

## REFINERIES, PETROCHEMICAL, AND CHEMICAL PLANTS PROJECT EXPERIENCE

| Type of Project | Description of Services Provided   | Project Location |
|-----------------|--|------------------|
| Chemical Plant  | Prepared an owner's claim against an engineering & construction management firm which was terminated for default for defective design work, delays, and cost overruns on a guaranteed maximum price contract to build a commercial-scale chemical plant scaled up from a pilot plant test facility.  | Colorado         |
| Chemical Plant  | On behalf of the Japanese EPC contractor, prepared a claim, developed a document database, and performed an analysis of costs and schedules for a \$450 million fertilizer plant. Prepared a \$100 million claim against the owner, which was abandoned as a result of the Gulf War. Successfully negotiated one Turkish and two Korean subcontractor's claims against the Japanese prime contractor.  | Iraq             |
| Chemical Plant  | On behalf of the EPC contractor, performed an analysis of the technical entitlement of over 400 change orders associated with an engineering and construction contractor's \$60 million claim on a magnesium oxide production plant. Determined the cause-effect relationship between the changed work and the resulting schedule impact and additional costs. Provided expert testimony at an ICC arbitration hearing in London. Contractor alleged that the FIDIC based contract provided relief under the Variations clause; the owner argued that it was a fixed price contract and no relief was available. Also analyzed cause-effect relationship of improper operation by the owner and resulting poor magnesium oxide production from the facility. | Jordan           |
| Chemical Plant  | On behalf of the owner, performed an analysis of entitlement, schedule delay and damages related to a contractor's \$12 million claim against a major international chemical company associated with the construction of two process units in an existing chemical plant. The initial EPC contractor was terminated, and sought recovery of its cost overruns as a result of field change orders. The owner alleged that the work was defective as a result of engineering errors, field installation errors, and welding defects.   | Louisiana        |
| Chemical Plant  | On behalf of the contractor, performed an analysis of an EPC contractor's change order and delay claims on a chemical plant project.   | Louisiana        |



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| Chemical Plant         | Provided construction claims consulting services, claims analysis, and change order reviews related to a methanol plant construction project. Reviewed the EPC contractor's contract and the EPC contractor's unresolved claims and change order requests to develop more complete descriptions of the claim issues, evaluate the merits of the claims, and prepare a summary of the claim documentation to support the client's settlement discussions with the EPC contractor. | Louisiana               |
| Chemical Plant         | On behalf of the EPC contractor, performed an analysis of the delays associated with the punchlist handover work, mechanical completion, and startup/commissioning of a chemical plant. Issues involved industry norms for pre-commissioning, mechanical completion, commissioning and start-up of the project, and whether the parties followed the contractual specifications for mechanical completion and turnover of the facility.  | Netherlands             |
| Chemical Plant         | Reviewed the owner's contract for the engineering, procurement, and construction of a chemical plant. Recommended changes to project management, scheduling, and project controls provisions to improve the owner's visibility into the progress reporting on the project. Provided a Claims Prevention Seminar.   | South Carolina          |



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| Chemical Plant         | Supplied dispute resolution services in support of a chemical company who was defending against \$150 million in impact claims made by a European EPC contractor on several polyethylene terephthalate (PET) plants. Participated in the document discovery, research, organization and coding of over 500,000 project records into an internet-based document repository. Assisted in answering interrogatories and prepared questions for fact witness depositions. Scrutinized the entitlement of alleged critical path schedule delays due to late and continuous changes, technology changes, late turnover package approvals, weather impacts, and slow agency reviews potentially affecting 15,000 schedule activities. Developed a comprehensive delay allocation model used to quantify and document critical path and concurrent delays affecting the schedules. Correlated issues to schedule activities. Employed a retrospective CPM schedule delay analysis methodology to correctly calculate entitlement for compensable delay costs and evaluate concurrent delays due to approved change orders, fact-based project issues, and weather impacts as supported by project records. Based on the findings, the contractor's claims were grossly overstated and unsupported in which the owner enjoyed a favorable settlement at a small fraction of the total dispute. Performed extensive schedule quality assurance review studies of the contractor's contemporaneous EPC project schedules to determine if these schedules were fit for delay analysis including identification and resolution of open-end activities, over use of constraints, incorrect as-built dates, missing as-built dates, missing original scope, and missing logic. | Spain, Argentina, and the Netherlands |
| Chemical Plant         | On behalf of the owner, analyzed a claim for delays and cost overruns against the engineering, procurement, and construction contractor of a polyol chemical plant project.   | Tennessee                             |
| Chemical Plant         | Provided Claims Prevention Training Seminar for Project Management, Contract Administration, and Legal Personnel of a major U.S. oil company building a new chemical plant.   | Tennessee                             |

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| Chemical Plant         | Reviewed Contracts, Policies, and Procedures related to Project Controls, Change Order Management, and Scheduling Requirements for a major U.S. Chemical Company. Recommended clauses to resolve potential inconsistencies, ambiguities, and conflicts. Prepared clauses for cost and schedule control procedures.   | Tennessee               |
| Chemical Plant         | On behalf of the owner, performed an analysis of its \$19 million claim for change orders, delay, and disruption on an EPC project involving a MDI chemical plant. The issues also included interpretation of whether the contract was a reimbursable or unit rate/lump sum price.   | Texas                   |
| Chemical Plant         | Reviewed owner's contracting strategy and risks associated with the engineering, procurement, and construction of several major chemical plant projects.   | Texas                   |
| Chemical Plant         | Reviewed and evaluated a contractor's request for loss of labor productivity labor costs associated with RFIs and change orders, a time extension and additional compensation related to the revamp of piping systems for a styrene chemical plant. Completed an evaluation of entitlement, prepared a time impact schedule analysis, assessed the contractor's loss of productivity, and developed an assessment of compensable damages. Also provided expert testimony (at deposition) on behalf of the contractor relative to the analyses performed and related findings and opinions. | Texas                   |
| Chemical Plant         | On behalf of the owner, reviewed a claim involving disputed change orders and extra work by a contractor against a chemical company of an EVS/ CVS upgrade project.  | Texas                   |
| Chemical Plant         | Provided a claims prevention training seminar for a chemical company and its EPCM contractor on a \$800 million methanol project   | Texas                   |
| Chemical Plant         | On behalf of the owner, performed a schedule quality assurance review of the EPCM contractor's EPC schedule on a new methanol plant.   | Texas                   |



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| Chemical Plant            | Reviewed change orders, schedule delays, and pending disputes between a major U.S. chemical company and its mechanical contractor on a methanol plant in Texas. Advised client as to its exposure regarding the technical issues involved in these issues for purpose of settlement negotiations.  | Texas                   |
| Chemical Plant            | Prepared an Extension of Time Claim for a Japanese contractor related to the construction of civil, structural, and building design and construction work related to a chemical plant project in the United Kingdom. The contractor's execution of the work was impacted by late access to the site, additional work, and changed work.  | United Kingdom          |
| Chemical Plant            | Provided Claims Prevention Training Seminar for Project Management and Contract Administration Personnel of a major U.S. chemical company on new boiler addition to an existing chemical plant. Reviewed contract and procedures proposed to be used for the project and recommended clauses to resolve potential inconsistencies, ambiguities, and conflicts. Prepared clauses for cost and schedule control procedures.  | Virginia                |
| Chemical Plant            | Retained by the owner of a surfactants expansion project to defend a claim by the electrical contractor for increased costs and loss of productivity. Evaluated standard of care, schedule, causation, labor productivity (including loss productivity due to changes), and damages.   | West Virginia           |
| Chemical Storage Facility | On behalf of the operator of a chemical storage facility, evaluated a claim associated with delays and cost overruns caused by scope changes and hurricane impacts. Operator alleged that the cost of the facility significantly increased as a result of owner-caused changes and impacts from Hurricanes Katrina and Rita, and that the owner agreed to compensate the operator for the Hurricane impacts. The owner alleged that the operator mismanaged the project, and that the delays and cost increases were primarily caused by other problems not related to the hurricanes. | Louisiana               |

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| Petrochemical Plant    | On behalf of the owner, performed an analysis of a contractor's \$11 million claim involving disputed change order work, loss of productivity, late materials deliveries, and other delay events on a new petrochemical plant project. Issues involved customs clearance delays and inadequate project management by the contractor.                  | Angola                  |
| Petrochemical Plant    | On behalf of the owner, performed an analysis of delays, acceleration, change orders, unit rate, and loss of productivity claims totaling \$20 million by a major U.S. engineering contractor and counterclaims by a major U.S. chemical company on an ethylene plant project.  | Argentina               |
| Petrochemical Plant    | On behalf of the owner, performed an analysis of a contractor's delay and loss of productivity claim on the design and construction of a polypropylene project.   | Argentina               |
| Petrochemical Plant    | On behalf of the insurance company, performed an analysis and prepared an Expert Report/testimony regarding an owner's alleged business interruption loss due to an unplanned shutdown of an MTBE plant in Alberta.   | Canada                  |
| Petrochemical Plant    | On behalf of the EPC contractor, performed an analysis of change order, delay, and loss of productivity claims on a linear alpha olefin (LAO) Project.  | Canada                  |
| Petrochemical Plant    | On behalf of the insurance company, performed an analysis of a \$50 million loss for property damage and business interruption resulting from cracking to a reactor vessel at a glycol process plant facility in Alberta. Prepared deposition questions and assisted loss adjusters and counsel for the underwriters with cost and schedule analyses. | Canada                  |
| Petrochemical Plant    | On behalf of the owner, performed an analysis of delay and disruption claims on the engineering, procurement, and construction of an ethylene cracker project.  | Netherlands             |

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| Petrochemical Plant | Reviewed the owner's contract for the engineering, procurement, and construction of a polyethylene plant. Recommended clauses to resolve potential inconsistencies, ambiguities, and conflicts. Prepared clauses for cost and schedule control procedures. Recommended changes to project management, scheduling, and project controls provisions to improve the owner's visibility into the progress reporting on the project. | Netherlands      |
| Petrochemical Plant | On behalf of the EPC contractor, performed an analysis of delays and time extension entitlement on a \$75 million claim by the mechanical subcontractor involving the procurement materials and installation of process plant equipment and piping on a major petrochemical plant.  | Texas            |
| Petrochemical Plant | On behalf of the owner, performed an analysis of a \$500 million property damage and business interruption claim resulting from fire damage to a petrochemical plant. Costs estimates for the property damage claim and schedule analyses were prepared considering acceleration, betterments, upgrades, and non-rebuilt facilities.  | Texas            |
| Petrochemical Plant | On behalf of a major international chemical company, analyzed its contract documents and specifications for engineering, procurement, and construction of chemical plants worldwide. Recommended clauses to resolve the potential inconsistencies, ambiguities, and conflicts. Prepared clauses for the cost and schedule control procedures. Provided a Claims Prevention Seminar.   | Texas            |
| Petrochemical Plant | On behalf of the owner of a large petrochemical plant project in Trinidad, evaluated numerous claims totaling US\$230 million involving delays, and cumulative impact to the project as well as whether the project achieved mechanical completion.   | Trinidad         |
| Petrochemical Plant | On behalf of the EPC contractor, performed an analysis of delay and acceleration claims on the engineering, procurement, and construction of an ammonia plant project.  | Trinidad         |
| Petrochemical Plant | Provided Claims Prevention Training Seminar for owners and contractors in Trinidad.   | Trinidad         |



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| Refinery               | On behalf of the owner, performed an analysis of a large engineering and construction firm's claims for cost overruns and delays associated with the lump sum construction of hydrocarbon production and process modules for the Kuparuk project.   | Alaska                  |
| Refinery               | On behalf of a European/Japanese joint venture EPC firm, evaluated a \$75 million claim on a refinery upgrade project. Assessed the technical entitlement of over 100 change orders forming the basis of the claims as well as the schedule analysis to demonstrate entitlement to an extension of time and delay damages. Evaluated the contractor's methodology for performing its schedule delay analysis and quantum calculations, and its loss of productivity analysis for proof of damages for labor cost overruns.  | Belgium                 |
| Refinery               | On behalf of the EPC contractor, performed claims analysis, damages assessment, and delay evaluations on a \$250 million refinery expansion project involving \$20 million in damages. The primary issues included bid error, loss of labor productivity, delay and acceleration.   | California              |
| Refinery               | Performed an analysis of the expediting costs associated with the \$320 million rebuild of a refinery in Alberta following a fire. This work was performed in support of the insurance company's interest on a property damage claim filed by the owner of the refinery. Analyzed the trade-offs of increased time-related costs that would have been incurred had the work not been expedited compared to the increased costs as a result of a fast track schedule. The results of the various scenarios were evaluated using Monte Carlo calculations to derive a probabilistic determination of the range of costs as a function of the variables involved in the analyses. Analyses contributed to a successful settlement between the insurance carrier and the owner. | Canada                  |
| Refinery               | Analyzed damages for the owner defending numerous change order claims on an international oil refinery upgrade project. Provided critical assessments of the contractor's pricing of its change order estimates.  | Canada                  |

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| Refinery               | On behalf of the owner, prepared an Expert Report defending against a contractor's claim associated with disputed change orders, delay, and loss of productivity on a new refinery debutanizer unit.   | Colorado                |
| Refinery               | Served as Tribunal Appointed Experts for technical and schedule delay issues associated with a €18 million claim and a €145 million counterclaim on a major oil refinery upgrading and expansion project in Europe. The disputes were being resolved in ICC arbitration proceedings. Prepared Expert Reports and testified before the Tribunal.  | Greece                  |
| Refinery               | On behalf of the EPC contractor, performed an analysis of an owner's \$19 million claim firm relative to home office and field cost budget overruns under a reimbursable contract for a \$200 million refinery project.  | Illinois                |
| Refinery               | On behalf of the owner, reviewed CPM schedules submitted for arbitration to verify their authenticity for use in a delay analysis by opposing expert. Prepared examination questions for counsel to cross-examine opposing expert at arbitration regarding causes of delay to the reconstruction of a refinery that was damaged by a cyclone.  | India                   |
| Refinery               | Prepared an expert report for an ICC arbitration in London concerning a refinery project in Iraq. Prepared analyses and provided opinions regarding the delays that occurred during the project and the parties responsible for the project delays. Prepared analyses and provided opinions concerning the validity of the costs the Contractor incurred as a result of terminating its subcontracts and executing new subcontracts with replacement subcontractors. | Iraq                    |
| Refinery               | Reviewed and critiqued contractor-prepared change requests, prepared a preliminary evaluation of the contractor's costs to date, and performed a detailed "but-for" analysis of the project schedule to establish a reasonable completion (absent supplier-caused delays) for the \$1.6 billion expansion of a refinery.   | Mexico                  |

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| Refinery               | Provided technical and project management consulting advice to the Project Management Consultant who represented the owner of a refinery in Russia that was undergoing a revamp. Additional advice included the identification of key performance indicators and EPC contracting issues.   | Russia                  |
| Refinery               | On behalf of the manufacturer, performed an analysis and an Expert Report regarding design defects that allegedly caused a failure of welds attaching the diplegs to the cyclone body in an FCC regenerator.   | Texas                   |
| Refinery               | On behalf of the EPC contractor, performed an analysis of change order, delay and disruption claims involving a ultra low-sulfur diesel Unicracker project at a refinery.  | Texas                   |
| Refinery               | On behalf of the owner, evaluated a claim for the recovery of costs, lost profits, and other asserted monetary damages allegedly incurred from furnishing ash materials to a major refinery expansion in Texas. Prepared an Expert Report and testified in deposition, which led to a successful settlement of the dispute.  | Texas                   |
| Refinery               | On behalf of the manufacturer of the pressure vessels, performed an analysis of the scheduling issues, delay claims, and damages incurred by the contractor on an oil refinery project. Evaluated the contractor's failure to properly/fully compensate the pressure vessel manufacturer for two pressure vessels that were fabricated and supplied to the project. Also evaluated the contractor's disruption claims and the contractor's performance and productivity and its claim for the repair of alleged faulty work related to the internals of the pressure vessels that were provided by our client. | Texas                   |
| Refinery               | On behalf of the owner, performed an analysis of a major international contractor's \$22 million delay and disruption claim on a \$100 million refinery upgrade project involving new hydrotreater and sulfur recovery units. Prepared a detailed schedule delay analysis, damage analysis, and provided mediation testimony which resulted in a successful settlement of the dispute.   | Trinidad                |

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| Refinery               | On behalf of the owner, performed an analysis of a Canadian contractor's \$25 million delay and disruption claim against the owner of a refinery. The venue was international arbitration under Uncitral arbitration rules. The contractor's scope of work involved the construction of a new visbreaker unit, modernization of instrumentation facilities, and a revamp of a fluid catalytic cracker oil upgrading process unit. This project involved the organization of thousands of documents and assessments of alleged delays and disruption impacts identified in change orders, correspondence, meeting minutes, disruption notices, monthly progress reports, and CPM updates. The scope of work also included a detailed CPM schedule analysis and the quantification of damages. Prepared an Expert Report in international arbitration prior to settlement of the dispute.  | Trinidad                |
| Refinery               | Performed schedule delay and change order analysis in support of an owner's defense of a \$10.5 million claim on upgrades to piping, boiler and flare facilities in a major international oil refinery.  | Trinidad                |
| Refinery               | Performed an analysis of various contractor's delay and change order claims on behalf of the owner on a major Gasoline Optimisation Project, including modifications to an existing FCCU unit, a new alky-acid unit, an isomerization unit, a new heavy naphtha hydrotreater and continuous catalytic regeneration platformer unit, and offsites facilities modifications. Claim evaluations included an assessment of the integrity of the contractor's baseline and schedule updates, preparing alternative impact analysis of delays allegedly caused by scope changes as well as concurrent delays caused by the contractor, reviewing cost support for the change order amounts, recalculation of time-related costs based on delay analyses, determination of damages based on assessment of contractual entitlements under the terms of the contract, and participation during negotiations to achieve settlement of the change order claims. | Trinidad                |
| Refinery               | On behalf of the contractor, performed an analysis of a contractor's pipe fabrication loss of productivity claim on a project involving the upgrade to an existing refinery.   | U.S. Virgin Islands     |



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| Refinery               | Evaluated a contractor's delay and disruption claim against a major equipment supplier including a review and analysis of the as-planned and as-built schedules, preparation of a retrospective "but-for" analysis of the project schedule, and an assessment of damages relative to the expansion of a refinery.  | United Arab Emirates    |
| Refinery               | Acted as the Project Management Advisor for FEED execution of a refinery hazardous waste facility and preparation of EPC contract documents.   | United Arab Emirates    |
| Refinery               | Prepared a mechanical contractor's \$20 million claim for delay, additional work, labor disputes, and loss of productivity regarding a \$790 million delayed coker project at the Cerro Negro oil upgrading project. Assisted counsel in the preparation of its briefs and document discovery requests, and prepared an Expert Report which was intended for witness testimony at ICC arbitration hearings in Geneva, Switzerland; however, the case settled before the hearing was conducted. | Venezuela               |
| Refinery               | On behalf of the EPC contractor, evaluated the causes of cost overruns that it incurred during a project to upgrade the coker in a refinery. Although the work was performed under a reimbursable contract, the owner decided to not pay part of the costs due to an alleged agreement to cap the Project Management costs and Fee.  | Wyoming                 |

*The projects listed above were performed by our consultants in a lead/key expert role for Long International or for other consulting firms.*