Operational challenges in the F&B Industry

Marc Olivé i Torralba
Alex Destruel

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Agenda

- AG Solution Group
- AG Solution & OSIsoft
- Typical client in F&B sector
- Business challenges
- Project challenges
- Some business cases

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About AG Solution Group

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We come from where your data come from

Industrial & Process Automation solutions

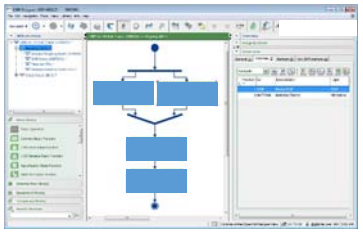
- PLC/SCADA & DCS Systems / Batch

Big Data & Operational Intelligence solutions

- Data infrastructure/ Big data & BI: OSIsoft PI

MES/MOM solutions

- Wonderware – Savigent



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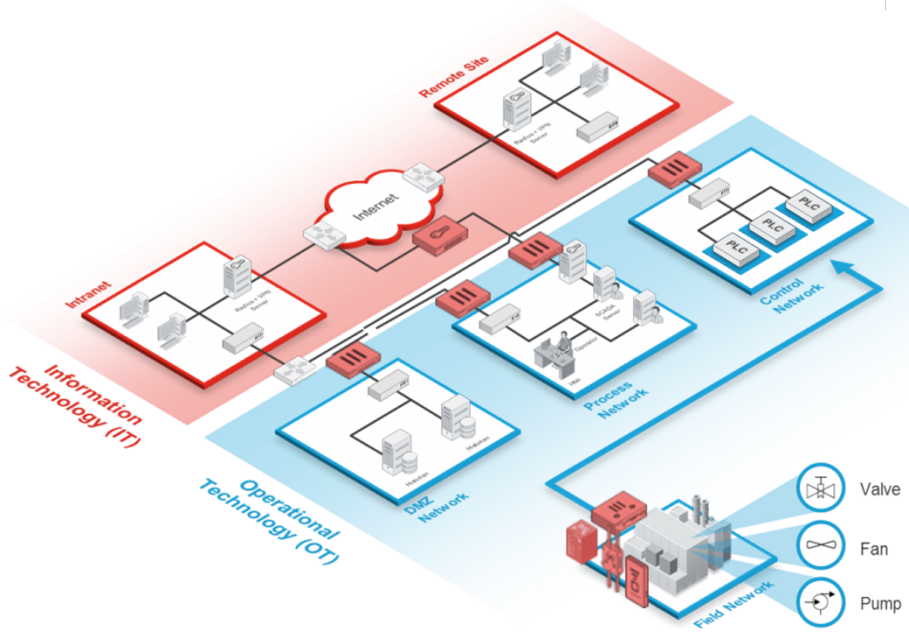
Security

The importance of Security in IT/OT convergence



IT and OT Convergence

- Hardened Security Appliance
- Network Segmentation
- Access Control (Device, User)
- Secure Wireless Access
- ICS Protocols for Threat Prevention

CISA® Certified Information Systems Auditor®
An ISACA® Certification

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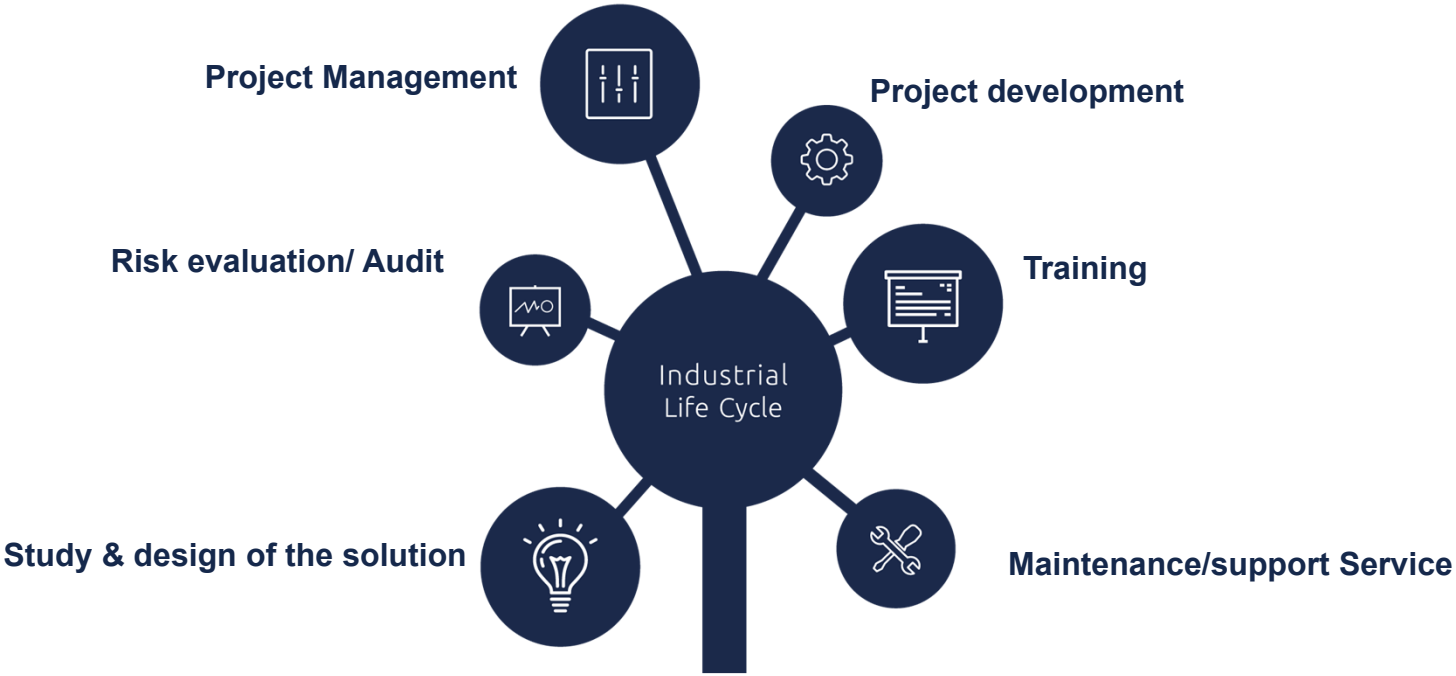
Services



AG Solution is a solutioning partner, not a traditional application integrator

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Experience in process industry

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Long & successful history AG Solution – OSIsoft

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Our Client profiles in the sector

- Worldwide presence
- Multisite
- Combination of Batch, continuous & semi continuous processes
- Different regulations in different countries

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Business challenges

Common challenges in the industry:

- Improve reliability
- Improve performance
- Reduce losses – costs

Particular challenge in F&B:

- Increase maturity in the discipline of regulatory compliance (**Quality**)

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Project & Solution challenges

- Need of a multi purpose information system (quality, operations, management...)
- Scalable
- User adoption for non-IT audience
- Business engagement

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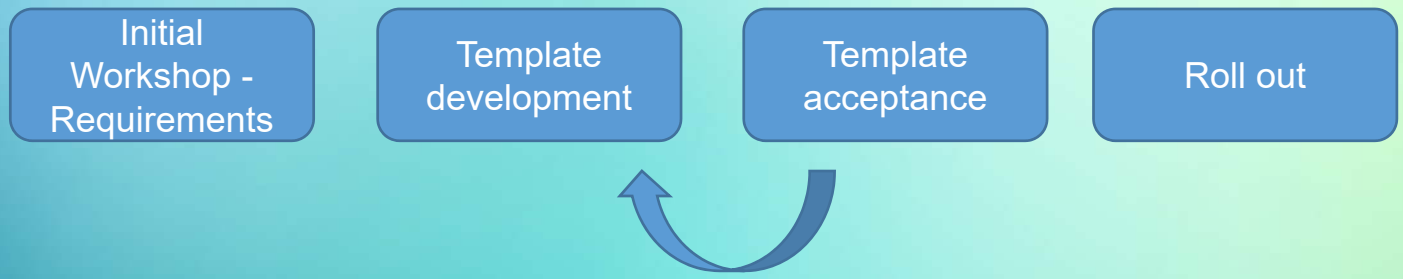
Our agile *methodology* & strategy→ PI AF

- Template based
- To engage user from the initial stage
- Leverage user adoption
- Focus on **what to do**, not on **how**



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Our solution portfolio

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Continuous Process verification

AG Solution
Process Automation & Industrial ICT

CHALLENGE

- Need to assess if Process is **in Control**
- Need to guarantee traceability
- Need to eliminate batch dumps

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Continuous Process verification

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Process Automation & Industrial ICT

CHALLENGE

- Need to assess if Process is **in Control**
- Need to guarantee traceability
- Need to eliminate batch dumps

SOLUTION

Process Verification in PI Vision and PI AF

- Continuous follow-up of process (Batch & Continuous)
- Set up threshold and/or Golden Batch limits
- Deviation detection

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CPP continuous monitoring

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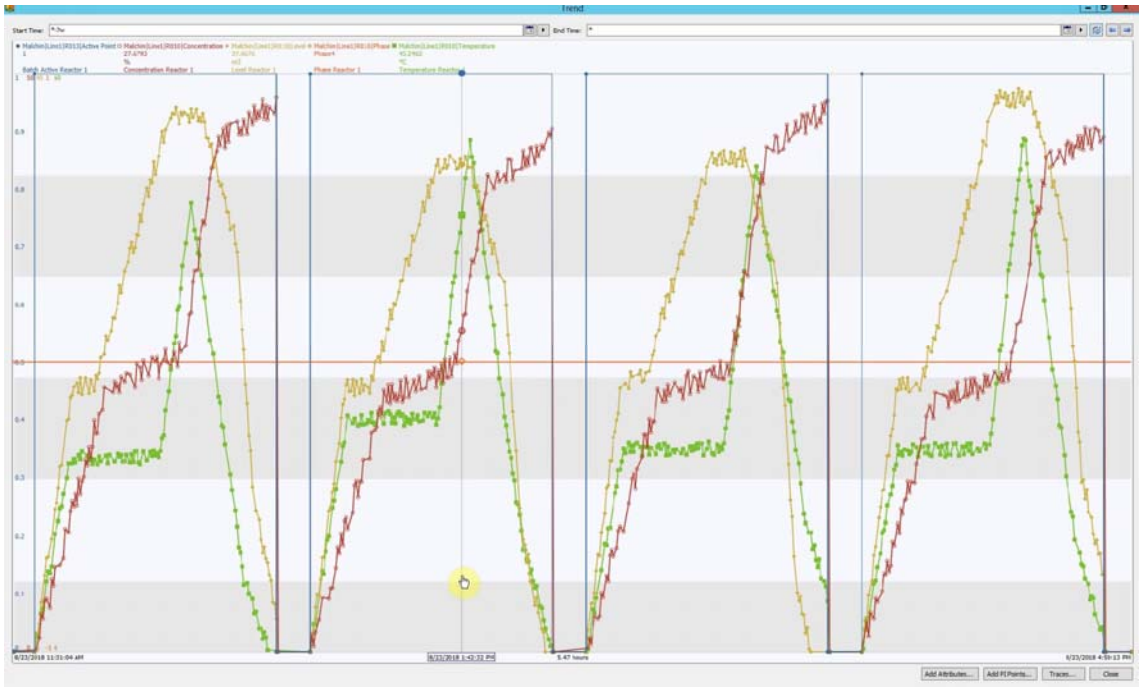
Monitoring per Event/Batch



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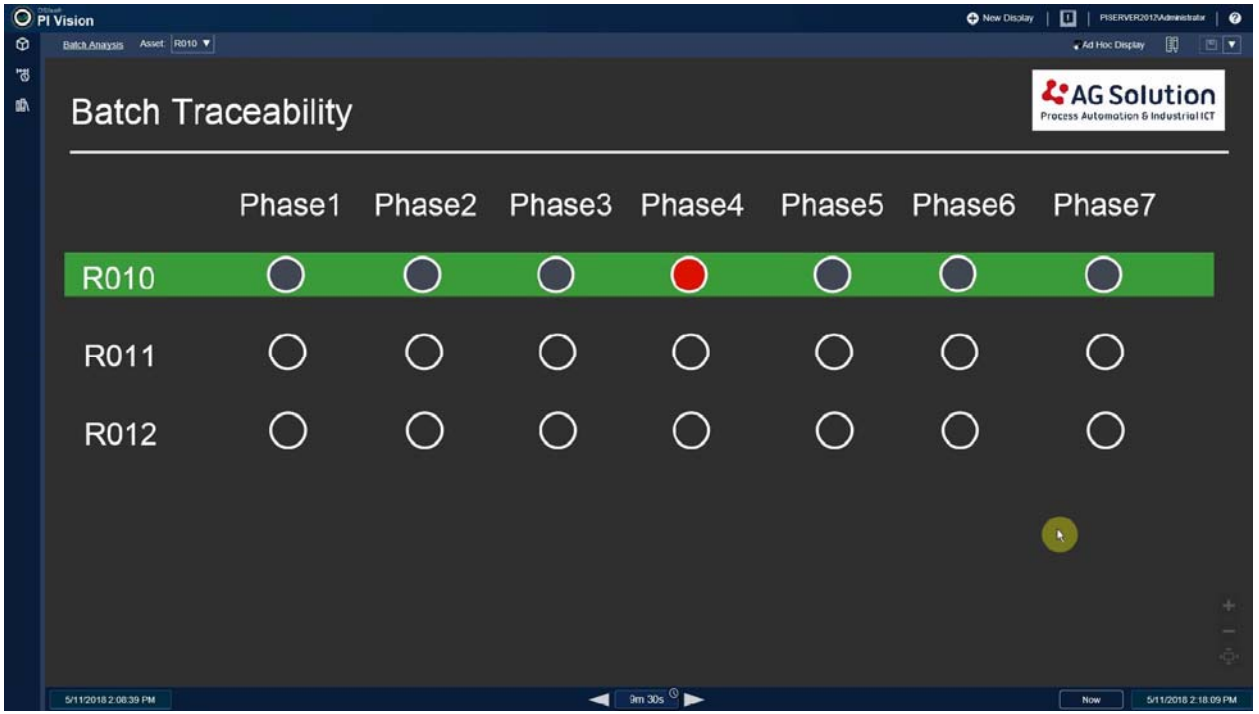
Phase overview



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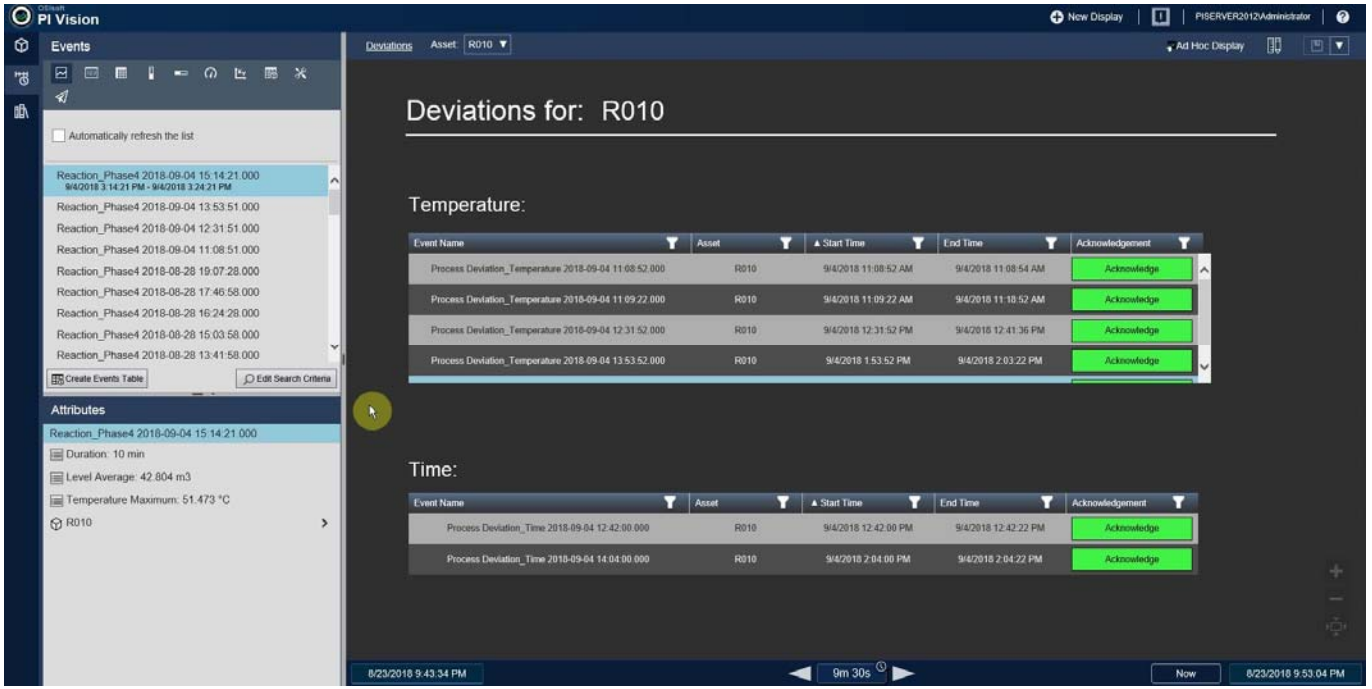
Deviation report per Phase



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Continuous Process verification

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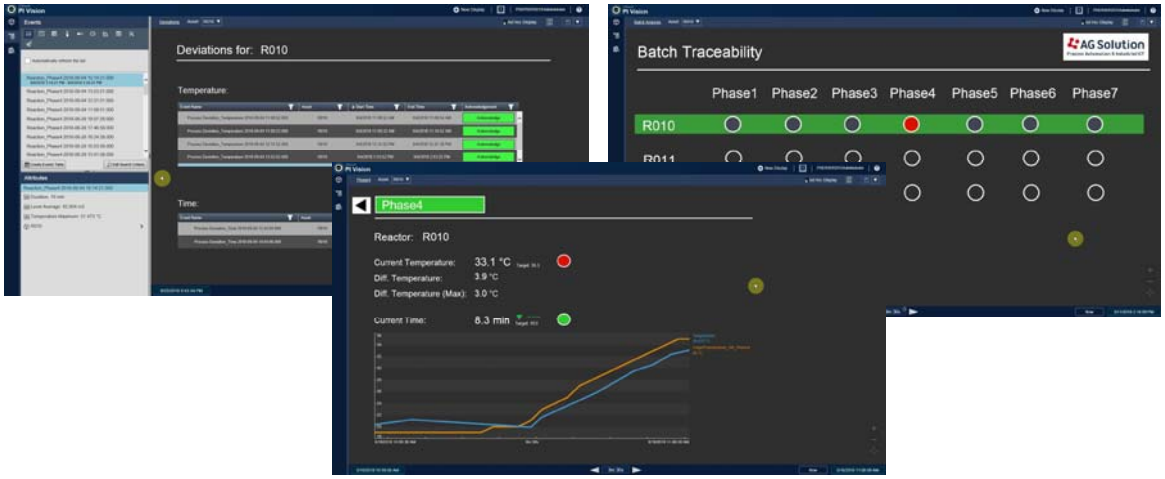

RESULTS

Improvements in:

- Guarantee quality
- Traceability → Audits
- Process knowledge
- Can be done also for non-quality parameters (like Energy or Mass balance)

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OEE measurement

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CHALLENGE

- **Measure and analyse OEE**
- **Downtime Event Manipulation**
- **Reporting capabilities**

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OEE measurement

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CHALLENGE

- **Measure and analyse OEE**
- **Downtime Event Manipulation**
- **Reporting capabilities**

SOLUTION

- **Combined solution**

+ Custom frontend

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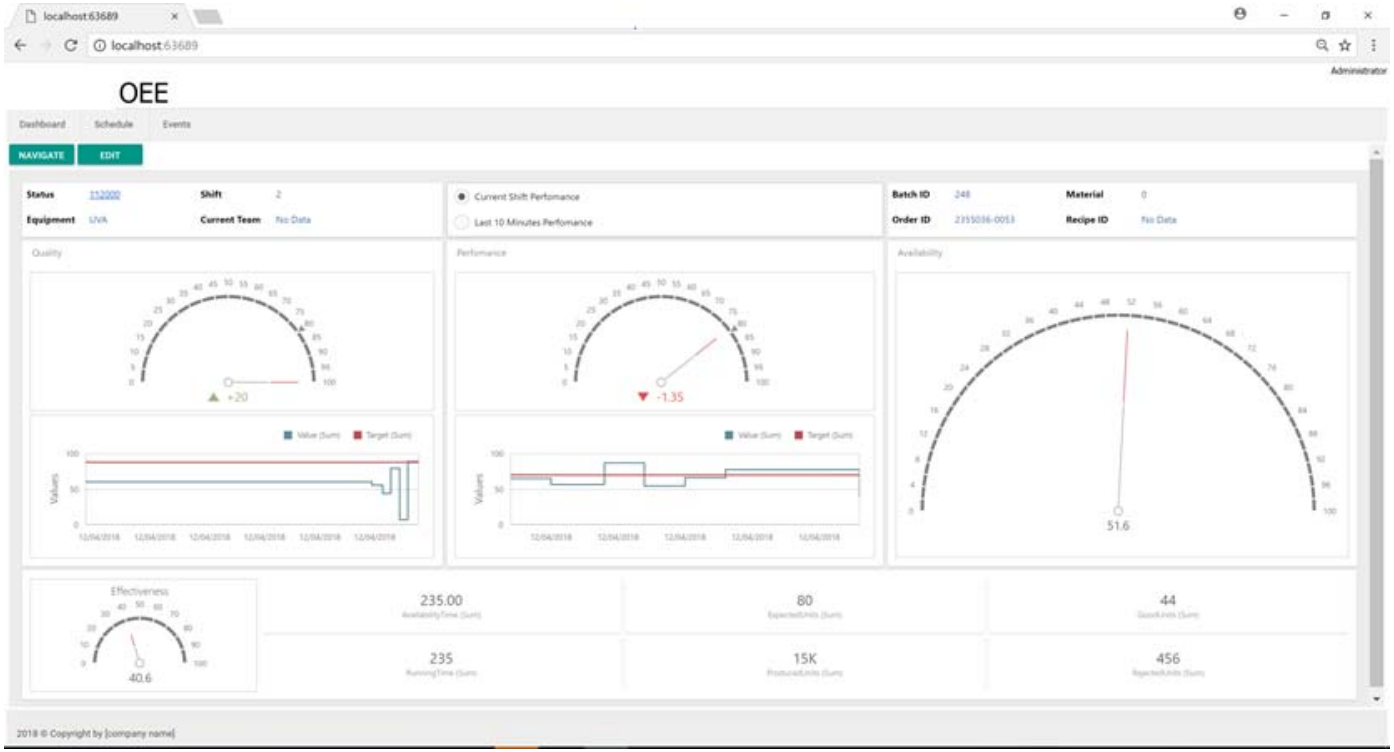
OEE calculation and visualization



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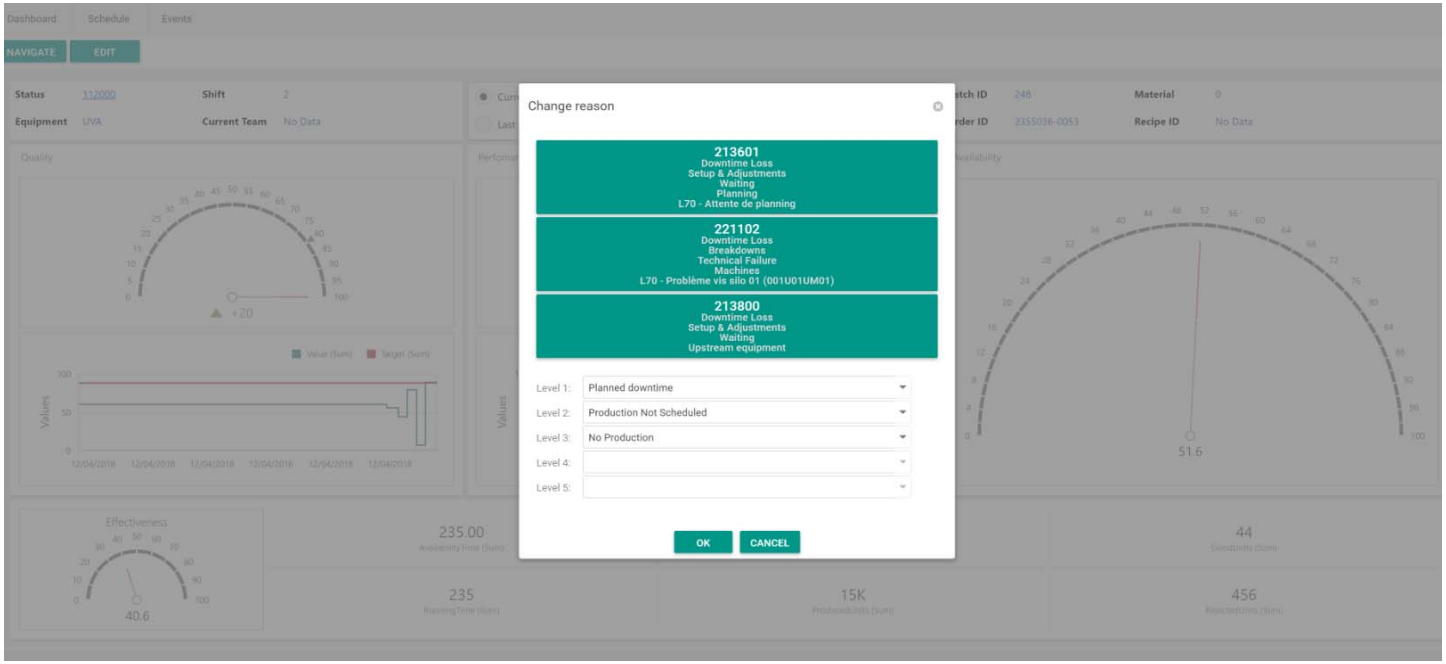
OEE: Smart Reason-tree justification



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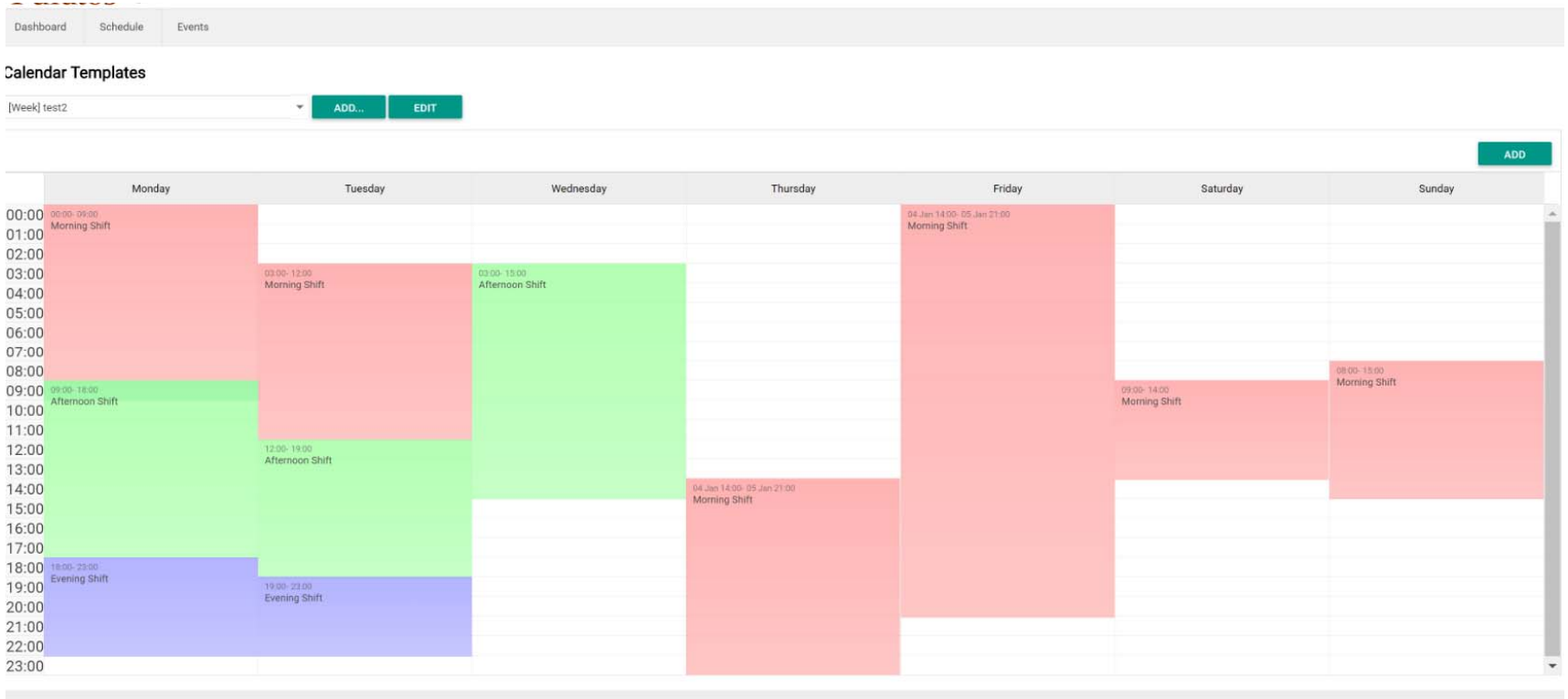
OEE: Machine calendar allocation



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OEE measurement

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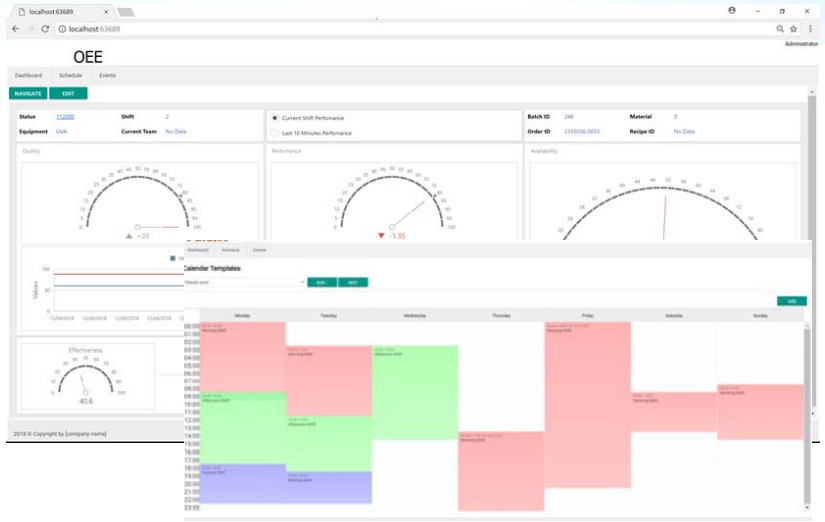

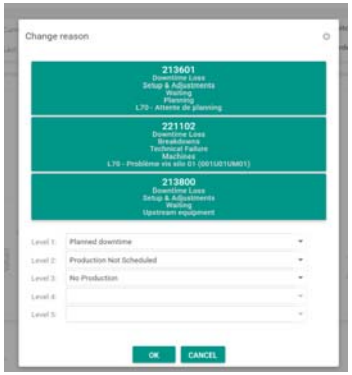

RESULTS

- Analysis of OEE parameters (quality, performance, availability)
- Analysis per Batch, shift, period
- Downtime Event manipulation
- Advanced reporting integrated

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AKTool: Alarm KPI tool

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CHALLENGE

Lack of Alarm Management

- Alarm display is full of alarms, even if nothing is wrong
- Operator ignores alarms
- Poor visibility of Bad actors

	Date	Class	Type	Priority	Source	Area	Event	Quantity 1	Average d'yratic 2	Total duration
1	30/10/14	Warning	Low	8	PC350/C	02_Reforming	Synthesis Gas Pressure Control PV - High warning limi	3061	1.786	1:30:04.000
2	30/10/14	Operator Message	Operator Message.	0	ESD/@ESD/Cause-AL1-16	02_Reforming	: Acknowledgment Alarm, High on	50	0.000	0.000
3	30/10/14	System, does not require acknowledgment	Process control system	0			CSIG::ES23A:Tag T1270.EventState does not exist	30	0.000	0.000
4	30/10/14	Alarm	High	12	ESD/@ESD/ESD	02_Reforming	group display Alarm	23	15:55.545	5:56:22.000
5	31/10/14	Operator Message	Operator Message.	0	StartUpReformer	02_Reforming	Shift_Operator Executing 'Start' command	21	0.000	0.000
6	17/09/14	Operator prompt	Request for Operator Inpu	0	StartUpReformer	02_Reforming	Operator prompt	10	31:42.333	4:45:21.000
7	30/10/14	Alarm	High	0	ESD/@ESD/Cause-AL1-16	02_Reforming	Cause ?? Trip Tag active	10	10:57.700	1:49:37.000
8	30/10/14	Alarm	High	0	ESD/@ESD/Cause-AL1-16	02_Reforming	Cause ?? Trip Tag active	10	10:57.200	1:49:32.000
9	30/10/14	Alarm	High	0	ESD/@ESD/Cause-AL1-16	02_Reforming	Cause ?? Trip Tag active	10	10:57.000	1:49:30.000
10	30/10/14	Alarm	High	0	ESD/@ESD/Cause-AL1-16	02_Reforming	Cause ?? Trip Tag active	8	41:03.429	4:47:24.000
11	31/10/14	System, does not require acknowledgment	Process control system	0			PERFMON:ES23A:CPU Idle Time in % is ok	8	0.000	0.000
12	31/10/14	OS process control system messages	Failure	0	ES23A		PERFMON:CPU Idle Time in % is low	8	0.000	0.000
13	30/10/14	Alarm	High	0	ESD/@ESD/Cause-AL1-16	02_Reforming	Cause ?? Trip Tag active	7	15:40.714	1:49:45.000
14	30/10/14	Alarm	High	0	ESD/@ESD/Cause-AL1-16	02_Reforming	Cause ??	6	57:02.000	4:45:10.000
15	30/10/14	Alarm	High	0	ESD/@ESD/Cause-AL1-16	02_Reforming	Cause ??	6	57:02.000	4:45:10.000
16	30/10/14	Alarm	High	0	ESD/@ESD/Cause-AL1-16	02_Reforming	Cause ??	6	57:02.000	4:45:10.000
17	30/10/14	Alarm	High	0	ESD/@ESD/Cause-AL1-16	02_Reforming	Cause ??	6	57:02.000	4:45:10.000
18	30/10/14	Alarm	High	0	ESD/@ESD/Cause-AL1-16	02_Reforming	Cause ??	6	57:02.000	4:45:10.000
19	30/10/14	Alarm	High	0	ESD/@ESD/Cause-AL1-16	02_Reforming	Cause ??	6	57:02.000	4:45:10.000
20	17/09/14	Alarm	High	12	ESD/@ESD/Cause-AL1-16	02_Reforming	Cause 6 active	5	26:16.800	2:11:24.000
21	17/09/14	Alarm	High	12	ESD/@ESD/Cause-AL1-16	02_Reforming	Cause 1 active	5	20:51.200	1:44:16.000
22	17/09/14	Alarm	High	12	ESD/@ESD/Cause-AL1-16	02_Reforming	Cause 2 active	5	20:51.200	1:44:16.000
23	17/09/14	Alarm	High	12	ESD/@ESD/Cause-AL1-16	02_Reforming	Cause 3 active	5	20:51.200	1:44:16.000
24	17/09/14	Alarm	High	12	ESD/@ESD/Cause-AL1-16	02_Reforming	Cause 4 active	5	20:51.200	1:44:16.000
25	17/09/14	Alarm	High	12	ESD/@ESD/Cause-AL1-16	02_Reforming	Cause 8 active	5	20:49.400	1:44:07.000
26	30/10/14	Warning	Low	8	TI311/I	02_Reforming	Measurement PV - Low alarm limit violated	4	33:57.000	1:41:51.000
27	30/10/14	Warning	Low	8	TI310/I	02_Reforming	Measurement PV - Low alarm limit violated	4	33:56.667	1:41:50.000
28	30/10/14	Warning	Low	8	TI312/I	02_Reforming	Measurement PV - Low alarm limit violated	4	33:56.667	1:41:50.000
29	30/10/14	Warning	Low	8	TI313/I	02_Reforming	Measurement PV - Low alarm limit violated	4	33:56.667	1:41:50.000
30	30/10/14	Alarm	Medium	8	TI310/I	02_Reforming	Measurement PV - Low warning limit violated	4	33:45.000	1:41:15.000
31	30/10/14	Alarm	Medium	8	TI312/I	02_Reforming	Measurement PV - Low warning limit violated	4	33:45.000	1:41:15.000
32	30/10/14	Alarm	Medium	8	TI313/I	02_Reforming	Measurement PV - Low warning limit violated	4	33:45.000	1:41:15.000
33	30/10/14	Alarm	Medium	8	TI311/I	02_Reforming	Measurement PV - Low warning limit violated	4	33:44.667	1:41:14.000
34	30/10/14	Warning	Low	8	TI314/I	02_Reforming	Measurement PV - Low alarm limit violated	4	33:34.000	1:40:42.000
35	30/10/14	Warning	Low	8	TI315/I	02_Reforming	Measurement PV - Low alarm limit violated	4	33:33.333	1:40:40.000
36	30/10/14	Warning	Low	8	TI316/I	02_Reforming	Measurement PV - Low alarm limit violated	4	33:33.333	1:40:40.000
37	30/10/14	Warning	Low	8	TI317/I	02_Reforming	Measurement PV - Low alarm limit violated	4	33:33.333	1:40:40.000
38	30/10/14	Warning	Warning - low	8	PC350/C	02_Reforming	Synthesis Gas Pressure Control PV - Low warning limit	2	18.000	36.000
39	30/10/14	Alarm	Medium	8	PC350/C	02_Reforming	Synthesis Gas Pressure Control PV - Low alarm limit vi	2	9.500	19.000

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AKTool: Alarm KPI tool

AG Solution
Process Automation & Industrial ICT

CHALLENGE

Poor Alarm Management

- Alarm display is full of alarms, even if nothing is wrong
- Operator ignores alarms
- Poor visibility of Bad actors

SOLUTION

Create an Alarm KPI tool based on OSIsoft PI System

- Capture, document and analyse alarms via OPC A&E
- Setup alarm performance KPI's
- Alarm reporting and statistics
- Export to .csv files

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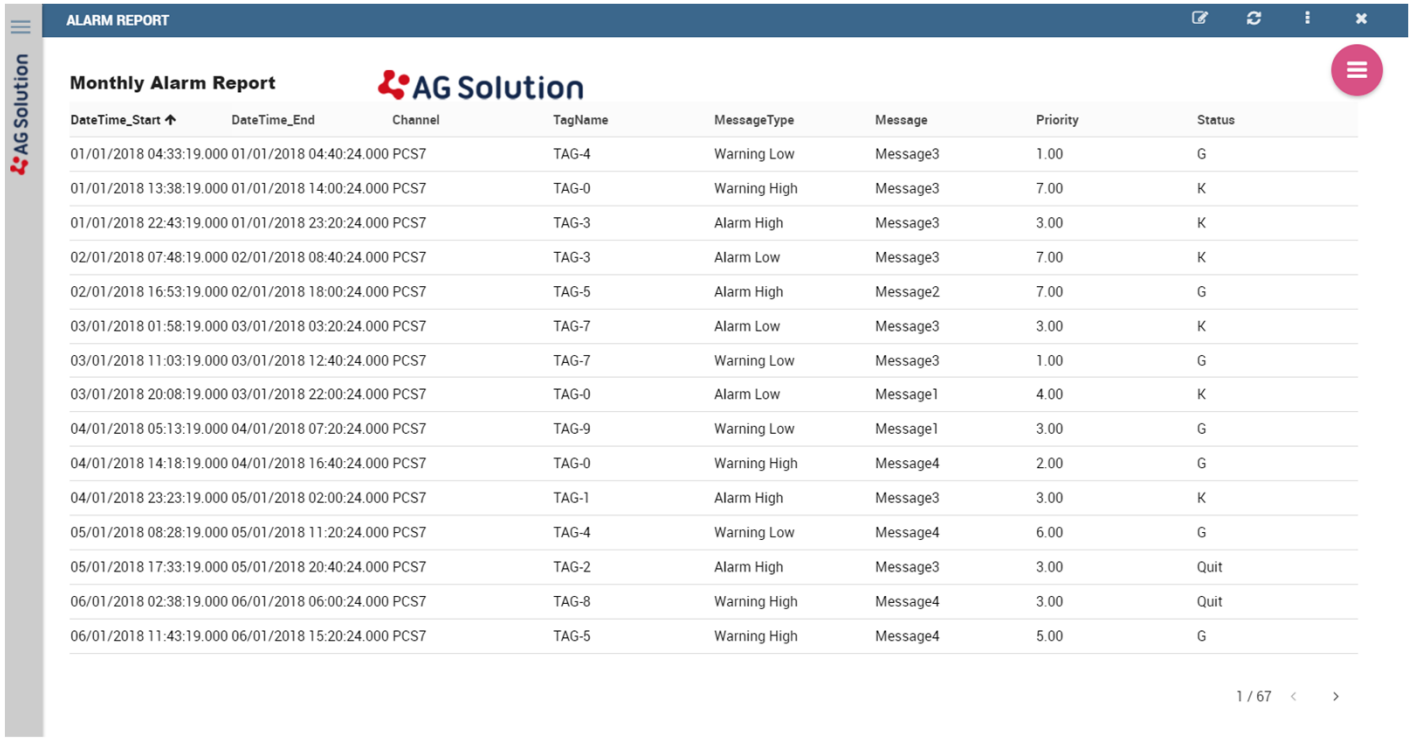
Alarm report



DateTime_Start	DateTime_End	Channel	TagName	MessageType	Message	Priority	Status
01/01/2018 04:33:19.000	01/01/2018 04:40:24.000	PCS7	TAG-4	Warning Low	Message3	1.00	G
01/01/2018 13:38:19.000	01/01/2018 14:00:24.000	PCS7	TAG-0	Warning High	Message3	7.00	K
01/01/2018 22:43:19.000	01/01/2018 23:20:24.000	PCS7	TAG-3	Alarm High	Message3	3.00	K
02/01/2018 07:48:19.000	02/01/2018 08:40:24.000	PCS7	TAG-3	Alarm Low	Message3	7.00	K
02/01/2018 16:53:19.000	02/01/2018 18:00:24.000	PCS7	TAG-5	Alarm High	Message2	7.00	G
03/01/2018 01:58:19.000	03/01/2018 03:20:24.000	PCS7	TAG-7	Alarm Low	Message3	3.00	K
03/01/2018 11:03:19.000	03/01/2018 12:40:24.000	PCS7	TAG-7	Warning Low	Message3	1.00	G
03/01/2018 20:08:19.000	03/01/2018 22:00:24.000	PCS7	TAG-0	Alarm Low	Message1	4.00	K
04/01/2018 05:13:19.000	04/01/2018 07:20:24.000	PCS7	TAG-9	Warning Low	Message1	3.00	G
04/01/2018 14:18:19.000	04/01/2018 16:40:24.000	PCS7	TAG-0	Warning High	Message4	2.00	G
04/01/2018 23:23:19.000	05/01/2018 02:00:24.000	PCS7	TAG-1	Alarm High	Message3	3.00	K
05/01/2018 08:28:19.000	05/01/2018 11:20:24.000	PCS7	TAG-4	Warning Low	Message4	6.00	G
05/01/2018 17:33:19.000	05/01/2018 20:40:24.000	PCS7	TAG-2	Alarm High	Message3	3.00	Quit
06/01/2018 02:38:19.000	06/01/2018 06:00:24.000	PCS7	TAG-8	Warning High	Message4	3.00	Quit
06/01/2018 11:43:19.000	06/01/2018 15:20:24.000	PCS7	TAG-5	Warning High	Message4	5.00	G

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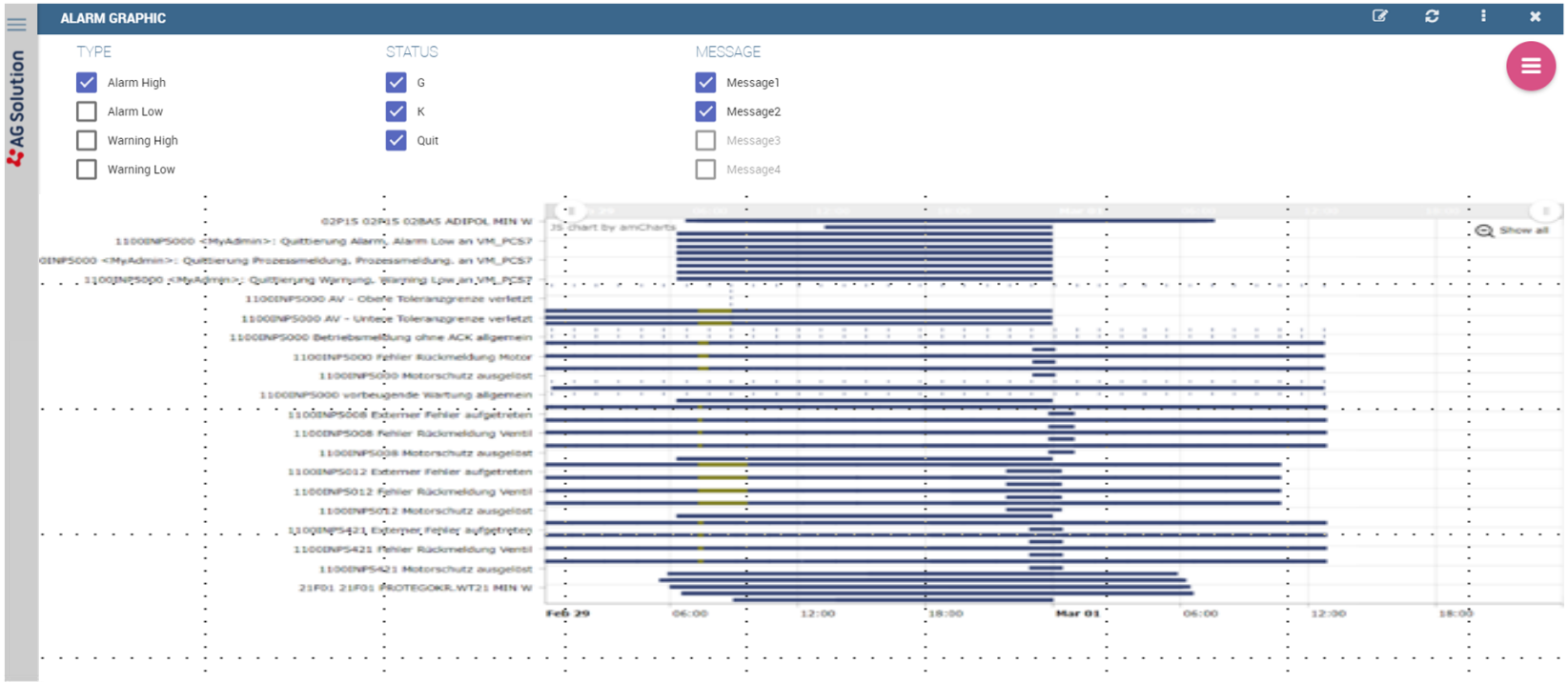
Alarm Gantt chart



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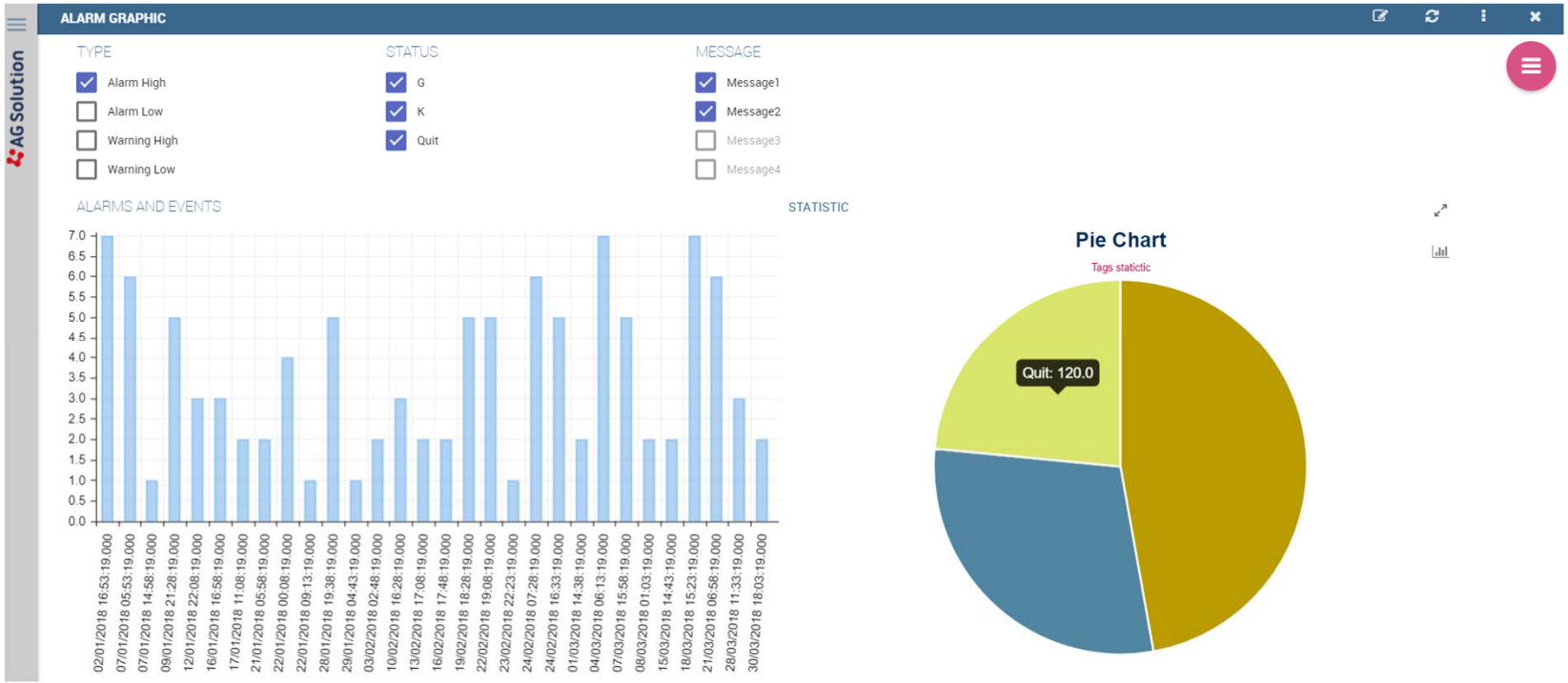
Alarm chattering



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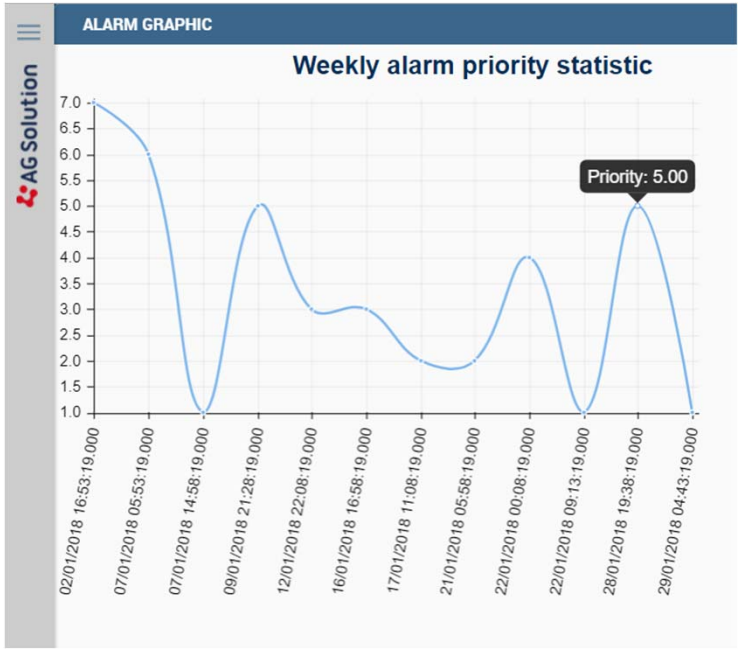
Alarm Statistics by source



Statistic

Channel	Last Event	Total	Last 10 Minutes		Last 30 Minutes		Last Hour		Delayed
PCS7TEST	2017/05/19 20:49:35.920	70904906	0	50.00% ▲	0	50.50% ▲	0	80.80% ▲	False
PCS7DEMO02	2016/04/26 15:04:05.647	5006328	0	-50.00% ▼	0	-20.00% ▼	0	-4.00% ▼	False
Teleperm	2017/05/19 19:37:50.000	152821	0	25.00% ▲	0	-12.00% ▼	0	11.00% ▲	False
Teleperm 2	2017/05/19 19:37:50.000	152813	0	-25.00% ▼	0	15.00% ▲	0	-12.00% ▼	False
PCS7_Server	2017/05/19 20:46:15.870	614597	0	0.00% ▲	0	11.00% ▲	0	-46.00% ▼	False
		Min=152813 Avg=15366293 Max=70904906 Sum=76831465	Min=0 Avg=0 Max=0 Sum=0		Min=0 Avg=0 Max=0 Sum=0		Min=0 Avg=0 Max=0 Sum=0		

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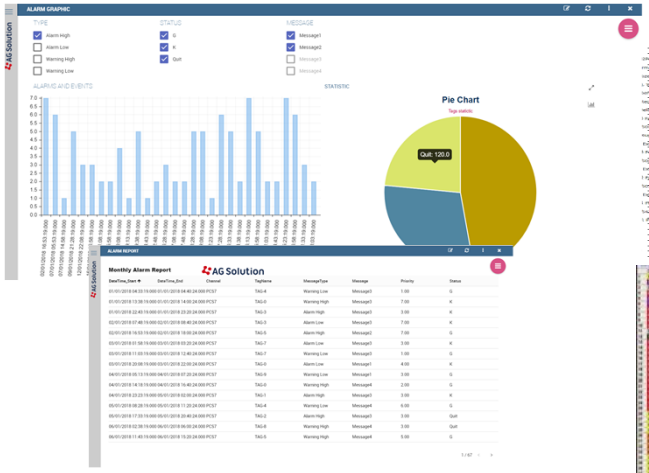

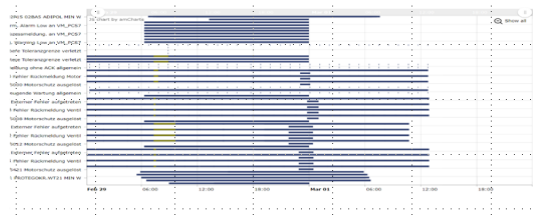

RESULTS

Better Alarm Management

- Visibility of **bad actors**
- Prevention of important failures
- Improve **safety**

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Conclusions

- Still a long way ahead in Operational Intelligence
- A trustable real time data and event infrastructure is needed: PI System
- Pilot → Strategic implementation
- Involvement of Customer SME is a must!
- Smart Standardization

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Questions?

Please wait for the **microphone**

State your **name & company**

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Contact Information

- Marc Olivé Torralba
- Senior System Engineer
- marc.torralba@agsolution.es

- Alex Destruel
- Business Development Manager
- alex.Destruel@agsolution.be

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