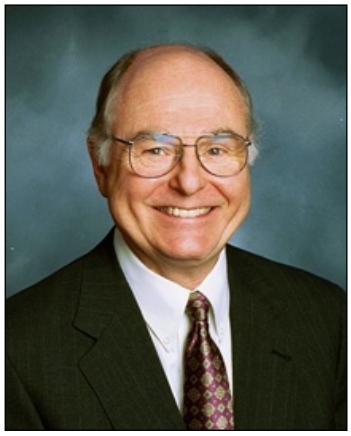
LONG INTERNATIONAL

KEITH D. HORNBACHER, M.B.A.



Mr. Hornbacher is a Principal Consultant with Long International and a Schedule and Cost Risk Analyst affiliated with Hulett & Associates, LLC. For over 30 years, Mr. Hornbacher has implemented quantitative schedule, cost, and integrated cost-schedule risk analysis, while ensuring project scheduling best practices are in place. He has conducted many risk analyses to quantify risks and evaluate their implications for project cost and schedule. In the process, he has performed many schedule assessments. He has experience applying Risk Drivers to large, multi-year projects leading to proactive risk mitigation planning for better project results. The client learns from these analyses: the probability of achieving cost and schedule objectives with existing project plans; the amount of time and cost contingency required for a desired level of confidence; which risks drove results; and the priority of response actions to address risks.

As a senior third-party risk analysis and planning specialist, Mr. Hornbacher has held project risk management and controls positions during the extension and expansion of Northern Border Pipeline Company's natural gas transportation system. For Raytheon, an aerospace and defense company, he performed as the Program Risk Manager on the U.S. FAA's Wide Area Augmentation System (WAAS), a NextGen air traffic management system. In addition to his role as a senior consultant, Mr. Hornbacher is starting his fifteenth year as Affiliated Faculty in Organizational Dynamics Graduate Studies at the University of Pennsylvania, where he presents seminars and clinics on managing project risk, uncertainty, and the unexpected. Graduate students learn how to utilize best-in-class quantitative risk analysis tools and methods in his clinics.

EDUCATION

M.B.A., Minnesota State University, 1982
B.S., Iowa State University, 1963

PROFESSIONAL AFFILIATIONS

Association for Advancement of Cost Engineering (AACE) International, member, contributor, and author

University of Pennsylvania, School of Arts and Sciences, Organizational Dynamics Graduate Studies, recently Affiliated Faculty

Geisinger Commonwealth School of Medicine, Adjunct Assistant Professor in Graduate Studies

Project Management Institute (PMI), member, contributor, leadership, and presenter roles

American Society for Quality (ASQ), contributor and presenter

Institute of Industrial and Systems Engineers (IISE), Life Member

Institute of Electrical and Electronics Engineers (IEEE), presenter and workshop contributor

International Cost Estimating and Analysis Association (ICEAA), member and workshop presenter

International Council on Systems Engineering (INCOSE), Past Director–Northstar Chapter, presenter

International Council on Systems Engineering (INCOSE)

TECHNICAL EXPERIENCE

Representative cost and schedule risk analysis experience includes:

- Understanding a project's objectives, parameters, stakeholders, and environment in which it is conducted.
- Verifying that a project schedule is consistent with industry-accepted best scheduling practices to prepare the task/activity logic network for Monte Carlo simulation.
- In large complex projects, coordinating teams of analysts to develop interfaced risk models.
- Interviewing project team members and other knowledgeable Subject Matter Experts (SMEs) to develop risk information. Characterizing root causes of risks described in the Risk Register by quantifying their probabilities of occurrence and ranges of impacts on durations, resources, and costs if they occur. Identifying activities that would be impacted by each risk (for example, by WBS or project phase, such as engineering, procurement, construction, and commissioning). In the same manner, identifying root causes of risks that do not yet exist in the Risk Register and characterizing their probability, impact, and the activities on which they would operate.
- Modeling risks' implications for project schedule and cost. Using modern Monte Carlo simulation software to derive integrated cost-schedule results and illustrate the team's confidence in the current plan's ability to finish on time and on budget. Facilitating risk mitigation workshops with project team members to develop a strategy that improves the project's prospects for achieving objective dates and cost at completion. Simulating the post-mitigation scenario to estimate how much contingency cost and time are needed to achieve a desired level of certainty, thereby assessing the team's recommendations.

PROJECT EXPERIENCE

Mr. Hornbacher has conducted cost and schedule risk analyses of many projects for clients in the industrial, commercial, and government sectors. He assisted the owners of a major offshore oil platform as they evaluated development options leading to a decision to proceed. He has worked with senior stakeholders in energy companies and performed risk analyses of proposed capital expansion projects. Representative projects include the following experience.

Industrial Plant Construction

- Schedule-cost risk analysis of a proposal to construct a natural-gas-based direct reduction plant to produce Hot Briquetted Iron (HBI), a high-grade feedstock for production of high-quality steel grades. Challenges included critically sequenced arrivals of procured materials and equipment to be installed as the tower was erected. Coordination of heavy lifts in tightly constrained spaces with trade resources working concurrently presented additional threats to cost and schedule.

Water Filtration Project

- Schedule and cost risk analysis of a multi-year, $1.5 billion water filtration and pipelines program to transport and purify water for a major metropolitan city. Conducted multiple risk workshops and interviews of multiple contractors, city water bureau engineers, and cross function teams. Assembled and modeled programs and sub-projects with their risks. Presented findings, recommendations, and narrative reports with exhibits illustrating before and after mitigation estimates of program contingencies. Prioritized risks for action and managed their work.

Offshore Oil Production Platform

- Cost-schedule risk analyses for the Hibernia owners' consortium. The analysis included modeling design, procurement, fabrication, mating of the topsides' five super modules with its Gravity Based

Structure (GBS), tow-out, hookup, commissioning, and RFO. Transportation and logistics models of weather-sensitive shipping routes drove portions of the cost/resource/schedule analysis to recommend alternatives from among several candidate fab sites. Mitigation plans were developed by team members, tested in the risk model, and presented to executives for strategic decisions.

Pipeline System Projects

- Schedule-cost risk analysis of a natural gas pipeline extension/expansion for Northern Border Pipeline Company. The U.S. pipeline system extends from Montana to Chicago, Illinois. Challenges included procurement and transportation of pipe from multiple mills and the performance of numerous Horizontal Directional Drills (HDD) under environmentally sensitive water bodies, rivers, and streams.
- Cost-schedule risk analyses for presentation to the board of directors of a major energy transportation company. Analyses included comparisons among alternative and competing plans to develop pipeline systems across mountainous terrain and through congested cities that traversed environmentally contaminated sites.

Complex Government Projects

- Cost-schedule risk analysis of the construction of the U.S. Capitol Visitor Center in Washington, D.C., for the U.S. Government Accountability Office (GAO). Challenges included multiple prime contractors and construction linked to many historic and operating federal buildings, including the Capitol building. Analyses supported testimony to Congress.
- Schedule risk analysis of the U.S. NASA James Webb Space Telescope mission. Challenges included complex schedules of design, procurement, fabrication, integration, and testing of major modules and coordinating multiple contractors at various locations to provide new scientific instruments.
- Schedule risk analysis for the U.S. GAO of the remediation of a Department of Energy (DOE) radioactive waste site located in Hanford, Washington. Audits of contractors' documentation and methods were performed on site and included review of government oversight performance.

PROFESSIONAL EXPERIENCE

Long International, Inc., and Hulett & Associates, LLC
St. Paul, Minnesota (November 2013 to Present)

Mr. Hornbacher is a Principal Consultant with Long International and a Schedule and Cost Risk Analysis Partner affiliated with Hulett & Associates, LLC. Mr. Hornbacher has focused for the last 15 years on quantitative schedule risk analysis, integrated cost-schedule risk analysis, and project scheduling best practices. He consults for many clients and has trained client teams in their organizations as well as conducted public courses in risk and scheduling.

Hornbacher Associates
St. Paul, Minnesota (1993 to Present)

Mr. Hornbacher is the Principal Consultant of Hornbacher Associates and is committed to enabling effective project risk management through consultation, practice, research, and education. For over three decades, his project experience has spanned a wide range, from structurally complex, multibillion-dollar programs to small, innovative product development projects. His experience includes work in diverse industries including construction, energy, aerospace, defense, transportation, software intensive systems, pharmaceuticals, large science, medical technology, and healthcare.

University of Pennsylvania
Philadelphia, Pennsylvania (2004 to Present)

Mr. Hornbacher is an active member of the Affiliated Faculty, Organizational Dynamics Graduate Studies, School of Arts and Sciences, at the University of Pennsylvania, where he develops and delivers graduate courses and clinics using a seminar format with students who are mid- to senior-level professionals. In 2015, he entered his tenth year as a Penn educator. His core course, "Project/Operational Risk, Uncertainty, and the Unexpected," has been delivered to several hundred students. In 2015, he introduced the workshop "Consulting: Quantitative Project Risk Analysis Tools and Methods." In a collateral role, he is a faculty advisor to students writing their theses leading to an M.S. in Organizational Dynamics.

Log/an, Inc.
Los Angeles, California (1985 to 1993)

Mr. Hornbacher was Vice President and Managing Consultant in the specialized consulting firm Log/an, Inc., with headquarters in Westwood, California, a suburb of Los Angeles. That firm had the distinction of developing early state-of-the-art Monte Carlo methods and software. Its quantitative risk analysis modeling tool was branded as *Monte Carlo™ for Primavera* when acquired by Primavera Systems (now Oracle Primavera). During his tenure with Log/an, Mr. Hornbacher fielded and further developed the software and methods in numerous assignments. He led teams of analysts, coordinated the work of geographically dispersed assets, and conducted cost-schedule risk analyses of complex programs/projects.

Red Owl Stores, Inc.
Minneapolis, Minnesota (1971 to 1985)

As the Transportation Manager of Red Owl Stores, Inc., a $1 billion grocery company, Mr. Hornbacher managed a $10 million annual budget with assets including 120 drivers and mechanics operating 75 tractors and 300 trailers in a five-state region. He was previously the manager of special projects, reporting to the Executive Vice President/CFO, and was a senior industrial engineer. Earlier, while working in a subsidiary, Snyder Drug Stores, Inc., Mr. Hornbacher was a distribution center operations supervisor. He started on the operational front lines and learned all aspects of that business "hands on."

Northwest Airlines, Inc. (now Delta Airlines)
Minneapolis, Minnesota (1969 to 1970)

Mr. Hornbacher started flying as a commercial pilot, second officer, and flight engineer following his discharge from active duty in the U.S. Marine Corps. He flew the B-727 and B-707 aircraft before being furloughed during labor disputes.

U.S. Marine Corps
United States and Foreign Service (1963 to 1969)

Captain Hornbacher was a pilot and instructor in the Grumman A-6 Intruder all-weather attack jet and the TC-4C Gulfstream I training aircraft. His combat service included a tour in Vietnam, where he was awarded the Distinguished Flying Cross (DFC). He held a Top Secret security clearance and was an air intelligence officer and maintenance test pilot. He was honorably discharged.

PUBLICATIONS AND SPEAKING ENGAGEMENTS

"Choosing Between Strategic Alternatives Using Risk Analysis in Decision Modeling," Association for Advancement of Cost Engineering (AACE) International Conference, July 2022; Recommended Procedure in review for publishing, 2023.

"Program/Project Risk Management: Quantitative Risk Analysis," INCOSE Tutorial, Minneapolis, MN, 2013.

"Integrated Cost-Schedule Risk Analysis Using Risk Drivers and Prioritizing Risks," Integrated Program Management Conference, Bethesda, MD, 2012.

"Systems Engineering in Project Management: Coping with Multibillion-Dollar Uncertainty and Risk," Norfolk, VA, 2011.

"Current Trends in Project Risk Management Practices," Project Management Institute, St. Paul, MN, 2010.

"Risk Driver Approach Prioritizing Project Risks," Evaluating Risk Responses Conference, Jersey City, NJ, 2008.