Catastrophic Events and Human Error:

A Few “Rotten Apples” or Organizational Dysfunction?

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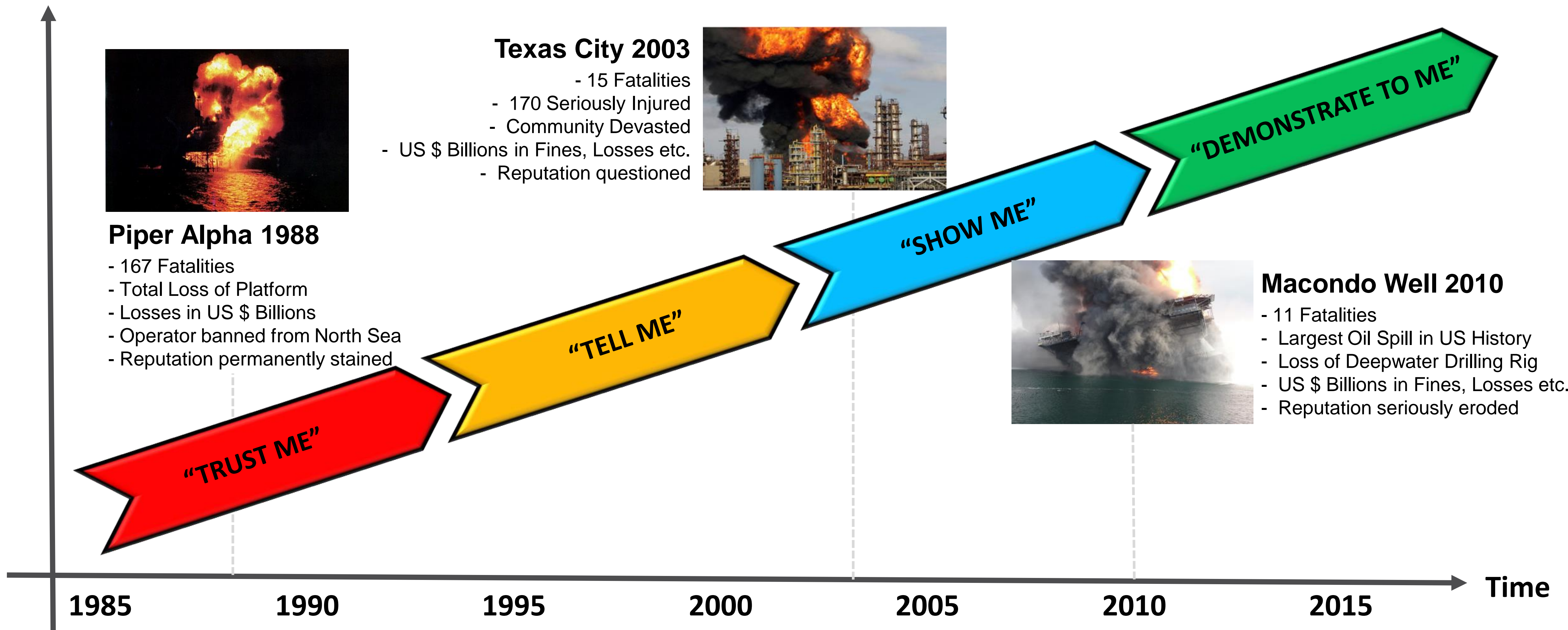
Greater Assurance Demanded
(International Oil and Gas Industry)



Why Catastrophic Events continue to occur:

1. **Prioritizing Occupational Injury Prevention vs. Major Operating Risks**

2. **Blaming Human Error on Front Line Workers vs. Dysfunctional Operating Culture**

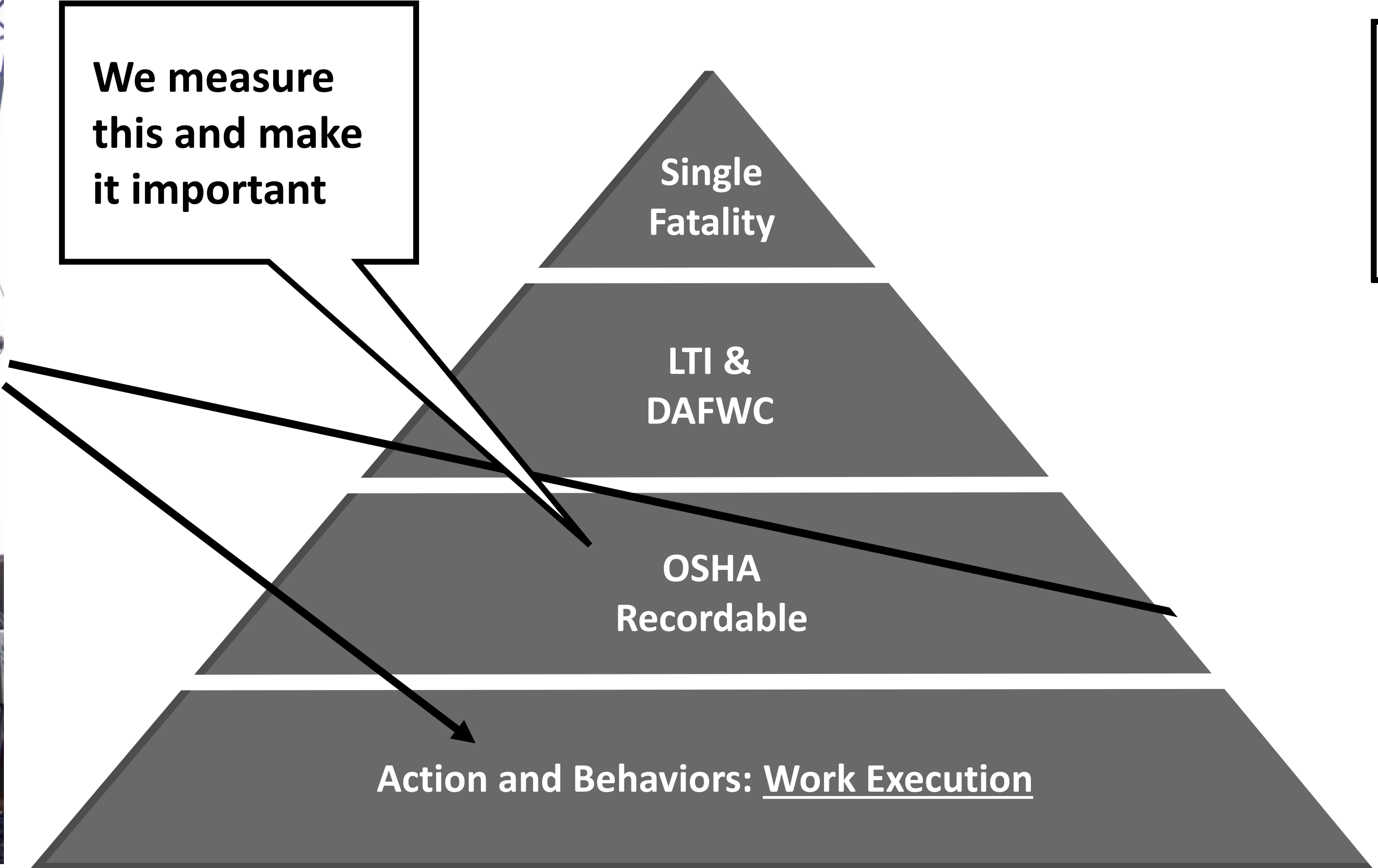
3. **Misuse of Performance Metrics to determine overall performance picture**

1. Prioritizing Occupational Injury Prevention

vs.

Major Operating Risks

We measure this and make it important



We don’t measure this in the same way

Relative risk rankings of Safe Work Execution vs. Work on "Barriers"

Probability and Frequency Rating						
	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	[illegible]	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
Consequence Rating						

Working at Height

Maintenance on a BOP

Work that can result in a serious Occupational Injury

Safe Work Execution

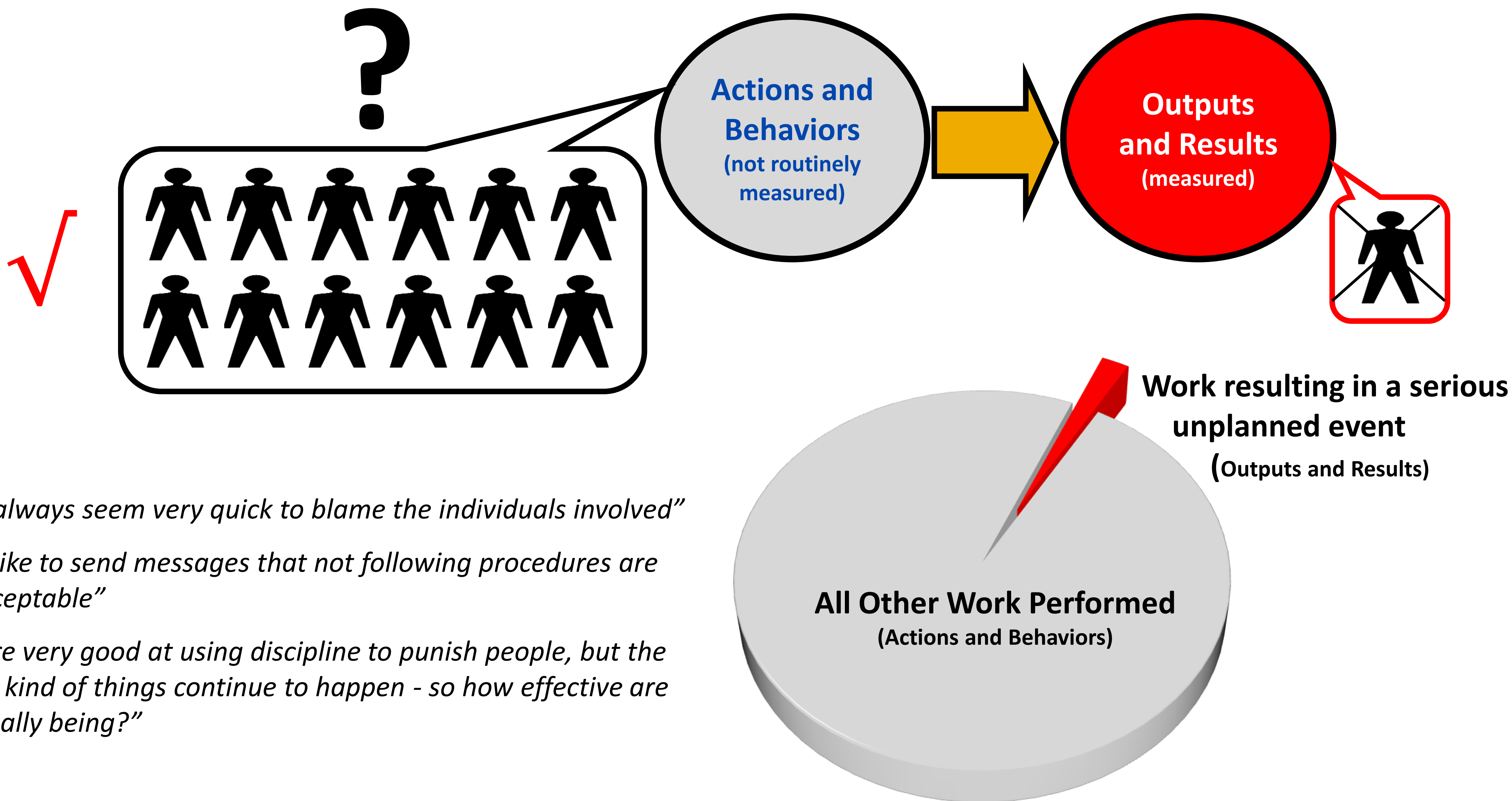
Work on "Barriers"
(to manage the Major Operating / HSE risks)

Work QA / QC

2. Blaming Human Error on Front Line Workers

vs.

Dysfunctional Operating Culture



- *"We always seem very quick to blame the individuals involved"*
- *"We like to send messages that not following procedures are unacceptable"*
- *"We're very good at using discipline to punish people, but the same kind of things continue to happen - so how effective are we really being?"*

The 2 x 2 Matrix

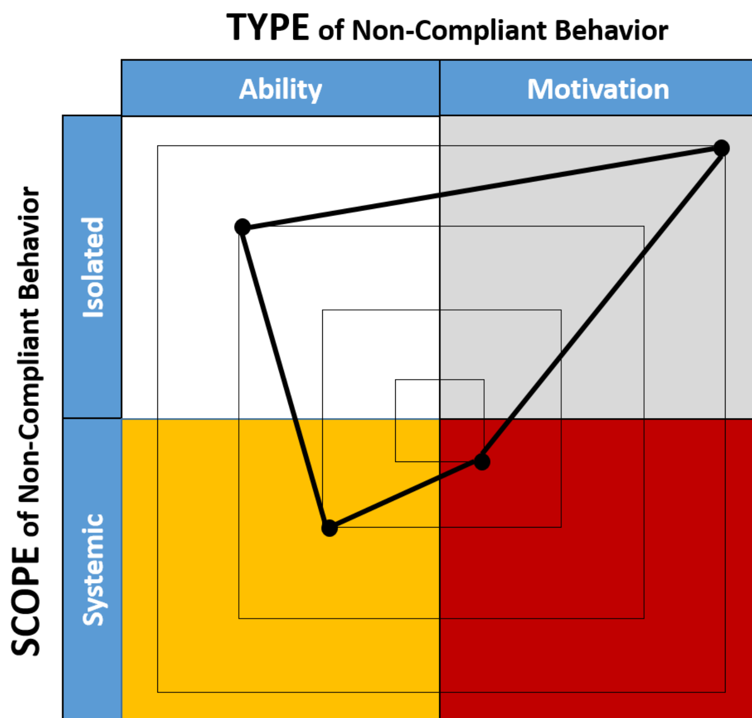
Non-Compliant Actions and Behaviors (Human Error) can be distilled down to one or more of four main underlying causes:

- **Isolated Ability**
- **Isolated Motivation**
- **Systemic Ability**
- **Systemic Motivation**

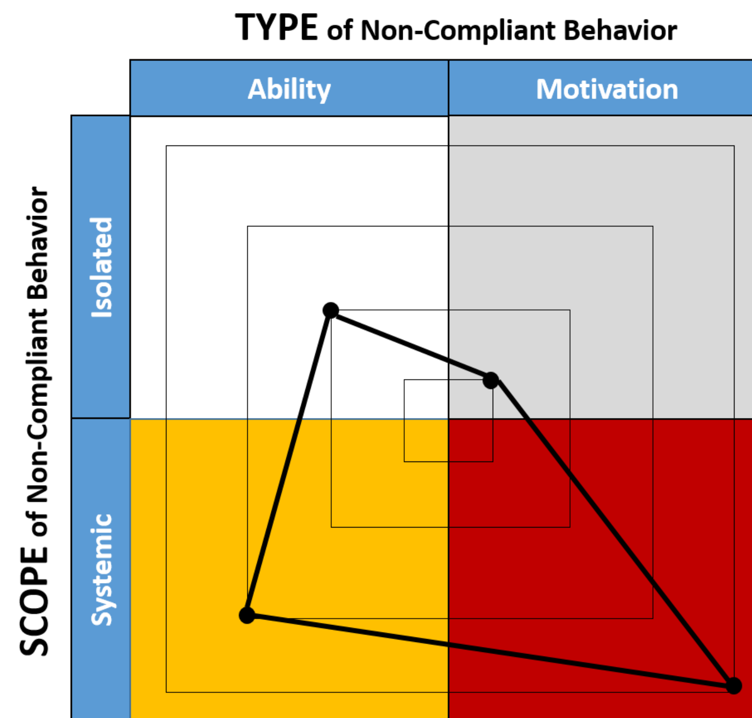
TYPE of Non-Compliant Behavior

SCOPE of Non-Compliant Behavior	Ability	Motivation
Isolated	Unintentional Individual Errors, Slips, Lapses or Mistakes	Deliberate Individual Deviations from Operating Practices and Systems of Work
Systemic	Deficiencies with Operating Standards Competence Programs, Resources and / or Systems of Work	Operating Culture defaults towards Normalized Deviance and supports “Casual Compliance”

Perceived underlying reasons for non-compliant actions and behaviors

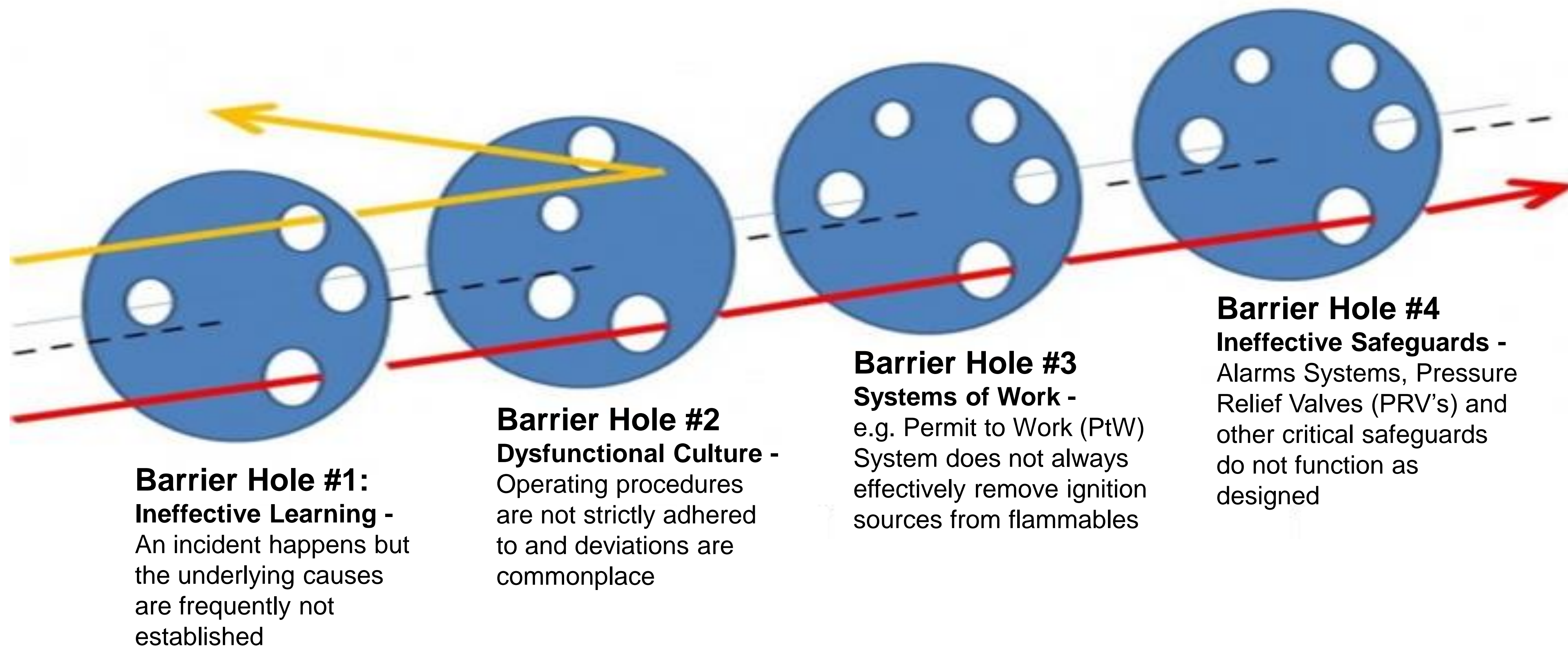


Actual underlying reasons for non-compliant actions and behaviors



Note: Where the **SCOPE** of non-compliance is systemic, solutions will likely reside within the top-half (rather than the bottom-half) of the organization

“Swiss-Cheese” Model



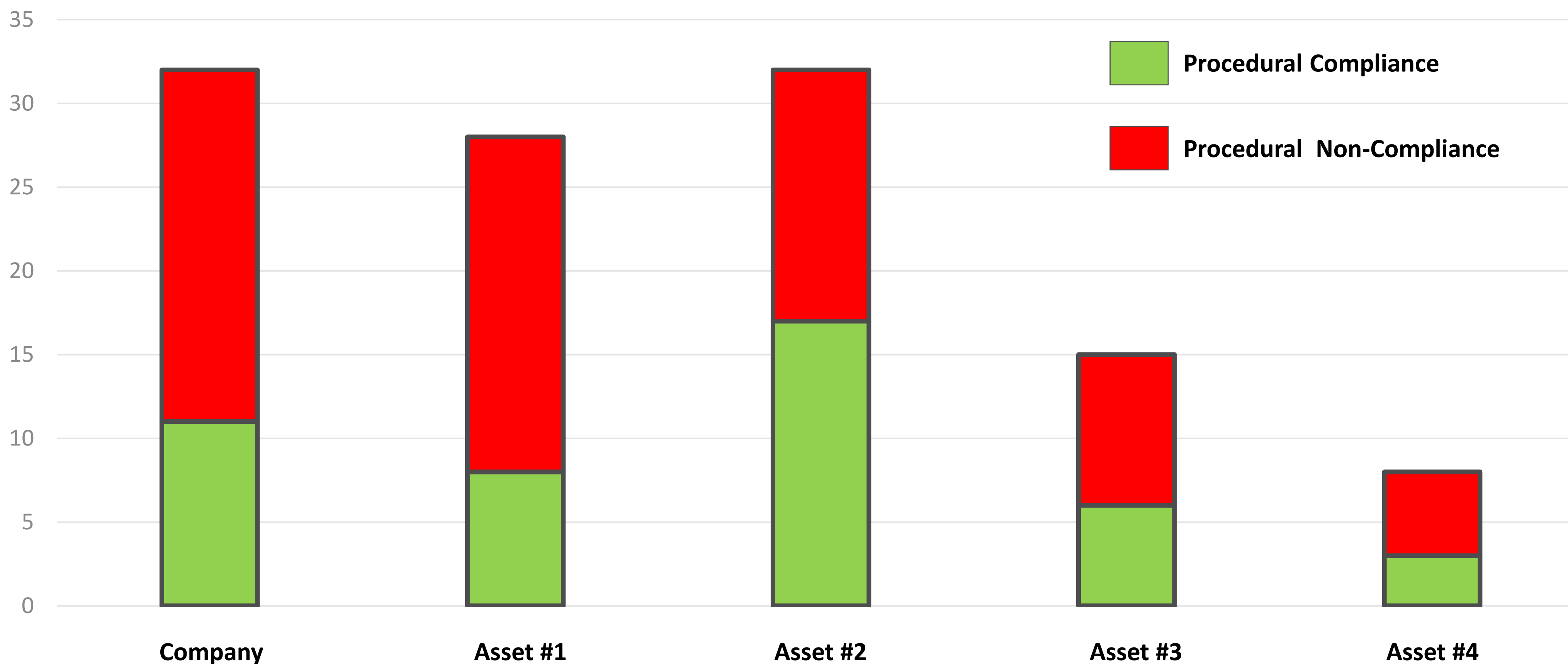
3. Misuse of Performance Metrics to determine overall performance picture

Metrics to determine future likelihood of Catastrophic Events:

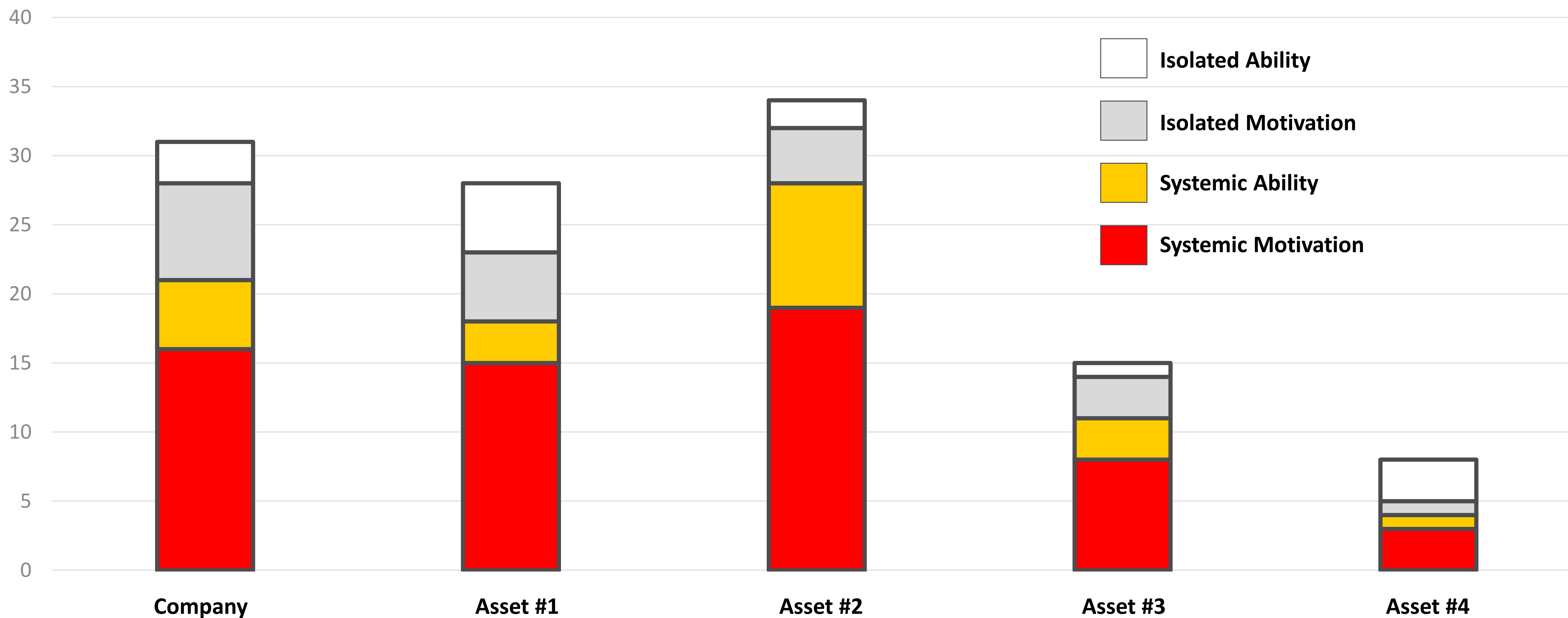
Requirements for Key Performance Indicators (KPI's):

1. Must reflect Major Operating Risks and Barrier Assurance;
2. Establish compliance levels (via actions and behaviors) of work on Barriers;
3. Determine the **TYPE** and **SCOPE** of all non-compliant work on Barriers;

Procedural Compliance for work on Barriers Q2-Q3 by Asset and Company



TYPE and SCOPE of Non-Compliant Behaviors for work on Barriers Q2-Q3 by Asset and Company



	Past management of Health, Safety and Environment (HSE)	Future management of Major Operating Risk
Performance Determination	Outputs and Results	Actions and Behaviors
Metrics	LTIR, TRIR, Near Misses Unplanned Spills / Discharges etc.	Barrier Status (availability and integrity)
Data Source of Metric	Work Execution: - Manage against unplanned negative outcomes (e.g. an injury) while doing the work	Work Performance: - Perform the work to the correct standard, so that Barriers always function as designed
Why Bad Things Happen	Perceived to be isolated, procedural violations and / or individual slips, lapses and mistakes (A Few “Rotten Apples”)	Recognition that non-compliance may be systemic and that the operating culture routinely defaults to “normalized deviance” (Organizational Dysfunction)
Corrective Actions	Solutions mostly reside close to the worksite (bottom-half of the organization)	Solutions mostly reside close to the corner office (top-half of the organization)

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