

Marcus Whitfield

Chemical Process Engineer

📍 Baton Rouge, LA 📞 (225) 555-0148 ✉️ marcus.whitfield@nexaemail.com 🔗 [linkedin.com/in/marcuswhitfield](https://www.linkedin.com/in/marcuswhitfield) 📄 PE
(Chemical) – Louisiana

Summary

Chemical engineer with 9 years designing and de-bottlenecking olefins and specialty-polymer production trains for Gulf Coast petrochemical operators. Deep proficiency in Aspen Plus and Aspen HYSYS steady-state and dynamic simulation, HAZOP/LOPA-driven safety design, and distillation/heat-exchanger network optimization. Led process safety reviews that closed 14 major-hazard findings ahead of insurer audits and cut steam demand 11% across a 220,000 tpy ethylene-glycol unit.

Core Competencies

Process Design: P&ID development, heat/mass balances, distillation & reactor sizing

Simulation: Aspen Plus, Aspen HYSYS, Aspen Energy Analyzer, MATLAB, gPROMS

Safety & Risk: HAZOP, LOPA, PHA facilitation, SIL verification, PSM/PSSR audits

Thermodynamics: VLE/LLE modeling, NRTL & Peng-Robinson property methods, exergy analysis

Professional Experience

Senior Process Engineer

Jun 2021 – Present

Vertex Chemical Processing, Baton Rouge, LA

- ▶ Redesigned the C2 splitter reflux scheme on a 220,000 tpy ethylene-glycol unit in Aspen Plus, cutting reboiler steam demand 11% and saving \$1.4M/yr in utility cost.
- ▶ Chaired quarterly HAZOP and LOPA sessions for six process units; drove closure of 14 major-hazard findings ahead of the annual insurer PSM audit with zero repeat citations.
- ▶ Built a dynamic Aspen HYSYS model of the propylene refrigeration loop to size a new emergency relief header, avoiding a \$650K overdesign flagged in the original vendor package.
- ▶ Mentored two graduate engineers on P&ID markup standards and SIL-rated instrument selection for a plant-wide safety instrumented system upgrade.

Process Engineer

Aug 2018 – May 2021

Meridian Specialty Polymers, Geismar, LA

- ▶ Modeled a new polymer-grade propylene purification train in Aspen Plus, right-sizing a 40-tray distillation column that came in 9% under the EPC contractor's capital estimate.
- ▶ Led debottlenecking of a shell-and-tube reboiler network using pinch analysis in Aspen Energy Analyzer, recovering 6,200 lb/hr of process steam for reuse on-site.
- ▶ Authored MOC and PSSR documentation for eleven capital projects, keeping the unit's incident-free operating streak at 1,100+ days through two consecutive turnarounds.
- ▶ Developed a MATLAB tool for real-time thermodynamic consistency checks on plant historian data, catching three mis-calibrated flow meters before month-end reconciliation.

Process Engineering Associate

Jul 2016 – Jul 2018

Apex Refining Solutions, Port Arthur, TX

- ▶ Supported HYSYS steady-state modeling of a hydrotreater revamp, verifying hydrogen balance and reactor quench design against license-holder guarantees.
- ▶ Conducted PHA re-validations for four legacy units, updating consequence modeling with current release-rate correlations and closing all open safeguards within schedule.
- ▶ Ran routine heat and mass balance reconciliations across the crude preheat train, identifying a fouling exchanger that recovered 4% unit thermal efficiency once cleaned.

Education

B.S., Chemical Engineering

2012 – 2016

Ashcombe Institute of Technology – GPA 3.72/4.0, AIChE Chapter Treasurer

Certifications & Software

Licensure: Professional Engineer (PE), Chemical – Louisiana, #PE-48213

Process Software: Aspen Plus & HYSYS Certified User; AutoCAD P&ID; Python (NumPy/Pandas)

Safety Training: OSHA 30 General Industry; Certified HAZOP Facilitator

Quality: Six Sigma Green Belt; ISO 9001 internal auditor