

MegaProjects in a Sizzling Market

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Our Vantage Point

- Over the past 20 years IPA has evaluated over 11,000 projects around the world, including over 400 major projects in the Middle East
- In the 1993-2003 period, we evaluated 108 megaprojects (>\$1 billion)
- In 2003-2007, another 100+ megaprojects have been added on the front-end, including over 25 “elephant”(on-shore) and “whale” (off-shore) projects
- In the roughly hundred-year history of the process industries, there has never been a period like this

Outline

- Megaprojects before the market turn were less than excellent
- Megaprojects in the bull market are much more difficult
- Returning to Sanity

Megaproject Success and Failure before the Market Turned

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

Costs grew	>25%
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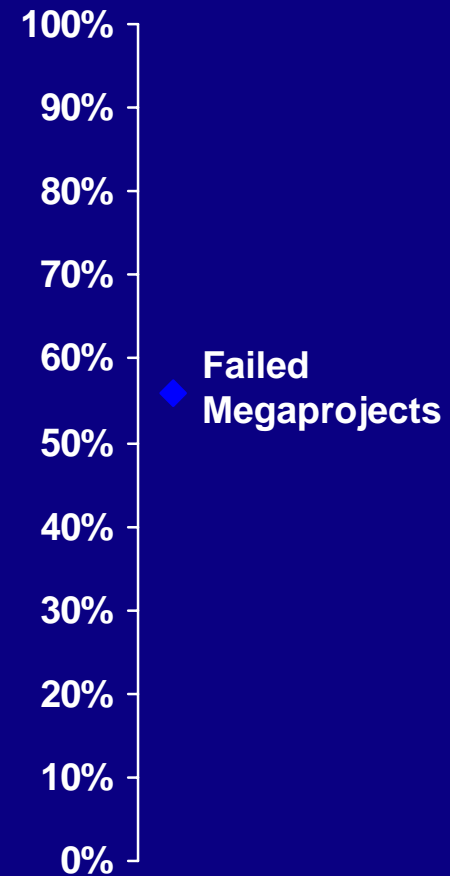
Schedule Slipped	> 25%
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Overspent (<i>Absolute Measure</i>)	> 25%
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Severe and Continuing Operational Problems 18 months or more	Yes
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- Of the projects that failed (56 percent):
 - 42 percent failed on one criterion
 - 32 percent failed on two criteria
 - 21 percent failed on three criteria
 - 5 percent failed on all criteria

Failure Rate



Past Megaproject Success and Failure

	Successes (44 percent)	Failures (56 percent)
Cost Overruns	3 percent	31 percent
Schedule Slip	2 percent	29 percent
Production as Percent of Plan*	94 percent	39 percent

**First 18 months*

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The Project Market is in Crisis

- Capital spending has increased very rapidly over the past 3 years and will continue to do so over the next decade - barring another oil price collapse
- Unlike past expansions, most sectors of the process industries have increased spending at the same time
- The input markets - engineering, materials and equipment, construction, and installation - lack sufficient capacity to do all of the work desired
- Therefore, work is being allocated by the oldest of mechanisms - price
- Markets will adjust, but some of the markets will respond slowly

The Role of Escalation

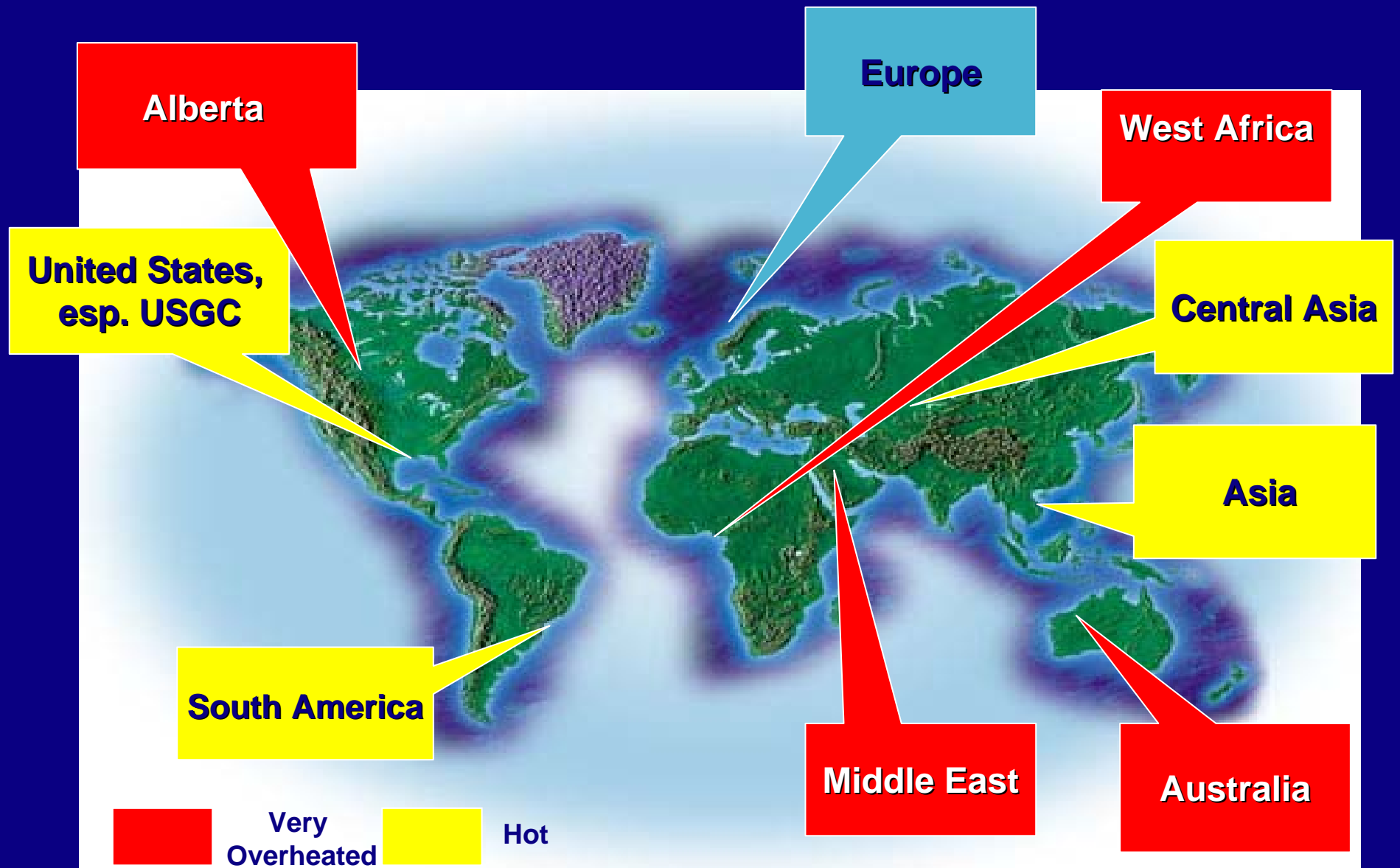
- Prices of factor inputs have escalated
 - They are a sizeable portion of the overall increases
 - The escalating prices add volatility to the market and add uncertainty to engineering, procurement, and construction (EPC) and construction contracts
- Spot shortages create serious schedule risks
 - Drilling vessels
 - Lay barges and heavy lift
 - High alloy steel
 - Selected equipment items, especially large vessels
- For contractors, schedule risk = cost risk
- Since January 2003, escalation has increased the average major project's cost by about 60 percent

Escalation is Not the Worst of It!

The worst features of the current market are:

- Slip in engineering schedules leading to acute losses of field productivity
- Lack of qualified field craft labour and supervision in many locations
- Shoddy engineering quality leading to serious operational problems in startup
- Large (but mostly justified) contractor risk premiums based on location and project-specific risk

Areas Most Affected Currently



Regions Displaying Highest Risk Premiums

REGION	AVERAGE RISK PREMIUM	COMMON PROJECT-SPECIFIC RISKS
Alberta, Canada	45% <i>(Up to 60 percent)</i>	<ul style="list-style-type: none"> • High potential for labor shortages • Harsh physical environment/climate
West Australia	50% <i>(Up to 100)</i>	<ul style="list-style-type: none"> • Labor shortages; small base • Concurrent Megaprojects
West Africa	60% <i>(Up to 150 percent)</i>	<ul style="list-style-type: none"> • High potential for labor shortages • Political instability • Civil unrest in region • Concurrent large projects in region • Onerous local content requirements
Middle East	40% <i>(Up to 110 percent)</i>	<ul style="list-style-type: none"> • Physical environment/climate • Concurrent megaprojects in region • High potential for labor shortages • Overwhelmed permitting authorities • Lack of flexibility in contracting

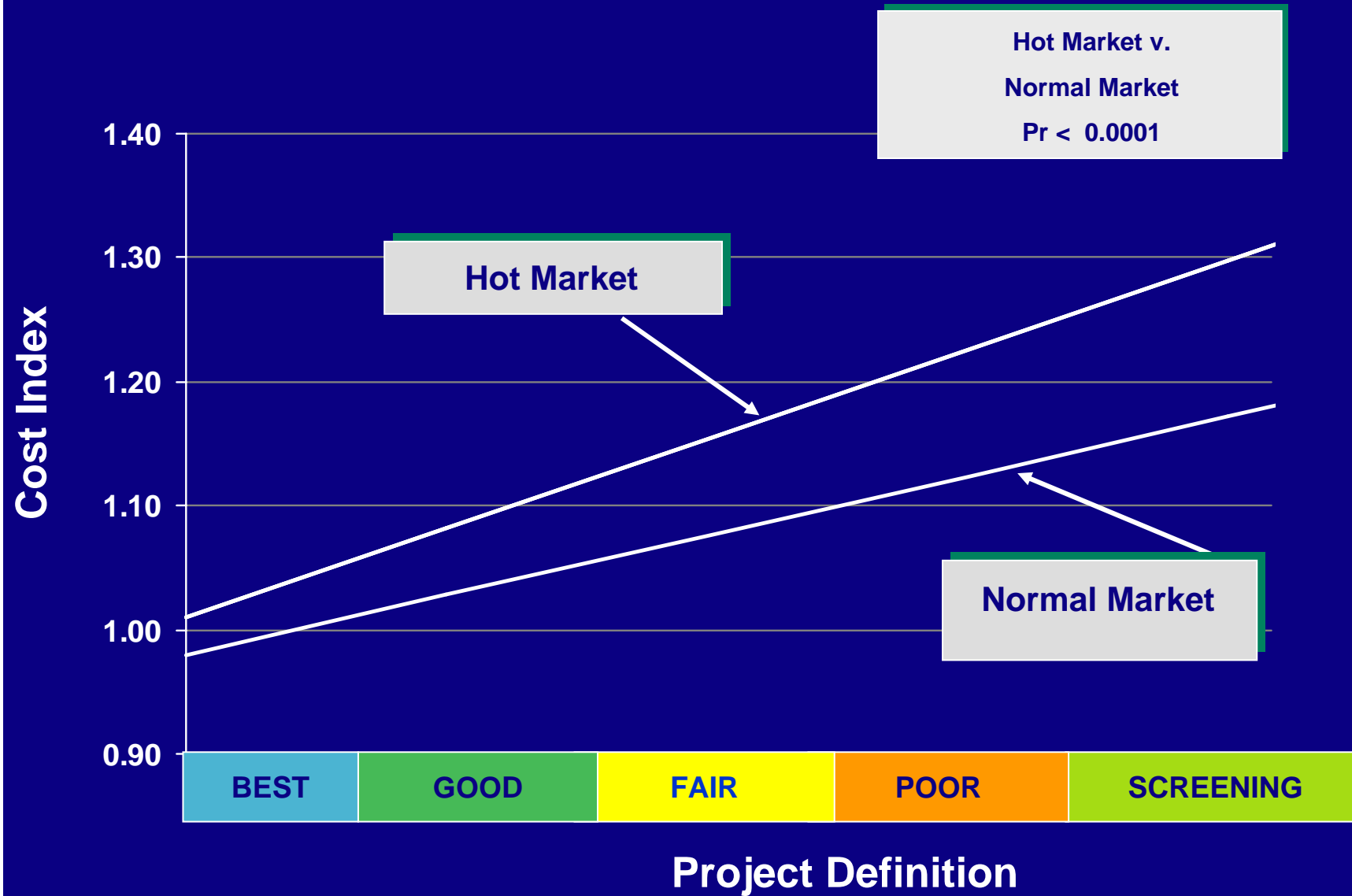
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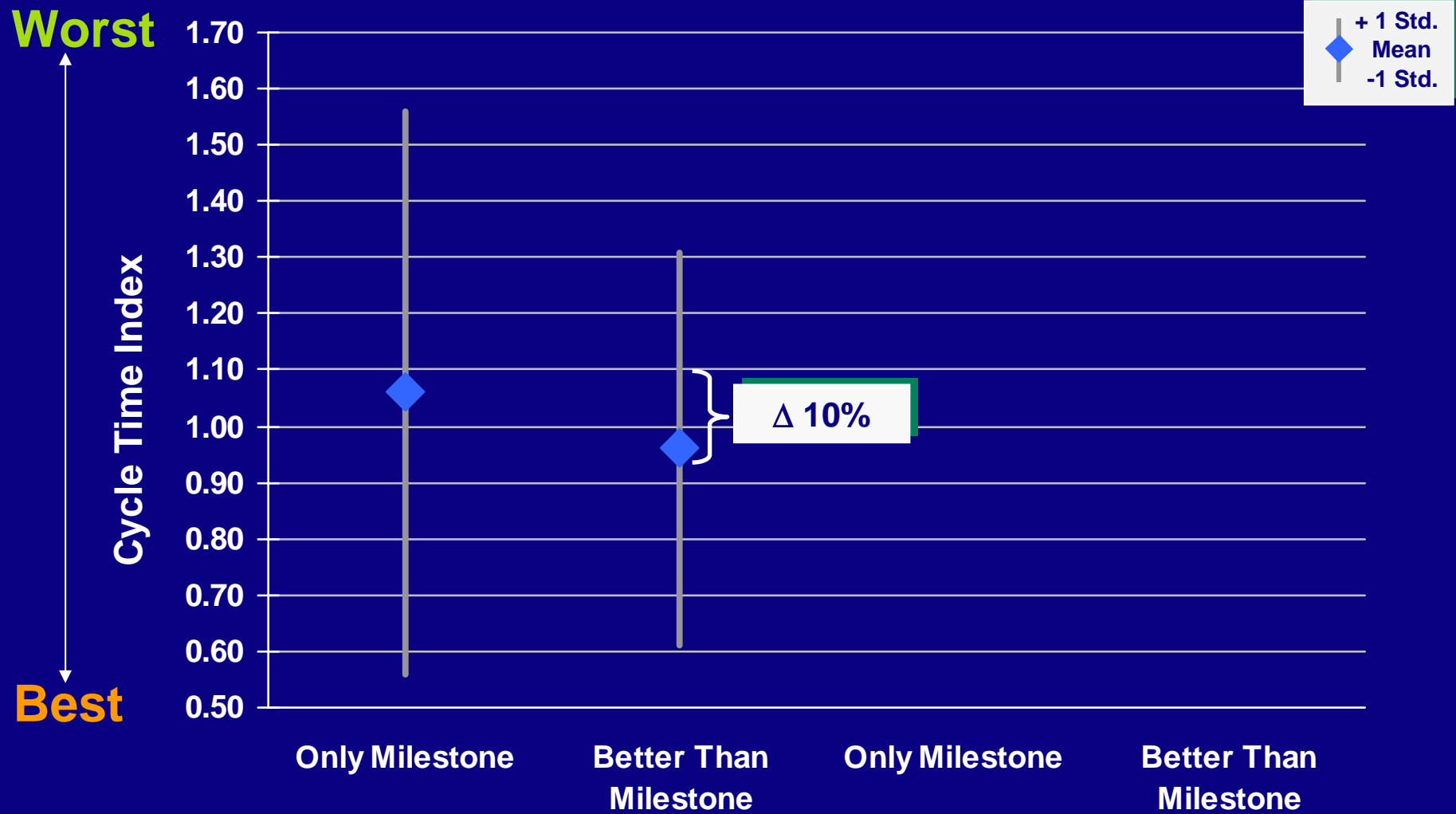
Hard Choices for Owners

- Evaluate the size and quality of your project organization versus the size of your project portfolio
- Trim your portfolio to meet your capabilities
- Don't be cheap; value deeply the contractors that do quality work for you
- Don't "twist-arms" to get contractors to bid
- Redouble your focus on sound practices

Project Definition and Cost Index



Detailed Owner Schedules Improve Cycle Time

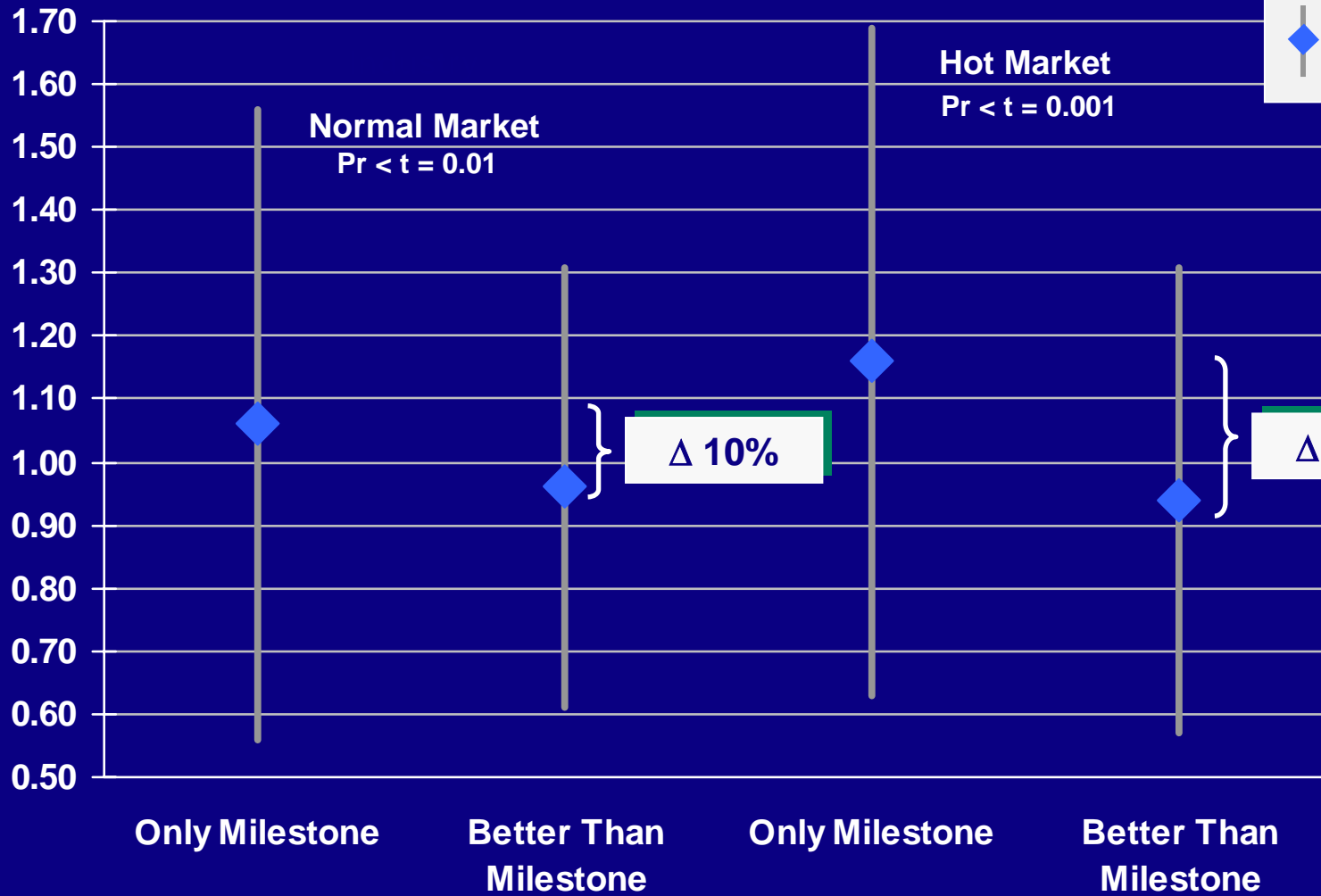


Detailed Owner Schedules Improve Cycle Time

Worst

Cycle Time Index

Best



+ 1 Std.
Mean
-1 Std.

Hot Market
Pr < t = 0.001

Normal Market
Pr < t = 0.01

Δ 10%

Δ 22%

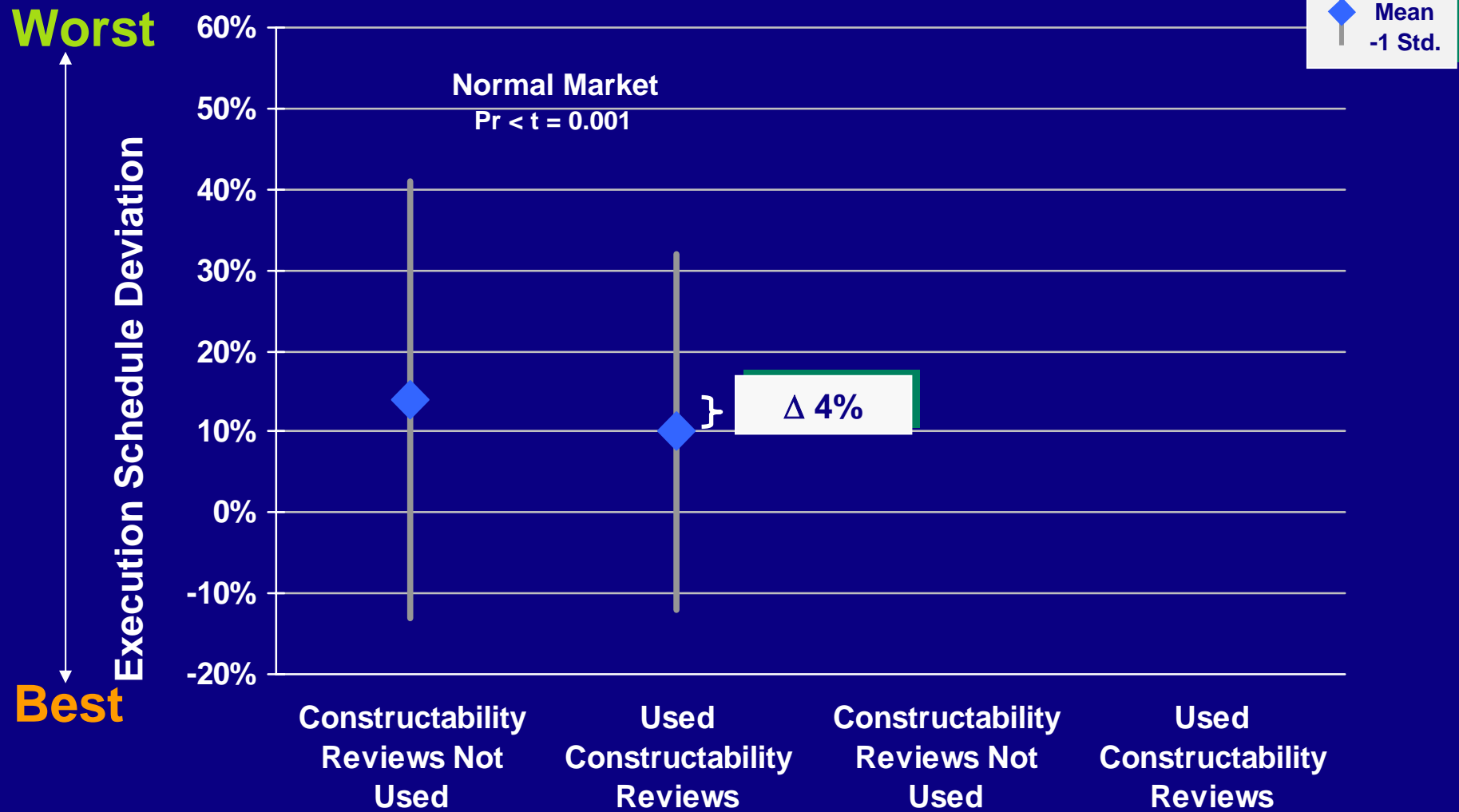
Only Milestone

Better Than Milestone

Only Milestone

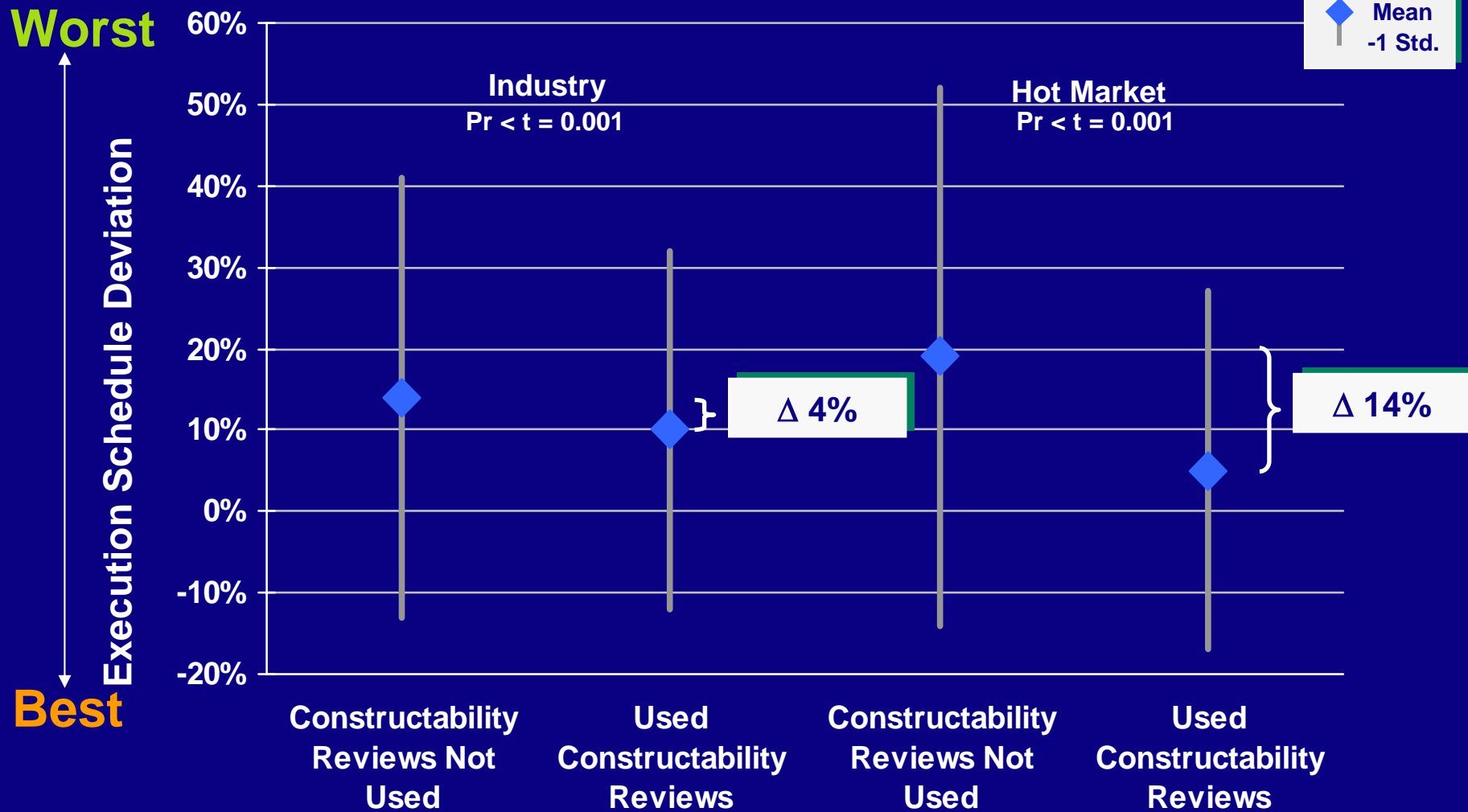
Better Than Milestone

Using Constructability Reviews Improves Execution Schedule Predictability



*Controlled for FEL

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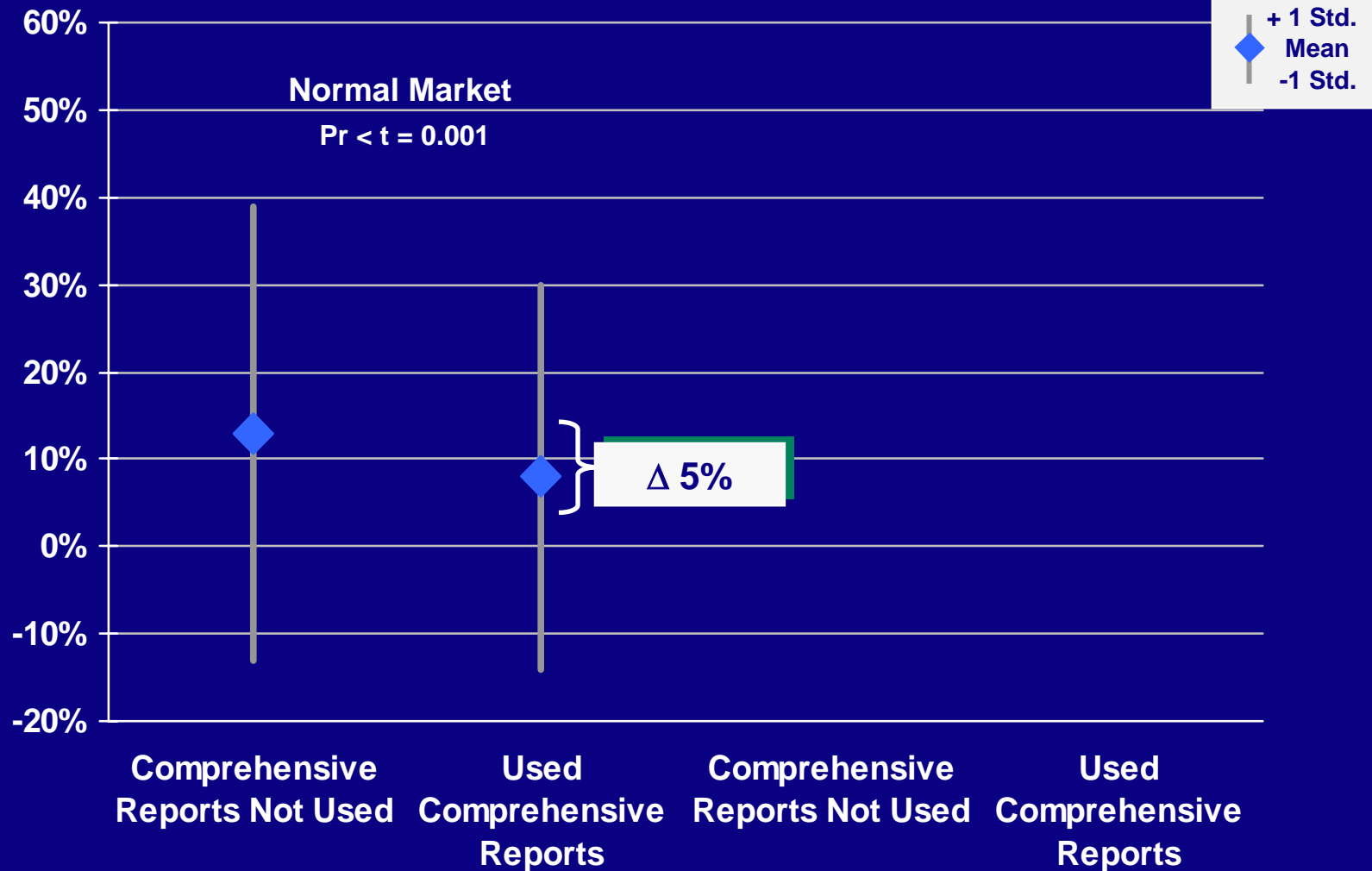
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Comprehensive Physical Progressing Reports Improve Execution Schedule Predictability

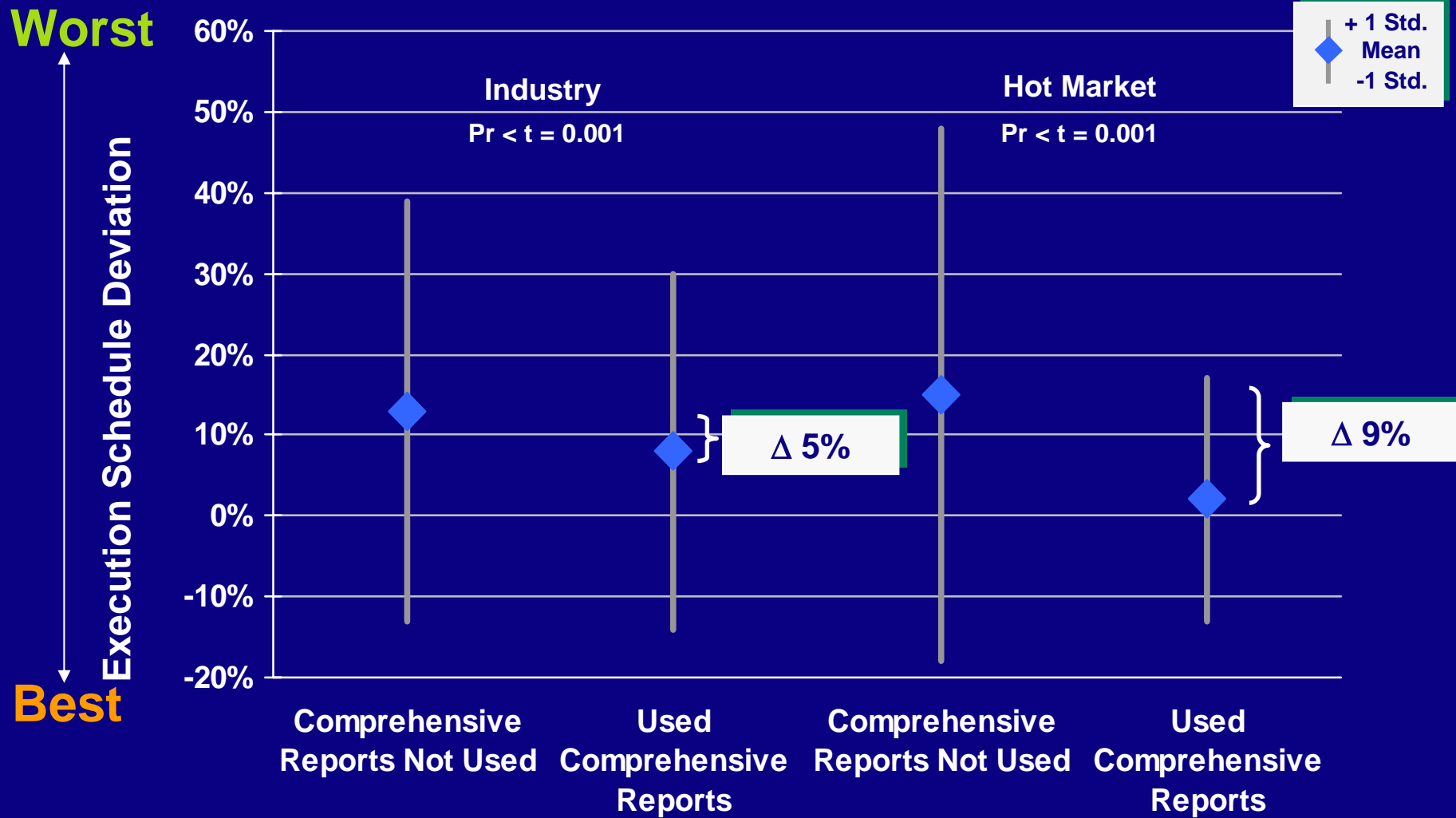
Worst

Execution Schedule Deviation

Best



Comprehensive Physical Progressing Reports Improve Execution Schedule Predictability



A final thought for all...

In every language and culture, greed is still a vice.

And in every language and culture, sound design and fine craftsmanship are still virtues.

Thank You

