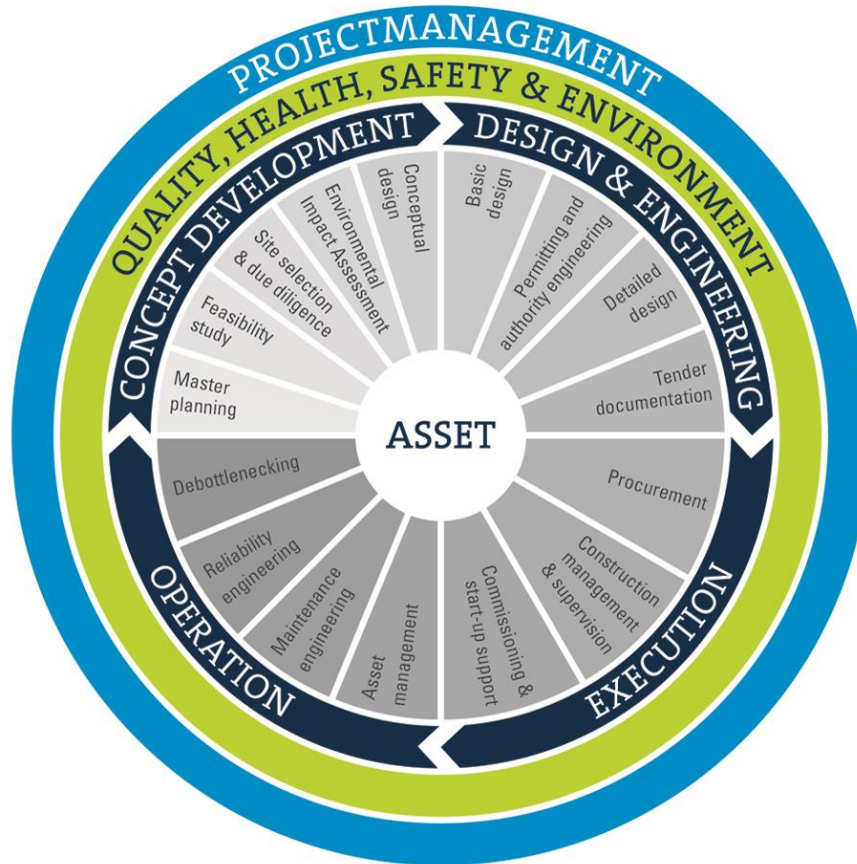




Safety. Asset Integrity first!



- Design & Engineering
 - Concept development
 - Process engineering
 - Basic and detail engineering
 - E/I&C / Process automation
 - Project planning
 - Cost estimation
- Project Management
- Procurement
- Construction Management
- Consultancy
 - Logistics
 - Asset management
 - Industrial safety
 - Permitting support

Bilfinger divisions

E&T and MMO complement each other

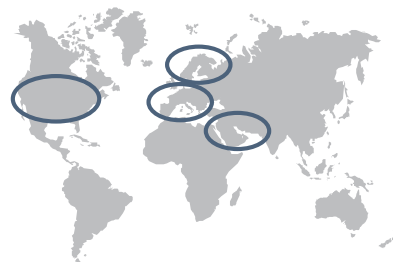
E&T – Engineering & Technologies



- Bundled expertise
- Faster roll-out of innovations
- Best practice transfer
- Approx. 9,000 employees

➤ **Internationally positioned**

MMO – Maintenance, Modifications & Operations



- Proximity to the customer
- Expertise on regional requirements
- High degree of flexibility
- Capacity ramp-up / ramp-down
- Approx. 23,000 employees

➤ **Regionally positioned**



About Me & (process) Safety



Asset Integrity

Definition



BILFINGER

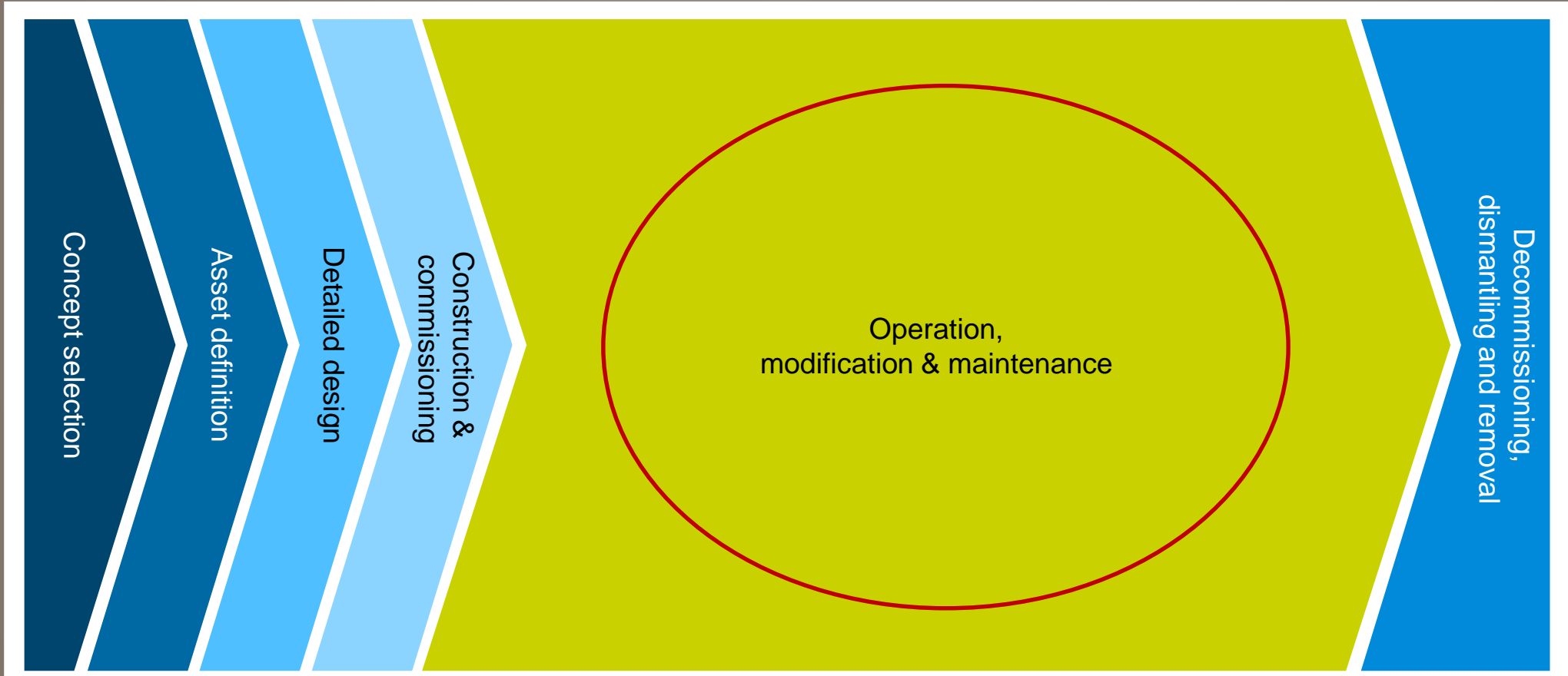
Asset Integrity Management Systems (AIMS) outline the ability of an asset to perform its required function effectively and efficiently whilst protecting health, safety and the environment and the means of ensuring that the people, systems, processes, and resources that deliver integrity are in place, in use and will perform when required over the whole life-cycle of the asset.



WIKIPEDIA
The Free Encyclopedia

Life cycle of an asset, integrity in every phase

scope of this dialogue (1)



Asset Integrity in process safety excellence

scope of this dialogue (2)

Company state	Process Safety Operation					Process Safety Management System					Process Safety Culture					Asset Integrity					
Maturity Ladder	Process Safety Document Management	PHA execution	Start-up / shutdown	Incident investigation	PHA close out management	Audits	PHA instruction	Business integration	PS Performance indication	PS change management	Escalation line to board	Process Safety knowledge base	Process Safety Communication	Process Safety Training	Behavior based	Cyber Security	Maintenance	SCE formulating	Alarm Management	Human Factors	Insurance risk profile
Generative: PS pioneer	Developing	Approach development	Developing	Sharing	Developing	External benchmark	Developing	Business continuity management	Sharing	Developing	CEO	Memberships	External	Providing	Value	Developing	Predictive	Developing	Standards	Developing	Lowest
Pro-active: PS leader	ADM	Cyclic	Periodic	Trained	Automated	Internal benchmark	Dedicated	Business integration	Predictive	Continuous improvement	HSE	Center of Competence	Interactive	All layers	Priority	Improved	Pro-active	Phasing out	Implementation	Improving	Low
Calculative: PS follower	As Build	MoC	Dedicated	Procedure	Database	Periodic	Enriched	HSE integration	Lagging	MoC	Location	Process Safety Officer	2P	Line management	Personal	Checked	Balanced	Risk driven	Active	Ergonomics	Medium
Reactive: PS lagger	RFC	Commissioning	PHA	Common Sense	Sharing	Authority visit	Dictated	Reference	Minor hazards	Passive	Production	HSE officer / Process Engineer	Written	Operational personnel	Obeying	Aware	Re-active	Experience	Evaluation	Compliance	High
Pathologic: PS apostate	No documents	No PHA	No analysis	No incident investigation	No close out management	No audits	No PHA instruction	No integration	No performance indication	No change management	No escalation line	No knowledge base	No communication	No training	Unaware	Ignorant	No maintenance	No SCE	No Alarm Management	None	Highest

The best practice?

[illegible]

The Question

Why is our image so limited?



Time

Is best practice good enough?

Can we do better?



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What is now available to enhance the picture?



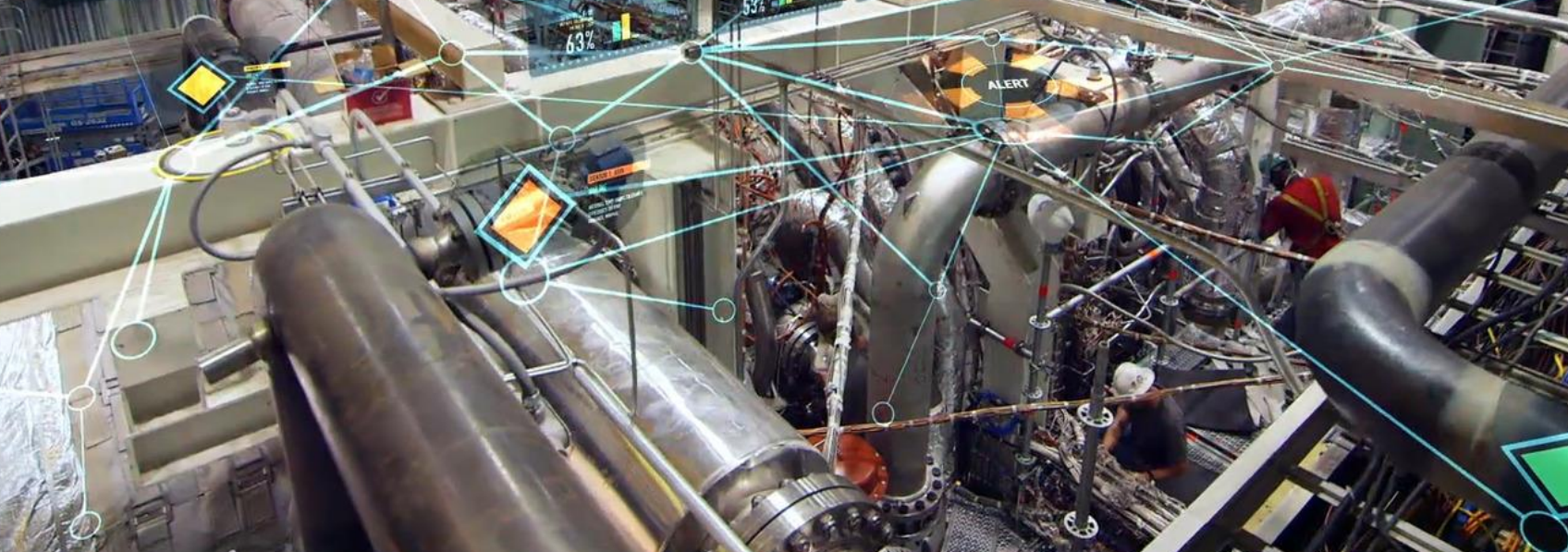
COMPONENT DIAGNOSTIC - LEVEL 22/24/28



SCHEDULE APPLICATOR - QUARTER TWO

SCHEDULED MAINTENANCE

DATE	TIME	LOCATION	DESCRIPTION	STATUS
2024-01-01	08:00	LEVEL 22	MAINTENANCE	PENDING
2024-01-01	12:00	LEVEL 24	MAINTENANCE	PENDING
2024-01-01	16:00	LEVEL 28	MAINTENANCE	PENDING
2024-01-02	08:00	LEVEL 22	MAINTENANCE	PENDING
2024-01-02	12:00	LEVEL 24	MAINTENANCE	PENDING
2024-01-02	16:00	LEVEL 28	MAINTENANCE	PENDING

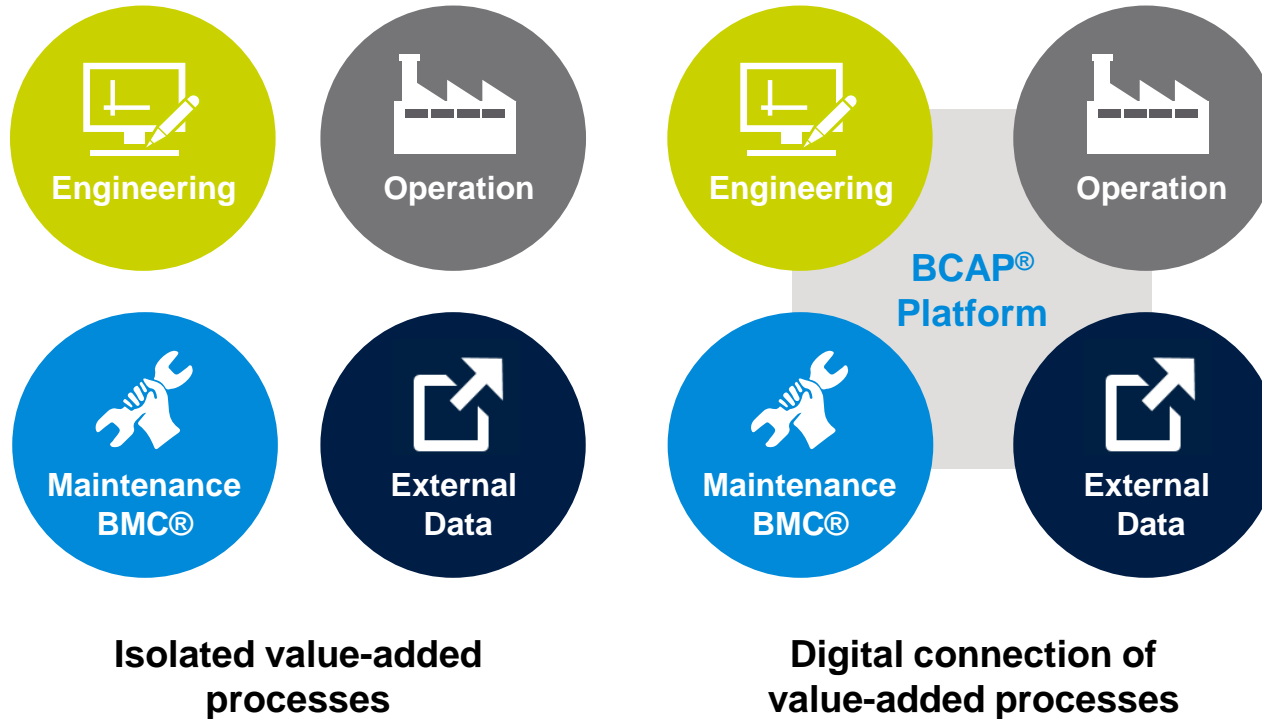


48 TON
1/1/2024

PIRANHA
MAINT & REPAIR

SENSOR 1 - 01/01
ONLINE
INTERNAL TEMP: 1.722
EXTERNAL TEMP: 1.722
MAINTENANCE: PENDING

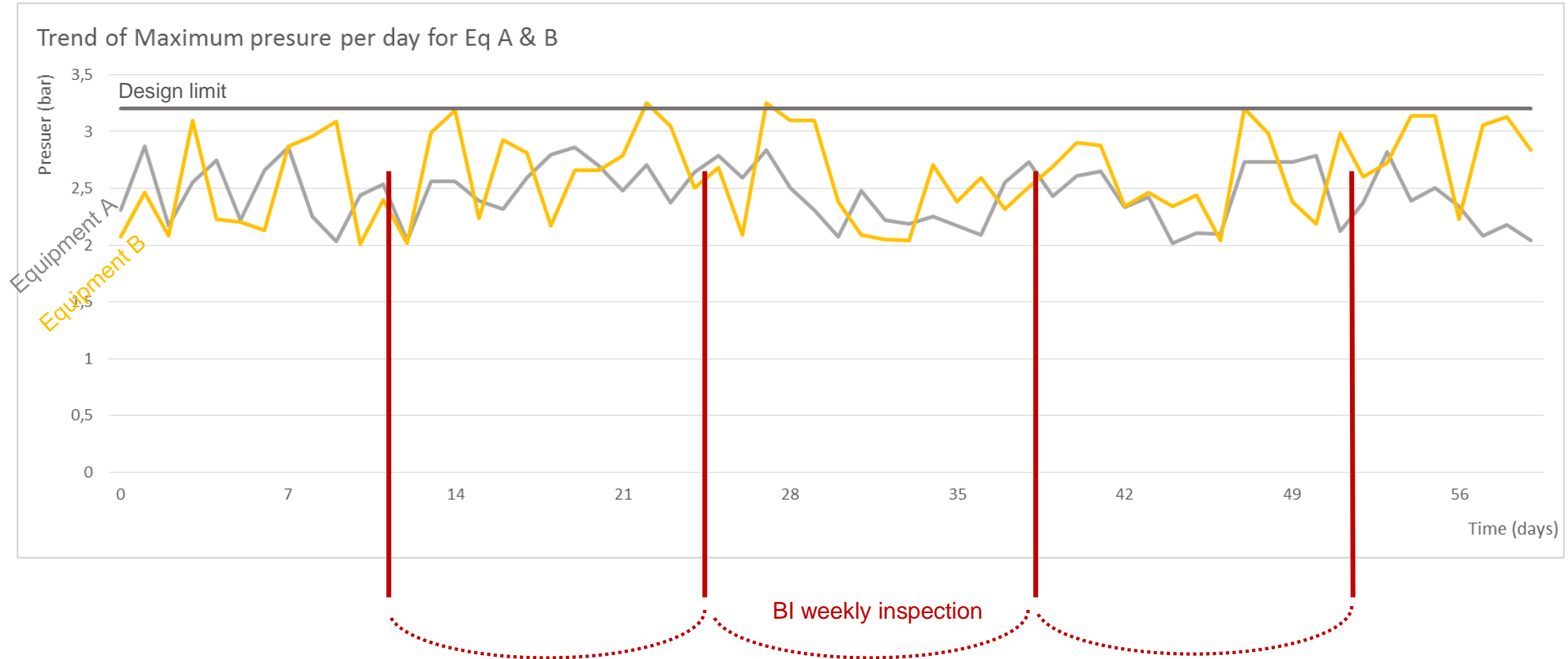
From stand-alone to digitally connected processes



Make Asset Integrity dynamic

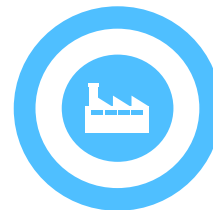
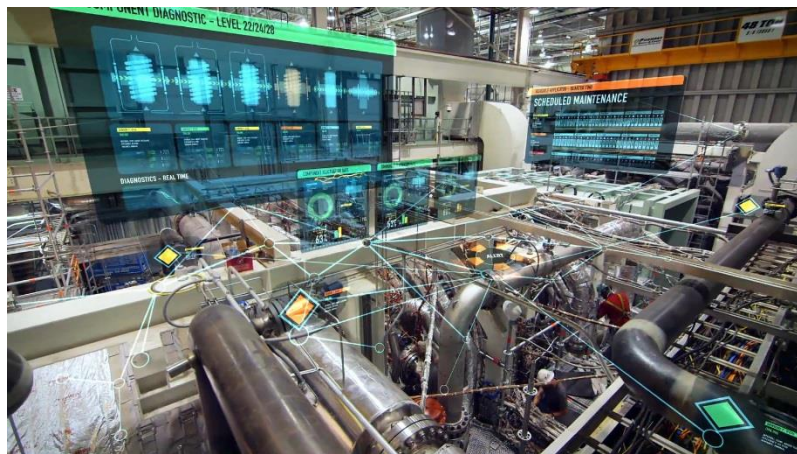
What to measure directly or indirectly to monitor asset integrity 24/7?

Optimize usage of maintenance resources & enhance quality of inspection



The next practice?

Or common practice?





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Questions - dialogue



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