CURTIS RUDER

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Summary

Oil & Gas Industry Knowledge

- Oil & Gas industry analyst calibrating detailed lookbacks of the U.S. refining market.
  - Individual refinery process models including market connectivity, unit capacities, and limits.
  - Domestic crude production, import crudes, outages, and finished product sales.
  - Modes of transportation including tariffs, fees, line capacity, and terminal connectivity.
  - Regional and company specific balances (synced to public company 10Q and EIA balances).
  - Refinery specific economics including gross, variable, and net cash margins.
- Advisory consultant providing bespoke studies and analysis for clients seeking to gain a better understanding of the implications of evolving industry dynamic.
  - Analyzed impact of IMO2020, RINs, sulfur credits, LCFS, RBOB specification change, etc.
  - Executed multiple crude valuation studies to help crude marketers understand the value of their crude, how properties impact value, and identify best-fit refineries.
  - Conducted detailed market analysis on multiple PADD3, PADD4, and PADD5 demand centers to identify refinery supply flexibility, midstream asset pinch points, and demand growth.

Refinery Economics and Planning

- Gasoline blender for 320 MB/D refinery.
  - Used the LP to optimize gasoline blending recipes, associated unit operation, and component balances based upon economic alternatives and weekly pricing updates.
  - Worked with trading organization to coordinate component buy and sell decisions.
  - Executed economic evaluations for base business and value creation projects.
- Refinery Aspen PIMS LP development.
  - Calibration and updates of LP vectors for all refinery conversion units and hydrotreaters.
  - Development of non-linear blending interactions using lab data and field data for use in the LP to better represent non-linearity of gasoline blending.

Process Engineering

- Process engineering support for key refinery process units.
  - Direct responsibility for FCC, crude units, light ends unit, Cumene unit.
- Familiarity with operational objectives and limitations of nearly all major refinery fuels units.

Technology

- Professional experience using and developing models with common refinery software packages.
  - Linear Programming (LP): Aspen PIMS and LP Solve (open source)
  - Process Models: Aspen HYSYS and *PRISM*
- Expert level knowledge of Microsoft Excel and Office.
  - Professional experience coding VBA and VB.Net.
  - Have extended Excel functionality to leverage databases, Outlook, web pages, and other data sources as well as creating Excel add-ins that can shared functionality across workbooks.
- Intermediate level experience with various development technologies.
  - Languages: VBA, SQL, VB.Net, Python, C#
  - Databases: SQLite, Microsoft Access, Postgres, Oracle
  - Other technologies: Machine learning, web development, version control

Experience

Imubit   Houston, TX   2022 – current

Principal Refining Process Optimization Engineer   2022 - current

- Primary responsibilities:
  - Leverage experience and knowledge across optimization projects to identify optimization strategy, identify risks, and manage client relations.
  - Support client exploratory discussions to help identify best-fit opportunities
  - Lead troubleshooting efforts for escalated challenges
- Key accomplishments:
  - Direct responsibility for developing highest utilized FCC control project in company history.
  - Identified and championed control optimization improvement that reduces complex project development timeline by 80-90% and improves economic optimization.
  - Created benchmarking process which allows seamless comparison of similar projects thus allowing less experienced engineers to quickly compare against best practice.
  - Developed client facing presentations and diagrams for explaining complex topics to a mixed target audience that have become the organizational template.

Baker & O'Brien   Houston, TX   2017 – 2022

Refinery Modeling Analyst   2017 - 2022

- Primary responsibilities:
  - Maintained process models for all 125 U.S. refineries, stayed current on industry trends, documented industry changes to equipment, philosophy, and operations.
  - Leveraged process models to create detailed quarterly industry lookbacks that captured a complete picture of the refining sector extending from crude origination, transportation modes and tariffs, refinery operations, and product supply to specific markets.
  - Incorporated evolving dynamics such as IMO2020, RINs, LCFS, RBOB specifications, etc. into analysis to capture market impacts and constraints of new legislation and guidance.
- Key accomplishments:
  - Created Crude Allocation LP which is linear programming approach to solving the U.S. crude distribution puzzle. The LP included considerations for refinery configuration, transportation modes, pipeline constraints, tariffs and fees, and optimal run plans.
  - Direct responsibility for reducing the industry lookback time commitment by ~200 hours per month by leveraging technology to automate data extraction, debottlenecking the refinery simulator code, and creating the Crude Allocation LP.
  - Identified industry trends months before publication by sources like Reuters by applying data-first approach and industry balances. One example is Canadian crude exports out of the U.S. gulf coast which had been previously unheard of, but the Crude Allocation LP identified infeasibilities that only resolved by allowing Canadian crude exports out of the Gulf Coast.

Technical Consultant   2019 - 2022

- Primary responsibilities:
  - Provided technical support for U.S. refining related advisory and ligation studies
- Examples of advisory studies:
  - Executed crude valuation and breakeven value estimates to help crude marketers understand how different refineries would value their crude relative to the refineries' normal crude diets.
  - Conducted detailed market analysis on multiple demand centers in the U.S. to help market participants understand refinery product flexibility, midstream assets, and demand growth.
  - Researched, developed, and supported the creation of topical market reports shared on Baker & O'Brien's website and RBN's daily blog.

- Developed IMO2020 predictive model and presented results at industry conference (COQA).
- Key accomplishments:
  - First full-time refinery modeling analyst in company history to also be a key contributor on consulting projects. This was a direct result from creative destruction due to automating much of the analyst role thus freeing time for additional value creation.
  - Created and repurposed the Crude Allocation LP approach for multiple six figure advisory projects that leveraged the LP to understand the economics for complex market studies.

Product Manager for Refinery Industry Modeling Software   2018 - 2022
- Primary responsibilities:
  - Align software strategy, vision, and marketing objectives for commercial application *PRISM*.
  - Serve as the primary developer for any required alterations and troubleshooting efforts.
  - Managed client relationships including sales, renewals, and support activities.
- Key accomplishments:
  - One of a team of two developers that migrated a proprietary software package from a deprecated technology to something modern. Due to client incompatibilities, this was an extensional threat to *PRISM* viability, and the conversion was nearly seamless to our clients who only noticed some subtle visual and runtime improvements.
  - Optimized *PRISM* simulation algorithm resulting in nearly 80% runtime reduction. This was especially important since quarterly analysis required running each refinery multiple times.

Flint Hills Resources   Corpus Christi, TX   2012 - 2017

Economics and Planning Gasoline Blending Planner   2016 – 2017
- Primary responsibilities:
  - Weekly LP runs, setting buy/sell plan for gasoline components, calibrating gasoline recipes, and performing economic evaluations for projects related to gasoline.
- Key accomplishments:
  - Identified historically unoptimized winter gasoline blending opportunity valued at 12.0 MM/yr related to V/L, T50, and RVP optimization.
  - Championed gasoline blending specification change worth 3.5 MM/yr related to RBOB season versus batch targets.
  - Developed and automated blending metrics and lookback process.
  - Supported blend header expansion project valued at 5.0 MM/yr.

Economics and Planning LP Model Development Planner   2015 - 2016
- Primary responsibilities:
  - Modeling refinery oil flow, calibrating unit sub-models, and improving blend modeling.
- Key accomplishments:
  - Developed grassroots tools which aggregated unit yield and important variable data, scrubbed the data for acceptance criteria, and leveraged multivariant regression analysis to develop unit vectors for 5 hydrotreaters, 2 FCCs, CCR, Coker, and hydrocracker.
  - Calibrated non-linear blending coefficients for RVP, MON, and RON by using extensive lab driven blend study results that improved the predicted versus actual property prediction standard deviations by more than 2X.

Strategic Reliability Engineer   2013 - 2015
- Primary responsibilities:
  - Failure mode analysis, equipment strategy development, and area turnaround scoping for the area covering a FCC, HF Alky, Cumene, and Coker unit.
- Key accomplishments:
  - Developed and taught multiple classes to site personnel on Crow-AMSAA failure analysis.

- o Championed the scoping effort on a Cumene unit outage.

Process Engineer   **2012 - 2013**
- Primary responsibilities:
  - o Technical support for FCC and Cumene units
  - o Interim managerial support as Lead Engineer for team of four process engineers
- Key accomplishments:
  - o Became site Aspen HYSYS expert due to proficiency
  - o Created whole unit PI graphics for unit monitoring that became the base expectation
  - o Created Solomon data reporting template that automated the data acquisition for the FCC

NCRA Refinery (CHS Inc)   McPherson, KS   2009 - 2012
Process Engineer   **2009 - 2012**
- Primary responsibilities:
  - o Technical support for two crude units, light ends unit, and HF Alky feed treating
- Key accomplishments:
  - o Supported refinery turnaround event as primary night support for catalyst loading a hydrocracker, exchanger cleanliness, tower internals inspection, and catalyst sulfiding

Education

Texas A&M – Corpus Christi	**M.B.A. with Finance Concentration**	2016 - 2019
Kansas State University	**B.S. Chemical Engineering**	2004 - 2009