DIGITAL SOLUTIONS

Moving towards real time risk

Hydraulic analysis, the corner stone of pipeline safety & performance

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What do we mean by asset “performance”

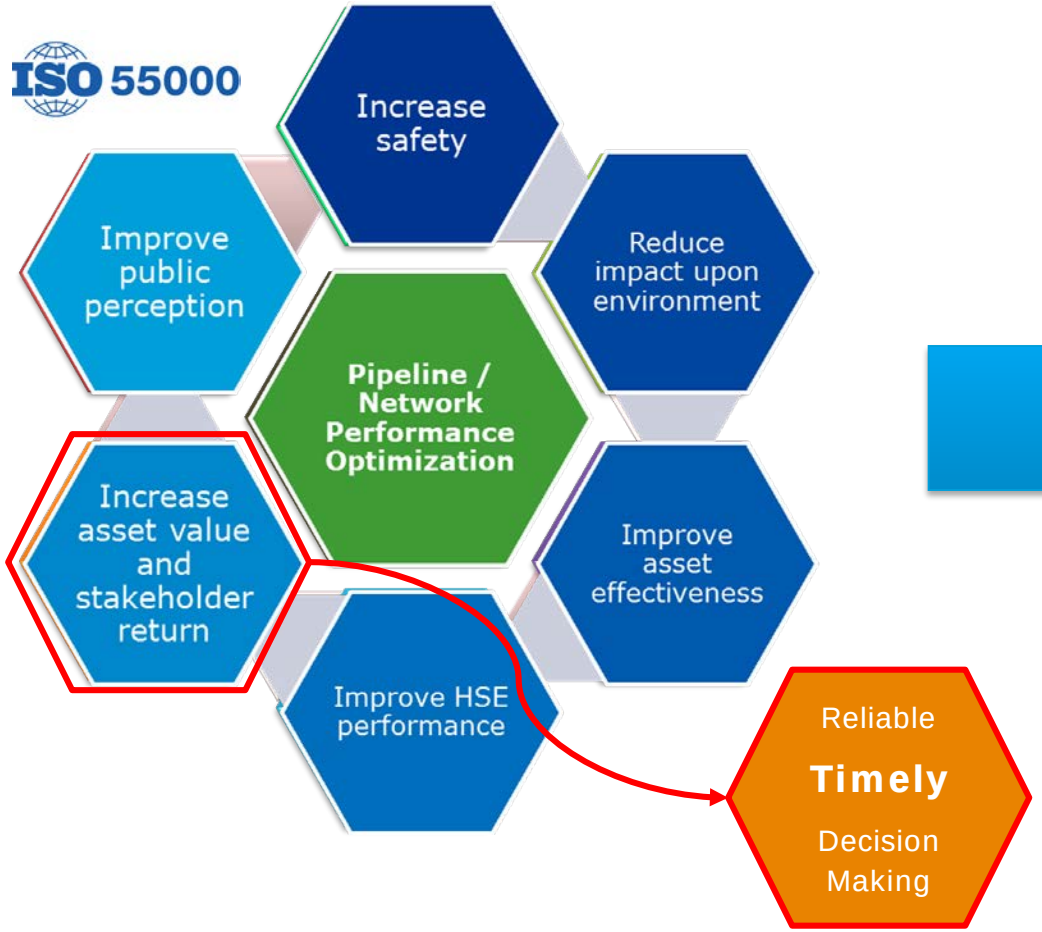
Asset **Performance** Management (APM)

techopedia

Definition - What does *Asset Performance Management (APM)* mean?

Asset performance management (APM) refers to the use of assets in order to realize business-specific goals. In business organizations, it is a framework that helps enable administrators to make good use of their physical assets. Different strategies are employed under asset performance management to maximize profits and reduce risk factors in a business.

Pipeline performance optimization



https://www.dnvgl.com/article/the-multiple-dimensions-of-asset-performance-management-166006

The journey towards operational risk and performance excellence

Performance Objectives

Safety

Public Perception

Environmental Impact

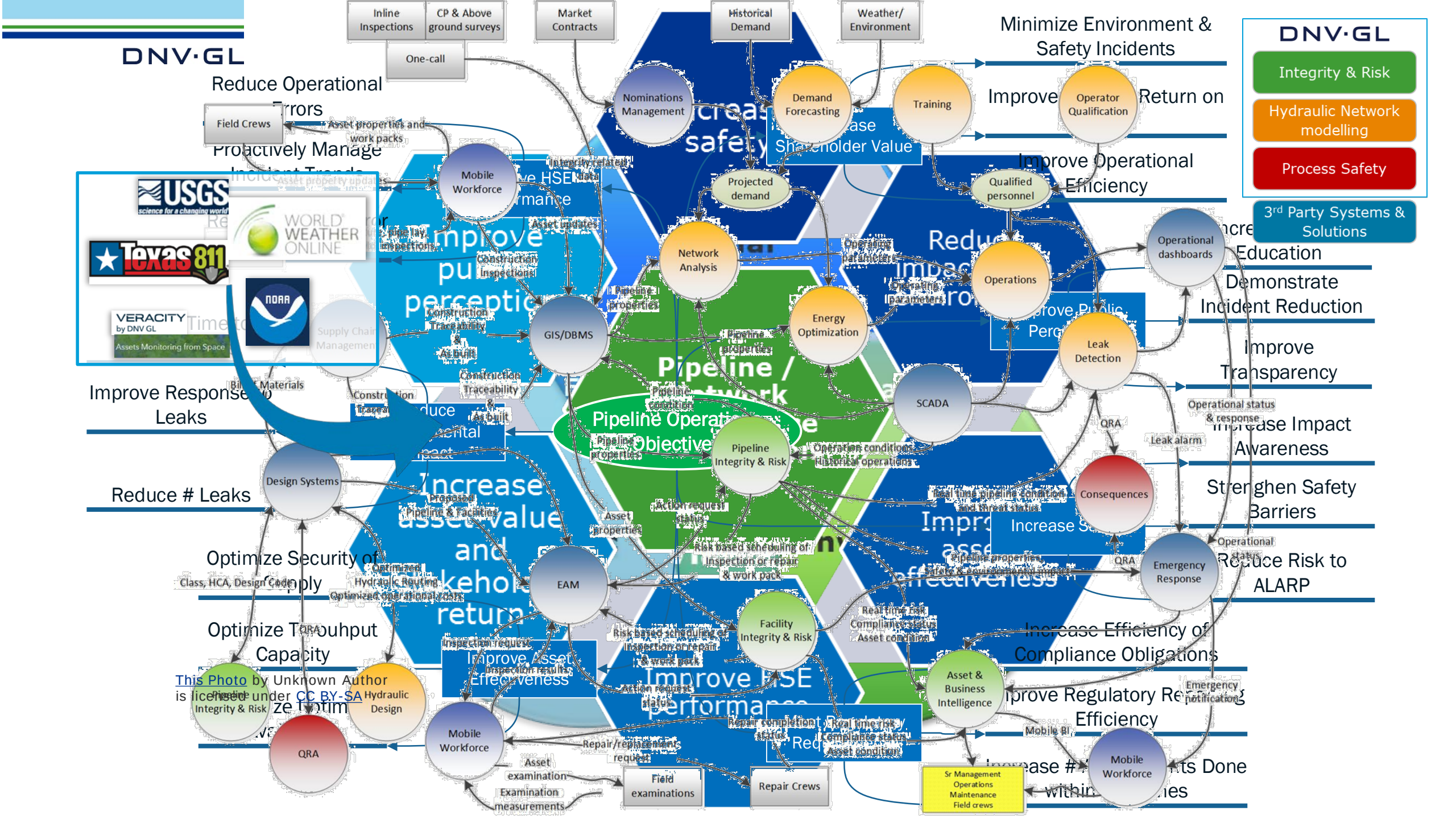
Asset Effectiveness

Economic Performance

Operational Maturity Level

Pipeline Lifecycle

	Acquire & create	Utilize	Maintain	Renew or Dispose
Enterprise Management				
Optimizing Asset Performance	Integrated operations with decision making based upon quantitative analytics utilizing verified & accessible data within and across all lifecycle stages and processes			
Disaster waiting to happen				



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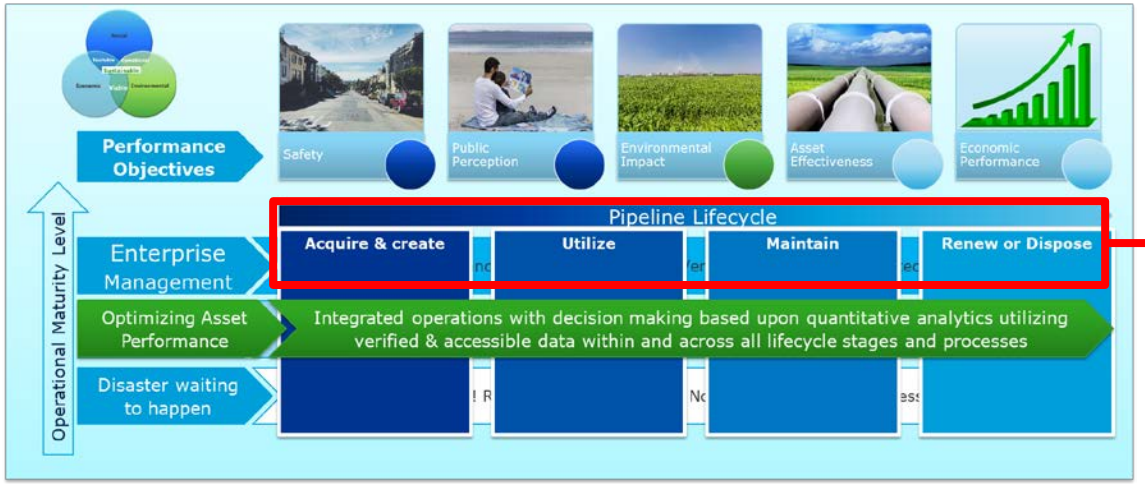
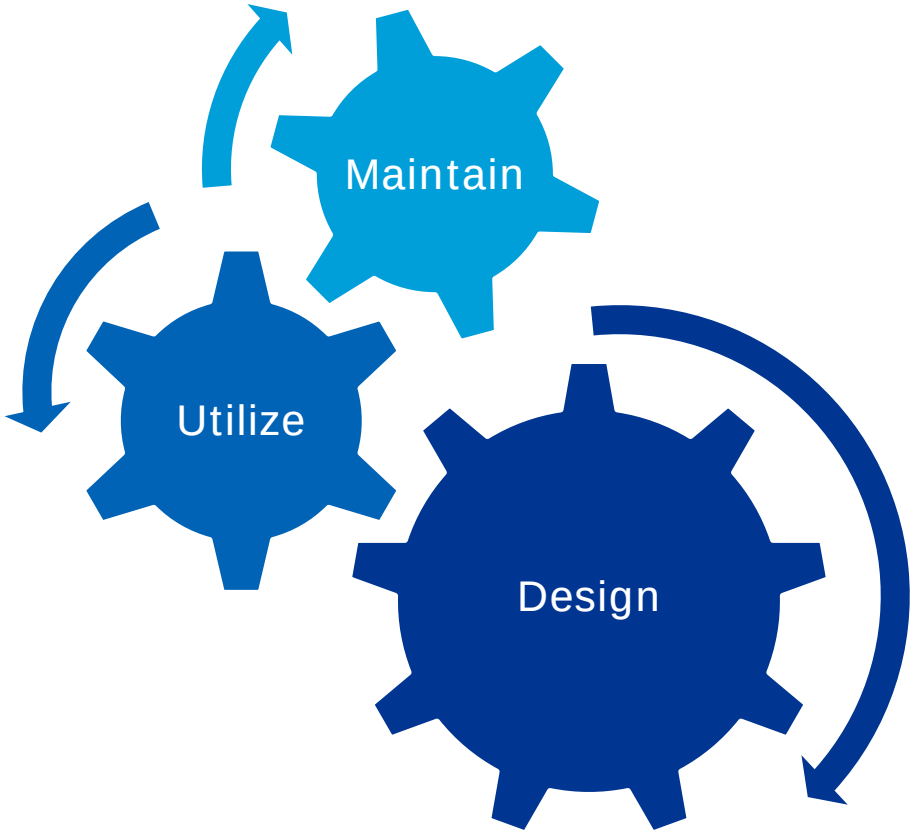
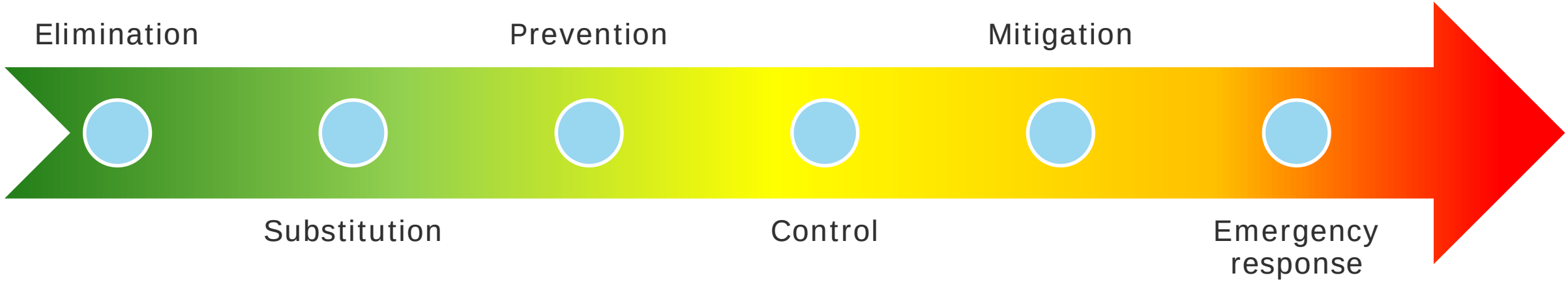
Spanning the lifecycle and operational boundaries



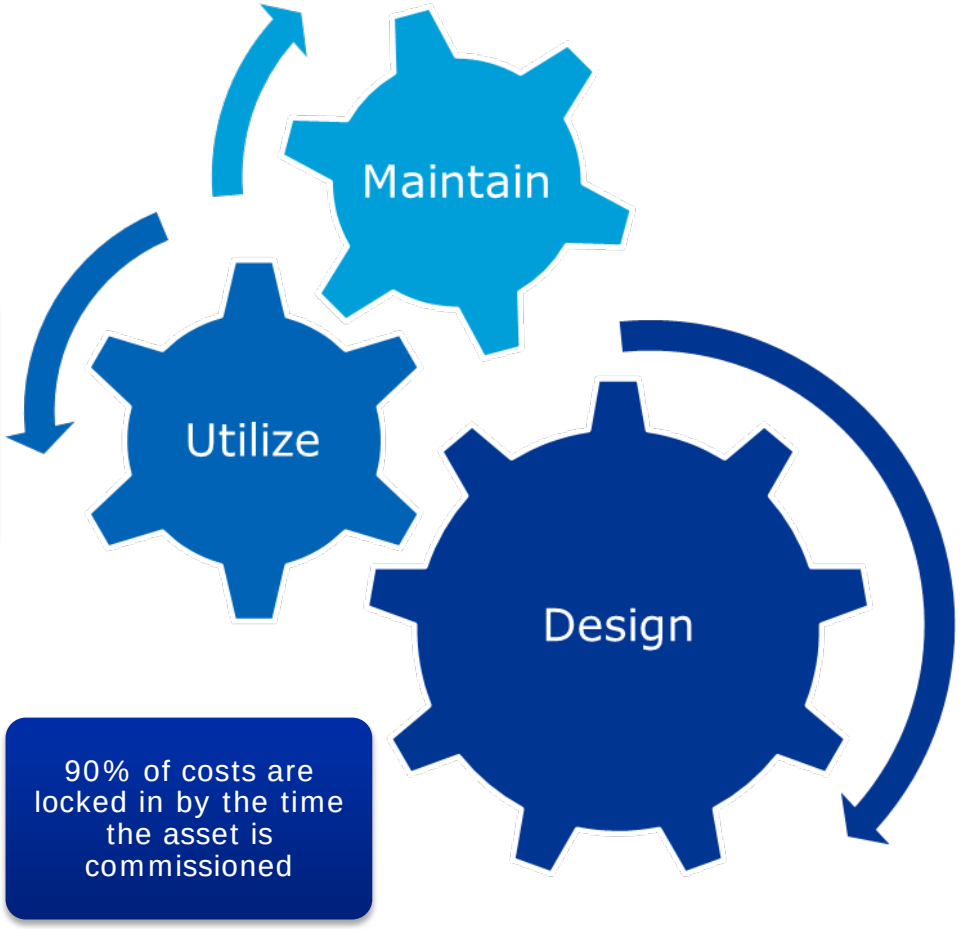


The spectrum of managing risk

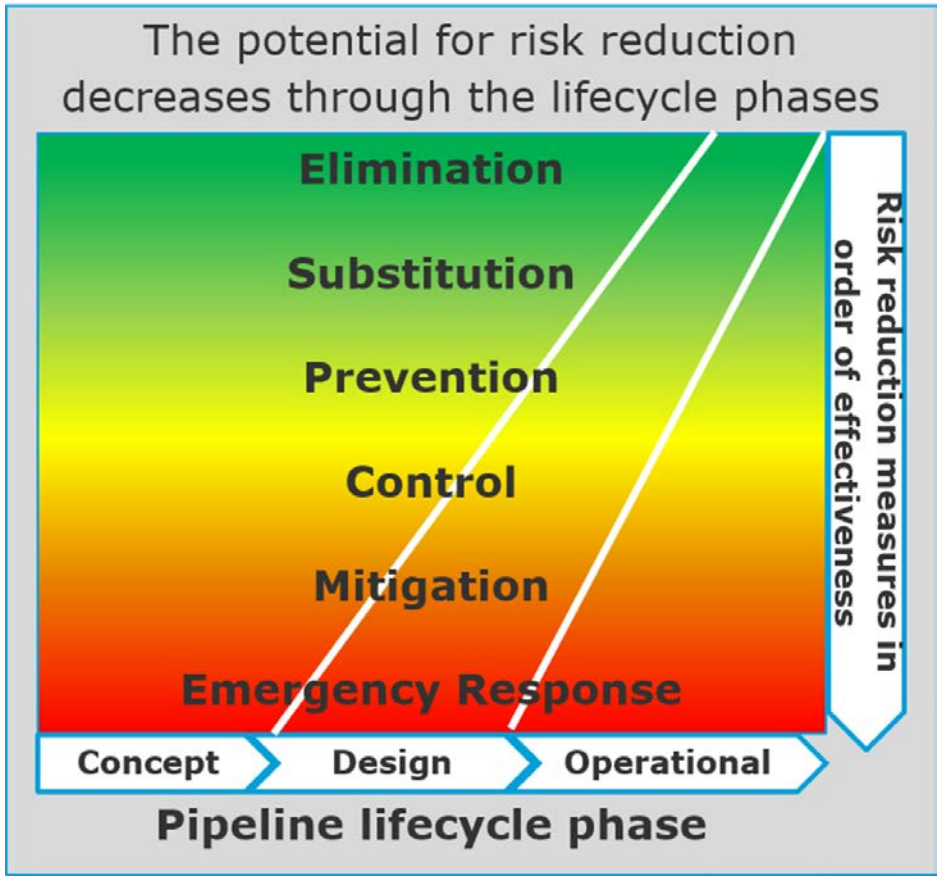


Breaking down lifecycle barriers

98% of lifetime cost is locked in by how the asset is designed, constructed and operated



90% of costs are locked in by the time the asset is commissioned

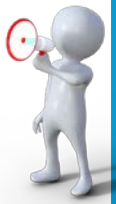


The need to break down operational barriers

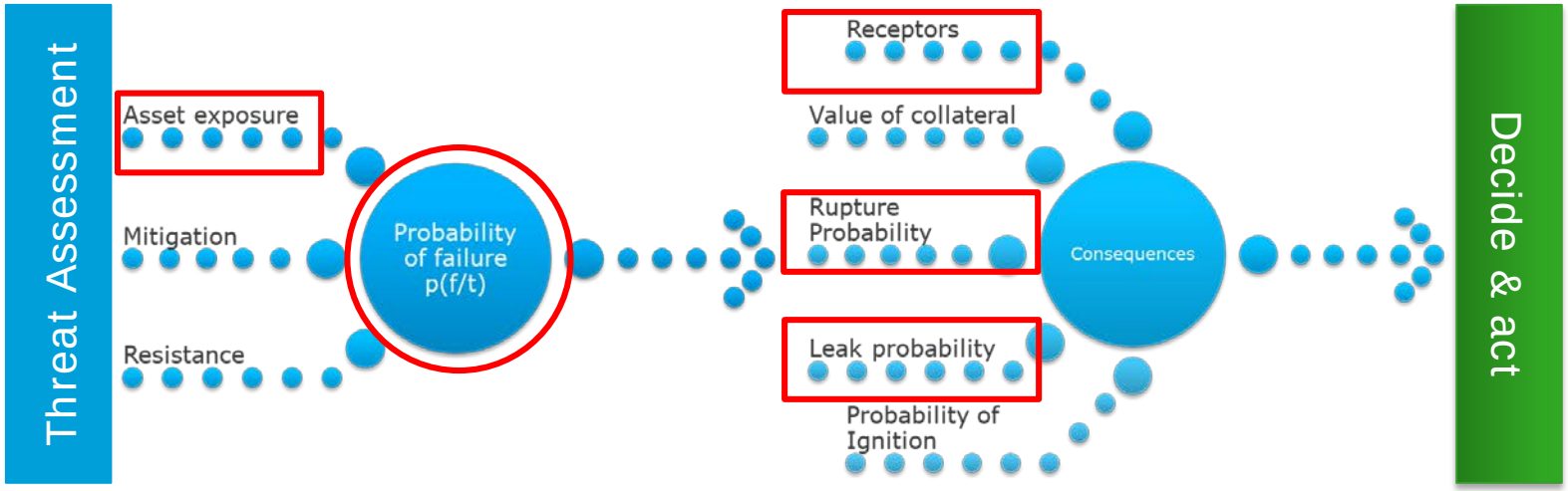
Risk assessment and risk based operational decision support

Safety, Damage Prevention, Integrity, …

"Back Office"



Control Room & Operations

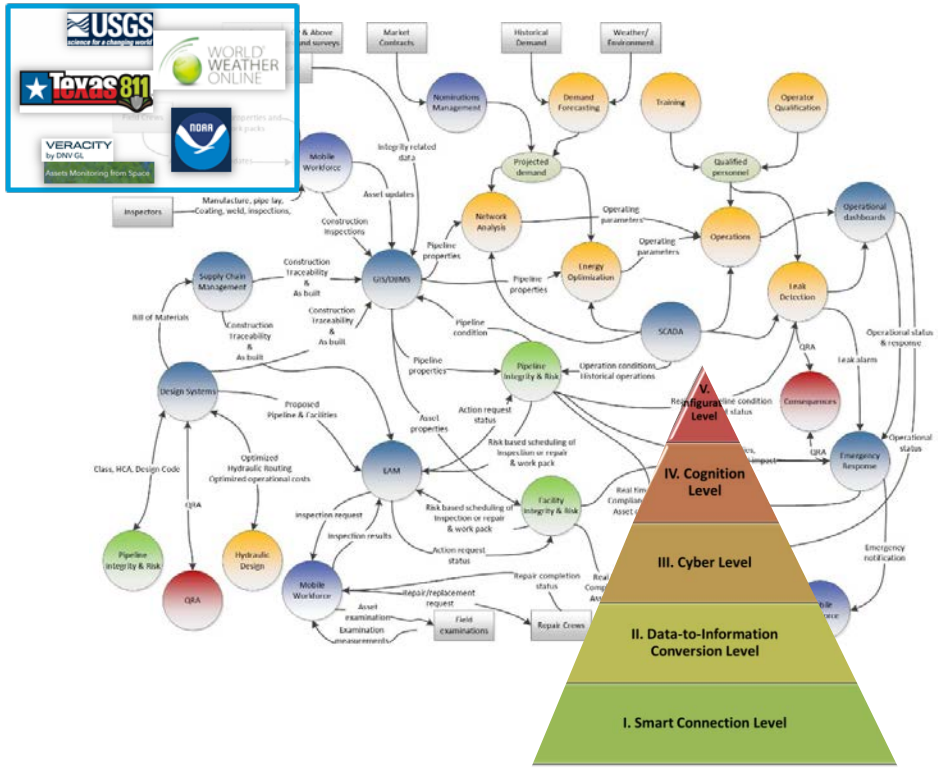


The types of exposure and the level of exposure to a threat is dynamic	Receptors can be dynamic	Operational profiles impact PoF	Our belief that there may be an active leak or rupture is dynamic

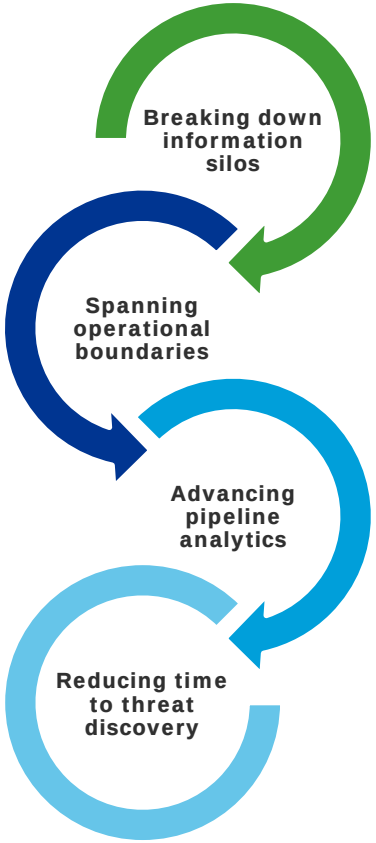
Achieving performance through asset centricity

To achieve this…

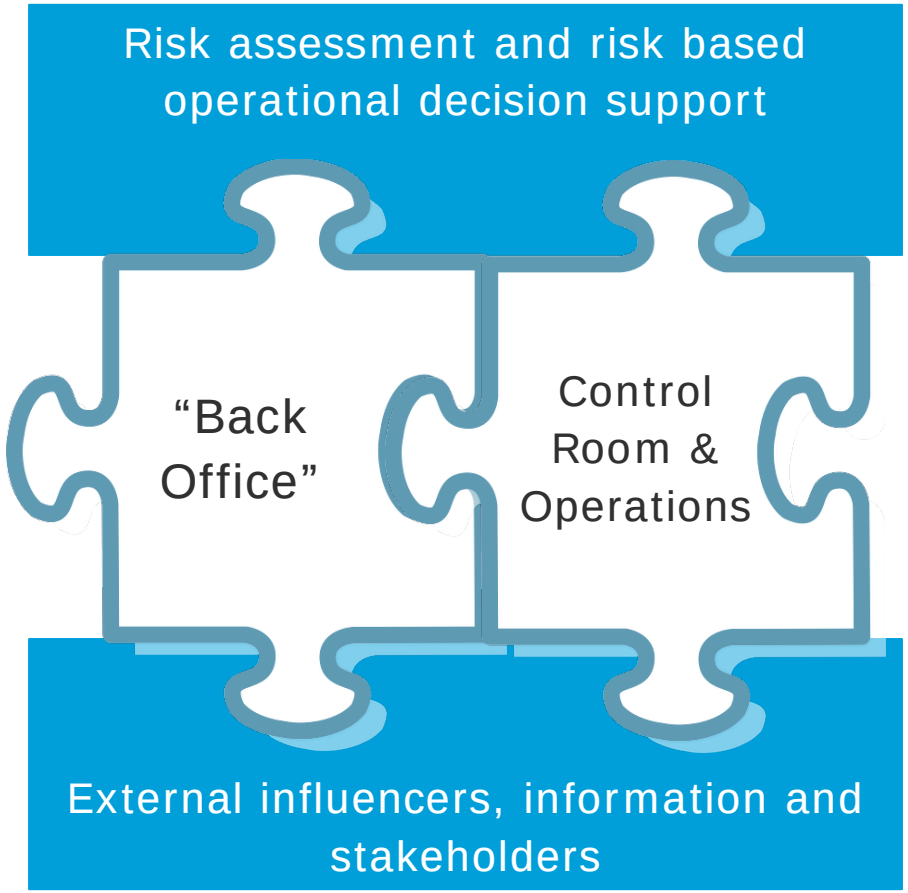
…we must address this…



…by doing this

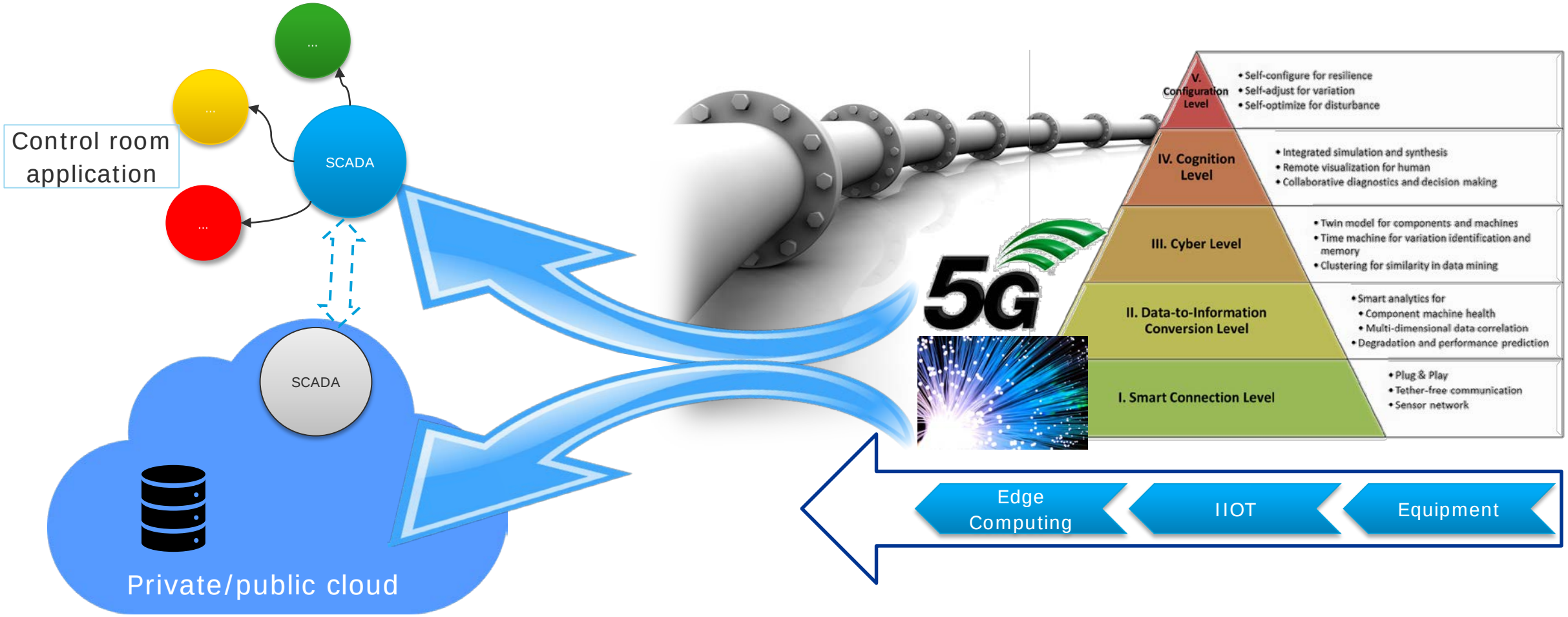


The landscape needs to change



How can technology help?

Data and “smart” equipment – increasing volume and complexity



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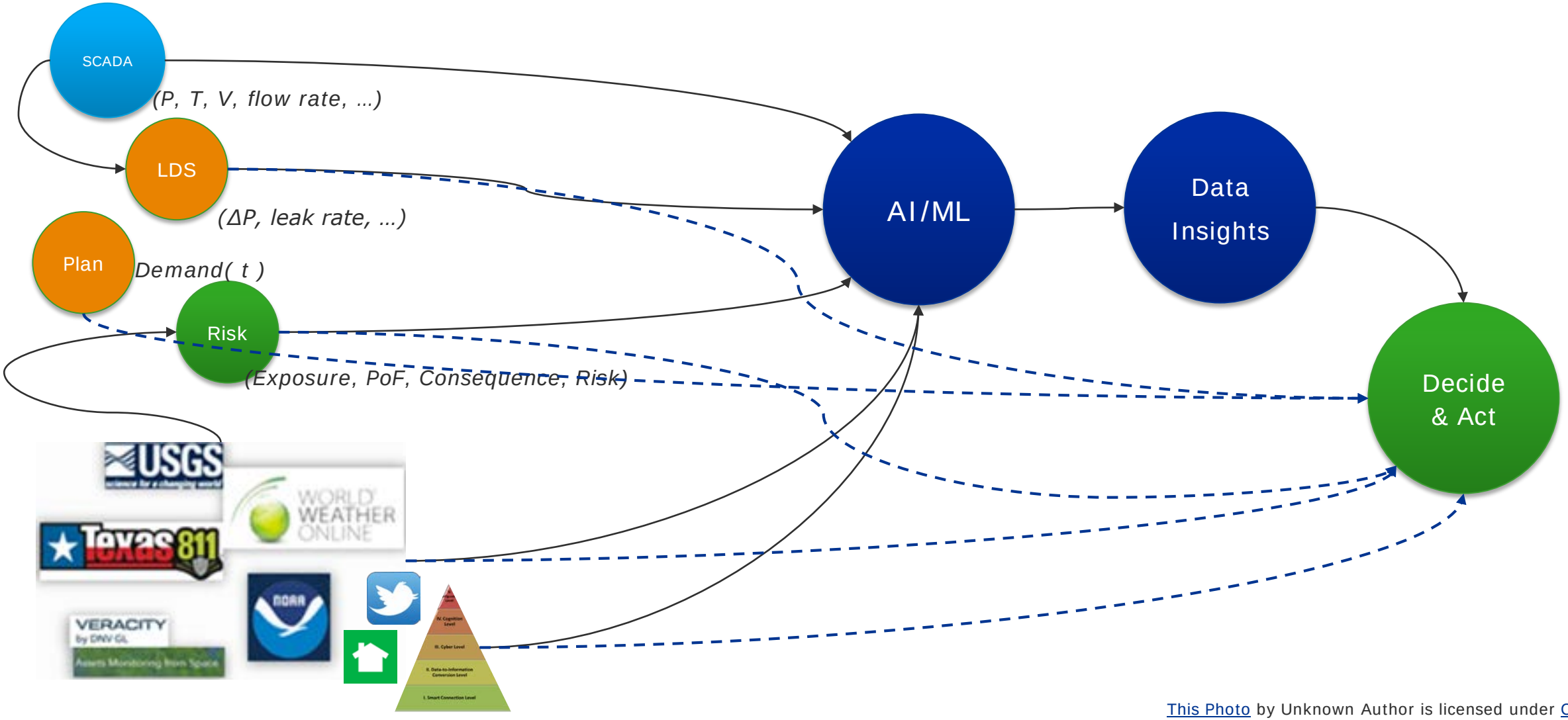
Combining engineering modelling and data driven analytics



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Technology is our enabler

"Devolved" analytics and decision making

Edge Computing → IIOT → Equipment

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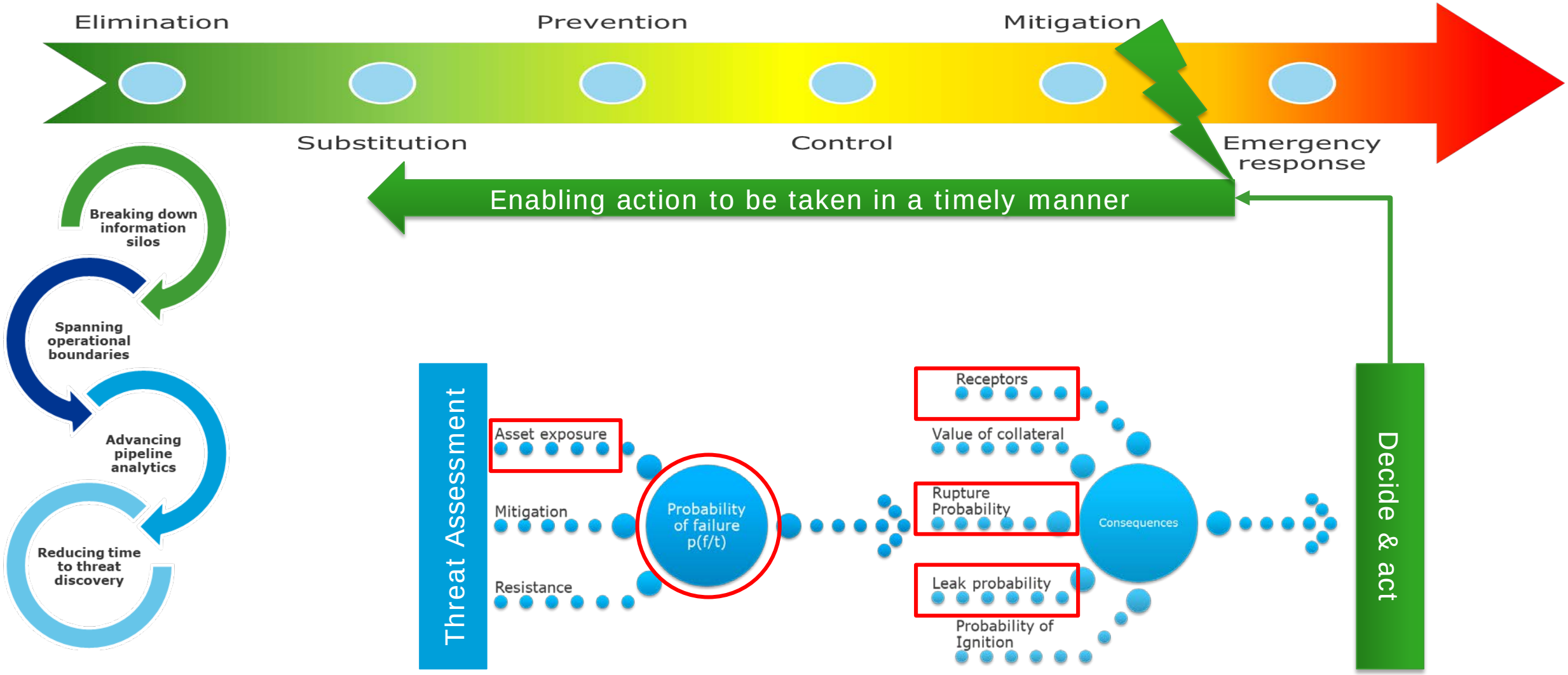
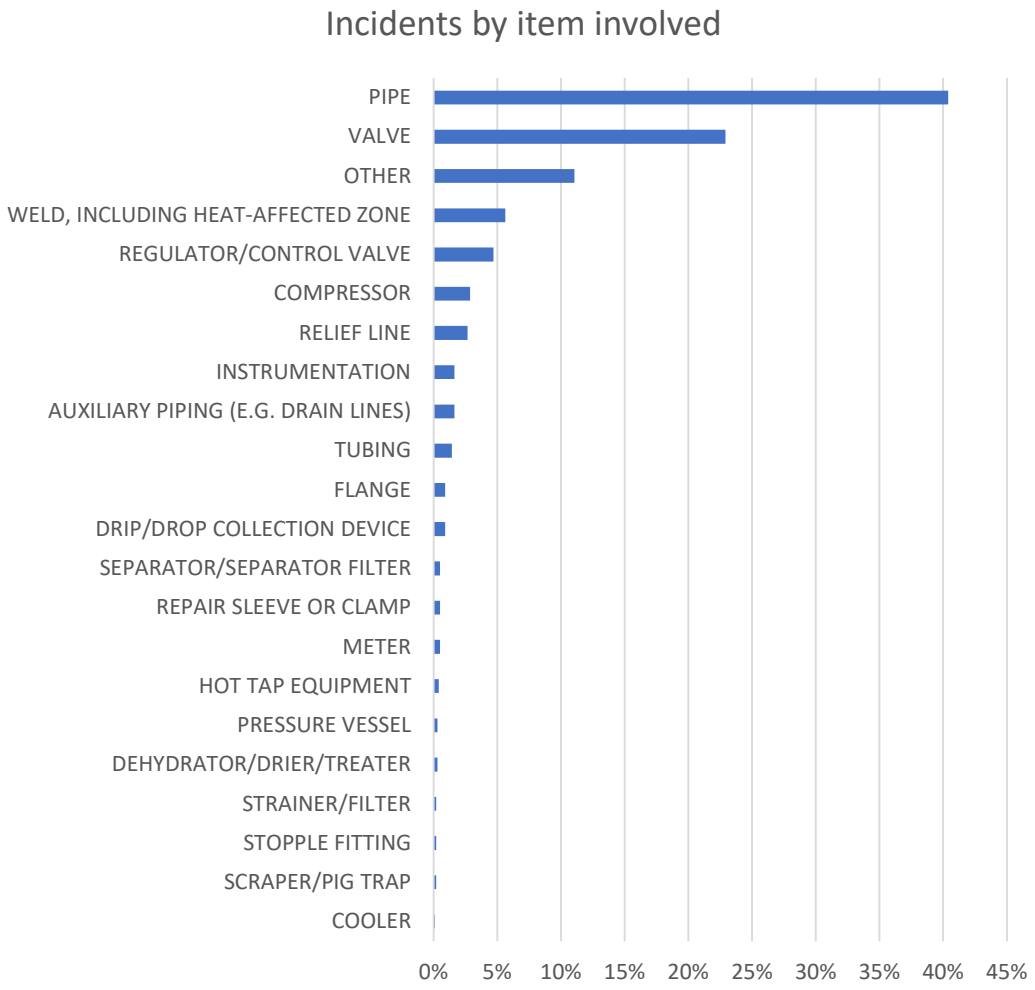
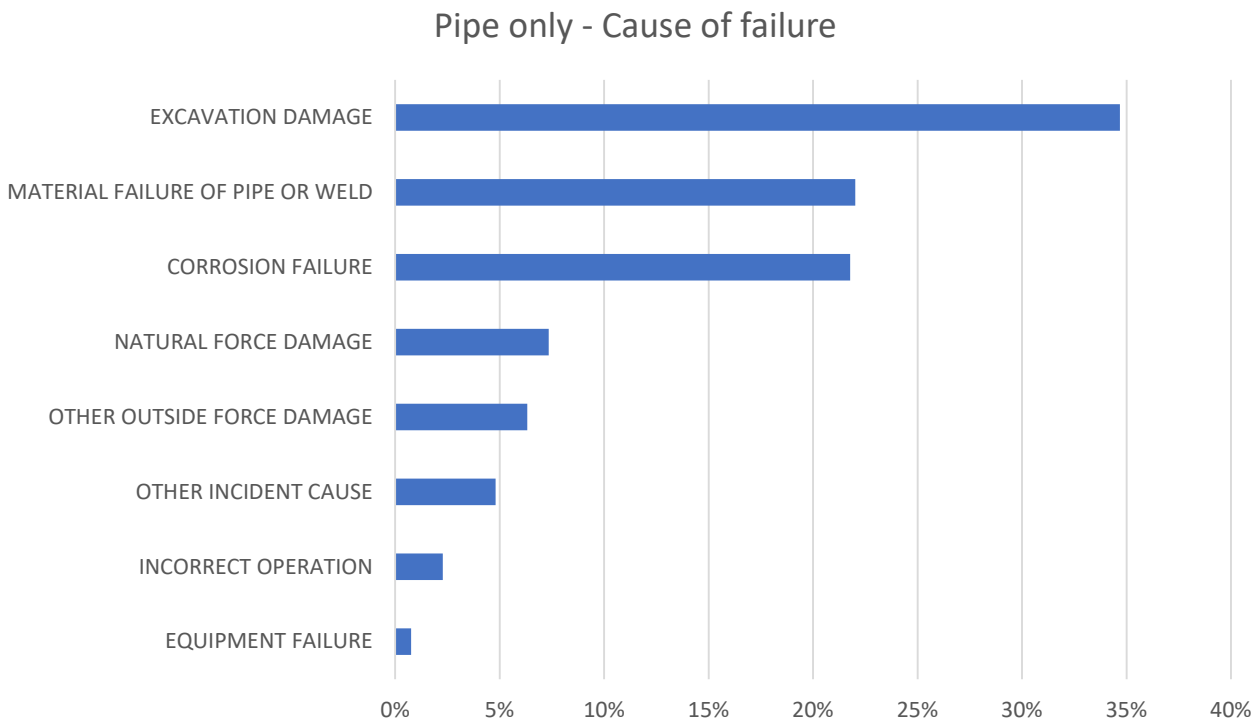
So….why do we need to do risk assessment near real-time?

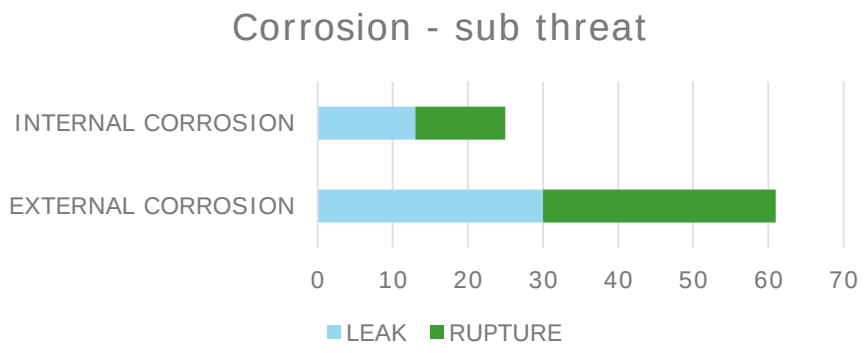


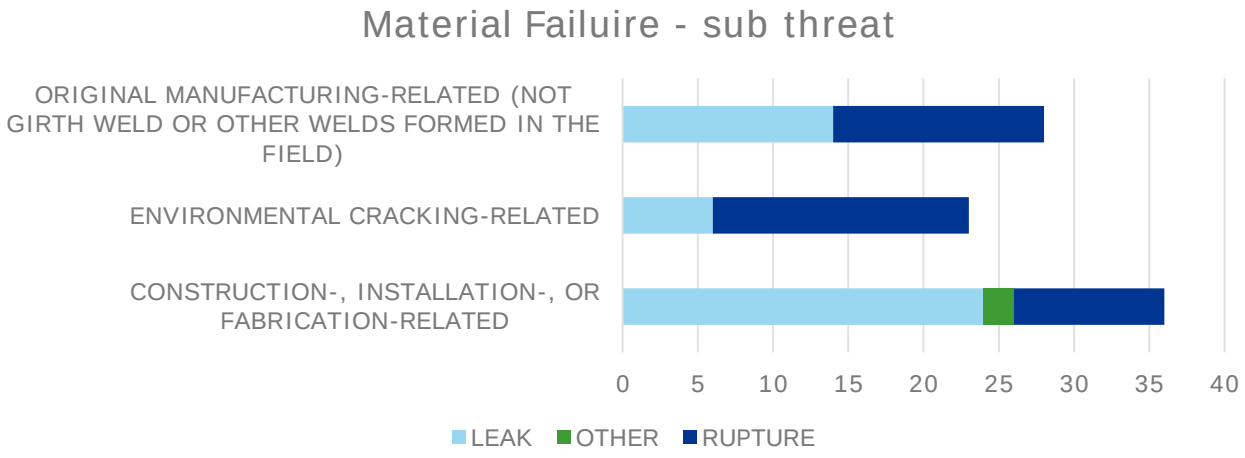
Pipeline system elements and causes of failure

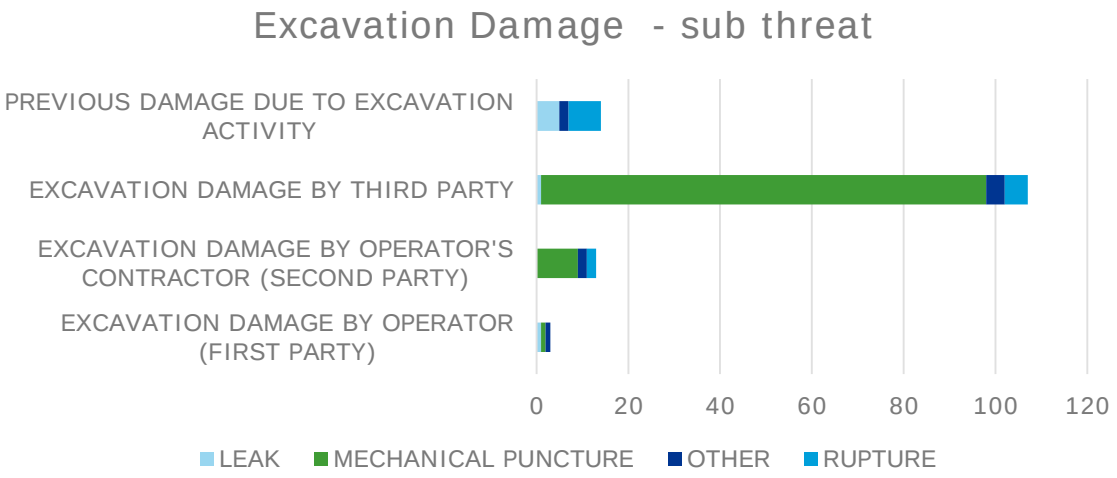


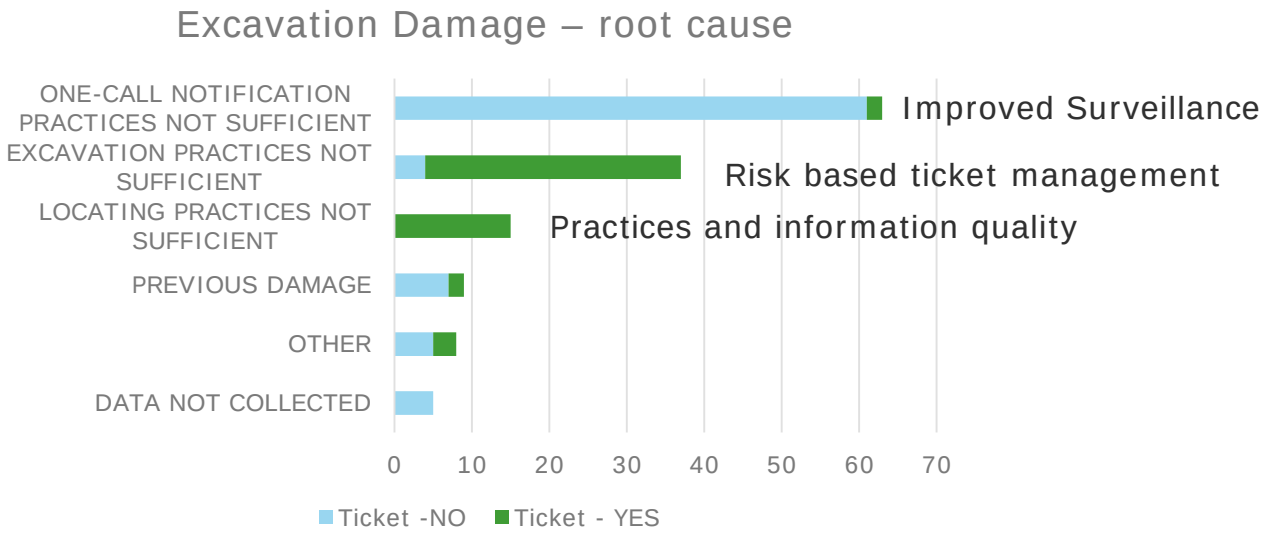


The major causes of incidents





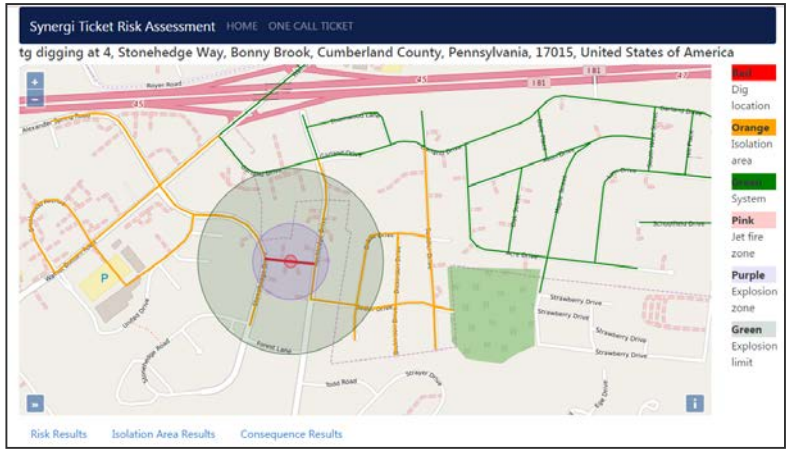




Example solution – one call ticket risk assessment

Know what's below. Call before you dig.

Risk based prioritization and response



- ❑ What is the risk associated with the excavation?
- ❑ Are special sites impacted?
- ❑ Could we have continuity of service?
- ❑ Meet demand / how many customers impacted?

Area isolation

Loss of supply

Customers

Simulate leak

Temp, Flow, velocity

Dispersion

Distance/concentration

Fire & radiation zones

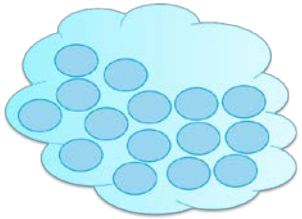
Distance to safe overpressure level

Probability of damage occurring

Contractor performance

Method susceptibility

Resistance & Mitigation



SynergiGasAPI

SOFTWARE

Synergi Gas - Advanced hydraulic modelling

PhastWebAPI

SOFTWARE

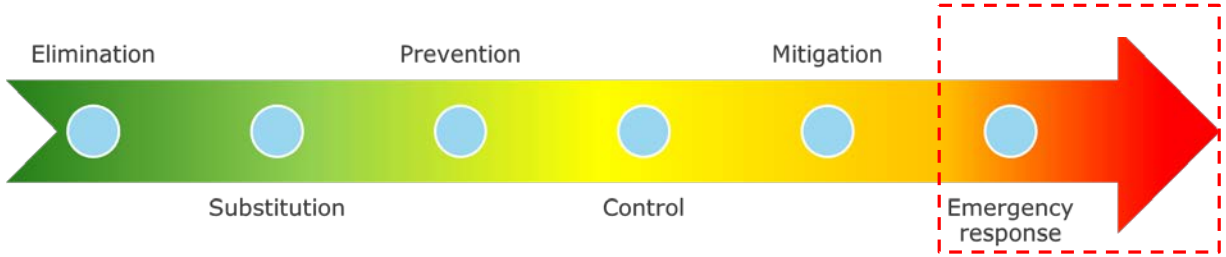
Phast - Process hazard analysis software

SynergiPipelineAPI

SOFTWARE

Synergi Pipeline - Pipeline integrity management

A specific challenge in the industry: PHMSA NPRM



"PHMSA is proposing to revise the Pipeline Safety Regulations applicable to newly constructed and entirely replaced onshore natural gas transmission and hazardous liquid pipelines to mitigate ruptures. Additionally, PHMSA is revising the regulations regarding rupture detection to shorten pipeline segment isolation times. These proposals address congressional mandates, incorporate **recommendations from the National Transportation Safety Board, and are necessary to reduce the consequences of large-volume, uncontrolled releases of natural gas and hazardous liquid pipeline ruptures."**

"…
These two incidents [San Bruno, Kalamazoo] are examples of release events where consequences can be significantly aggravated by some combination of missed opportunities by operators, including: **(1) Identifying that a rupture has occurred; (2) failing to take appropriate and prompt action(s) once a rupture has been identified**, including calling 911 following the rupture, activating emergency response protocols, and notifying first responders and public officials; and (3) failing to promptly access and close available segment isolation valves that would be most beneficial for mitigating the impact of the rupture.
"

What can risk do for us when we are in the red zone?

Risk =

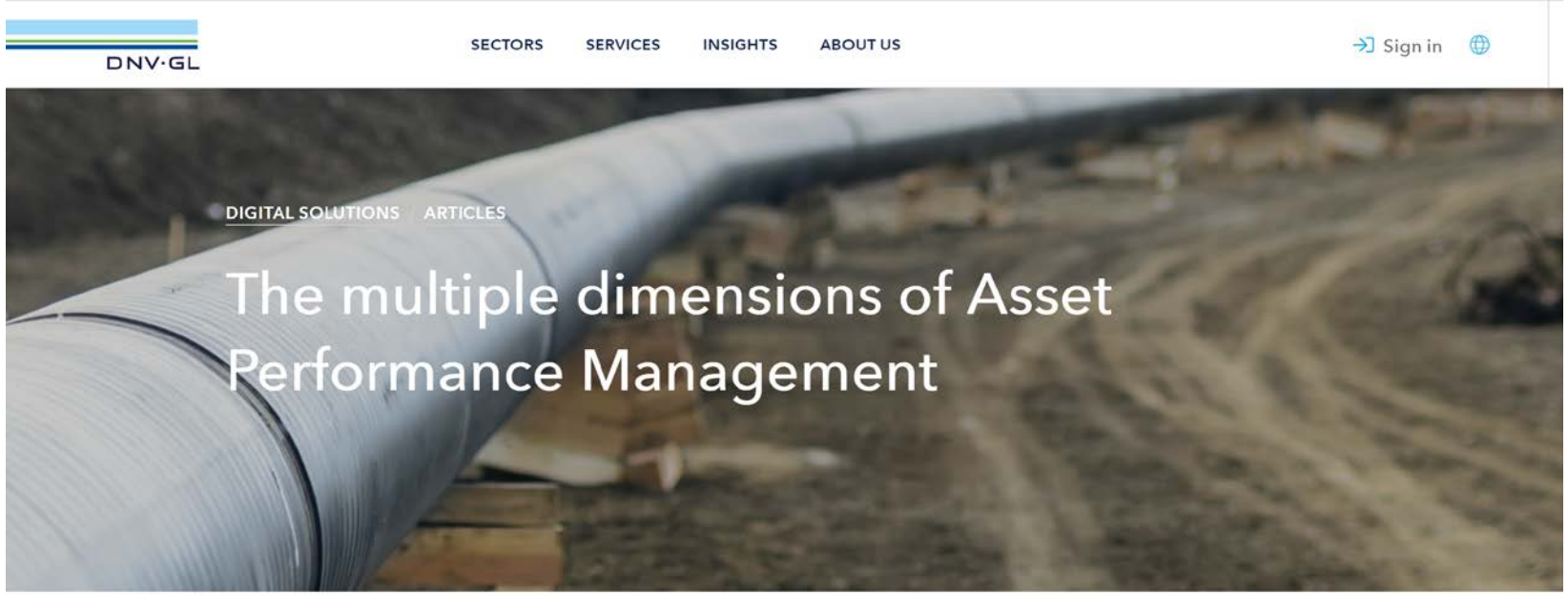
Probability of failure

X

Consequence of failure

- Prioritize actions by segment risk level
- PoF is our “prior” belief that a failure could occur at a point in time and at a defined location
- Prioritize by consequences
- Prioritize by locations where there is the highest potential for risk exposures to have increased

Find out more about APM for pipelines



The natural gas industry is an example of where it is both a fuel of the present and widely accepted as a transition fuel in the quest for a carbon-neutral future. In this role it has the spotlight upon its performance. Performance here is defined on multiple dimensions. The challenge is to reliably deliver critical energy to industry and domestic users in a safe and sustainable way. This is set in a social

CONTACT US:

How can we help you?

REQUEST INFORMATION >

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Capabilities of Representative APM Vendors

APM Categories	ABB*	ARMS Reliability	AspenTech	AVEVA*	Bentley Systems*	Detechtion Technologies*	DNV GL	GE Digital*	IBM*	IPS-Intelligent Process Solutions*	MaxGrip*	SAP*	SAS	Siemens*	Uptake Technologies
Asset Risk Management	Limited	Comprehensive	Limited	Limited	Comprehensive	No capability	Comprehensive	Comprehensive	Limited	Comprehensive	NR	Limited	Limited	Comprehensive	Limited
Reliability-Centered Maintenance (RCM)	Limited	Comprehensive	Limited	Limited	Comprehensive	No capability	Comprehensive	Comprehensive	Limited	Comprehensive	NR	Limited	Limited	Comprehensive	Limited
Predictive Asset Management	Comprehensive	No capability	Comprehensive	Comprehensive	Comprehensive	Comprehensive	Comprehensive	Comprehensive	Comprehensive	Comprehensive	NR	Comprehensive	Comprehensive	Comprehensive	Limited
Condition-Based Management	Comprehensive	No capability	Limited	Comprehensive	Comprehensive	Comprehensive	Comprehensive	Comprehensive	Comprehensive	Comprehensive	NR	Comprehensive	Limited	Comprehensive	Comprehensive

Comprehensive, cross-industry capabilities | Limited or unproven capabilities | No capability

Source: Gartner
*Capabilities listed are provided by multiple products of different origins (see the Representative Vendors section).
ID: 335410

Thank you for your attention

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