivery of electrical and process safety learnings to proactively improve electrical safety at site.
- Carried out Electrical safety Audits at site, highlighted gaps with supporting safety requirements, staff training & competence and recommended solution to eliminate management system, electrical competence and electrical system flaws to prevent electrical incidents.
- Developed safe methods of work for cross reference with PTW and Electrical Safety Documents. Implemented electrical safety improvements associated with LV Testing, safety controls for work/testing/modifications on/or adjacent to live equipment and work/testing of HV Generators including learning from experience and review/compliance with company, industry, international standards.
- Carried out detailed analysis of electrical heat tracing isolations/PM jobs with partial tracing circuits in service, work party isolation method, identified safety controls for site wide implementation in order to provide safe and effective method with high value optimization of resource time.
- Developed electrical group isolation method of electrical motors and heaters during Major Turnaround in order to ensure safe and effective isolation of electrical equipment with process units. This provided significant savings in scheduled time, resources and required effort for individual isolations.
- Shared Electrical Safety Improvements, best practices, learning from past and Shell experience, at site, with in Shell companies, and with external stake holders through Ras Laffan Electrical Safety Forum.
- Carried out detailed analysis of HV Ring Main Units based on extensive experience (Refinery, NGL, storage plants) of wide range of RMU products from various manufactures. Developed innovative

solution of 11KV RMU interlocking facilities to prevent arcing fault/short circuit due to erroneous operation.

- Developed, reviewed, and implemented effective Portable Electrical and Ex equipment Inspection program at Qatar Shell GTL in line with Company (DEP 63.10.08.11) and International Standards (BS 7671, HSE UK Guidance Notes, IEC 60079 requirements), and learning from experience/internal/external incidents. This helped to ensure safety of extensively used portable equipment and temporary supplies at site to support CAT change and heavy mechanical repairs.
- Carried out detailed analysis of use of portable hoses at site, learning from BUKOM Static electricity ignition Incident, requirements as per company (DEP 80.64.10.11) and international standards (NFPA 77 Static Electricity). Provided guidance to other departments (Mechanical, Operations), recommended specifications for new hoses including conductive hoses for flammable fluids and use in hazardous area and semi-conductive/dissipative hoses for steam and compressed air applications as per ISO 6134. Revised controls in site inspection procedures and developed inspection controls.
- Analyzed, developed and applied portable Ex equipment Selection and Inspection strategy to meet site Hazardous area classification requirements, in line with company (RMP 63.10.08.50) and International Standards (IEC60079-17). One of the first Shell site where this approach was formally applied, shared the Ex inspection and portable equipment inspection experience in Shell Global Knowledge sharing workshop to setup a formal procedure for application at other Shell sites.
- Analyzed the HAC requirements for GTL area including review of Leak sources, Hazard radius and installation requirements in line with DEPs, IP 15, IEC60079 and NFPA 70, other NFPA/API requirements. Provided guidance to Operations for control of vehicles, siting of Generators, temporary supplies near Hazardous classified areas in order to prevent risk of ignition.
- Carried out assessment of Ex integrity of Electrical Ex equipment affected by Hot air in Fin Fan area. Analyzed Equipment Ex protection, certification, allowable temperature and effect of higher ambient temperature. Developed and applied mitigation including barrier walls, detailed Ex inspection and approved (flame resistant & Fire retardant) fire security coating of Electrical cables.
- Carried out detailed review and approval of modification in Ex enclosures including analysis of suitable Spacing & Clearance, Internal Volume, Power Consumption/Heat Dissipation and documentation.
- Analysed, developed and applied portable Ex equipment Selection and Inspection requirement as Subject matter expert in line with site specifications, company (RMP 63.10.08.50) and International Standards (IEC60079-17).
- Analyzed and provided guidance for Telecom Installation (RF antennas, WIFI transmitters) in/around GTL plant areas, assessed risk of using WIFI devices and provided guidance in line with company (DEP 32.71.00.10) and international standards (IEC 60079-0) against control of Ignitions and RF risk in classified areas.
- Supervised and carried out Maintenance, Inspection, Audits, Commissioning and testing of Electrical Installations and apparatus in hazard classified areas. Evaluation and selection of Ex equipment in line with IEC60079 and IP Code 1/15. Trained and authorized Ex Inspector from ASA Baseefa and CompEx.
- Participated in ENMCS upgrade SAFOP, Peer review as project electrical lead. Participated as Discipline Focal Point in ENMCS Upgrade HAZID and GTL Elevators HAZOP. Participated in PSSR Audit while standing in for Area Maintenance Manager GTL, ensured effectiveness of multidiscipline maintenance controls for successful completion of process system safety review audit.

<u>POWER GENERATION & DISTRIBUTION SYSTEM</u>

- Led detailed analysis (including trend studies, developed excel data profiles/analysis tool) of site loading conditions, power generation capacity, control system response, system disturbances, grid protection & operating experience. Played a key role for Operations and Technology department to increase plant throughput and reduction in HOG flaring by analysis and implementation of Grid power export increase. Development and analysis of precise simulation cases through IPSA &SKM for power system transient studies and protection system response. Focused delivery of integrated solution - step

by step power export increase including hardware/software controls, ensured compliance with Government/Kahramaa contractual requirements, MOC execution to achieve approximately 70MUSD revenue generation – received EVP Qatar Recognition award for outstanding achievement. Facilitated Pearl GTL site to lead the pack in flaring emissions improvements, with its HOG flaring staircase in compliance with regulations and license to operate. Received VP award as recognition of exceptional achievement.

- Carried out detailed analysis of Kahramaa Grid interface protection scheme with site power generation (10*40MW GTG/STG), identified improvements in interlocking and protection scheme, performed detailed, testing, recommended solution for interlocking and protection including concurrence with Government electrical supply company (Kahramaa) for improvements and detailed testing, approval of safety documents, switching programs, grid interface switching and group synchronization of site generation with grid.
- Provided best technical solution and detailed analysis of GTL HV/LV System for temporary design/operational change of HV switchboard distribution to rectify stuck HV ZVC Contactor problem. Developed and executed practical solution of modified design operation after review of switchboards loading profile, short circuit analysis, load flow, transformer taps analysis and mitigation as per operating condition. Carried out successful execution covering +100 switching operations and mitigating actions to prevent train shutdown. Received appreciation from VP Production for safe & flawless execution highly complex and high risk job.
- Led Pearl Arc flash initial assessment as SME. Carried out detailed examination of Arc Flash risk, assessment of containment methods used for HV/LV Switchgear, and latest techniques to minimize consequence based on experience and application of company DEPs and International Standards (IEC 62271, IEC 60439, IEC 60298, IEC 61641. Developed, reviewed, and approved Safe Work practices (including temporary operating procedures, switching programs, testing method statements) to eliminate Arc Flash Hazard during testing commissioning of new Switchboards. Developed HV System safety learnings & safe work practices from Pearl Project and shared in regional (Ras Laffan) electrical safety forum as company representative.
- Carried out detailed technical analysis and investigation of 40MW STG UPS and Turning Gear failure. Led and collaborated with Instrument Engineering, Rotating Equipment, electrical engineering and Operations department as Lead Investigator to identify and analyze all possible failures/causes including UPS switchover fault, Control system (Siemens PCS7) failure, Turning gear failure, STG rotor bowing impact assessment and gaps in operations interventions & procedures. Identified, integrated and developed fit for purpose technical solution including electrical/operational procedures, Job aid for manual turning, control system modifications and electrical modifications.
- Led technical solution of complex manufacturing problems as site Subject Matter Expert for LV Switchboards (~4000 LV assemblies site wide), analyzed various issues with LV Switchboards and proposed solution/modifications to site and Vendor/ABB solve complicated site problems as well as improvement in future vendor products:
    - 200KW starter power contact overheating: carried out detailed analysis of overheating problem, highlighted vendor about design deficiency (contact design, racking/alignment, current rating, spring tension) and proposed solution of additional power contact. Evaluated other options including online contact diagnostic/power contact engagement, contact spring tension test, starter racking behavior, standard requirements, contact rating & feeder loading. Convinced vendor with data and analyzed evidence to negotiate cost effective (no profit-no loss) solution to rectify the problem. Shared learning with Shell Global Solutions and other sites to prevent similar problem.
    - IMCS Communication improvements: Implemented various improvements after detailed analysis of nuisance IMCS communication problems i.e. re-arrangement of backplane cables, replacement of incorrect lugs, starter internal wiring analysis to prevent EMI, re-arrangement of fiber optic converters for better heat dissipation, communication redundancy improvement and long term options for LON vs Ethernet communication.

- 35/55KW Starters issues: Carried out detailed investigation of 35/55KW starter internal power cable overheating issues and detailed analysis of cable crimps, fuse switch/contactor termination, cable/connector current carrying capacity, power cable stress, cable insulation/type and starter loading profile. Concurred and influenced vendor for flaw associated with design and quality of internal power cables, assembling/crimping work for rectification of problem in existing and future products.
- DC Control supply improvements: Investigated issues of loss of control supply. Recommended improvements for online DC control supply monitoring/tightness checks on loops with running loads. Suggested vendor and site other options for DC supply redundancy including ring distribution, parallel DC distribution, thermography of termination and detailed checks during MTA.
- Lighting/VSD Harmonic and circuit loading issues: Carried out detailed analysis of legacy nuisance lighting trip issues including circuit load design, loading profile, MCB & RCD characteristics. Identified problem with RCD sensitivity to VSD harmonics and lighting switching loads close to MCB operating curve (leading to false trip of MCBs). Provided solution to vendor by providing suitable RCD type and recommended replacement of MCBs with another suitable type which prevented nuisance tripping issues at GTL plant.
- Carried out 690V vs 400V motor feeder distribution analysis as guidance for other new projects including site experience, standard requirements (DEPs, IEC 60038) considering effect of cost saving, arc flash, cable size/voltage drop, switchgear spare requirement and transformer size. Shared learning with Shell Global Solutions for selection and implementation in new projects (Alkarana).

- Led technical investigation of STG Earth fault trip. Provided detailed analysis to electrical engineering team for likely failure with consequence of earth fault trip. Developed and advised detailed (step-by-step) HV testing and analysis to identify HV bus duct earth fault and further rectification work.
- Developed custom made design of Ex distribution boards to meet site requirements. Design meets the site HAC requirements, company (DEP 33.64.10.10, DEP 33.67.01.31) and International standards (IEC60439, IEC 60079-14)
- Analyzed load details, installation requirements as per DEPs and reviewed/approved various modifications including EHT modification for flow instruments, lighting circuit modifications, Welding outlet distribution board modification. Reviewed additional load hook up options and analyzed existing load/operating condition of Lighting, Analyzer house, Welding/power outlet boards and selected most suitable design option.
- Identified, reviewed, and approved design requirements as per site and DEP 33.67.01.31 requirements for various LV modifications and projects including GTL Elevator Project, FCD Project, GTL Storage Containers installation etc. Recommended solution for safe design of non-standard package equipment.

<u>ENMCS & PROTECTION SYSTEM</u>

- Electrical Lead role as Technical authority and SME for hardware & software obsolescence mitigation, safe & flawless system Upgrade of Electrical Network Monitoring & Control System (ENMCS) used for site power generation & distribution system (6*32MW GTGs, 4*40MW STGs, 132/33/11/6.6KV Switchboards, HVHV Transformer & Motors), including:
  - Thorough analysis, risk assessment and temporary mitigations for obsolescence of ENMCS system (ABB 800xA with AC800M controllers and IEC61850 relay connectivity, Microscada with IEC61850 connectivity) as Technical Authority and Subject Matter Expert. Assessment of Hardware & software life cycle. Analysis of failure modes, failure history and impact assessment on power system in case of failure of any node. Review, arrangement and testing of spares including preparation/ offline testing of old removed equipment from other systems, extensive savings in equipment cost. Initiation, definition, justification, scoping of long term ENMCS upgrade project.

- Detailed analysis of various upgrade options including site impact assessment, concurrence with site instrument engineers, PCD security team, Shell Global solutions, Vendor consultation and review of alternate technology/systems. Review of future software versions/technology/features to select best optimum upgrade solution for site.
- Assessment and technical evaluation of Virtualized solution including concurrence with VMware, ABB and Honeywell to analyze benefits and challenges from other global projects. Extensive research of online resources, technology review and comparison with site ENMCS design intent to analyze Virtualization risks and benefits.
- Evaluation of technical bids for Upgrade project including review of CVs, interviews/assessment and selection of required staff including ENMCS/IMCS Lead, Sr. engineers, system engineers etc. Detailed analysis and approval of project scope as ENMCS/IMCS technical lead for project team covering company, Integrator (Imtech) and specialist vendor (ABB) engineers.
- Led technical review and approval of ENMCS upgrade study as Technical Authority. Provided guidance to project team and vendor specialists for integration and interface upgrade with field control & protection devices without any impact on site power generation & distribution including various improvements in power system trends, reliable PQ control during migration, improvements in redundant operation of system nodes.
- Effective negotiation with local and global vendor representatives to achieve ~30% cost saving for major project by inspiring and convincing vendor with effective feedback and role in consultation to other existing/future projects – as landmark, highly integrated, largest and most complex system in Shell – demonstrated value as role model for other new customers (Shell projects) for vendor systems.
- Developed strategy for online migration of highly critical ENMCS system (replacement of Servers and upgrade of operating system & applications) without any disturbance and shut down of running power system equipment and highly integrated process. Flawless completion of online upgrade of Power Management System.
- Shared experience and learning with Shell Global Solutions and other sites including evaluation of developmental technology as pilot upgrade project with virtualized ENMCS solution.

- Detailed analysis and SME technical support (operational/troubleshooting) for site ABB ENMCS System as well as support to other Shell sites. Provided technical feedback and improvements to Manufacturer for Load shedding application, calculations, displays, controller modifications, controller logic/loading, online downloads (solution development for flawless changes based on extensive risk analysis, offline simulation, online mitigations/controls) and testing. Provided high value experience feedback to other Shell projects for application and effective use of ENMC System, Controller Loading, IEC61850 communication, redundancy of DCS communication, operational improvements and improvements in controller interfaces.
- Provided permanent technical solution of legacy ENMCS spurious HV Feeder/s load shed trip problem. Carried out detailed analysis of switchgear installation practice for electromagnetic compatibly. Detailed analysis of immunity of electronic interfaces including AC800M Controller IOs, opto isolators, Protection relay binary inputs, cable glanding and termination practice. Carried out thorough analysis by conducting precise site EMI measurements (with specialist instrument support by Lambda Engineering NL), identified interference sources, susceptible devices and identified dominant coupling effects between source and victim. Carried out thorough analysis of findings, further testing/simulation and provided permanent solution to override interference. Shared analysis and solution with Shell Global Solutions and other Shell sites to rectify similar problem. Highlighted deficiencies with digital relay inputs to vendor (ABB) and other Shell projects to prevent similar issues in future.
- Thorough analysis of reliability of existing HV Distribution and HV bus section operation including review of requirements in line with DEP & international standards requirements, recommended protection schemes from various manufacturers, and experience based on learning from power systems in past power, petrochemical and Oil&Gas companies. Analyzed the possible fault scenarios, developed &

analyzed solution of additional 67L and innovative method of Bus section OC&EF protection (51/51N) to improve power system reliability. Carried out detailed analysis of various developed options including protection scheme review, failure modes, distribution system reliability, power supply security assessment and failure mitigation including impact assessment of any required modifications. Developed an innovative HV Bus section protection solution with minimal changes on existing in-service HV Switchboards. Provided analysis to site electrical team for all options and recommended best possible solution with minimal site impact, and implementation of final solution. Proposed Shell Design & Engineering practice (DEP) improvement for provision of Directional and restricted earth fault protection for normally closed HV bus section schemes. Shared learnings with other Shell sites/electrical engineers through Shell Global Knowledge sharing workshop.

- Carried out comprehensive analysis of false HVHV Transformer OTI/WTI Trip to mitigate erroneous operation due to condensation/sensitive binary inputs of microprocessor based relays. Provided thorough evaluation of transformer failure modes associated with oil/winding temperature rise including transformer overloading, cyclic overloads, cooling system failures and high ambient temperature. Impact assessment including reduction of insulation life, generation of gases and protection device operation. Assessment of typical transformer applications (Generator transformer, Unit transformer, Distribution transformer, Grid Transformer) for adequacy of protection and required modifications, including implementation of changes through MoC. Shared and practically implemented solution at site as well Global sharing with other Shell sites through Shell Global forum.
- Leading technical assurance as Subject Matter Expert and site focal point for Performance Assurance of Process safety requirements for Safety Hardware Barriers – Safety Critical Element PS010 (covering Power Management System, Load Shedding System and Protection Systems):
    - Developed and established customized performance assurance method for online testing of highly integrated load shedding system against likely failure modes. Analyzed all dominant failure modes, possible test methods and established test method covering a combination of intrusive and non-intrusive checks to ensure reliable system operation, including logic verification, controller calculation checks, simulations, and function trip tests of dedicated loads with complete system in operation mode. Analyzed hardware/software/operational risks and established risk assessment & method statement. Carried detailed verification, risk assessment & mitigation for flawless execution of high-risk load shedding tests on site wide common system, partial test during Turnaround of each train, while other train was fully functional. Collaborated with all stake holders including Operations, Integration team, Area electrical engineers, and Turnaround team to develop confidence and assurance of effective mitigation measures during test. Ensured safe & flawless execution of Load shed tests during Turn around (highest critical TA electrical job).
    - Developed performance assurance method for GTG/STG Power management tests (Automatic PQ Control) during normal plant operation. Detailed analysis of site power generation conditions and analysis/concurrence for allowable window for GTG/STG PQ changes without any adverse effect on site production. Provided guidance to operations and electrical team for flawless execution of PQ Tests covering hundreds of control/auto operations including review/approval of test results.
    - Management, review, approval of all site wide protection relay settings, settings, changes, and Protection & System studies. Developed detailed database for backup management, Process Control Domain security improvements, system restoration and development of long term improvements, obsolescence mitigations, upgrade, and spares management.
- Focal point and technical lead for ongoing Pearl As-Built system Studies (Stage 3 studies):
    - Reviewed and analyzed of all protection relay settings changes implemented during commissioning and startup, and operational issues.
    - Coordination review and analysis of all HV relay settings, logic configurations, protection and trip schemes to ensure power supply security and system reliability.

- Developed simulation cases for IPSA & SKM PTW for transient and steady state studies including fault recovery, critical clearing time, load flow, power generation loss, grid loss, motor start and restarting studies. Review and approval of simulation studies including system/setting changes and assurance of reliable operation within transient and steady state limits.
- Analyzed protection schemes/settings implemented by various Implementation Contractors, identified & corrected flaws with upstream/downstream coordination (original settings were developed by ICs in isolation).
- Investigated cases with high system fault currents, identified generic system data, advised Mott Macdonald to update provided as-built equipment data to achieve SC values within acceptable system limits.
- Review and development of common relay settings format and schedules to consolidate relay settings developed by various implementation contractors at site, including systematic backup through SAP.

- Analyzed HV motor fire incident and supported area electrical team by developing & implementing Low Load motor protection scheme. Carried out detailed analysis of motor datasheet, starting curves, actual load/unload profile, operational contingencies, no load and locked rotor characteristics to advise most adequate protection function settings to prevent motor damage/fire incident in result of pump internal faults.
- Submitted DEP improvement suggestions regarding application of Directional Earth Fault and Restricted Earth Fault protection for closed bus section switchboards. Provide detailed analysis based on vast experience of design/modification of IEEE/IEC transformer protection schemes, experience from power system disturbance investigations. Provided technical assistance for update of new DEP protection scheme for new Shell Projects.
- Provided technical support to commissioning electrical team to investigate frequent earth fault trip problem. Carried out investigation of nuisance transformer secondary earth fault protection trip, identified problem with incorrect CT earthing leading to false trip and recommended solution to solve the problem.
- Carried out thorough analysis of erroneous 11KV motors earth fault trip problem during starting. Review and approval of vendor proposed stabilizing resistor scheme, identified CT connection problem and recommended solution to vendor for correction. Calculation, analysis and approval of settings and implementation of changes to achieve reliable operation.
- Provided support to external Shell sites for Motor thermal overload setting based on site and past experience of setting/configuration of variety of protection relay families (electromechnical, static, numerical relays and IEDs from various manufacturers), for adequate trip class setting as per evaluation of motor actual & allowed run-up time in order to prevent false overload trip. Provided guidance for evaluation of motor parameters as per IEC/NEMA standards and selection/setting of applicable protection function parameters in microprocessor based protection relay from various manufacturers including ABB and Siemens.
- Carried out detailed analysis of GTL Protection relay settings, analysed various issues including earth fault setting, contactor breaking capacity/fuse cross over point as per AC 3 Utilization category. Analysed motor protection curves and recommended motor protection improvements in line with previous experience and IEC/IEEE Standards reference.

<u>DISCIPLINE ENGINEERING, RELIABILITY, ENGINEERING LEADERSHIP</u>

- Assigned by VP Pearl GTL and Engineering Manager to play a key role in 4 member Pearl GTL Organization Health Review (OHR) team with Royal Dutch Shell Operational Excellence consultant. OHR was carried out following famous *McKinsey* methodology (and back office support & benchmark organization health data analysis) undertaking a variety of data-gathering methods, including leadership interviews (up to country chair, EVP and LT interviews), focus groups and a dedicated Organizational Health survey; which measured the specific management practices that drive performance outcomes and blockers. Analyzed and used Health check results to improve 'organization

health' and ultimately our performance. Worked together with Pearl Leadership Team to understand what the health check data are telling us, and implemented solutions to improve our capability. The outcome was a concrete action plan outlining the next steps towards increasing capability, leveraging existing strengths and improving Safety, Operational and Financial performance. Provided feedback to site leadership team based on health review findings/analysis to formulate new Vision & Strategy for Pearl GTL.

- Performed key role as Pride in Production (site behavioral development program) Super Coach for whole engineering department and role modeled demonstration of PiP behaviors (Openness & Honesty, Empowerment & Ownership, Learning from Experience, Passion & Energy, Leadership at all levels, Being Connected & Valued) to deliver Safe & reliable engineering performance at site and to coach engineering staff to deliver their best potential.
- Developed detailed technical scope covering Asset/Project/Turnaround scope, reviewed & approved technical bids, negotiated & established the service contract, and now working as Contract Holder for site ABB contract for ENMCS, HV/LV Switchgear (up to 132KV) and Protection system with ACV of US$12M (high value and highly production critical contract). Responsible for contract management, technical evaluation of manpower and services. Provided site wide contract and manpower management support for safe & flawless execution of specialist electrical support scope including effective utilization of resources to achieve 30% cost saving from largest electrical service contract.
- Improved availability, minimum downtime, flawless execution of preventive and corrective maintenance of Site electrical power system covering 132/33/11/6.6/0.69/0.4 KV Distribution, power generation and grid connection. Carried out review, technical assurance and management of Electrical Network Monitoring and Control System (ENMCS), Load Shedding System, res-starting and re-acceleration of Loads. Site subject matter expert for ENMCS and Protection System.
- Continuous analysis and assessment of process safety and asset integrity health of associated electrical systems/Safety Critical elements/Protection systems to ensure they remain safe to operate as desired in line with DEM1, Gas Game and QSGTL strategies. Regular analysis of system disturbances, power generation and loading conditions, trends, preventive & corrective maintenance findings, alarms to proactively support Operations and electrical maintenance to ensure power system reliability.
- Provided detailed analysis and technical solution to site Instrument engineering team for EMC compliance and Ex integrity for replacement IS barrier for Samson positioners including detailed review of Intrinsically Safe circuit segregation, termination, labelling, earthing at FAR/CCR, Honeywell DCS/MDF cabinet power distribution and earthing review etc as per company standards and IEC 60079-14 requirements. Raised the concern to Vendor and Shell Global Solutions for best possible solution for site modification to ensure Ex integrity as well as EMC compliance.

Key Responsibilities:

- Manpower planning, Review manpower requirements and develop organization structure with consideration of scheduled PM activities, anticipated CM, project support / modifications, and manpower efficiently.
- Short listing, interviews and assessment of staff to fill positions as per organization structure.
- Assessment and authorization of staff in line with QSGTL Electrical Safety Rules.
- Improving electrical equipment reliability and availability through Risk and Reliability Management (S-RRM, S-RCM) and Root Cause Analysis (RCA).
- Electrical focal for Mitigation of Threats to Availability (MTA) program and Operations Reliability Improvement Program (ORIP). Identified gaps, developed and implemented various improvement to ensure reliable operation of Heat tracing, LV Switchgear/IMCS, HV Switchgear, Power Generation, ENMCS and Protection system.
- Provided coverage as authorised stand-in for area Maintenance manager. Performed a Key role in PSSR, Electrical SAFOP audits, Qatar Shell Maintenance Execution Readiness program for assessment of

Maintenance resources including manpower, tools, test equipment, drawings, manuals, procedures, test records / system compilation manuals.

- Monitoring, review and performance improvement of electrical system through KPIs, SCE Performance review, learning from Incidents across Shell, and proactive monitoring of performance indicators / potential bad actors.
- Asset Management, development of Electrical Maintenance plans, performance standards, strategies and procedures for electrical equipment, and providing technical expertise for electrical maintenance activities, standards and procedures as Reliability Engineer for Electrical Discipline. Development of long term Electrical Master Plans in their interrelationship with equipment Life Plans.
- Improvement of technical skills, coaching, competence assessment, of staff to ensure effective maintenance and minimum down time.
- Leading and managing day-to-day activities of the electrical team, establish clear goals and objectives related to the safe, flawless and reliable performance of all electrical equipment.
- Providing a liaison with other maintenance groups and operations department to discuss, develop, review and manage electrical maintenance and reliability strategies.
- Holding HSSE Critical Position, and Technical authority for electrical jobs and providing technical guidance and trouble-shooting support for electrical equipment, and ensure that all maintenance activities and procedures are aligned with reliability requirements.
- Collaborated with other disciplines/maintenance groups to determine and predict equipment's life using Failure Modes and Effects Analysis (FMEA), Bad Actor Management, mitigation of threats to electrical reliability and plant production.
- Creating a continuous improvement process by elimination of "bad actors" in terms of performance and reliability.
- Maintaining and updating database of all historical data pertaining to electrical failures, and assist in analyzing failure data and preparing reliability test report.
- Developing local Qatari Engineers for acquiring lead positions in line with their IDP/GPA.
- Contract holder for electrical vendor support contracts, involved in monitoring and control of maintenance budget/ OPEX of > USD 10M.
- Discipline scope sponsor / Technical authority for review and approval of turnaround scope. Supervision, technical review and approval of shutdown scope and major overhaul. Preparation, review, and approval of shut down/turnaround plans by using SAP, Scope IT (Roser Consys) and Navitrack system Tools.
- Preparation of CAPEX proposals and ensure timely completion of CAPEX projects.

Saudi Aramco, Jeddah Oil Refinery, Saudi Arabia (January, 2003 to May, 2009)

Experience includes power distribution Sr. Technician/specialist support as well as Maintenance, Testing/re-commissioning of Electrical Equipment in Saudi Aramco Juaymah, Berri and Yanbu NGL Plants, Riyadh, Yanbu, Rabigh and Jeddah Oil refineries and Distribution Bulk Plants in Western region of Saudi Arabia.

Performed a key role in inspection/audit of Saudi Aramco Western region Refineries/Bulk Plants. Carried out review of plant electrical equipment, spares, SAP data update, required special tools and equipment. Developed and implemented various online modifications/upgrades to improve safety and reliability of electrical systems. This provided a great opportunity to interpret and cross reference company design practices and various international standards (IEEE/NFPA/IEC/BS). Many of the changes cover smooth and friction less online modification/upgrade work during normal plant operation.

British Petroleum Exploration & Production, Pakistan (June 2001 to Jan 2003)

Experiences includes Maintenance, testing and commissioning of Generators, Motors, Transformer, UPS, Soft Starters, PLCs, ESD Systems, Protection Relays, Batteries and chargers in Oil&Gas exploration and production facilities.

National Power International, 4 X 323MW Hub Power Station, Pakistan **(July, 1997 to June 2001)**

Experience includes Preventive and Predictive Maintenance of 500KV GIS, MV/LV Switchgears, 4X323 MW Generators, Motors, Transformers, UPS, VSDs, PLCs, DCS, Batteries and chargers.

Performed a key role in early commissioning and PM/CM execution at largest private owned power plant in Pakistan.

Fauji Fertilizer Co, Pakistan **(May, 1995 to July, 1997)**

Experience includes Preventive and Predictive Maintenance of MV/LV Switchgears, Generators, Motors, Transformers, UPS, VSDs, PLCs, Protection Relays, Batteries and chargers.

EDUCATION

- B. Tech. (Bachelor of Technology) Hons in Electrical from Preston University, Islamabad, Pakistan
- B. Tech. (Bachelor of Technology) Pass in Electrical from SIT, Al-Khair University AJK, Pakistan
- HNC in Electrical Engineering from COLU, University of Teesside, U.K.
- Diploma of Associate Engineer Electrical. (D.A.E.) from GIT, RYK, Pakistan

PERSONAL INFORMATION

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