

Keeping the Lights On

A road map for taking electric reliability
to the next level

Presented by Dan O'Neill

to

the EEI Customer Operations Executive Workshop

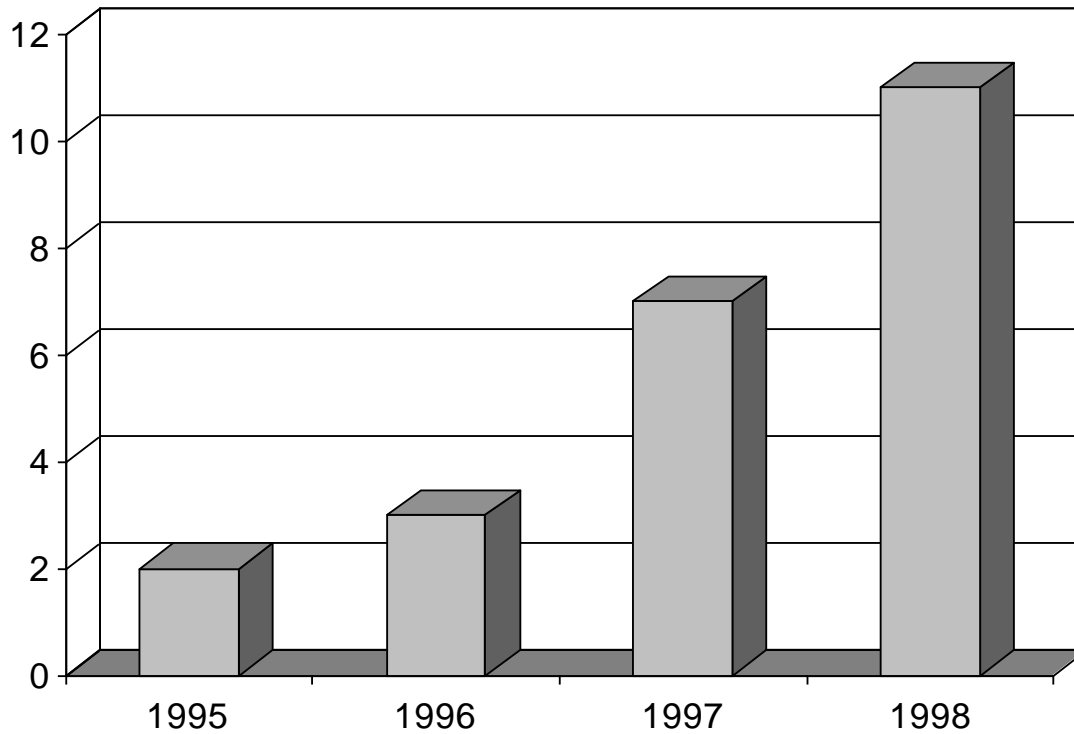
March 27, 2000



Navigant
CONSULTING, INC.

Commissions are adopting new reliability rules

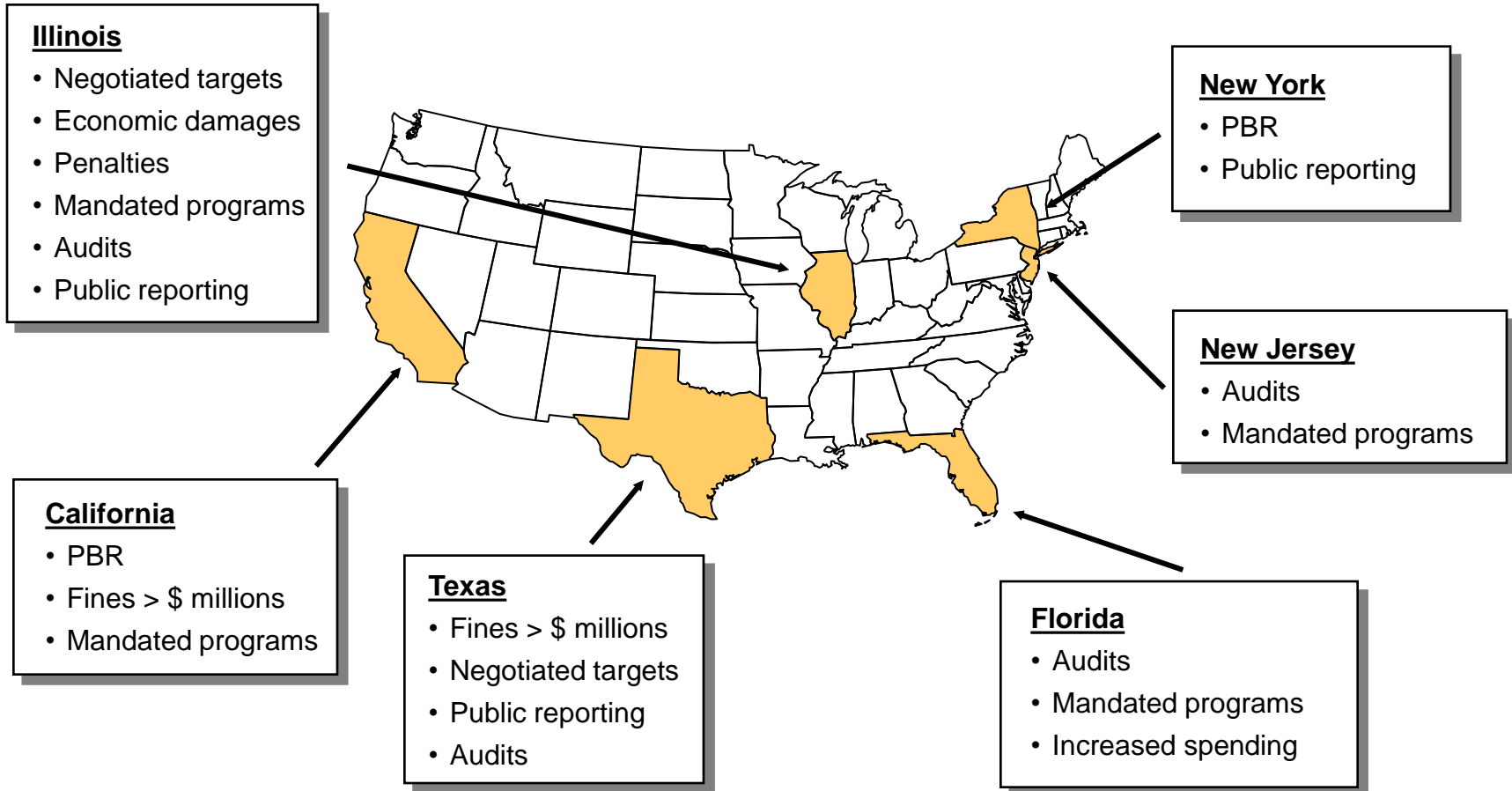
Number of states with new rules



Source: Article by Navigant's Dan O'Neill, Public Utilities Fortnightly, March 1999

What utilities were doing is no longer good enough

The new rules have real teeth in them



To comply, companies are looking at spending a lot more time and money

ComEd's very public troubles are a good example



DOWNTOWN BLACKOUTS

Power fails, sparks fly



"They have neglected their infrastructure for too long... We are sick and tired of them, and they had better change."

Mayor Richard Daley



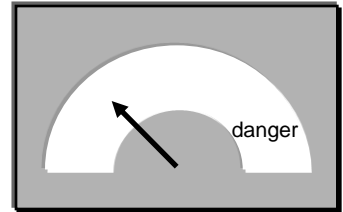
Image courtesy of CLTV

"This level of service under these conditions is a disgrace to us. It's a personal disgrace to me. I will not tolerate it, and you will not have to."

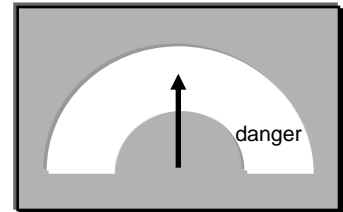
**Could
this
happen
to you?**

Just managing SAIDI is no longer good enough

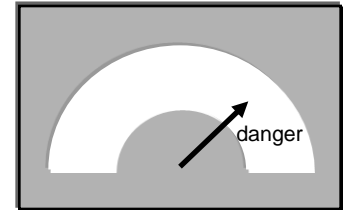
SAIDI / SAIFI



Worst Circuits



Complaints



• Commissions and customers are no longer satisfied with good performance on system averages like SAIDI, SAIFI and CAIDI

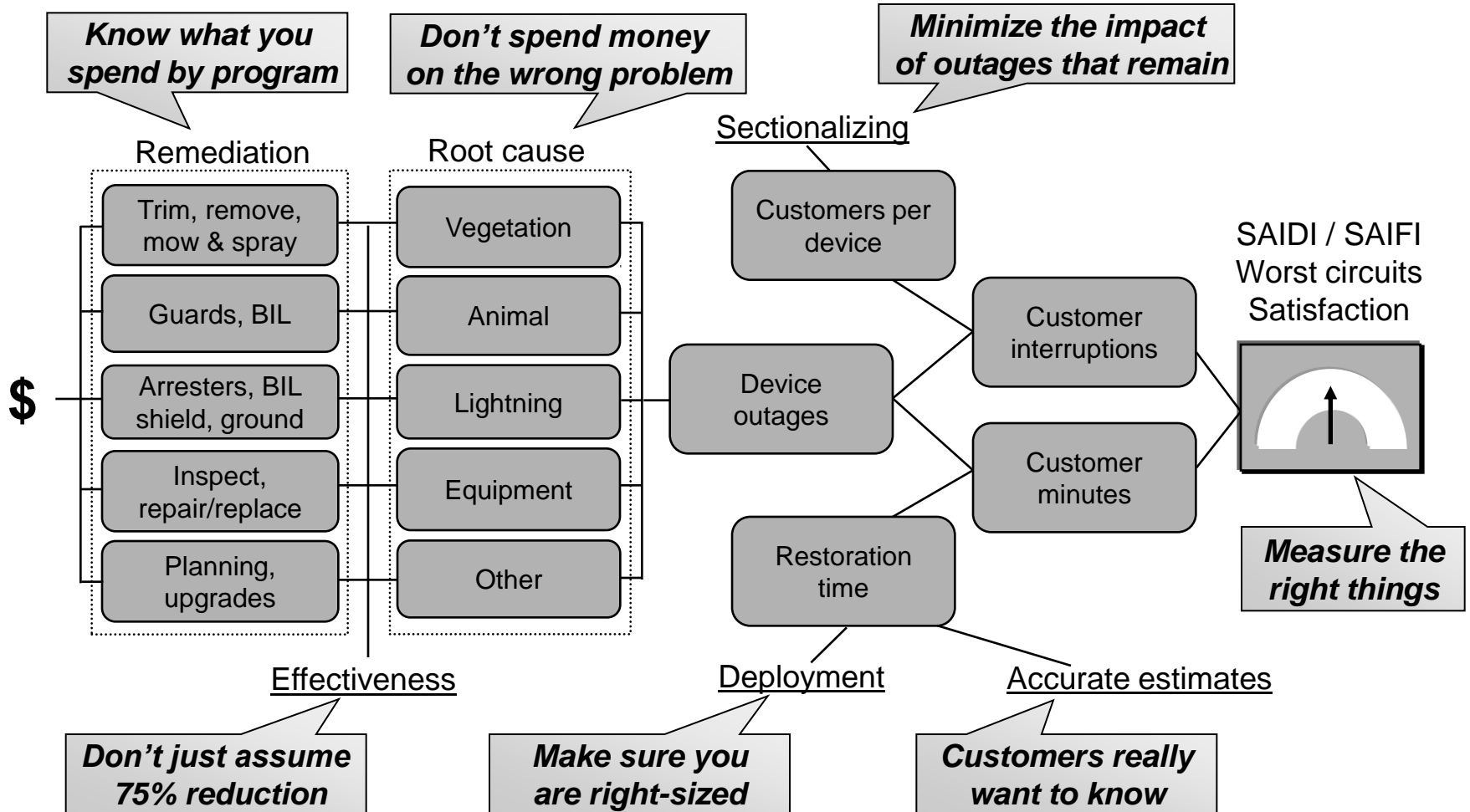
• Many of the new regulations require reporting of performance on worst circuits, with negotiated targets for improvement, e.g., what was proposed by the Texas PUC:

	SAIFI	SAIDI	Compliance
- 'Minimum acceptable	3.8	315	98.5%
- 'Target'	2.6	158	90.0%

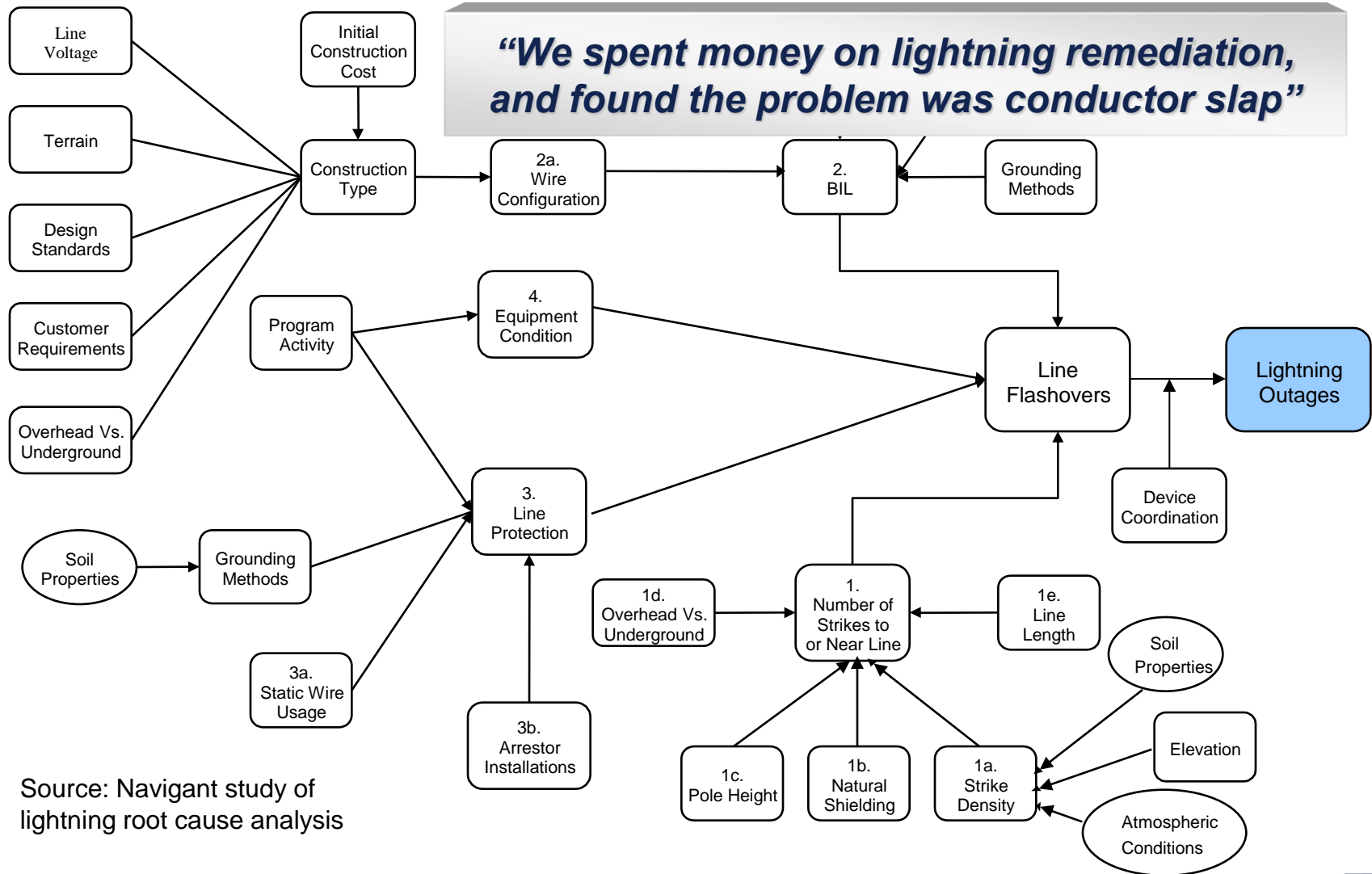
• What they really want is customer satisfaction, few complaints, and not even small 'pockets' of consistently poor performance

Many companies don't even measure 'worst pockets' now

Utilities need to know what it takes to 'move the needle'



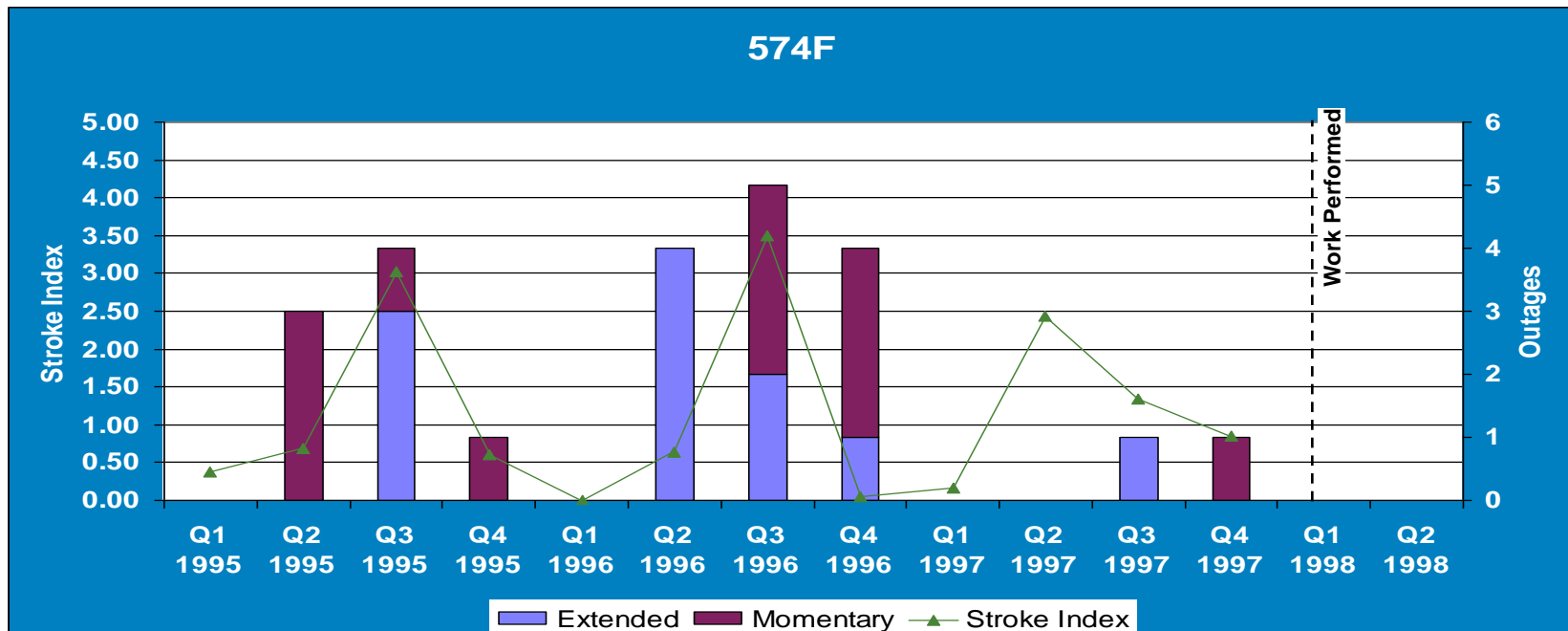
Effective remediation starts with accurate root cause analysis



Source: Navigant study of lightning root cause analysis

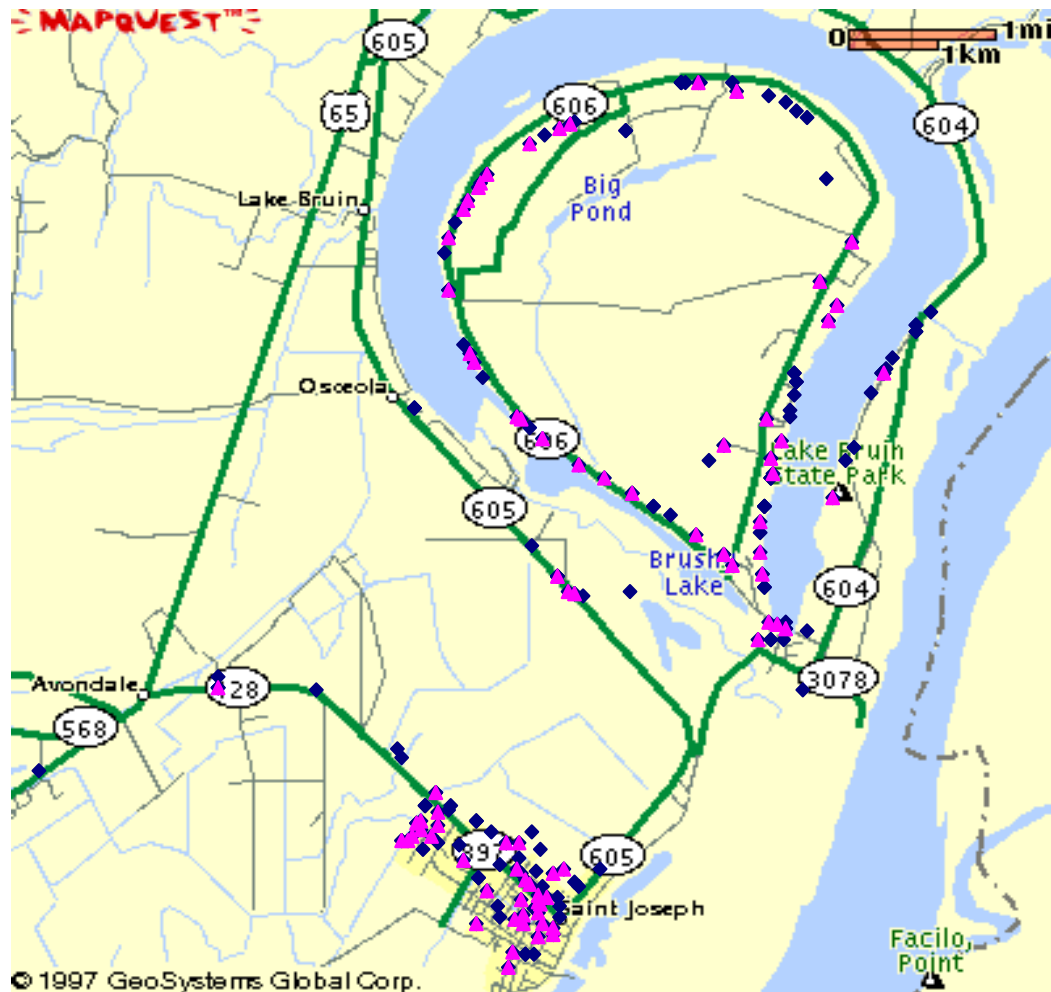
Effectiveness requires studies of before-and-after impact

“We had assumed that vegetation remediation would reduce tree-caused outages 75 percent. The study showed it was closer to 50 percent.”



Source: Navigant study of lightning remediation effectiveness

Detailed geographic data can be used to spot patterns



“We didn’t realize we could do that with our data”

Example:

For animal mitigation, we helped a company use its geographic data to detect patterns of animal-caused outages for more effective programs to prevent squirrel-caused outages

Other examples of in-depth studies include lightning, vegetation, circuit breakers, etc.

Source: Navigant study of animal remediation

Restoration can be improved at each step on the way



Non-storm:	5 min	10 min	20 min	10 min	15 min	10 min	45 min
Storm:	10 min	30 min	20 min	15 min	20 min	30 min	60 min

Where are storms hurting you the most?

Where is your best opportunity to improve?

How can you keep customers well informed?

What staffing do you need to meet your targets?

And would an external auditor agree that you are doing all you can?

Decision analysis can be effectively applied to T&D programs

*Illustration -
Vegetation model*

Failure Rates per Mile

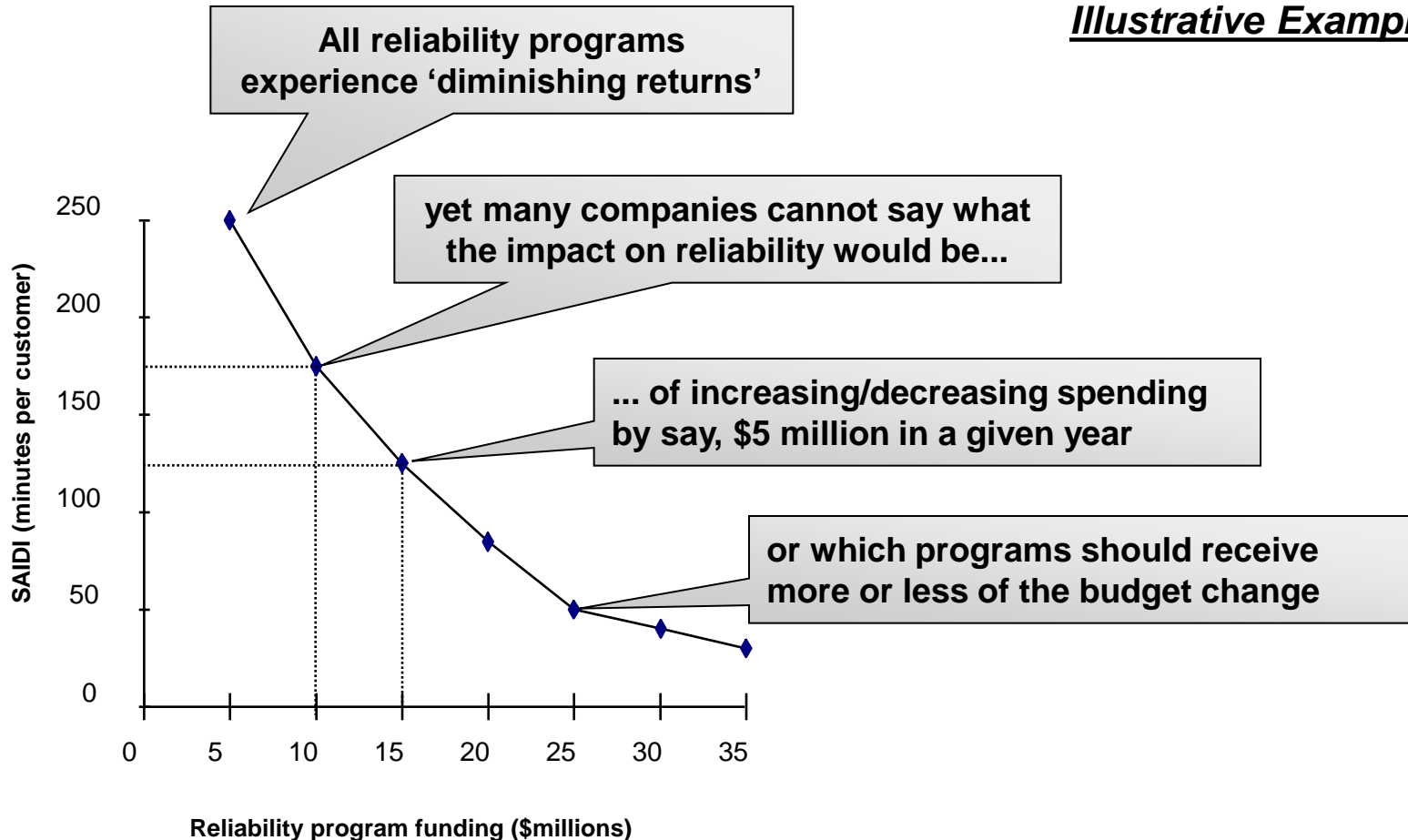
Segment	Backbone						Lateral						
	Bare				Covered		Bare				Covered		
Wire	5 kV		> 5 kV		All kV		5 kV		> 5 kV		All kV		
Voltage	L	H	L	H	L	H	L	H	L	H	L	H	
Veg. Density	L		H		L		H		L		H		
Years Since Last Trimmed	1			--									
	2			-									
	3	0.06	0.13	0.06	0.13	0.05	0.09	0.06	0.13	0.15	0.35	0.08	0.13
	4				+								
	5				++								
Customers Impacted per Outage	600 Customers						40 Customers						
Duration per Outage	150 Minutes						150 Minutes						

Source: Navigant T&D decision analysis model

Without this kind of analysis, you could be shooting in the dark

Many companies do not know where they are “on the curve”

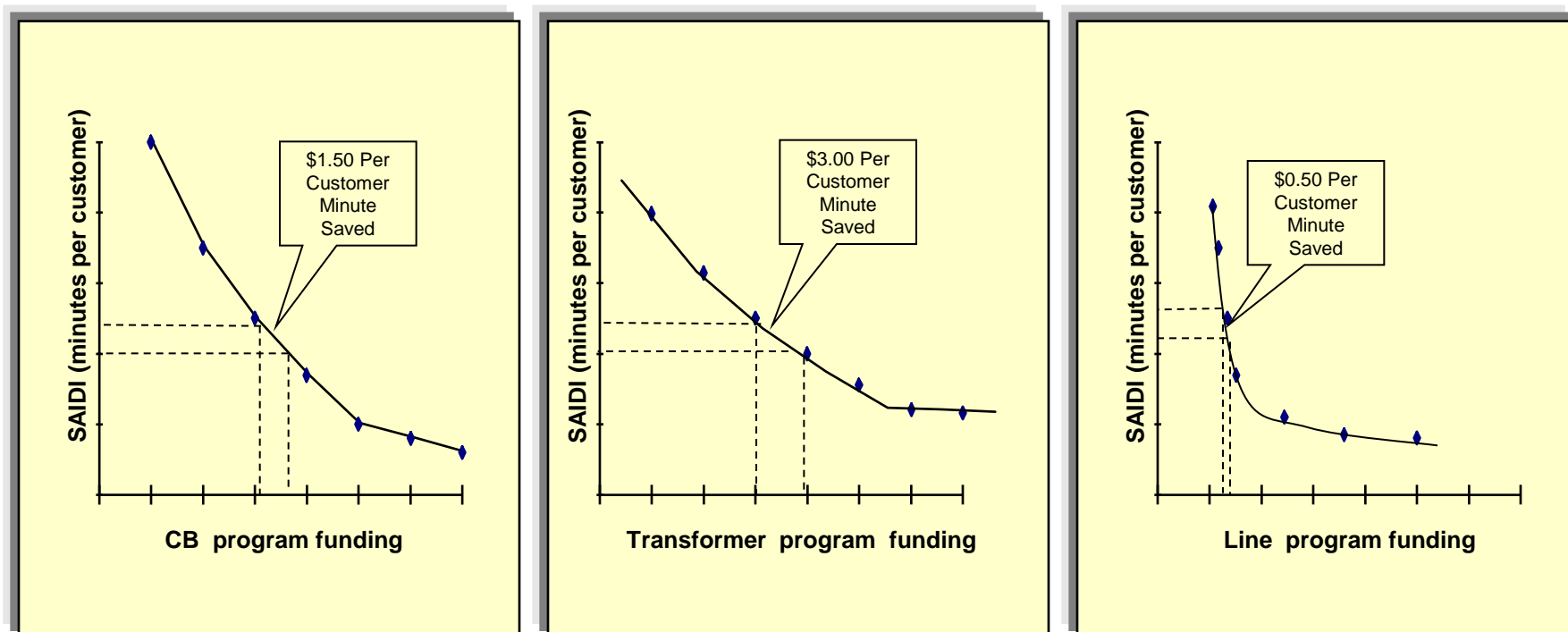
Illustrative Example



Yet CEOs, CFO's (and regulators) expect to know the answer

Few companies have optimized across programs

Illustrative Example

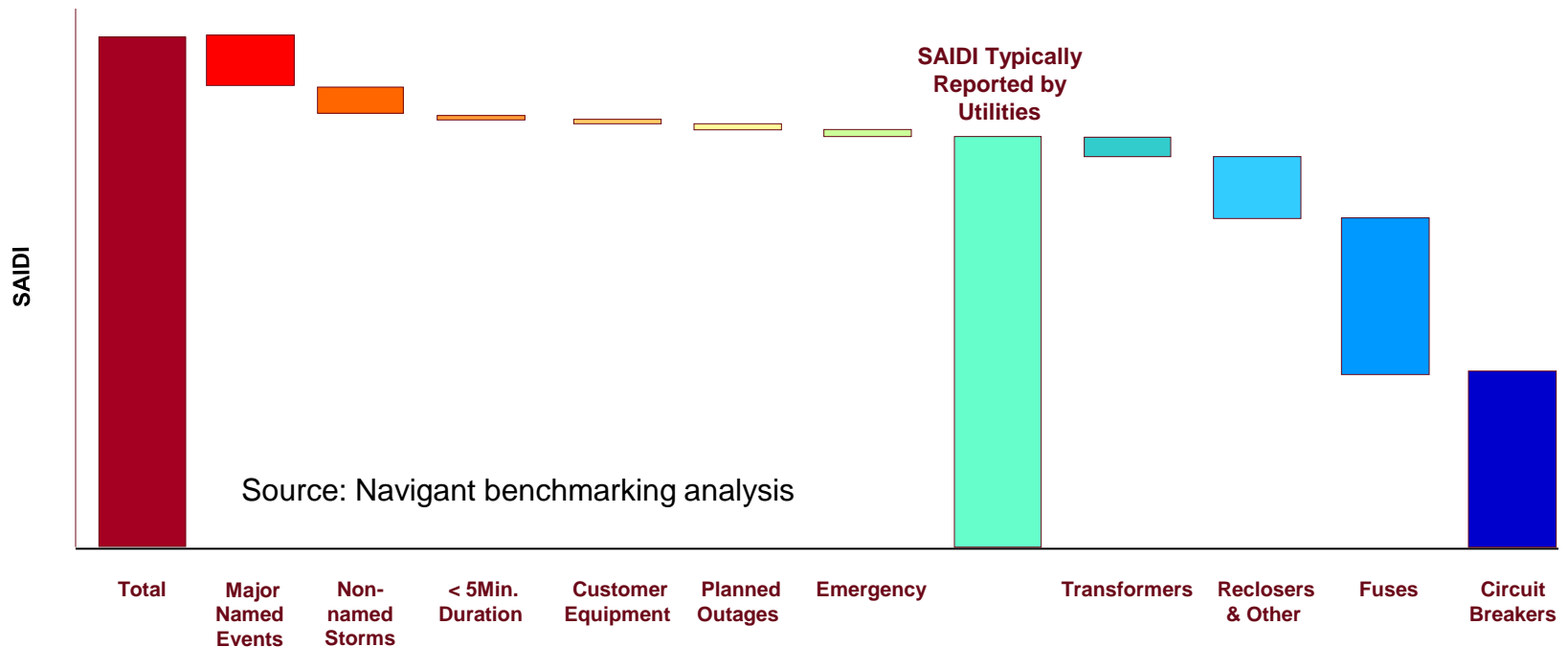


Source: Navigant T&D decision analysis model

One utility saved tens of \$millions, without reducing reliability, by redirecting its budget through this type of analysis

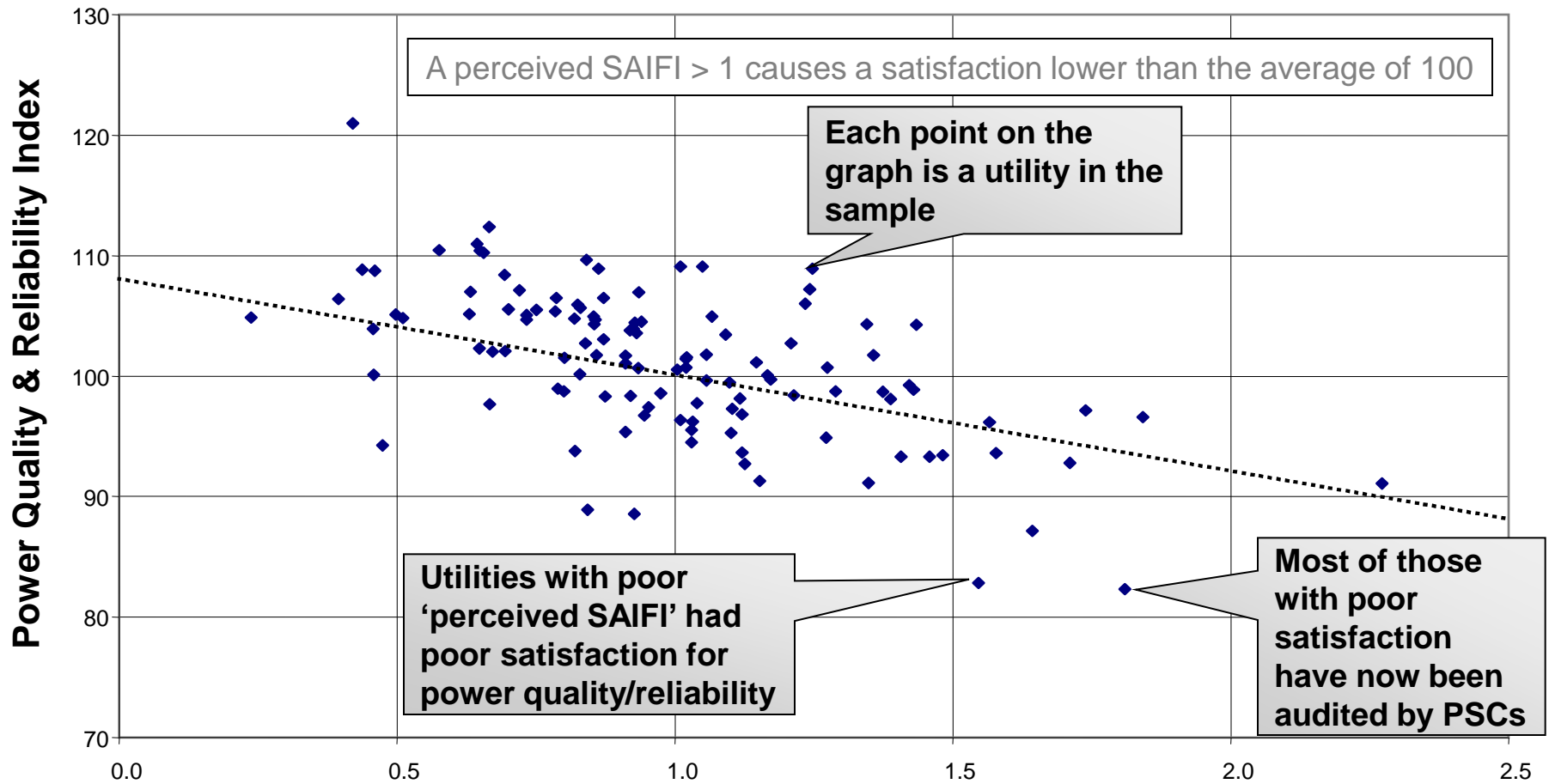
An apples-to-apples comparison is now possible

- Navigant Consulting has obtained all of the newly public data on reliability
- We have contacted all of the companies to find out what is included and excluded, to get true “apples-to-apples” comparisons
- We have used proprietary detailed outage databases to estimate the impacts of various treatments and exclusions



As it becomes known that these data can be publicly obtained, utilities will need to know where they stand on this basis

Methods now exist that can target customer satisfaction



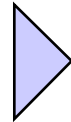
Source: JD Power & Associates, with Navigant Consulting

Perceived SAIFI

In another graph, 'perceived SAIFI' was shown to track actual SAIFI

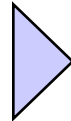
Next step - move up to the next level

Regulatory Trends



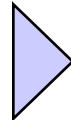
Know what local, state and federal regulators are doing nationwide, and get ready to respond to a reliability audit

Benchmarking



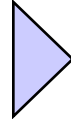
Know how you stand relative to other companies in terms of performance, spending, and best practices

Outage Data Analysis



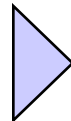
Use a standard set of queries to develop useable information from your trouble call history

Bang Per Buck



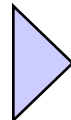
Know which programs deliver the most reliability improvement per dollar spent and how much it takes to achieve your targets

Service restoration



Improve restoration time and customer satisfaction through employing the latest methods and technology to restore and inform customers quickly

Business model

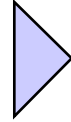


Organize effectively for targeting shareholder value through performance, with links to the right indicators, measures, roles, and incentives

Here is a road map up to the next level

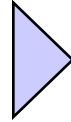
What kind of results can you expect?

Regulatory Trends



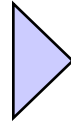
Avoid embarrassing showdowns with local, state, and federal officials that could cost \$millions in penalties and mandates

Benchmarking



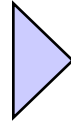
Don't spend time and money chasing the wrong target

Outage Data Analysis



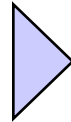
Why re-invent the wheel? Standard analyses can provide unique, valuable insights when applied to your data

Bang Per Buck



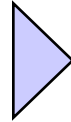
Many companies are wasting money on the wrong programs. Some have saved tens of millions of dollars by doing it right

Service restoration



Time is money. Better methods to reduce restoration time and keep customers informed can achieve results more effectively

Business model



The ultimate test for the customer and the regulator is satisfaction. Link it to everyday work and use it to incent your company and reap rewards

The 'next level' - customers and regulators expect it now

Questions and answers



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Taking reliability programs to the 'next level'