

S. ANDREW MCINTOSH



Mr. McIntosh is a Senior Principal with Long International and has over 50 years of engineering, construction, and energy and management consulting experience. He has extensive international greenfield and brownfield project development and project management experience in diverse areas such as oil and gas, including refinery, pipelines, and offshore projects, LNG, petrochemical and ferrous metallics. Mr. McIntosh has been involved in projects ranging in value from US\$20 million to US\$2.0 billion. He has provided expert analysis of technical issues and their causes and effects related to project management performance on multibillion-dollar EPCA projects. In addition, Mr. McIntosh has extensive experience in the development of project management and project execution plans and procedures, stage-gate processes for project development, and the analysis and resolution of engineering and construction claims involving disputed

change orders, schedule delay, and loss of productivity claims. More recently, he completed expert analysis of technical issues, and the causes and effects of an EPC contractor's project management performance on a major LNG project.

During his career, Mr. McIntosh provided expert advice to foreign governments on major LNG project development and natural gas monetizing strategies from natural gas offshore fields and from associated gas derived from offshore oil producing fields. He has prepared and submitted various independent expert reports including an expert report involving a US\$2.7 billion refinery upgrade project in South America and a US\$270 million claim arising out of EPC works on the project. His report was presented to the International Chamber of Commerce (ICC), resulting in a favorable outcome for the client. Moreover, he submitted an expert report to IDRC and testified on technical matters before a tribunal on a major arbitration arising out of EPC works on a refinery project in Vietnam. Mr. McIntosh has also prepared expert reports for two other major arbitrations arising out of EPC works on two LNG projects in Australia and testified before an international tribunal on technical matters for one of those projects. He similarly prepared expert reports and testified in a major refinery arbitration out of Vietnam. He has evaluated EPC performance on major petrochemical projects on behalf of clients either contemplating litigation or simply wishing to record lessons learned for future project execution.

Before joining Long International, he served as President of the Natural Gas Company of Trinidad and Tobago and was a Senior Operations Advisor, Vice President – Operations, and Vice President – Technical Services for several international energy companies. Among his many responsibilities in these roles were enhancing and strengthening existing Enterprise-Wide Risk Management Systems (EWRMS), and he was the champion of EWRMS at Atlantic LNG and the National Gas Company of Trinidad and Tobago.

EDUCATION

Certificate in Petroleum Engineering – Oil & Gas Consultants' Institute, 1993
B.S. (Honors) Mechanical Engineering – University of West Indies, 1971

TECHNICAL EXPERIENCE

- Extensive leadership experience, recognized as a visionary, dynamic, results-oriented, and trusted leader
- Over 50 years of experience in natural gas-driven industries including 17 years as a senior-level executive, and three years as President of The National Gas Company of Trinidad and Tobago

- Experienced with major EPC project management and plant operations with a proven record of completing major expansion projects on schedule and within budget
- Expertise with greenfield and brownfield project development, execution, commissioning, and startup
- Extensive experience in the assessment of change orders and closure of punch list items arising from a systems approach to process plant mechanical, pre-commissioning and commissioning, and start-up activities
- Expertise in analyzing technical issues and EPC and EPCm project management performance issues relative to multibillion-dollar construction claims
- Negotiation of construction claim final settlements for major EPC contracts
- Thorough knowledge of petrochemical plant operations such as refinery, LNG, ferrous metallurgy, including recognition as a top-flight Director of Process Operations, and Director of Maintenance/Reliability Engineering
- Served for ten years as Chief Engineer/Manager-Engineering for an offshore oil and gas production operation
- Significant experience with budget preparation and control
- Experienced with development and implementation of KPIs for Process Plant Operations Assurance
- Contracts reviews, negotiations, executions, and post-award contract management
- Creation of engineering and project management plans and procedures
- Development and maintenance of corporate technical standards and procedures
- Championed the development of Corporate Strategic Plans, underpinned by SMART performance Management Systems, and Enterprise-Wide Risk Management Systems (EWRMS)
- Championed and strengthened existing EWRMS that led to improved corporate performance by identification of top risks and their associated mitigation initiatives

PROJECT EXPERIENCE

Mr. McIntosh served as a member of the Board of Directors and President of the Natural Gas Company of Trinidad and Tobago. He also held roles as Senior LNG Operations Advisor in a 530,000 BOE/day natural gas exploration and production company and as Vice President – Operations, and Vice President – Technical Services of a 4-Train, 15 mtpa LNG facility. Other significant positions held include General Manager, Operations and Process Consultant, Senior Manager – Operations, Executive Manager – Energy Projects, and Project Engineer on major capital projects and operating facilities.

PROFESSIONAL EXPERIENCE

Long International, Inc.

Trinidad and Tobago (March 2015 to Present)

As a Senior Principal with Long International, Mr. McIntosh provides project management and project development advisory services as well as expert services in all facets of engineering and construction contract dispute analysis and resolution, litigation/arbitration/mediation support, and expert testimony. Since joining Long International, Mr. McIntosh has prepared and submitted various independent expert reports including an expert report involving a refinery upgrade project. He also submitted an expert report, a reply report, and a joint expert report to IDRC, and testified before a tribunal on a major arbitration arising out of EPC works on a refinery project in Vietnam. More recently, Mr. McIntosh completed a more than

2,000-page expert report on issues related to EPC works on an LNG project in Australia, which was the result of three years of review, research, and analysis. He testified in arbitration as a Project Management Expert before a tribunal on this project in February 2022. In addition, Mr. McIntosh has prepared expert reports on another major arbitration arising out of EPC works on another LNG project in Australia involving project management issues.

Independent International Consultant

Trinidad and Tobago (March 2012 to March 2015)

Mr. McIntosh leveraged his years of experience in the energy sector to assist governments, independent natural gas producers, and project developers in structured, sustainable natural gas based industrial development such as LNG, ammonia (fertilizers), methanol, ferrous metallics (direct reduced iron, hot briquetted iron (HBI)) and CPFs. He built local capacity by providing logistical support to the energy sector, including engineering, project management, plant and facility maintenance and operations, and inspection services.

The National Gas Company of Trinidad and Tobago

Trinidad and Tobago (March 2009 to March 2012)

As President, Mr. McIntosh inspired leadership of the most profitable state corporation in Trinidad and Tobago, which had revenues of US\$3 billion, and 850 employees. The company also had 4.4 Bcfd natural gas transmission capacity, and 1,000 km of pipeline infrastructure, including the Western Hemisphere's largest (56-inch dia.) natural gas pipeline. Mr. McIntosh initiated major transformational changes to organizational structure, completed a new strategic plan for the 2011-2015 period, conducted negotiations of all major upstream and downstream gas contracts and new projects, and served as a board member.

BP Trinidad and Tobago LLC

Trinidad and Tobago (October 2007 to March 2009)

Mr. McIntosh was the Senior LNG Operations Advisor. In this role, he provided expert advice on all governance aspects, including technical and operations matters, relative to the BP Trinidad and Tobago LLC joint venture project, and Atlantic LNG Company of Trinidad and Tobago. In addition, he provided LNG technical expertise to peer reviews, and other due diligence matters in several BP Worldwide Operations business units. In this latter role, Mr. McIntosh represented BP on all stage-gate reviews during the execution of the Angola LNG Project, including providing expert opinions on closure of assurance items varying from change orders, operations and maintenance issues, and punch list item completion.

Atlantic LNG Company of Trinidad and Tobago

Trinidad and Tobago (May 2004 to September 2007)

As Vice President, Operations, Mr. McIntosh was accountable as the company Operating Authority. He was responsible for providing assurance to the president on the effective establishment and utilization of the operating envelope of the US\$4 billion asset. He led more than 400 members of the Operations Team, and established strategies and targets. In addition, he set priorities, managed staff acquisition, provided development and mentorship, and served as a role model for Atlantic's commitment to safety, people, and performance. His key accomplishments included the successful integration of Train 4 into the facility, which at the time, was the largest commercial ConocoPhillips Cascade Process LNG Train in the world, and designed a plan to transform Atlantic's Operations into a "best-in-class" center for operational excellence.

As Vice President, Technical Services, Mr. McIntosh served as the company's technical authority. He had direct responsibility for engineering excellence out of Houston, Texas as well as for the Trinidad operations. As with the Petrotrin Refinery Upgrade Project discussed below, Mr. McIntosh was responsible for completing EPC works, and the pre-commissioning, commissioning, and startup of Train 4 as an independent train. After a successful 72-hour performance test of the train at design capacity, the train operations were integrated into the wider LNG facility, which comprised three trains (1, 2, and 3). The total capacity of the 4-Train facility was 15 mtpa. A crucial aspect of this project was the delivery of an accurate 3D Model early in the detailed engineering phase of EPC works. For this task, Mr. McIntosh ensured that the required 30%, 60%, and 90% model reviews were executed on time and, most importantly, that the action items from each review were substantially complete before the next review was due.

Mr. McIntosh led a smooth transition from construction to systems mechanical completion, pre-commissioning, commissioning, start up, and hand over to owner/operator by employing the proven method of systems handover. Having applied this method on the project, Mr. McIntosh became familiar with best-in-class project management processes, including management of change, PSM elements, QA/QC, and effective Project Execution Plan development to guarantee planning for successful project commissioning, startup, and handover. To ensure a successful transition from construction to pre-commissioning, commissioning, startup, and handover, Mr. McIntosh prepared an Operations Readiness Assessment (ORA). The ORA included effective sequencing of constituent components, and covered all aspects of systems mechanical completion: pre-commissioning including hydrostatic testing and flushing; commissioning including function testing, hydraulic testing, and SIL testing to ensure that required safety interlocks worked as designed across the various systems. Mr. McIntosh also conducted Pre-Start-Up Safety Reviews. Overall, his key accomplishments at the company included the completion of the EPC works on Train 4, the world's largest LNG train valued at US\$1.3 billion, and the execution of a major project to improve plant reliability valued at US\$120 million.

MFS Services Ltd.

Trinidad and Tobago (October 2002 to April 2004)

As the General Manager, Mr. McIntosh developed new business opportunities in the upstream sector. He contributed to the establishment of the offshore fabrication industry in Trinidad and Tobago and executed several capital projects in the offshore oil fields of BP Trinidad and Tobago.

Lurgi Metallurgie GmbH

Frankfurt, Germany (September 2001 to September 2002)

As an Operations and Process Consultant, Mr. McIntosh developed project proposals for HBI plants, including process design and operations procedures. In addition, he served as an advisor to the Presidential Advisory Board.

Cliffs and Associates Ltd.

Point Lisas, Trinidad and Tobago (February 1997 to August 2001)

As Senior Manager, Operations, Mr. McIntosh managed a greenfield project startup of the first commercial application of Lurgi's Circored® process to manufacture HBI. He directed commissioning and startup of the plant, which produced 100,000 tons of HBI before the plant shutdown for major modifications. He also oversaw all process and maintenance operations. Mr. McIntosh was also required to advise the Project

Execution Unit on the closure of all TQs, NCRs, COs, and punch list items arising from EPC activities. Some closing actions required coordination among several licensors.

Petroleum Company of Trinidad and Tobago (Petrotrin)

Trinidad and Tobago (July 1994 to January 1997)

As Executive Manager, Energy Projects, Mr. McIntosh was responsible for the first major refinery expansion of Petrotrin's 180,000 bopd oil refinery in Pointe a Pierre, Trinidad. This expansion added several new units, *e.g.*, Catalytic Reformers, Hydrotreaters, a Visbreaker, a Vacuum Distillate Unit, a Sulfur Recovery Unit, New Hydrogen Compression, and PSA Units, and converted an old pneumatic control system to DCS as well as an upgrade to a FCCU. Mr. McIntosh was directly responsible for EPC works, including pre-commissioning, commissioning, and startup. The Commissioning and Start-Up Team reported directly to him. Moreover, Mr. McIntosh successfully ensured operational readiness for startup and integration of the new and upgraded units into the existing refinery.

Additionally, Mr. McIntosh managed an offshore waterflood injection project, the design and construction of two new platforms, new injection and offtake wells, pipelines, vessels, and secondary recovery (steam flood injection) of onshore oil. He had direct responsibility for commissioning and startup of thermal units, and oil and gas production systems. Mr. McIntosh was also responsible for closure of all TQs, NCRs, COs, and punch list items arising from greenfield and brownfield EPC activities. Some closing actions required coordination among several licensors. Mr. McIntosh represented Petrotrin in all multi-lateral conversations with the Government of Trinidad and Tobago, and five international financial institutions led by the IADB.

Trinidad Marine (Trinmar) Ltd.

Trinidad and Tobago (February 1984 to June 1994)

As Chief Engineer/Manager, Engineering, Mr. McIntosh was responsible for marine operations, gas compression operations, asset integrity, reliability and maintenance, and capital projects execution. He completely re-tooled the Engineering Department, and rebuilt a major compression station after a disastrous fire in 1986, which included a complete structural re-build, new 2,500 PSIG gas compressors, new platforms, and new infrastructure to support new high pressure gas compressor operations. Furthermore, Mr. McIntosh was responsible for closure of all TQs, NCRs, COs, and punch list items arising from greenfield and brownfield EPC activities.

Trinidad and Tobago Oil Company (Trintoc) Ltd.

Trinidad and Tobago (May 1977 to January 1984)

As a Project Engineer and Area Engineer, Mr. McIntosh directed the maintenance for a crude distiller, power plant, and tank farm. As the Maintenance Superintendent, he directed maintenance activities for the entire operation.

Guyana Bauxite Company (Guybau) Ltd.

Guyana (July 1971 to April 1977)

As a Project Engineer, Mr. McIntosh successfully delivered several capital projects in both the Alumina and Bauxite Divisions. As a Calcining Specialist for the Alumina Division, he successfully developed the first commercial application of laser technology in the alignment of Rotary Calcining Kilns. As a Senior Calcining Engineer for the Bauxite Division, he successfully constructed and commissioned what was,

at that time, the world's largest calciner. During the project, he successfully solved a major problem that was causing premature refractory failure in the second largest calciner. As a Maintenance Superintendent for the Mines Division, Mr. McIntosh demonstrated ability to solve complex problems, and introduced several innovations that improved equipment reliability, lowered costs, and improved employee morale that resulted in a significant decrease in HR issues.

PUBLICATIONS AND SPEAKING ENGAGEMENTS

"The Importance of Project Handover Documents," *Long International, Inc.*, December 2015.

"Keys to Successful Major Project Execution," *Long International, Inc.*, November 2015.

EXPERT REPORT PREPARATION AND TESTIMONY

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| 2023–2024 | On behalf of the owner and EPC contractor, participated in a QRA to evaluate the status of a major refinery upgrade project in the Middle East and provided schedule-risked completion dates for the project mechanical completion, commissioning, and start-up and handover. |
| 2024 | On behalf of the owner, participated in a schedule risk analysis to evaluate the status of a major petrochemical project in Saudi Arabia and provide schedule-risked completion dates for the project mechanical completion, commissioning, and start-up and handover. |
| 2020–2022 | On behalf of the owner, prepared and submitted a project management expert report, a reply report, and a joint expert report to IDRC for a major arbitration arising out of EPC works on a refinery project in Vietnam. Testified before a tribunal in 2021. Prepared a second expert report, a reply expert report, and a joint expert report for the project. The arbitration hearing before the IDRC is planned to occur in April 2022. |
| 2017–2022 | On behalf of the owner, completed a more than 2,000-page Project Management Expert Report on an LNG project in Australia, which was the result of three years of review, research, and analysis of the planning and installation of various networks of gas pipelines and compressor stations. Testified during an arbitration hearing held in February 2022. |
| 2018–2021 | Project Management Expert for a major joint venture start-up LNG producer in its claim against an international EPC contractor involving major cost and schedule overruns on a multi-train LNG project in Australia. Led a project management expert team and worked with schedule and damages experts to prepare expert reports and furnish various opinions to support the client's prosecution of its claim. Prepared a Project Management Expert Report. |
| 2020 | Prepared an expert report on a US\$2.7 billion refinery upgrade project in South America involving a US\$270 million claim arising out of EPC works on the project. The expert report was presented by the client to the ICC with a favorable outcome to the client. |
| 2017–2018 | Project Management Expert for a major international EPC contractor prosecuting a delay and damages claim against a refinery operator of a major refinery upgrade project. Submitted an expert report to the ICC in the matter of determining responsibility for the supply of utilities for pre-commissioning and commissioning. Based largely on the expert report, the client won the case. |



- 2016–2017 Project Management Expert for a major joint venture start-up LNG producer in its claim against an international EPC contractor involving major cost and schedule overruns on a multi-train mega LNG project that was constructed using a modular methodology where the various process modules were built overseas. Presented an expert report to senior management of the joint venture LNG producer. Responded to questions regarding the basis for opinions expressed in the report.
- 2013–2014 Project Management Expert for various national gas companies in Africa in matters related to the development of LNG projects in Ghana, Mozambique, and Tanzania. Responded to questions regarding the basis for analysis and opinions before various government agencies on complex matters such as Host Government Agreements (HGAs). Many major changes were made to HGAs as a result of Mr. McIntosh's expert opinions and reports.
- 2011–2012 Project Management Expert for a national gas company defending many claims from its customers relative to the delivery of contracted natural gas supplies. Presented an expert report to the board of directors of the national gas company and responded to questions regarding the basis for opinions expressed in the report. All claims were satisfactorily resolved.
- 2009 Project Management Expert for a national gas company in its claim against an international EPC contractor involving major cost and schedule overruns on an offshore pipeline construction project. Presented an expert report to the board of directors of the national gas company and responded to questions regarding the basis for opinions expressed in the report.
- 2006 Project Management Expert for a major LNG producer (15 mtpa) in its claim against an international EPC contractor involving major cost and schedule overruns on brownfield upgrades to the 15 mtpa LNG facility. Responded to questions regarding the basis for analysis and opinions before the board of directors of the LNG producer. The claim was resolved in favor of the producer.
- 2005 Project Management Expert for a major LNG producer (15 mtpa) in its claim against an international EPC contractor involving major cost and schedule overruns on the construction of a 5.4 mtpa LNG plant. Presented an expert report to the board of directors of the national gas company of the LNG producer, and responded to questions regarding the basis for opinions expressed in the report. The claim was resolved in favor of the LNG producer.
- 2001 Project Management Expert for an international joint venture prosecuting a cost recovery claim against an international EPC contractor involving cost and schedule overruns on a greenfield HBI project. Presented an expert report to the board of directors of the joint venture and responded to questions regarding the basis for opinions expressed in the report.
- 1997 Project Management Expert for a national oil company prosecuting a major cost recovery claim against an international EPC contractor involving cost and schedule overruns on a major refinery upgrade project. Presented an expert report to the board of directors of the national oil company and responded to questions regarding the basis for opinions expressed in the report.