

# KEVIN D. VILLAVICENCIO

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- Process Engineer with seven (7) years of design experience for oil & gas, chemical and power plants.
- Diverse experience in process simulation and modelling, conceptual design and development of PFD, P&ID, and HMB for FEED and EPC projects, hydraulic design, equipment sizing, relief system design, and conducting design reviews such as P&ID Review and HAZOP.
- Possess high proficiency in programming & effectively utilizes it for developing tools that pioneered automation and increased work efficiency, recognized with **Process Engineering Department's Employee of the Year** in 2020 and **Engineering Division's Special Citation Award** in 2018.

## WORK EXPERIENCE

**JGC Corporation (Yokohama, Japan)**  
**PROCESS ENGINEER II**

**JUN 2018 – MAY 2019**  
(Project Assignment)

P&ID Development Team, LNG Canada Project

- Ensured high-quality and on-schedule issuance of 250+ sheets of P&ID, PFD and MEFS with rigorous check of design changes, and active management and communication with a remote CAD operator team.
- Established close and effective coordination with other engineering teams (instrumentation, piping, mechanical) for quick and correct close-out of clarifications, and timely inclusion of their design changes to the P&IDs.
- Prepared Technical Queries to Client for design clarifications and modifications, ensuring that such changes comply with applicable Client standards.
- Developed an MS Word-based automated report generation for revision descriptions (total of 750+ reports), reducing 100+ man-hours required for preparation.

**JGC Philippines, Inc. (Manila, Philippines)**  
**PROCESS ENGINEER II**

**JAN 2014 – PRESENT**

Process Design Team

- Held Assistant Lead Engineer roles, supervising the quality of staff engineers' deliverables. Monitored project progress and managed workload distribution to meet schedule and cost.
- Experienced working in various project stages such as Proposal Stage, Front-End Engineering Design (FEED), Engineering, Procurement and Construction (EPC), both for local and international projects.
- Highly skilled in a broad range of core process design activities as preparer & reviewer:
  - Performed conceptual design works for the development of Process Flow Diagrams (PFD), Heat & Material Balances (HMB), Piping & Instrumentation Diagrams (P&ID) and Cause & Effect matrices. Utilized various simulation tools to aid in design.
  - Executed detailed calculations for hydraulic balance, pump rating, vessel sizing, heat exchanger thermal rating, relief load calculation and relief valve sizing.
  - Studied various codes and standards (e.g. ASME, API, Shell DEP) that served basis of design, ensuring that designs are following applicable standards.
  - Conducted design reviews including P&ID Reviews and HAZOP Studies of various process units. Completed close-outs of review comments and recommendations.
  - Supported in pre-commissioning activities such as calculations for steam blowing and chemical cleaning.
- Demonstrated high technical aptitude and deep appreciation of fundamental engineering principles. Applies a comprehensive approach in problem solving to provide creative solutions to more challenging problems. This led to the delegation of design studies for more complex systems:
  - Evaluated an existing 12-km raw water pipeline being integrated with a new pump system using an extensive hydraulic calculation model that accounted for the 12-km pipeline's full

elevation profile. Avoided total replacement of the pipe by employing a control scheme that addresses the limitations of the existing design.

- Designed an Aqueous NH<sub>3</sub> Supply System composed of a supply tank and pumping system, an alternative to costlier packaged units. Calculated for daytime temperature profile of the supply tank via solar irradiance to determine peak temperatures. This served as design basis for the blanketing pressure to prevent vaporization.
- Determined the transient temperature profile of an Air Fin Cooler to estimate the time for ambient cool-down during emergency stop. Employed finite difference method to integrate transient heat transfer equations.
- Maintained a collaborative mindset when communicating with other engineering disciplines, vendors, clients and JGC Yokohama counterparts for effective coordination.
- Prepared on-demand training materials for Relief System Design for cadet engineers. Also conducted a presentation for Relief Valve Sizing basic concepts and methodologies for JGC Yokohama and JGC Philippines engineers. Consciously kept the balance of having a detailed, comprehensive discussion and using a language suitable for young engineers and engineers without prior relief valve sizing experience.

#### Software Development

- Awarded with **Engineering Division's Special Citation Award** in 2018 and **Process Engineering Department's Employee of the Year** in 2020 for the development of multiple calculation software that increased efficiency in work execution, directly translating to significant reductions in cost and manhours.
- **Relief Load Calculation Tool**
  - Replaced and improved highly fragmentized calculation procedures with a single standardized tool offering great flexibility in calculating different relief scenarios and different units of measurement.
  - Decreased manhour consumption by minimizing the set-ups required at the start of a project and introducing highly automated documentation procedures.
  - Deployed a variety of calculation methods to cover most failure scenario types. This includes:
    - Relief load calculation methods based on API Standard 521
    - Control valve sizing calculations based on ISA 75.01
    - Homogeneous Expansion Model for two-phase fluids
  - Contributed substantial improvements to the overall work execution of relief load design, the tool is now being utilized globally among JGC's Global Engineering Centers.
- **Relief Load Data Manager**
  - Created a fully-automated solution for data transfer, which integrated the new Relief Load Calculation Tool with existing relief valve sizing software, replacing the previous manual transfer method.
  - Reduced data transfer time from typically 23 minutes per item, to 10 seconds per item (99% reduction). Currently applied to a large project with 700+ relief valves, this is expected to save 260+ hours (more than a month) of manual data transfer work.
- **HAZOP Worksheet Tool**
  - Developed an MS Excel-based (via VBA), low-cost, in-house alternative over expensive HAZOP Worksheet software without compromising performance.
  - Provided significant cost savings for the company in terms of software licenses, and was utilized in multiple local, small-scale projects.
- **Cause and Effect Diagram Tool**
  - Introduced an improved method for C&E diagram preparation, allowing tabular input of cause-and-effect relationships which are more intuitive and efficient. The tool is still capable of generating the required matrix-format output, with up to 50% manhour reduction

#### Project Experience

- Refinery:
  - *Kuwait National Petroleum Company Clean Fuels Project*
  - *Pertamina Cilacap Blue Sky Project*
  - *Basrah Refinery Upgrading Project*
  - *Various design studies on local (Philippine) refineries*

- LNG Plant:
  - *Saudi Aramco Fadhili Gas Plant Proposal Project*
  - *LNG Canada Project*
- Chemicals:
  - *Chevron Phillips USGC Ethylene Project*
  - *Oleo-Fats Edible Oils As-built Project*
  - *Quimi-Kao and Kao Chemicals GmbH Tertiary Amine Plant FEED Project*
- Power Plant
  - *Sarangani Energy Corporation Coal Fired Power Plant*
  - *ASEAGAS Biomass Plant (Balance of Plant)*
  - *Energy Development Corporation Palayan Binary Power Plant (Geothermal)*

## EDUCATION

### M.S. ENERGY ENGINEERING (2016-2021 *expected*)

#### University of the Philippines – Diliman Campus

- Field of specialization focuses on techno-economic studies of Renewable Energy Systems (hybrid solar-wind-diesel-battery systems) for off-grid Philippine islands
- Electives Taken:
  - *Energy Economics and Systems Evaluation*
  - *Batteries and Fuel Cells: Fundamentals, Systems and Applications*
  - *Advanced Mathematical Methods in Engineering*
  - *Quantitative Methods in Industrial Engineering*
  - *Data Science and Analytics*

### B.S. CHEMICAL ENGINEERING (2008-2013)

#### University of the Philippines – Diliman Campus

- Real-Time Detection of H<sub>2</sub>S Gas using Thin Film CuO-doped SnO<sub>2</sub> Gas Sensor  
*Finalist, UP College of Engineering Undergraduate Project Competition 2013*
  - Developed a sensor system for the monitoring of H<sub>2</sub>S gas concentrations
  - Fabricated a thin film sensor on glass substrate as low-cost alternative for commercial sensors
  - Configured an Arduino microcontroller to relay sensor readings to Matlab for real-time display and monitoring
- H<sub>2</sub>, CO & CO<sub>2</sub> Production via Coal Gasification for Industrial Chemical Synthesis & Power Generation
  - Carried-out an economic and technical assessment on the feasibility of a Coal Gasification Plant
  - Evaluated the most suitable gasification technology based on our requirements.
  - Developed a worksheet that establishes the heat and material balance for the whole plant. The worksheet performs thermodynamic and kinetic calculations to determine optimal operating conditions, non-ideal fluid properties, reaction rates and overall plant capacity.
- Electives Taken:
  - *Heterogeneous Kinetics and Catalysis*
  - *Petroleum Engineering and Petrochemicals*
  - *Polymer Science and Engineering*
  - *Essentials of Electrical and Electronics Engineering*
- Organizations:
  - *Philippine Institute of Chemical Engineers – Junior Chapter Luzon*
  - *UP Academic League of Chemical Engineering Students*
  - *UP Kalilayan (provincial socio-civic organization)*

### Quezon National High School (2004-2008)

- Valedictorian, Engineering and Science Education Program (ESEP) Curriculum
- Represented the school in various competitions and positions:
  - 1<sup>st</sup> Place, National Science Quiz Bee – Biology (2005)
  - 3<sup>rd</sup> Place, First Philippine National Ozone Quiz (organized by DENR-EMB, 2007)
  - Editor-in-Chief, Official School Publication (AY 2007-2008)

## SOFTWARE PROFICIENCY

<b>Microsoft Office</b>	Office 365 (Word, Excel, etc) with proficiency in using VBA/Macro
<b>Process Simulation</b>	PRO/II, Aspen HYSYS
<b>Process Design</b>	HTRI Xchanger Suite, Aspen FlareNet
<b>Other Software</b>	Minitab, HOMER Pro, QGIS
<b>Programming Languages</b>	Visual Basic, Python, R, Java

## ADDITIONAL INFORMATION

<b>Professional License</b>	Licensed Chemical Engineer (Philippine Professional Regulations Commission)
<b>Languages</b>	English, Filipino