16th STS-AIChE Southwest Process Technology Conference

From Principles to Practice:

▶ **Governing AI Responsibly in Manufacturing**

▶ **Kaytlin Henderson**

▶ **Dow**

Sept 22-23, 2025, University of Houston

Kaytlin Henderson

➢ Analytics & AI Leader, Enterprise Data & Analytics at Dow

    ➢ Responsible for shaping and implementing AI strategy focusing on key deliverables around Responsible AI framework emerging AI capabilities

➢ 13 years at Dow in R&D, Manufacturing, and Information Systems

➢ AIChE Career and Education Operating Council Past Chair

➢ B.S. in Chemical Engineering from Lafayette College 2003-2007

➢ Ph.D. in Chemical Engineering from Carnegie Mellon University 2007-2012

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From Principles to Practice:
Governing AI Responsibly in Manufacturing

Organized by the South Texas Section of AIChE ®

Our Industry Manages Risk

- We engineer **safety & reliability** into operations—**control-layer safeguards**, **cybersecurity**, and **data privacy**.

- Apply the **same risk techniques** to AI: **assess, classify, set controls, document, monitor**.

- **Trust drives value:** Responsible AI boosts **privacy**, **decision confidence** & **brand**; governance gaps block scaling.

Safety by design
Control-layer guardrails

RAI in enterprise risk
Risk: cyber, privacy, data, AI

RESPONSIBLE AI PRINCIPLES

Dow Code of Conduct

Respect for People	Integrity	Citizenship

Responsible AI Principles

Human Oversight & Control

AI will be controlled by the expertise of humans to augment innovation, decision making & productivity to achieve trusted outcomes.

Fair & Inclusive

AI must be unbiased and balanced for all groups to enhance inclusivity and well-being.

Transparent & Accountable

Clearly link design and outcome to increase transparency and accountability.

Data Security & Privacy

Safeguard autonomy, identity and dignity by protecting data privacy throughout AI system design, development, and deployment.

Safe & Reliable

System to perform as originally designed and to respond safely to new situations preventing harm or endangerment of human life, health, property, or the environment.

AI Policies, Processes and Procedures

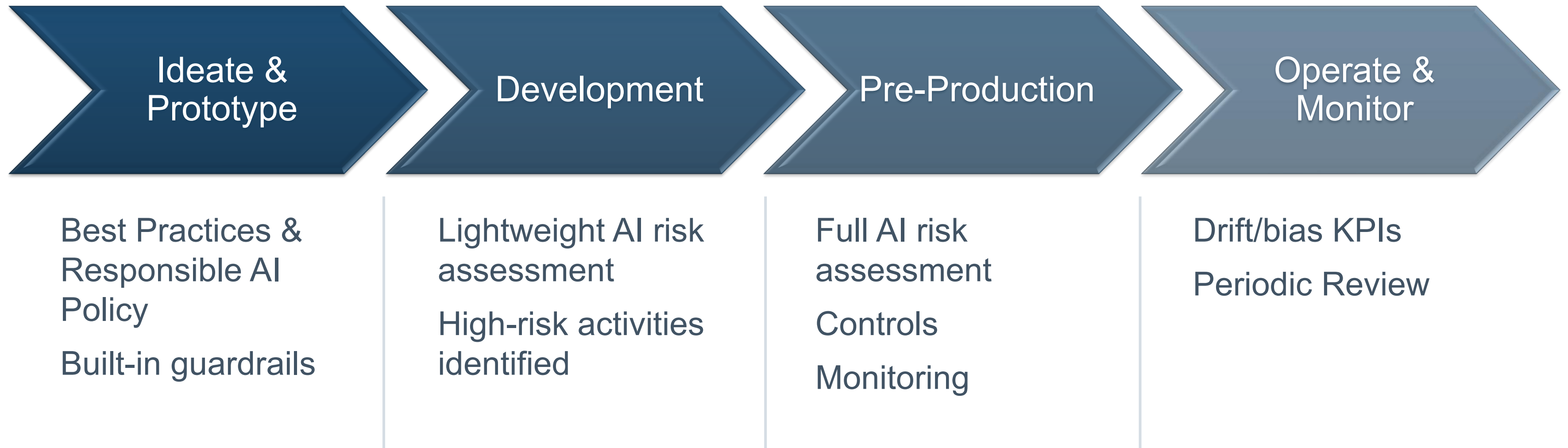| GenAI – Acceptable Use	Benchmarking	Governance

Drive innovation & value through responsible and ethical AI use rooted in strong core values

DOW®

Move at the pace of innovation

## AI Governance at the Right Time

Ideate & Prototype	Development	Pre-Production	Operate & Monitor
Best Practices & Responsible AI Policy	Lightweight AI risk assessment	Full AI risk assessment	Drift/bias KPIs
Built-in guardrails	High-risk activities identified	Controls	Periodic Review
		Monitoring	

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One Size Doesn't Fit All: Governing AI by Type

Traditional AI

Solves specific problems using historic data
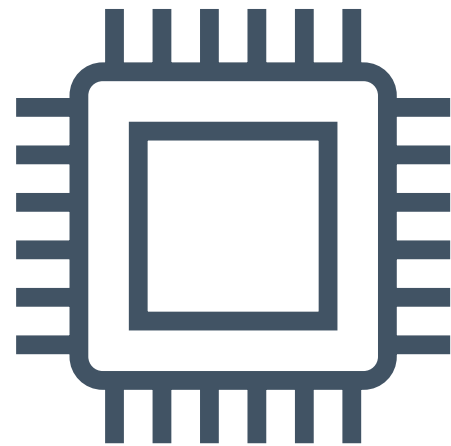
Generative AI

Creates new content based on what you ask it

Agentic AI

Reasons, make decisions, and take actions to reach a goal
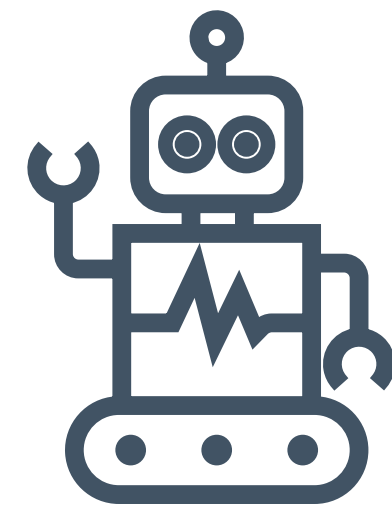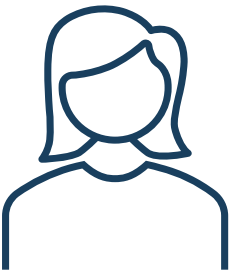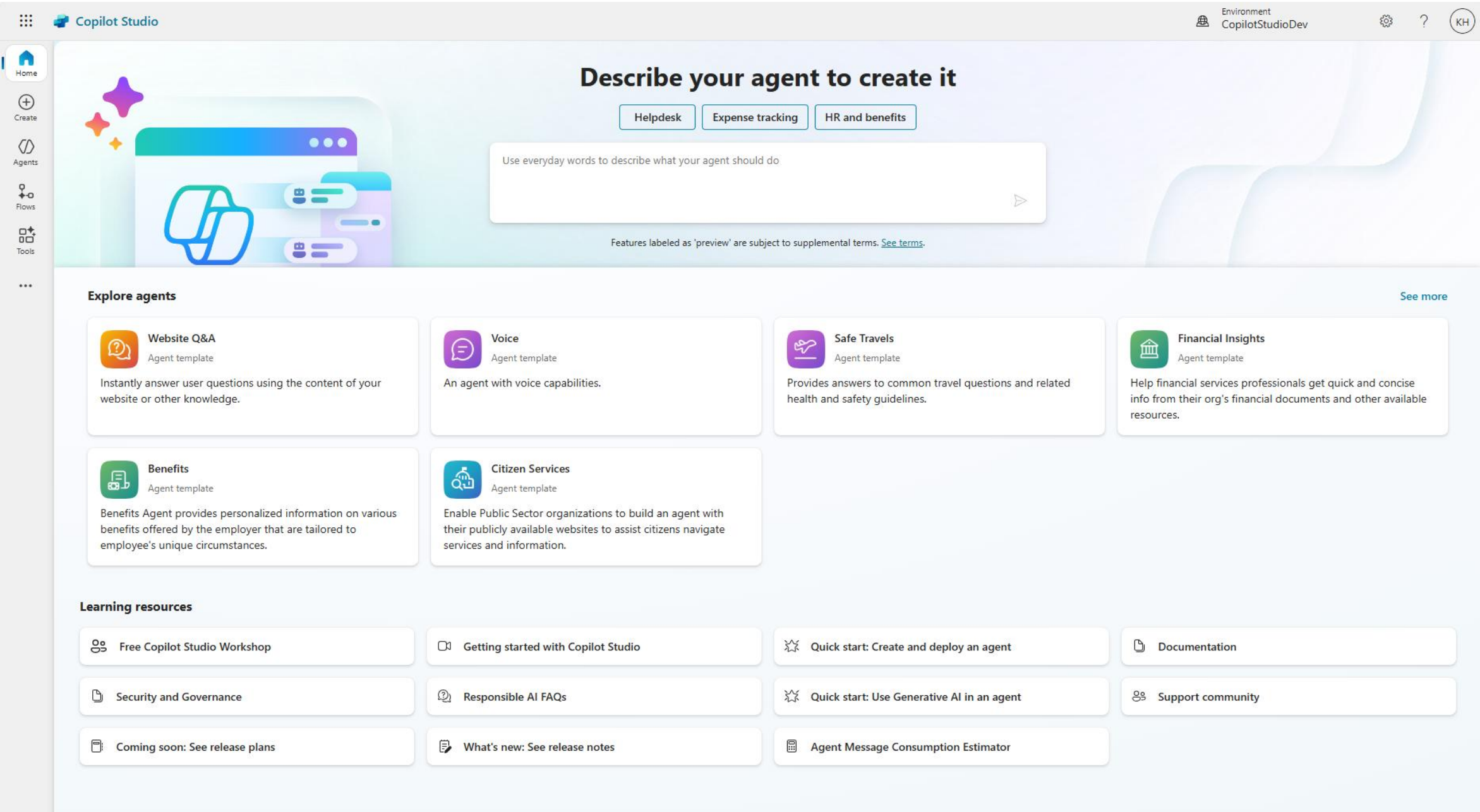
Traditional AI: Furnace Reliability

Furnace Subsystems

Asset Name	Reliability Risk...	Open Alerts
	100	6
	56	0
	56	0
	46	0
	35	0
	35	0
	34	0
	29	0
	28	0
	23	0
	22	0
	13	0

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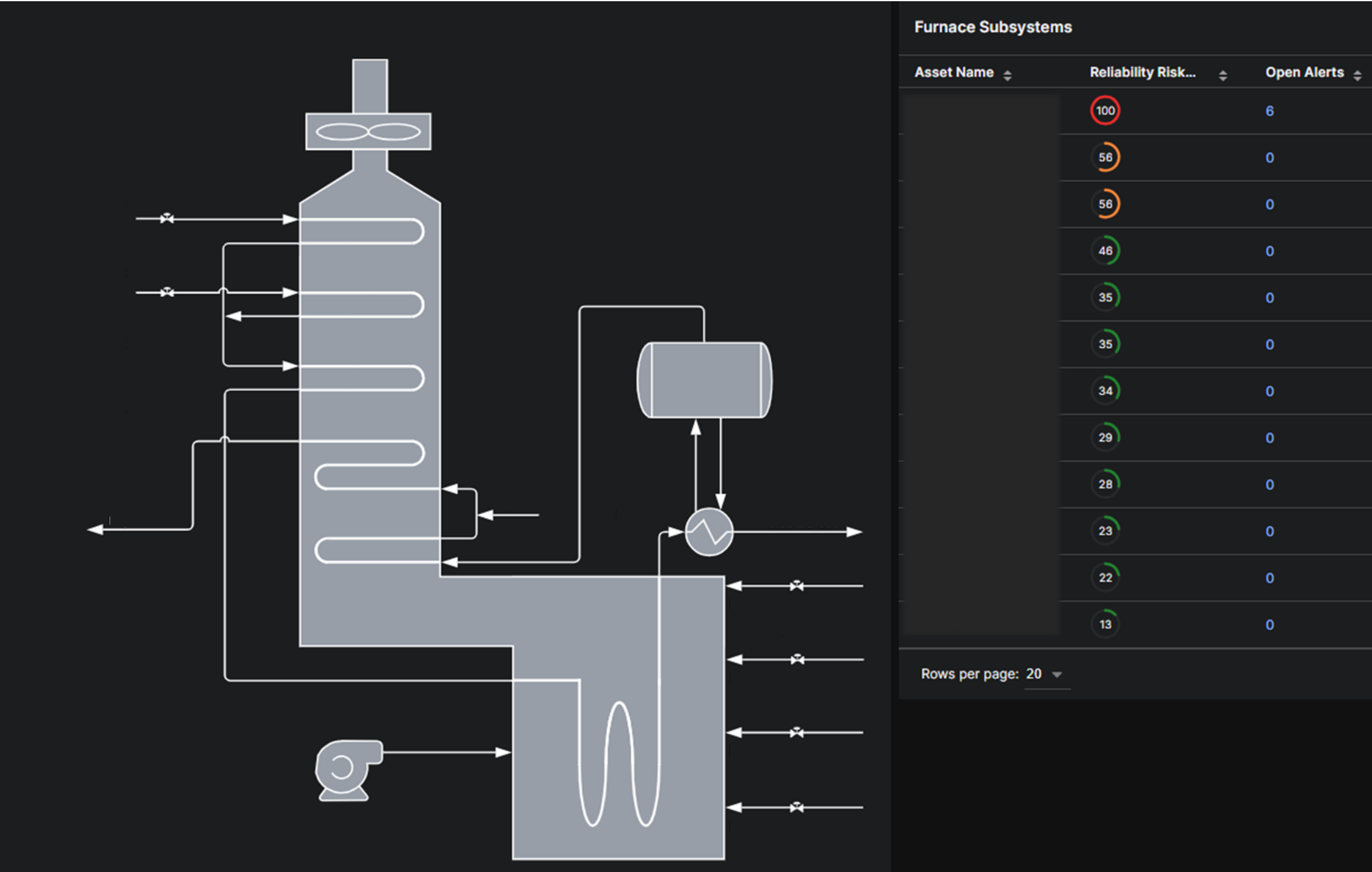
Accuracy Monitoring

Transparency

Generative AI: Chatbots

Human Review

Transparency
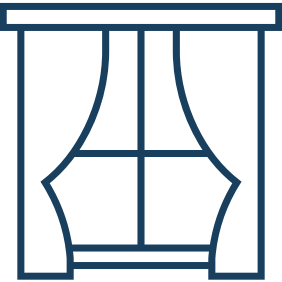
Data Security & Privacy Controls

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Agentic AI: Freight Leakage
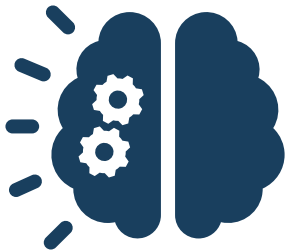

Failsafe

Human-in-the-loop

Responsible AI: The Foundation for Scalable Innovation

- Governance builds trust
- Trust accelerates adoption
- Innovation thrives responsibly