



LAWRENCE W. LOUIE, P.E.



Mr. Louie is a Principal with Long International and has over 35 years of engineering, construction, and project management consulting experience. He has extensive knowledge of major LNG, offshore oil & gas development, pipeline, infrastructure, and oil sands projects valued up to US\$54 billion. Mr. Louie has employed his expertise on major capital projects in the U.S. as well as international locations such as Angola, Australia, Brazil, Canada, Congo, Indonesia, Kazakhstan, Nigeria, Norway, Papua New Guinea, Philippines, South Korea, U.K. and Venezuela. He has had broad involvement with projects that were executed by multi-national joint ventures on the owner's side. Mr. Louie has been the team leader for cost and schedule risk assessments for mega-and giga-projects totaling over US\$200 billion. Before joining Long International, Mr. Louie served as a Senior Cost Engineering Consultant for Chevron U.S.A., Inc. Through his

proven work experience, Mr. Louie provides clients with superior analytical and problem-solving skills that are effective in mitigating or resolving performance and contract related issues.

EDUCATION

Master's Certificate of Project Management, ESI/George Washington University, 2004

Master's Certificate of Global Business Management, ESI/George Washington University, 1996

B.S., Mechanical Engineering, California Polytechnic State University, San Luis Obispo, 1981

PROFESSIONAL REGISTRATIONS

Registered Professional Mechanical Engineer, California (No. M23788)

PROFESSIONAL AFFILIATIONS

American Society of Mechanical Engineers – Life Member

TECHNICAL EXPERIENCE

Representative U.S. and international technical experience includes:

- Development of engineering and project management plans and procedures.
- Formulation of technical procedures and specifications.
- Preparation and analysis of change orders.
- Analysis of cost and schedule risks.
- Assessments of cost and schedule risks.
- Negotiations of significant change orders concerning engineering errors, scope growth, delay, and disruption.
- Preparation of contracts, and negotiations, signings, and post-award contract management.
- Organizer, facilitator, and speaker/instructor for cost engineering seminars.
- Organizer, facilitator, and speaker/instructor for value engineering and value improvement practice seminars and workshops.



PROJECT EXPERIENCE

Mr. Louie has served as a Project Engineer, Project Design Representative, Team Lead, and Senior Cost Engineering Consultant on major domestic U.S. and international projects. Representative projects include the following:

- Senior Cost Engineering Consultant – Reviewed the A/R estimate and schedule for a US\$37 billion modular onshore oil and gas project located in Kazakhstan. Coordinated the expertise of in-house technical and cost engineering specialists including partner representatives. Reviewed and evaluated contractor's estimate and schedule and provided an extensive list of adjustments prior to cost and schedule risk assessment and final investment decision. Actively participated in the ranges and metrics used in the cost and schedule risk assessment.
- Senior Cost Engineering Consultant – Assessed the A/R estimate and schedule for a US\$15 billion modular onshore LNG project located in Canada. Coordinated the expertise of in-house technical and cost engineering specialists including partner representative. Analyzed and evaluated contractor's estimate and schedule and provided a list of adjustments including weight and quantity growth, productivity, and project team size. Actively participated in the ranges and challenged the competing metrics used in the cost and schedule risk assessment.
- Senior Cost Engineering Consultant – Reviewed the A/R estimate and schedule for a US\$30 billion modular onshore LNG offshore upstream and infrastructure project located in Western Australia. Coordinated the expertise of in-house technical and cost engineering specialists during three separate contractor's estimates and schedule reviews. Studied and assessed each contractor's estimate and schedule and provided a list of adjustments including weight and quantity growth, craft and engineering productivity, duration, and HUC carryover. Performed a mid-project and 80 percent project complete management review during execution. Actively participated in the ranges and metrics used in the cost and schedule risk assessment.
- Senior Cost Engineering Consultant – Evaluated the A/R estimate and schedule for a US\$37 billion modular onshore LNG, offshore upstream and infrastructure project located in Western Australia. Coordinated the expertise of in-house technical and cost engineering specialists during three separate contractor's estimates and schedule reviews. Reviewed and evaluated each contractor's estimate and schedule, and provided a list of adjustments including weight and quantity growth, craft and engineering productivity, logistics, duration, and HUC carryover. Performed annual cost and schedule review updates with partners. Actively participated in the ranges and challenged the competing metrics used in the cost and schedule risk assessment.
- Senior Cost Engineering Consultant – Coordinated the review of the Life of Field estimate and schedule for an AU\$47 billion non-operated, modular onshore LNG offshore upstream and infrastructure project located in Western Australia. Coordinated the expertise of in-house technical and cost engineering specialists during the operator's estimate and schedule reviews. Provided an independent assessment of the estimate and schedule with recommended cost and schedule contingencies significantly greater than operator. Recommendations provided the impetus to change the scope and location for this project.
- Senior Cost Engineering Consultant – Reviewed an A/R estimate and schedule for a US\$5 billion non-operated offshore oil and gas platform located West of Shetlands. Coordinated with an in-house schedule specialist during the operator's estimate and schedule reviews. Recommended adjustments to weight and bulk growth, module fabrication yard productivity, HUC carryover, and brownfield modifications.
- Senior Cost Engineering Consultant – Evaluated an A/R estimate and schedule for a US\$5 billion non-operated offshore oil and gas platform located in Western Australia. Coordinated in-house cost and schedule review and participated in the partners joint assessment during the operator's estimate and



schedule reviews. Recommended adjustments to weight and bulk growth, module fabrication yard productivity, HUC carryover, engineering productivity, and brownfield modifications.

- Senior Cost Engineering Consultant – Reviewed the A/R estimate and schedule for a US\$4 billion offshore compliant tower oil and gas facility located in Angola. Coordinated the expertise of in-house technical and cost engineering specialists during three separate contractor’s estimates and schedule reviews. Actively participated in the ranges and challenged the metrics used in the cost and schedule risk assessment. Identified topsides operating weight growth exceeding the capacity of the compliant tower during the cost and schedule risk assessment.
- Study Coordinator, Facilitator, and Cost Engineering Consultant – Provided conceptual cost estimates for the production and drilling facilities for a US\$2 billion offshore compliant tower oil and gas facility located in Angola. Facilitated customized value engineering, technology selection, design to capacity, energy optimization, and weight reduction workshops. Reviewed the A/R estimate and analyzed equipment and execution bids on behalf of the project team.

PROFESSIONAL EXPERIENCE

Long International, Inc.

Danville, California (May 2019 to Present)

As a Principal, Mr. Louie conducts cost and schedule risk assessments and evaluates project cost estimates for major LNG and oil and gas projects.

Chevron U.S.A., Inc.

San Ramon, California (1982 to 2017)

As a Senior Cost Engineering Consultant, Mr. Louie was responsible for performing cost estimate reviews and cost and schedule risk assessments for multi-billion-dollar LNG and oil and gas projects.

PUBLICATIONS AND SPEAKING ENGAGEMENTS

“Estimate Plans: Start to Finish,” AACE International Conference, June 2006.

“Great Expectations from Learning Curves,” AACE International Conference, June 2002.

“Unraveling the Chaos in Topsides Metrics,” AACE International Conference, June 2001.

“The Real Productivity Inside Door No. 3,” Chevron In-House Knowledge Transfer.

“Cost and Schedule Risk Assessments through the Years,” Chevron In-House Knowledge Transfer.

“Six Degrees of Separation in Estimate and Schedule Assurance Reviews,” Chevron In-House Knowledge Transfer.

“Why is Up with Offshore Topsides and Onshore Module Weights the Norm?” Chevron In-House Knowledge Transfer.

“Why Does Engineering Quality Impact Cost and Schedule?” Chevron In-House Knowledge Transfer.

“Avogadro’s Number of Options but Incomplete Family of Curves,” Chevron In-House Knowledge Transfer.