



Edward W. Merrow, Founder and President

Ed Merrow, Founder and President of Independent Project Analysis, Inc. (IPA), is highly recognized as a subject matter expert in the execution of large and complex megaprojects and capital projects in general. Ed's broad knowledge of capital projects is sought out by Fortune 100 company executives and professionals worldwide. His expertise in megaprojects is built on decades of research on the unique challenges of these complex investments. With the recent surge in megaproject activity across the oil, minerals, and chemical industries in all parts of the world, Ed's studies are motivated by the need to understand the complex behaviors of megaprojects and to identify the drivers of megaproject success and failure.

Ed's years of analysis and research have culminated in the publication of his latest work, *Industrial Megaprojects—Concepts, Strategies, and Practices for Success* (Wiley, April 2011).

Ed has spent 38 years studying megaprojects at IPA and the Rand Corporation, analyzing the drivers of success and failure in capital projects, including very large, complex projects. These studies include, "Upstream Megaprojects Revisited: What's The Problem?" (2010); "Estimating Problems in Large and Complex Projects" (2009); "Success in Frontier Regions" (2004); "Contracts, Teams, and Success in Megaprojects" (2003); "Analysis of Upstream Megaprojects" (2002); "An Analysis of Cost Improvement in Chemical Process Technologies" (1989); "Understanding the Outcomes of Megaprojects: A Quantitative Analysis of Very Large Civilian Projects" (1988); "The Relative Cost Factor: A Method of Comparing Petroleum Refinery Investment" (1987); "Cost Growth in New Process Facilities" (1983); and "Constraints on the Commercialization of Oil Shale" (1978).

Ed received the 2007 Construction Industry Institute's highest honor, the Carroll H. Dunn Award of Excellence, and the 2001 Engineering and Construction Contracting (ECC) Division Award for Outstanding Contributions to the Industry.

Ed is often requested as a keynote speaker at major companies worldwide. In 2011, Ed delivered the opening keynote address at the Project Management Institute Southern Alberta Chapter (PMI-SAC) Professional Development Conference and the 25th International Project Management Association (IPMA) World Congress. Each keynote address highlighted the recent megaproject research findings detailed in Ed's book. Also in 2011, Ed presented "Oil Industry Megaprojects: Our Recent Track Record" at the 2011 Offshore Technology Conference (OTC). In 2009, he presented "Capital Construction in a Volatile Environment" at the National Petrochemical and Refiners Association (NPRA) International Petrochemical Conference. In 2007, Ed delivered keynote addresses at the meeting of the Project Management Institute—Arabian Gulf Chapter on megaproject opportunities in oil and gas, petrochemical, power generation, and infrastructure in Gulf countries. He also delivered "The Global Industry in Crisis" for the Construction Users Roundtable National Conference (CURT). In 2006, he delivered the keynote, "Megaprojects—A Global Perspective," at the Construction Owners Association of Alberta (COAA) Annual General Meeting.

Ed has served as a panelist, panel chairman, and contributor to *Chemical Engineering Progress*. He has testified before the United States Congress regarding cost overruns in major capital projects. He was a panel member for analysis of project risks at the National Academy of Sciences/National Academy of Engineering. He has also been a Distinguished Lecturer for the Society of Petroleum Engineers (SPE), and was chosen to instruct a course entitled "Special Considerations in Multi-Billion Dollar Projects" for the Construction Industry Institute's Executive Leadership Course at the McCombs School of Business, in Austin, Texas. Ed has published articles on megaprojects, capital project effectiveness, contracting strategies, and understanding project risk in journals, including *Petroleum Economist*, *Offshore*, *Upstream*, *Chemical Innovation*, and *Chemical Engineering*.

Professional Background

Independent Project Analysis, Inc. (IPA) is the leading benchmarking consulting firm that provides a unique project research capability for the process and extraction industries. IPA has one of the most extensive and detailed capital projects databases available, with information on more than 13,000 capital projects, including 300+ megaprojects, executed worldwide. IPA conducts extensive research studies to identify the drivers of capital project success and failure, and performs independent quantitative benchmarking analyses to support its clients' continuous efforts to improve their projects and project systems.

Before he established IPA, Ed spent 14 years with the Rand Corporation, where he developed and directed Rand's Energy Program and its Research Program for the Chemical Process Industries.

After receiving degrees from Dartmouth College and Princeton University, Ed was an Assistant Professor at the University of California (UCLA), where he taught mathematical economic modeling and industrial organization for 4 years.

IPA's Extensive Megaproject Database

Megaprojects are conventionally defined as projects that cost US\$1 billion-plus. However, that simple definition fails to capture what makes these projects special. Some \$1 billion projects, because of their location, technology, and organizational makeup, are relatively straightforward endeavors. Within IPA, a *megaproject* is defined as any project that can, by its size and character, disrupt or change its own project environment; that is, megaprojects frequently have a huge influence on their governmental regulatory systems, local labor markets, local political and social environments, financial environments, and/or physical and natural environments.

The projects in IPA's Megaprojects Database represent an average cost of \$2.6 billion in 2010 terms, with an average authorization year of 2004. Approximately 100 different owner companies are represented. Nearly 70 percent of the projects are joint ventures. Most projects are greenfield investments; a few are major expansions to an existing plant or field. These megaprojects represent oil and gas developments, petroleum refineries (grassroots and modernizations), chemical complexes, LNG, and minerals development. The megaprojects in the database were executed in locations around the world: North America, the Middle East, Europe, Asia, West Africa, South America, and Australia.

Alcan	ExxonMobil	Repsol	
Alcoa	Falconbridge	Santos	
ADNOC	Lukoil	Saudi Aramco	
BHP	Marathon	Sasol	
Borealis	Nexen	Shell	
BP	NOVA	Statoil	
Chevron	Chemicals	Syncrude	
Codelco	Pemex	Suncor	
Conoco Phillips	Petrobras	Unocal	
DOW Corning	PDVSA	Woodside	
Ecopetrol			

Examples of Owner Companies in IPA's Megaproject Database

Megaproject Geographical Distribution in IPA's Database

Data for these megaprojects are gathered through interviews with project teams as part of IPA's Project Evaluation System (PES®). These data are extensive and detailed. Each megaproject is characterized by over 3,000 project attributes, including technology, project scope, project management practices (e.g., contracting strategies and team integration), estimated and actual cost, planned and actual schedule duration, level of project definition completed, use of Value Improving Practices, risk mitigation techniques, safety data, and operational/production attainment performance.

IPA's ongoing megaproject research, led by Ed Merrow, is motivated not only because of the increasing frequency of megaprojects across the oil, minerals, and chemical industries, but also because megaprojects have an alarmingly high failure rate. The most important single insight into megaprojects is that they are much more fragile than is commonly believed. Seemingly small mistakes, especially in the pre-authorization work, can generate a cascade of failure in execution. Ed's extensive analysis into the complexities and behaviors of megaprojects has generated key findings on the fundamental drivers and strategies that contribute to the success of these unique and fragile projects.

IPA World Offices

IPA has seven offices worldwide. IPA's corporate headquarters is located in Ashburn, Virginia, USA. For more information about IPA please visit our website at www.IPAGlobal.com or call any of our offices.

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