Impacts across the Organization – Uniper's Digital Journey with OSIsoft EA Deployment

Lingli Zheng, Nadia Beleno

©2019 OSIsoft, LLC

Agenda

- We are Uniper
- Approach to digital Transformation at Generation
- Case Study – Reliability Management
- Infrastructure
- Summary
- Questions

©2019 OSIsoft, LLC

Uniper at a glance

International energy company with more than 11,000 employees

Our operations

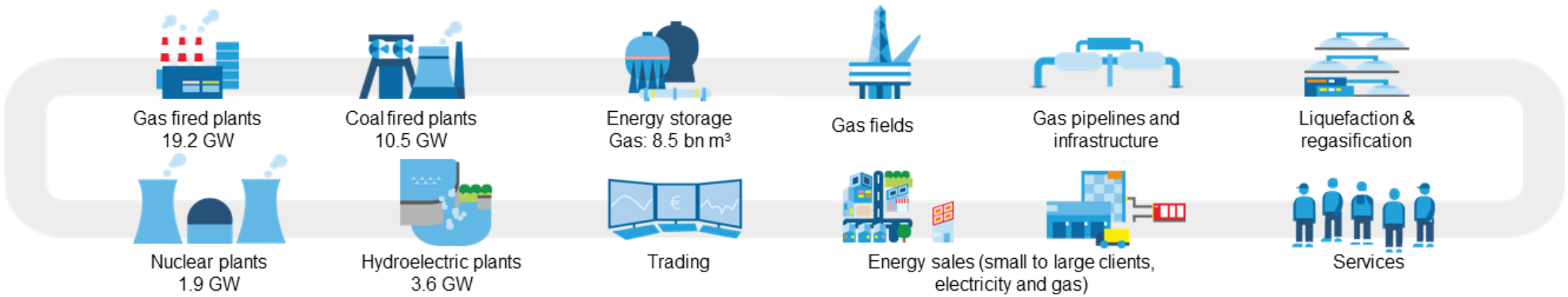
Power Generation
Commodity Trading
Energy Storage
Energy Sales
Industrial Services

40+ countries around the world
4th largest generator in Europe

Employees: 12,635

- Power generation, Storage, Services - Europe
- Power generation - International
- Commodity Trading, Energy Sales

€2.12 bn	100 years	38.2 GW
EBITDA	Experience	Total generation



Data: Uniper Annual and Sustainability Reports 2016

©2019 OSIsoft, LLC

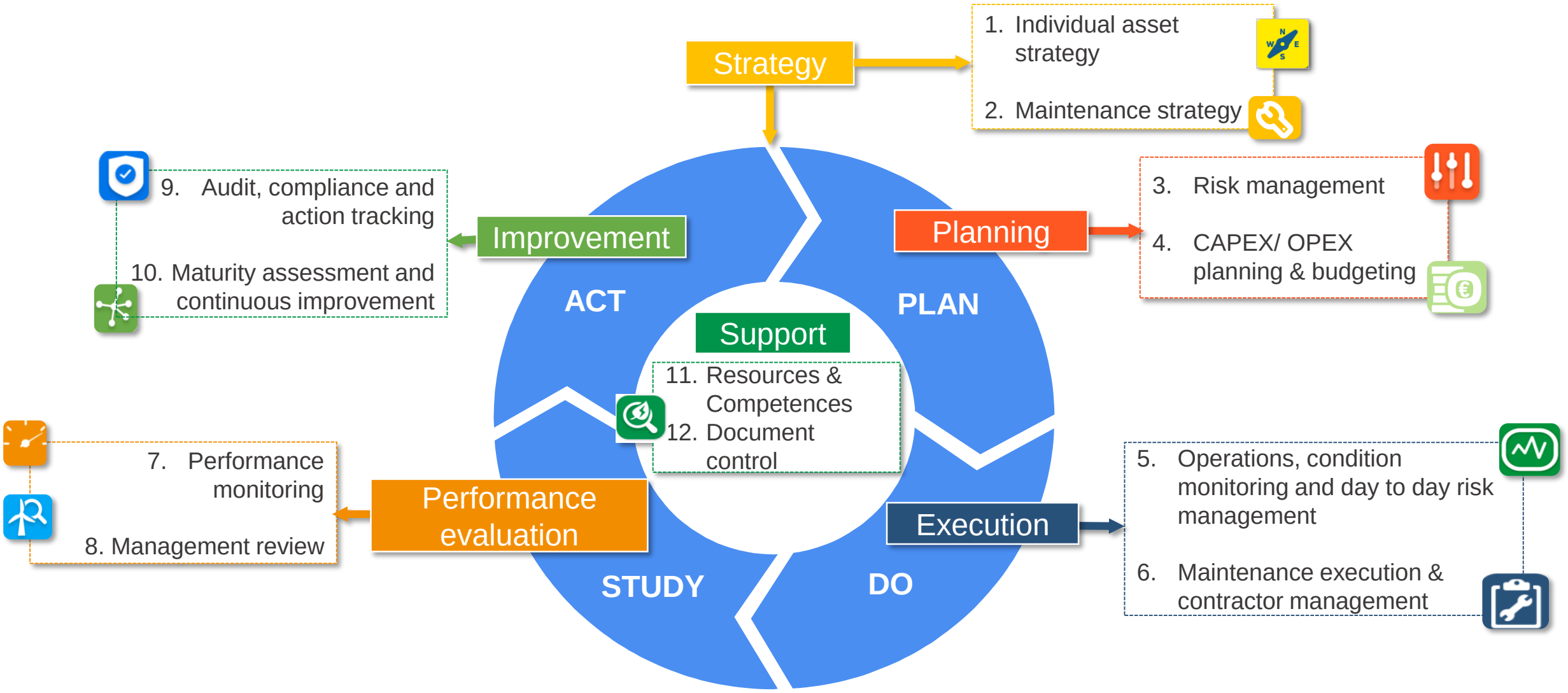
Agenda

- We are Uniper
- Approach to digital Transformation at Generation
- Case Study – Reliability Management
- Infrastructure
- Summary
- Questions

©2019 OSIsoft, LLC

Uniper’s Strategic Digital Initiatives

Digitalization@Generation - Framework



Derived from **ISO 55001** Asset management – Management systems – Requirements

©2019 OSIsoft, LLC

Digitalization@Generation - Focus and Challenges

„ How is our Turbine vibration during the last startup?“

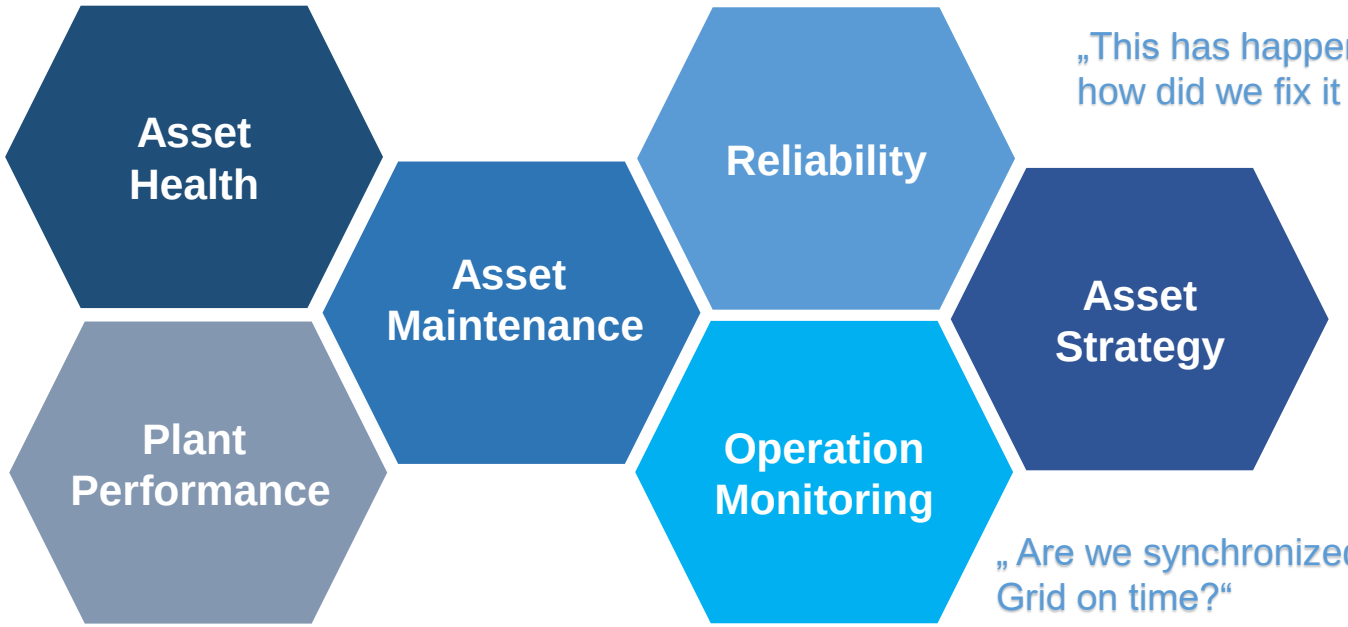
„This has happened before, how did we fix it last time?“

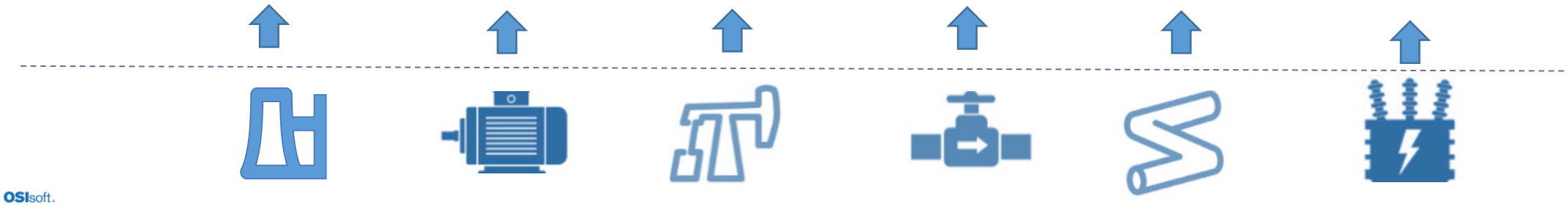
„ Can we accept this bid to start up our plant in the next 8 hours?“

„What‘s the efficiency last week? “

„ Are we synchronized with Grid on time?“

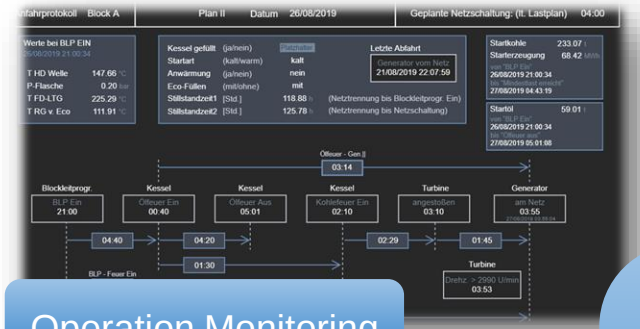
„I need to know the actual EOH before planning the next Maintenance date“



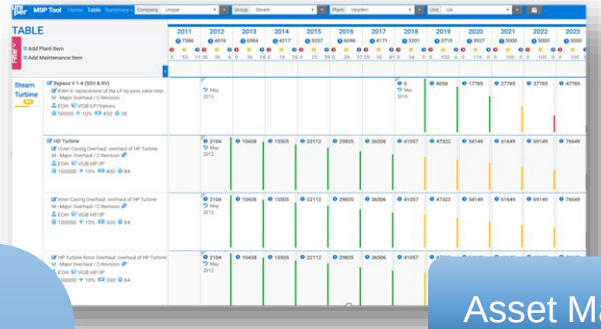


©2019 OSIsoft, LLC

Digitalization@Generation - Key Solutions:



Operation Monitoring



Asset Maintenance

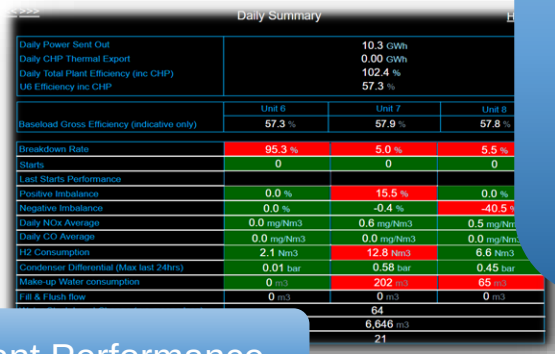
Standardized Architecture

Standard Central Reports

Local Site Specific Reports

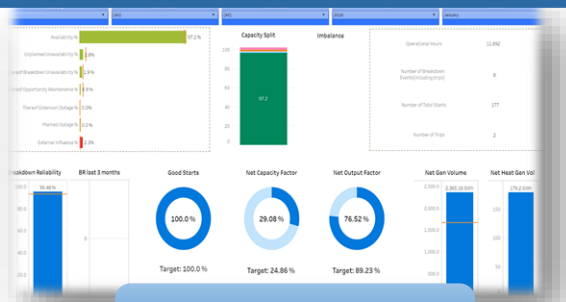
Daily-Yearly Reports

Data Governance



Plant Performance

Plant Reliability



Production

©2019 OSIsoft, LLC

Anfahrprotokoll Block A	Plan II Datum 26/08/2019	Geplante Netzschaltung: (lt. Lastplan) 04:00

Werte bei BLP EIN
26/08/2019 21:00:34

T HD Welle	147.66 °C
P-Flasche	0.20 bar
T FD-LTG	225.29 °C
T RG v. Eco	111.91 °C

Kessel gefüllt	(ja/nein)	Platzhalter	
Startart	(kalt/warm)	kalt	
Anwärmung	(ja/nein)	nein	
Eco-Füllen	(mit/ohne)	mit	
Stillstandzeit1	[Std.]	118.88 h	(Netztrennung bis Blockleitprogr. Ein)
Stillstandzeit2	[Std.]	125.78 h	(Netztrennung bis Netzschaltung)

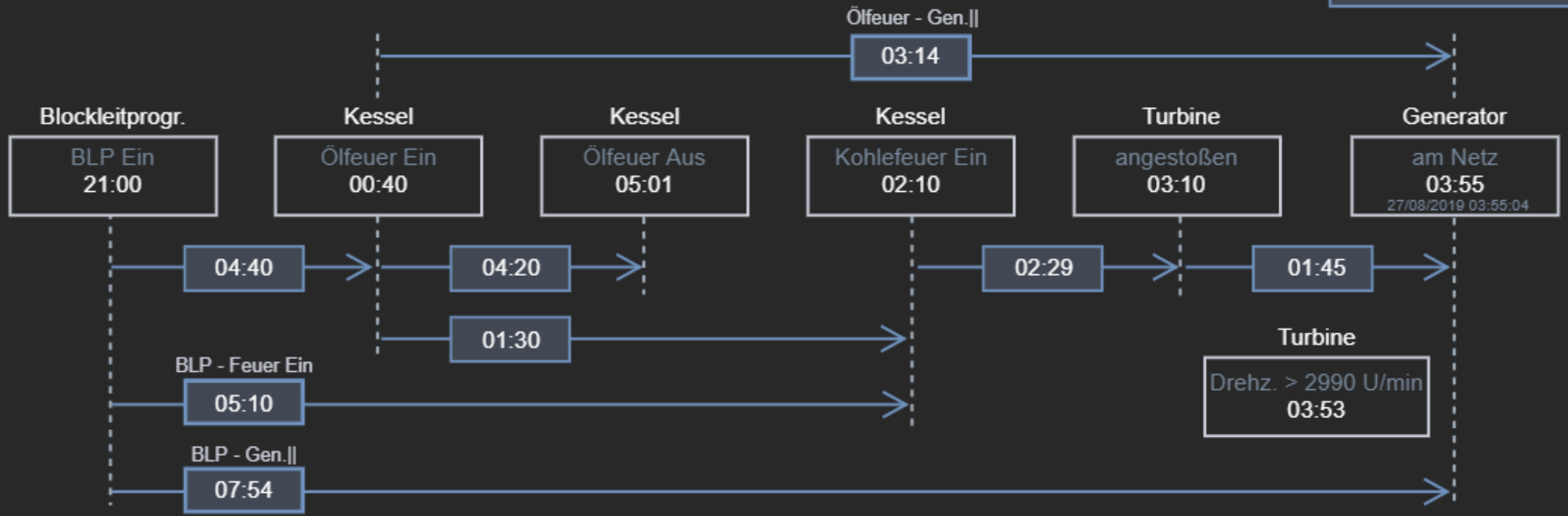
Letzte Abfahrt
Generator vom Netz
21/08/2019 22:07:59

Startkohle	233.07 t
Starterzeugung	68.42 MWh

von "BLP Ein"
26/08/2019 21:00:34
bis "Mindestlast erreicht"
27/08/2019 04:43:19

Startöl	59.01 t

von "BLP Ein"
26/08/2019 21:00:34
bis "Ölfeuer aus"
27/08/2019 05:01:08



©2019 OSIsoft, LLC

Events

Automatically refresh the list

UK_RAT_Unit1_Startup_2019-01-19 06:54:23.041
1/19/2019 6:54:23 AM - 1/19/2019 8:26:23 AM

UK_RAT_Unit1_Startup_2019-01-17 06:25:25.099

UK_RAT_Unit1_Startup_2019-01-16 05:57:10.083

UK_RAT_Unit1_Startup_2019-01-15 06:20:30.077

UK_RAT_Unit1_Startup_2019-01-14 07:25:00.036

UK_RAT_Unit1_Startup_2019-01-13 05:15:22.069

UK_RAT_Unit1_Startup_2019-01-11 05:55:15.023

UK_RAT_Unit1_Startup_2019-01-10 05:25:45.034

UK_RAT_Unit1_Startup_2019-01-09 04:46:05.048

Edit Search Criteria

Attributes

UK_RAT_Unit1_Startup_2019-01-19 06:54:23.041

Configuration

Display: *Click Save Icon** *(read-only)*

Edit Search Criteria

- **Database** — Asset Management
- **Time Range** — Custom Time Range
- **Event Severity**
- **Event Name**
- **Event Type and Attribute Value** — Selected

Event Type

UK_RAT_Unit Start

Event Attribute

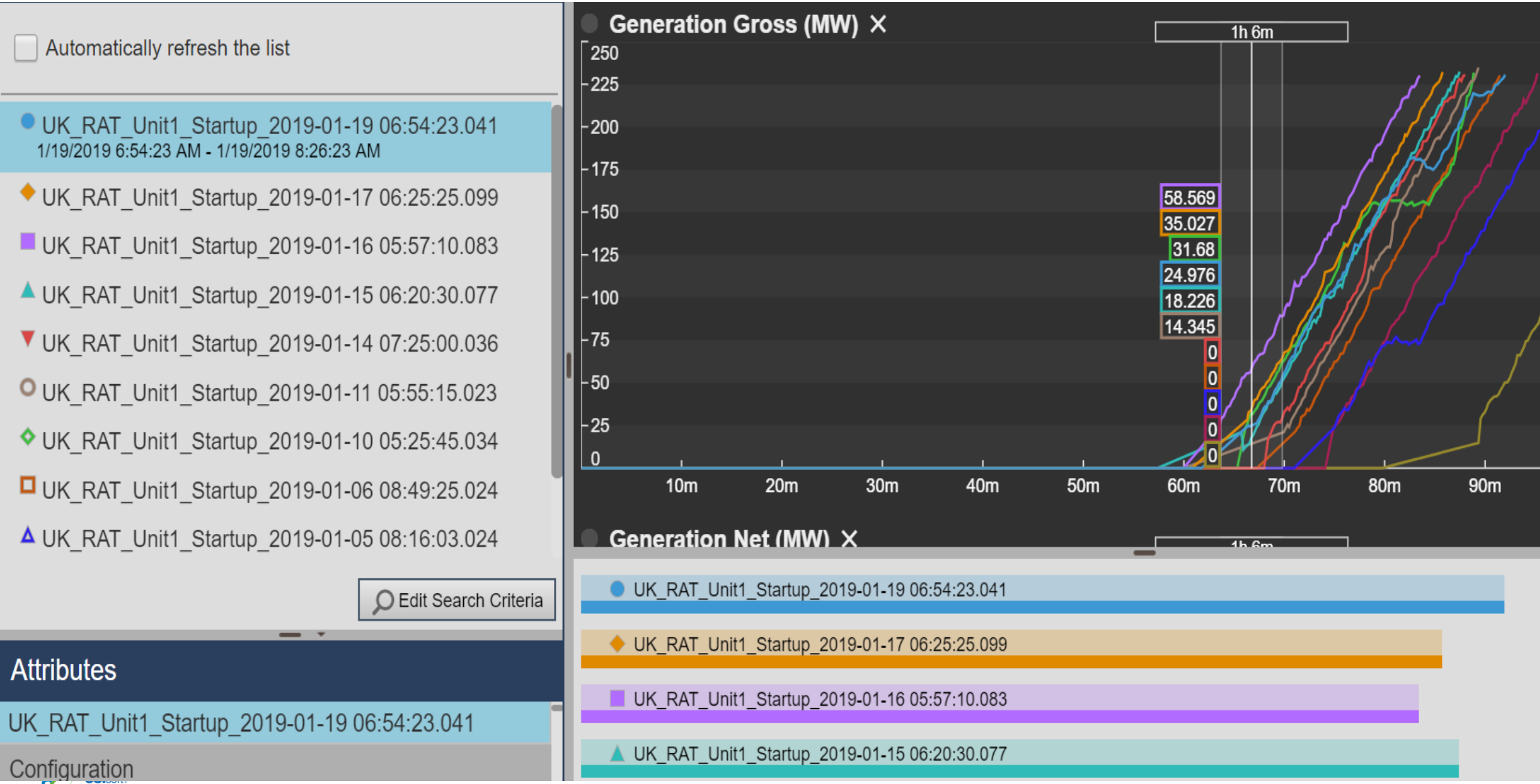
Startup Type | = | Hot

- **Asset Name** — \\Defruni0902\Asset Management...
- **Asset Type**

Return All Descendants

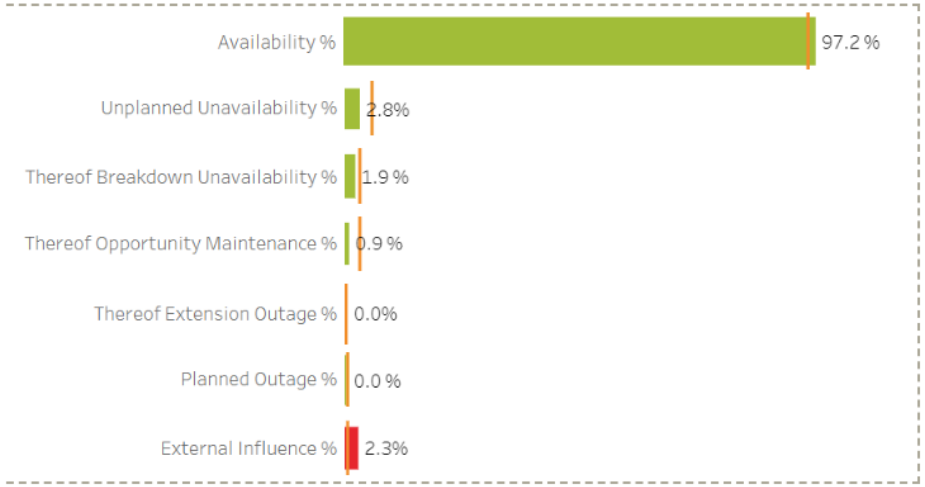
Apply | Reset | Cancel

2.0h 2.5h 3.0h

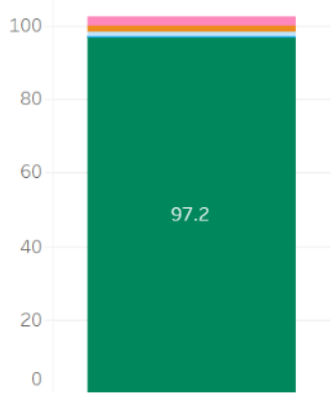


©2019 OSIsoft, LLC

Country	Site Name	Unit Name	Year	Month
(All)	(All)	(All)	2019	January



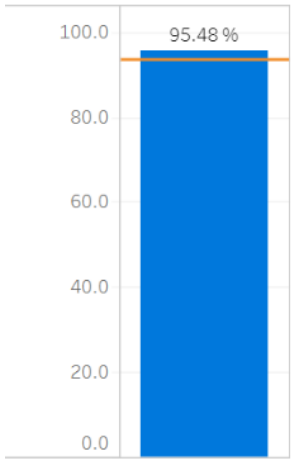
Capacity Split



Imbalance

Operational Hours	11,692
Number of Breakdown Events(including trips)	8
Number of Total Starts	177
Number of Trips	2

Breakdown Reliability

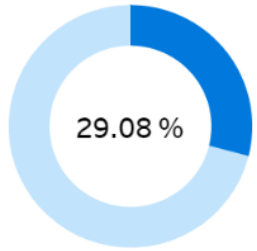


BR last 3 months

Good Starts

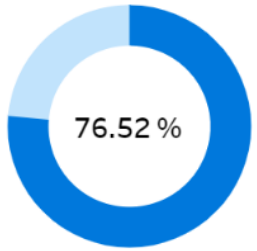
Target: 100.0 %

Net Capacity Factor



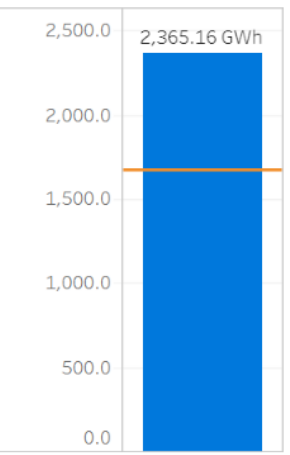
Target: 24.86 %

Net Output Factor

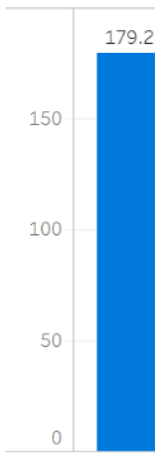


Target: 89.23 %

Net Gen Volume



Net Heat Ge



©2019 OSIsoft, LLC

Agenda

- We are Uniper
- Approach to digital Transformation at Generation
- Case Study – Reliability Management
- Infrastructure
- Summary
- Questions

©2019 OSIsoft, LLC

Grain Power Station Reliability Management

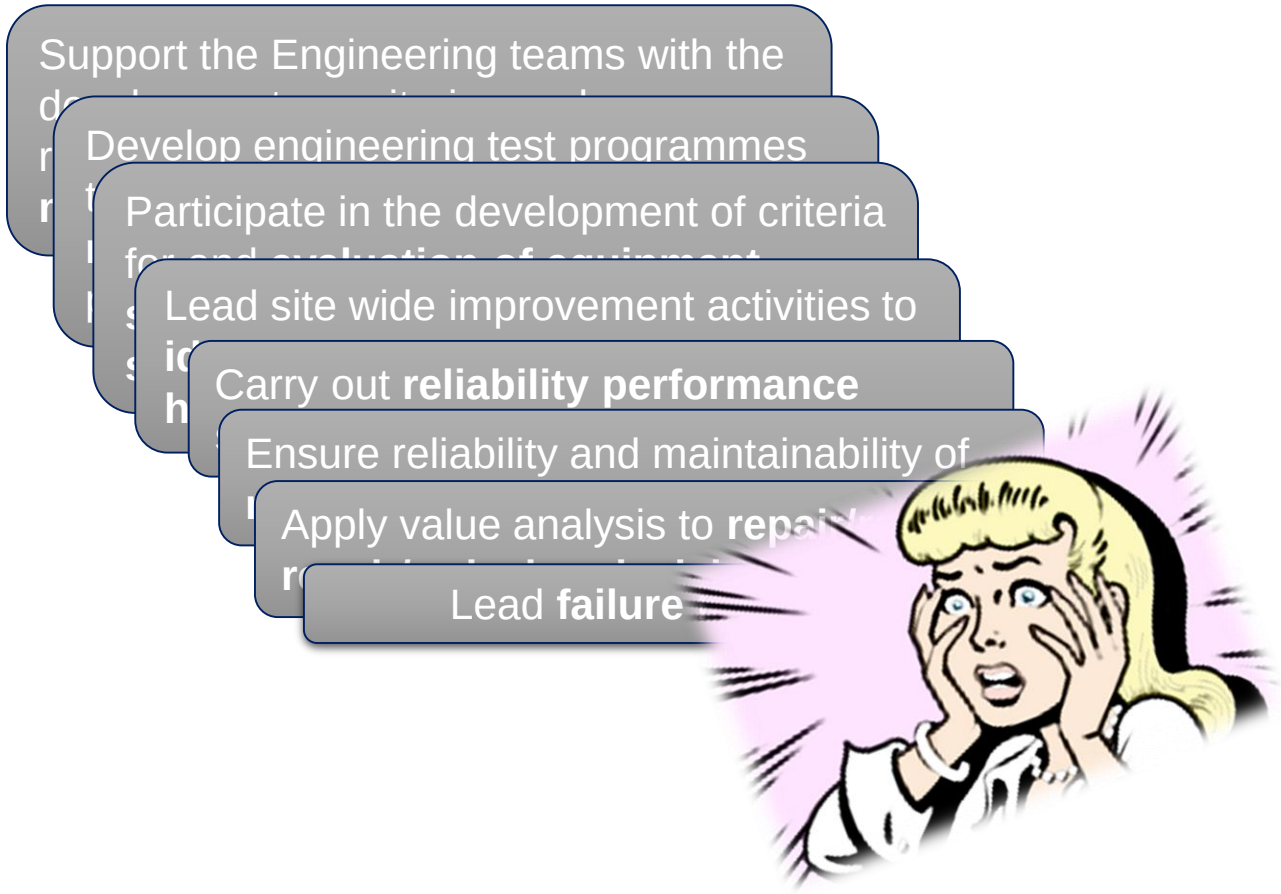
Reliability Engineer provides the expertise and technical support to **Identify, Maintain, and Improve** the reliability of the plant and its individual components

Figures and Facts

Assets = ~**31680**

Critical Assets = ~**2661**

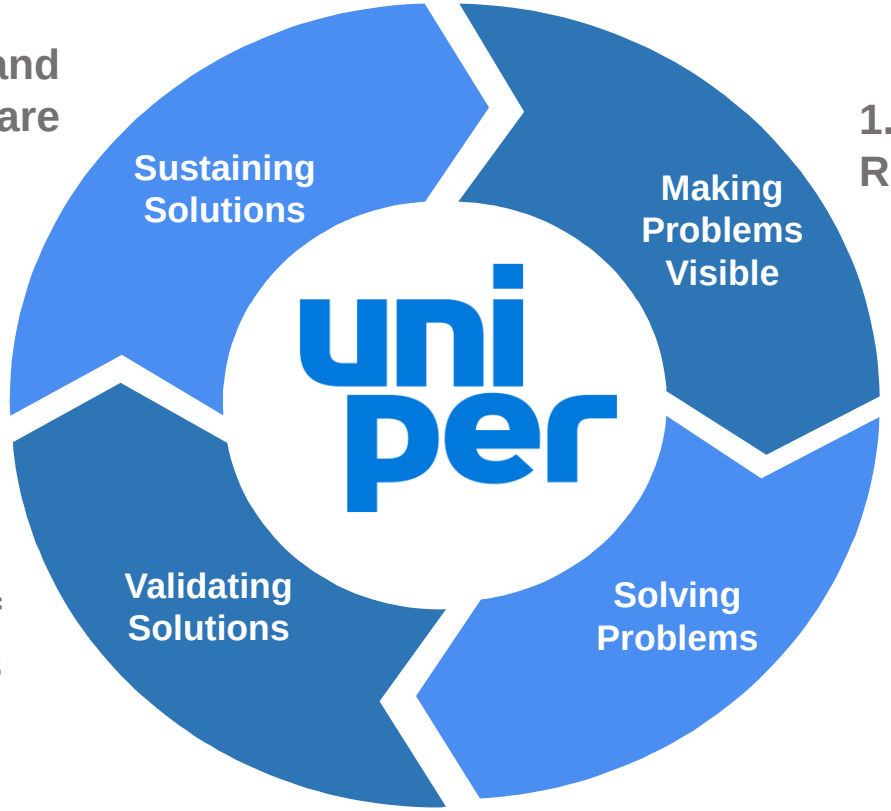
Investigations = **38**/year



©2019 OSIsoft, LLC

Grain Power Station Reliability Management

Failure Reporting and Corrective Action System – Powered by OSIsoft PI, SAP and Tableau



1. Failure Identification and Reporting

2. Prioritisation

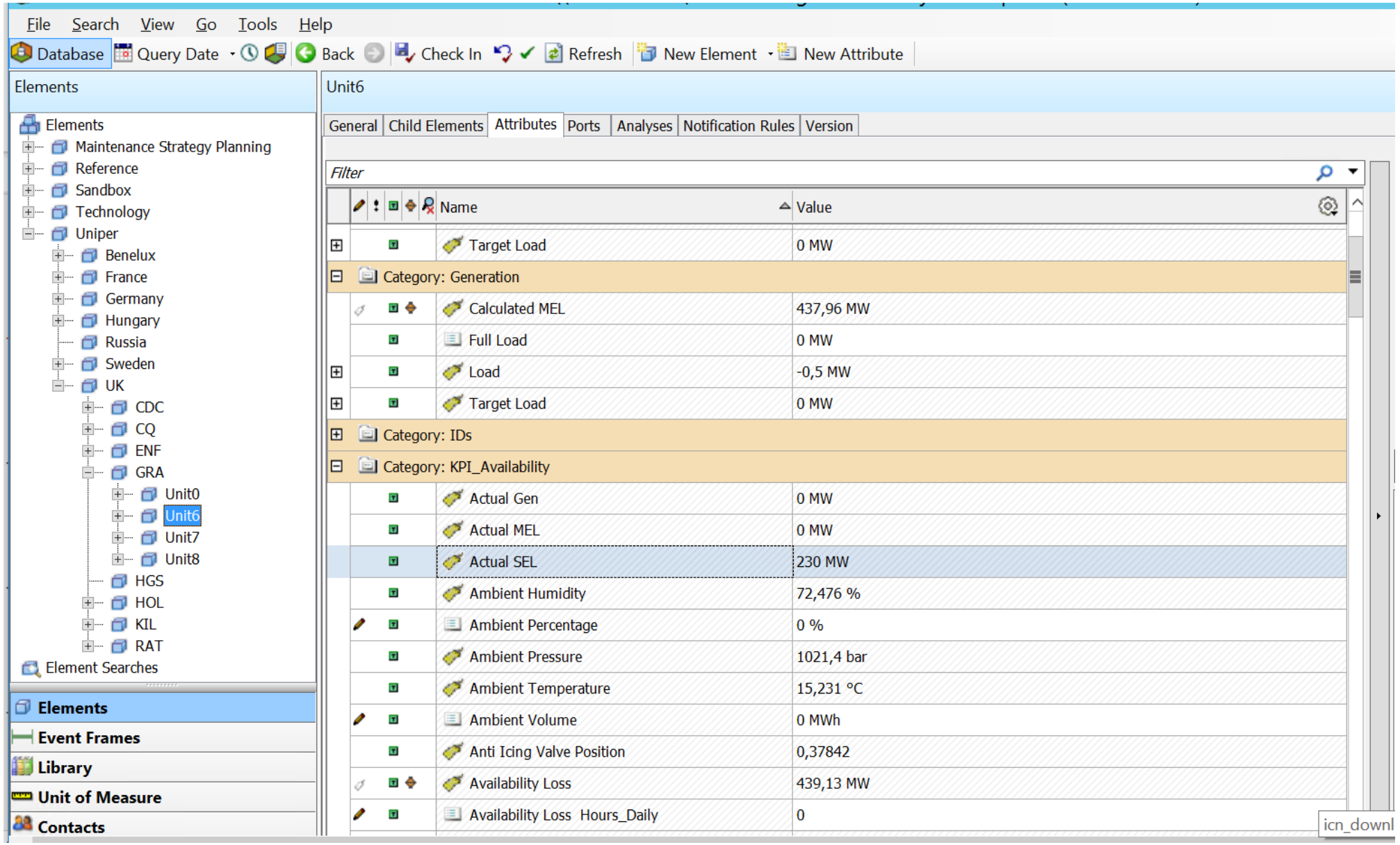
3. Investigation – which rely on data accuracy and technical background

4. Measuring Effectiveness of Implemented Solutions

5. Documentation and Knowledge Share

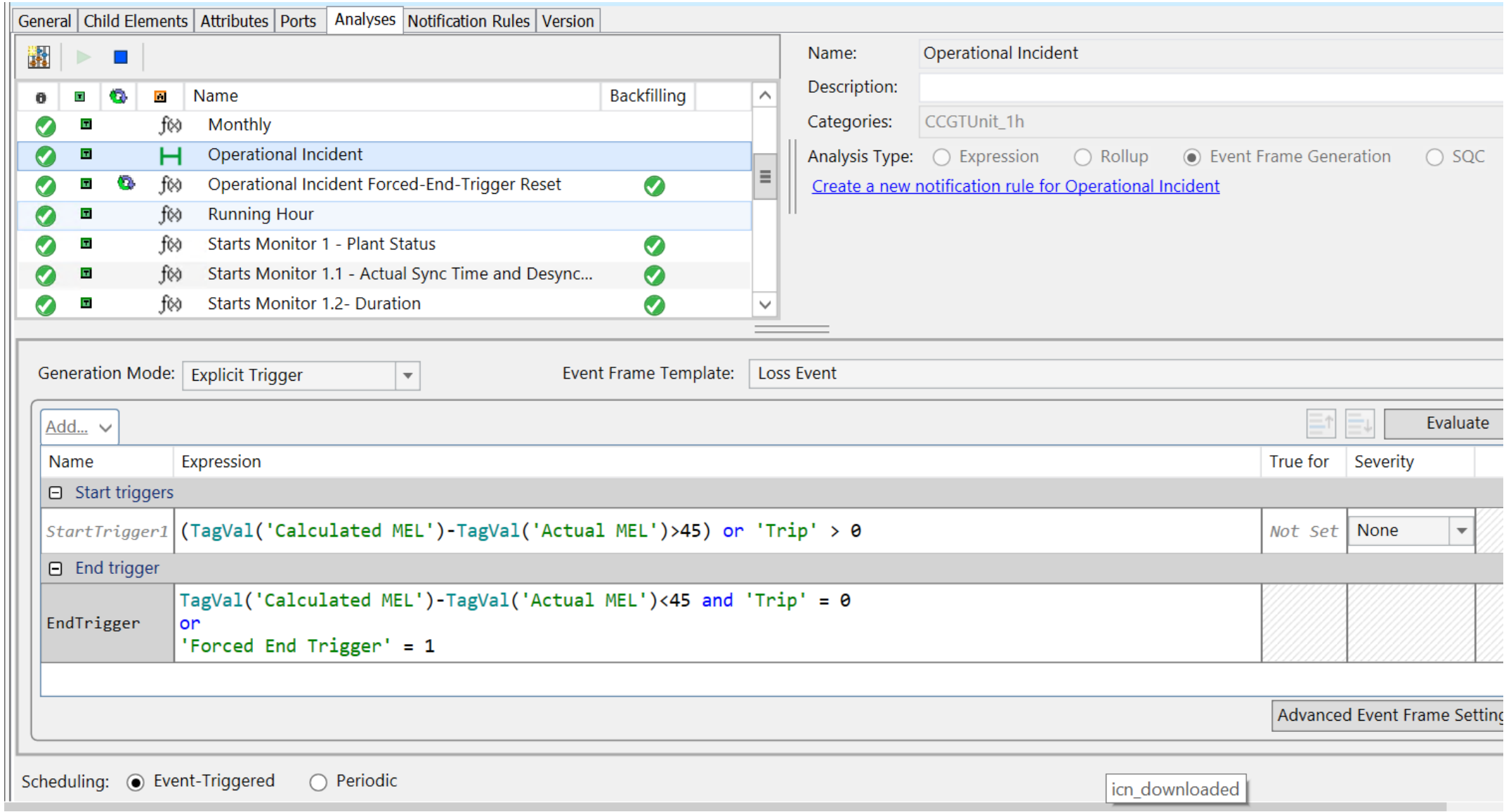
©2019 OSIsoft, LLC

Failure Identification and Reporting



©2019 OSIsoft, LLC

Failure Identification and Reporting

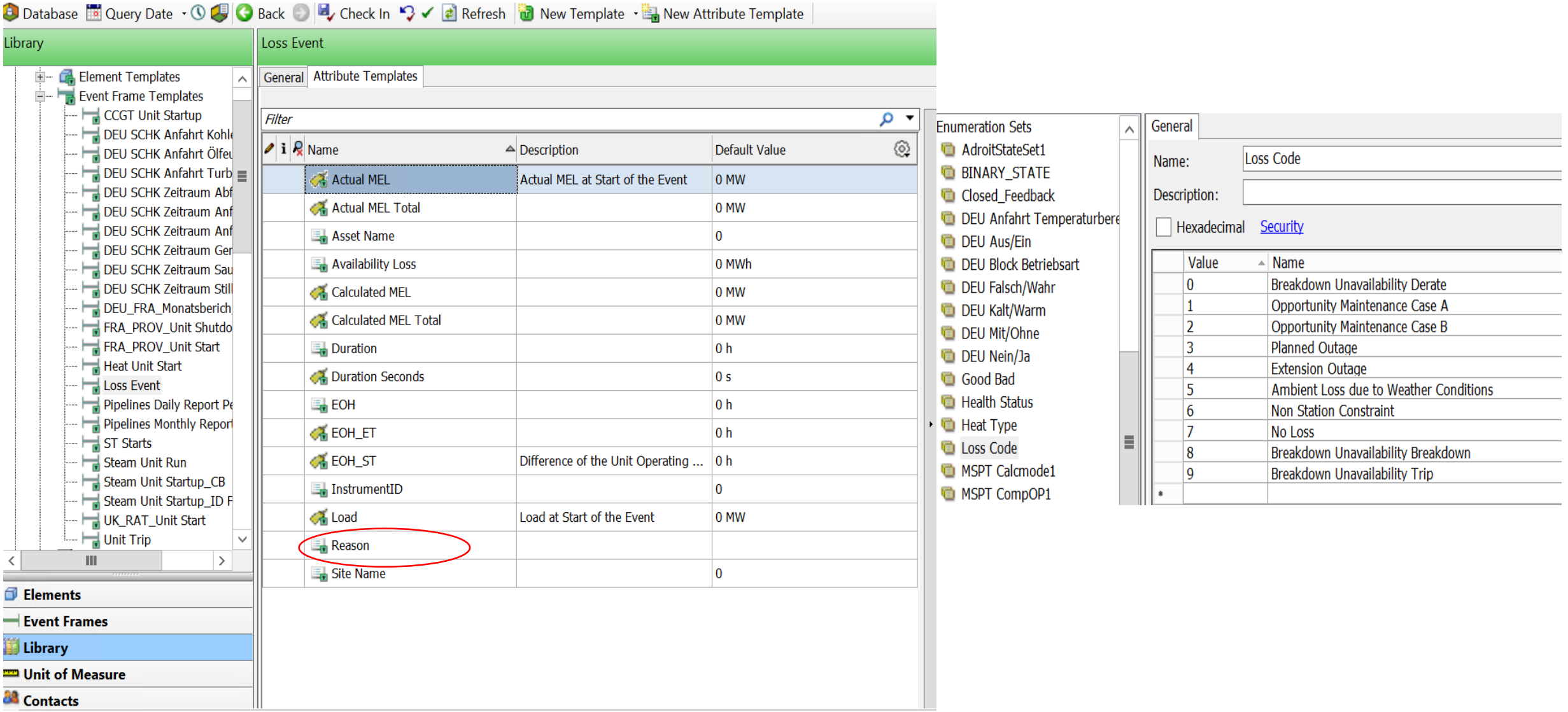


©2019 OSIsoft, LLC

Failure Identification and Reporting

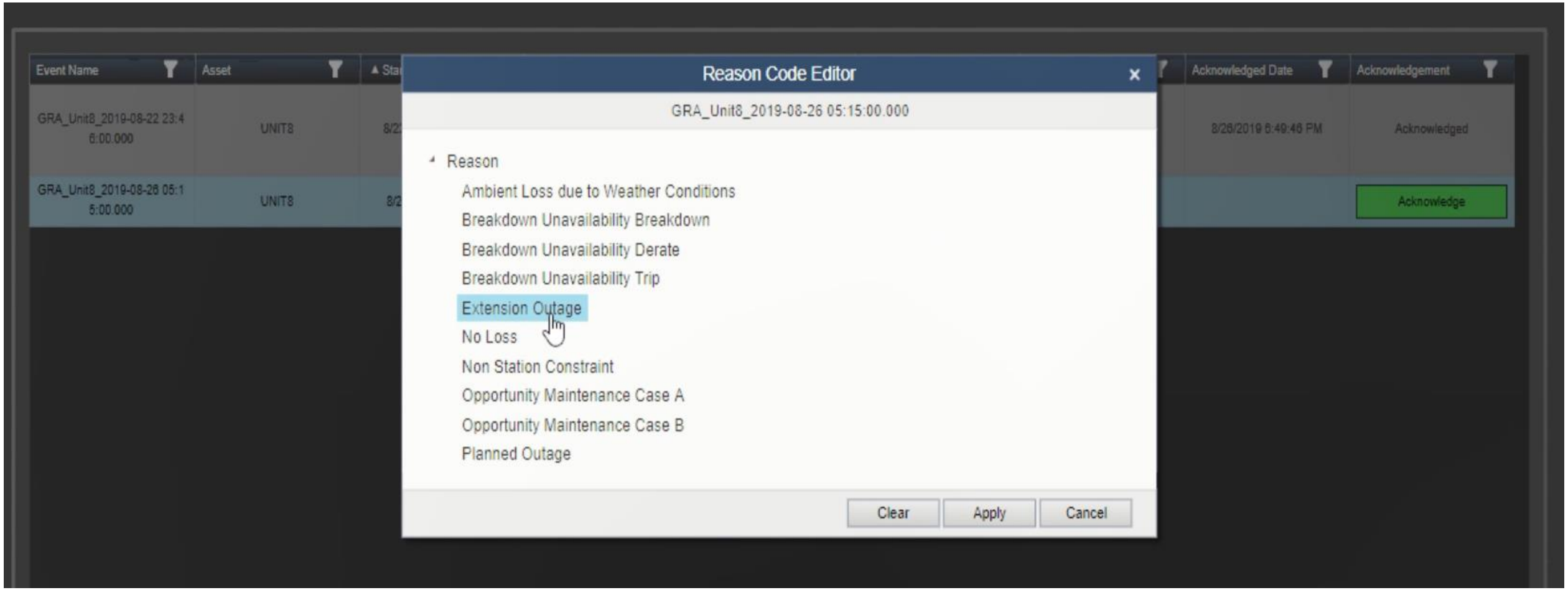
©2019 OSIsoft, LLC

Failure Identification and Reporting



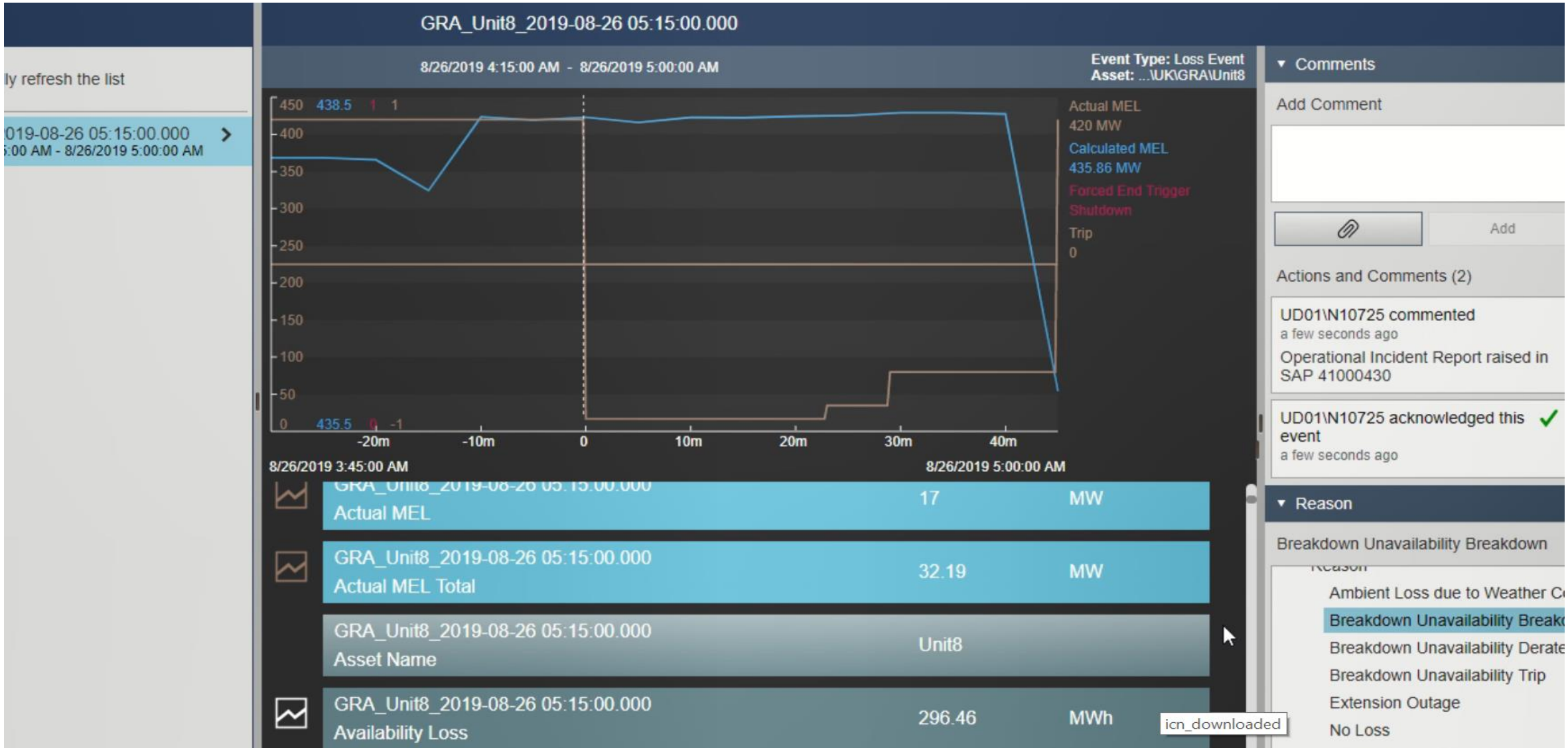
©2019 OSIsoft, LLC

Failure Identification and Reporting



©2019 OSIsoft, LLC

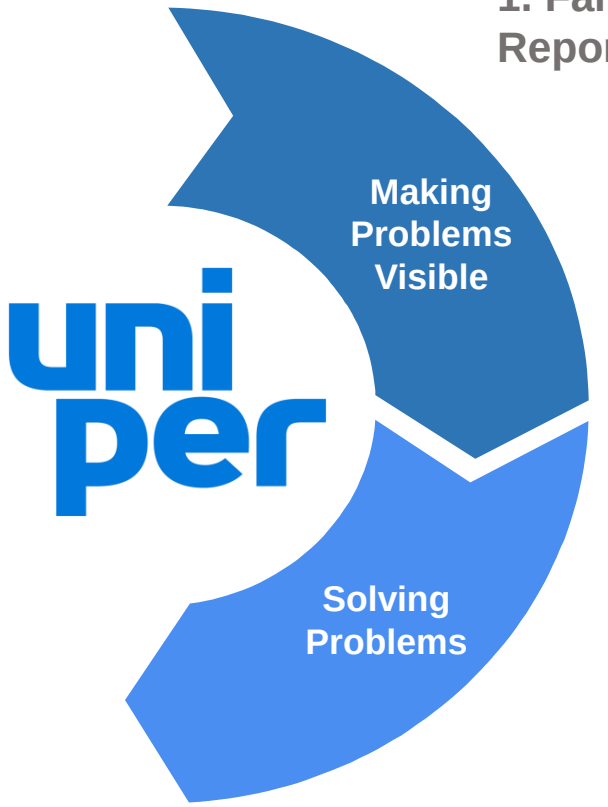
Failure Identification and Reporting



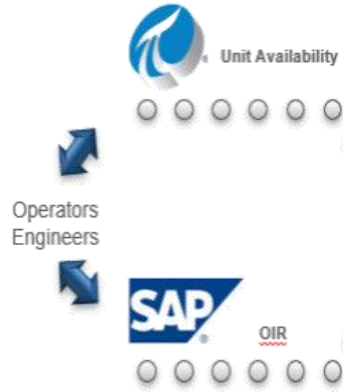
©2019 OSIsoft, LLC

Grain Power Station Reliability Management

Failure Reporting and Corrective Action System – Powered by OSIsoft, SAP and Tableau



1. Failure Identification and Reporting

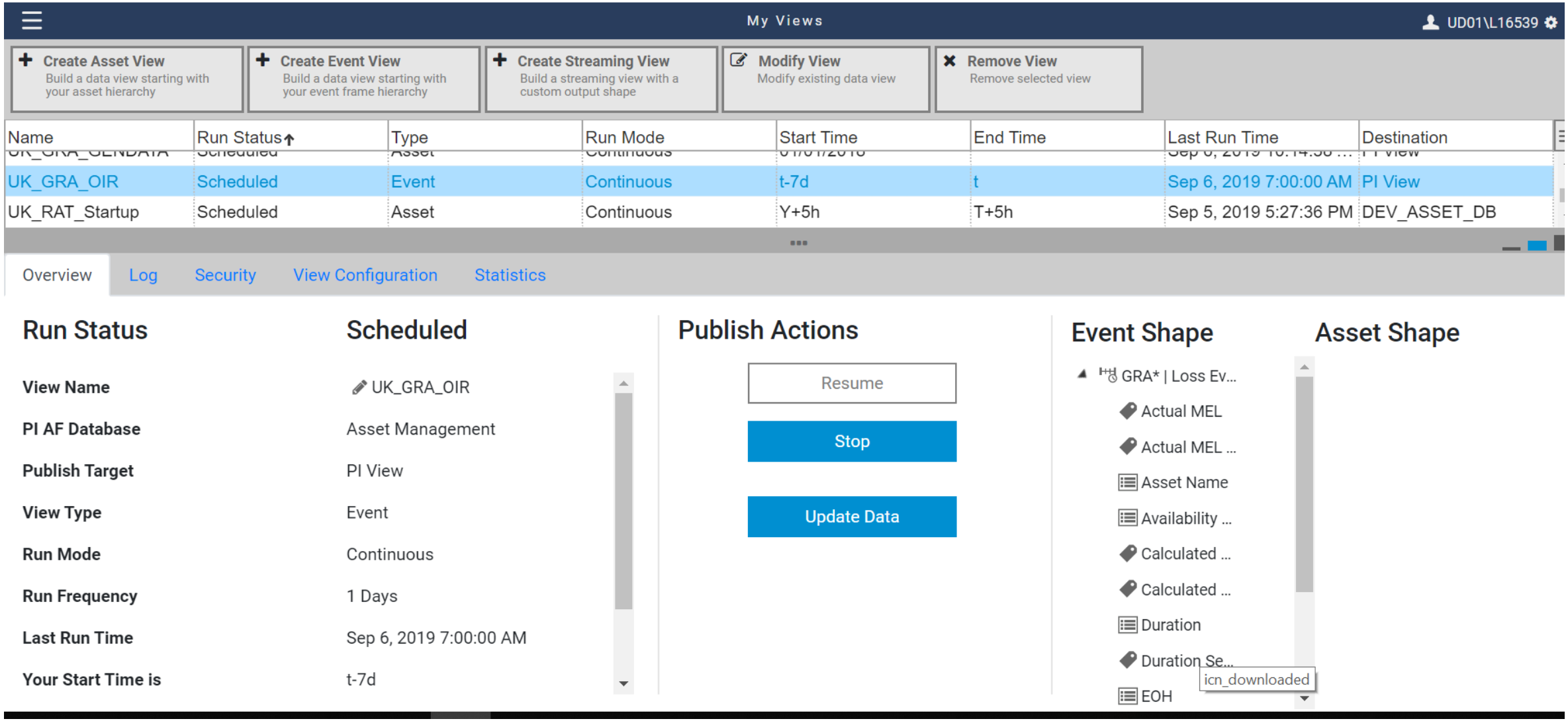


2. Prioritisation

3. Investigation – which rely on data accuracy and technical background

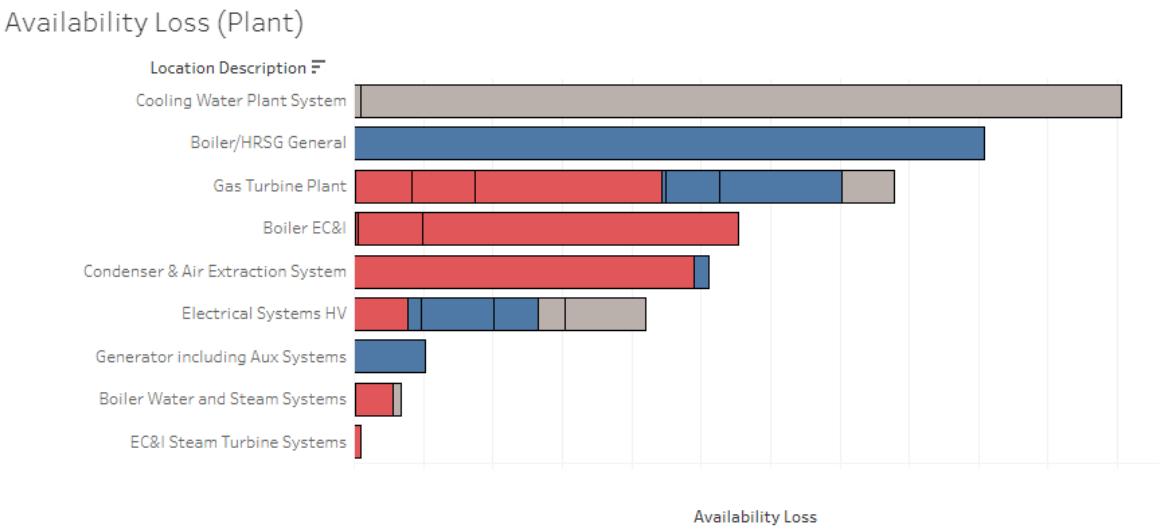
©2019 OSIsoft, LLC

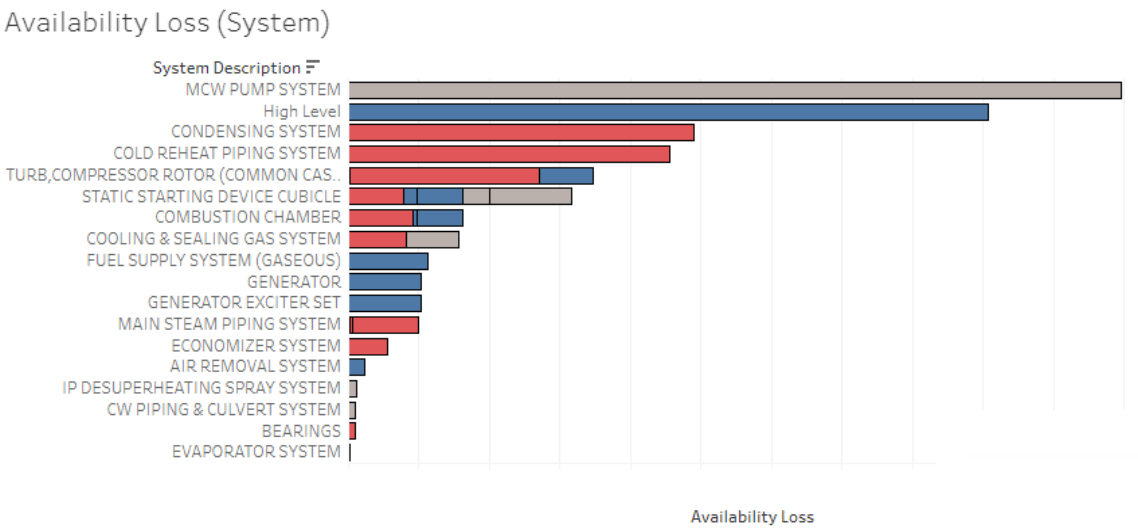
Prioritization

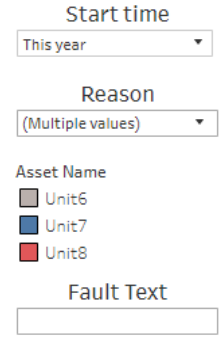


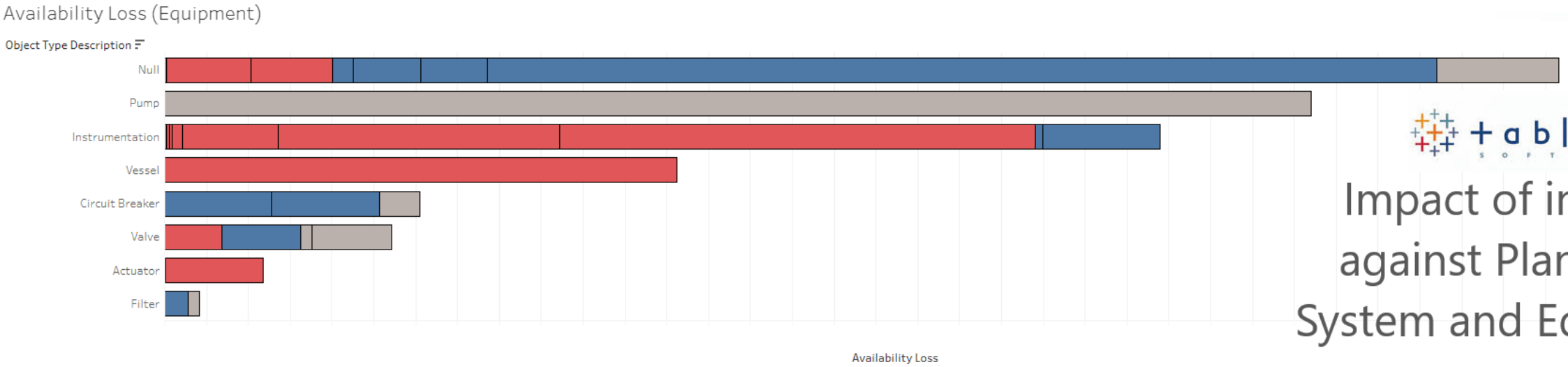
©2019 OSIsoft, LLC

Prioritization









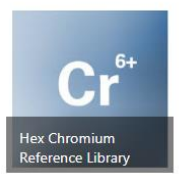
Impact of incident against Plant Area, System and Equipment

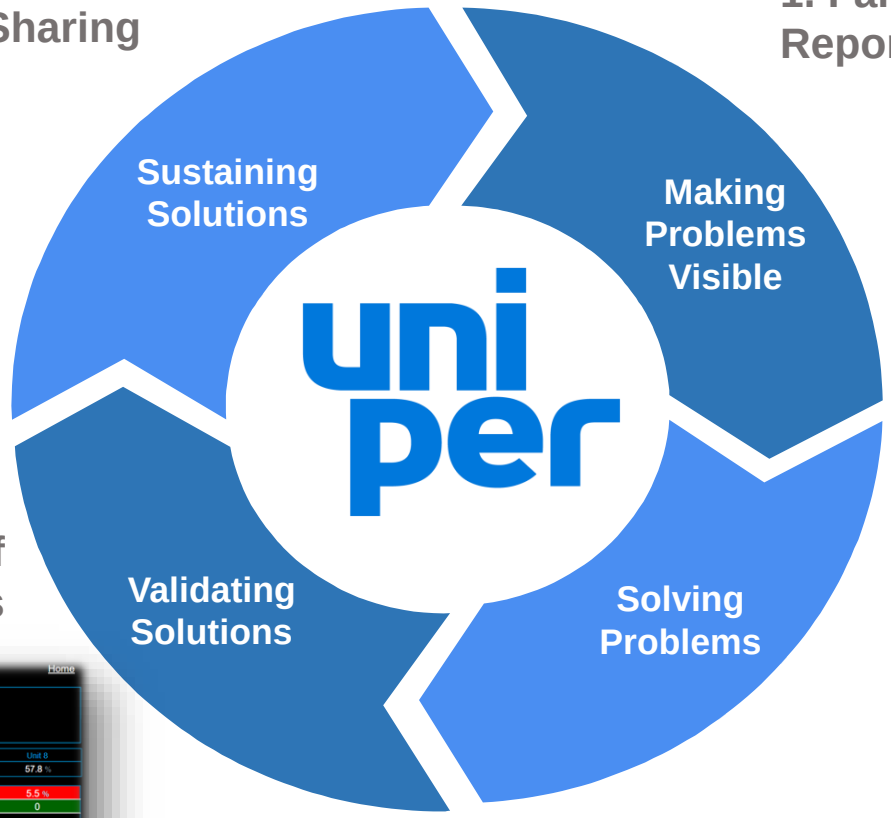
©2019 OSIsoft, LLC

Grain Power Station Reliability Management

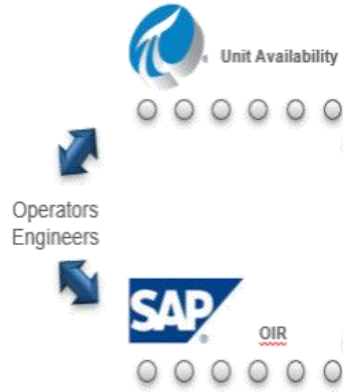
Failure Reporting and Corrective Action System – Powered by OSIsoft, SAP and Tableau

5. Documentation and Knowledge Sharing

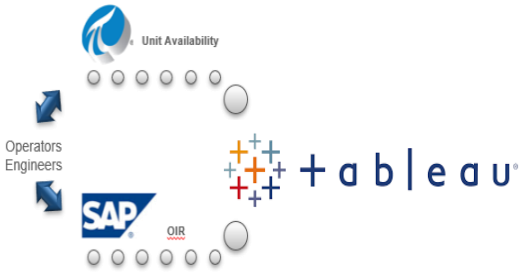




1. Failure Identification and Reporting

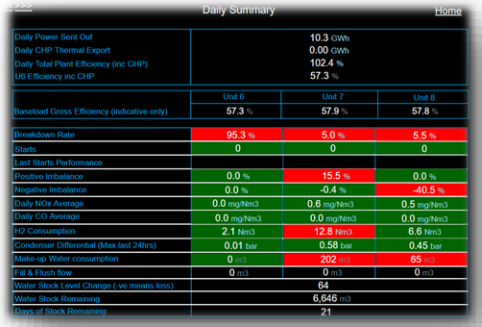


2. Prioritisation



3. Investigation – which rely on data accuracy and technical background

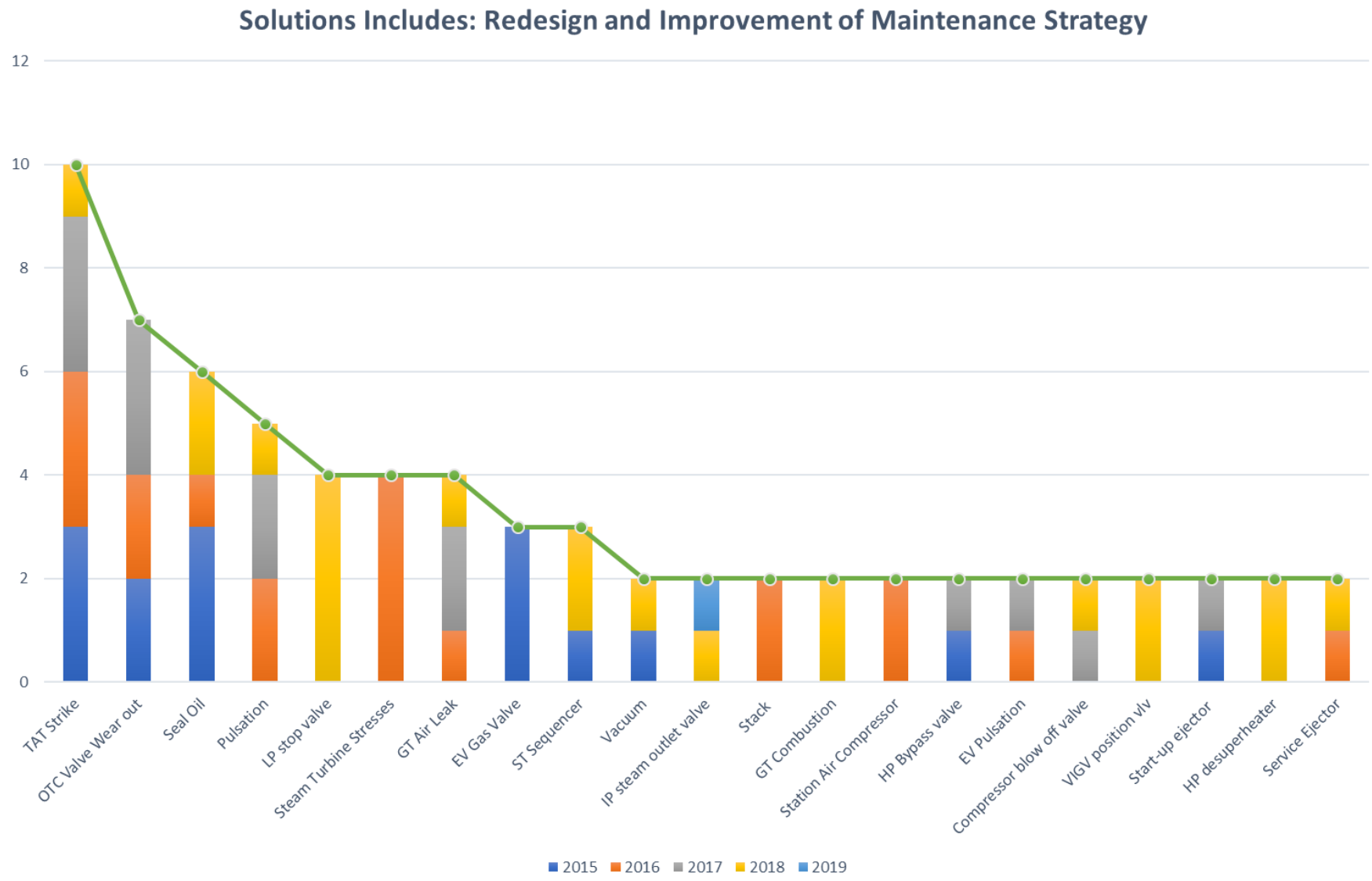
4. Measuring Effectiveness of Implemented Solutions



©2019 OSIsoft, LLC

Grain Reliability Management: Return of Investment

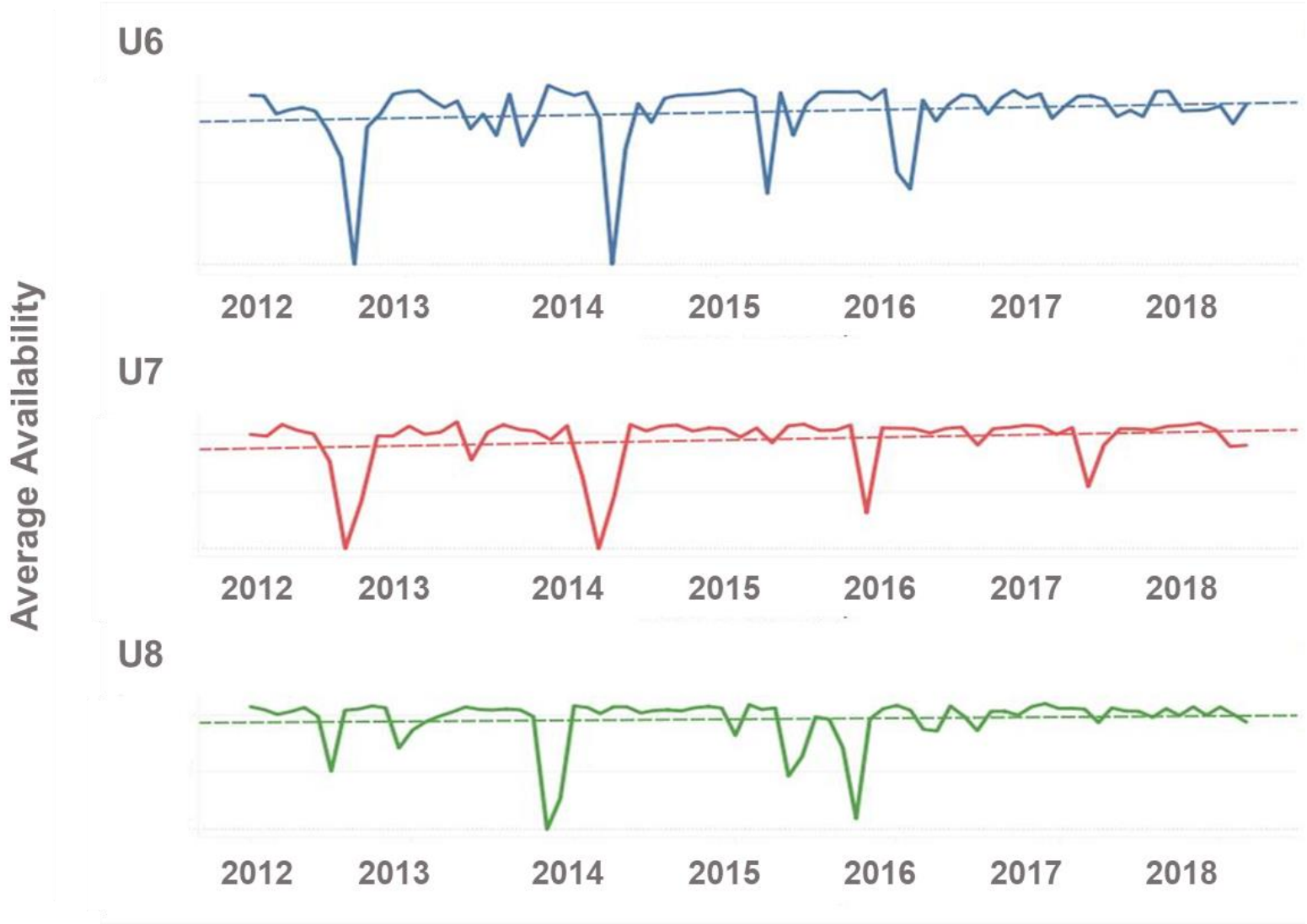
Reduction of Recurrent Incidents



©2019 OSIsoft, LLC

Grain Reliability Management: Return of Investment

Reduction of Force Outages



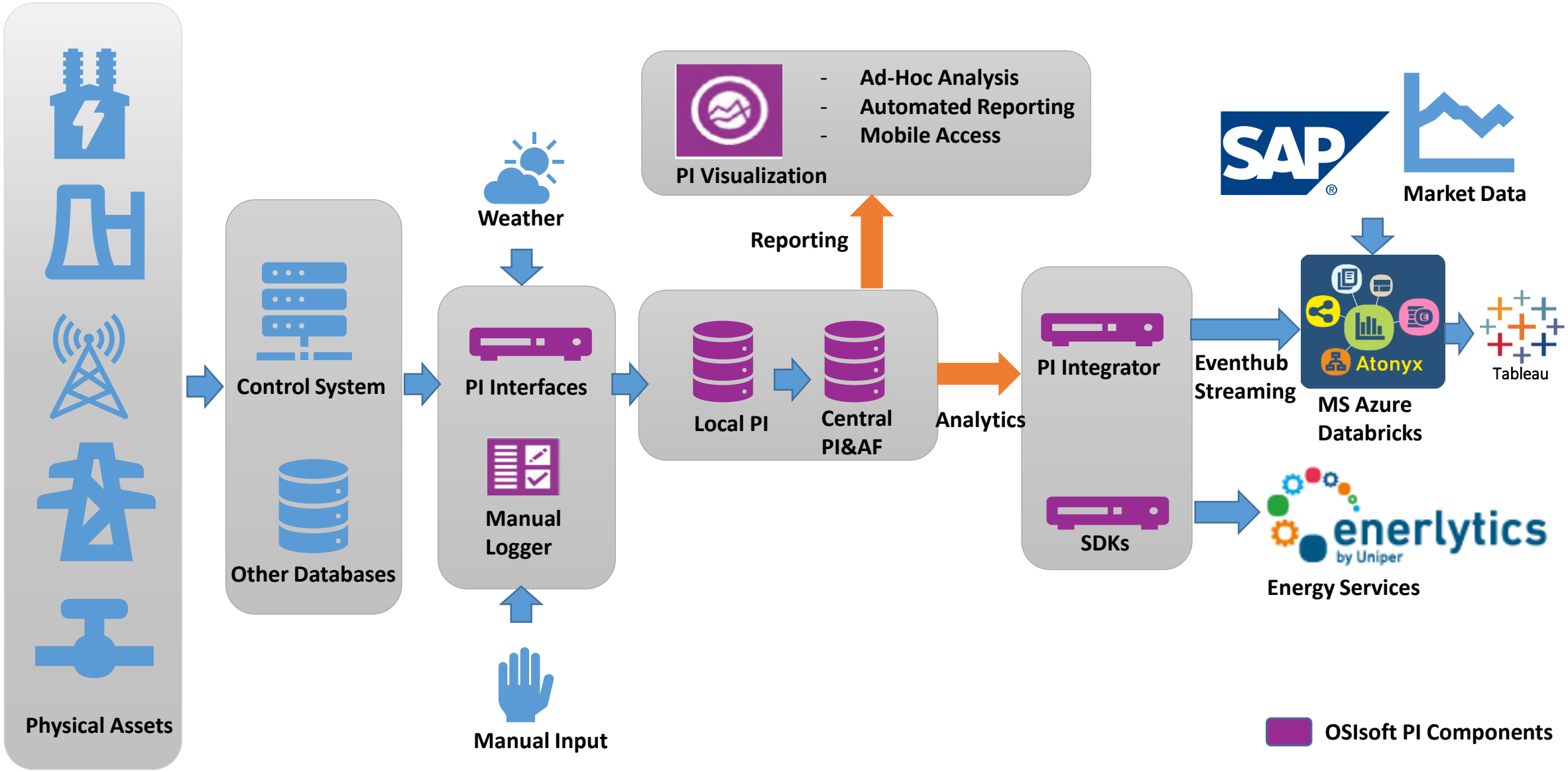
©2019 OSIsoft, LLC

Agenda

- We are Uniper
- Approach to digital Transformation at Generation
- Case Study – Reliability Management
- Infrastructure
- Summary
- Questions

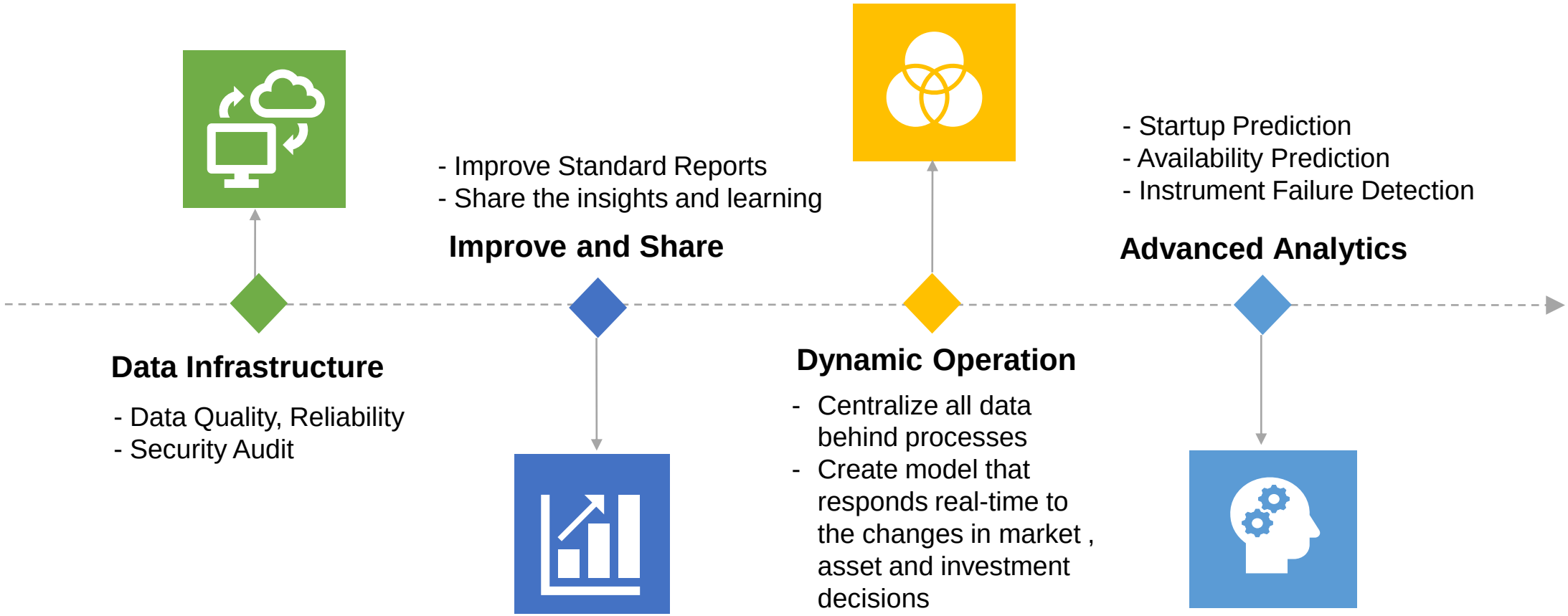
©2019 OSIsoft, LLC

Digitalization @ Generation - Infrastructure



©2019 OSIsoft, LLC

Digitalization @ Generation – Next Steps



Data Infrastructure

- Data Quality, Reliability
- Security Audit

- Improve Standard Reports
- Share the insights and learning

Improve and Share

Dynamic Operation

- Centralize all data behind processes
- Create model that responds real-time to the changes in market , asset and investment decisions

- Startup Prediction
- Availability Prediction
- Instrument Failure Detection

Advanced Analytics

©2019 OSIsoft, LLC

Agenda

- We are Uniper
- Approach to digital Transformation at Generation
- Case Study – Reliability Management
- Infrastructure
- Summary
- Questions

©2019 OSIsoft, LLC

Summary - Uniper's Digitalization Journey with OSIsoft PI

CHALLENGES

- Data quality and reliability
- Lacking Standard and transparency
- Heterogeneous PI Maturity at sites
- Data accessibility

SOLUTION

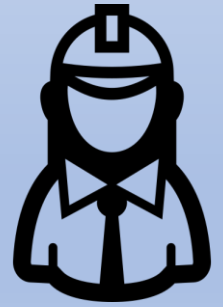
- PI System as backbone for Data Infrastructure
- Lighthouse Project
- Standardizing KPI and Automated Reporting Framework

BENEFITS

- Improved plant reliability and efficiency
- Reduced OPEX and CAPEX
- Simplified processes
- **Empower Our People!**

Lingli Zheng
Senior Data Engineer
lingli.zheng@uniper.energy

Nadia Beleno
Lead Reliability Engineer
Nadia.beleno@uniper.energy



"We would like our people to think for themselves, make decisions, take risks, to be open minded, technically experienced and Curious."

Questions?

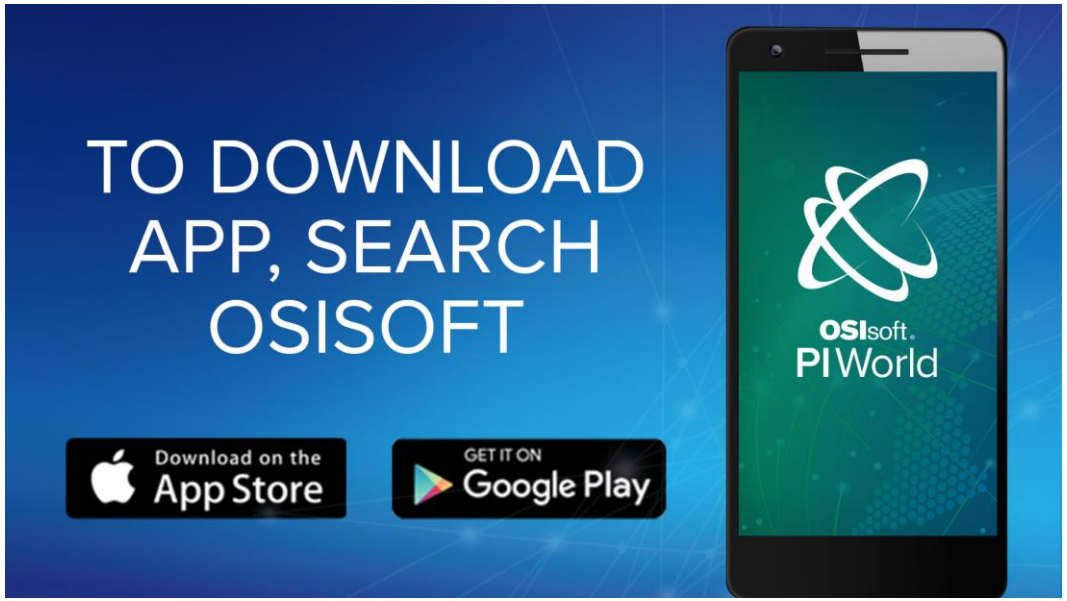
Please wait for the **microphone**

State your **name & company**

Please remember to…

Complete Survey!

Navigate to this session in mobile agenda for survey



©2019 OSIsoft, LLC

©2019 OSIsoft, LLC