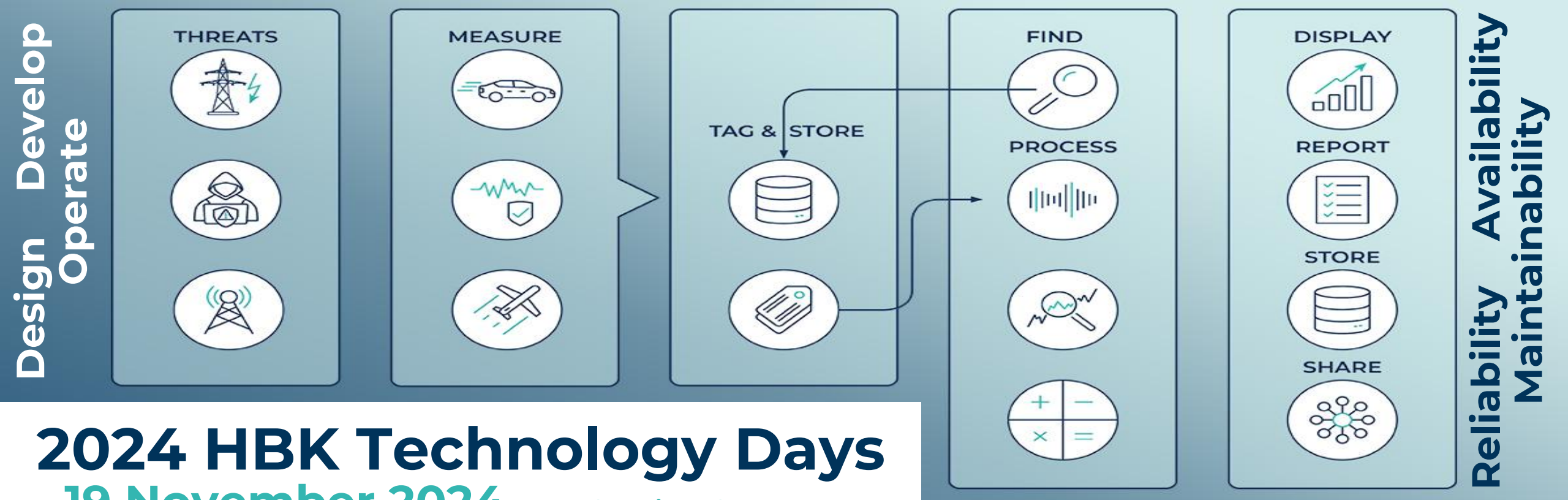




# 2024 HBK Technology Days

## 19 November 2024

### ReliaSoft Cloud - Overview

- Fully web-based and Software-as-a-Service platform
- Scalable solutions for a global user base
- Initial release is focused on FMEA
- FMEA powered by AI Assist



### Session 6: The ...abilities – Reliability, Availability, Maintainability (RAM) for Dependability

- Introducing ReliaSoft Cloud – a SaaS platform for FMEA with AI Assist

Jon Aldred,  
Director, Product Management, HBK

# Introducing ReliaSoft Cloud

## – a SaaS platform for FMEA with AI Assist

### Abstract

- An introduction to ReliaSoft Cloud, a fully web-based Software-as-a-Service platform (SaaS). For secure global deployment with database and web servers managed by HBK, requiring no hardware requirements or local IT support, and user access via web browser. A scalable solution for many users over a geographically dispersed workforce.
- Initial release is focused on FMEA, with multiple FMEA types per major published standards with flexibility to customize for customer specific needs. Dashboards to drive decisions and track progress on design improvements and risk reduction.
- With AI Assist to help with FMEA creation and consistency, to assist brainstorming and/or re-use of FMEA elements with the power of AI. AI Assist is designed to prioritise re-use, to first check to see if there are similar records in your ReliaSoft Cloud database. If similar records are found, these results will always be displayed first.

### About the presenter, Jon Aldred, Director, Product Management, HBK

- Jon is Director of Product Management for HBK, and responsibilities include the product roadmaps for nCode and ReliaSoft software brands for durability and reliability engineering. His responsibilities include assessing the impact of new market trends such as electrification, digitalization and lightweighting on future software needs.

# Introducing ReliaSoft Cloud

FMEA

Jon Aldred  
Director, Product Management

# ReliaSoft Cloud - Overview

- Fully web-based and Software-as-a-Service platform (SaaS)
  - Users access via web browser (no local installs)
  - Secure global deployments with database and web servers managed by HBK (no hardware requirements or local IT support)
- Scalable solutions for a global user base
  - Enables many users over a geographically dispersed workforce.
  - Starts at just 10 users / 100 viewers and scales up to thousands of users and unlimited viewers.
- Initial release is focused on FMEA

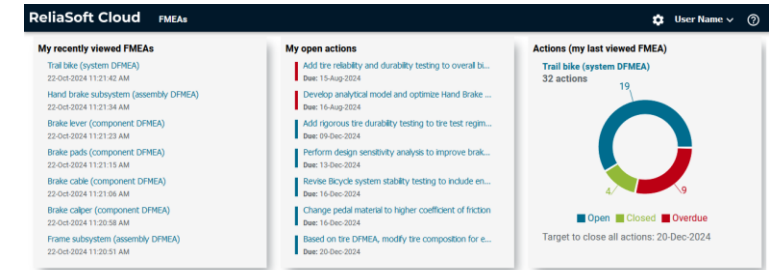
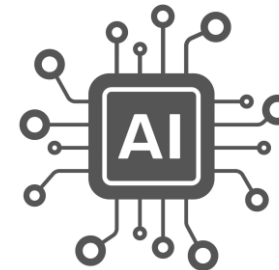


The screenshot displays the ReliaSoft Cloud FMEA interface. The main window shows a worksheet for a project titled '0001 - DEMO - System DFMEA - Trail bike'. The interface includes a 'WORKSHEET' tab, a 'TREE' view on the left, and a 'HEADER' section at the top. The central table lists various failure modes and their associated risk ratings. The right sidebar contains an 'Action' panel with recommended actions, responsibility assignments, and completion dates.

| Description                                                                                                                                                                                                                                | S(I) | O(I) | D(I) | RPN(I) | AP(I) | S(V) | O(V) | D(V) | RPN(V) | AP(V) |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|--------|-------|------|------|------|--------|-------|
| Causes:<br>Insufficient friction delivered by hand brake subsystem between brake pads and wheels during heavy rain conditions.                                                                                                             | 5    | 5    | 250  | H      | 3     | 2    | 60   | L    |        |       |
| Controls:<br>All-Terrain braking system design guide (doc # 123)<br>All-Terrain bicycle stopping test #ABCD                                                                                                                                |      |      |      |        |       |      |      |      |        |       |
| Actions:<br>DFMEA on All-Terrain Hand Brake subsystem<br>Develop analytical model and optimize Hand Brake design<br>Improve stopping test by including all weather conditions<br>Add rigorous tire durability testing to tire test regimen |      |      |      |        |       |      |      |      |        |       |
| Brake system mis-adjusted by bicycle user.                                                                                                                                                                                                 | 5    | 9    | 450  | H      | 3     | 6    | 180  | M    |        |       |
| Underperforming brake system capacity (pads, cables, callipers, etc.)                                                                                                                                                                      | 1    | 1    | 10   | L      | 1     | 1    | 10   | L    |        |       |
| Excessive bicycle operator weight                                                                                                                                                                                                          | 1    | 1    | 10   | L      | 1     | 1    | 10   | L    |        |       |
| Excessive maintenance or repair required to keep bicycle operational                                                                                                                                                                       | 7    |      |      |        | 7     |      |      |      |        |       |
| Handling is unstable                                                                                                                                                                                                                       | 10   |      |      |        | 10    |      |      |      |        |       |

# ReliaSoft Cloud - FMEA

- Multiple FMEA types per major published standards with flexibility to customize for your specific needs
- Leverage knowledge across FMEAs, along with brainstorming assistance powered by AI
- Dashboards to drive decisions and track progress on design improvements and risk reduction
- SaaS enables regular updates as new features and enhancements are added
- Annual subscription pricing



**RSWEB FMEAs**

AIAG-4 Design

01 - DEMO - System DFMEA - Trail bike

| FUNCTIONS                                                                                                                                                                                            | REQUIREMENTS                                                                                           | POTENTIAL FAILURE MODES                                                              | POTENTIAL EFFECTS OF FAILURE                                                                           | SEV | CLASS | POTENTIAL CAUSES OF FAILURE                                                                                         | OC | CONTROL TYPE | CURRENT DESIGN (LEVELS)                             | OC | RPN(O) | AP(O) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-----|-------|---------------------------------------------------------------------------------------------------------------------|----|--------------|-----------------------------------------------------|----|--------|-------|
| Bicycle must provide safe and reliable transportation, including safe stopping distances and safe operation under all customer usage conditions as defined in the AIS-Termin technical specification | Contract requirement related to this function<br>Another contract requirement related to this function | Does not stop in required distance<br>User dissatisfied with stopping distance (7,7) | Potential accident or injury without warning (10,10)<br>User dissatisfied with stopping distance (7,7) | 10  | KL6   | Insufficient friction delivered by hand brake subsystem between brake pads and wheels during heavy rain conditions. | 5  | Preve        | All-Terrain braking system design guide (doc # 123) | 5  | 250    | 14    |
|                                                                                                                                                                                                      |                                                                                                        |                                                                                      |                                                                                                        |     |       |                                                                                                                     |    | Det          | All-Terrain bicycle stopping test # ABC             |    |        |       |
|                                                                                                                                                                                                      |                                                                                                        |                                                                                      |                                                                                                        |     |       | Brake system mis-adjusted by bicycle user.                                                                          | 5  | Det          | Bicycle system durability test # 789                | 9  | 450    | 14    |

**Cause**

Class: KLD - Key leading

Potential causes of failure:

- Insufficient friction delivered by hand brake subsystem between brake pads and wheels during heavy rain conditions.

Controls:

- OC: 10, 10
- OC: 5 - Moderate, 3 - Low
- OC: 5 - Moderate, 2 - Very high
- RPN(O): 250, 60
- AP(O): 14, 14
- % change in RPN: 76

Discard Save

# AI Assist for FMEA Records

## AI Assist helps with FMEA creation and consistency

- The ability to assist brainstorming and/or re-use of FMEA elements with the power of AI.

## Re-use is always prioritized

- AI Assist will first check to see if there are similar records in your ReliaSoft Cloud database.
  - If there are similar records found, these results will always be displayed first.
  - If no similar records are found, then AI Assist will parse your existing definition(s) and make appropriate suggestions
  - The more robust your existing FMEAs are, the better the suggestions for re-use will be.

AIAG-4 Design - Pump Design - Initial FMEA

WORKSHEET TREE HEADER

| Functions                                      | Requirements | Potential failure modes | Potential effects of failure | S(i) | C |
|------------------------------------------------|--------------|-------------------------|------------------------------|------|---|
| Transmit fluid at a rate of 5 gpm +/- 1.5 GPM. |              |                         |                              |      |   |

Transmit fluid at a rate of 5 gpm +/- 1.5 GPM.

- + Add function
- + Add requirement
- + Add failure
- + AI assist
- Cut
- Copy

+ Add functions

+ Add requirements

+ Add failures

+ AI assist - failures

- ☒ Fluid flow rate exceeds 6.5 gpm
- ☒ Fluid flow rate drops below 3.5 gpm
- ☐ Valve leaks causing flow rate inaccuracies
- ☐ Pump failure leading to halted fluid transmission
- ☐ Sensor malfunction results in incorrect flow measurement
- ☐ Fluid overheats due to excessive flow speed
- ☐ Flow meter provides inaccurate readings leading to operational inefficiency
- ☐ Clogging of fluid pathway restricts proper flow
- ☐ Rupture or leakage in fluid transmission line
- ☐ Pressure irregularities affecting fluid dynamics

Add

| Functions                                      | Requirements | Potential failure modes             |
|------------------------------------------------|--------------|-------------------------------------|
| Transmit fluid at a rate of 5 gpm +/- 1.5 GPM. |              | Fluid flow rate exceeds 6.5 gpm     |
|                                                |              | Fluid flow rate drops below 3.5 gpm |

# Example worksheet / tree screenshots

ReliaSoft CloudFMEAs

Lisa Hacker

AIAG-4 Design

0001 - DEMO - System DFMEA - Trail bike

WORKSHEETTREEHEADER

| Functions                                                                                                                                                                                             | Requirements                                          | Potential failure modes            | Potential effects of failure                         | S(i) | Class | Potential causes of failure                                                                                         | O(i) | Control type | Current design | D(i) | RPN(i) |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|------------------------------------|------------------------------------------------------|------|-------|---------------------------------------------------------------------------------------------------------------------|------|--------------|----------------|------|--------|
| Bicycle must provide safe and reliable transportation, including safe stopping distances and safe operation under all customer usage conditions as defined in the All-Terrain technical specification | Contract requirement related to this function         | Does not stop in required distance | User dissatisfied with stopping distance (7,7)       | 10   | KLd   | Insufficient friction delivered by hand brake subsystem between brake pads and wheels during heavy rain conditions. | 5    |              |                |      |        |
|                                                                                                                                                                                                       | Another contract requirement related to this function |                                    | Potential accident or injury without warning (10,10) |      |       |                                                                                                                     |      |              |                |      |        |
|                                                                                                                                                                                                       |                                                       |                                    |                                                      |      | S     | Brake system mis-adjusted by bicycle user.                                                                          | 5    |              |                |      |        |

ReliaSoft CloudFMEAs

Lisa Hacker

AIAG-4 Design

0001 - DEMO - System DFMEA - Trail bike

WORKSHEETTREETREEHEADER

> Description

S(i)O(i)D(i)RPN(i)AP(i)S(r)O(r)D(r)RPN(r)AP(r)

Causes:

Insufficient friction delivered by hand brake subsystem between brake pads and wheels during heavy rain conditions.

Controls:

• All-Terrain braking system design guide (doc # 123)

• All-Terrain bicycle stopping test #ABCD

Actions:

• DFMEA on All-Terrain Hand Brake subsystem

• Develop analytical model and optimize Hand Brake design

• Improve stopping test by including all weather conditions

• Add rigorous tire durability testing to tire test regimen

Brake system mis-adjusted by bicycle user.

Underperforming brake system capacity (pads, cables, calipers, etc.)

Excessive bicycle operator weight

Excessive maintenance or repair required to keep bicycle operational

Handling is unstable

55250H3260L

59450H36180M

1110L1110L

1110L1110L

77

1010

Cause

Class

KLd - Key leading

Potential causes of failure

Insufficient friction delivered by hand

Action

Recommended actions

DFMEA on All-Terrain Hand Brake subsystem

Responsibility

Design team

Planned completion date

24-Oct-2023

Actions taken

DFMEA #12345 at https://rsweb/fmea/117

Actual completion date

20-Oct-2023

DiscardSave

# Initial release – available now

## ▲ With the initial release, you can:

- Manage all the FMEAs in your site (group/filter/sort)
- Create new FMEAs or import from Excel®
- View and edit FMEAs in complementary “worksheet” and “tree” views
- View dashboards on your personal home page and per FMEA
- Manage and customize FMEA types (select fields, names and tip text)
- Manage active users (site admin only) or your own personal account

Visit [hbkworld.com](https://www.hbkworld.com) or contact HBK representative



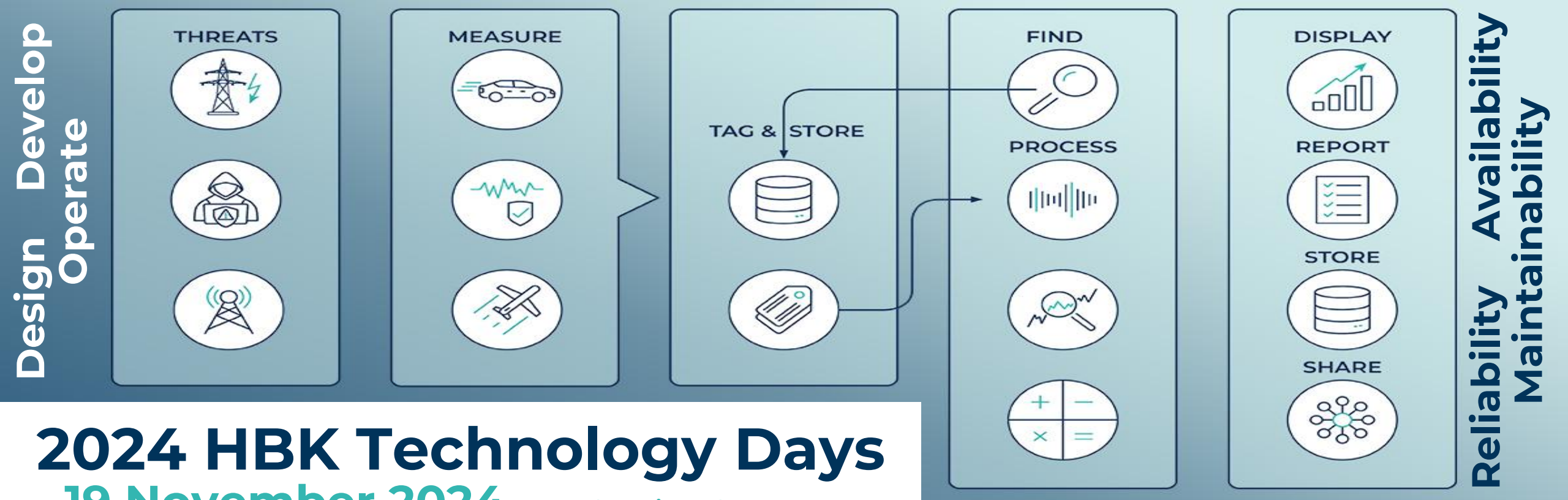
# Thank You



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