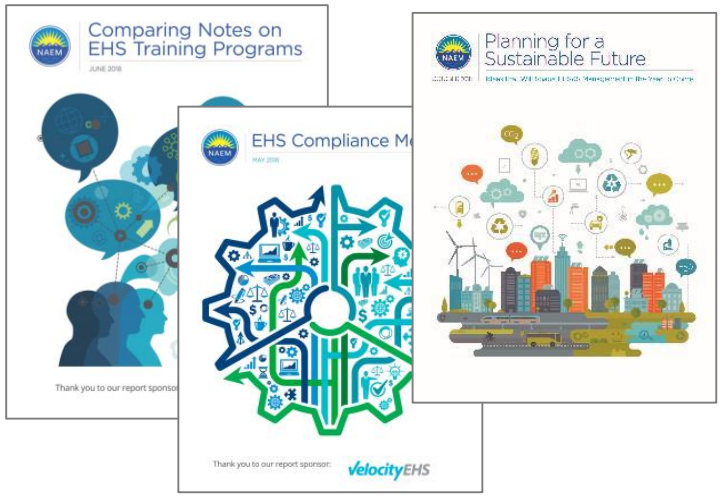
Improve Enterprise Risk Management With Systems Thinking and New Technology

November 21, 2019

Welcome to NAEM

Peer Forums

Research Insights



Targeted Networking

Actionable strategies that empower EHS&S leaders to make an impact

We Connect EHS & Sustainability leaders

120

Corporate Members

4,700

Individual Members

60

Affiliate Members

Reaching a community of Practice

100K+

Today’s Speakers

Danyle Hepler
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Safety Manager
Haley & Aldrich Inc.

Ross Johnson
President
Bridgehead Security
Consulting, Inc.

Improve enterprise risk management with systems thinking and new technology

Danyle Hepler, Haley & Aldrich, Inc.
Ross Johnson, Bridgehead Security Consulting, Inc.

HALEY ALDRICH

Learning objectives:

Learn how different parts of an organization can function systemically, how to create a holistic portrait of risk using metrics from across your company, and how effectively some of today's technologies can mitigate risk.

By end of presentation: You will think differently about high-impact, low-frequency (HILF) events

HALEY ALDRICH

Who we are

Danyle Hepler
Corporate Health & Safety Manager
Haley & Aldrich, Inc.

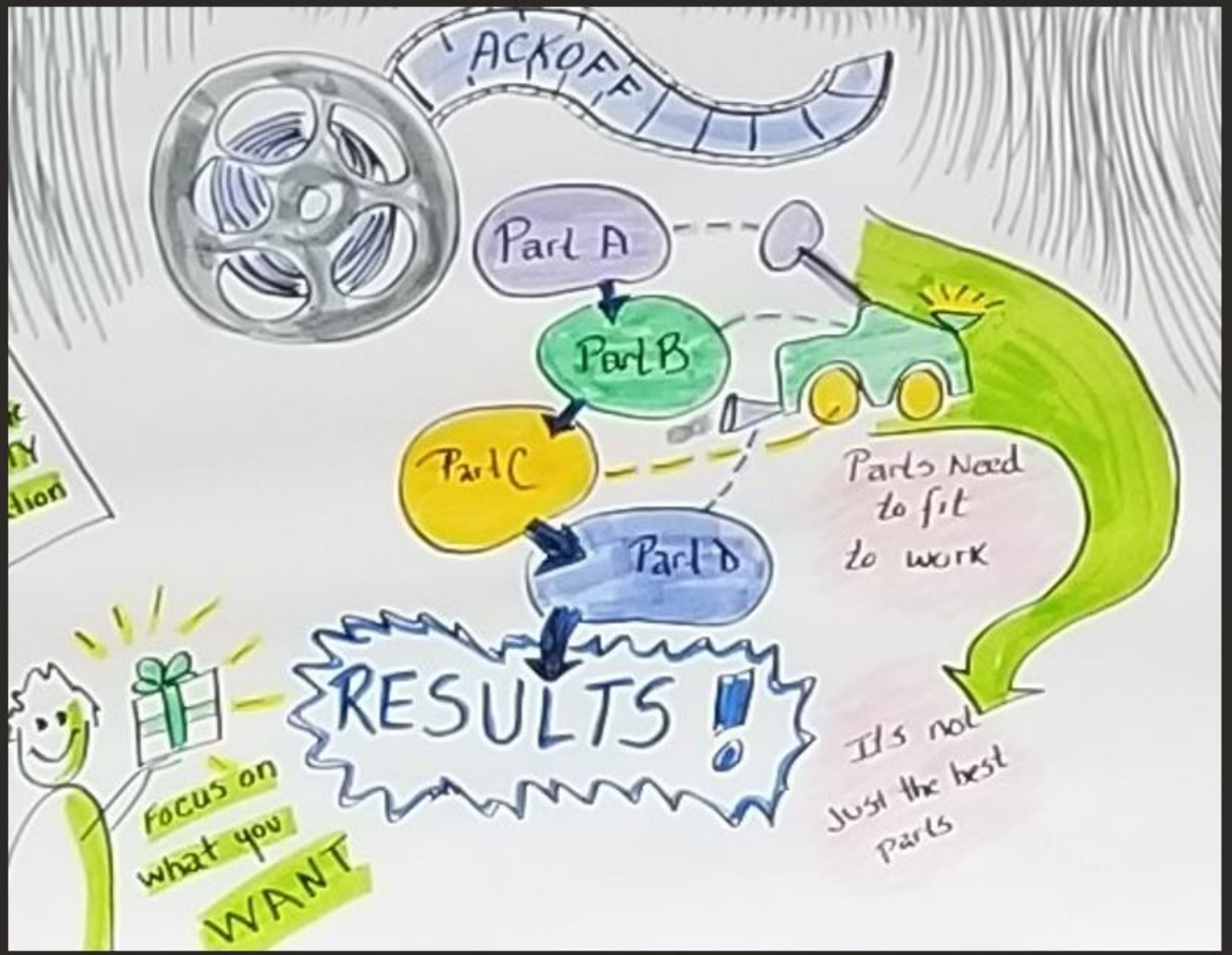
Ross Johnson
President
Bridgehead Security Consulting

Limited views

- Mental models
- Assumptions
- Data and details presented

  (may be limiting or incomplete)

Think of data as fitting together for systems thinking (thinking in holistic terms)



Why patterns are important

- Our operations develop systemic patterns
- These systems give us data
  - Data gives us information, information gives us knowledge

This knowledge allows us to observe our operations in motion, predict problems, and intervene before they become dangerous or damaging

"THERE IS A GIANT DIFFERENCE BETWEEN KNOWING A THING AND KNOWING THE DATA BEHIND THAT THING. "

-CHRIS MCCHESNEY, CO-AUTHOR OF THE 4 DISCIPLINES OF EXECUTION

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How to gain knowledge from data

- The system will give us frequent data. Data can be positive or negative.
- Positive and negative feedback loops. Use the data to understand how the system is operating (wanted outcomes vs. unwanted outcomes)
- Use frequent data (feedback loops) to predict the system's behavior
- This data is information that we use to form knowledge for better predictions (we adjust our behavior)

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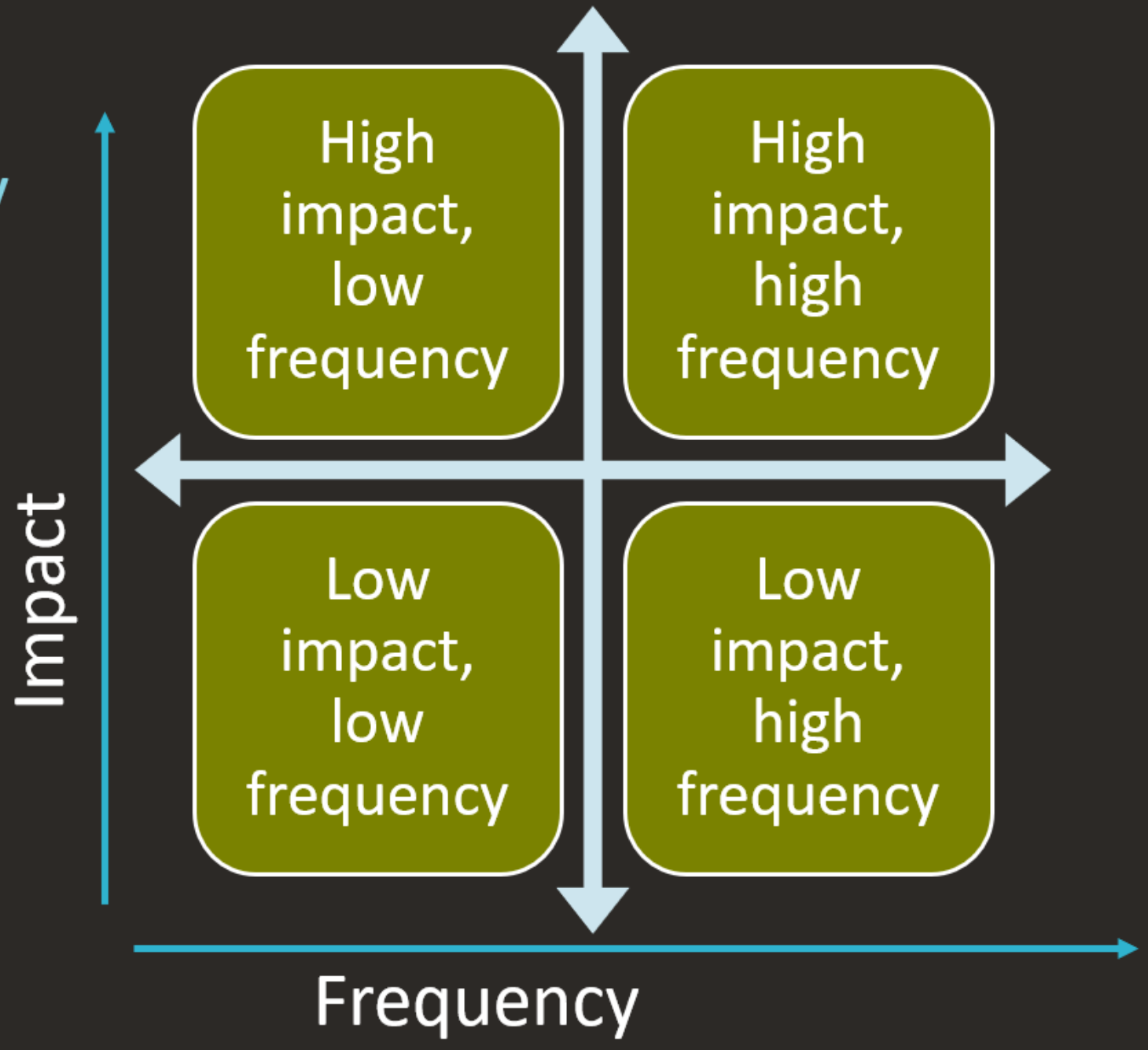
Impact and frequency chart



How to gain knowledge from data

- When we have data from certain areas, we tend to put resources towards these areas because the data tells us something. We use data to justify where we put our resources for wanted outcomes.

- However, we lack data for HILF events because by nature they're infrequent and unpredictable

- HILF events are difficult to predict in time/location or both. These kind of events are often overlooked and we don't tend to spend time evaluating this quadrant (i.e. Pacific Northwest earthquake scenario will definitely happen someday, but no one knows when)

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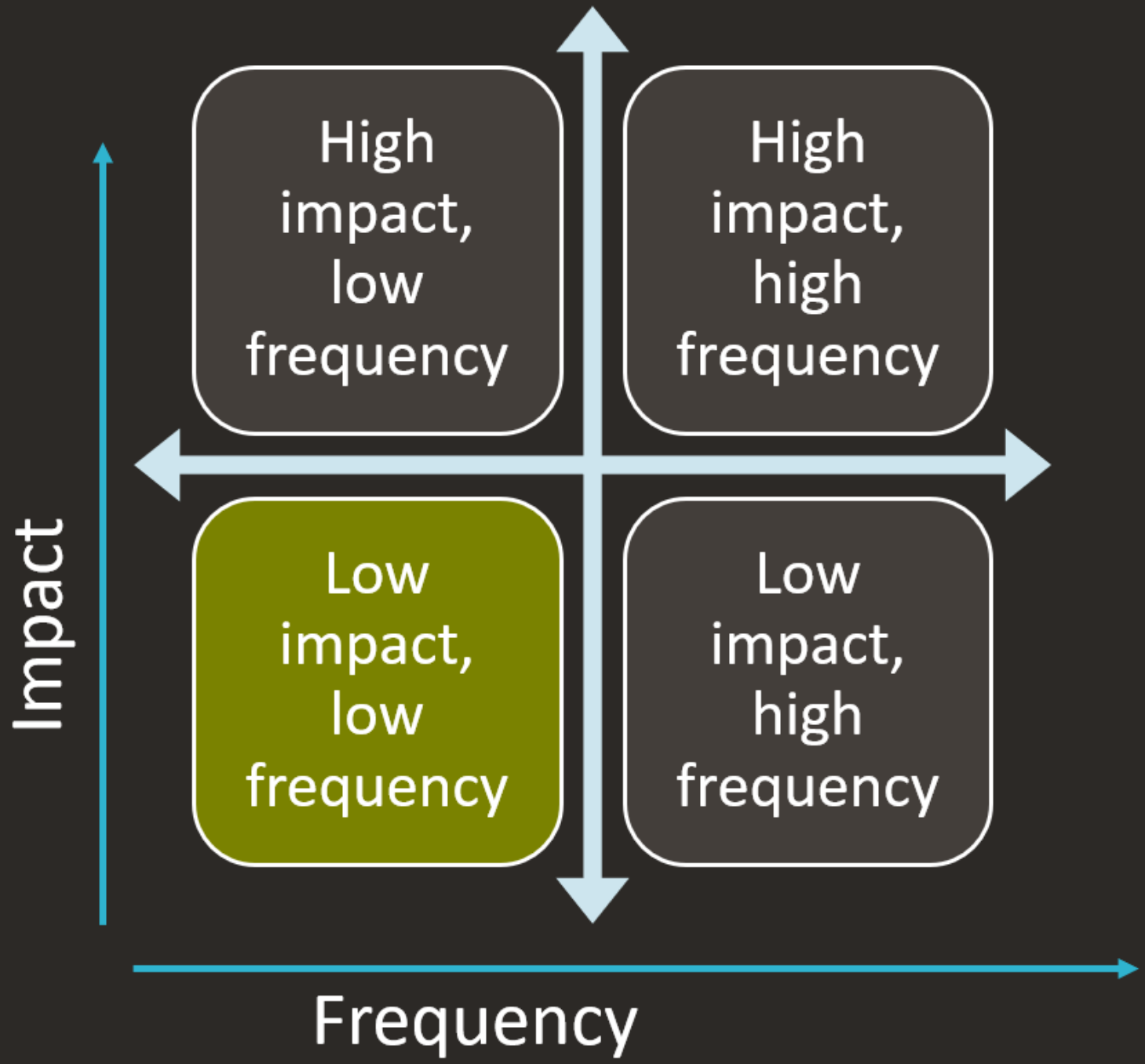
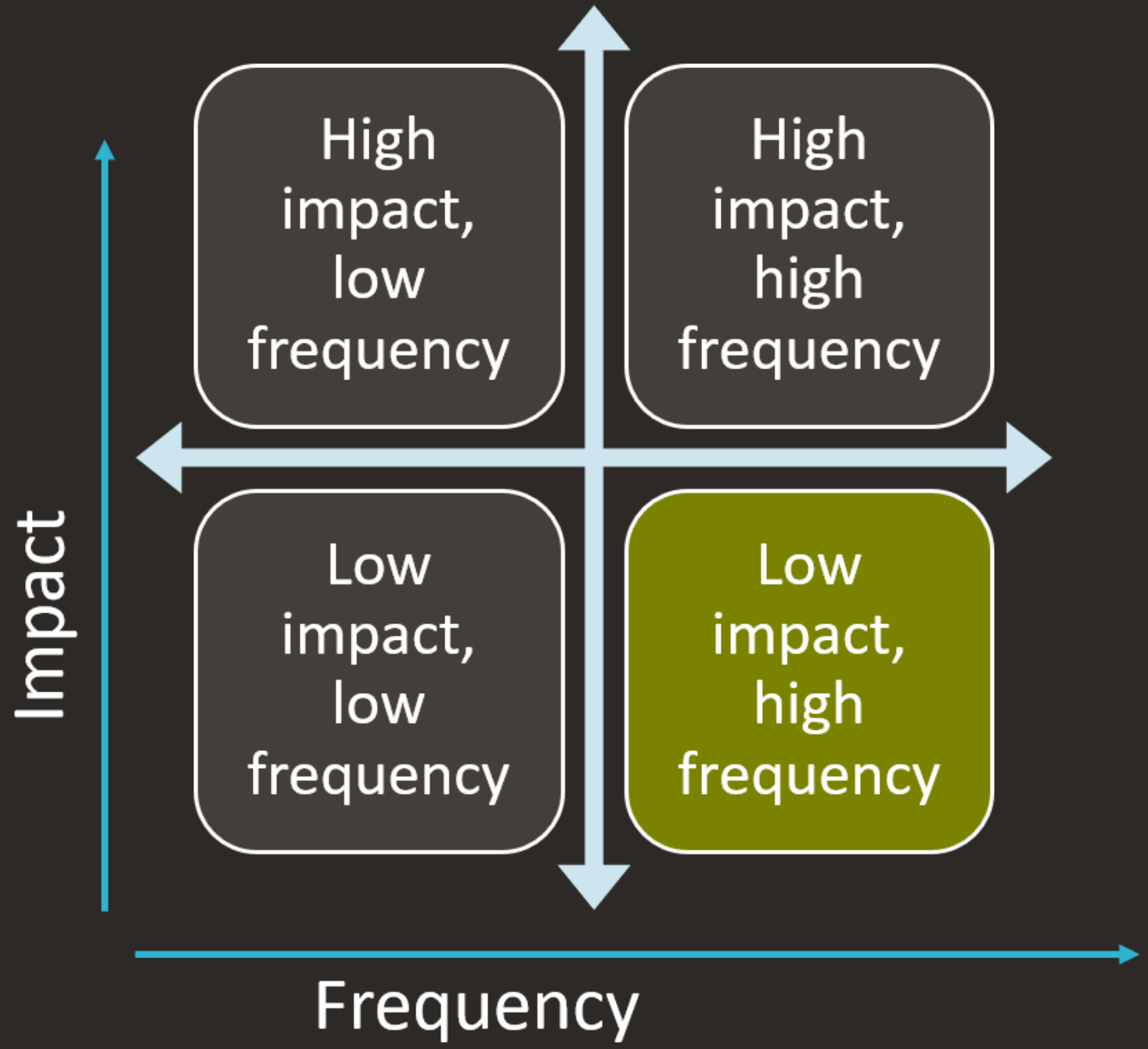
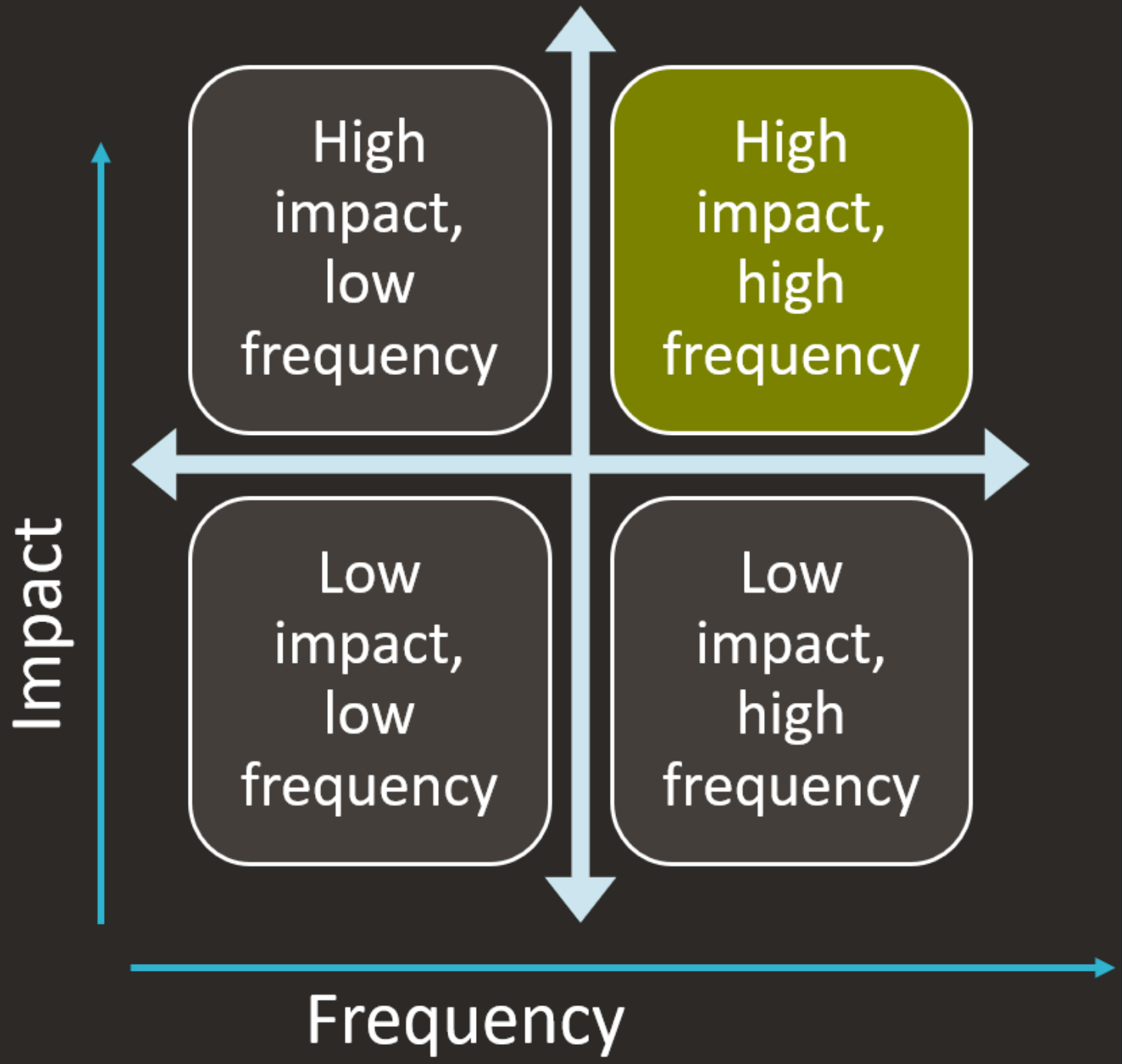


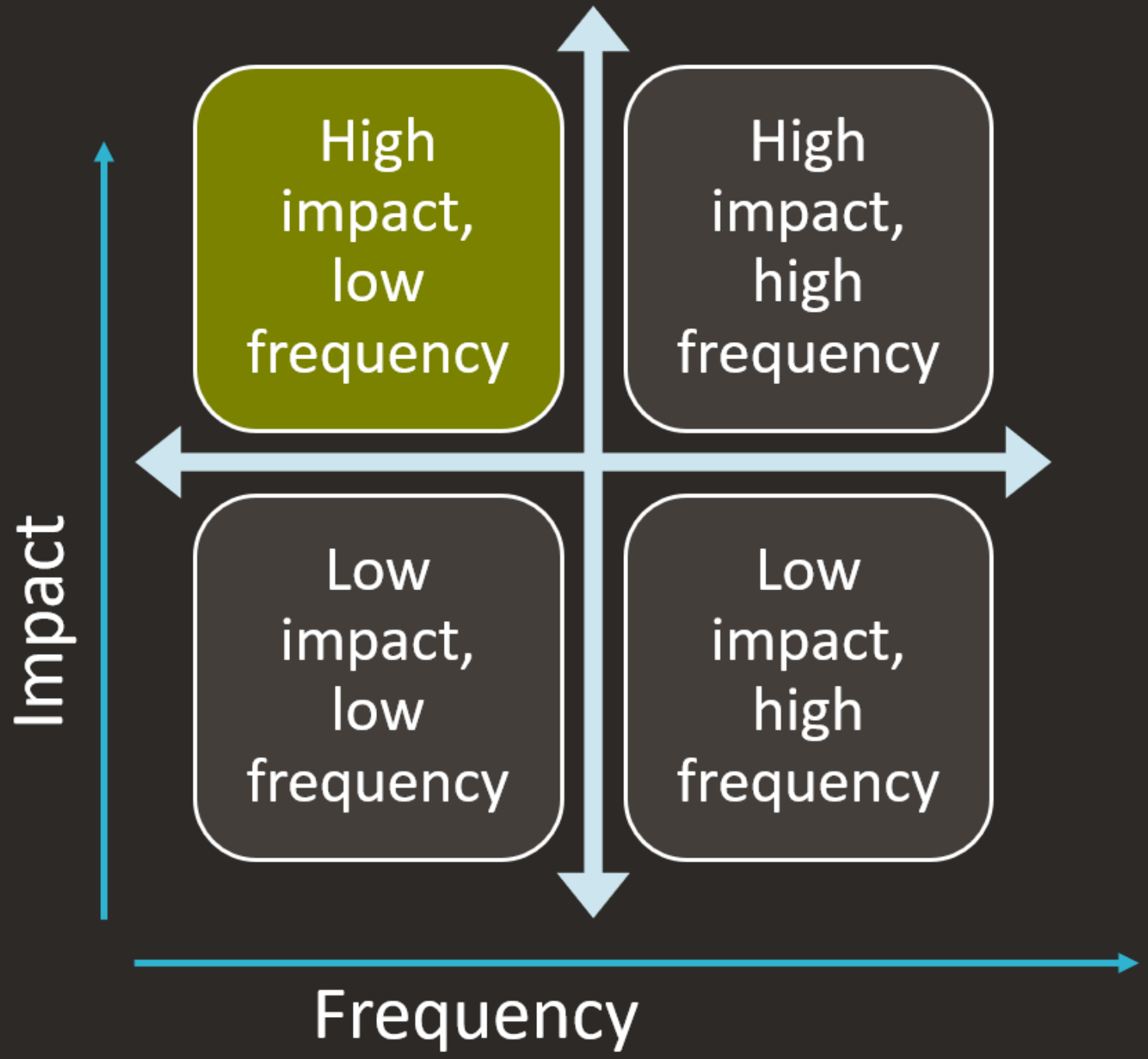
- We might start here to understand how are systems are working
- Events in this quadrant are rare, and when they do happen, they are predicted to have little impact on the organization
- They are often ignored with a level of confidence



- These events happen a lot, but when they do happen there is little impact on the organization
- Develop corrective actions, evaluate effectiveness – did our metrics improve?
- Develop metrics, key performance indicators (KPI)



- Events which fall into this quadrant are really dangerous – they can happen easily, and when they do, they can hurt the organization
- Because of their importance and likelihood, they are usually handled by Operations
- Well control in the oil drilling industry is a good example



- HILF events are the most dangerous
- They don't happen often, so don't usually prompt the concern (resources) they probably deserve
- When they do happen, they can badly damage or destroy an organization or community
- Examples are the Macondo Well Blowout in the Gulf of Mexico, and the Chernobyl nuclear accident

What information is available?

- What kind of data can we use?
  - What are the constraints on the data? Do we own it? Is privacy a concern? How will we address these constraints?
- KPIs can help you determine what to focus on
  - What are KPIs in your industry/business?
  - Track and analyze variances by using trending tools, breakeven analysis, what-if scenarios
  - Break it into steps on different duration lengths

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Can we predict the future?

- What kind of data can we use?
- But HILF events are HILF events
  - Just sit and wait for it to happen and hope for the best?
- ‘What if’ scenarios help us put focus on recovery efforts
  - Break it into steps on different duration lengths

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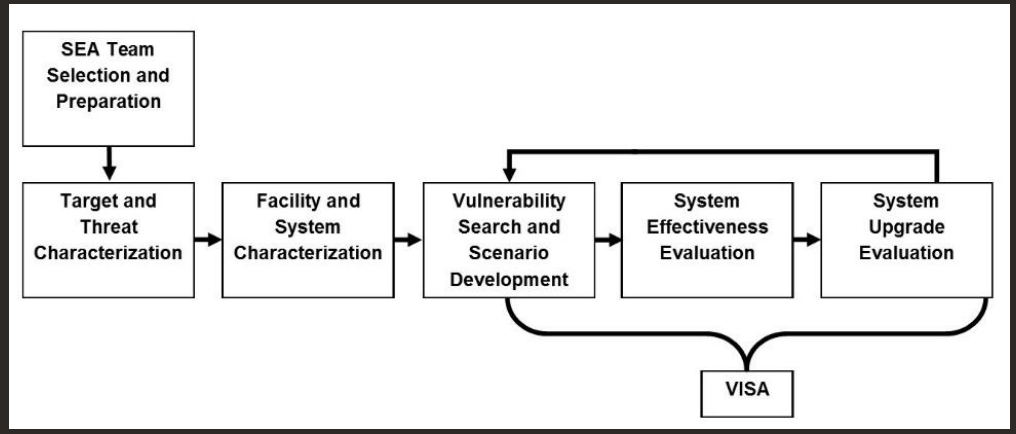
Scenario-based testing

- Design basis threat and Vulnerability to Integrated Security Analysis (VISA) process
  - Create realistic & credible threat scenario, & fragment into steps
  - Determine response time of law enforcement
  - Wargame each step against physical or cyber protection systems to determine degree of effectiveness
  - See who wins: adversary or law enforcement
  - Upgrade protection systems & re-run simulation to test effectiveness



Technology allows us to tear down silos

Some ways technology is being used in the security, environmental, health, and safety professions:

- Drones
- 3D Visualization and VR
- IH and area monitoring
- Training platforms
- Lone worker monitoring
- Machine learning
- Artificial intelligence

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Systems in use today

Can we predict the future?

- Taleb: “Prediction, not narration, is the real test of our understanding of the world.”
  - Security uses VISA process
  - Octopus is physical & cyber security information management system that works by crossing into other silos
  - SIGA works with industrial control systems by analyzing analog outputs of system to look for anomalies.
- Imagine event & stress test
  - Watch for indicators within system
  - What is the response?

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Bottom line:

Collect as much data as you can and apply it across the organization's silos to better understand the impact and frequency of events

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Discussion:
What kind of technology have you seen or are you using to mitigate risk in your organizations?

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Questions?

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Save the Date for NAEM's 2020 Conferences

EHS Software, Innovation & Technology Showcase	EHS Operational Excellence	Sustainability Impact From Aspiration to Operation	EHS&S Management Forum
March 3-5	**May 5-7**	**Aug. 3-5**	**Oct. 20-23**
New Orleans, LA	**Columbus, OH**	**Denver, CO**	**Fort Worth, TX**

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