

The Seven Deadly Mistakes in Industrial Megaprojects

Meet Alaska 2012

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Our Vantage Point on the Industry

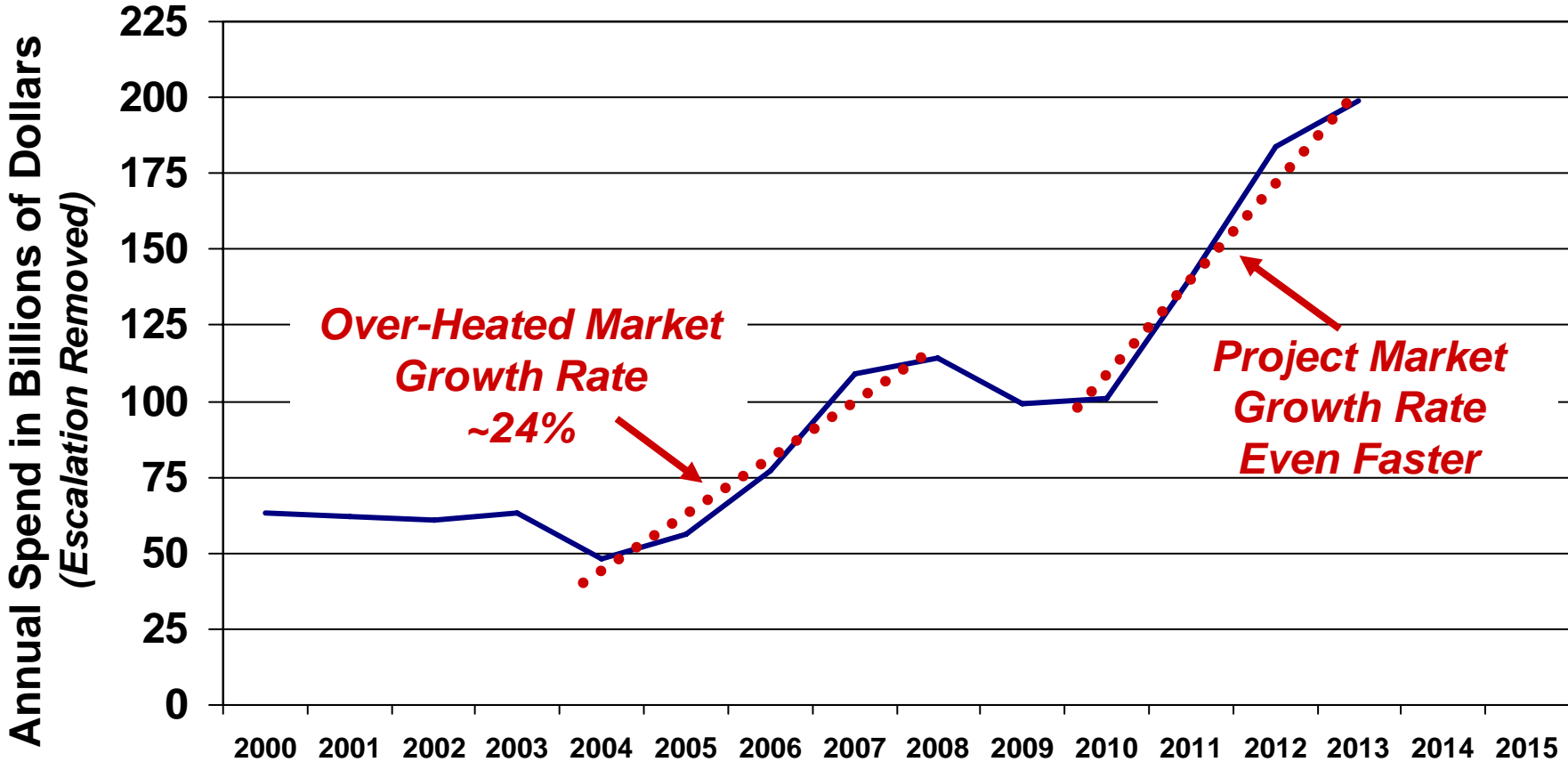
- **Independent Project Analysis evaluates industrial projects, large and small, around the world**
 - **Are the projects ready to proceed to the next phase?**
 - **Are the projects set up to succeed (or fail)**
 - **At the end, did the projects accomplish their goals?**
- **In a typical year, 600-700 new projects are added to our databases**
- **About 10 percent of these projects fall into the very large category—over \$1 billion in capital**
- **Projects in the \$5-\$10 billion range are now common and 5 projects over \$40 billion are headed for authorization**



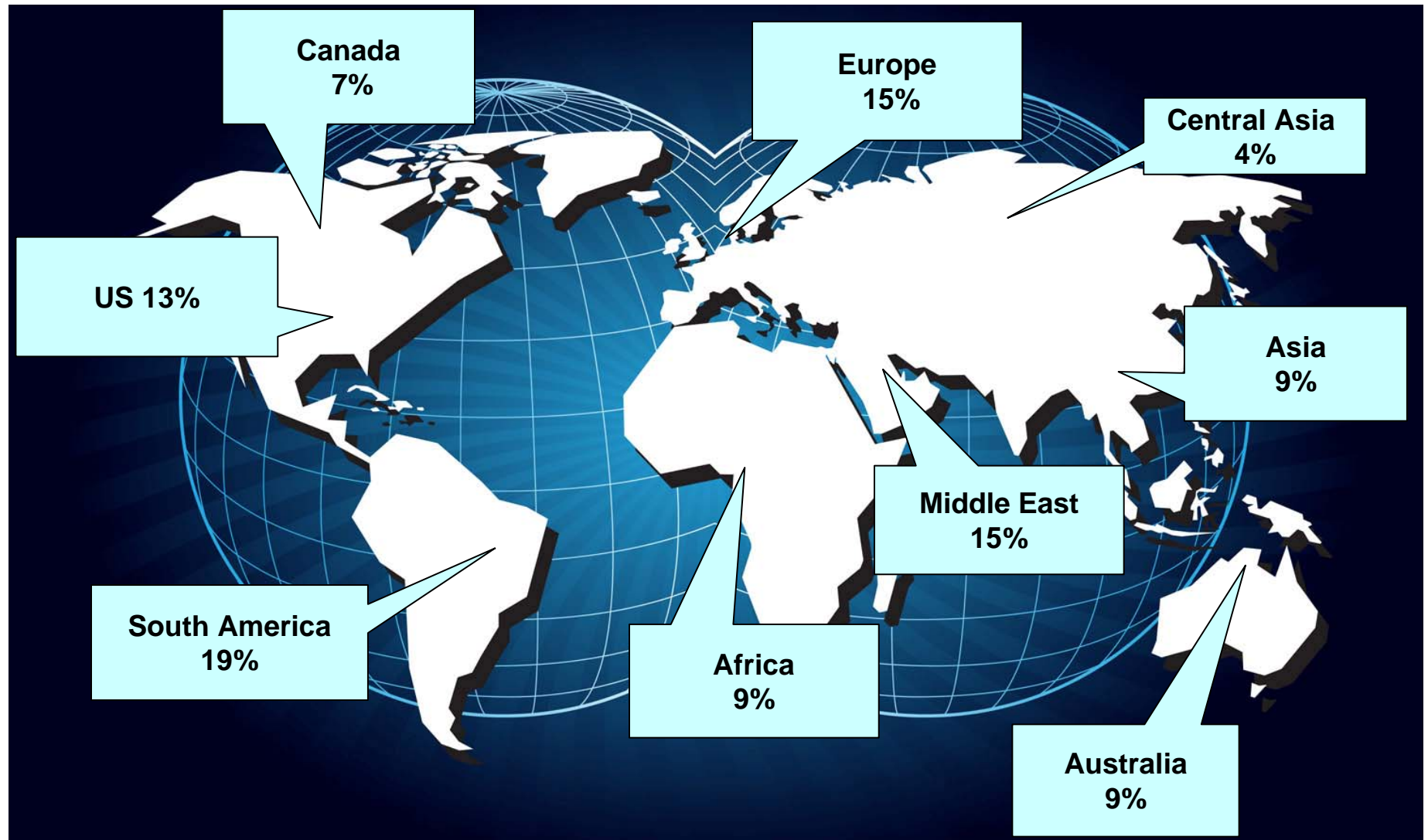
Industrial Megaprojects

- **Megaprojects executed by the petroleum, minerals, chemicals, and power industries are now shaping the economic landscape around the world**
- **Easily accessed mineral resources close-to-market have largely been depleted**
- **Oil companies must venture into deep water and difficult environments because national resource holders control much of the easily-developed petroleum**
- **Chemical companies seeking low-cost feedstocks or fast-growing markets must exploit economies of scale to compete globally**
- **Extensive infrastructure development requires projects to be large enough to spread the infrastructure costs over a wide base of beneficial production to be economic**

IPA Forecast of Industrial Megaproject Activity, 2000 - 2015



Geographical Distribution of Megaprojects Evaluated





The Key Issues

- **Projects are getting larger and more complex everywhere in the world**
- **As we will see, large projects are failing much too often**
- **Do large projects fail more often simply because they are more difficult—or...**
- **Do we alter our practices?**
- **What do we need to do differently going forward?**



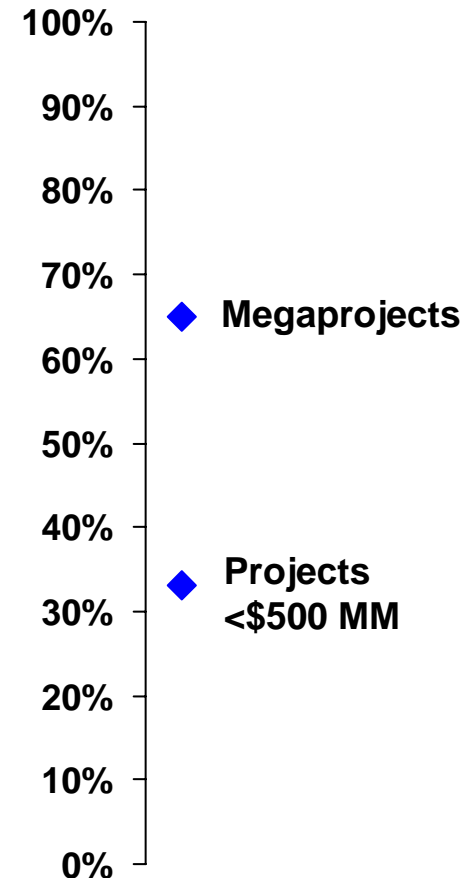
Defining Success and Failure

- We deem a project to be a failure if one or more of the following occurred:

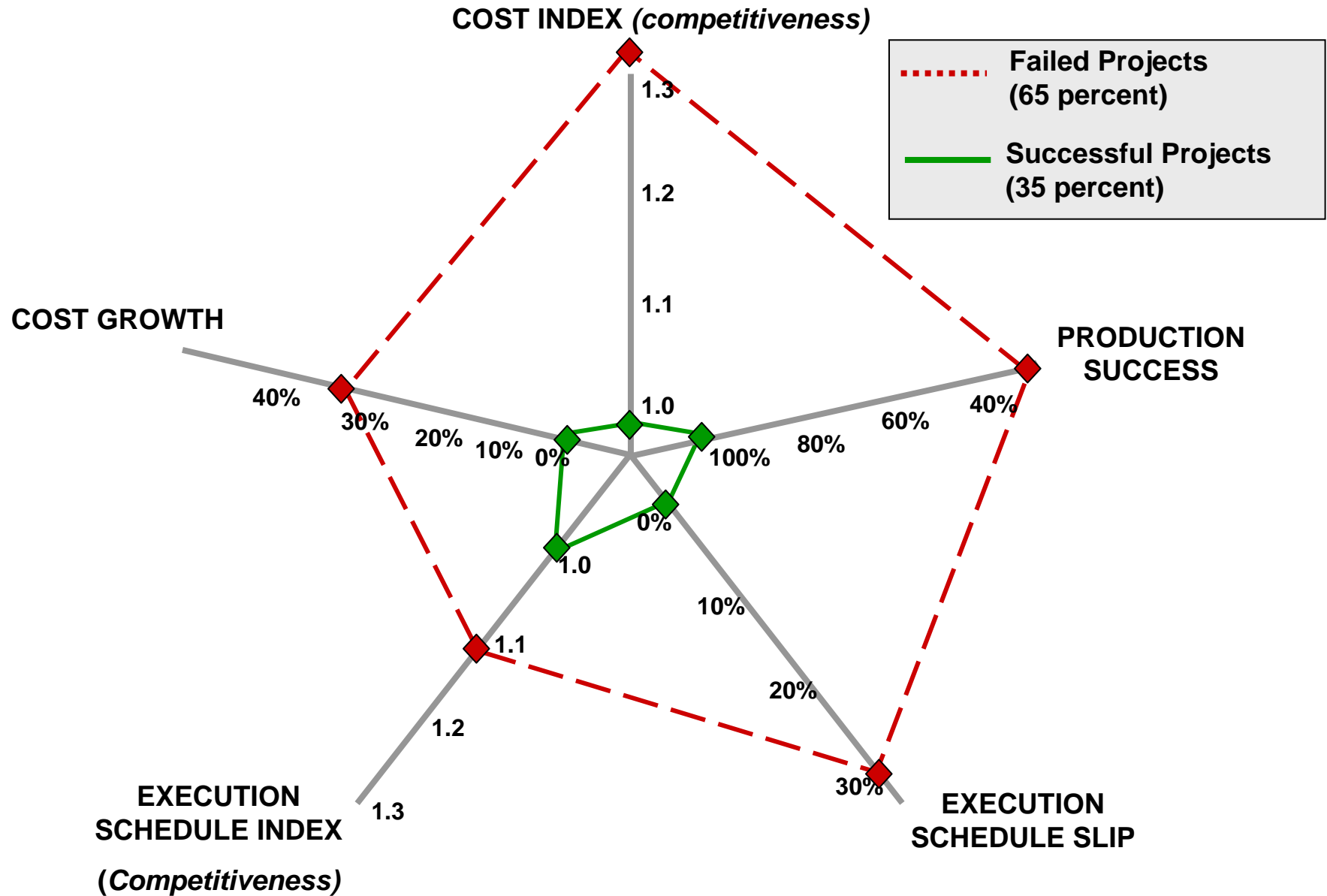
Costs grew (real)	25% +
Schedule Slipped	25% +
Overspent (<i>Absolute Measure</i>)	25% +
Severe and Continuing Operational Problems for 2 Years or more after startup	Yes

- About two-thirds of large projects failed by these criteria—twice the rate of smaller projects

Failure Rate



Megaprojects Split Into Radically Different Groups





Seven Deadly Mistakes in Industrial Megaprojects

- 1. I want to keep it all!**
- 2. I want it yesterday!**
- 3. We'll just work out the details of the deal later.**
- 4. Why do you want to spend so much up-front?**
- 5. Let's cut that cost estimate down!**
- 6. Let contractors the risk; they're doing the project!**
- 7. If the project manager overruns, fire the bastard!**



I Want to Keep it All!

- **Megaprojects affect many more people than just the investors**
- **All those affected by the project will want some say in how the project is organized and executed and especially in how the value of the project is allocated**
- **If these stakeholders—claimants on project value—are not satisfied that the allocation is fair, they disrupt the project and render it unmanageable**
- **Disruption kills megaprojects because they are inherently fragile; when they break they tend to shatter**



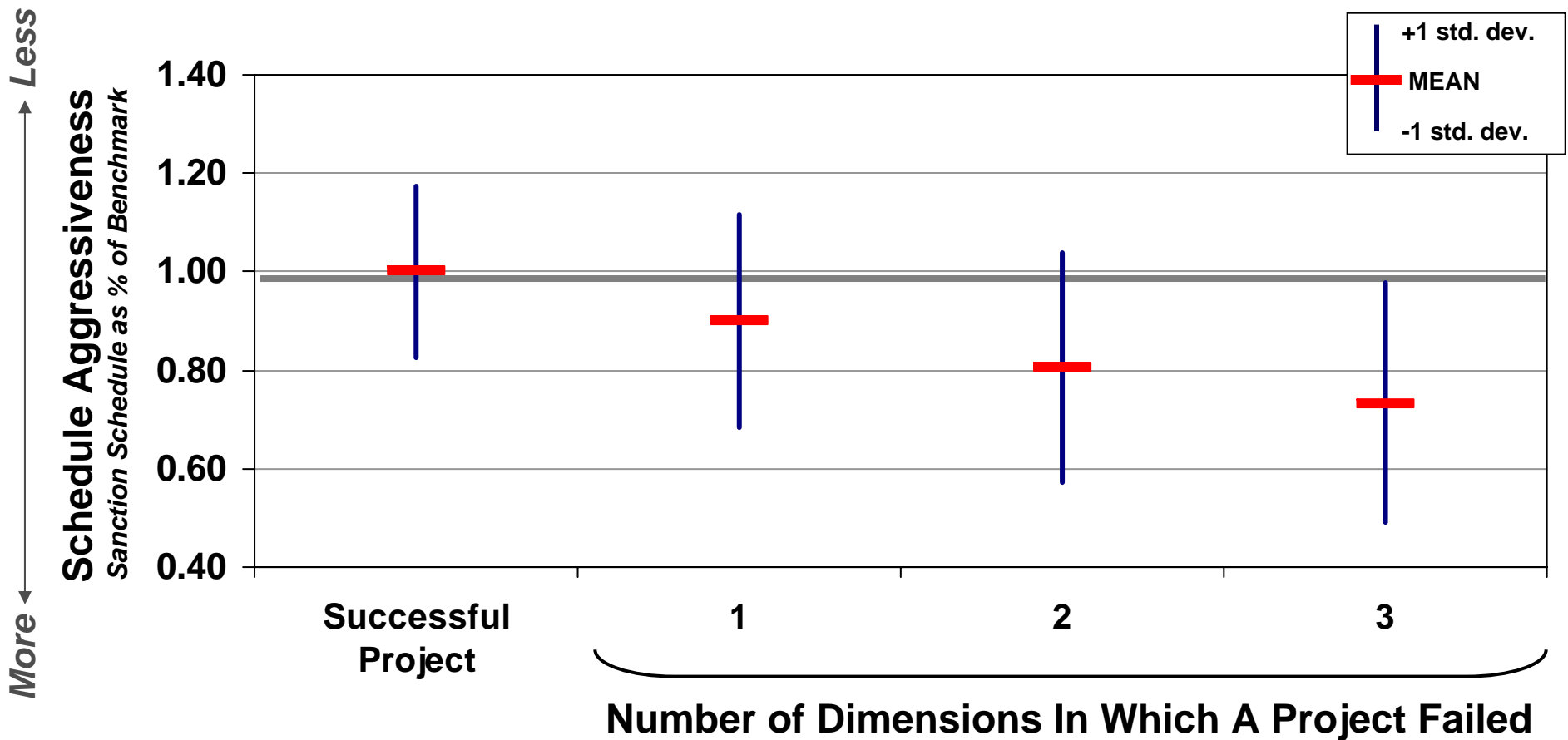
I Want it Yesterday! Speed Kills

- **The drive for speed, results in the projects outrunning:**
 - **Basic technical data development**
 - **Stakeholder alignment**
 - **Permitting requirements**
 - **Front-end loading development**
 - **Even the business deal**
- **Large projects are complex and tightly inter-connected**
 - **They cannot recover from cut-corners**
 - **There are no “work-around” strategies that actually work**

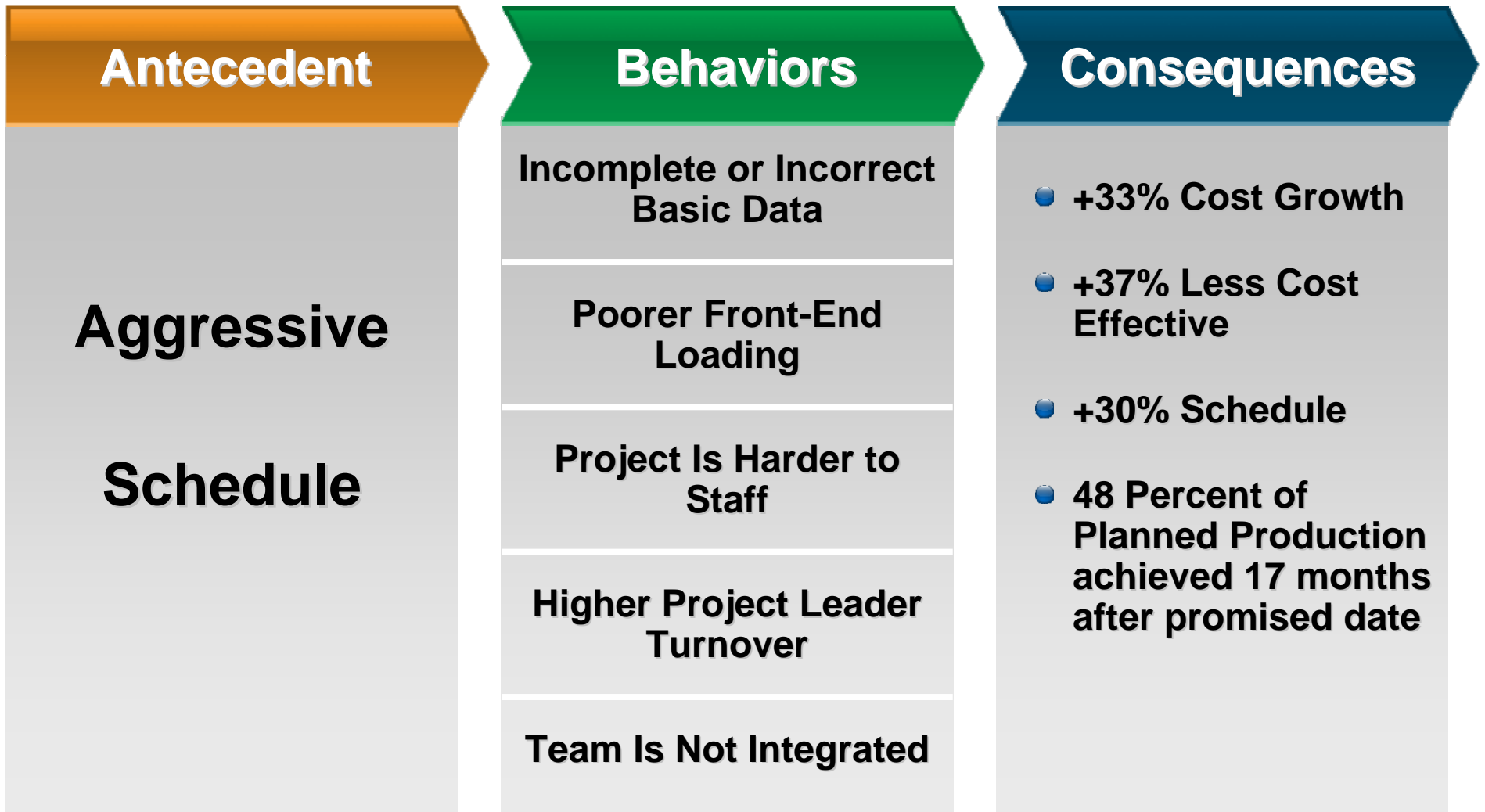
Speed Kills

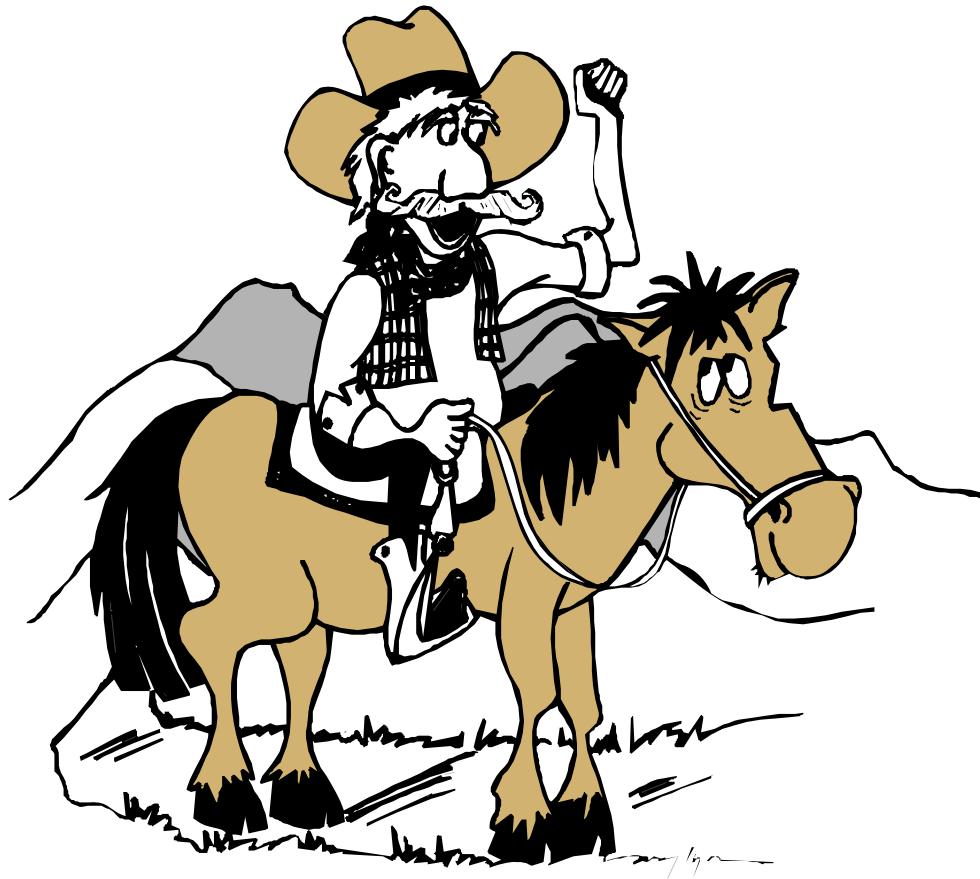
Dimensions of Failure

- High cost growth (25%+)
- Severe schedule slip (25%+)
- Large overspend (25%+)
- Production Failure (*first two years*)



The ABCs of Megaproject Failure





***Mamas, don't let your babies
grow up to be cowboys!***

Willie Nelson



“We’ll Work Out the Deal Later”

- **The contours of the business deal, especially between resource holders and project sponsors, must be worked out before the project scope is developed**
 - **Exactly how are we going to generate a large enough revenue stream to repay the investment plus some profit?**
 - **How is the cost/tax regime of the resource going to be adjusted to fit the economic realities?**
 - **How will downside risks be allocated?**
 - **How will any upside be divided?**
- **The deal must shape the project; the project cannot shape the deal!**

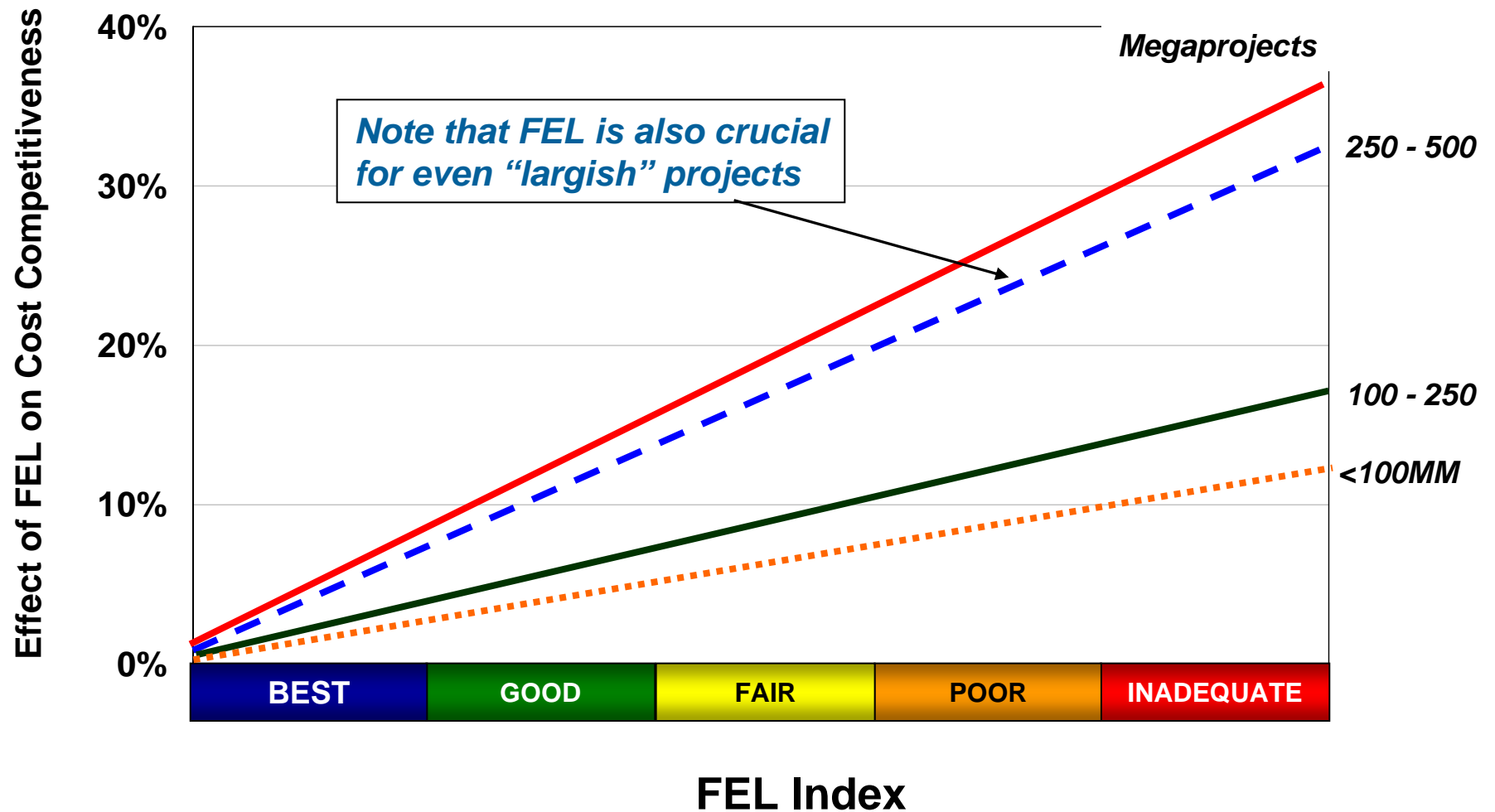


Why Do You Want to Load-up the Front-End?

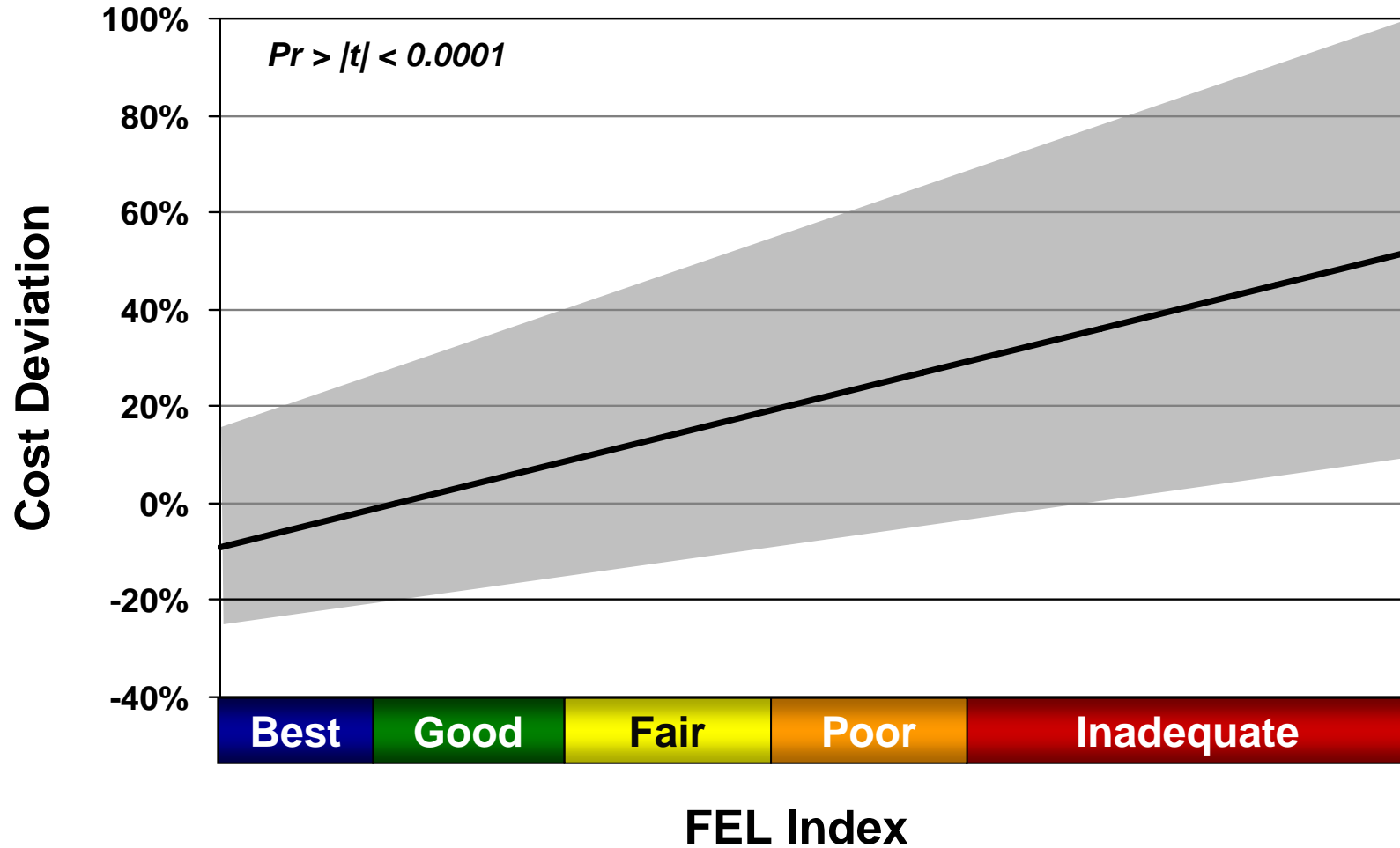
- The front-end of projects—before we authorize them—is the time for defining the scope and planning the execution in detail
- What is done (and not done) on the front-end has more bearing on megaproject outcomes than anything else
- But it's expensive—3 to 5 percent of eventual total cost—and people are often cheap in the name of being frugal
- Loading up the front-end is the best possible investment



FEL is Most Important for Megaprojects

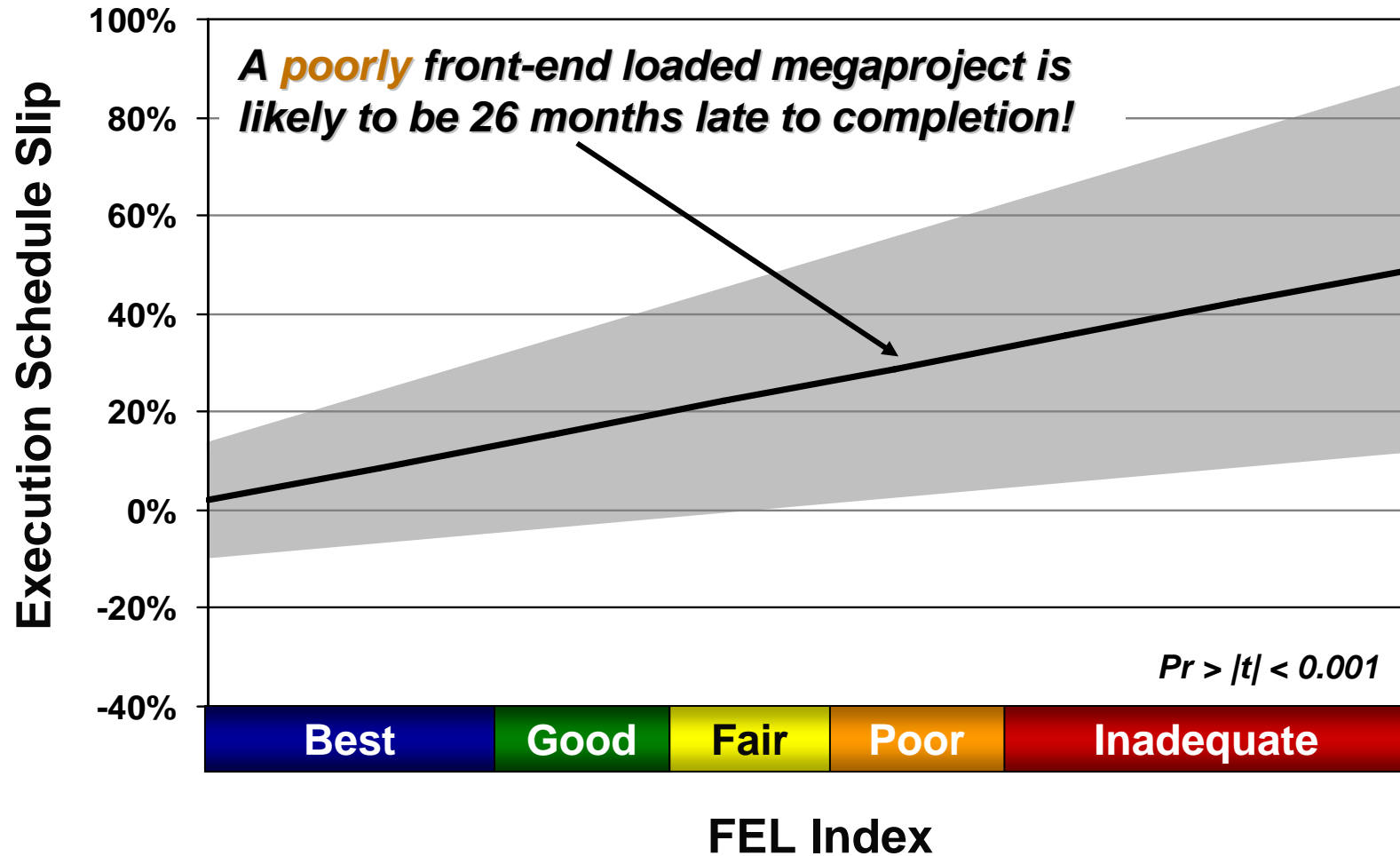


FEL Drives Cost Predictability



Shading represents ±1 standard deviation

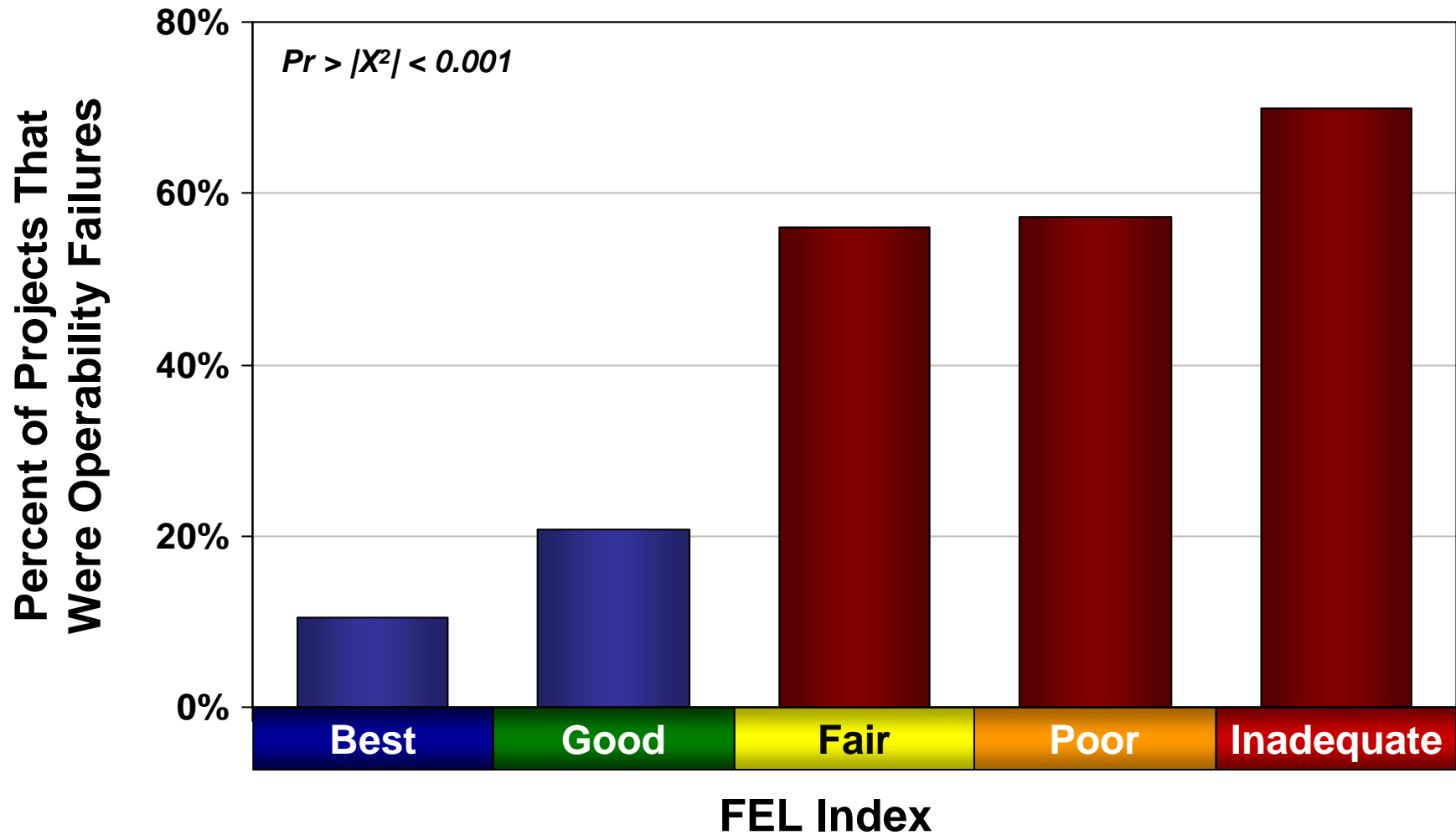
FEL Drives Schedule Predictability



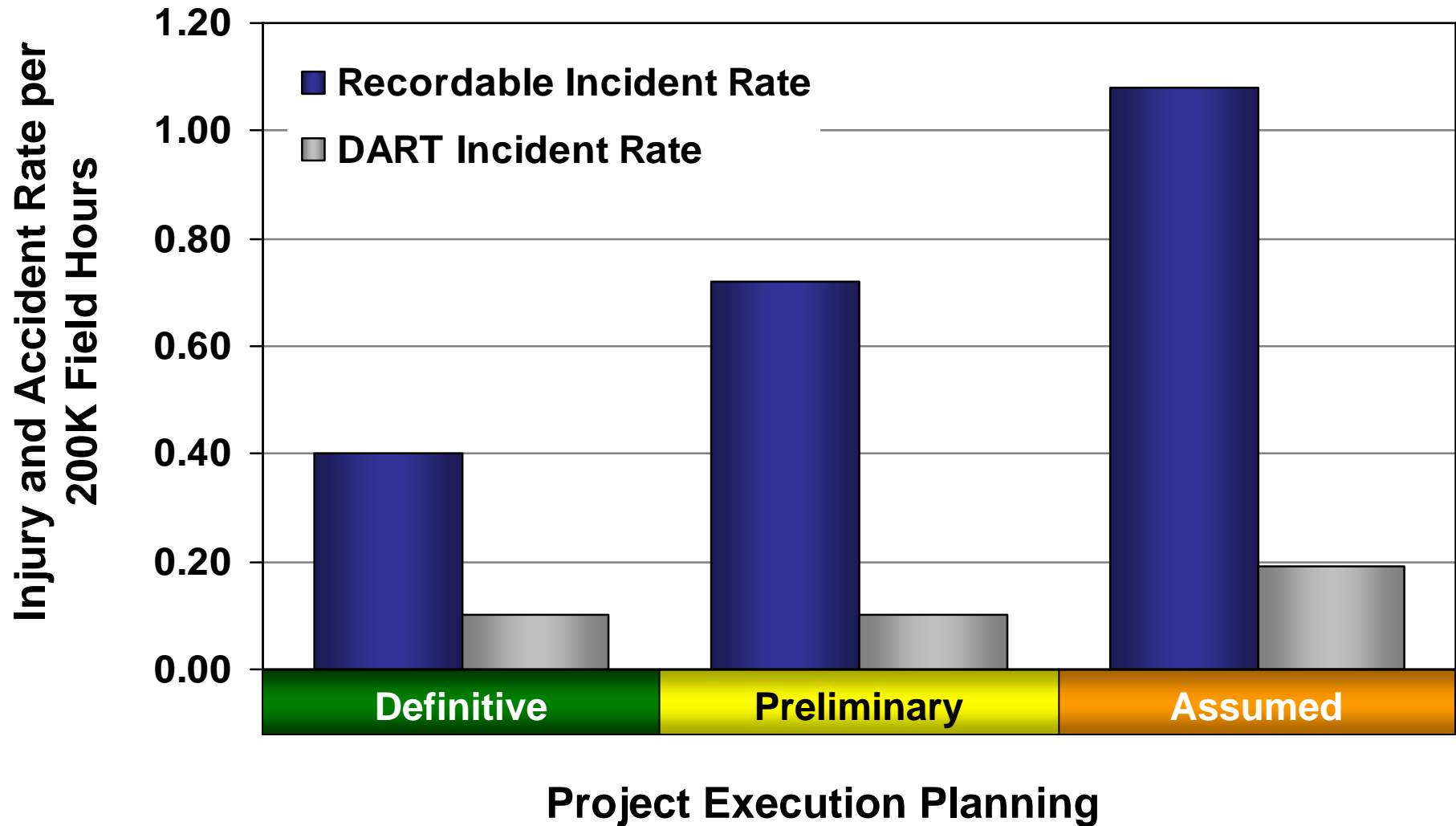
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FEL Reduces Operability Problems

Failure to produce at or close to the rate promised at authorization is debilitating to the economics of the project!

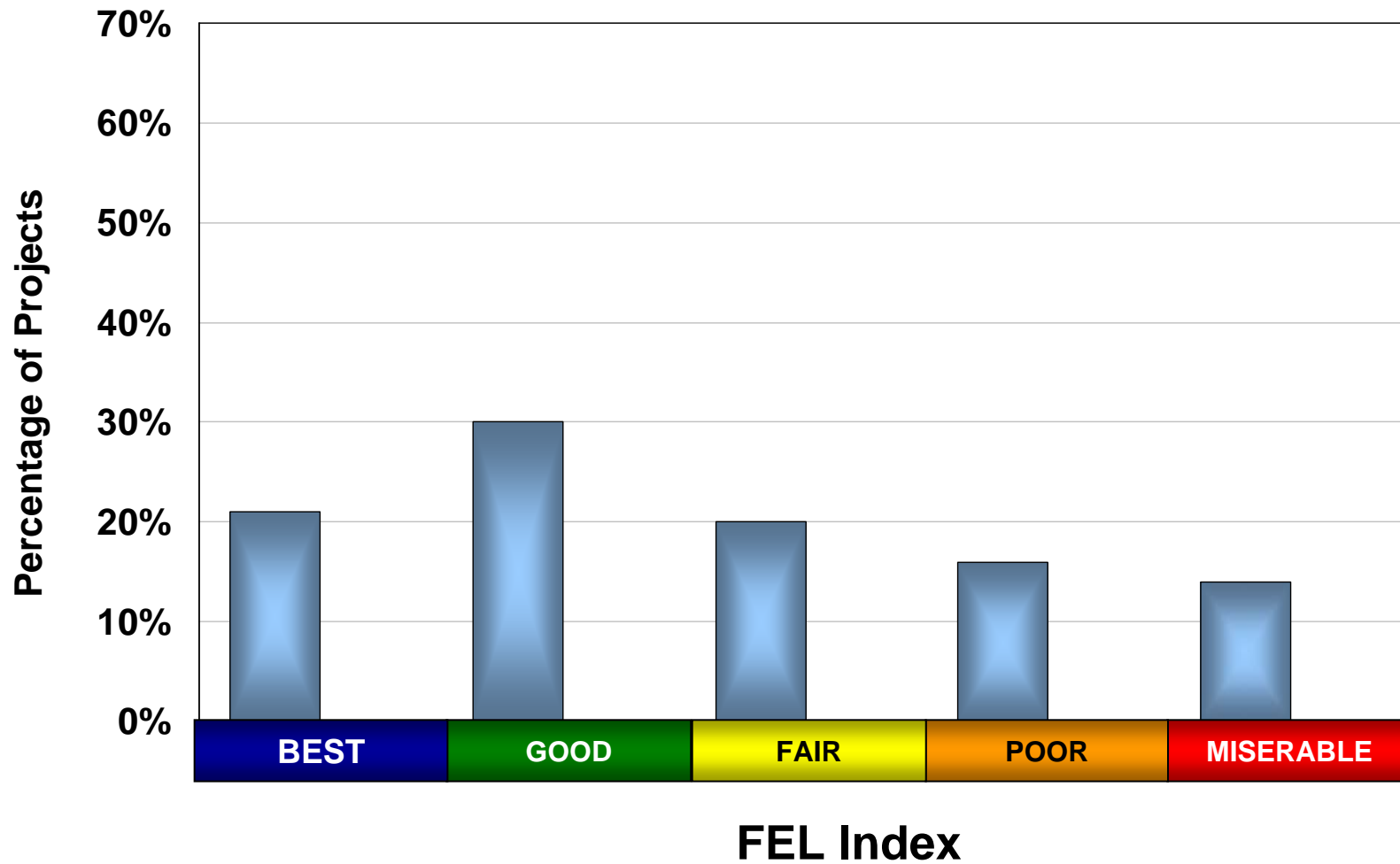


Execution Planning Improves Safety

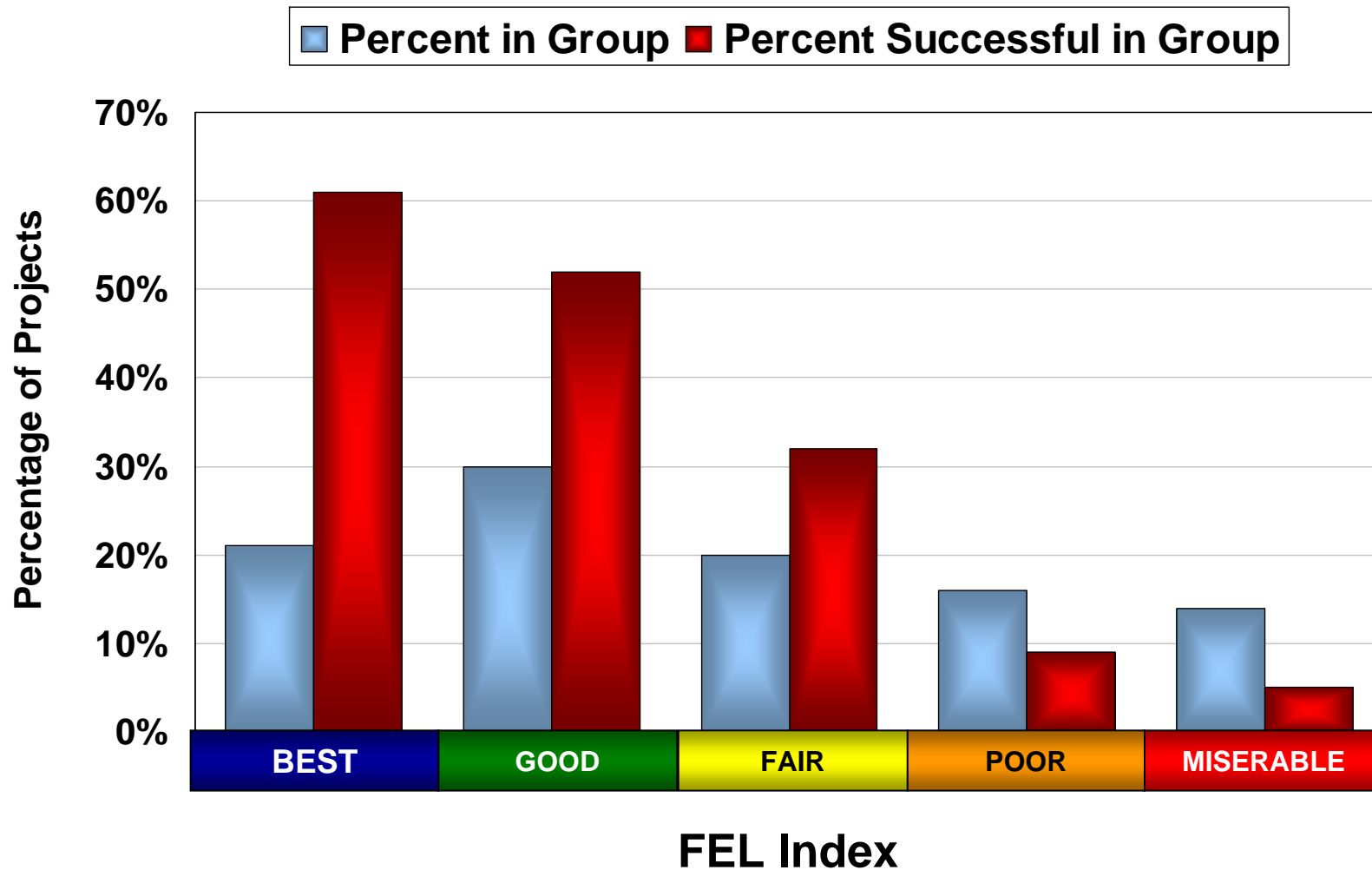


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How Well Are Megaprojects Defined at Authorization?



What Difference Does it Make?





Let's Get that Estimate Down!

- **A good many megaprojects die when the first full cost estimate is prepared....and that's a good thing!**
- **What is not good is when the business response to an estimate that is higher than the budget is “sharpen your pencils!”**
- **Cost estimates are merely a reflection of the scope of the project that you want to do and the circumstances in which you must do the project**
- **Nearly 20 percent of the megaprojects in our database attempted a “cost-reduction exercise” just before or just after authorization**
- **Every last project failed.**



The Contractors Should Carry the Risk!

- **We often attempt to transfer cost risk to contractors in the form of lump-sum (fixed price) contracting; “we’ll put a ceiling on the cost!”**
- **In megaprojects, risk transfer rarely actually occurs and even when it does, it is necessarily economically inefficient**
- **Contractors are non-capitalized, variable-cost firms**
- **They have very limited ability to carry large equity-type risks and price risk very aggressively when they are forced to carry it**
- **That is not gouging; it is plain common sense**



Let's Hold the Wrong Folks Accountable!

- **The very high failure rate in megaprojects is indeed the result of an accountability problem**
- **But those actually responsible for the failures are almost never those actually blamed**
- **Of the 207 failed industrial megaprojects that I reviewed, project management was actually culpable in less than 10 of the cases**
- **Overwhelmingly, the source of failure can be found in the within the business promoting the project**
- **The search for scapegoats should always start with the morning mirror**



Seven Deadly Mistakes in Industrial Megaprojects

1. I want to allocate the value fairly and stabilize the project
2. I want it yesterday
3. We'll deal with problems as they arise.
4. We will follow best practices in front-end definition
5. The only way it can cost less is if I want less
6. It's our project. We risk, they risk doing the project!
7. Accountability manages responsibility

Thank you!

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IPA independent project analysis, inc.