Ahmed Mohamed Sabri

Personal Data

- Nationality: Egyptian
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Work Experience

August 2008 – Now EPROM- MIDOR REFINERY Alexandria, Egypt

Senior Process Engineer for Technical Service Department.

With over **16 years** refinery experience in technical assistance, monitoring, and evaluating the performance of units of **Naphtha hydrotreating, Naphtha splitter, Naphtha reforming (platformer-CCR), naphtha isomerization (penex), kerosene merox, LPG merox, light ends treatment and LPG recoonvery Units**, with a strong focus on process and energy optimization, troubleshooting, all conducted within a process safety management environment.

Technical Training Experience

- Provide training courses for younger process engineers (Operation, start up, shutdown, and troubleshooting).
- Provide on-job training for operators about new modifications such as installing a second train for PENEX unit, or for operation troubleshooting.
- Update operating manual sections (as Process description, PFD, P&ID's) when applying modifications.
- Develop / Update detailed operating instructions and Operators training manual.
- Prepare Training plans for younger engineers.

- Provide training courses for process engineers about design simulation and equipment performance.

Senior Process Engineer Responsibilities and Duties

- **Process Unit Performance / Monitoring:**
  - Monitor / Evaluate process concerns and investigate root causes of plant operational problems and provide corrective actions.
  - Optimize the operating conditions to maximize profits or minimize costs, consistent with the current economic operating parameters and the products at the required target marketing specifications.
  - Calculate Process unit / Refinery overall material balance and Thermal efficiency.
  - Monitor / Evaluate all Units' equipment performance based on daily quick spot and monthly for overall equipment performance.
  - Monitor / Evaluate Chemicals Injection program performance.
  - Provide Technical support during performing test runs and in the analysis of the results of test runs.
  - Monitoring and evaluating start-up and shutdown activities.
  - Establishing the operating conditions of waste facilities to cope with environmental laws.
  - Develop / Direct younger process engineers.

- **Project Development and Implementation:**
  - Recommend/review new installations or modifications to improve existing facilities.
  - Study new ideas and innovative technologies for feasibility and justification to enhance plant operation, reliability, profitability, or performance.
  - Develop/review design packages and modification procedures, to determine if projects can be developed and executed by the refinery forces (minor projects) or if outside assistance is required (major projects).
  - For minor projects develop design basis and all related process documents, confirm the justification, obtain final approvals, and follow-up till implement the projects.
  - For major projects, provide technical support for screening of alternative proposals to meet the project objectives, prepare data and information required to progress the projects through the various project stages; also review and confirm all project process-related data or documents.

- **Projects Activities:**

  ➢ Midor Refinery Expansion Project:

  This project was to increase the Refinery capacity to 160%, NHT capacity increased to almost 125 % with minor modifications/replacement of some pumps,

Penex unit now have a new train of reactors with common De-IsoPentanizer, stabilizer, and De-isohexanizer along with chillier to retrieve LPG from off gases. UOP is the Basic Design contractor and TPIT is the EPC contractor for this project. My role was Naphtha complex Process representative for Midor (the owner), hereafter some of my duties:

- Participate in refinery general study efforts and develop necessary documentation as preparing basic design package for Midor refinery expansion.
- A member of Midor team who discuss with UOP the configuration study for Midor refinery capacity expansion, and preparing for the feasibility study.
- Review/approve all basic process relevant documents issued by the Designer (UOP) in the Basic Design Package; such as PFD, P&IDs, HMB, MSG, Cause & Effects chart, Utilities Consumption, Equipment PDS, and Instruments PDS.
- Review / Approve all detailed process relevant documents issued by Designer (TPIT).
- Prepared the report of early probation test for NHT, Platformer, Penex, light ends and LPG recovery units

➢ Others:

- Participating in a committee to upgrade CCR CRCS (Catalyst Regeneration Control System) that is responsible for the operation and control of continuous catalyst regeneration system.
- Participated in the assessment of new technology for new platformer scallops type presented by UOP
- Participated in process safety committee to perform gap analysis between current company procedures and Egyptian Process safety management standards and guidelines with the help of 4 pillars, 20 elements of CCPS (www.psmegypt.com)

- **Catalyst Activities:**

➢ NHT:

- Responsible for Naphtha hydrotreater catalyst performance monitoring-analysis and predicting change time
- Responsible for all correspondences with the catalyst vendor regarding any issue
- Participated in a committee to change catalyst type by providing actual conditions to the vendor and discuss with him all possibilities

- Managed 2 skimming of NHT catalyst and 1 complete replacement under nitrogen atmosphere with a sub-contractor

➢ Platforming-CCR:

- Responsible for platforming catalyst performance monitoring including daily analysis and 6-month routine special analysis in UOP labs
- Managed complete catalyst replacement (in CCR section and platformer) 3 times
- Responsible for monitoring, evaluation, and replacement of molecular sieves like net gas chloride treaters and LPG chloride treaters

➢ Penex:

- Responsible for Penex catalyst performance analysis and predicting change time
- Responsible for all correspondences with the catalyst vendor regarding any issue related to catalyst and continuous monthly reports sent to vendor
- Managed catalyst replacement under nitrogen atmosphere 5 times with a sub-contractor
- Responsible for monitoring, evaluation, and replacement of molecular sieves including, feed driers, make-up gas driers, and sulfur guard bed

Computerized Applications and AI Experience:

- Monitoring, Calculating, and Recording unit's performance conditions by Excel Spreadsheets.
- Develop some spreadsheets to do some calculations like compressor efficiency calculations, heat exchangers fouling calcs based on GPSA Engineering data book, and heater skin temperature calcs based on API-530
- Develop Web apps using python language such as :
  - Units_conversions
  - gas_properties_calculations
  - scatter_plotting
  - machine_learning

- Provide the refinery managers with daily summary reports of refinery units' performance as a dashboard using python, streamlit, Dash and other libraries.

- Designed and implemented 'Refinery_expert,' an AI assistant for refinery process engineering, utilizing prompt engineering techniques on the POE platform with established Large Language Models (LLMs)
- Develop specialized GPT-based solutions, including *GPSA Expert GPT*, *API PSV design and selection GPT*, and *LPG Merox Expert*, among other GPTs serving as knowledge repositories and decision-support tools for process engineers.
- Developed a new methodology using Jupyter Notebook to check everyday data and detect any deviations in process instrumentations and report automatically to technology and development manager.
- Have vast experience in prompt engineering
- Developed a machine learning model to predict H_2 composition in platformer recycle gas. Integrated the model with Excel via a custom VBA function that communicates with a Flask API, allowing users to easily request predictions and receive results directly in their spreadsheets.

Simulation Applications:

Apply simulation requirements for the refinery to improve unit performance, develop the operations technology, and solve operating problems on process and utility units.

- Simulation Programs:
  - PRO II: Excellent knowledge in building up simulation models in several process applications
  - HYSYS: Excellent knowledge in building up simulation models in several processes, Certified Aspen Hysys user CERT 00013335
  - APC: Good knowledge of advanced process control principles
  - Others: HTRI, COMSOL
  - Adaptable to MatLab/Simulink and AVEVA Process Modeller.

Optimization and troubleshooting

I will list here some summarized examples of process optimizations and/or process troubleshooting that I've done where a site survey is being conducted, DCS/Laboratory data was collected and sometimes simulation was applied. Also, equipment vendor/unit licensor was sometimes contacted

- **Restored Penex Unit Efficiency:** Troubleshooted a rapid de-activation that is occurred in 2018 in penex catalyst where temperature difference across the active bed was decreasing in range of 0.25 C° per day. The main contributor to this problem

was NHT catalyst deactivation where some oxygenates were slipping into penex liquid feed

- **Resolved Persistent Corrosion Issues in the CCR Section:** The vent gas wash tower system was having continuous corrosion problems in the venturi and downstream pipeline; the root cause was the improper mixing of vent gas and caustic in addition to bad insulation around the pipeline from vent gas to venturi

- **Optimized Nitrogen Usage During Turnarounds:** Reduced the nitrogen amount consumed in turnaround generally by monitoring operation teamwork during purging, and suggesting that purging equipment be done at vacuuming to 125 mm hg absolute and then breaking the pressure to 1.35 bar absolute instead of pressurizing to 2 or 3 bars and then depressurizing to atmospheric pressure, the amount was almost reduced by half. Updated refinery procedure accordingly

- **Capacity Test Run and Debottlenecking:** Successfully increased a Platformer unit's throughput to 118% of its nameplate capacity. Identified and addressed key bottlenecks in heaters, net gas compressors, and coolers, and submitted a detailed performance report to UOP for further optimization

- **Hydrogen Balance and refinery Mass Balance:** Independently developed and introduced a simplified Excel-based tool for calculating hydrogen and overall refinery mass balances following a major revamp on daily basis, enabling more accurate data-driven decision-making

- **Successfully Executed Platformer Inert Start-Up:** Assisted in platformer inert start-up (was done first time in 20 years), the problem was that the compressor was designed for hydrogen-like gas, and inert start-up required higher molecular weight flow, licensor, and equipment vendor was contacted and it was done smoothly with no problem at all

- **Introduced Cost-Saving Process Change:** I suggested a PFCP (process facility change proposal) to route penex driers knockout bleeder to closed drain instead of waste water, as small amount of light naphtha was eventually evaporated, while in closed drain it can be reprocessed. The waste amount was estimated to be 0.7 M3 per week, representing 0.5 ton per week representing 350 $ weekly loss at that time (2014)

- **Energy Management Program Implementation:** Assisted in initiating energy management program where we utilized the Energy Intensity Index (EII) of Solomon as a benchmark for our refinery's energy consumption. Developed spreadsheets to monitor EII on a daily basis for each refinery unit and as a whole, enabling effective benchmarking and optimization of energy usage.

- **Identified and Monitored High Energy Consumers:** Out of over 600 electrical equipment units, identified 12 as the most significant consumers, accounting for around 50% of the refinery's total electrical energy consumption. Currently in the phase of adapting real-time voltage and current readings to be connected to the Distributed Control System (DCS) for these twelve units to continuously monitor and improve their efficiency.

- **Advanced Process Control:** Presented compelling APC use cases to executive leadership, gaining approval to explore APC solutions from AspenTech, ABB, and AVEVA. Led initial evaluation efforts, positioning the refinery to adopt cutting-edge automation and control technologies.

Education

Currently I am MBA student in Alexandria university, Egypt. Below are my B.SC data

- University: Suez Canal University.
- Faculty: Petroleum & Mining Engineering, Suez.
- Duration: Sep. 2002 – May 2007.
- Qualification: B.Sc. in Petrochemicals & Petroleum Refining Engineering
- Graduate project: Fluidized Catalytic Cracking (F.C.C.), with excellent degree

Certifications

- Advanced Data analysis, Udacity, April 2022
- Machine Learning cross skilling, Udacity, June 2022
- Aspen Certified user, ID 00013335, May 2024
- PHA-HAZOP leader, REF 2025003007 TÜV NORD, Jan 2025

Training Courses

- Gas Compressors Operation, Maintenance and Troubleshooting " by OGS "
- Pump technology "by OGS".
- Tower internals. "by OGS".
- Heat transfer process. "by OGS".

- Process fired heater technology. "by OGS"
- Control valve engineering "by OGS".
- Process measurement fundamentals "by OGS".
- PLC and DCS system "by OGS".
- HYSYS simulation "by OGS".
- Hazard identification & Hazop basic "by ENPPI".
- ENG104Fundamentals of Distillation Design & Synthesis with Aspen PLUS by "Aspen Technology Inc"
- Callidus Combustion school by "UOP | callidus Technology, LLC"
- Data analysis basic/professional/advanced and machine learning by " Udacity "

Computer Skills

- Microsoft Applications:
  - Excellent knowledge of all Windows operating systems.
  - Excellent knowledge of Microsoft office (Excel, Word, PowerPoint and Visio).
- Data analysis and machine learning:
  - Python/pandas/numpy/sci-kit learn/plotly/streamlit
  - SQL/tableau.
  - Orange data mining
  - KNIME

Language

- Arabic: Mother tongue.
- English: Fluent, Professional working proficiency
- French: Fair