



Quarterly Management Meeting

25th of March 2025, Brasov

We pioneer motion

Agenda 25th of March 2025

Time	Topic	Responsible	Meeting room
08:00 – 08:30	Welcome / Introduction	Nicoleta Stan	Transfagarasan
08:30 – 09:30	Quarterly Management Meeting – WP review <ul style="list-style-type: none"> • WP 1 – TPM • WP 2 – Poka Yoke • WP 3 – RFMEA • WP 4 – Dev. & Ch. Management • WP 5 – SQM 	Sebastian Sisca Laura Stan Alexandru Popescu Florin Coman Marius Picioara	Transfagarasan
09:30 – 12:00	Shopfloor review of Quality improvement plan <ul style="list-style-type: none"> • BMW L2 – WP 2 + WP 3 + Robotic AOI • LTF L2 – WP 2 + WP 3 • Molding – WP 2 + WP 3 + Traceability • Incoming inspection – WP 5 	Alexandru Popescu Ioana Catana Ioana Catana Marius Picioara	Shopfloor
12:00 – 13:00	Lunch		Canteen
13:00 – 14:00	Shopfloor review of Quality improvement plan <ul style="list-style-type: none"> • SCR L3 – WP 1 + WP 2 + WP 3 	Claudiu Oprisanu	Shopfloor
14:00 – 15:30	Shopfloor review – SCR Volume Accumulator production (E5 Error related – 30 parts – ABBA test)	Claudiu Oprisanu	Shopfloor
15:30 – 16:30	Shopfloor review – Blocked SSP (current incident) <ul style="list-style-type: none"> • Technical cleanliness concept • FDM TM 	Radu Rosu Valentin Zarnescu	Shopfloor
16:30 – 17:00	PFMEA	Marian Dascalescu	Transfagarasan
17:00 – 17:30	Fit for Quality	Nicoleta Stan	Transfagarasan
17:30 – 18:00	Escalation Level 2 Exit criteria	Nicoleta Stan	Transfagarasan
18:00 – 18:30	Wrap-up & Feedback	Nicoleta Stan	Transfagarasan
19:00 – 21:00	Dinner		

Quarterly Management Meeting

Improvement Plan

1

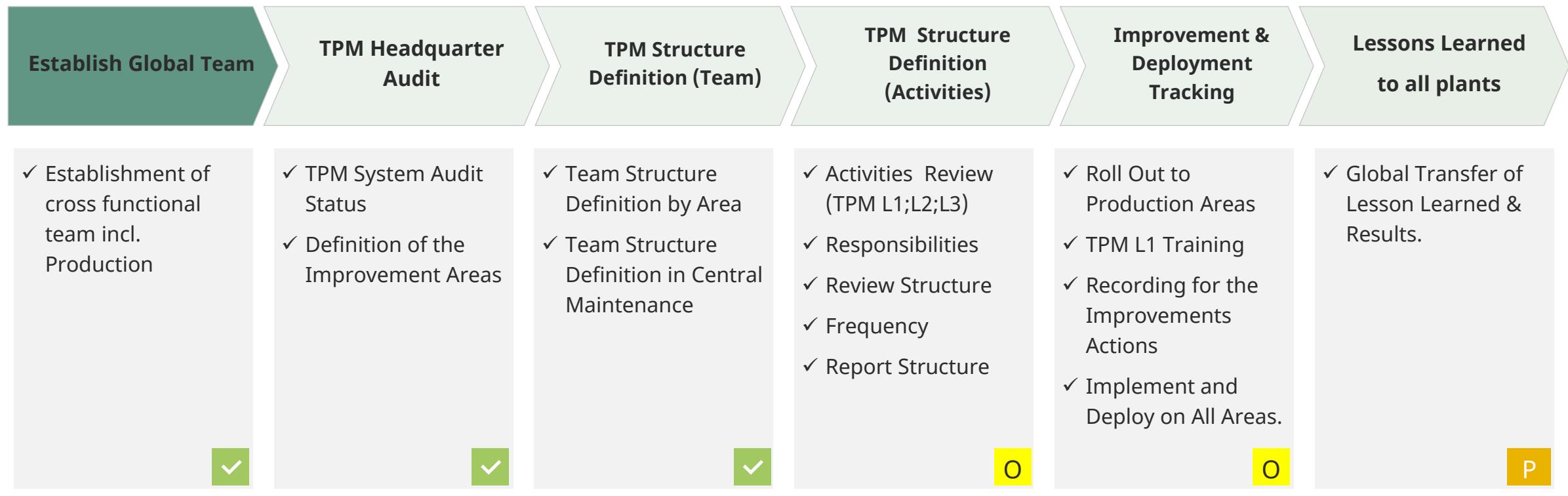
ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION

Work package 1	Work package 2	Work package 3	Work package 4	Work package 5
<p>Total Productive Maintenance</p> <p><u>Leader:</u> Sisca Sebastian</p> <p><u>Scope:</u></p> <ul style="list-style-type: none"> • TPM Headquarter Audit • TPM Structure Definition • Roll-out to Production Areas 	<p>Poka Yoke / Line Site Review</p> <p><u>Leader:</u> Laura Stan</p> <p><u>Scope:</u></p> <ul style="list-style-type: none"> • Prepare a Poka-yoke lists for all lines • Review of Poka-yoke with master parts • Line Audit with focus on Poka-yoke / detection systems 	<p>Reverse FMEA / Pass Through Characteristics</p> <p><u>Leader:</u> Alexandru Popescu</p> <p><u>Scope:</u></p> <ul style="list-style-type: none"> • Review of R-FMEA process • Prioritization of R-FMEA for plant and plan audits accordingly • Periodical updates of FMEA / WI / CP / etc. 	<p>Deviation and Change management</p> <p><u>Leader:</u> Florin Coman</p> <p><u>Scope:</u></p> <ul style="list-style-type: none"> • Re-Training of Deviation and Change management process • Tracking system introduction for changes and deviations • 4M standard restart on shopfloor 	<p>Supplier Quality Management</p> <p><u>Leader:</u> Marius Picioarea</p> <p><u>Scope:</u></p> <ul style="list-style-type: none"> • Review with R&D if the CSR transposed to the suppliers correspond to the actual status • Risk evaluation components / suppliers • Review incoming quality component process



ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION

Work Package 1 - TPM Improvement Steps



✓ Done

O Ongoing

P Planned

ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION

TPM Global Audit Team

**Vlcek, Ladislav**

TPM Auditor; TPM Coordinator; Lean Coach Trutnov

**Ernst, Miroslav**

TPM Auditor; Lean Coach Trutnov

**Malik, Zbynek**

TPM Auditor; Lean Coach Frenstat

**Jasek, Vladimir**

TPM Auditor ; TPM Coordinator & Trainer Frenstad

**Silviu, Tatu**

TPM Auditor; Lean Coach Brasov

**Sisca, Sebastian**

TPM Auditor; TPM Coordinator; Central Maintenance; Brasov



ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION

TPM Headquarter Audit Result

Results of the audit done by the Headquarter Team:

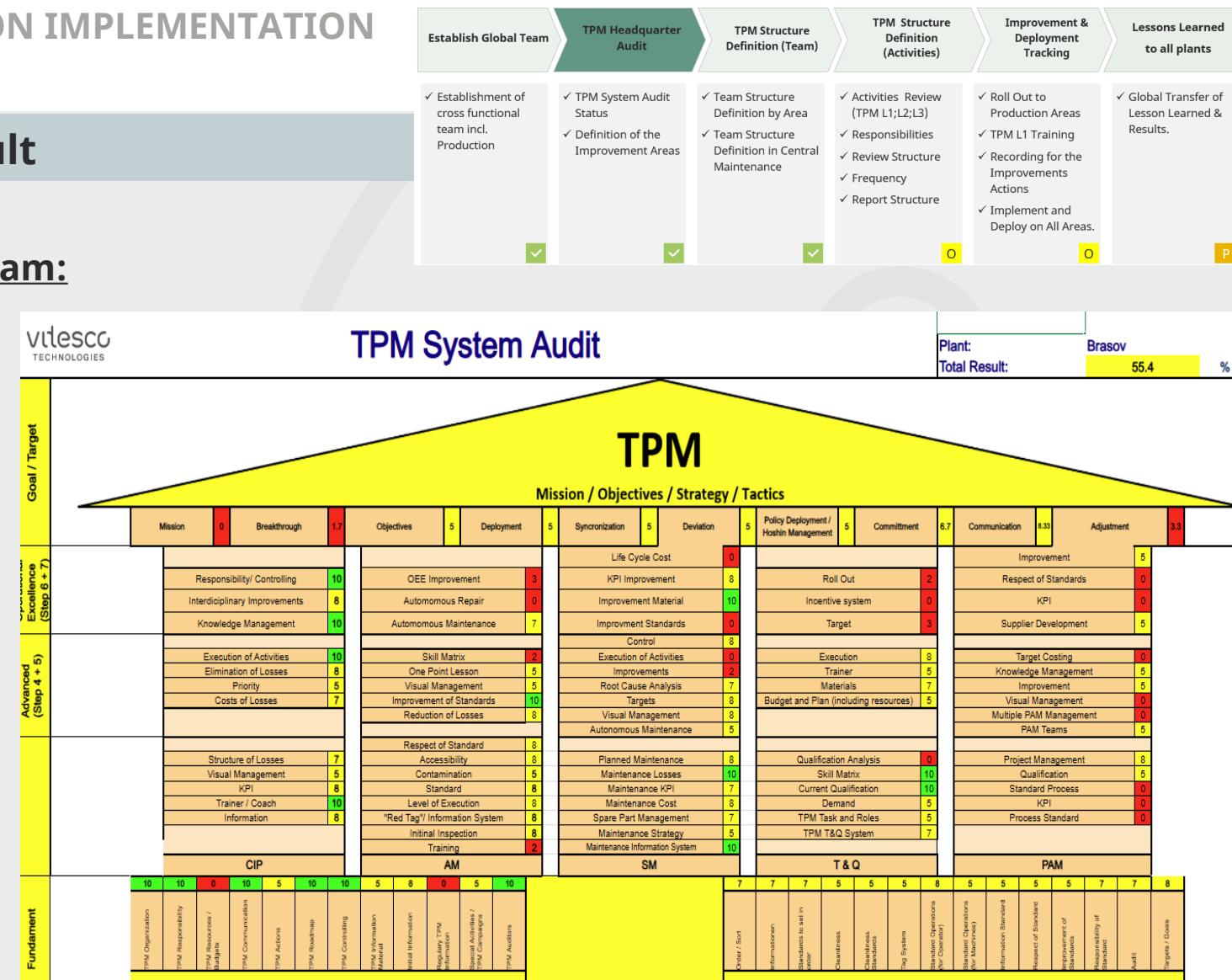
- Systems and Definition -> OK
- Improvement area:
TPM L1 execution (50% score)

Conclusion:

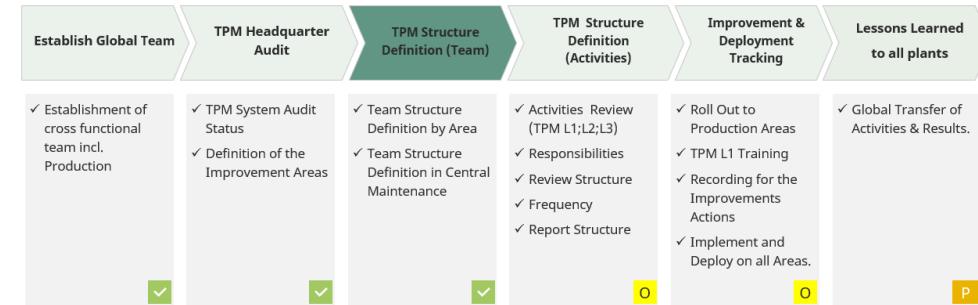
- TPM execution to be improved

Actions:

- TPM Structure Definition (Team & Activities)
- Roll-out to production areas



ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION



TPM Structure Definition (Team)

Governance

Execution

TEAM MEMBERS

Sponsor: IE & Maintenance Manager

Central Maintenance

FF Manager

PSL

Shift/Line Lead

Operators

IE responsible

Maintenance Eng

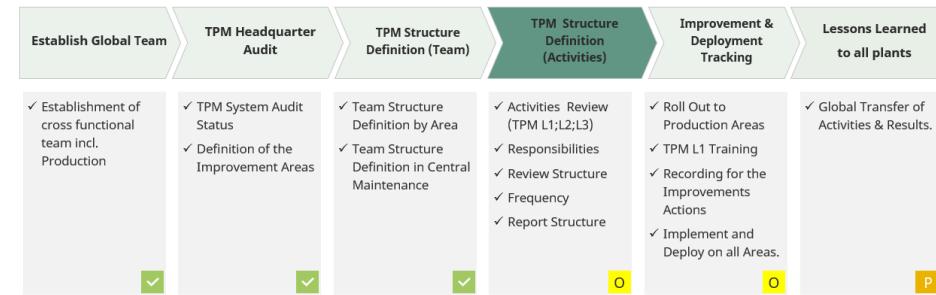
Maintenance
Technicians

RESPONSABILITIES

- Definition
- Initial Training
- Track overall results
- Regular Audit

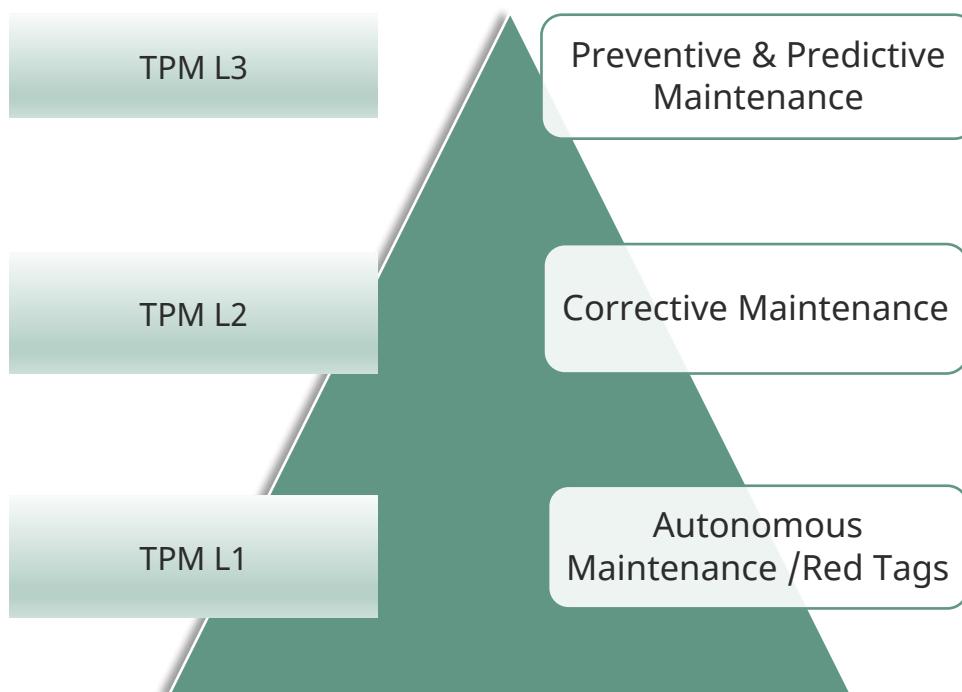
- Daily Execution
- Track daily records
- Follow the definition
- Deploy on all lines/levels

ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION



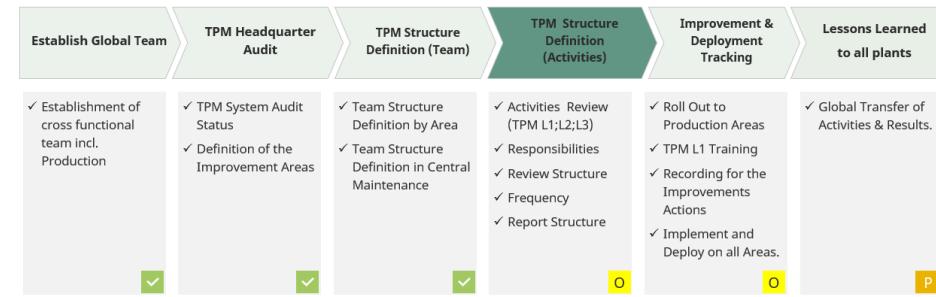
TPM Structure Definition (Activities)

Activities to be Executed



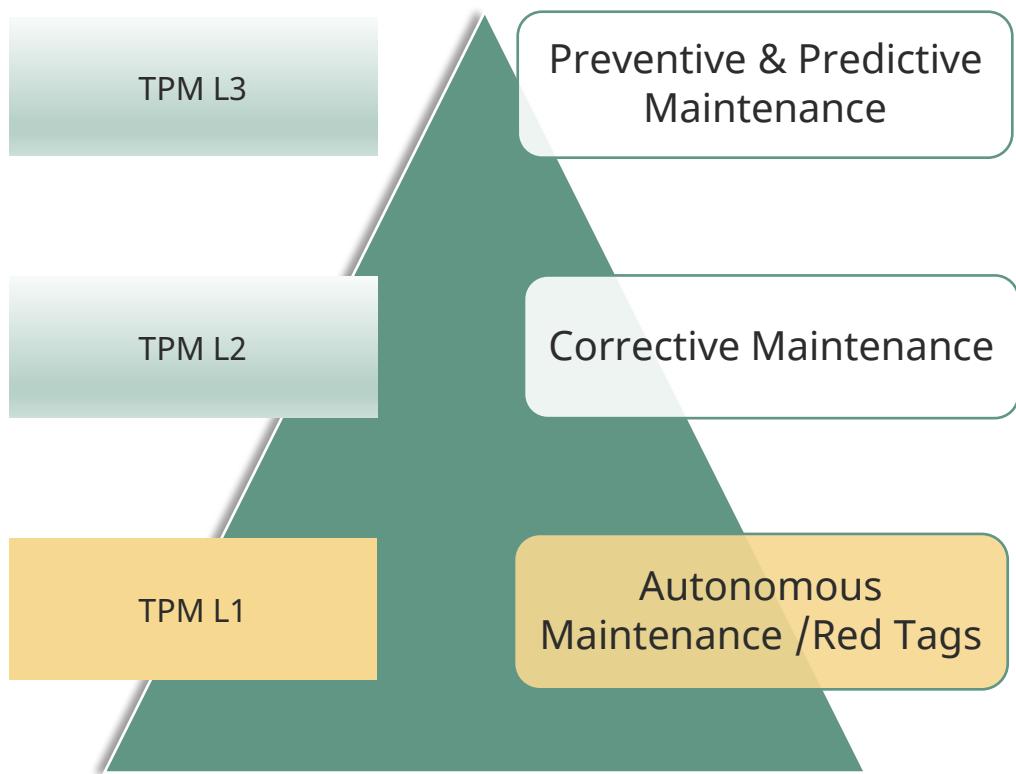
Who	Frequency	Review Structure (Execution)	How
Maintenance Tech & Engineers	Scheduled according SAP e.g. 3 month	Weekly Maintenance Gemba	Link Preventive Link Predictive
Maintenance Technicians	Shiftily according to the Production Opened Tickets	Daily Maintenance Gemba	Link
Operators	Shiftily/Daily/Weekly	Daily Maintenance Gemba	Link

ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION

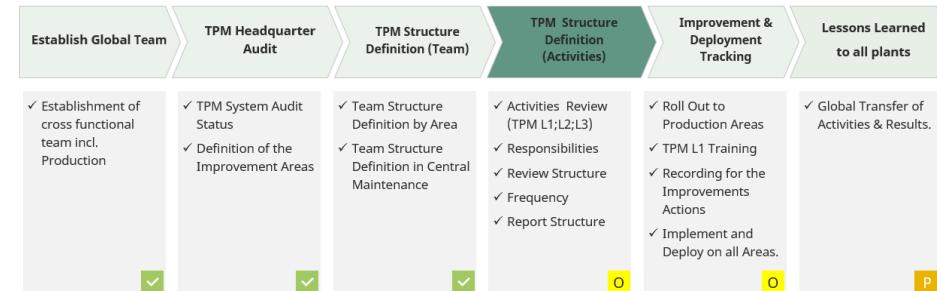


TPM Structure Definition (Activities) – TPM L1 Example

Activities to be Executed

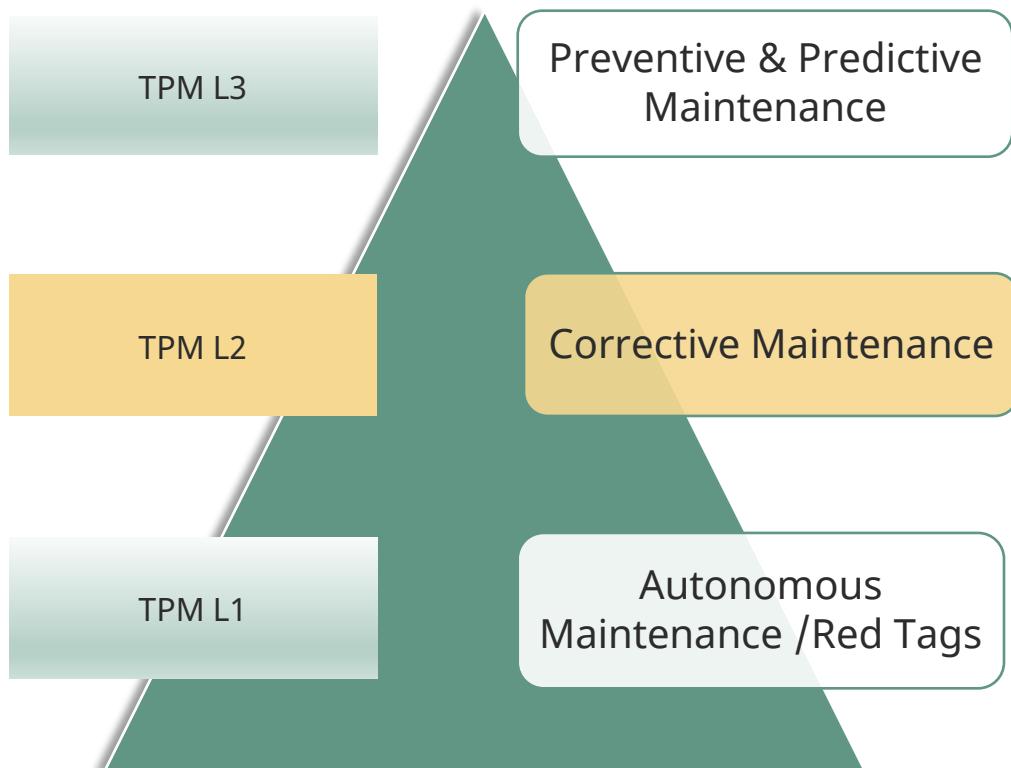


ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION



TPM Structure Definition (Activities) – TPM L2 Example

Activities to be Executed



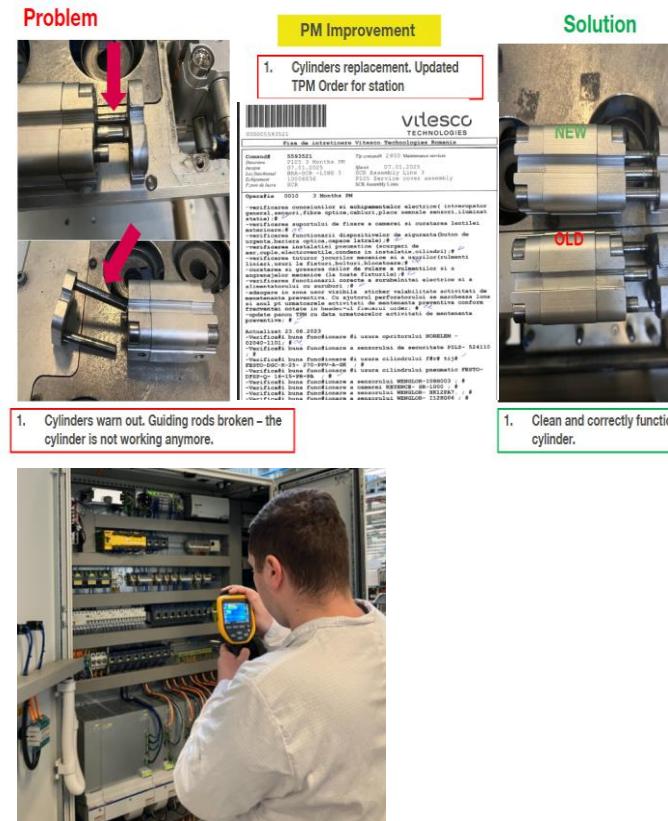
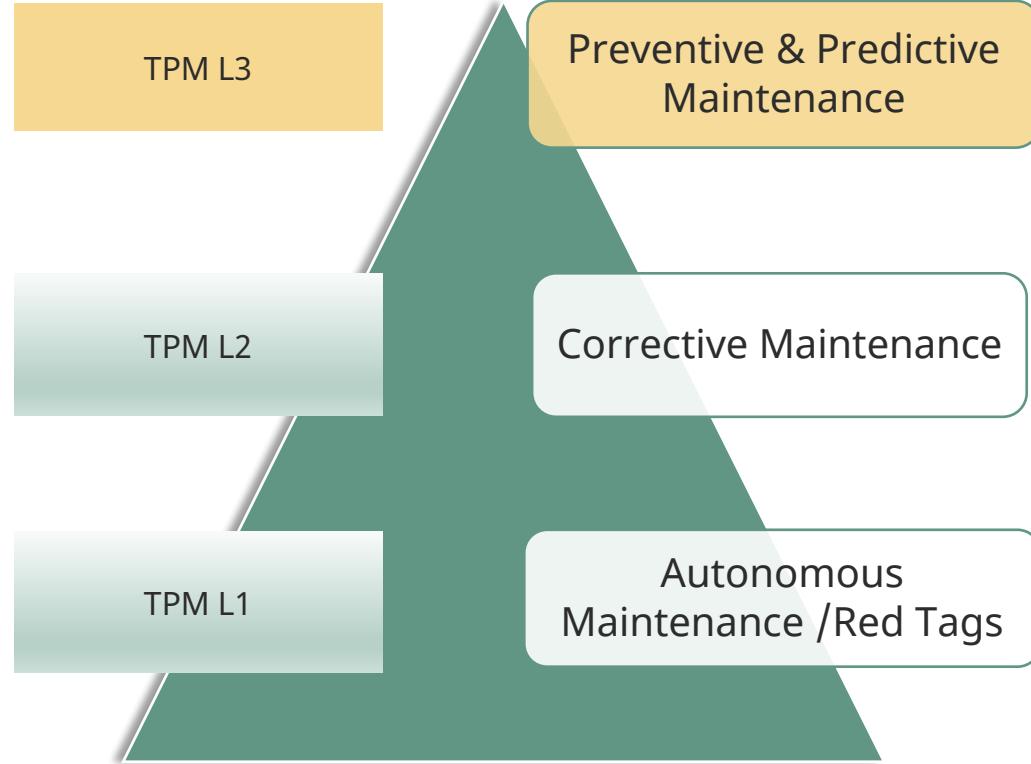
Downtime pareto - 4,582 total incidents



ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION

TPM Structure Definition (Activities) – TPM L3 Example

Activities to be Executed



Establish Global Team	TPM Headquarter Audit	TPM Structure Definition (Team)	TPM Structure Definition (Activities)	Improvement & Deployment Tracking	Lessons Learned to all plants
✓ Establishment of cross functional team incl. Production	✓ TPM System Audit Status	✓ Team Structure Definition by Area	✓ Activities Review (TPM L1;L2;L3)	✓ Roll Out to Production Areas	✓ Global Transfer of Activities & Results.
	✓ Definition of the Improvement Areas	✓ Team Structure Definition in Central Maintenance	✓ Responsibilities	✓ TPM L1 Training	
			✓ Review Structure	✓ Recording for the Improvements Actions	
			✓ Frequency	✓ Implement and Deploy on all Areas.	
			✓ Report Structure	O	P

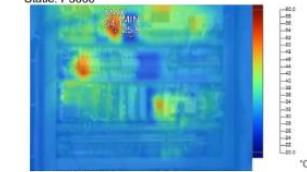
SCHAFFLER

Inspecție de identificare

Obiectiv inspectat

Liniă: AUDI C7
Locația: Tablou Electric
Statie: P5000

Data inspecției: 28.02.2025



DESCRIERE DEFECT

A fost identificata o supra incalzire a releului MOELLER R23/SS care poate functiona la maxim 45°C.
Max operating current 20A
acesta avand 54.1°C. Operating temperature -20...45°C

MASURI RECOMANDATE-TERMEN

Inlocuirea imediata a releului / Cat de repede posibila, nu mai mult de o luna.

PROBLEMA IDENTIFICATA SI MASURILE LUATE SPRE REMEDIERE

Data remediere: Verificator: Iliescu Alexandru Semnatura:

2. Cat de repede posibila, nu mai mult de o luna

ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION



TPM Improvement & Deployment Tracking

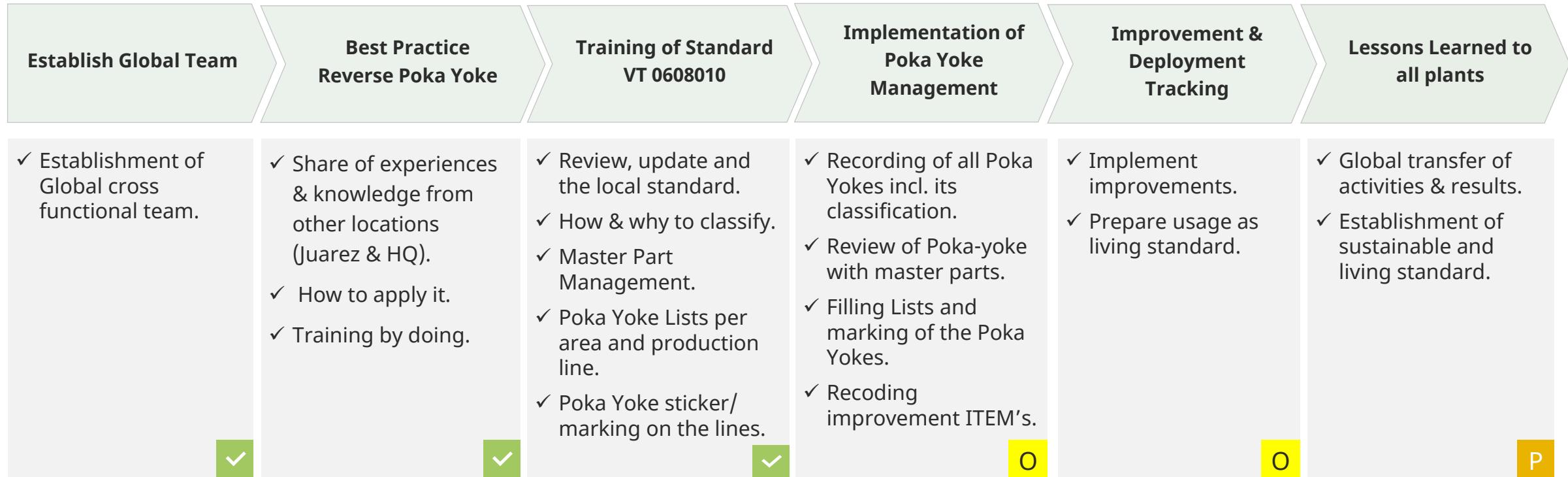
Topic	Due Date	Responsible	2024						2025						Status	
			Nov	Dec	Jan	Feb	Mar	Apr	Mai	Jun	Jul	Aug	Sep	Oct	Nov	
A Establish global team	30.12.2024	Sisca & H.Q.														Done
B TPM Audit (Headquarter)	30.12.2024	Sisca & H.Q.														Done
C TPM Structure Definition (Team)	31.01.2025	Sisca														Done
D TPM Structure Definition (Activities)	30.04.2025	Sisca														80%
E Improvement & Deployment Tracking	30.06.2025	Sisca														70%
F Deployment Check (sustainability)	30.09.2025	Sisca														10%
G Lessons learned transfer	15.12.2025	Sisca														0%

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ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION



✓ Done
 O Ongoing
 P Planned

ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION

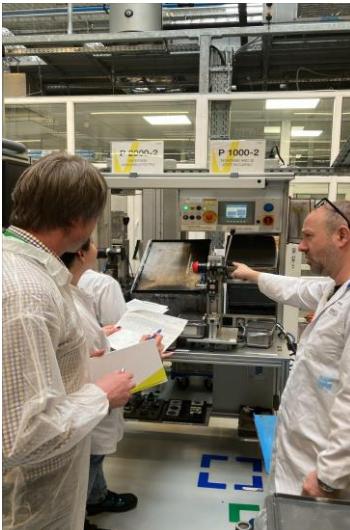
Global Team

- Ramirez, Hector Alejandro, SCH Juarez, TL Quality Engineer
- Lahr Soeren, SCH Germany, Head Quarter
- Moehnke, Gunnar, SCH Germany, Head Quarter
- Zaplaic Maria, SCH BSV, Serial Life Manager Fuel Delivery Module
- Eduard Spataru, SCH BSV, Quality Engineer Fuel Delivery Module
- Juganaru Alexandra, SCH BSV, Serial Life Manager Selective Catalytic Reduction
- Gargaun Daniela, SCH BSV, Quality Engineer Selective Catalytic Reduction
- Avram Loredana, SCH BSV, Serial Life Manager Components
- Stoica Alexandra, SCH BSV, Quality Engineer Components
- Dicu Irina, SCH BSV, Quality Engineer Components
- Catana Ioana, SCH BSV, Team Leader Quality Molding
- Popescu Alexandru, SCH BSV, Head of Focus Factory Industrial Engineer
- Zarnescu Valentin, SCH BSV, Segment Leader Fuel Delivery Module

Briscoi Adriana, SCH BSV, Segment Fuel Delivery Module
Oprisanu Claudiu, SCH BSV, Selective Catalytic Reduction



Establish Global Team	Best Practice Reverse Poka Yoke	Training of Standard VT 0608010	Implementation of Poka Yoke Management	Improvement & Deployment Tracking	Lessons Learned to all plants
✓ Establishment of Global cross functional team.	✓ Share of experiences & knowledge from other locations (Juarez & HQ). ✓ How to apply it. ✓ Training by doing.	✓ Review, update and the local standard. ✓ How & why to classify. ✓ Master Part Management. ✓ Poka Yoke Lists per area and production line. ✓ Poka Yoke sticker/ marking on the lines.	✓ Recording of all Poka Yokes incl. its classification. ✓ Review of Poka-yoke with master parts. ✓ Filling Lists and marking of the Poka Yokes. ✓ Recoding improvement ITEM's.	✓ Implement improvements. ✓ Prepare usage as living standard.	✓ Global transfer of activities & results. ✓ Establishment of sustainable and living standard.



ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION

- Poka Yoke process from Mexico Juarez was shared with Brasov
- Brasov adapted to have a more complex and robust process check



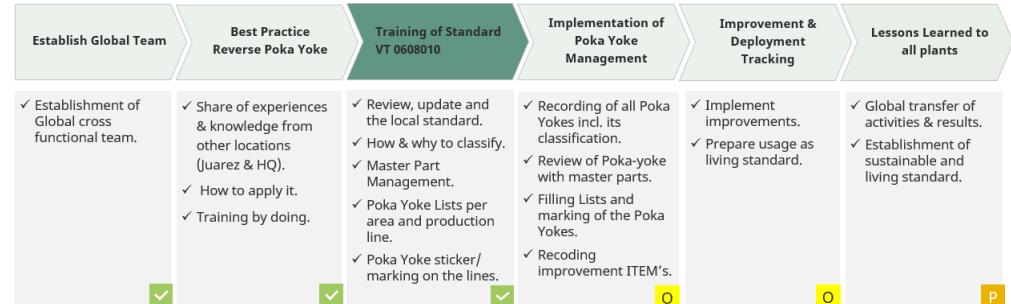
What the team did:

1. Analysis the process for Poka Yoke Juarez
2. Analysis the process for Poka Yoke Brasov
3. Identify the difference between the Juarez and Brasov process
4. Identify how to apply/ adapt to Brasov process
5. Implement in Brasov plant the audit concept and adapt the template

Summary:

- Local standard was updated
- Update global standard VT 0608010
- Update the Poka Yoke list
- Create the template for the Poka Yoke line audit
- Implement the process of Poka Yoke line audit

ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION



Global procedure for Poke Yoke	
Group Standard	vitesco TECHNOLOGIES
Poka Yoke	
Y7 Standard Version 04	
VT 0608010	
Poka Yoke	
Rule level / type	Group Standard
Responsible function	Operations
Organization	Operations Quality
Organizational scope	All organizational units
Superior (objekt)	-
Further relevant rule(s)	VT 0500021 PMO (Failure Mode and Effects Analysis) VT 0500075 Test Coverage Analysis for the production of electronic circuit boards VT 0500076 Test Coverage Analysis for the production of electronic components VT 0500744 Test Coverage Report VT 0500080 Design of Experiments (DOE) VT 0510060 Design for Six Sigma (DFSS) VT 0510061 Design for Six Sigma (DFSS) - Poka Yoke, Minimise-proofing, Failure Prevention, Failure Detection
Key word(s)	
Functional contact	Operations
	VT 010
	Functional mailbox for feedback
Version	04
Day of release	<i>Select to insert release date</i>
Review Frequency	2 years!



Summary:

- Global Team involved in **the training -> 65 persons** from Quality Engineer/ Process Engineer/ Industrial Engineer/ Product Quality Manager/ Maintenance Engineer

ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION

Area	Number of lines (BMW)	Poka-Yoke list recorded	Poka-Yoke Line Audit	Progress
FDM	8	4	4	49%
SCR	2+2	4	4	100%
Components	11	9	9	81%
Molding	5	5	5	100%
Total	28	22	22	79%



Example of Poka Yoke List												
Priority	Line	Category	Poka Yoke	Production Line	Station	Poka-Yoke type	Poka-Yoke description	Categorizing	Monitoring/Review	Year in calendar	Review Plan	Comment
ASYY_1_000F	ASYY_0001	BMW/Marke	PBB	Prevention			(Performance Support/PC detection already)			2023/06/30		
							Poka-Yoke for presence, orientation and type of the predrill GBS					
							(Performance Support/PC detection already)					
							Reverse PBBM1	PPM&E				
ASYY_1_000Z	ASYY_0002	BMW/Marke	PBB	Prevention			Vigilance control device	A) ID special character/shape through to customer (e.g. Master Part)		2023/06/30		
							(Performance Support/PC detection already)					
							Master Part	Control/Card MM				
ASYY_1_000Y	ASYY_0003	BMW/Marke	PBB	Prevention			Camera for reading SMC from tool part			2023/06/30		
							(Performance Support/PC detection already)					
							AS	AMS				
ASYY_1_000W	ASYY_0004	BMW/Marke	PBB	Prevention			Camera for reading presence of crimp	A) ID special character/shape through to customer (e.g. Master Part)		2023/06/30		
							(Performance Support/PC detection already)					
							Master Part	Control/Card MM				
ASYY_1_000F	ASYY_0005	BMW/Marke	PBB	Prevention			Poka-Yoke for presence, orientation and type of the predrill DSEL	(Performance Support/PC detection already)		2023/06/30		
							(Performance Support/PC detection already)					
							Reverse PBBM1	PPM&E				
ASYY_1_000F	ASYY_0006	BMW/Marke	PBB	Prevention			Poka-Yoke for presence, orientation and type of the predrill PERL	(Performance Support/PC detection already)		2023/06/30		
							(Performance Support/PC detection already)					

Example of Poka Yoke Audit													Poka-Yoke Documentation (Serial, Testing, Variation)			FINDING	CAUSE	CORRECTIVE ACTION	RESPONSIBLE	DATE
Poka-Yoke list number	AS YY0001	Poka-Yoke ID			Retirement Number (in case of fault)			MASTER VERIFICATION METHOD AND/OR SIMULATED FAULT			Poka-Yoke Documentation (Serial, Testing, Variation)			FINDING	CAUSE	CORRECTIVE ACTION	RESPONSIBLE	DATE		
CREATION DATE	Poka-Yoke ID	Start	End	New	Retirement	Number	Failure	Test	Result	Reason	Tested	Other	Quantity	Findings	Causes	Corrective Actions	Responsible	Date		
P1000	CT_2001	*	*	*			PMM0002 - New Mount of MAPPS MEC	AS	No. 300 m/00	No. 200 m/00	No. 400 m/00		C 1000 m/00 PPM T02 m/00	Missing the attribution for type of MAPPS.	Misunderstanding of the concept	Update the poka-yoke list	Julian Meier	2023/05/25		
P1000	CT_2002	*	*	*			Simulate failure When the sensor is in wrong position the status does not match	AS	No. 300 m/00	No. 200 m/00	No. 400 m/00		C 1000 m/00 PPM T02 m/00 An other document	Missing the attribution for type of MAPPS. Verification: No mapps parts instead of mechanical pole Where is monitor is control and instead of PMM	Misunderstanding of the concept	Update the poka-yoke list	Julian Meier	2023/05/25		
P2000	AS_2003						Simulate failure When the sensor is in wrong position the status does not match	AS	No. 300 m/00	No. 200 m/00	No. 400 m/00		NA	NA	NA	NA	NA			
P2000	AS_2004	*	*	*			PMM0002 - New Mount of MAPPS MEC	AS	No. 300 m/00	No. 200 m/00	No. 400 m/00		C 1000 m/00 PPM T02 m/00	Geometries is "C" instead of "A"	Misunderstanding of the concept	Update the poka-yoke list	Julian Meier	2023/05/25		
P2000	AS_2005	*	*	*			PMM0002 - New Mount of MAPPS MEC	AS	No. 300 m/00	No. 200 m/00	No. 400 m/00		C 1000 m/00 PPM T02 m/00	Geometries is "C" instead of "A"	Misunderstanding of the concept	Update the poka-yoke list	Julian Meier	2023/05/25		
P2000	AS_2006						We cannot complete the fixture	AS	No. 300 m/00	No. 200 m/00	No. 400 m/00		Line line step is expressive (highlighting) is out of tolerance. Check geometry "C" instead of "A".	Machine concept Misunderstanding of the concept	1. Machine concept 2. Misunderstanding of the concept	Julian Meier	24.04.2023 24.04.2023			

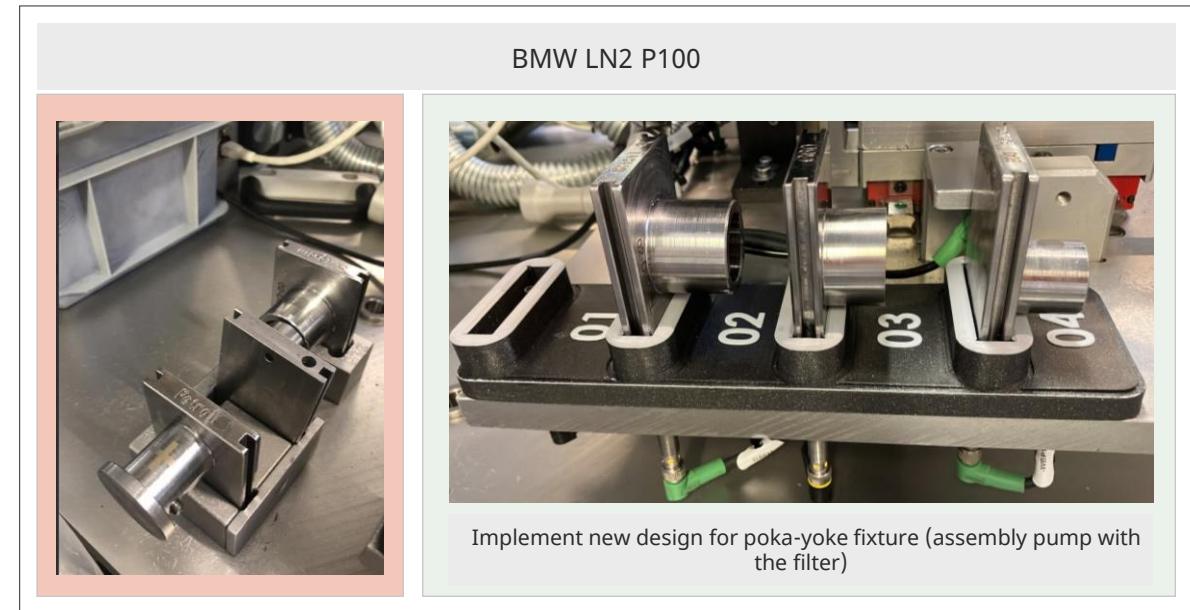
Summary:

- Poka Yoke list/ Master sample review/ Line site audit performed in 22 production line from 28, more exactly 79%

ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION

Area	Improvement actions	Update documentation	Poka-Yoke design	Master samples
FDM	25	0	5	20
SCR	2	2	0	0
Components & Molding	38	28	6	4
Total	65	23	11	22

Area	Improvement actions	Open	Closed	Progress
FDM	25	24	1	4%
SCR	2	0	2	100%
Components & Molding	38	27	11	30%
Total	65	51	14	21%

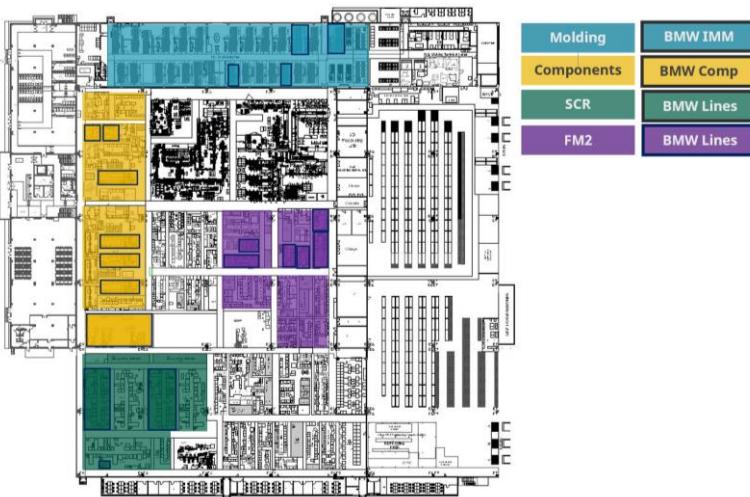


Summary:

- Improvement actions identified **65 ITEM's**; 21% from them closed

ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION

Item	Topic	Due Date	Resp.	2024						2025								Status
				Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
A	Establish Global Team	CW51/2024	QMS															Done
B	Training of Standard VT 0608010 and documentation	CW06/2025	QMS															Done
C	Poka Yoke list creation & Line Audit	CW20/2025	SLM															79%
D	Improvement ITEM's	CW20/2025	SLM															21%
E	Lessons Learned to all plants	CW51/2025	QM															0%

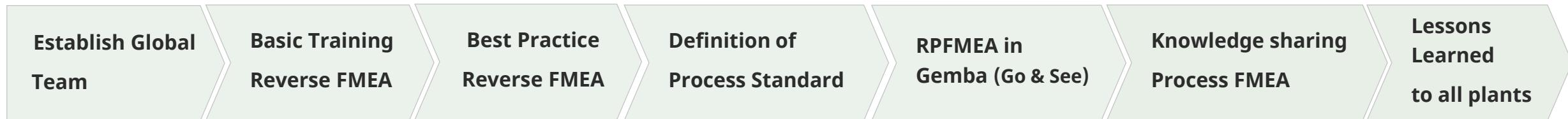


ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION

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RFMEA IMPROVEMENT STEPS



✓ Establishment of Global cross functional team.	✓ Trainer from PTC. ✓ General Method. ✓ Tools, etc. ✓ Roles, Functions.	✓ Share of experiences & knowledge from other locations. ✓ How to apply it. ✓ Training by doing.	✓ Process definition for BSV to ensure standardization over all areas. ✓ Documentation Follow ups.	✓ Gemba RPFMEA acc. planning ✓ Multidisciplinary team. ✓ Activity prioritization.	✓ FMEA Method. ✓ FMEA Structure. ✓ FMEA Tool. ✓ FMEA Reviews.	✓ Global transfer of activities & results. ✓ Establishment of sustainable and living standard.
✓	✓	✓	✓	O	✓	P

✓ Done

O Ongoing

P Planned

ESTABLISH GLOBAL TEAM

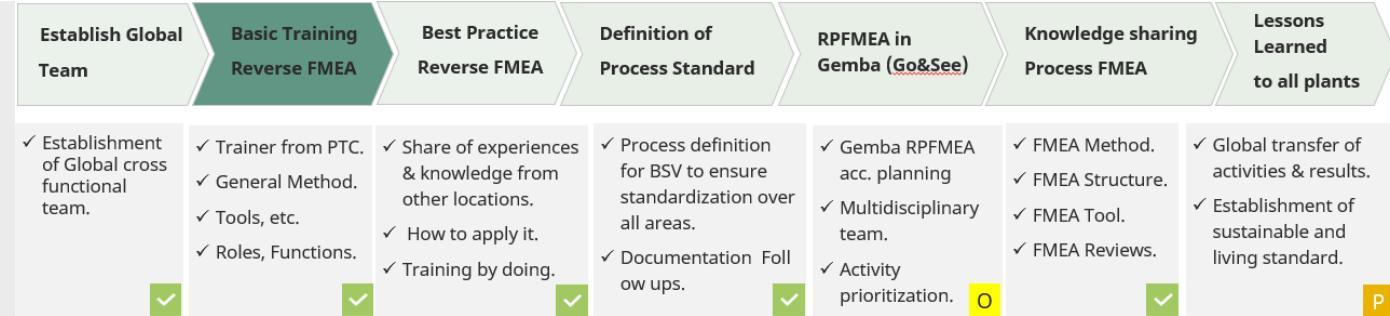
Establish Global Team	Basic Training Reverse FMEA	Best Practice Reverse FMEA	Definition of Process Standard	RPFMEA in Gemba (Go&See)	Knowledge sharing Process FMEA	Lessons Learned to all plants
<ul style="list-style-type: none"> ✓ Establishment of Global cross functional team. ✓	<ul style="list-style-type: none"> ✓ Trainer from PTC. ✓ General Method. ✓ Tools, etc. ✓ Roles, Functions. ✓	<ul style="list-style-type: none"> ✓ Share of experiences & knowledge from other locations. ✓ How to apply it. ✓ Training by doing. ✓	<ul style="list-style-type: none"> ✓ Process definition for BSV to ensure standardization over all areas. ✓ Documentation Follow ups. ✓	<ul style="list-style-type: none"> ✓ Gemba RPFMEA acc. planning ✓ Multidisciplinary team. ✓ Activity prioritization. O	<ul style="list-style-type: none"> ✓ FMEA Method. ✓ FMEA Structure. ✓ FMEA Tool. ✓ FMEA Reviews. ✓	<ul style="list-style-type: none"> ✓ Global transfer of activities & results. ✓ Establishment of sustainable and living standard. P



RPFMEA TRAINING

Reasons to perform:

- Unstable processes causing Quality Incidents or other KPI losses.
- Uncovers any risk of failure modes that were not treated, or emerged due to process drift, equipment aging, tooling wearing, or other changes..
- Helps to identify areas where further improvements can enhance quality, efficiency and safety.
- General "Go and see" approach.



Material and Documents to be used:

- Process FMEA
- Control Plan / WI's / Test Instructions
- Maintenance Plans
- 8D, Internal NCR, Yokoten / Lesson Learned, FPY
- Product Drawings / Specifications (Ramp Ups)

People to be involved:

- Serial Life Manager/FMEA moderator
- QMPP / Process Quality
- Industrial Engineer / Technician
- Production Operator / Line Leader
- Experienced / open minded member

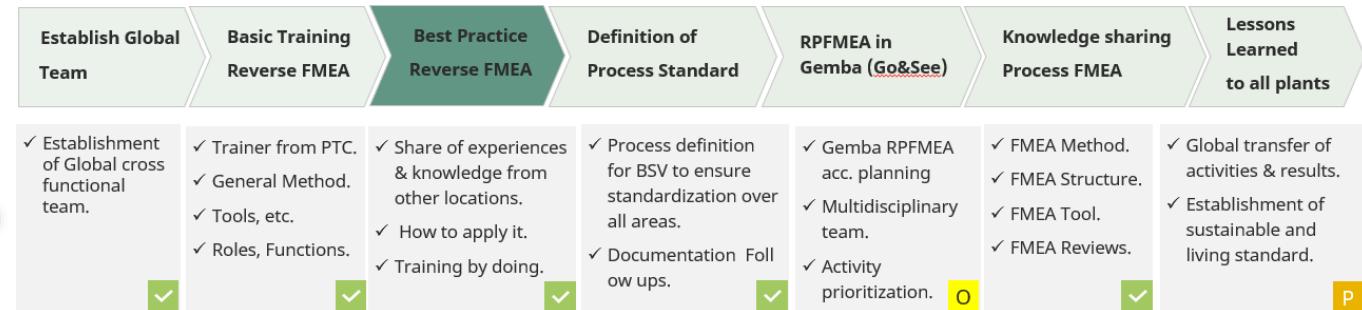


Reverse FMEA / Line Challenge - Appendix 3 to P 170005

Toolbox "Problem solving" @Schaeffler
Gallus Drischler SZ/HZA-QMS1, Version "B" 2024-04

BEST PRACTICE RPFMEA

- Lesson Learned from LBO was shared with BSV
- Brasov adapted to have a more complex and robust process check



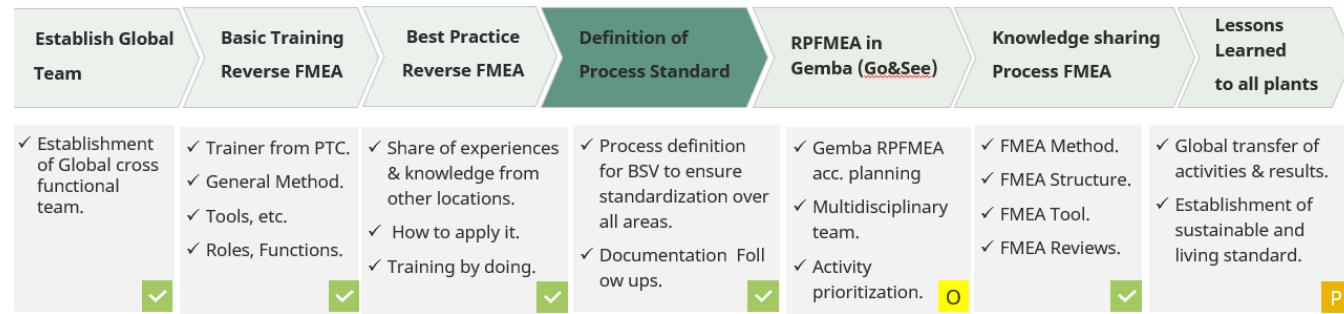
What to do:

1. Check implementation and effectiveness of the prevention and detection measures, following the process flow.
2. Check contents from Process FMEA vs. reality.
3. Simulate Failure and check if process robust (Machine & Parts Flow/ Handling) incl. known Incidents.
4. Challenge the Process with additional tests, failures modes (borderline parts, ...)
5. Check fixtures, alignments, electrical/pneumatic connections, WI, Change over instruction, TPM instructions
6. In case of deviation, define Containment Actions / Corrective Actions and update of P-FMEA.

Structure and methodology of RPFMEA defined and applied to Brasov plant for all areas.

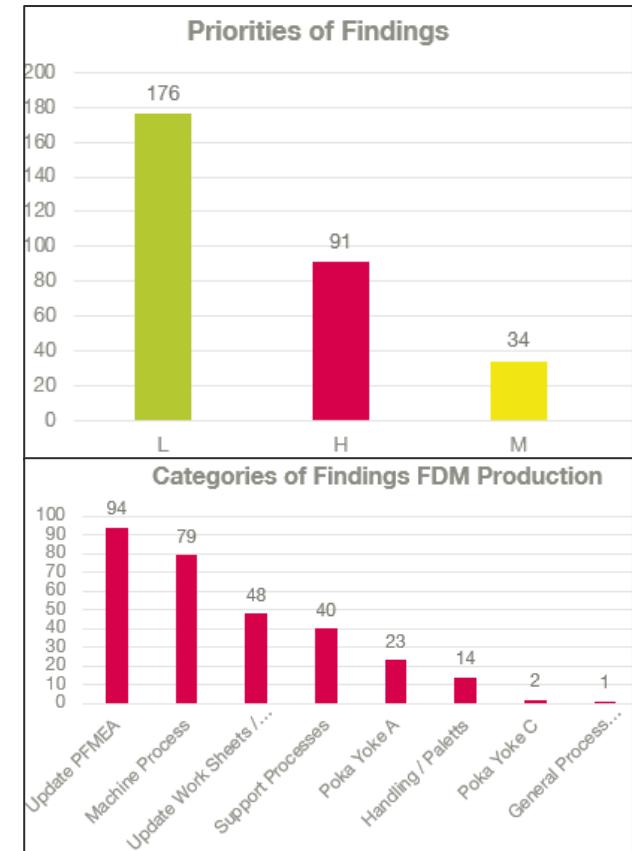
STANDARD DEFINITION

- Standard Action list defined for all the areas
- Classification of the improvement actions to be done and priority



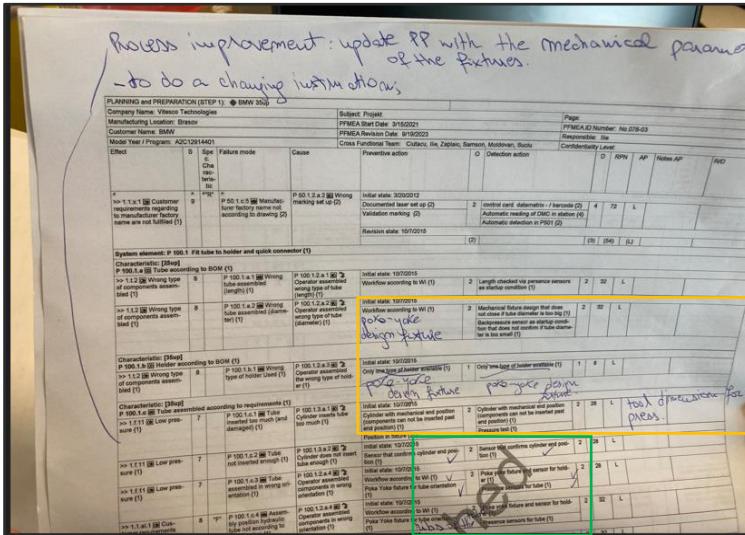
Reverse PFMEA Tracking Action list template:									
Plant:	BSV								
Customer Product	Production line	Manufacturing process (station or equipment)	Reverse PFMEA Before G70 or After G70	Responsible for tracking improvement action	Index	Failure mode	Improvement Action	Category of Improvement	Action Focus: D = Detection E = Elimination of failure mode
BMW	TM1 LN41	P50	After SOP SLM	1	Particles in boxes/Contamination	Update of the PFMEA needed, failure not available in the current PFMEA	Update PFMEA	Detection	M. Zaplaic
BMW	TM1 LN41	P50	After SOP SLM	2	Unit assembly with wrong type of component	Update of the PFMEA needed, failure not available in the current PFMEA	Update PFMEA	Detection	M. Zaplaic
BMW	TM1 LN41	P50	After SOP SLM	3	Holder in wrong position(upside down)	Update of the PFMEA needed, failure not available in the current PFMEA Detection action: Startup condition: sensor for reading holder presence Prevention: Poka-yoke fixture design	Update PFMEA	Detection	M. Zaplaic
BMW	TM1 LN41	P50	After SOP SLM	4	Holder in wrong orientation	Update of the PFMEA needed, failure not available in the current PFMEA Detection action: Startup condition: sensor for reading holder presence Prevention: Poka-yoke fixture design: Operator acts according to WI, step (operator puts the holder into the poka-yoke fixture)	Update PFMEA	Detection	M. Zaplaic
BMW	TM1 LN41	P50	After SOP SLM	5	Standard work Instruction with small photos	Update the template of the WI (for MFA2 and BMW) Pre: Preparation seeWI Detection: Device change with master samples	Update Work Sheets / Documentation	Detection	A. Bordeanu
BMW	TM1 LN41	P50	After SOP SLM	6	Missing tunnel clips from holder (for MFA project)	Activate in the PLC the master sample program for the missing tunnel clips (for MFA2 project)	Update PFMEA	Detection	M. Zaplaic
BMW	TM1 LN41	P50	After SOP SLM	7	Master sample program is not working (for MFA project)	Machine Process	Detection	D. Radu	
BMW	TM1 LN41	P50	After SOP SLM	8	2 labels for preventive maintenance(an old one from 2024 and the new one for 2025)	Support Processes	Elimination	P. Vrabie	
BMW	TM1 LN41	Board	After SOP SLM	9	Old date for the preventive maintenance on the on the board	Update the document from the board: Last Preventive maintenance needs to be checked if it was done (on the document from the line is written 15.12.2024)	Support Processes	Elimination	A. Briscol
BMW	TM1 LN41	P100	After SOP SLM	10	Missing information from the changing instruction	Update changing instruction with the number of every fixtures and with the PNs that are being produced on that fixture	Update Work Sheets / Documentation	Detection	A. Bordeanu
BMW	TM1 LN41	P100	After SOP SLM	11	Standard work Instruction with small photos	Update the template of the WI (for MFA2 and BMW)	Update Work Sheets / Documentation	Detection	A. Bordeanu
BMW	TM1 LN41	P100	After SOP SLM	12	Break down and scrap	Mechanical parameters of the fixtures to be locked and secured with paint(screw end of stroke, sensor end of stroke, camera position)	Machine Process	Elimination	P. Vrabie
BMW	TM1 LN41	P100	After SOP SLM	13	Tube inserted to much	Update Work Sheets / Documentation	Elimination	A. Bordeanu	
BMW	TM1 LN41	P100	After SOP SLM	14	Wrong tube assembled	Update Process parameters with the mechanical parameters of each fixture	Update PFMEA	Detection	M. Zaplaic
BMW	TM1 LN41	P100	After SOP SLM	15	Assembly position hydraulic tube not according to specification	Update of the PFMEA needed, add as prevention poka-yoke design fixture	Machine Process	Detection	P. Vrabie
BMW	TM1 LN41	P100	After SOP SLM	16	Assembly position hydraulic tube not according to specification	Create master sample	Elimination	P. Vrabie	
BMW	TM1 LN41	P100	After SOP SLM	17	Assembly position hydraulic tube not according to specification	TCU programming for the master sample of the tube ribs	Machine Process	Elimination	P. Vrabie
BMW	TM1 LN41	P100	After SOP SLM	18	Assembly position hydraulic tube not according to specification	Update Control Plan after master sample of the tube ribs is done	Update Work Sheets / Documentation	Detection	E. Spataru
BMW	TM1 LN41	P100	After SOP SLM	19	P100_1.2 Wrong tube assembled(diameter)	Update PFMEA with the master sample of the tube ribs is done	Update PFMEA	Detection	M. Zaplaic
BMW	TM1 LN41	P100	After SOP SLM	20	P100_1.b.1 Wrong type of holder used	Update PFMEA needed, remove the current detection and prevention action and add poka-yoke fixture design	Update PFMEA	Detection	M. Zaplaic
BMW	TM1 LN41	P100	After SOP SLM	21	P100_1.c.4 Assembly position hydraulic tube not according to specification	Update of the PFMEA needed, rename the prevention from Poka-yoke fixture for tube orientation to poka-yoke fixture for tube ribs	Update PFMEA	Detection	M. Zaplaic
BMW	TM1 LN41	P100	After SOP SLM	22	Part not according to BOM, quick connector	Remarks the process step P100_1.d that is valid only for BMW G70	Update PFMEA	Detection	M. Zaplaic
BMW	TM1 LN41	P100	After SOP SLM	23	Tube without blue marking	Update PFMEA	Elimination	M. Zaplaic	
BMW	TM1 LN41	P300	After SOP SLM	24	Break down and scrap	Mechanical parameters of the fixtures to be locked and secured with paint(screw end of stroke, sensor end of stroke, camera position)	Machine Process	Elimination	P. Vrabie
BMW	TM1 LN41	P300	After SOP SLM	25	Tube inserted to much	Update Process parameters with the mechanical parameters of each fixture	Update Work Sheets / Documentation	Elimination	A. Bordeanu
BMW	TM1 LN41	P300	After SOP SLM	26	Tube not inserted enough	Update PFMEA by renaming the prevention from sensor that confirms cylinder and position to Sensor that confirms press end position	Update PFMEA	Detection	M. Zaplaic
BMW	TM1 LN41	P300	After SOP SLM	27	Components not prestaged	Update the template of the WI and update the photos for a better understanding	Update Work Sheets / Documentation	Elimination	A. Bordeanu
BMW	TM1 LN41	P300	After SOP SLM	28	Missing information from the changing instruction	Update Process parameters with the number of every fixtures and with the PNs that are being produced on that fixture	Update Work Sheets / Documentation	Detection	A. Bordeanu

Tracking list created, classification of findings defined.

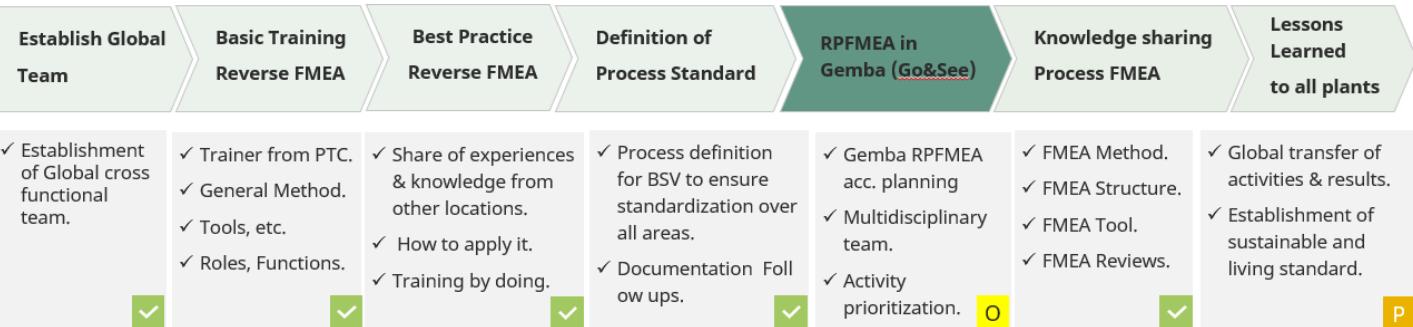


RPFMEA IN GEMBA

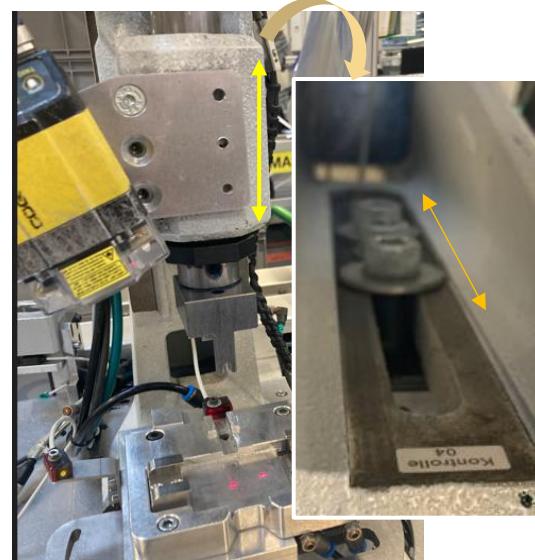
1.) Go along the process check P-FMEA vs. reality



- Confirm proven tests during Gemba
- Confirm Process is consistent to the P-FMEA
- Deviations within P-FMEA highlighted



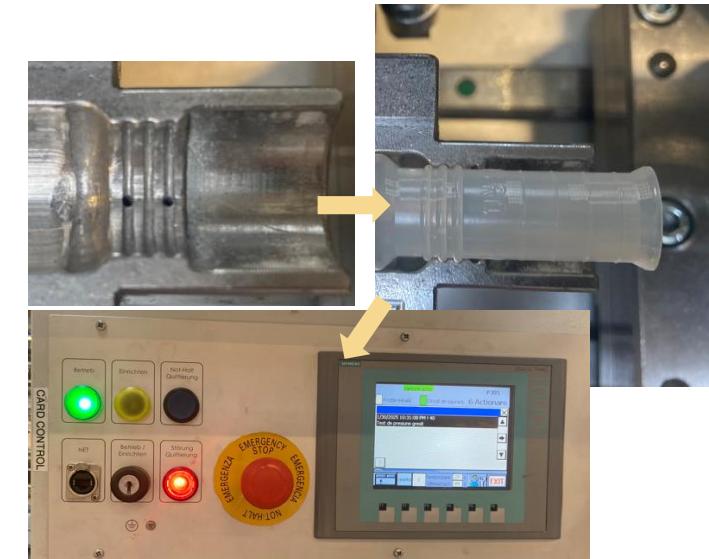
2.) Identify weaknesses and risks for incidents



Example:

Lever Arm Press – no height fixation.
In case of adjustment damages possible.

3.) Simulation of failures / detection systems



Example:

Check detection system (air blow) wrong tube position.

IMPLEMENTATION STATUS CW13

Schedule above refers to BMW related lines/ processes only.

Status vs. Target

Number reviewed processes:

FDM: 50% → 4/8

Comp.: 40% \Rightarrow 4/10

SCB: 100%* ⇒ 2/2

Mold : 88% \Rightarrow 8/9

Status of closed Items:

802* improvement items found

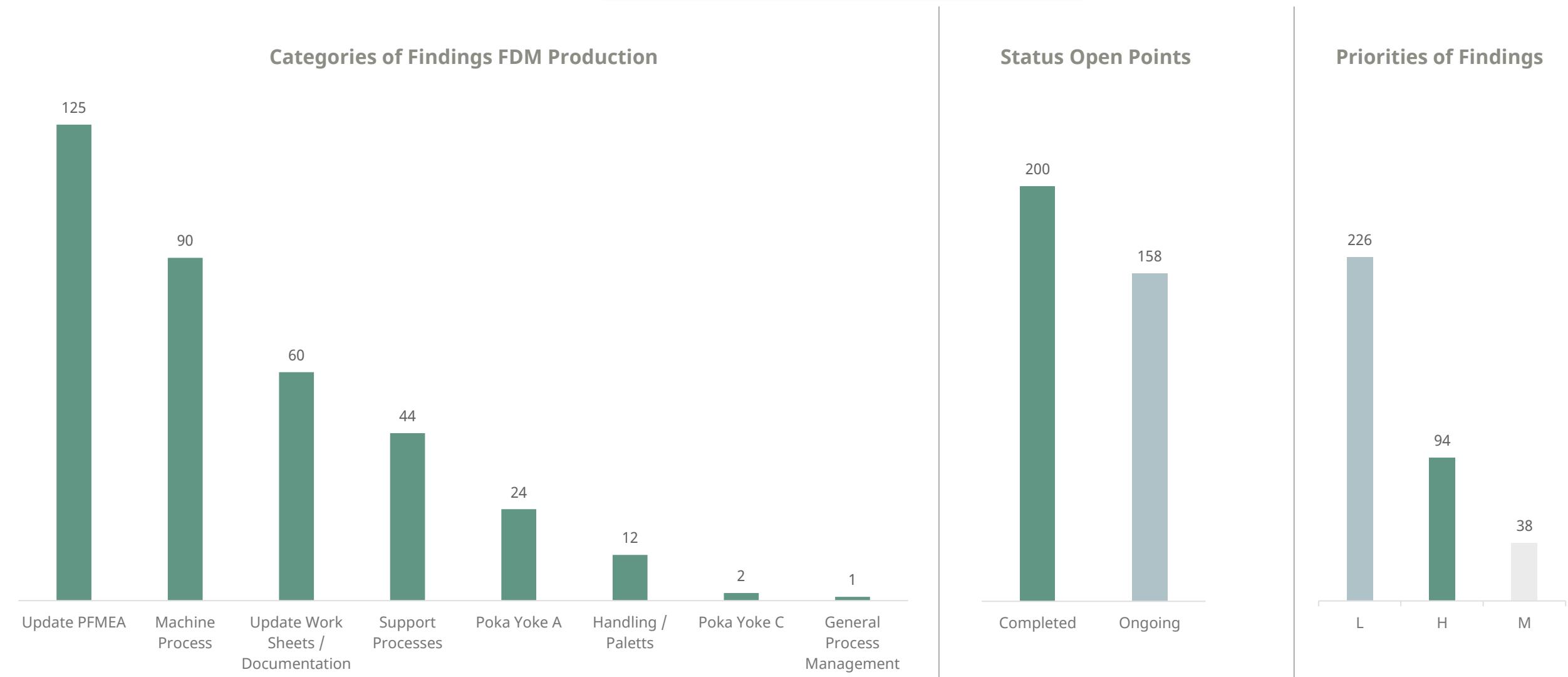
306* improvement items closed

Remarks:

- *number will change as Gembas still in progress

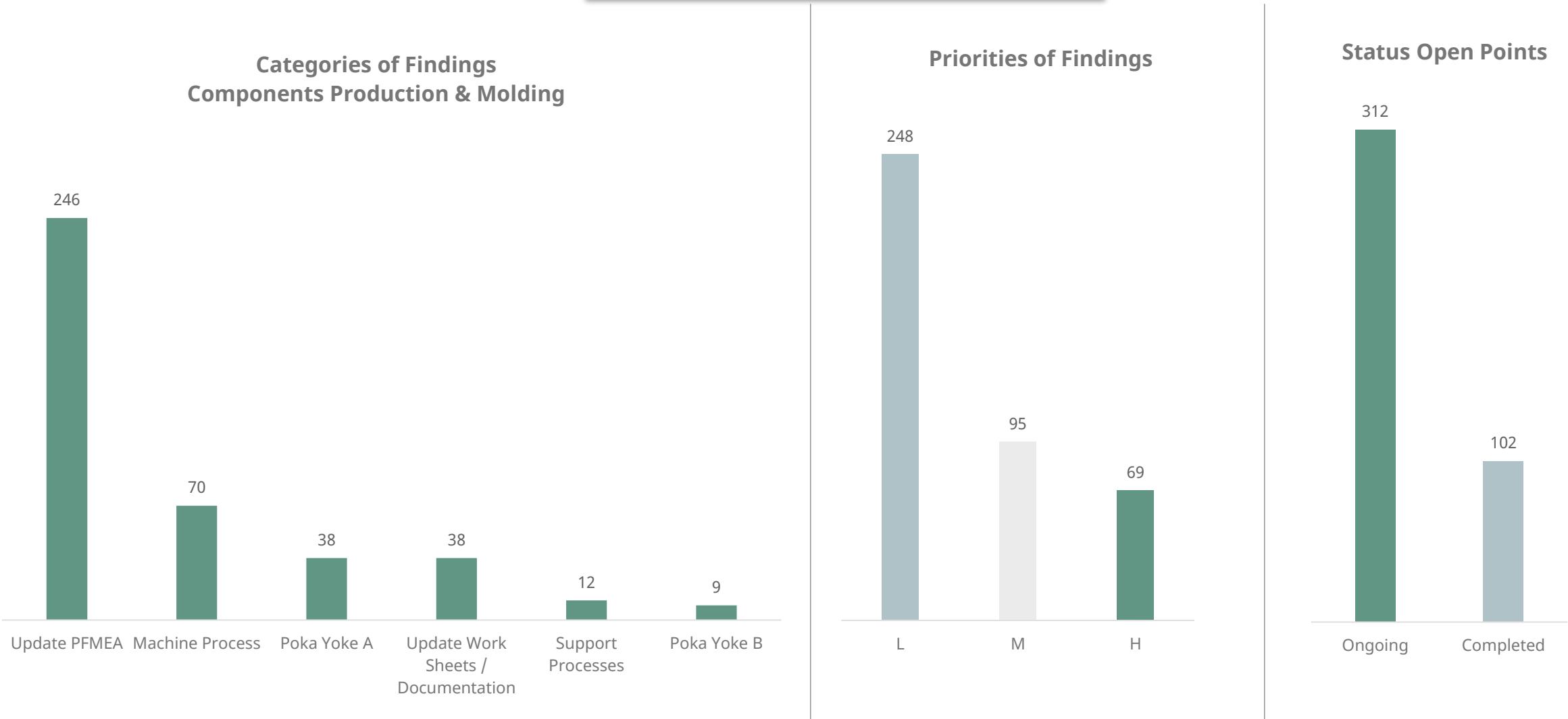
IMPLEMENTATION STATUS CW12

Pareto FDM Processes

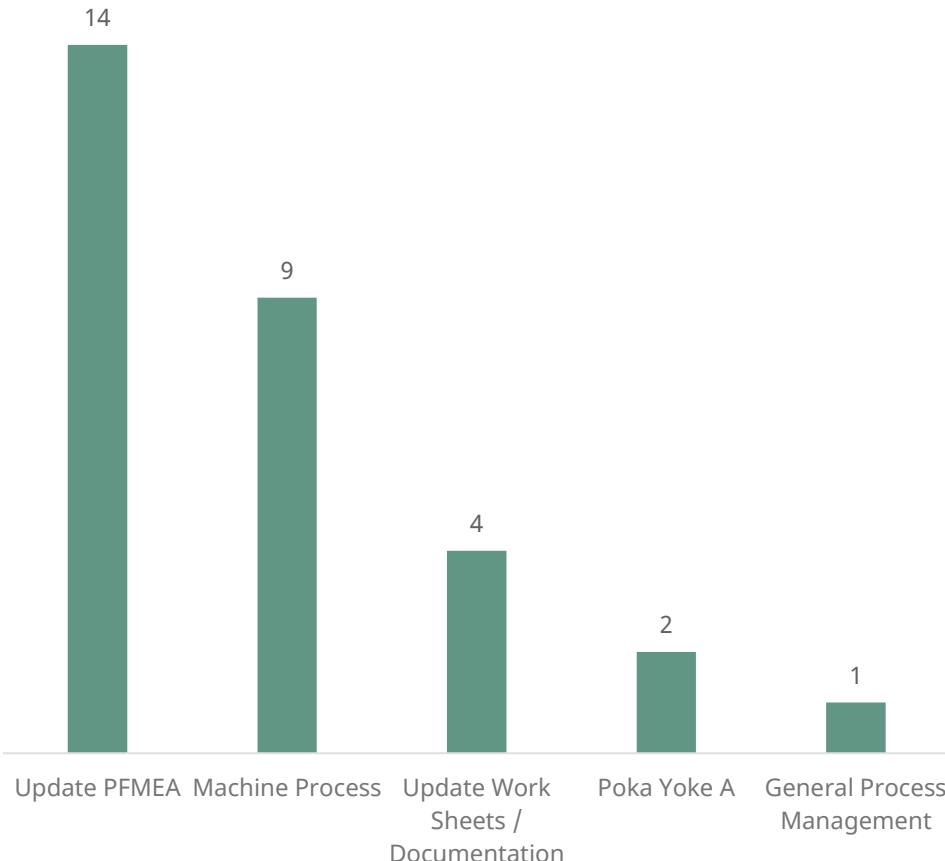
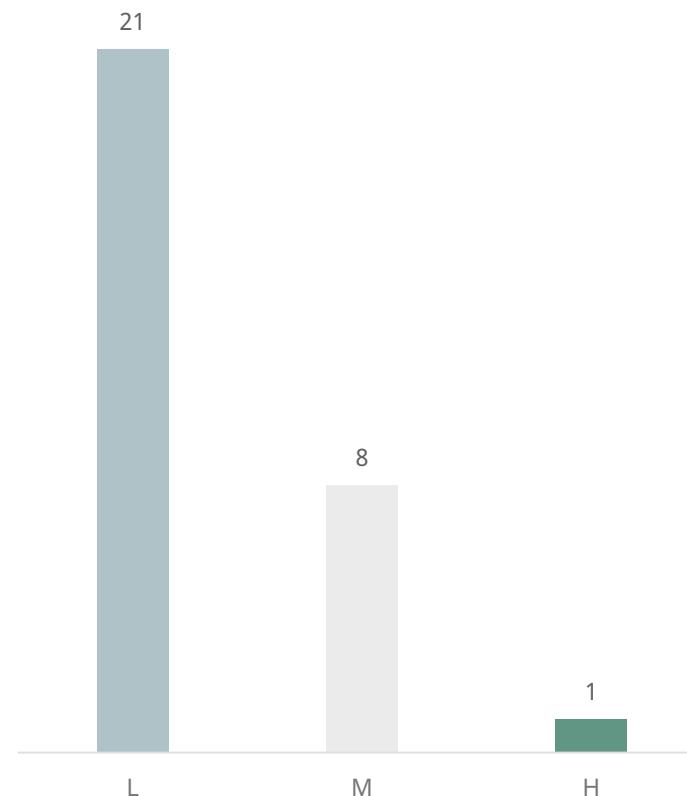
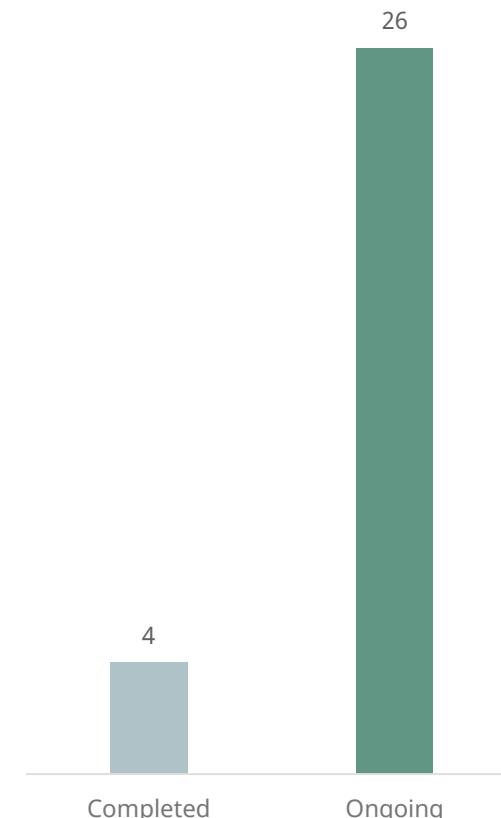


IMPLEMENTATION STATUS CW12

Pareto Components and Molding Processes



Incomplete PFMEA's updated needed, treated with Low priority, machine process related items treated with high and medium priority

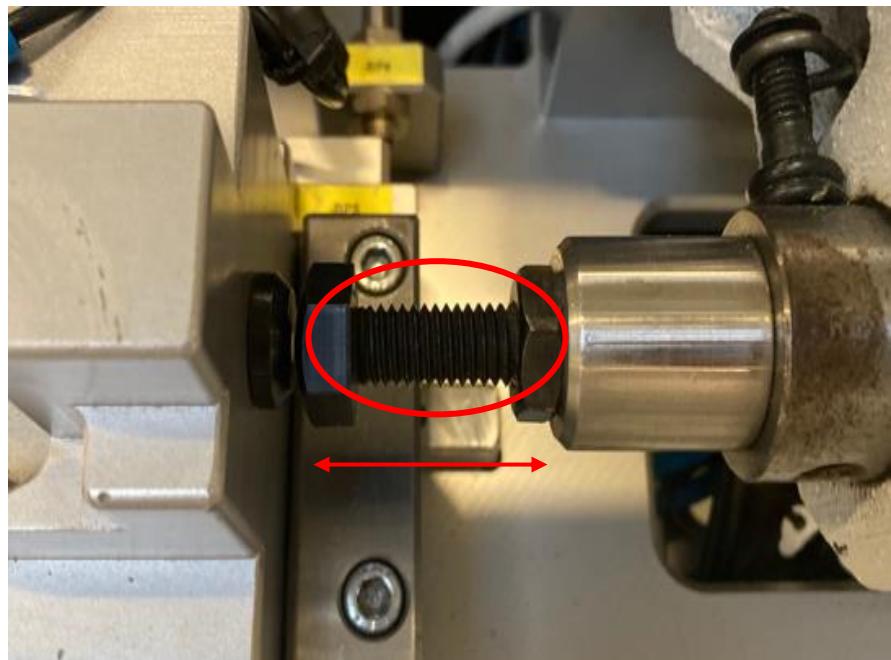
IMPLEMENTATION STATUS CW12**Pareto SCR production****Categories of Findings SCR****Priorities of Findings****Status Open Points**

Process more automated, no major findings in production, PFMEA will be completely reviewed acc. BMW requirements and specifications

IMPROVEMENTS - EVIDENCES

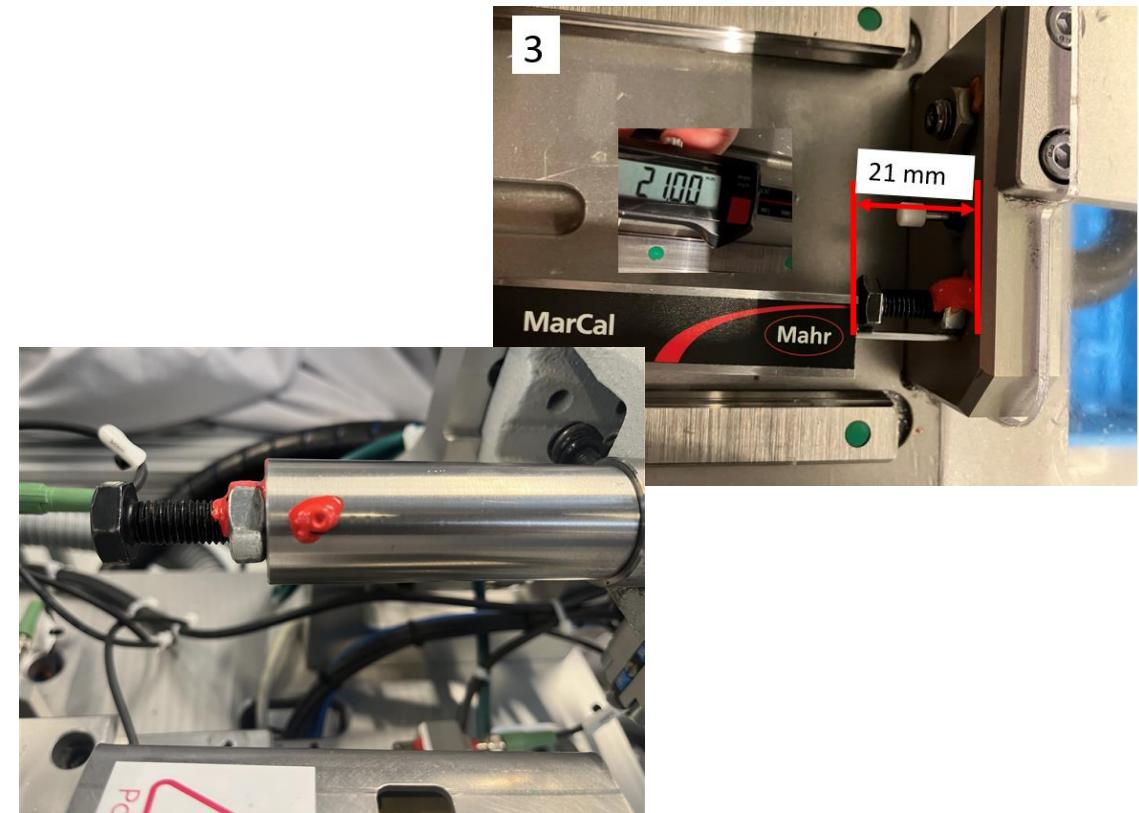
INITIAL SITUATION

Press stop defined by screw w/o fixation and clear distance definition.
Internal incidents known (e.g., broken flange, tube not fully inserted).



IMPROVEMENT

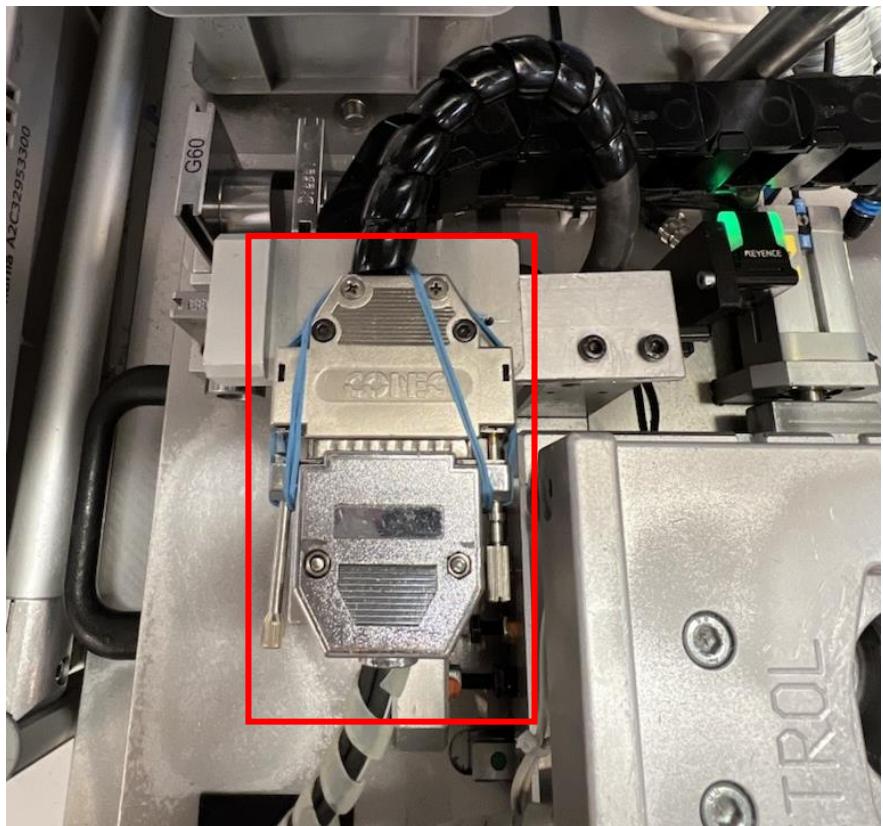
Locked screws for pressing tool. Mechanical parameter added in Process Parameter sheet.



IMPROVEMENTS - EVIDENCES

INITIAL SITUATION

Communication cable, not proper fixed. FPY affected, minor stoppages



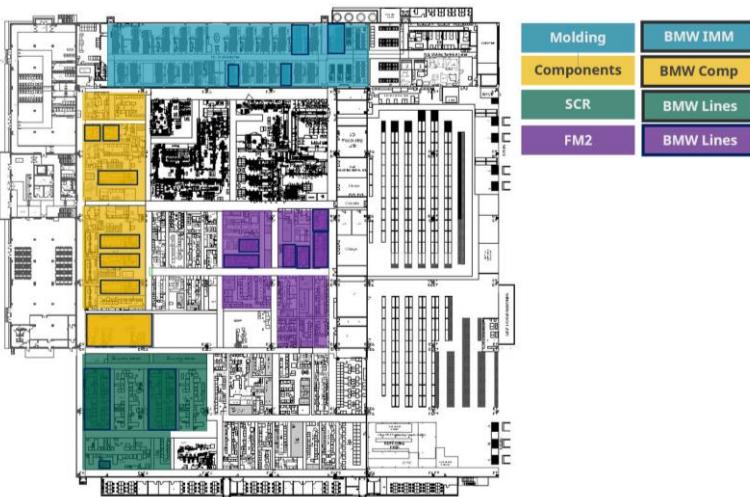
IMPROVEMENT

Design of the coupling has been changed with industrial one.



ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION

Item	Topic	Due Date	Resp.	2024						2025						Status	
				Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	
A	Planning of RPFMEA on BMW lines/projects	13.11.2024	A. Popescu														Done
B	Execution of RPFMEA according to planning	10.07.2025	Team														62%
C	Implementation of improvement actions defined in RPFMEA workshop	08.08.2025	Team														25%
D	Update and maintain PFMEA	27.07.2025	Team														29%

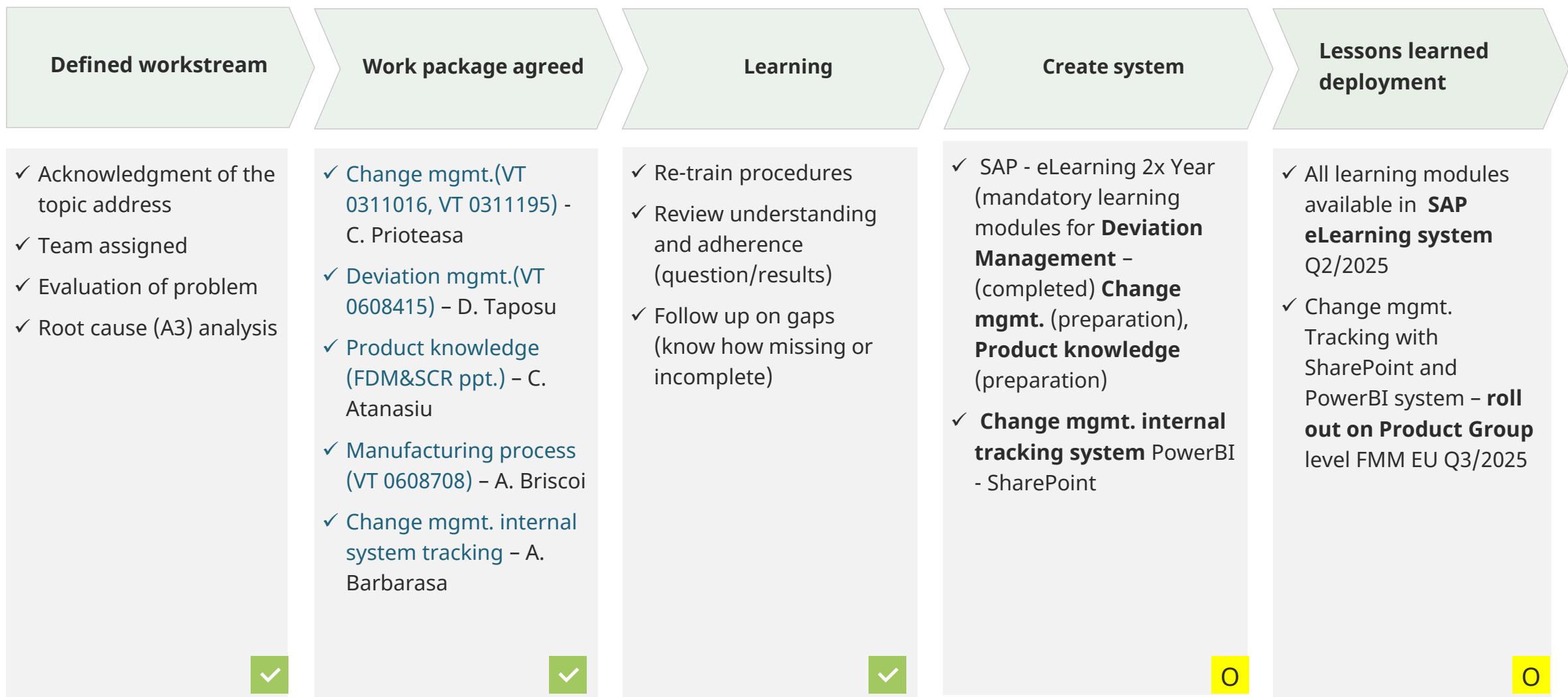


ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION

Work package 1	Work package 2	Work package 3	Work package 4	Work package 5
<p>Total Preventive Maintenance</p> <p><u>Leader:</u> Sisca Sebastian</p> <p><u>Scope:</u></p> <ul style="list-style-type: none"> • TPM Headquarter Audit • TPM Structure Definition • Roll-out to Production Areas 	<p>Poka Yoke / Line Site Review</p> <p><u>Leader:</u> Laura Stan</p> <p><u>Scope:</u></p> <ul style="list-style-type: none"> • Prepare a Poka-yoke lists for all lines • Review of Poka-yoke with master parts • Line Audit with focus on Poka-yoke / detection systems 	<p>Reverse FMEA / Pass Through Characteristics</p> <p><u>Leader:</u> Alexandru Popescu</p> <p><u>Scope:</u></p> <ul style="list-style-type: none"> • Review of R-FMEA process • Prioritization of R-FMEA for plant and plan audits accordingly • Periodical updates of FMEA / WI / CP / etc. 	<p>Deviation and Change management</p> <p><u>Leader:</u> Florin Coman</p> <p><u>Scope:</u></p> <ul style="list-style-type: none"> • Re-Training of Deviation and Change management process • Tracking system introduction for changes and deviations • 4M standard restart on shopfloor 	<p>Supplier Quality Management</p> <p><u>Leader:</u> Marius Picioara</p> <p><u>Scope:</u></p> <ul style="list-style-type: none"> • Review with R&D if the CSR transposed to the suppliers correspond to the actual status • Risk evaluation components / suppliers • Review incoming quality component process



DEVIATION AND CHANGE MANAGEMENT



ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION

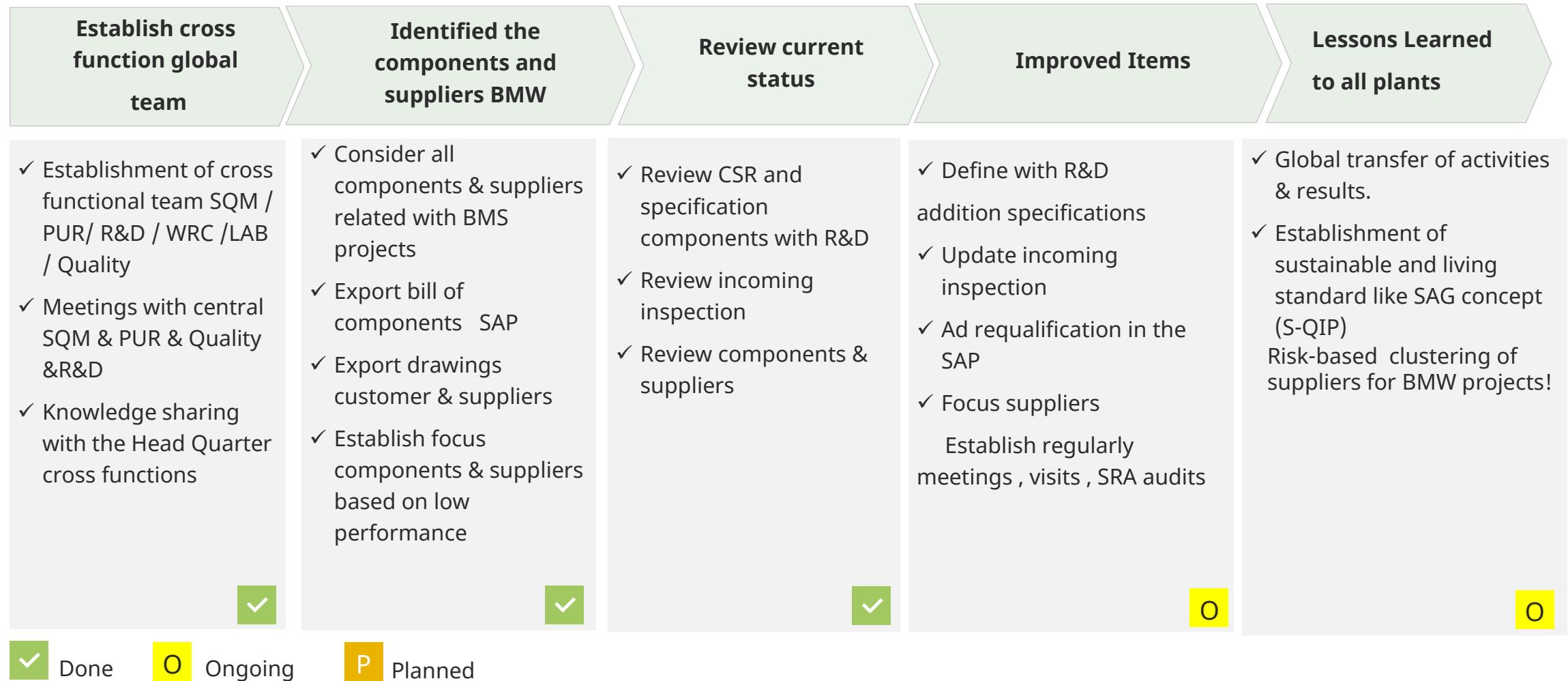
Item	Topic	Due Date	Responsible	2024		2025				Status
				Nov	Dec	Jan	Feb	Mar	Apr	
A	Training process change management	CW44/CW45	C. Prioteasa/A. Barbarasa							Done
B	Evaluate status of know how - questionnaire test	CW47/CW48	C. Prioteasa							Done
C	Update tracking tool system of plant change mgmt.	CW46	F. Coman/A. Barbarasa							Done
D	Training manufacturing process (4M)	CW50	A. Briscoi							Done
E	Training product knowledge FDM&SCR	CW50/CW03	C. Atanasiu /A. Tapu							Done
F	Training deviation management	CW13/CW15	D.Taposu/R.Toma							Done
G	Evaluate training effectiveness	CW51/CW05	By functional area							Done
H	Evaluate gaps and improvement areas	CW51/CW10	By functional area							Done
I	Systemic follow up – create eLearning automated triggers sessions (2x per year) for Change Management (WK15), Deviation Management (Completed) and Product knowledge (On going)	Q1/2025	By functional area							On going

ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION

Work package 1	Work package 2	Work package 3	Work package 4	Work package 5
<p>Total Preventive Maintenance</p> <p><u>Leader:</u> Sisca Sebastian</p> <p><u>Scope:</u></p> <ul style="list-style-type: none"> • TPM Headquarter Audit • TPM Structure Definition • Roll-out to Production Areas 	<p>Poka Yoke / Line Site Review</p> <p><u>Leader:</u> Laura Stan</p> <p><u>Scope:</u></p> <ul style="list-style-type: none"> • Prepare a Poka-yoke lists for all lines • Review of Poka-yoke with master parts • Line Audit with focus on Poka-yoke / detection systems 	<p>Reverse FMEA / Pass Through Characteristics</p> <p><u>Leader:</u> Alexandru Popescu</p> <p><u>Scope:</u></p> <ul style="list-style-type: none"> • Review of R-FMEA process • Prioritization of R-FMEA for plant and plan audits accordingly • Periodical updates of FMEA / WI / CP / etc. 	<p>Deviation and Change management</p> <p><u>Leader:</u> Florin Coman</p> <p><u>Scope:</u></p> <ul style="list-style-type: none"> • Re-Training of Deviation and Change management process • Tracking system introduction for changes and deviations • 4M standard restart on shopfloor 	<p>Supplier Quality Management</p> <p><u>Leader:</u> Marius Picioarea</p> <p><u>Scope:</u></p> <ul style="list-style-type: none"> • Review with R&D if the CSR transposed to the suppliers correspond to the actual status • Risk evaluation components / suppliers • Review incoming quality component process



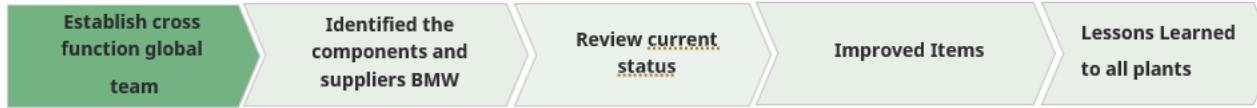
ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION SQM


✓ Done

O Ongoing

P Planned

ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION SQM



Local Team:

- SQM SCR : Mirela L. / Alin I. / Alex. C / Marius P.
- SQM FDM : Roberta S. / Ciprian G./ Claudiu S. / Laurentiu M. / Marius P.
- R&D : Alex T. / Cristian U. / Andra P./Catalin P.
- Purchasing : Monica B/ Razvan A.
- Laboratory : Stefanel T.
- Quality : Nicoleta S / Jan Z
- Production : Alex B



Global Team:

- Marius Hupka - Vice President Supplier Quality Management
- Matthias Renz - Vice President Supplier Quality Division E-Mobility
- Ante Burazin - Supplier Quality Manager - Product Group Fluid Management Modules
- Alexander Schmidt-Wallach - Head of Supplier Quality Management Business Unit Hydraulics & Turbocharger
- Dieter Kerst - Director Supplier Quality Management Business Division Powertrain Solutions
- Matthias Greiner - Head of SQM BU Actuation
- Campbell-John, Gawain – Head of Product Quality Management
- Andre Wolter, Vitesco Germany, Head Quarter

Cross-functional
Team established

ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION SQM

IN FOCUS COMPONENTS LIST

BMW focus & all components



All components means 53 from 25 suppliers / Focus components 9 from 7 suppliers

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Part number	Component name
A2C16388500	pump assy GENIV a
A3C0361800000	pump assy GENIV a
A3E98001279	spring carrier
A3E98001556	diaphragm 26
A3E98001757	Pressure sensor sent
A3E98001762	blind rivet 3,15x 4,37
A3E98001871	accumulator body assy GENIV
AAA2049410000	compression spring Di= 1,75x10,40x47,76
AAA2076800000	piston 4,5

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IN FOCUS COMPONENTS LIST

BMW focus & all components

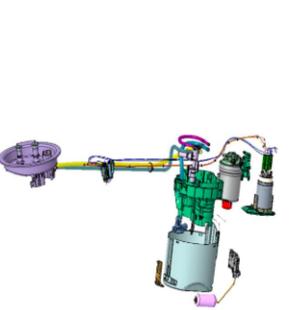
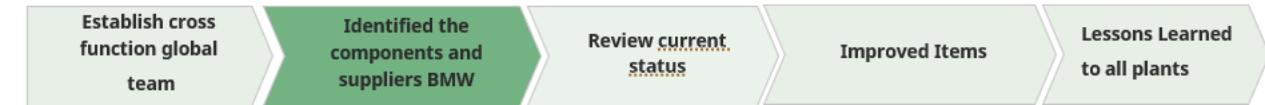


All components means 294 from 75 suppliers / Focus components 12 from 8 suppliers

Third-Party Confidential | SQMS Brasov | Picioara Marius February 2025

Part number	Component name
A2C11670201	cable harness assy
A2C53295168	magnet
A2C53090644	float
A2C99929801	SJP hous. transfer 0,65 7,4 YE round
A2C12913601	cable harness assy
A2C11518701	cable harness assy D G 5 4Y
AAA2049020000	cable harness assy G P 4Y
AAA2053420000	cable harness assy
A2C97111301	COVER
A2C97111500 r	FILTER
A2C52047811	disk
A2C98975300	Pump element assy

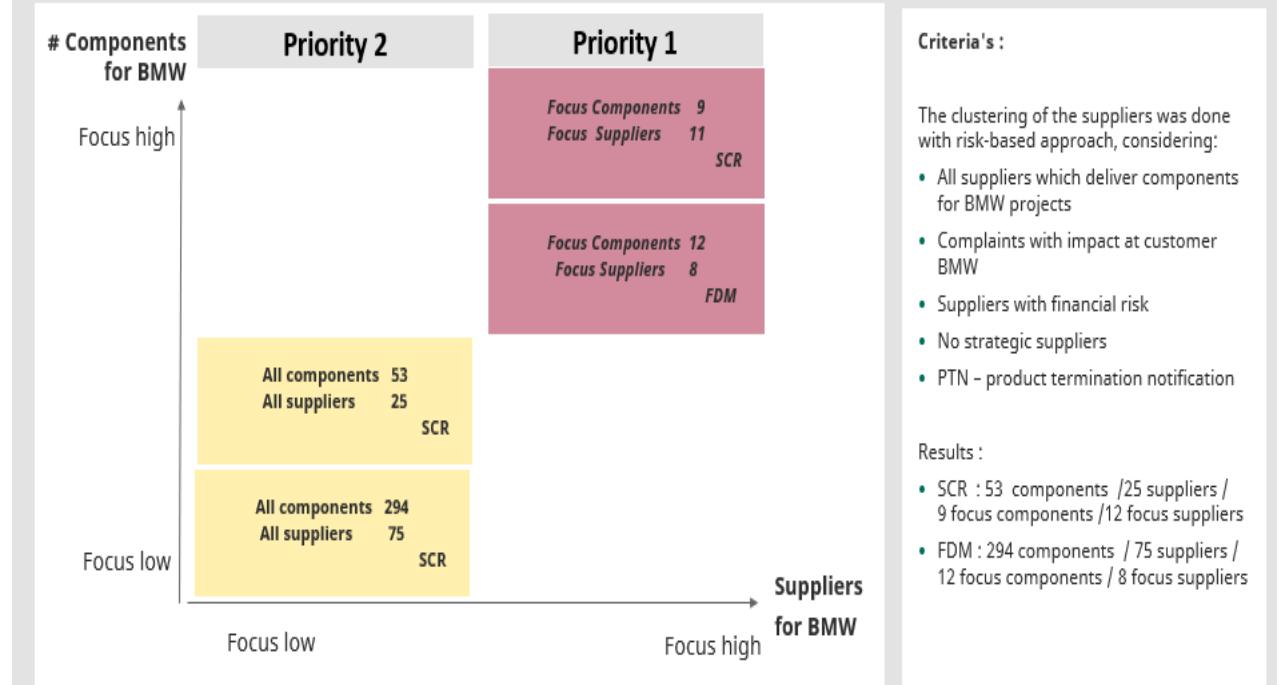
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BMW Q Performance

ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION _SQM

Focus components & Focus suppliers



Focus components &
Suppliers identified



43

ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION SQM



Review with R&D the CSR BMW drawing & supplier drawings:

SUPPLIER QUALITY IMPROVEMENT_ WORK PACKAGE 5
L1 Review specifications drawings customer & supplier for critical components SCR

Review drawings customer & supplier for all components including VA + pressure sensor + pump

Customer drawing:

- Overall dimensions present in customer drawing 3 [2F] characteristics with bellow correlation:

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Customer DRW Page 1
Customer DRW Page 2

SUPPLIER QUALITY IMPROVEMENT_ WORK PACKAGE 5
L1 Review specifications drawings customer & supplier for focus components

VA & FG DRW	SCR SPEC for VA and FG	VA Components PN	Name	Component DRW	Inspection plan update after E5 topic / Review
No 2F dimensions for components	No component correlation	AAA2076800000	piston 4.5	4 x 2F Dimensions	7 dimensions (5 dimensions at the supplier)
		AAA2049410000	compression spring D=1.75x10.40x47.76	No 2F Dimensions	9 dimensions (5 dimensions at the supplier)
		AAC398001871	accumulator body assy GENIV a	3 x 2F Dimensions	8 dimensions + 3 x 2F Dimensions
		AAC398001762	blind rivet 3,15x4,37	No 2F Dimensions	1 dimension + label and packaging type (4 dimensions at the supplier)
		AAC16388500	pump assy GENIV a	6 x 2F & 2 x 2P Dimensions	6 x 2F & 2 x 2P Dimensions
		AAC0361800000	pump assy GENIV a	6 x 2F & 2 x 2P Dimensions	6 x 2F & 2 x 2P Dimensions
		AAC398001757	Pressure sensor sent	4 x 2F Dimensions	3 x 2F Dimensions 1 x 2F

Conclusion SQM: 2F dimension included in incoming inspection plan.
Conclusion R&D: 2F characteristics defined only for components with tightness function.
Gap: No gap.
Pass through characteristic: N/A
Action to mitigate R&D: N/A
Action to mitigate SQM: N/A

No Gaps : All

Third-Party Confidential| SQMS Brasov | Alin Ivan | January 2025

SUPPLIER QUALITY IMPROVEMENT_ WORK PACKAGE 5
L1 Review specifications drawings customer & supplier for components FDM

- Overall dimensions present in customer drawing have correlation with components drawings . [2F] characteristics with bellow correlation:
 - F13 – SSP nozzle diameter
 - F14 – Crimp quality
 - F19 – reliability crimp, pullout force test

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Durchmesser SSP-Düse
SSP-NOZZLE-DIMETER

F13 Funktion Funktion Unterlieferant SUB-SUPPLIER

SUPPLIER QUALITY IMPROVEMENT_ WORK PACKAGE 5
L1 Review specifications drawings customer & supplier for focus components

Part number	Component name	Component drw or dimensional checking's	Present	Inspection update
A2C16702001	cable harness assy	No 2F dimensions	1x Visual+1x dimensional	3x Visual+ 2x dimensional
A2C33291618	magnet	No 2F dimensions	Visual+dimensional	6 dimensions MSS
A2C3390544 Roger A2CS3807614 Saefeng	float	Only weight as "F"	Visual+dimensional	3 dimensions MSS
A2C9995801	SJF house, transfer Ø65 7,4 YE round	5 special characteristics "W"	Visual+dimensional	6 dimensions MSS
A2C29151801	cable harness assy O.G.S.Y	No 2F dimensions	Never skip on visual inspection	10 dimensions MS
AAC21518701	cable harness assy O.G.S.Y	No 2F dimensions	Never skip on visual inspection	10 dimensions MS
AAA2049020000	cable harness assy O.P.Y	No 2F dimensions	Never skip on visual inspection	10 dimensions MS
AAA2033420000	cable harness assy	No 2F dimensions	Never skip on visual inspection	5 dimensions MS
A2C97111301	COVER	4 dimensions	Visual+dimensional	5 dimensions MSS
A2C97111300	FILTER	1 dimension	Visual+dimensional	3 dimensions MSS
A2C52047811	disk	No dimensions	Visual+dimensional	6 dimensions MSS
A2C88975300	Pump element assy	8 SC dimensions	Visual+dimensional	6 dimensions MSS

Conclusion SQM: Correlation with focus components

Conclusion R&D: Correlation with focus components

Gap: No Gap.

Pass through characteristic: N/A

Action to mitigate R&D: N/A

Action to mitigate SQM: N/A

No Gaps : All

Third-Party Confidential| SQMS Brasov | Alin Ivan | January 2025

Conclusion:

All function characteristics " F " from customer drawings were transferred to the suppliers drawings.

PTC pass through characteristics was not identified mark in the drawings .

After the components evaluation 124 characteristics were define and add in the incoming inspection



Done

ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION SQM



Review incoming inspection process:

BMW Q PERFORMANCE

SUPPLIER QUALITY IMPROVEMENT_ WORK PACKAGE 5

L3 Review incoming quality component process

- L3.1 Evaluated the efficiency of the current inspection process components content / frequency / detection

Dynamic rule check

Before : 4 out of 53 components did not have the Safe launch batches check; 2 of them are in focus components.
Today : All 4 components were corrected with inspection setup according with the rules

SCHAFFLER

SUPPLIER QUALITY IMPROVEMENT_ WORK PACKAGE 5

L3 Review incoming quality component process

- L3.1 Evaluated the efficiency of the current inspection process components content / frequency / detection

In focus components inspection plan

Before

After

Conclusion:
Warranty returns - actions for the pump and pressure sensor were implemented to the supplier
Internal claims : All dimensions issues were defined due to Task Force ES , incoming inspection is update.

SCHAFFLER

SAP INSPECTION PLAN EFFICIENCY

- L3.1 Evaluated the efficiency of the current inspection process components content / frequency / detection status 28.02.25

In focus components inspection plan

Conclusion:
Warranty returns - actions for the pump and pressure sensor were implemented to the supplier
Internal claims : All dimensions issues were defined due to Task Force ES , incoming inspection is update.

SCHAFFLER

BMW Q PERFORMANCE

SUPPLIER QUALITY IMPROVEMENT_ WORK PACKAGE 5

L1 Review specifications drawings customer & supplier for focus components

VIA & FG DRW	SCR SPEC for VA and FG	VA Components PN	Name	Component DRW	Inspection plan update after ES topic / Review
No 2F dimensions for components	No component correlation	A3E98001556	diaphragm 26	4 x 2F Dimensions	4 x 2F Dimensions
		AAA20176800000	piston 4.5	No 2F Dimensions	7 dimensions (5 dimensions at the supplier)
		A3E98001279	spring carrier	No 2F Dimensions	21 dimensions (3 dimensions at the supplier)
		AAA2049410000	compression spring D1: 1.75x10.40x 47.76	No 2F Dimensions	9 dimensions (5 dimensions at the supplier)
		A3E98001871	accumulator body assy GENIV a	3 x 2F Dimensions	8 dimensions + 3 x 2F Dimensions
		A3E98001762	blind rivet 3.15x 4.37	No 2F Dimensions	1 dimension + label and packaging type
		A2C16388500	pump assy GENIV a	6 x 2F & 2 x 2P Dimensions	6 x 2F & 2 x 2P Dimensions
		A3C056180000	pump assy GENIV a	6 x 2F & 2 x 2P Dimensions	6 x 2F & 2 x 2P Dimensions
		A3E98001757	Pressure sensor sent	4 x 2F Dimensions	3 x 2F Dimensions

Conclusion SQM: 2F dimension included in incoming inspection plan.
Conclusion R&D: 2F characteristics defined only for components with tightness function.
Gap: No gap.
Pass through characteristic: N/A
Action to mitigate R&D: No actions needed
Action to mitigate SQM: 64 characteristics add to the incoming inspection plan after ES Error Task Force and BMW Q Performance review.

BMW Q PERFORMANCE

SUPPLIER QUALITY IMPROVEMENT_ WORK PACKAGE 5

L3 Review incoming quality component process

- L3.1 Evaluated the efficiency of the current inspection process components content / frequency / detection

Dynamic rule check

Before : 2 out of 12 did not have the Safe launch correct set (only 3 lots)
Today : All components have the correct set

SCHAFFLER

SUPPLIER QUALITY IMPROVEMENT_ WORK PACKAGE 5

L3 Review incoming quality component process

- L3.1 Evaluated the efficiency of the current inspection process components content / frequency / detection

FDM in focus components inspection plan

Before : 12 out of 12 had incoming inspection dimensional and visual defined
Today : additionally check - connector variant for cable harness will be add . slide 8

SCHAFFLER

SAP INSPECTION PLAN EFFICIENCY

- L3.1 Evaluated the efficiency of the current inspection process components content / frequency / detection status 28.02.25

Main contributors with systemic issues :
CO : 1X VACUUMSCHMELZE GMBH & CO.KG/1X LEONI AG/1X HILLERS 2025 - FDM

Actions "0 KM claims":
Magnet : drawing change add 2F with monitoring to the new supplier;
Cable hardness : incoming inspection update;
S/P housing transfer : review packaging concept supplier & Schaeffler.

SCHAFFLER

BMW Q PERFORMANCE

SUPPLIER QUALITY IMPROVEMENT_ WORK PACKAGE 5

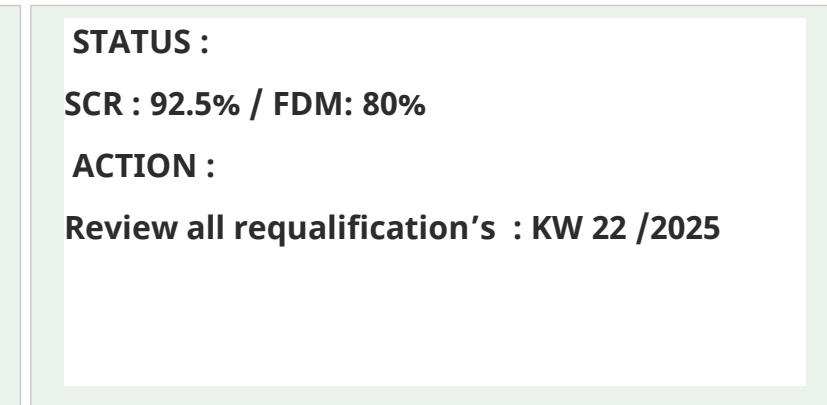
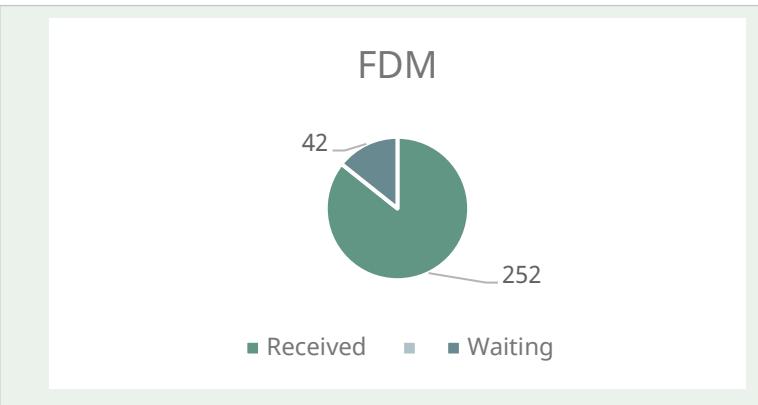
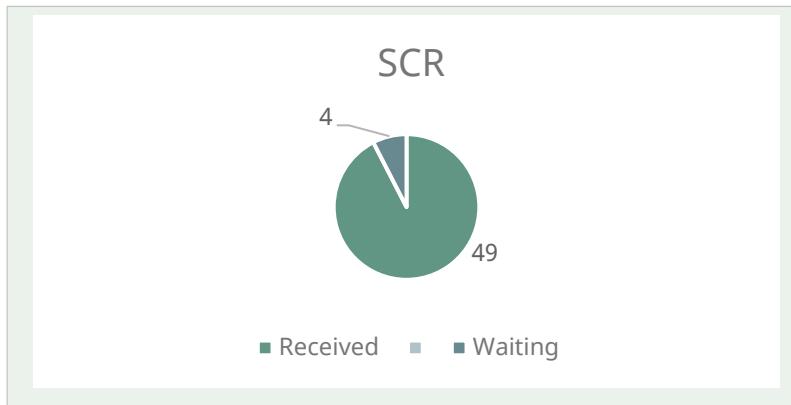
L1 Review specifications drawings customer & supplier for focus components

Part number	Component name	Component drw if dimensional checking to	Present	Inspection update
A2C11970201	cable harness assy	No 2F dimensions	To Visual 1x dimensional 2x MSS	2x Visual 2x dimensional 5 dimensions MSS
A2C32521548	magnet	No 2F dimensions	Visual dimensional 2 dimensions MSS	Check with R&D possibility to mark dimension 1.0 +/- 0.0 as 2F. SQM to check with new supplier, the feasibility of performing SPC for this dimension.
A2C31590644 Roger A2C31590644-00000000	flast	Only weight as "F"	Weightdimensional 1x dimensional 2 dimensions MSS	1x dimensional 1x dimension Add depth testing test + weight
A2C09826001	S/P housing transfer 0.6x 7.4 x 6 round	5 special characteristics "N"	Weightdimensional 6 dimensions MSS	Weightdimensional 6 dimensions MSS
A2C12913801	cable harness assy	No 2F dimensions	Never skip on visual inspection 10 dimensions MSS	Add visual for confirmation
A2C11970701	cable harness assy D 0.5x 47	No 2F dimensions	Never skip on visual inspection 10 dimensions MSS	KE Safety launch 10 dimensions MSS
AAA2090020000	cable harness assy G 7x 47	No 2F dimensions	Never skip on visual inspection 10 dimensions MSS	KE Safety launch 10 dimensions MSS
AAA2051040000	cable harness assy	No 2F dimensions	Never skip on visual inspection 5 dimensions MSS	KE Safety launch 5 dimensions MSS
A2C09111301	COVER	4 dimensions	Weightdimensional 5 dimensions MSS	Weightdimensional 5 dimensions MSS
A2C09111500	filter	1 dimension	Weightdimensional 3 dimensions MSS	Weightdimensional 3 dimensions MSS
A2C22040711	stap	No dimensions	Weightdimensional 6 dimensions MSS	Weightdimensional 6 dimensions MSS
A2C09073200	Pump element assy	8 30 dimensions	Weightdimensional 8 dimensions MSS	Weightdimensional 8 dimensions MSS

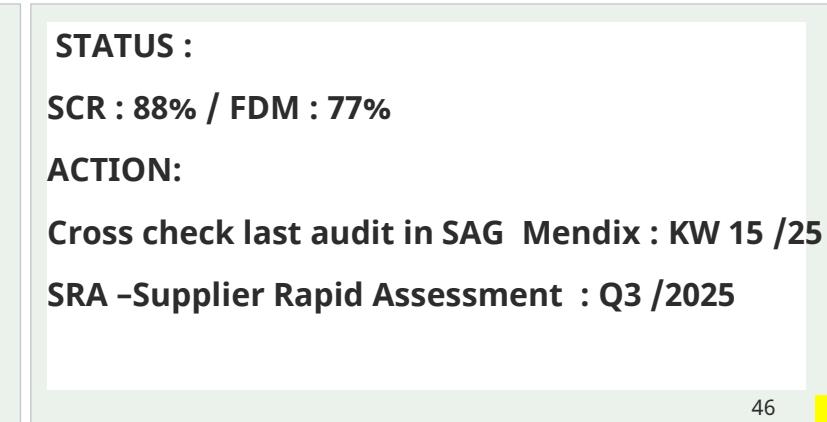
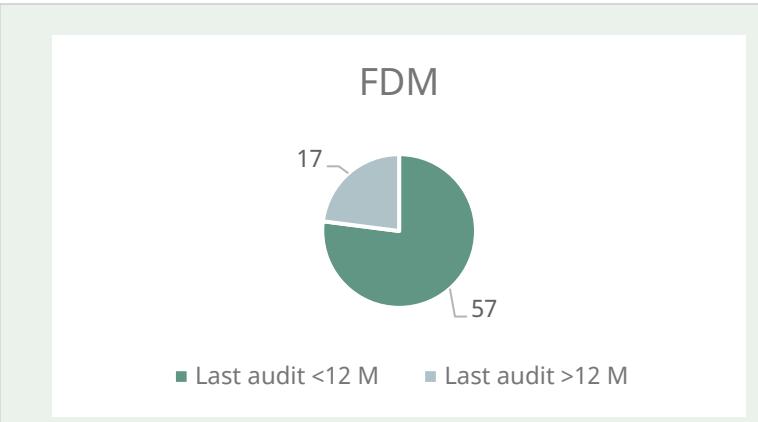
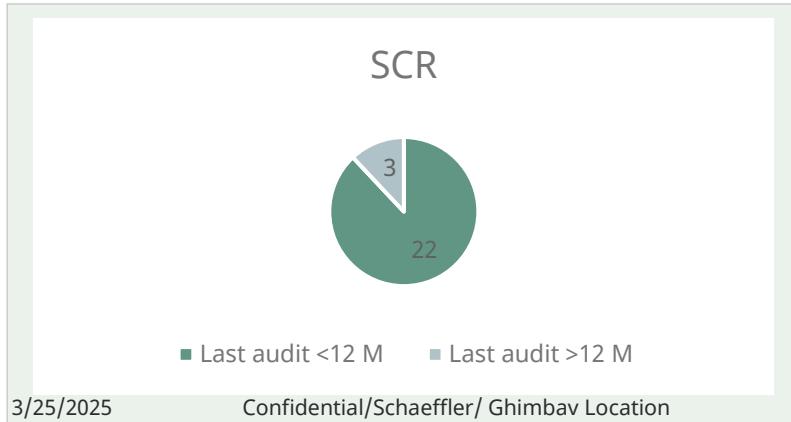
ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION SQM



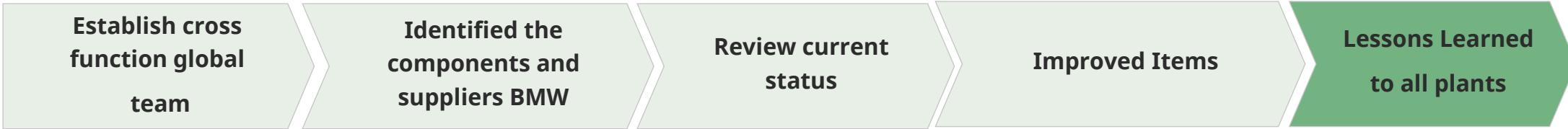
REQUALIFICATION COMPONENTS <12 M:



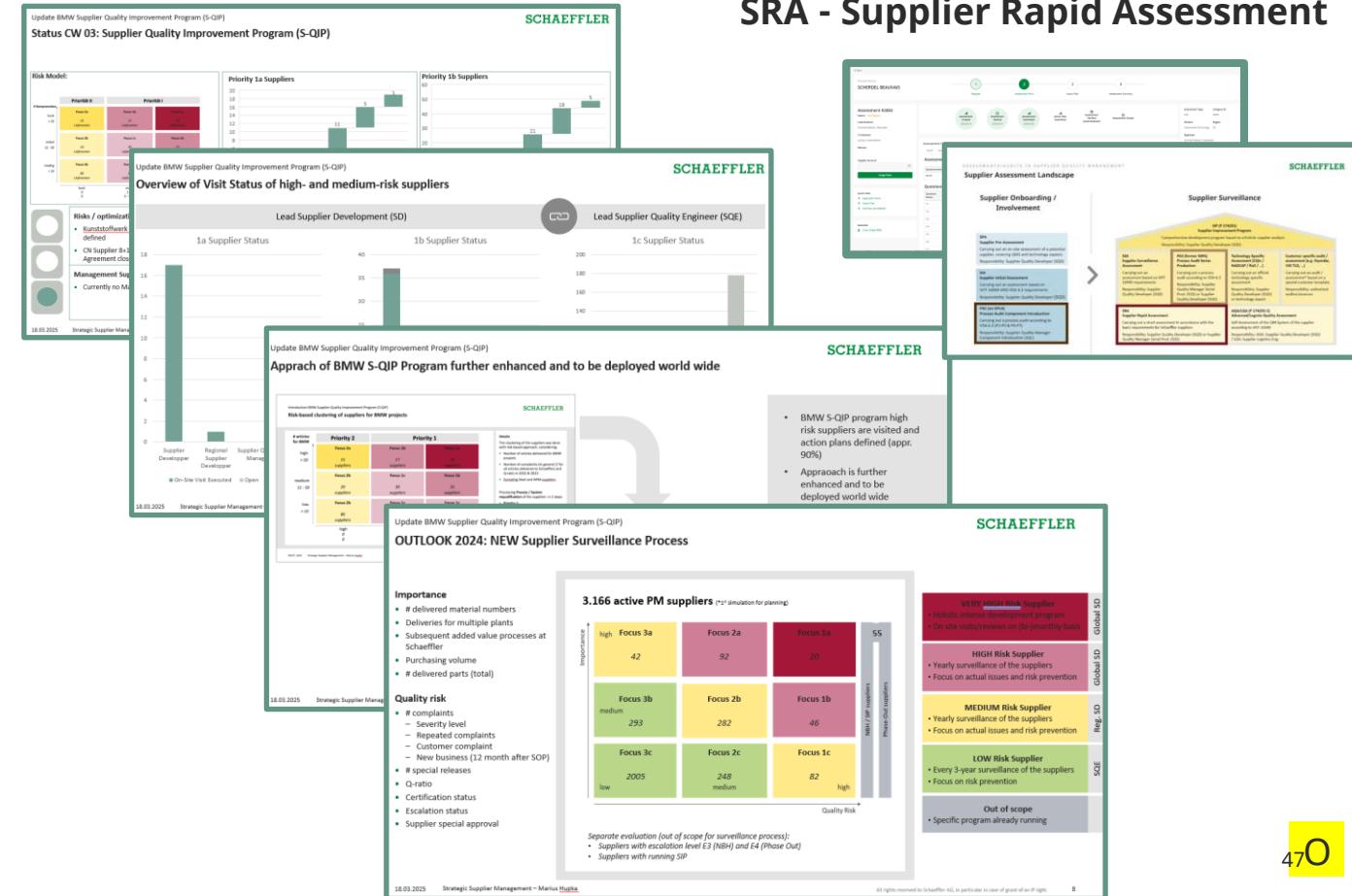
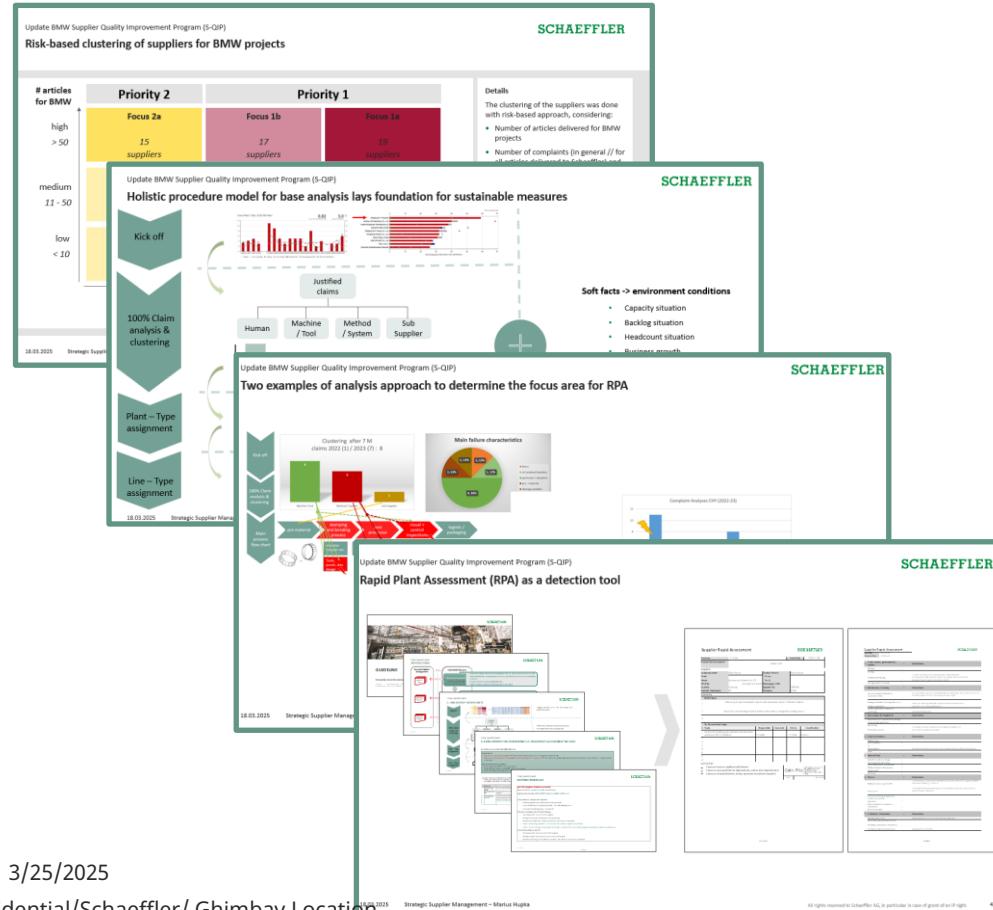
REQUALIFICATION SUPPLIERS & LAST AUDIT <12 M:



ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION _SQM



SAG concept BMW (S-QIP) Risk-based clustering of suppliers for BMW projects!



ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION

Item	Topic	Due Date	Resp.	Status													
				Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
A	Review specifications drawings customer & supplier	KW 10 2025	A.Ivan / M. Leches/ L. Mihaila /C. Udrea/ A. Paunescu														Done
B	Evaluate and mitigate the risk for components / suppliers SCR	KW 22 2025	A.Ivan / M. Leches/ L. Mihaila /C.Udrea/ A . Paunescu														80%
C	Review incoming inspection processes	KW 10 2025	Picioarea M /Ivan/ Leches														Done
D	Q performance monitoring monthly quarterly base with focus on customer contributors	KW 27 2025	Picioarea M /Ivan/ Leches														80%

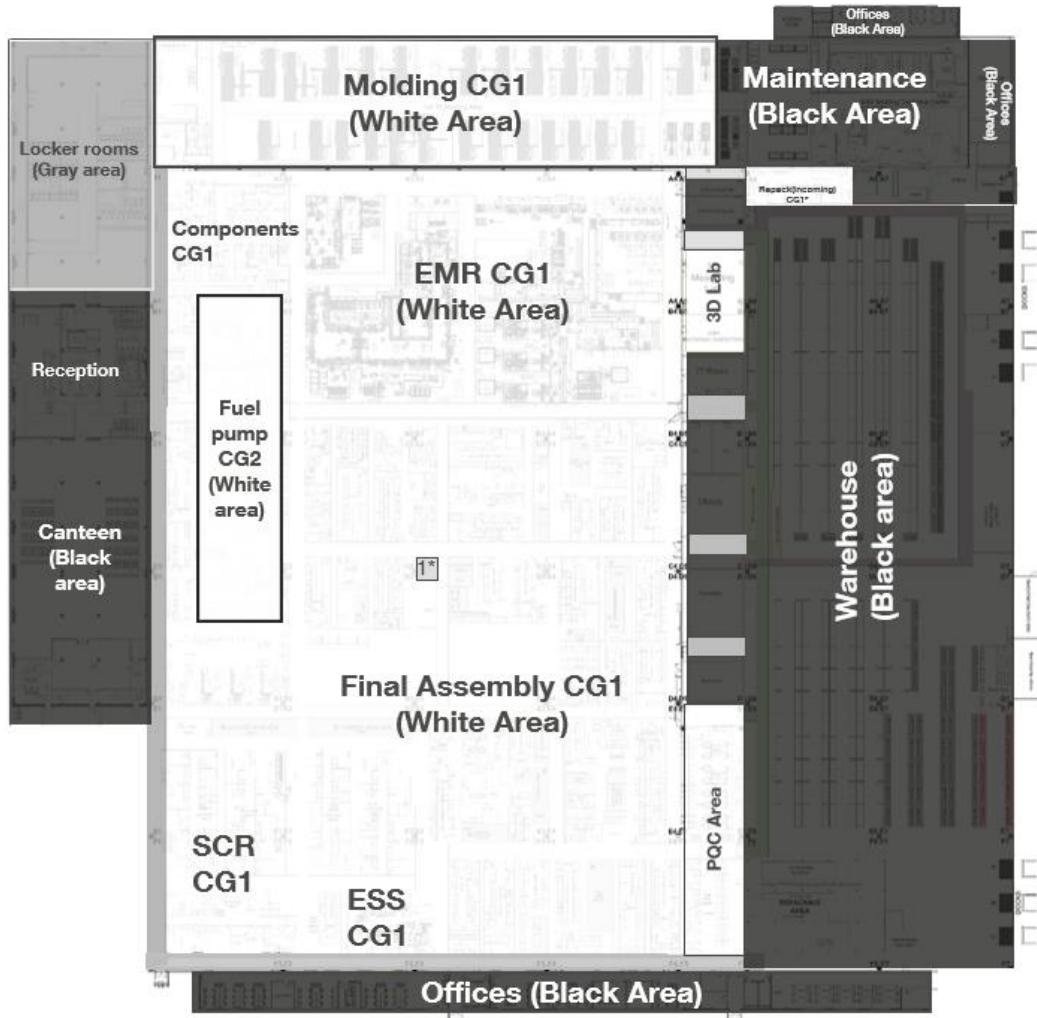


Quarterly Management Meeting

Technical cleanliness concept



TECHNICAL CLEANLINESS IN PLANT BRASOV

**Technical cleanliness area**

White areas: production; implemented technical cleanliness rules



CG1-cleanliness zone



CG2-cleanliness room

Grey areas: lockers, material transfer



Black areas: warehouse, canteen, outside

1* Relaxing area

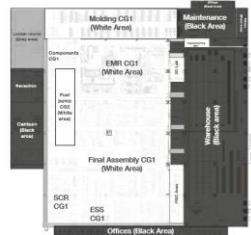
TECHNICAL CLEANLINESS IN PLANT BRASOV



Internal Standard [VT 0608815 - 04 Technical Cleanliness.pdf](#) is applied for Brasov Plant
Based on the Group Standard (VT 0607153) & External Standards (VDA19.1, VDA 19.2,
ISO 16232, ISO 14644)



Technical Cleanliness Layout based on the ANNEX-B/G/W PLANT LAYOUT(INFORMATIVE)
Cleanliness grade area defined for each area (CG2- [VT 0688815-A05-02 Production labels.pptx](#))



**PLANT LAYOUT
HALL 1**

TECHNICAL CLEANLINESS AREAS
CG1- CLEANLINESS ZONES
CG2- CLEANLINESS ROOM

* Pending area



*available at the entrance of the production area



The general rules for the CG1 and CG2 areas:

[VT 0608815-A04-02 General rules in the clean areas .docx](#)



Technical Cleanliness Working Instruction for:

1. FDM Product (applicable also for TM->WI-11709-Technical Cleanliness -FSU-CG1 [Working I.](#))
2. SCR Product (WI-11710-Technical Cleanliness -SCR-CG1->[Working I.](#));
3. Molding product (WI-11713-Technical Cleanliness Molding CG1 [Working I.](#));
4. Pump product (WI-11712-Technical Cleanliness - Pompe-CG2 [Working I.](#));
5. Components (WI-11714-a-Technical Cleanliness Componente [Working I.](#));



Line Spot Check Audit: is available in e-IAS: [LPA2 - Technical Cleanliness | VT eIAS](#)

QUESTIONNAIRE	
<input checked="" type="checkbox"/> All Y	
1. >	Cleanliness Are there no mechanical processes creating particles close to assembly area?(Maintenance interventions, Facility activities, etc.)
2. >	Cleanliness Are the boxes, inserts and covers for components, sub-assemblies and finish goods clean?
3. >	Cleanliness Are the components in production buffers in clean plastic bags, in covered boxes and in an appropriate number in the box? (Avoid contamination from environment, contact with boxes or between parts)
4. >	Cleanliness Are the components protected from contamination in the production line? (Components in clean bags-in case of buffer boxes, bags to be changed 1/wk, grills on the bottom of open boxes)
5. >	Cleanliness Are the components packaged and stored in a clean, dry place until ready to use?
6. >	Cleanliness Is the existing equipment capable to keep the defined process requirements?Are there any deviations from the process? If yes, is there a plan behind and are risks taken into consideration?
7. >	Cleanliness Is the equipment clean, including line material buffers, upper side of equipment? Are the cables bound and closed? (check tables, fixtures, upper side of equipment, cables and wirings.)
8. >	Cleanliness In case of longer production stops, is the equipment protected from particles accumulation with appropriate protective means: plastic foil, etc.?
9. >	Safety Do employees wear the appropriate protective equipment?
10. >	SS Is the regular cleaning done according to SS instruction?
11. >	Cleanliness Is the Technical Cleanliness instruction number 11709(FSU)/11710(SCR)/11711(HVE)/11712(Pump)/11713(Molding)/11714(Component) displayed?
12. >	Cleanliness Is the Technical Cleanliness instruction respected (take the work instruction and check the area/line status compared to the examples found in the instruction)?
<input type="button" value="Save and public"/> <input type="button" value="Save as Draft"/>	



Technical Cleanliness included in the Layer Process Audit (LPA):

Cleanliness	Is the Technical Cleanliness instruction respected (take the work instruction and check the area/line status compared to the examples found in the instruction)?
-------------	--



Induction Trainings for new Employees:

[04 Technical Cleanliness Induction EN fara ESD.pptx](#)

Technical cleanliness included in the Follow up trainings;

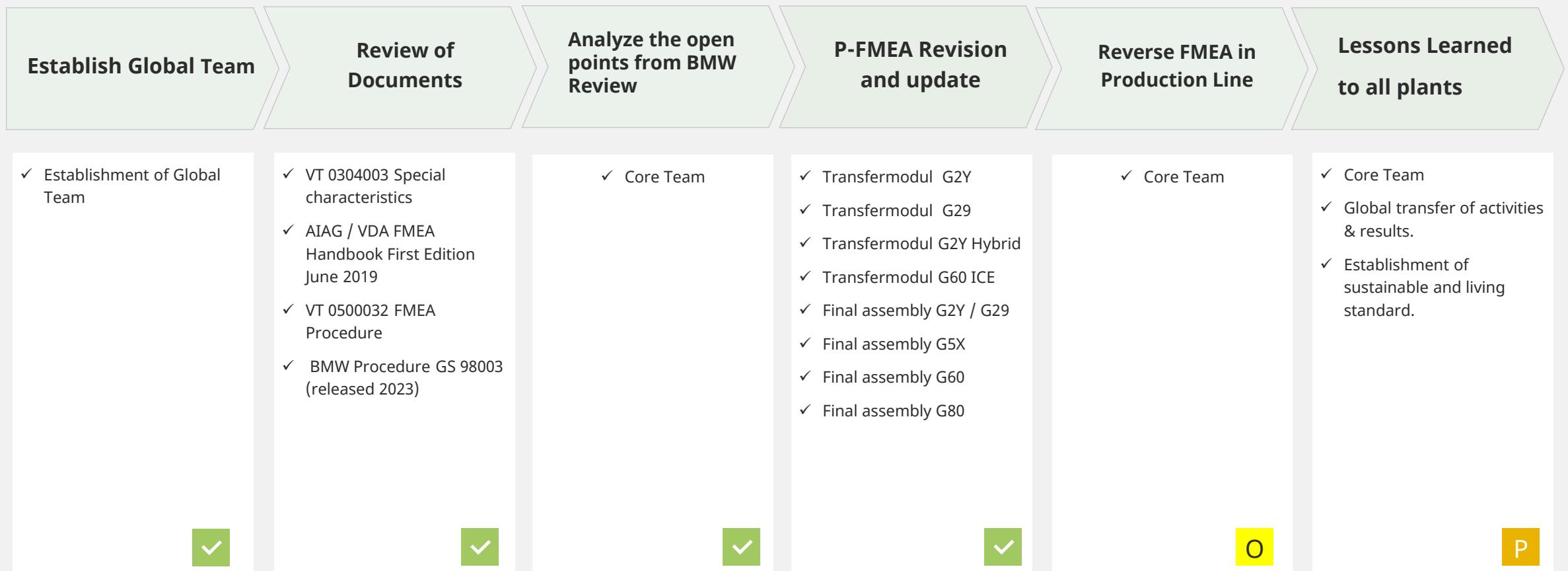


Quarterly Management Meeting

PFMEA

3

ROADMAP FOR PFMEA REVIEW



Done



Ongoing



Planned

FMEA COOPERATION

Establish Global Team

Review of Documents

Analyze the open points from BMW Review

P-FMEA Revision and update

Reverse FMEA in Production Line

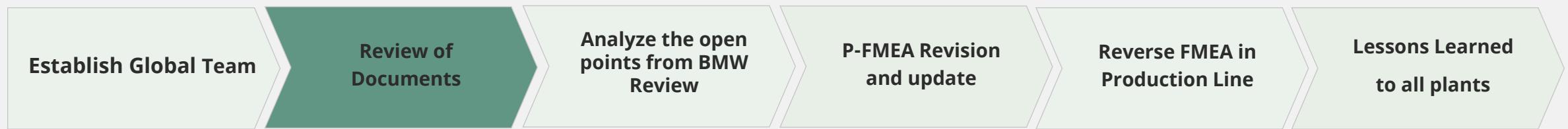
Lessons Learned to all plants

Support

- Jankowski Bartosz, Schaeffler Czech Republic, Trutnov Plant
- Hangrad Zoltan, Schaeffler Hungary, Debrecen Plant
- Lahr Soeren, Schaeffler Germany, Head Quarter
- Dascalescu Marian, Schaeffler Romania, BSV Plant
- Paunescu Andra, Schaeffler Romania, BSV Plant
- Tanase Stefan, Schaeffler Romania, BSV Plant
- Zaplaic Maria, Schaeffler Romania, BSV Plant
- Vrabie Paul, Schaeffler Romania, BSV Plant
- Spataru Eduard, Schaeffler Romania, BSV Plant
- Briscoi Adriana, Schaeffler Romania, BSV Plant
- Popescu Alexandru, Schaeffler Romania, BSV Plant



FMEA - REVIEW OF DOCUMENTS



Reviewed Standards:

- VT 0304003 special characteristics
- VT 0500032 FMEA Procedure
- AIAG / VDA FMEA Handbook First Edition June 2019
- BMW Procedure GS 98003 (released 2023)

Group Standard
Special Characteristics
VT 0304003 Annex 04 Version 04

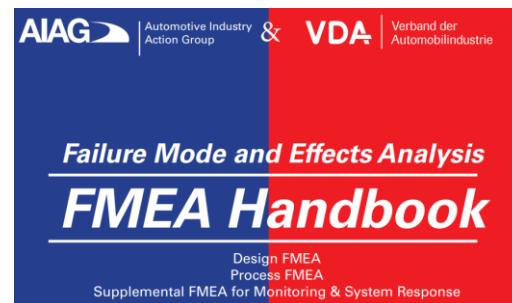


Group Standard
Failure Mode and Effects Analysis
VT 0500032 Annex 3 Version 3



VT 0304003 Annex 04
Special Characteristic Examples

VT 0500032 Annex 03
Rating Catalogues for Design FMEA, Process FMEA, FMEA-MSR



BMW Group Standard

Released

GS 98003
2023-08

Replacement for
GS 98003:2021-02

FMEA

Failure Modes and Effects Analysis

BMW FMEA AUDIT

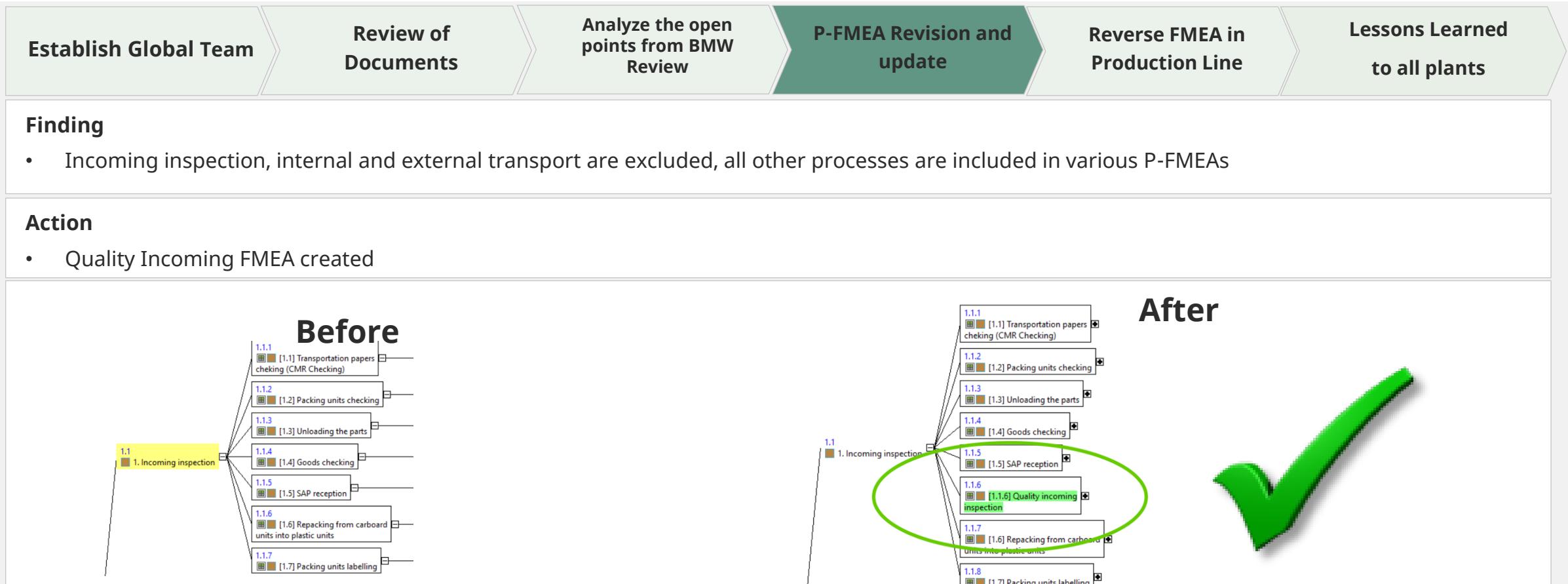
Establish Global Team		Review of Documents	Analyze the open points from BMW Review	P-FMEA Revision and update	Reverse FMEA in Production Line	Lessons Learned to all plants	
Chapter	P-FMEA Quality checklist	Audit Comment	Action			Due date	Status
1.1	1.1 Have the content-related targets, the scope of consideration and the level of detail for the FMEA been defined, coordinated with the customer and documented?	Incoming inspection internal and external transport are excluded, all other processes are included in various FMEA's	*Create Process FMEA for Incoming inspection				FDM: 100% SCR: 100% Pump: 100% LTF: 100% MTS: 100% Molding: 100%
2.2	2.2 Is the scope of consideration consistently and sufficiently detailed and coordinated with the customer?	Process influencing factor are only named generally as man, machine, material - Missing detailing and naming	*renaming of causes according to the process steps (detailed one)				FDM: 100% SCR: 9.5% Pump: 0% LTF: 0% MTS: 0% Molding: 0%
3.1	3.1 Are the functions / characteristics fully recorded in accordance with the objective?	Some functions are missing e.g. loading bushing at molding	*check of function for each process step			FDM: N/A SCR: N/A Pump: N/A LTF: N/A MTS: N/A Molding: 100%	
3.2	3.2 Are the functions / characteristics clearly described?	Very generic description especially on the level of the process influencing factors	*renaming of functions according to the process steps (detailed one)			LTF: 31.10.2025 MTS: 30.05.2025 Molding: 31.07.2025	FDM: 100% SCR: 9.5% Pump: 0% LTF: 0% MTS: 0% Molding: 50%
3.4	3.4 Are all functions up to the characteristic level logically linked and, if already known, the special characteristics correctly documented?	Some links have been missing	*define function for each potential failure (effect, failures & causes)				FDM: 100% SCR: 9.5% Pump: 0% LTF: 35% MTS: 0% Molding: 100%
3.5	3.5 Are the functions aligned with the linked FMEA's?	No continuity to DFMEA functions / SC List / Drawings	*all SC will be aligned between P-FMEA / SC List / Drawings				FDM: 87.5% SCR: 9.5% Pump: 0% LTF: 0% MTS: 0% Molding: 50%
3/25/2025	Confidential/Schaeffler/ Ghimbav Location						56

BMW FMEA AUDIT

Establish Global Team		Review of Documents	Analyze the open points from BMW Review	P-FMEA Revision and update	Reverse FMEA in Production Line	Lessons Learned to all plants
Chapter	P-FMEA Quality checklist	Audit Comment	Action		Due date	Status
4.1	4.1 Are the failures completely derived from the functions according to the objective?	Some failures have been missing, e.g. electrical connector at flange molding, missing bushing in stator molding	*perform reverse P-FMEA *update P-FMEA		FDM: 31.04.2025 SCR: 30.06.2025 Pump: 30.09.2025 LTF: 31.10.2025 MTS: 30.05.2025 Molding: 31.07.2025	FDM: N/A SCR: N/A Pump: N/A LTF: N/A MTS: N/A Molding: 100%
4.2	4.2 Are the failures described meaningfully, clearly and comprehensibly?	Many causes are too generally formulated, e.g. does not work according WI	*renaming of failures			FDM: 100% SCR: 9.5% Pump: 0% LTF: 0% MTS: 0% Molding: 70%
4.3	4.3 Are the failures logically linked?	Some failures have not been linked	*link all potential failures			FDM: 100% SCR: 9.5% Pump: 0% LTF: 100% MTS: 0% Molding: 100%
4.4	4.4 Have the malfunctions been compared with the adjacent FMEA's and are the particular failures in the FMEA marked accordingly? Has the failure analysis been coordinated with the customer?	Missing alignment with DFMEA	*align all severities (effects) between D-FMEA & P-FMEA			FDM: 100% SCR: 9.5% Pump: 0% LTF: 80% MTS: 0% Molding: 50%
5.9	5.9 Are the S-assessments consistently aligned with the higher-level and lower-level FMEA's?	Missing alignment with DFMEA	*align all failures (effects) between D-FMEA & P-FMEA			FDM: 100% SCR: 9.5% Pump: 0% LTF: 80% MTS: 0% Molding: 50%
7.3	7.3 Does the FMEA comply with the current plan status and are the documents required to create the FMEA (block boundary) and documents derived from the FMEA (documentation BFF and BM in specification documents, drawing) up to date?	Misalignment between SC in customer drawing and S in internal drawing/FMEA Update for Stator Molding the Symbols for characteristics	*verify all characteristics in the customer drawing vs P-FMEA and update if necessary			FDM: 100% SCR: 100% Pump: 0% LTF: 0% MTS: 0% Molding: 50%
3/25/2025	Confidential/Schaeffler/ Ghimbav Location					

BMW PFMEA AUDIT FINDINGS

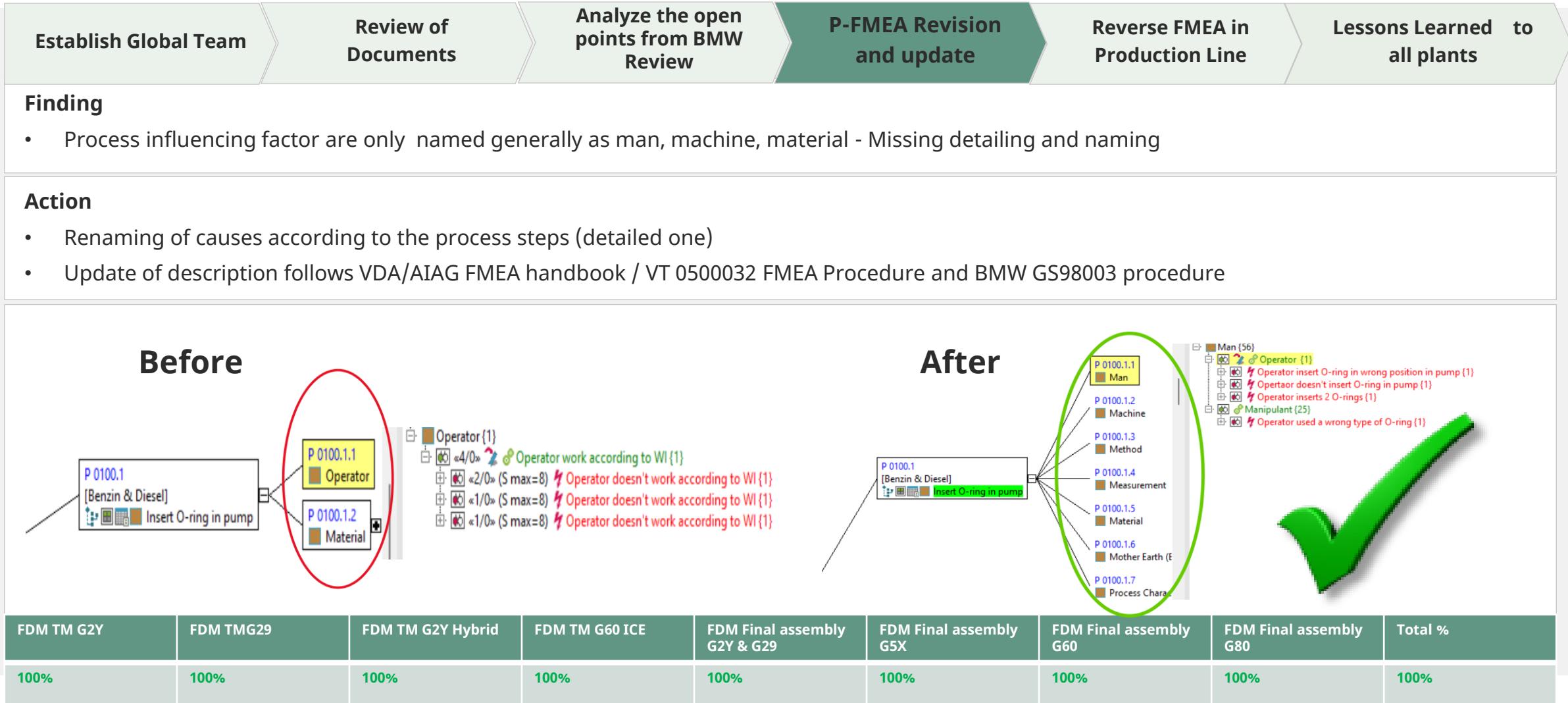
1.1 Have the content-related targets, the scope of consideration and the level of detail for the FMEA been defined, coordinated with the customer and documented?



FDM TM G2Y	FDM TMG29	FDM TM G2Y Hybrid	FDM TM G60 ICE	FDM Final assembly G2Y & G29	FDM Final assembly G5X	FDM Final assembly G60	FDM Final assembly G80	Total %
100%	100%	100%	100%	100%	100%	100%	100%	100%

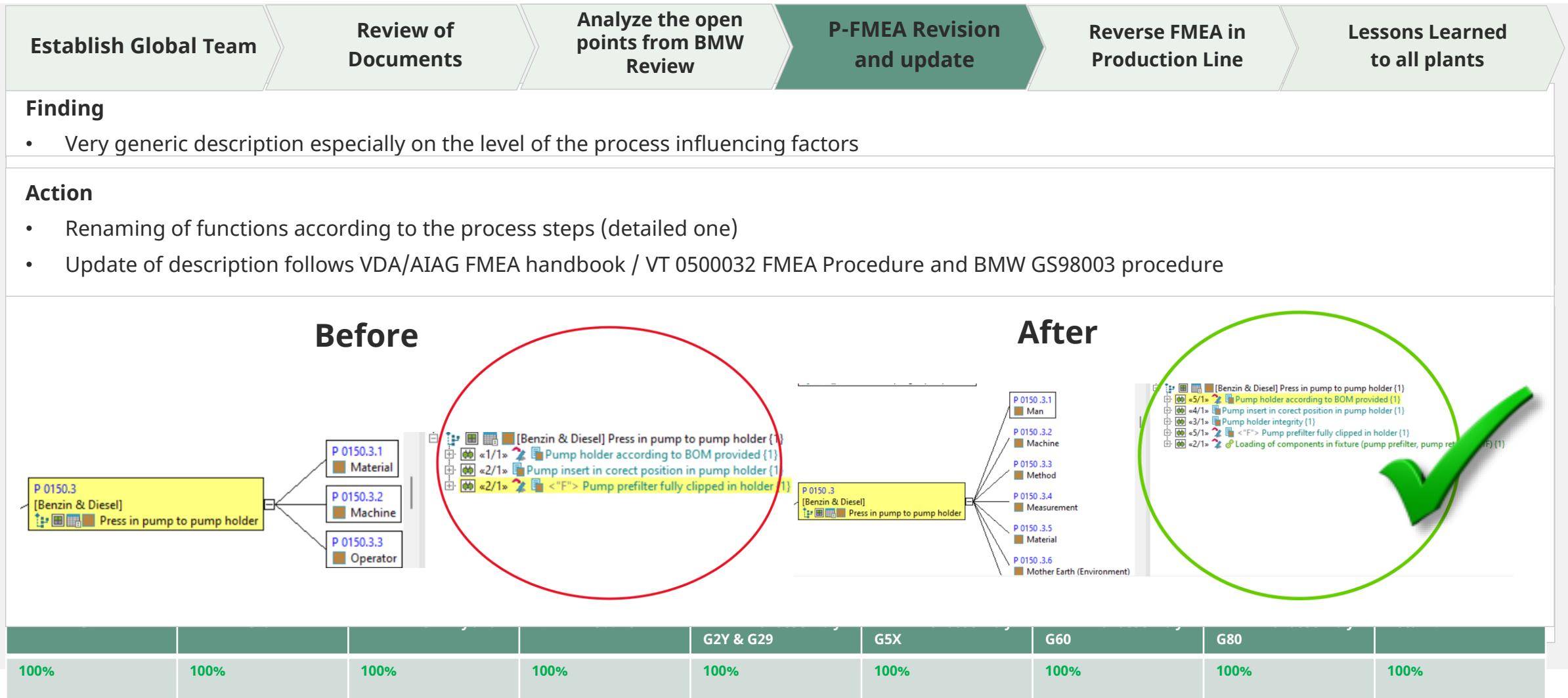
BMW PFMEA AUDIT FINDINGS

2.2 Is the scope of consideration consistently and sufficiently detailed and coordinated with the customer?



BMW PFMEA AUDIT FINDINGS

3.2 Are the functions / characteristics clearly described?



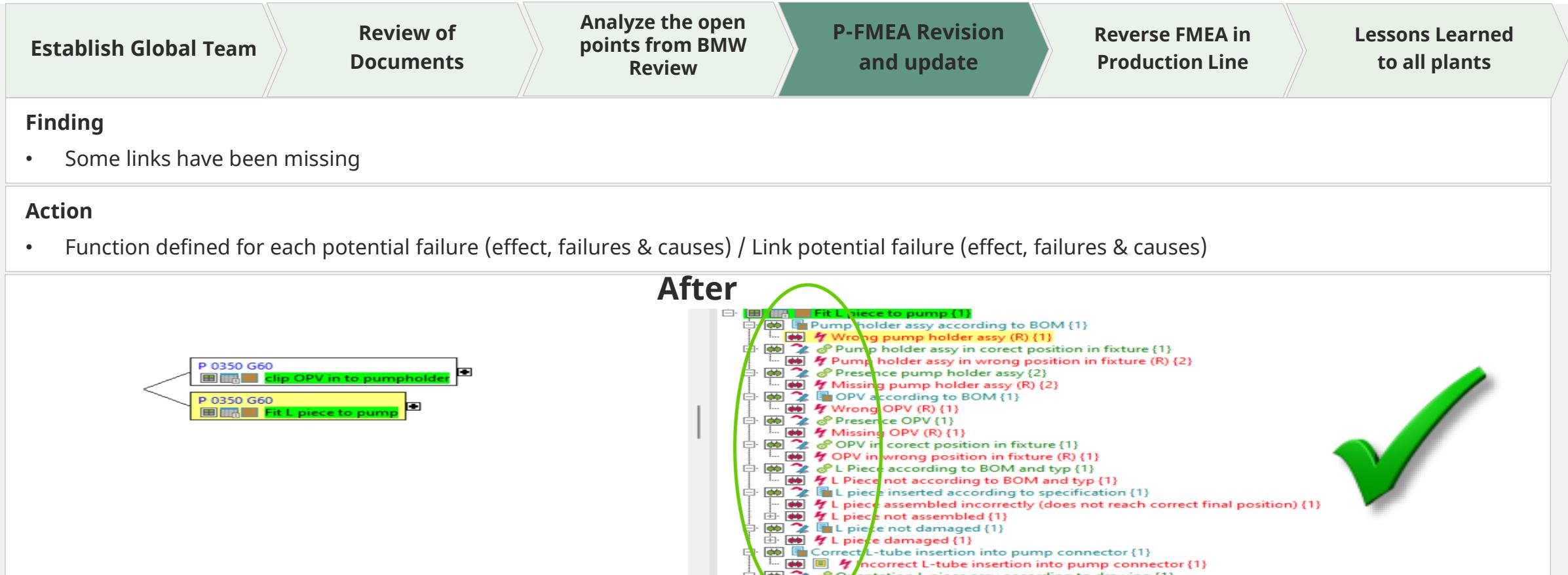
BMW PFMEA AUDIT FINDINGS

3.4 Are all functions up to the characteristic level logically linked and, if already known, the special characteristics correctly documented?

Establish Global Team	Review of Documents	Analyze the open points from BMW Review	P-FMEA Revision and update	Reverse FMEA in Production Line	Lessons Learned to all plants																		
Finding																							
<ul style="list-style-type: none"> Some links have been missing 																							
Action																							
<ul style="list-style-type: none"> Function defined for each potential failure (effect, failures & causes) / Link potential failure (effect, failures & causes) 																							
<p style="text-align: center;">Before</p> <table border="1"> <thead> <tr> <th>FDM TM G2Y</th> <th>FDM TMG29</th> <th>FDM TM G2Y Hybrid</th> <th>FDM TM G60 ICE</th> <th>FDM Final assembly G2Y & G29</th> <th>FDM Final assembly G5X</th> <th>FDM Final assembly G60</th> <th>FDM Final assembly G80</th> <th>Total %</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> </tbody> </table>						FDM TM G2Y	FDM TMG29	FDM TM G2Y Hybrid	FDM TM G60 ICE	FDM Final assembly G2Y & G29	FDM Final assembly G5X	FDM Final assembly G60	FDM Final assembly G80	Total %	N/A								
FDM TM G2Y	FDM TMG29	FDM TM G2Y Hybrid	FDM TM G60 ICE	FDM Final assembly G2Y & G29	FDM Final assembly G5X	FDM Final assembly G60	FDM Final assembly G80	Total %															
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A															

BMW PFMEA AUDIT FINDINGS

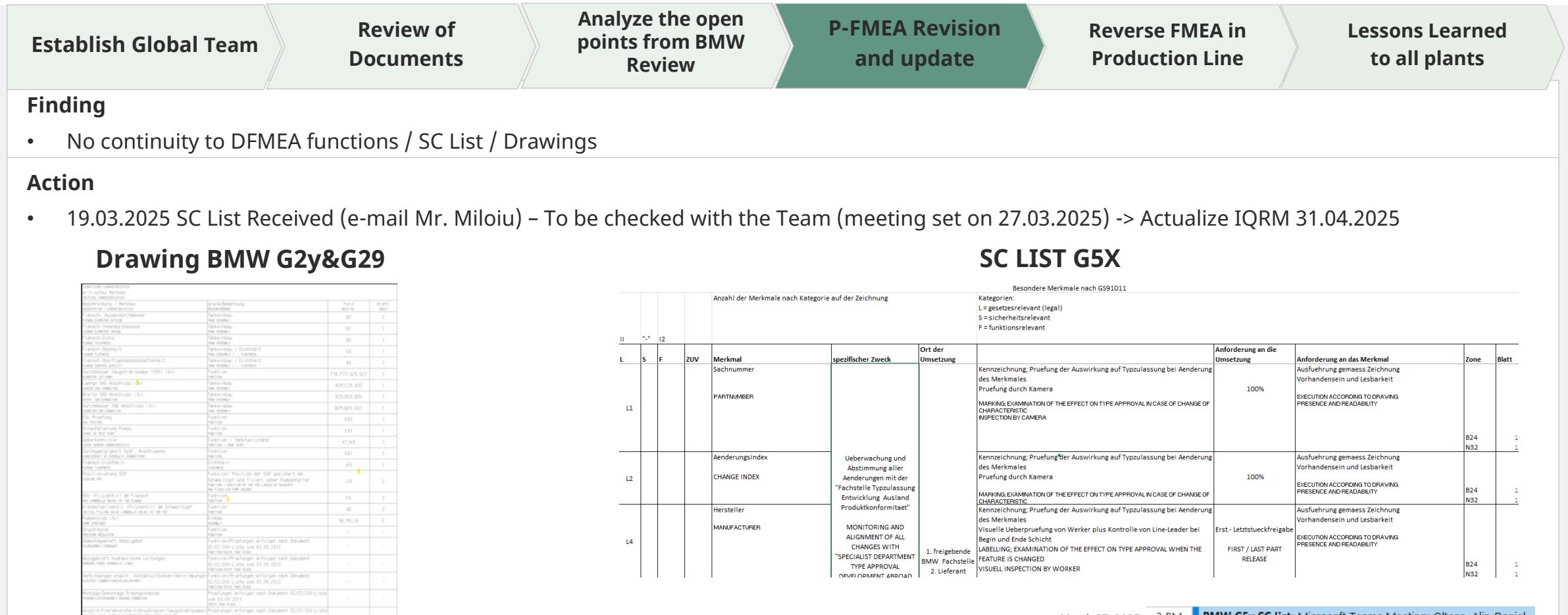
3.4 Are all functions up to the characteristic level logically linked and, if already known, the special characteristics correctly documented?



FDM TM G2Y	FDM TMG29	FDM TM G2Y Hybrid	FDM TM G60 ICE	FDM Final assembly G2Y & G29	FDM Final assembly G5X	FDM Final assembly G60	FDM Final assembly G80	Total %
100%	100%	100%	100%	100%	100%	100%	100%	100%

BMW PFMEA AUDIT FINDINGS

3.5 Are the functions aligned with the linked FMEA's?



FDM TM G2Y	FDM TMG29	FDM TM G2Y Hybrid	FDM TM G60 ICE	FDM Final assembly G2Y & G29	FDM Final assembly G5X	FDM Final assembly G60	FDM Final assembly G80	Total %
100%	100%	100%	100%	100%	0%	100%	100%	87.5%

BMW PFMEA AUDIT FINDINGS

4.2 Are the failures described meaningfully, clearly and comprehensibly?



Finding

- Many causes are too generally formulated, e.g. does not work according WI

Action

- Perform reverse P-FMEA (done ML 2 & FP 4)
- Update P-FMEA

Before

Operator {1}
 Operator doesn't work according to WI {1}
 Operator doesn't work according to WI {1}
 Operator doesn't work according to WI {1}

After

Operator insert O-ring in wrong position in pump {1}
 Operator doesn't insert O-ring in pump {1}
 Operator inserts 2 O-rings {1}
 Operator used a wrong type of O-ring {1}



FDM TM G2Y	FDM TMG29	FDM TM G2Y Hybrid	FDM TM G60 ICE	FDM Final assembly G2Y & G29	FDM Final assembly G5X	FDM Final assembly G60	FDM Final assembly G80	Total %
100%	100%	100%	100%	100%	100%	100%	100%	100%

BMW PFMEA AUDIT FINDINGS

4.3 Are the failures logically linked?

Establish Global Team	Review of Documents	Analyze the open points from BMW Review	P-FMEA Revision and update	Reverse FMEA in Production Line	Lessons Learned to all plants
Finding					
<ul style="list-style-type: none"> Some failures have not been linked 					
Action					
<ul style="list-style-type: none"> Link all potential failures 					

Before

- [Benzin & Diesel] Press and clip lever arm into level sensor assy {1}
 - «1/1» (S max=6) ⚡ MTS not according to BOM provided, check characteristic {2}
 - «1/1» (S max=6) ⚡ Lever assy not according to BOM provided {2}
 - «1/0» (S max=6) ⚡ Lever arm not fully mounted {1}
 - «0/0» ⚡ Bearing of bracket assy in housing damaged {2}
 - «1/2» (S max=6) ⚡ Bracket damaged at mounting of lever arm assy {2}
 - «0/1» ⚡ Lever assy bent {1}

After

- [Benzin & Diesel] Press and clip lever arm into level sensor assy {2}
 - «1/1» ⚡ MTS not according to BOM provided {2}
 - «1/1» ⚡ Lever assy not according to BOM provided {2}
 - «1/3» ⚡ Lever arm not fully mounted {1}
 - «1/1» ⚡ Bearing of bracket assy in housing damaged {2}
 - «1/2» ⚡ Bracket damaged at mounting of lever arm assy {2}
 - «1/1» ⚡ Lever assy bent {1}



FDM TM G2Y	FDM TMG29	FDM TM G2Y Hybrid	FDM TM G60 ICE	FDM Final assembly G2Y & G29	FDM Final assembly G5X	FDM Final assembly G60	FDM Final assembly G80	Total %
100%	100%	100%	100%	100%	100%	100%	100%	100%

BMW PFMEA AUDIT FINDINGS

4.4 Have the malfunctions been compared with the adjacent FMEA's and are the particular failures in the FMEA marked accordingly? Has the failure analysis been coordinated with the customer?

Establish Global Team	Review of Documents	Analyze the open points from BMW Review	P-FMEA Revision and update	Reverse FMEA in Production Line	Lessons Learned to all plants
Finding					
<ul style="list-style-type: none"> Missing alignment with DFMEA 					
Action					
<ul style="list-style-type: none"> Align all severities (effects) between D-FMEA & P-FMEA 					

Before

- ☐ «0/0» ✅ Good types in package {1}
- ☒ «0/2» S=8 (S max=8) ❌ Wrong types in package {1}
- ☒ «0/1» S=2 (S max=2) ❌ Good parts are disposed of {1}
- ☐ «0/0» ✅ Signal pressure sensor according to specification {1}
- ☒ «0/1» S=7 (S max=7) ❌ Signal pressure sensor not according to specification {1}
- ☐ «0/10» ✅ Good types of components assembled {1}
- ☒ «0/22» S=8 (S max=8) ❌ Wrong type of components assembled {1}
- ☐ «0/0» ✅ Pre-heating without malfunction {1}
- ☒ «0/4» S=7 (S max=7) ❌ Malfunction pre-heating {1}
- ☐ «0/10» ✅ Starting process step {1}
- ☒ «0/7» S=3 (S max=3) ❌ Process step does not start {1}
- ☒ «0/4» S=3 (S max=3) ❌ Process does not start {1}
- ☐ «0/1» ✅ Filter integrity {1}
- ☒ «0/1» S=7 (S max=7) ❌ Filter damaged {1}
- ☐ «0/4» ✅ Assembly process without malfunction {1}
- ☒ «0/1» S=4 (S max=4) ❌ Malfunction in assembly process {2}
- ☒ «0/3» S=4 (S max=4) ❌ Malfunction in assembly process {2}
- ☐ «0/2» ✅ Complete assembly in the line {1}
- ☒ «0/2» S=4 (S max=4) ❌ Incomplete assembly in the line {1}
- ☐ «0/2» ✅ Performing process step {1}
- ☒ «0/2» S=3 (S max=3) ❌ Process step can not be performed {1}
- ☐ «0/8» ✅ Correct level of fuel indication {1}
- ☒ «0/9» S=4 (S max=4) ❌ Incorrect level of fuel indicated {1}
- ☒ «0/4» ✅ Fuel supply unit: Ensure delivery rate (also cold / hot / initial & restart) {1}
- ☒ «0/6» S=8 (S max=8) ❌ Fuel supply unit: No delivery rate for engine consumption (during operation) {1}

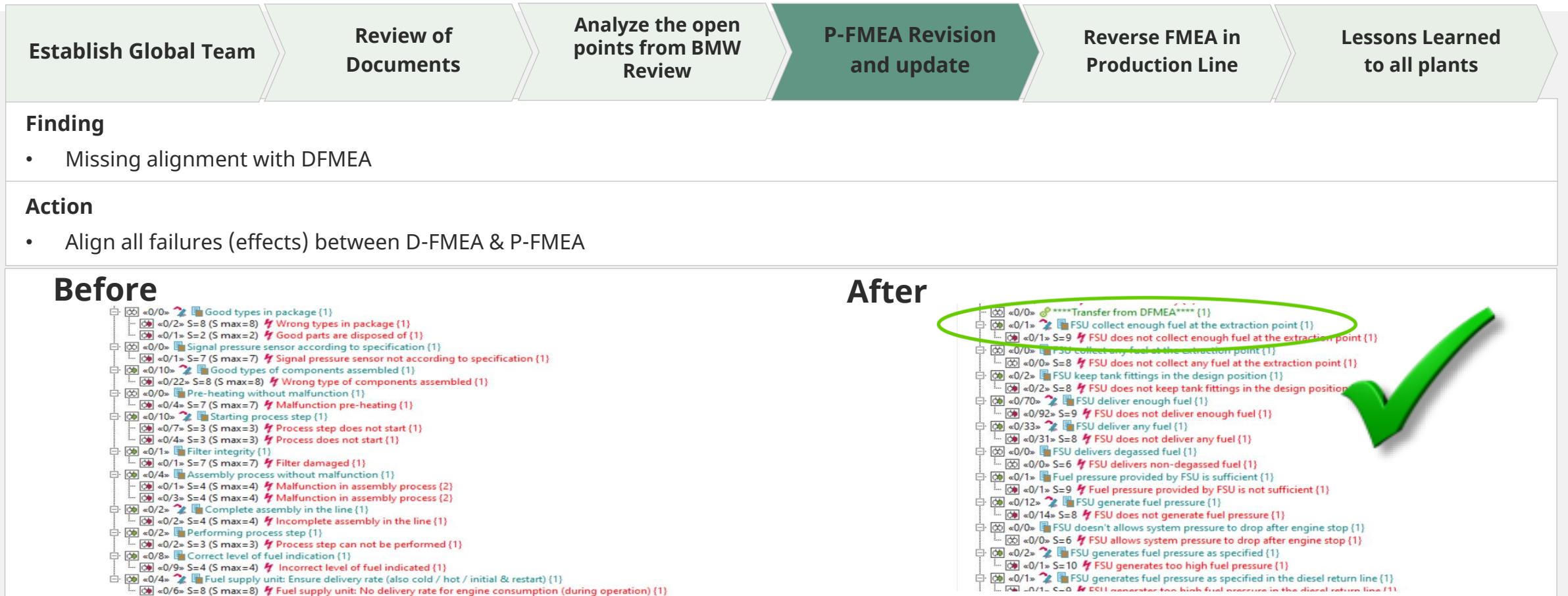
After

- ☐ «0/0» ✅ ***Transfer from DFMEA*** {1}
 - ☒ «0/1» ✅ FSU collect enough fuel at the extraction point {1}
 - ☒ «0/1» S=9 ❌ FSU does not collect enough fuel at the extraction point {1}
 - ☐ «0/0» ✅ FSU collect any fuel at the extraction point {1}
 - ☒ «0/2» ✅ FSU keep tank fittings in the design position {1}
 - ☒ «0/2» S=8 ❌ FSU does not keep tank fittings in the design position {1}
 - ☒ «0/70» ✅ FSU deliver enough fuel {1}
 - ☒ «0/92» S=9 ❌ FSU does not deliver enough fuel {1}
 - ☒ «0/33» ✅ FSU deliver any fuel {1}
 - ☒ «0/31» S=8 ❌ FSU does not deliver any fuel {1}
 - ☒ «0/1» ✅ FSU delivers degassed fuel {1}
 - ☒ «0/0» S=6 ❌ FSU delivers non-degassed fuel {1}
 - ☒ «0/1» ✅ Fuel pressure provided by FSU is sufficient {1}
 - ☒ «0/1» S=9 ❌ Fuel pressure provided by FSU is not sufficient {1}
 - ☒ «0/12» ✅ FSU generate fuel pressure {1}
 - ☒ «0/14» S=8 ❌ FSU does not generate fuel pressure {1}
 - ☒ «0/0» ✅ FSU doesn't allow system pressure to drop after engine stop {1}
 - ☒ «0/0» S=6 ❌ FSU allows system pressure to drop after engine stop {1}
 - ☒ «0/2» ✅ FSU generates fuel pressure as specified {1}
 - ☒ «0/1» S=10 ❌ FSU generates too high fuel pressure {1}
 - ☒ «0/1» ✅ FSU generates fuel pressure as specified in the diesel return line {1}
 - ☒ «0/1» S=0 ❌ FSU generates too high fuel pressure in the diesel return line {1}
- 

FDM TM G2Y	FDM TMG29	FDM TM G2Y Hybrid	FDM TM G60 ICE	FDM Final assembly G2Y & G29	FDM Final assembly G5X	FDM Final assembly G60	FDM Final assembly G80	Total %
100%	100%	100%	100%	100%	100%	100%	100%	100%

BMW PFMEA AUDIT FINDINGS

5.9 Are the S-assessments consistently aligned with the higher-level and lower-level FMEA's?



FDM TM G2Y	FDM TMG29	FDM TM G2Y Hybrid	FDM TM G60 ICE	FDM Final assembly G2Y & G29	FDM Final assembly G5X	FDM Final assembly G60	FDM Final assembly G80	Total %
100%	100%	100%	100%	100%	100%	100%	100%	100%

BMW PFMEA AUDIT FINDINGS

7.3 Does the FMEA comply with the current plan status and are the documents required to create the FMEA (block boundary) and documents derived from the FMEA (documentation BFF and BM in specification documents, drawing) up to date?

Establish Global Team	Review of Documents	Analyze the open points from BMW Review	P-FMEA Revision and update	Reverse FMEA in Production Line	Lessons Learned to all plants
Finding					
<ul style="list-style-type: none"> Misalignment between SC in customer drawing and S in internal drawing/FMEA 					

Before

Name	Standard
C-Merkmal	▲
Critical characteristic	"D"
CRITICAL CHARACTERISTIC	CC
POTENTIAL CRITICAL CHARACTERISTIC	YC
POTENTIAL SIGNIFICANT CHARACTERISTIC	YS
SIGNIFICANT CHARACTERISTIC	SC
Significant characteristic	"W"

After

Name	Vitesco
Functional characteristics	"F"
Legal characteristics	"R"
Safety characteristics	"S"



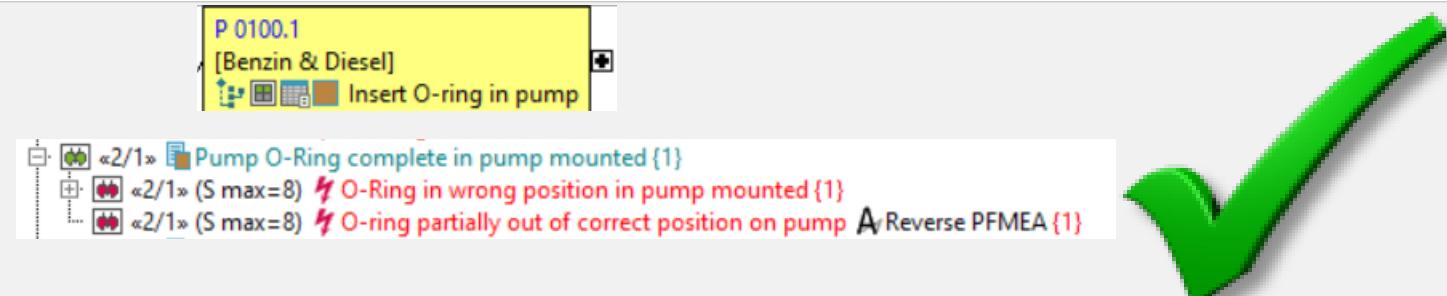
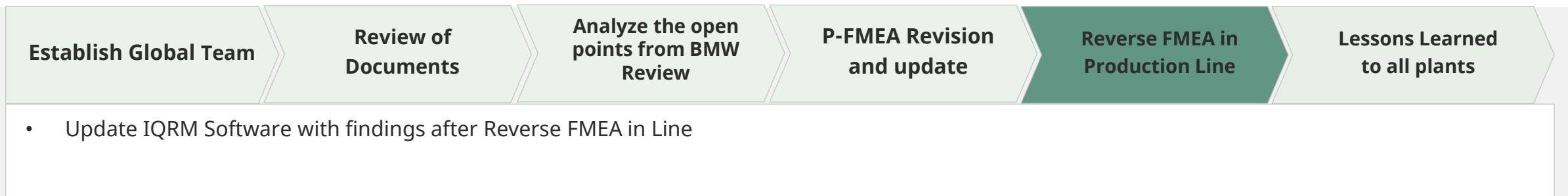
Action

- Checked all characteristics between customer drawings and P-FMEA

FDM TM G2Y	FDM TMG29	FDM TM G2Y Hybrid	FDM TM G60 ICE	FDM Final assembly G2Y & G29	FDM Final assembly G5X	FDM Final assembly G60	FDM Final assembly G80	Total %
100%	100%	100%	100%	100%	100%	100%	100%	100%

BMW PFMEA AUDIT FINDINGS

Reverse FMEA in PRD Line



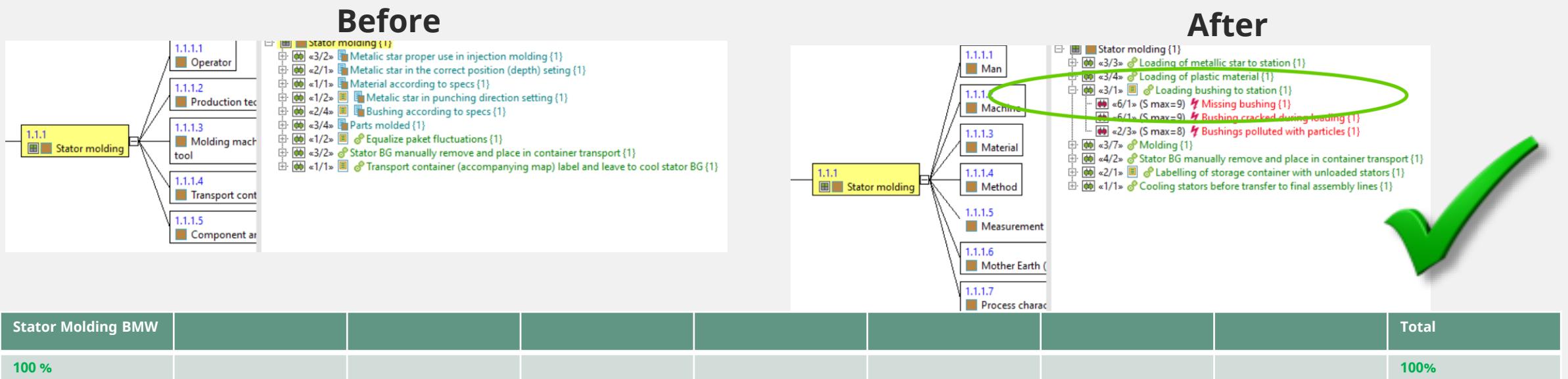
<1.m Flow rate according to specification, flow rate> Flow rate not according to specification, no flow rate	8	A O-ring partially out of correct position on pump	<P 0100.1.1.a Operator> Incomplete manual loading of o-ring (partially out of position)	A Initial state: 3/6/2025 P100 - Work Instruction 7457 P100 - correct loading of o-ring is described in Work Instruction	3	P150 - Pressing LTF to pump, pressing force and stroke check, 100%, automatic P100 - incorrect position of o-ring will lead to rejects during pressing on P150	4	L		
<1.aq FSU deliver any fuel> FSU does not deliver any fuel	8									

FDM TM G2Y	FDM TMG29	FDM TM G2Y Hybrid	FDM TM G60 ICE	FDM Final assembly G2Y & G29	FDM Final assembly G5X	FDM Final assembly G60	FDM Final assembly G80	Total %
0%	0%	0%	0%	100%	0%	100%	100%	37.5%

BMW PFMEA AUDIT FINDINGS

3.1 Are the functions / characteristics fully recorded in accordance with the objective?

Establish Global Team	Review of Documents	Analyze the open points from BMW Review	P-FMEA Revision and update	Reverse FMEA in Production Line	Lessons Learned to all plants
Finding					
<ul style="list-style-type: none"> Some functions are missing e.g. loading bushing at molding 					
Action taken					
<ul style="list-style-type: none"> Update P-FMEA Molding with the function "Loading bushing at stator molding" 					



BMW PFMEA AUDIT FINDINGS

4.1 Are the failures completely derived from the functions according to the objective?



Finding

- Some failures have been missing, e.g. missing bushing in stator molding

Action taken

- Update P-FMEA Stator Molding with the potential failure "Missing bushing"

Before

OK «2/4» Bushing according to specs {1}
X «1/1» (S max=8) Wrong Bushing used {1}
X «1/1» (S max=8) Bushing twisted inserted {1}
X «1/10» (S max=8) Bushing cracked {1}

Requirement: [1.1.1.1 Stator molding]			
1.1.1.1.b Correct quantity of bushings are loaded to station (4 bushings)			
<1.1.1.1.a Operator>	8	Missing bushing	
<1.1.1.1.a Operator>	5		
<1.1.1.1.a Operator>	8		
<1.1.1.1.a Operator>	8		
<1.1.1.1.a Operator>	9		
<1.1.1.1.a Operator>	8		

After

Initial state: 3/5/2025			
Workflow according to WI 182			
Workflow according to WI 182	3	Camera check in pump assembly line and stator assembly	4

Stator Molding BMW							Total
100 %							100%

BMW PFMEA AUDIT FINDINGS

4.1 Are the failures completely derived from the functions according to the objective?



Finding

- Some failures have been missing, e.g. electrical connector at flange molding

Action

- Update P-FMEA Flange Molding with the potential failure "Missing electrical connectors geometry"

Before

1.1.3.2 Check electrical pins

- Check electrical pins (1)
- <2/3> missing / bent / deformed electric plugs are detected / selected (1)
- <2/3> (S max=8) missing / wrong position electric plugs are not detected (1)

After

1.1.3.2 Check electrical pins

Characteristic: 1.1.3.2 Check electrical pins

	Initial state: 3/20/2025	Preventive maintenance sheet 8651	Tool for electrical continuity check
1.1.3.2a Machine> Tool / Insert wear	Electrical connectors length not according to drawing	Checking of Tool and Inserts for cracks, wear, gripping marks / Step 2 Mobile side check	3
1.1.3.2b > Checking of electrical connectors geometry	Electrical connectors width not according to drawing	Checking of Tool and Inserts for cracks, wear, gripping marks / Step 2 Mobile side check	3
1.1.3.2c Geometrical requirements are met> Flange without clips on the electrical connector	7	Initial state: 3/20/2025	
1.1.3.2d Legally- safety- and environmental requirements are met> Missing electrical connection	7	Preventive maintenance sheet 8651	
1.1.3.2e Geometrical requirements are met> Flange without clips on the electrical connector	8	Tool for electrical continuity check	3
1.1.3.2f Electrical contacts according to specification> Electrical contacts not according to specifications	7	Initial state: 3/20/2025	
1.1.3.2g Electrical contacts according to specification> Electrical contacts not according to specifications	8	Preventive maintenance sheet 8651	



Flange Molding BMW								Total
100%								100%

BMW PFMEA AUDIT FINDINGS

FMEA PLANNING/ALIGN P-FMEA TO REQUIREMENTS

Item	Topic	Due Date	Resp.	2025												Status
				Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
A	FDM	31.04.2025	Dascalescu M													98.7%
B	SCR	30.06.2025	Juganaru A / Dascalescu M													9.5%
C	Pump	30.09.2025	Avram L / Dascalescu M													10%
D	LTF	31.10.2025	Avram L / Dascalescu M													39.5%
E	MTS	30.05.2025	Avram L/ Dascalescu M													10%
F	Molding	31.07.2025	Avram L/ Dascalescu M													68.3

- A. FDM -> 54 Process steps (Main Line 2 + TM 2)
- B. SCR -> 31 Process steps
- C. PUMP -> 98 Process steps (Line 4,5,6,7)
- D. LTF -> 86 Process steps (Line 2 and 3)
- E. MTS -> 12 Process steps
- F. Molding -> 11 Process steps



Quarterly Management Meeting

Fit for Quality



4

QUALITY MINDSET IMPROVEMENT | FIT FOR QUALITY TIMELINE



QUALITY MINDSET IMPROVEMENT | FIT FOR QUALITY IMPLEMENTATION

WE ALL LIVE AND SHAPE QUALITY

- 1
 - 2
 - 3
 - 4
 - 5
 - 6
 - 7
 - 8
- Our objective Zero defects

WE ANALYZE AND PLAN PROPERLY

- 1
 - 2
 - 3
 - 4
 - 5
 - 6
 - 7
 - 8
- Our objective Zero defects

WE MASTER OUR WORK

- 1
 - 2
 - 3
 - 4
 - 5
 - 6
 - 7
 - 8
- Our objective Zero defects

WE APPLY OUR RULES, METHODS AND TOOLS

- 1
 - 2
 - 3
 - 4
 - 5
 - 6
 - 7
 - 8
- Our objective Zero defects

FOCUS & KPI

Responsibility & Awareness
Everyone acts in a Quality driven manner!

- Customer Incidents (0km)*
- Customer Incidents (field)*
- Customer satisfaction*

FOCUS & KPI

Orientation
Proceed in a goal-oriented approach!

- Reverse P-FMEA*
- P-FMEA & Control Plan correlation*
- Audits results*

FOCUS & KPI

Qualification
Continuous learning!

- Integration process / Induction*
- Follow-up Test results*
- Fit for Quality Training execution*

FOCUS & KPI

Methods & Compliance
Traceability & Systematic work!

- Internal Incidents / NCRs*
- A3 Sheet assessment results*
- 5S Audits results*
- Safety Incidents*

QUALITY MINDSET IMPROVEMENT | FIT FOR QUALITY IMPLEMENTATION

WE ENSURE RELIABLE PROCESSES

1
2
3
4
5
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7
8



WE SEE MISTAKES AND REACT IMMEDIATELY

1
2
3
4
5
6
7
8



WE VERIFY OUR WORK AND GIVE FEEDBACK

1
2
3
4
5
6
7
8



WE SHARE AND ACT ON LESSONS LEARNED

1
2
3
4
5
6
7
8



FOCUS & KPI

Process Robustness

Robust & stable processes!

Capabilities & SPC

TPM Level 2 execution

Poka Yoke Audits

Product Audits

FOCUS & KPI

Attention & Action

Fast and appropriate response!

Deviations from Standard

Customer Sorting Events

PET Incidents

Improvements ideas

FOCUS & KPI

Confirmation & Verification

Verification of our work!

Layer Process Audits

Process Audits

Cycle time of LPA & Process Audits

LPA & Process Audits Output

FOCUS & KPI

Collaboration

Lessons Learned!

Number of initiated LL

No. of applied / implemented LL

Maximum LL Cycle Time

Effectiveness of LL

QUALITY MINDSET IMPROVEMENT | FFQ 7 GOLDEN RULES FOR ZERO DEFECTS

1



I inform myself about my work and my product. So, I know exactly what I am doing. I follow the guidelines.

2



I am committed to Zero Defects. Consequently, I only accept good quality from others and pass on only good quality myself.

3



I am attentive and recognize mistakes – both, in the process and in the product.

4



When I find a mistake, I correct it without delay – or get help.

5



I have the confidence and talk to my superior if I have doubts or uncertainties.

6



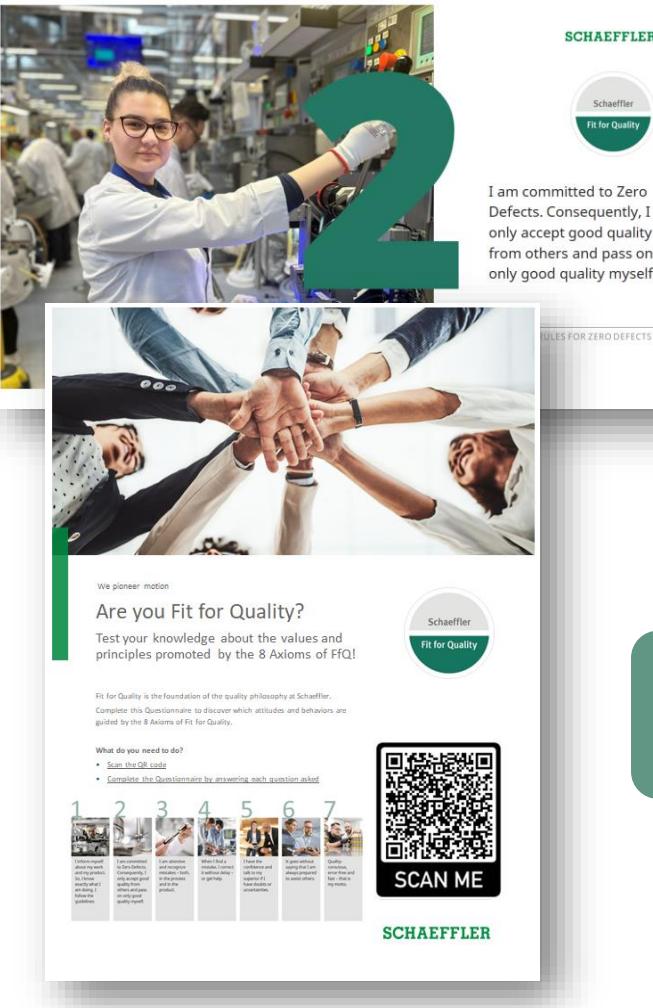
It goes without saying that I am always prepared to assist others.

7

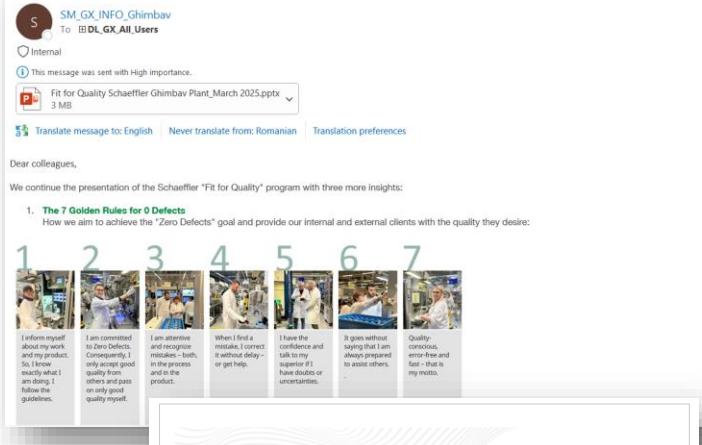


Quality-conscious, error-free and fast – that is my motto.

QUALITY MINDSET IMPROVEMENT | FIT FOR QUALITY STRATEGY



Fit for Quality: reguli de aur, organigramă & chestionar/ Fit for Quality: golden rules, org chart & questionnaire



QUALITY MINDSET IMPROVEMENT | FIT FOR QUALITY TRAINING

Target

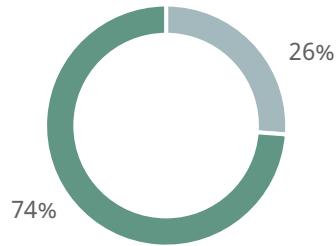
Execution of Fit for Quality Training for all VT Employees



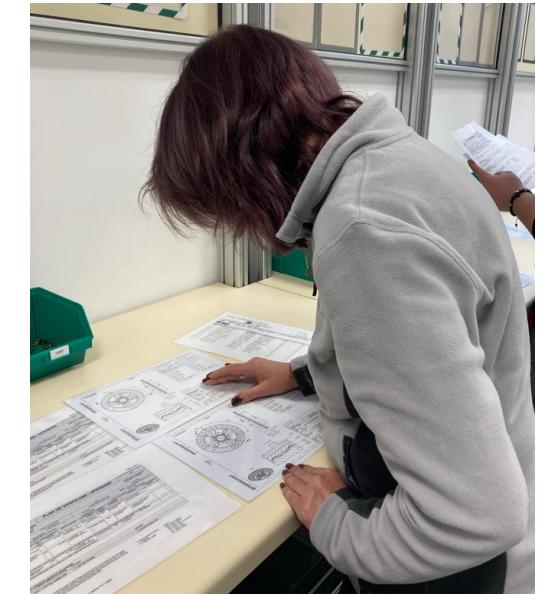
- > Training sessions started | July 2024
- > Actual status: 1 weekly session (group of maximum 16 people)
- > Expected due date for Training completion: Q1 2026
- > 390 trained Employees out of 1490



% of people trained in Fit for Quality Status March 2025



■ Trained ■ To be trained



QUALITY MINDSET IMPROVEMENT | INFO ROUNDS

- Monthly Info Rounds in all segments, each shift with presentation of internal & external Quality topics (ex. Customer claims | Effect of a defect) to increase the awareness.

Planning

2023 INFO ROUNDS PLANNING

No	Area	Shift	Date	Time	Presentation Segment Leader	Q Responsible	Status
1	Molding	1	05.02.2025	14:25 - 14:45	Marius Cobanu	Irina	Done
2	Molding	2	05.02.2025	14:45 - 15:05	Marius Cobanu	Irina	Done
3	Molding	3	05.02.2025	15:05 - 15:25	Marius Cobanu	Irina	Done
4	Components	1	28.01.2025	14:25 - 14:45	Daniel Boianu	Irina	Done
5	Components	2	28.01.2025	14:45 - 15:05	Daniel Boianu	Irina	Done
6	Components	3	28.01.2025	15:05 - 15:25	Daniel Boianu	Irina	Done
7	SCR	1	27.01.2025	14:25 - 14:45	Claudiu Oprisanu	Daniela	Done
8	SCR	2	27.01.2025	14:45 - 15:05	Claudiu Oprisanu	Daniela	Done
9	SCR	3	27.01.2025	15:05 - 15:25	Claudiu Oprisanu	Daniela	Done
10	FMI	1	29.01.2025	14:25 - 14:45	Valentin Zamfirescu	Ana	Done
11	FMI	2	29.01.2025	14:45 - 15:05	Valentin Zamfirescu	Ana	Done
12	FMI	3	29.01.2025	15:05 - 15:25	Valentin Zamfirescu	Ana	Done
13	FMI	1	29.01.2025	12:15 - 12:35	Adriana Briscoi	Anina	Done
14	FMI	2	29.01.2025	12:35 - 12:55	Adriana Briscoi	Anina	Done
15	FMI	3	29.01.2025	12:55 - 13:15	Adriana Briscoi	Anina	Done
16	Molding	1	18.01.2025	14:25 - 14:45	Marius Cobanu	Mirica Ionel	Done
17	Molding	2	18.01.2025	14:45 - 15:05	Marius Cobanu	Mirica Ionel	Done
18	Molding	3	18.01.2025	15:05 - 15:25	Marius Cobanu	Mirica Ionel	Done
19	Components	1	12.01.2025	14:25 - 14:45	Daniel Boianu	Irina	Done
20	Components	2	12.01.2025	14:45 - 15:05	Daniel Boianu	Irina	Done
21	Components	3	12.01.2025	15:05 - 15:25	Daniel Boianu	Irina	Done
22	SCR	1	18.01.2025	14:25 - 15:05	Claudiu Oprisanu	Daniela	Done
23	SCR	2	18.01.2025	15:05 - 15:45	Claudiu Oprisanu	Daniela	Done
24	SCR	3	18.01.2025	15:45 - 16:25	Claudiu Oprisanu	Daniela	Done
25	FMI	1	12.01.2025	12:15 - 12:35	Valentin Zamfirescu	Ana	Done
26	FMI	2	12.01.2025	12:35 - 12:55	Valentin Zamfirescu	Ana	Done
27	FMI	3	12.01.2025	12:55 - 13:15	Valentin Zamfirescu	Ana	Done
28	FMI	1	19.01.2025	8:45 - 7:35	Adriana Briscoi	Anina	Done
29	FMI	2	19.01.2025	14:25 - 15:10	Adriana Briscoi	Anina	Done
30	FMI	3	19.01.2025	15:10 - 15:45	Adriana Briscoi	Anina	Done
31	Molding	1	02.04.2025	14:25 - 14:45	Marius Cobanu	Irina	Done
32	Molding	2	02.04.2025	14:45 - 15:05	Marius Cobanu	Irina	Done
33	Molding	3	02.04.2025	15:05 - 15:25	Marius Cobanu	Irina	Done

Internal & External Quality Topics

LTF

Consecinta nerrespectarii instructiunilor de lucru

SCHAFFLER

Internal & External Quality Topics

Asa DA

Asa Nu

Componente EC43, Gen 1

Consecintele nefolosirii echipamentului de lucru



QUALITY MINDSET IMPROVEMENT | Q CONFERENCE

- Q Conference 8th Edition (Schaeffler Cristian Plant): KPIs 2019-2014, Conference (Explore the highlights & tendencies) | Q Olympics (Become a Quality Champion) | Marketplaces (Electric BMW, Scanner 3D printing, Air Diameter Technique & Others) | Special (Maximize your potential) - Date: 28.02.2025

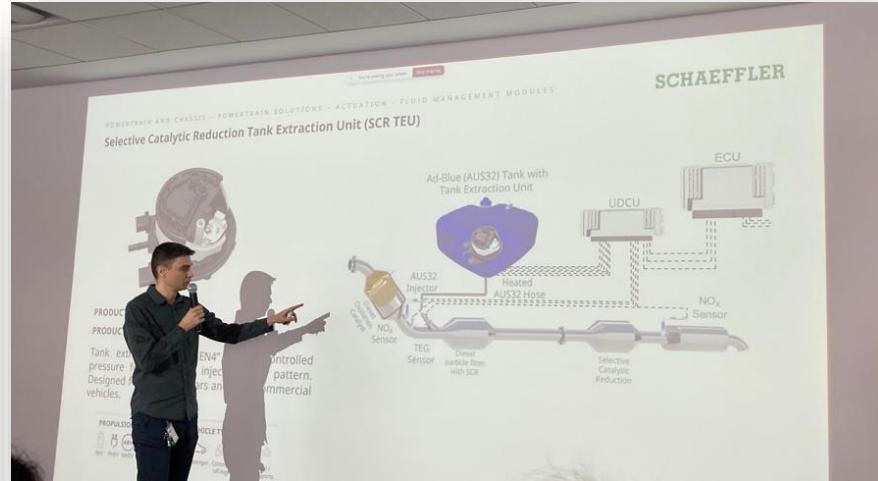


February 28th 2025
A passion for Quality has shaped our culture

Q Conference | 8th Edition

CONFERENCE ⓘ ⓘ		Q OLYMPICS Become a Quality Champion	
Explore highlights and tendencies		<ul style="list-style-type: none"> Measure properly! Identify defects! Verify your knowledge! 	
08:30	Welcome		
08:50	Introduction	I. Paraschiv M. Capilnean E. Grama	
09:10	GM Quality Excellence: Segment 18	C. Moldovan	
09:30	AI Assisted Shopfloor Processes	A. Häuß	
09:50	Schaeffler New@Ghimbav: Automotive Applications	A. Tapu	
10:10	Coffee break		
10:20	GPO: Opening a New Chapter	I. Francisco	
10:40	Innovate&Elevate: From Idea to the Streets	C. Breaban C. Duduman	
11:00	Innovation Culture@R&D Schaeffler Brasov	A. Husu	
11:20	Coffee break		
SPECIAL ⓘ ⓘ Maximize your potential			
<ul style="list-style-type: none"> 15:00 Start competition 13:30 Lunch 14:30 Awarding Ceremony 			
Schaeffler Rooms			
MARKETPLACE Discover solutions in ShopFloor			
BMW@Schaeffler New: Inside the product		Scanner 3D Printing: CAD Model generation	
Expo hall Administrative M. Boaea		Segment 16 Hall 4 D. Solontanu	
Eddy testing: Accurate surface defects detection		Benchmark Room: Measure residual austenite X-ray	
Segment 10 Hall 6 T. Gulin & R. Juhosz		R&D Center G. Sedreanu	
Arkitec system: Robotic Laser Assembly		Air Diameter Technique & CBR Automated MAQS	
Segment 1 Hall 1 P. Oprea		Segment 24 Hall 9 C. Doroftei & I. Crăciun	

*All marketplaces are available (in parallel) between 11:30 - 13:30
*Q Olympics @ QPS Academy
*Innotech & Schaeffler Room ⓘ ⓘ



QUALITY MINDSET IMPROVEMENT | 2025



Global Quality Week
28.03 -03.04.2025



TPM L1 Workshop

Global Quality Conference



LL Value-Stream Mapping workshop



Info Rounds



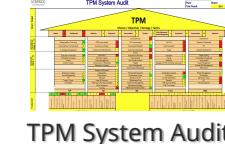
Info Rounds



Info Rounds



August



TPM System Audit
13.11.2025

October

FfQ monthly review
Troubleshooting & Progressive Development



Info Rounds



2026

December



Schaeffler

Fit for Quality

FfQ monthly review
Troubleshooting & Progressive Development



2025

March



TPM L1 Workshop

May



Global FFM Operations Workshop Wuhu
WORKSHOP

Global Learning Week
24-28.03.2025

2026

July

Schaeffler Award 2025:
❖ Sustainability
❖ Excellence
❖ Innovation
❖ Passion



Info Rounds



September

~50 % of people
trained in
Fit for Quality



November

Global Learning Week
24-28.11.2025



World Quality Day



Quarterly Management Meeting

Escalation Level 2 Exit criteria

5

BMW EL2 Criteria Review

Status of points 1 – 5 have been presented by Schaeffler on 19.03.2025

Attendees: 19.03.2025

BMW:

- Hr. Lauda
- Hr. Kaiser
- Hr. Springwald
- Hr. Drasch

Schaeffler:

- Hr. Campbell
- Hr. Möhnke
- Hr. Fink

1. Completed, fully comprehensive root cause analysis including implementation of effective immediate measures and definition of sustainable long-term measures on the subject of "SCR Module E5 Error".
2. Completed, fully comprehensive root cause analysis including implementation of effective immediate measures and definition of sustainable long-term measures on the topic of "MAPPS CuS corrosion"
3. Global LeLe transfer and implementation of all measures defined on the subject of "blocked flange" to other injection molding processes and implementation worldwide in Vitesco plants.
4. Setup of a Vitesco globally knowledge transfer process for implementation of lessons learned and measures out of customer complaints (Tier 1, BMW and end customer) steered by Vitesco headquarter.
5. Ensuring cross-project standards (benchmark G6x/G7x) for traceability for current and upcoming ItO projects for the scope of the FDM flange Objective: to minimize a potentially affected quantity as quickly and precisely as possible in the event of damage in order to keep the impact on the customer/BMW/Vitesco as low as possible.
6. Sustainable measure for customer-relevant changes/deviations to ensure early communication with the customer.
7. Set up of quarterly management meetings to review: Q-Performance, Vitesco quality mindset improvement (introduced during G70 requalification), Roadmap for optimization of structural deficits (identified during current Q-issues e.g. P-FMEA, incoming inspection, specification of subcomponents).

To be reviewed @ Plant Brasov:
26.03.2025



SCHAFFLER

BACKUP

BMW EL2 Criteria Review

BMW EL2 Letter

Dated: 19.09.2024



"Despite escalating this to level 1, we have **not seen a satisfactory response or any meaningful progress** on the de-escalation criteria that were outlined. Given the **lack of progress**, we are now escalating this matter to level 2 to ensure a direct involvement of Vitesco top management.

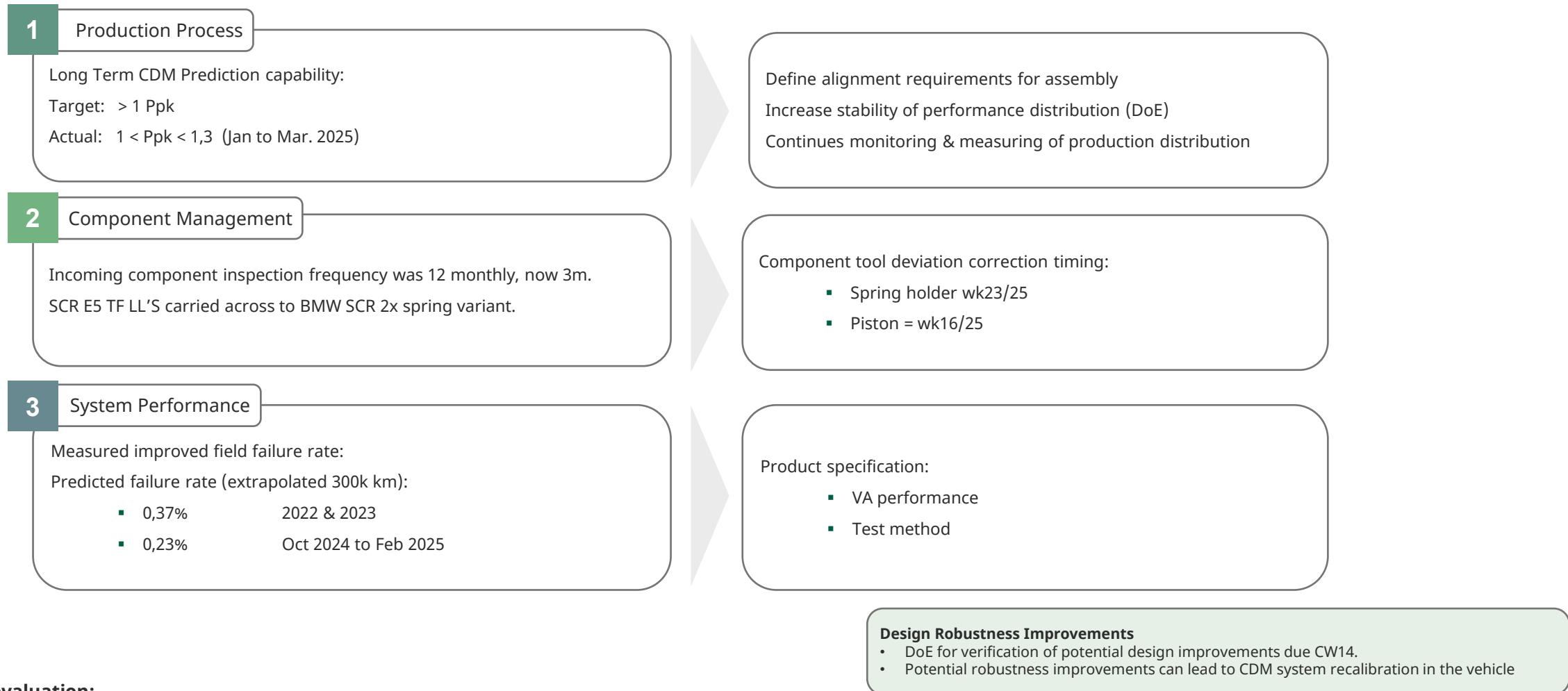
The de-escalation criteria communicated as part of the level 1 escalation continue to show **no satisfactory progress** and remain valid"

1. Completed, fully comprehensive root cause analysis including implementation of effective immediate measures and definition of sustainable long-term measures on the subject of "SCR Module E5 Error".
2. Completed, fully comprehensive root cause analysis including implementation of effective immediate measures and definition of sustainable long-term measures on the topic of "MAPPS CuS corrosion"
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EL2 - #1 - SCR E5 Error

- Completed, fully comprehensive root cause analysis including implementation of effective immediate measures and definition of sustainable long-term measures on the subject of "SCR Module E5 Error"

Status - 14.03.2025: Schaeffler Task Force (TF) presented a comprehensive detailed technical status of the progress of all actions completed to date.



SAG evaluation:

- 3/25/2025 Confidential/Schaeffler/ Ghimbav Location
14.03.2025 – Significant improvement has been demonstrated since EL2 in October 2024.

EL2 - #2 - MAPPS CuS Corrosion

2. Completed, fully comprehensive root cause analysis including implementation of effective immediate measures and definition of sustainable long-term measures on the topic of "MAPPS CuS corrosion"

Status – 19.03.2025

Float – de-gassing H₂S deviation

Introduction of Rogers Float

Plant Juarez: completed for all variants wk08/25

Plant Brasov: completed for all variants wk11/25

Plant Wuhu: Planned introduction wk14/25

Sanfeng supplier development program:

Status: Post supplier development program:

- Sanfeng float batch DOE 3.1 conform to specification requirements.
- PPAP production batch completed.

Re-building trust in supplier based on data and facts

- New PPAP's for the floats
- Testing of degassing of the floats: Sanfeng + SAG (SBA / BSV / WHU) + evaluation of degassing test results
- Safe Launch @ Sanfeng & SGA → increase sample size for the degassing test to ensure robust Safe Launch concept in SAG plants

Root Cause Analyses

Reproduction Test Status: it has not been possible to invoke the formation of a CuS bridge – no functional failures.

Tests conducted with aggressive test fuel (high H₂S content) in combination with temperature 200 cycles.

Hypothesis: unknown external additional influence in the field that is out of scope of Schaeffler.

Next steps: BMW & Schaeffler to review IS / IS NOT for contrast in territories where CuS failures occur (Korea / China / US)

Product Quality Improvement Plan

Process and Material Specification Review:

Flux

Material Specification Review:

Alternative flux identified with reduced content of **colfonium**:

Introduction:

May / June 2025 → pending on Doe results (condensation test 3, pull off, cross section, temp. shock and vibration (new housing))

BMW Release Requirements:

- No drawing release is required
- No PPAP is required

Schaeffler Release Plan:

- Adherence to internal change management process
- First produced parts will have:
 - Serial numbers and first shipment numbers recorded in part history

Cable Harness

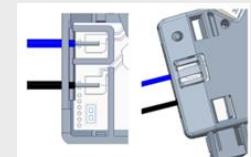
- No deviations
- No recommendation to change material specifications
- No recommendation to change design

Solder Material Specification

- No deviations
- No recommendation to change material specifications

Soldering Process Review

- Recommendation to improve control of position of harness to MAPPS contact pad.
- May / June 2025 → pending on Doe results



Design Robustness Proposals

Conceptual Robustness Improvement Measures: Schaeffler completed concept design reviews.

MAPPS Housing Modification → introduce barrier between solder pads

- Indicative SOP → ~Q3/2026

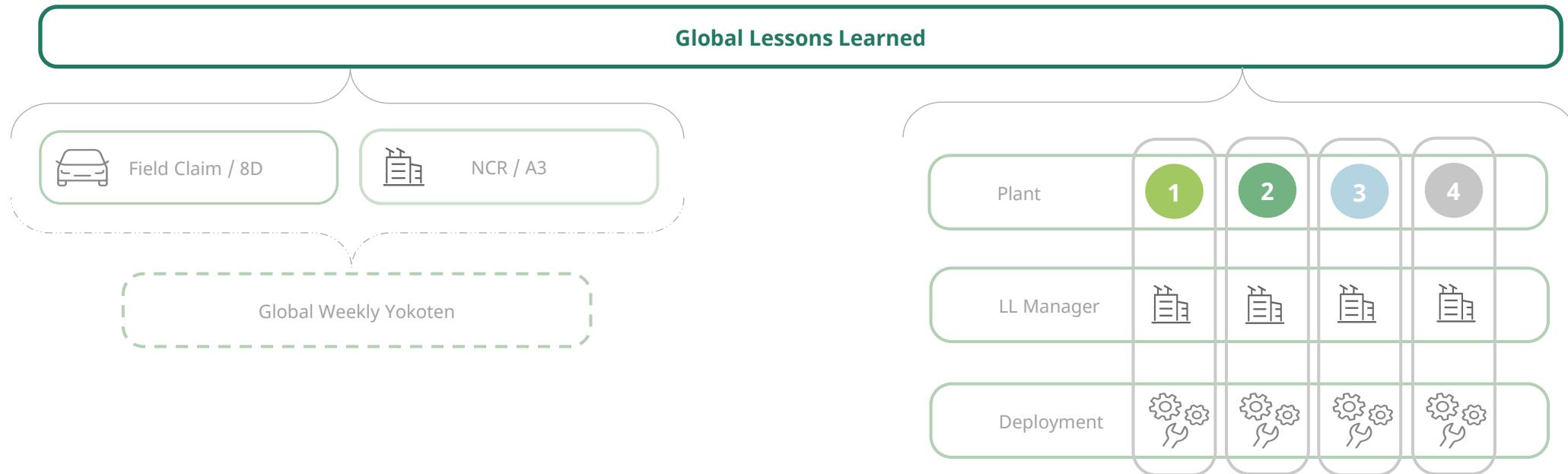
SAG evaluation:

- 19.03.2025 – BMW Senior Management review frequency reduced from once per week to once every three weeks.

EL2 - #4 - Global Knowledge Transfer / Lessons Learned

4. Setup of a Vitesco globally knowledge transfer process for implementation of lessons learned and measures out of customer complaints (Tier 1, BMW and end customer) steered by Vitesco headquarter.

Previous Status ~2023



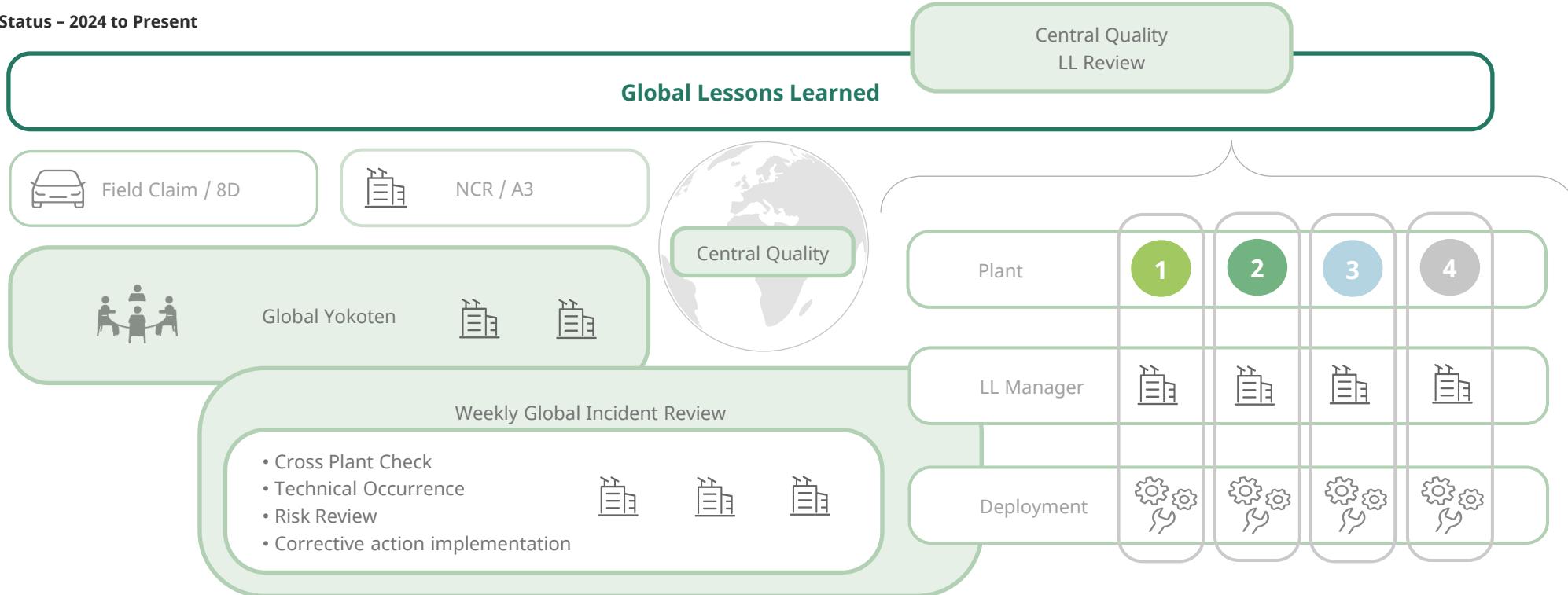
Summary:

- 'Lessons Learned' process definition criteria must be fulfilled for receiving plant to 'accept' incoming LL.
- Operates on self governance.
- Global Yokoten was operating as an info call without cross plant coordination.

EL2 - #4 - Global Knowledge Transfer / Lessons Learned

4. Setup of a Vitesco globally knowledge transfer process for implementation of lessons learned and measures out of customer complaints (Tier 1, BMW and end customer) steered by Vitesco headquarter.

Current Status - 2024 to Present



Summary:

- Addition of central Quality LL coordination for both formal LL and internal improvement measures implemented in 2023 with further improvement throughout 2024
- Next Steps → Q2/2025 SAG Q-Organisation → Value-Stream Mapping workshop to align “Global Expectations” → identify current “Pain Points” → define “Improvement Measures”

SAG evaluation:

- 19.03.2025 – Internal read across process implemented by Central Quality - planned continuous improvement measures (LEAN workshop / VSM)

EL2 - #4 - Global Knowledge Transfer / Lessons Learned

4. Setup of a Vitesco globally knowledge transfer process for implementation of lessons learned and measures out of customer complaints (Tier 1, BMW and end customer) steered by Vitesco headquarter.

Status - 19.03.2025

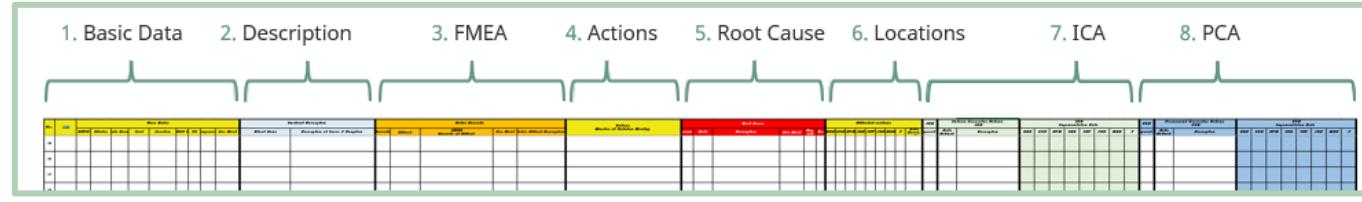


Scope for further improvement::

- Digitalisation
- Automated data source integration
- 'Central Quality' – increased 'Peer to Peer' reviews
- Web-based communities per discipline / technology



Category	Sub-Category	Region A		Region B		Region C		Region D		Region E		
		Q1	Q2									
Customer Complaints	Initial Assessment	High	Medium	Low	Medium	High	Medium	Low	Medium	High	Medium	Low
Customer Complaints	Root Cause Analysis	Medium	High	Low	Medium	High	Medium	Low	Medium	High	Medium	Low
Customer Complaints	Action Planning	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium
Customer Complaints	Implementation	Medium	High	Low	Medium	High	Medium	Low	Medium	High	Medium	Low
Customer Complaints	Follow-up	High	Medium	Low	Medium	High	Medium	Low	Medium	High	Medium	Low
Internal Issues	Initial Assessment	Low	Medium	High	Low	Medium	High	Low	Medium	High	Medium	Low
Internal Issues	Root Cause Analysis	Medium	High	Low	Medium	High	Medium	Low	Medium	High	Medium	Low
Internal Issues	Action Planning	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium
Internal Issues	Implementation	Medium	High	Low	Medium	High	Medium	Low	Medium	High	Medium	Low
Internal Issues	Follow-up	High	Medium	Low	Medium	High	Medium	Low	Medium	High	Medium	Low
Supplier Issues	Initial Assessment	Medium	High	Low	Medium	High	Medium	Low	Medium	High	Medium	Low
Supplier Issues	Root Cause Analysis	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium
Supplier Issues	Action Planning	Medium	High	Low	Medium	High	Medium	Low	Medium	High	Medium	Low
Supplier Issues	Implementation	High	Medium	Low	High	Medium	High	Low	High	Medium	High	Low
Supplier Issues	Follow-up	Medium	High	Low	Medium	High	Medium	Low	Medium	High	Medium	Low



Summary:

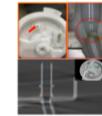
- Addition of central Quality LL coordination for both formal LL and internal improvement measures implemented in 2023 with further improvement throughout 2024
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SAG evaluation:

- 19.03.2025 – Internal read across process implemented by Central Quality - planned continuous improvement measures (LEAN workshop / VSM)

EL2 - #3 - Blocked Flange Lessons Learned

3. Global LeLe transfer and implementation of all measures defined on the subject of "blocked flange" to other injection moulding processes and implementation worldwide in Vitesco plants

Lessons Learned acc. 8D		8D	RA Implementation Tracking																																																					
<ol style="list-style-type: none"> 1. Traceability data for flow test 2. Dedicated flow test program for each variant 3. Creation of dedicated master sample per version 4. Create a Poka Yoke for the rod position 5. Training Welding procedure (release of the tool after repair) 	<p>SCHAEFFLER</p> <p>8D Report</p> <p>Title: BMW_G60/G70-blocked SAE connector</p> <p>8D Report No.: 700090010324 Creation Date: 04.07.2024 Revision Date: 04.07.2024</p> <table border="1"> <thead> <tr> <th colspan="2">Event</th> </tr> <tr> <td>Material:</td> <td>AAZ199620101 fuel supply unit BMW</td> </tr> <tr> <td>Customer:</td> <td>BMW, Muenchen / Muenchen</td> </tr> <tr> <td>Plant:</td> <td>BRA - Brasov (VT)</td> </tr> <tr> <td>Division:</td> <td>Powertrain Solutions</td> </tr> <tr> <td>BU:</td> <td>Actuation</td> </tr> <tr> <td>Complaint No.:</td> <td>50000036854 - 0002</td> </tr> <tr> <td>Complaint Type:</td> <td>Field</td> </tr> <tr> <td>Serial No.:</td> <td>5A2AC105241420556</td> </tr> <tr> <td>Production Date:</td> <td>21.05.2024</td> </tr> <tr> <td>Complaint Qty:</td> <td>9 Accepted: 9 Rejected:</td> </tr> <tr> <td>Comm. Decision:</td> <td>Accepted - Warranty</td> </tr> <tr> <td>Part Disposal:</td> <td>Verschrotten VT</td> </tr> <tr> <td>Re-occurrence:</td> <td></td> </tr> <tr> <td>Cust. Prod. No.:</td> <td>5A2A C81-05</td> </tr> <tr> <td>Cust. Incident No.:</td> <td>200032021</td> </tr> <tr> <td>Cust. Ref. No.</td> <td></td> </tr> <tr> <td>Cust. Inc. Date:</td> <td>15.06.2024</td> </tr> <tr> <td>Vehicle:</td> <td></td> </tr> <tr> <td>Platform:</td> <td></td> </tr> <tr> <td>VIN:</td> <td></td> </tr> <tr> <td>Veh. Build Date:</td> <td></td> </tr> <tr> <td>Lic/Reg. Date:</td> <td></td> </tr> <tr> <td>Repair Date:</td> <td></td> </tr> <tr> <td>Mileage:</td> <td>0 Miles</td> </tr> <tr> <td>Country:</td> <td></td> </tr> <tr> <td>Region:</td> <td></td> </tr> </thead></table>	Event		Material:	AAZ199620101 fuel supply unit BMW	Customer:	BMW, Muenchen / Muenchen	Plant:	BRA - Brasov (VT)	Division:	Powertrain Solutions	BU:	Actuation	Complaint No.:	50000036854 - 0002	Complaint Type:	Field	Serial No.:	5A2AC105241420556	Production Date:	21.05.2024	Complaint Qty:	9 Accepted: 9 Rejected:	Comm. Decision:	Accepted - Warranty	Part Disposal:	Verschrotten VT	Re-occurrence:		Cust. Prod. No.:	5A2A C81-05	Cust. Incident No.:	200032021	Cust. Ref. No.		Cust. Inc. Date:	15.06.2024	Vehicle:		Platform:		VIN:		Veh. Build Date:		Lic/Reg. Date:		Repair Date:		Mileage:	0 Miles	Country:		Region:		<p>Customer complain - SAE Connector Blocked - Customer notification 500000366854</p> <p>Problem description</p> <p>Fuel pump delivery rate too low due to blocked SAE connector</p>  <p>Corrective actions</p> <p>Process before : description:</p> <ul style="list-style-type: none"> Visible burr in the hydraulic connector NOK Parts passed the flow test Different programs for each variant One program available for all variants (variants available with multiple connectors) Master samples for the part done by setter at each change-over One single pair of master samples that cover all the ports Missing Poka-Yoke system on the rod from the fix side of the rod during change-over Possibility to rotate the rod during change-over <p>Lessons learned - Internal cross check</p>  <p>Process after: description:</p> <ul style="list-style-type: none"> No burr in the hydraulic connector NOK Parts are not passing the flow test Different programs for each variant Different programs for each variant Automatic selection of the port done directly by the program that respects the variant Dedicated master samples for all variants Poka-Yoke system on the rod from the fix side of the molding tool to prevent the rotation of the rod during change-over
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Variant	SAG Plant	Tool	#1	#2	#3	#4	#5
PWR PIN	BSV	541 101	Planned 30.04.2025	20.08.2024 reconfirmed	20.08.2024 reconfirmed	N/A	31.07.2024
G60 / G70	BSV	559 101	26.07.2024	11.07.2024	11.07.2024	31.07.2024	
G2Y	BSV	530 101	Planned 05.05.2025	20.08.2024 reconfirmed	20.08.2024 reconfirmed	N/A	
G2Y	CJS	T3	N/A	SOP	SOP	N/A	26.09.2024
PWR PIN	CJS	T4	N/A			N/A	
G68	WHU	L126 Wuxi MI (external)	Flange received DMC label after ok test	Ball test	N/A	SOP	
G20/28	WHU	Dalian Luanyi (external)	N/A	Visual Check straight port	N/A	N/A	

SAG evaluation:

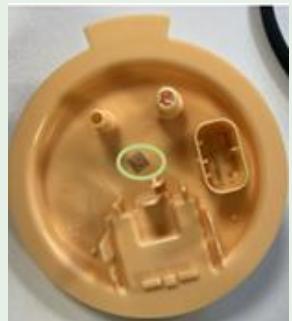
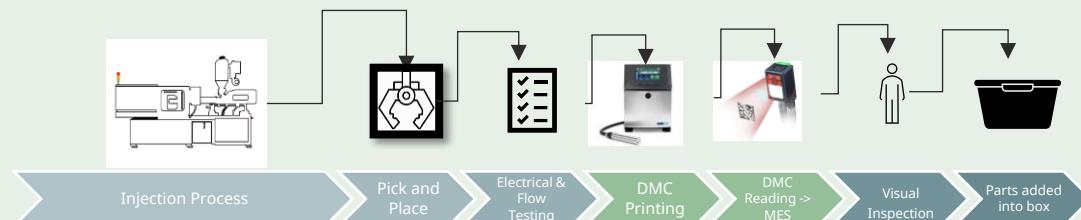
- 19.03.2025 – Traceability implementation in Juarez is under evaluation – see slide #11.

EL2 - #5 - FDM Flange Traceability Strategy

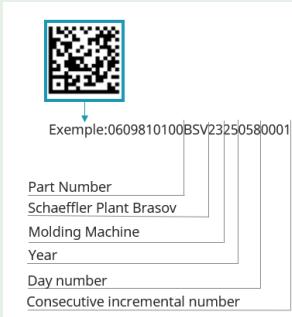
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Flange Traceability Improvement Plant Juarez

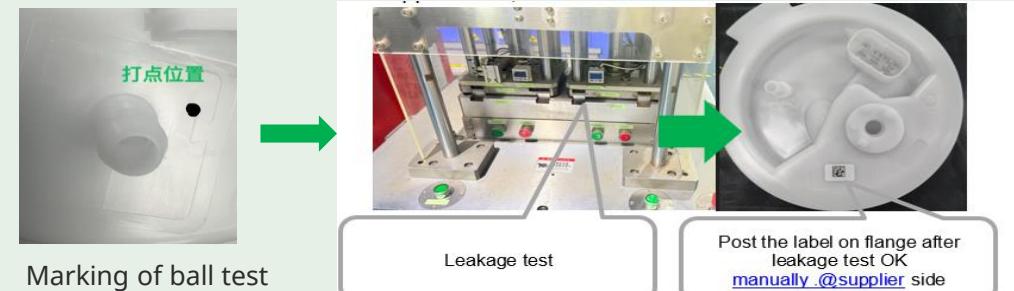
Intended Process Flow for IMM 11, 80 % of BMW Business Juarez according to Brasov 35 up



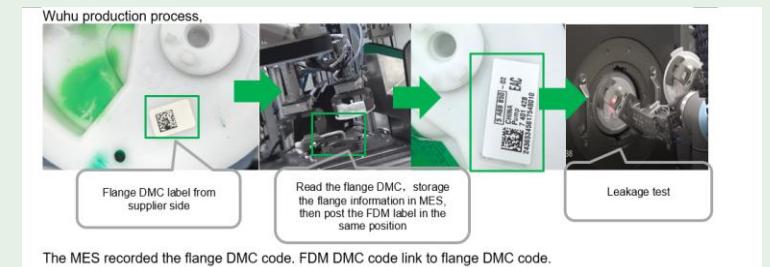
PART NUMBER	NAME	CUSTOMER	MODE	IMM
A3C0178340100 & 200	Flange	BMW PP	ATM	11
A3C0178300100 & 200	Flange	BMW PP	ATM	11
A3C0178320100 & 200	Flange	BMW PP	ATM	11
A3C0178330100 & 200	Flange	BMW PP	ATM	11
A3C0178310100 & 200	Flange	BMW PP	ATM	11
A3C0178350100 & 200	Flange	BMW PP	ATM	11
A3C0178360100 & 200	Flange	BMW PP	ATM	11
A3C0178300200	Flange	BMW PP	MAN TOOL 1&2	22
A3C0178320200	Flange	BMW PP	MAN TOOL 1&2	22
A3C0178330200	Flange	BMW PP	MAN TOOL 1&2	22
A3C0178340200	Flange	BMW PP	MAN TOOL 1&2	22
A3C0178310100	Flange	BMW PP	MAN TOOL 1&2	22
A3C0178350100	Flange	BMW PP	MAN TOOL 1&2	22
A3C0178360100	Flange	BMW PP	MAN TOOL 1&2	22
A2C11123701	Flange	BMW G2Y	MAN	12
A2C11123801	Flange	BMW G2Y	MAN	12
A2C11123601	Flange	BMW G2Y	MAN	12
A2C11124001	Flange	BMW G2Y	MAN	12
A2C11123901	Flange	BMW G2Y	MAN	12



Flange Traceability Improvement Plant Wuhu



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Barcode:	AAA9098500100MIT1072221000257
Size:	30



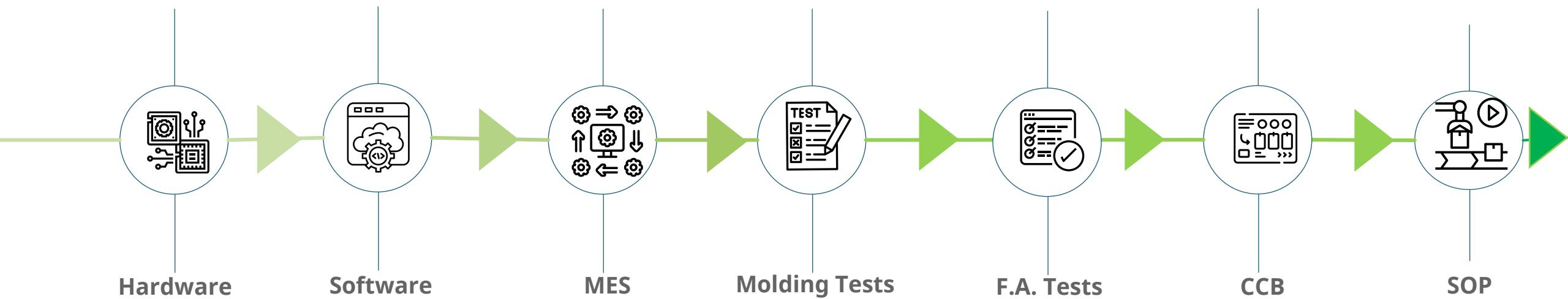
Variant	SAG Plant	Tool	Change to DMC marking
BMW PWR PIN	CJS	IMM 11	Cost collection for introduction of Brasov 35up approach and introduction for CCB
BMW G2Y	CJS	IMM 12/22	Cost collection for manual handled mold is under investigation of Engineering and Operation CJS for CCB

Variant	SAG Plant	Tool	Change to DMC marking
G68	WHU	L126 Wuxi MI (external)	Flange received DMC label after ok test at supplier
G20/28	WHU	Dalian Luanyi (external)	Change over to DMC label with G58 project

* New BMW projects are handled after the CLAR WE requirements by drawing over R&D

Project (improvement) - *Flange traceability*: Time Plan - BMW Flanges

G60/G70 IMM 023	<input checked="" type="checkbox"/>						
Power Pin IMM 023	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	28.03.2025	11.04.2025	<input checked="" type="checkbox"/>	30.04.2025
G2Y IMM 028	<input checked="" type="checkbox"/>	07.04.2025	11.04.2025	18.04.2025	25.04.2025	<input checked="" type="checkbox"/>	05.05.2025



Printer:
 • Connect printer power cable
 • Connect signals to the robot

Scanner
 • Connect power cable
 • Connect network cable
 • Set IP + Configure Read DMC
 • Positions

- Create Wittmann program
 - Create PLC program
 - Block in PLC
 - Scanner
 - Download functions into PLC
- In MES - data, time
 - Create specifications

- Update routing
- Loading test-plan MES
- Loading order with the new routing
- Position of the DMC
- Scan tests
- Automatic packaging tests

- Scan tests
- "Checking interlocking (if the DMC is transferred in the DMC of FA)"
- CCB in the analysis phase.

EL2 - #4 - Global Knowledge Transfer / Lessons Learned / Local Process

LESSONS LEARNED STANDARDS AND RESPONSIBLES

Group Standard Managed Lessons Learned VT 1014273 Version 6	
VT 1014273 Managed Lessons Learned	
Rule level / type	Group Standard
Responsible function	Quality & LEAN
Organization	Vitesco Technologies Group AG and subsidiaries under the management control of Vitesco Technologies
Organizational scope	All organizational units
Superior rule(s)	VT 0100000 - Quality Management System
Further relevant rule(s)	VT 1014272 Structured Problem Solving VT 1000203 Quality Alert
Key word(s)	Lesson, Lessons Learned, Structured Problem Solving, 8D, A3, Lessons Learned Tool
Functional contact	Quality & LEAN QL BPM QMS LessonsLearned@vitesco.com
Version	6
Day of release	August 1, 2024
Review Frequency	3 year(s)

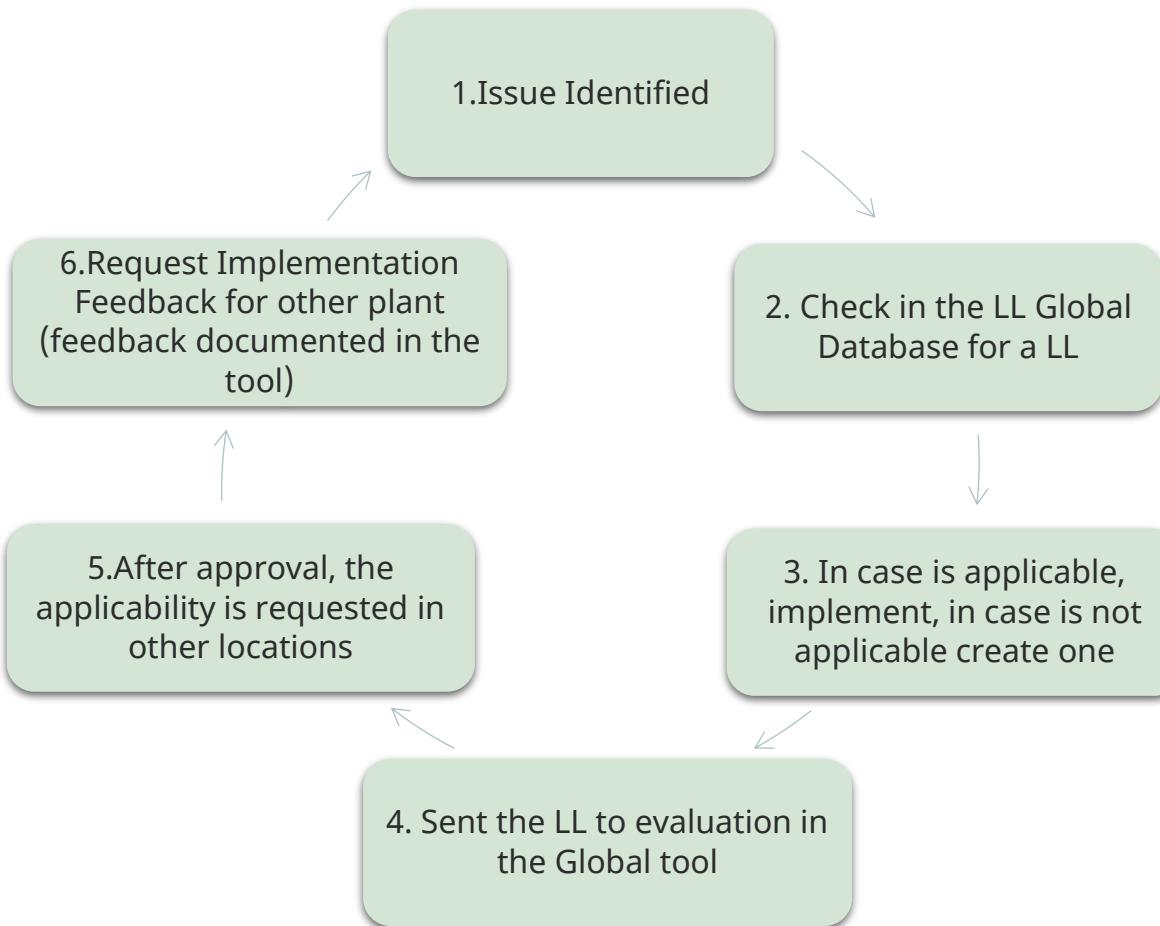
Location Standard Lessons Learned Process VT 0905094 Version 06	
VT 0905094 Lessons Learned Process	
Rule level / type	Location Standard
Responsible function	Quality & LEAN
Organization	Vitesco Technologies Romania
Organizational scope	Plant Brasov
Superior rule(s)	VT 1014273 - Group Standard Managed Lessons Learned
Further relevant rule(s)	-
Key word(s)	lessons learned; improvement; read across
Functional contact	Quality & LEAN Quality Management System -
Version	06
Day of release	December 8, 2023
Review Frequency	3 year(s)

Role Descriptions

- **LL User** (employees)
- **LL Specialist** (person that is specialist in the process)
- **LL Implementation responsible** (Serial Life Manager with support from the Process team (Quality, Process) - Brasov Plant)
- **LL Manager** (The person that managed the lessons before to be uploaded in the Global LL Tool and the one that create implementations request when a new LL is published and is applicable for Brasov Plant.)

- Group and Local Standards available for description of the Lessons Learned Process.
- Roles in the organization involved in the Lessons Learned Process

EL2 - #4 - Global Knowledge Transfer / Lessons Learned / Local Process

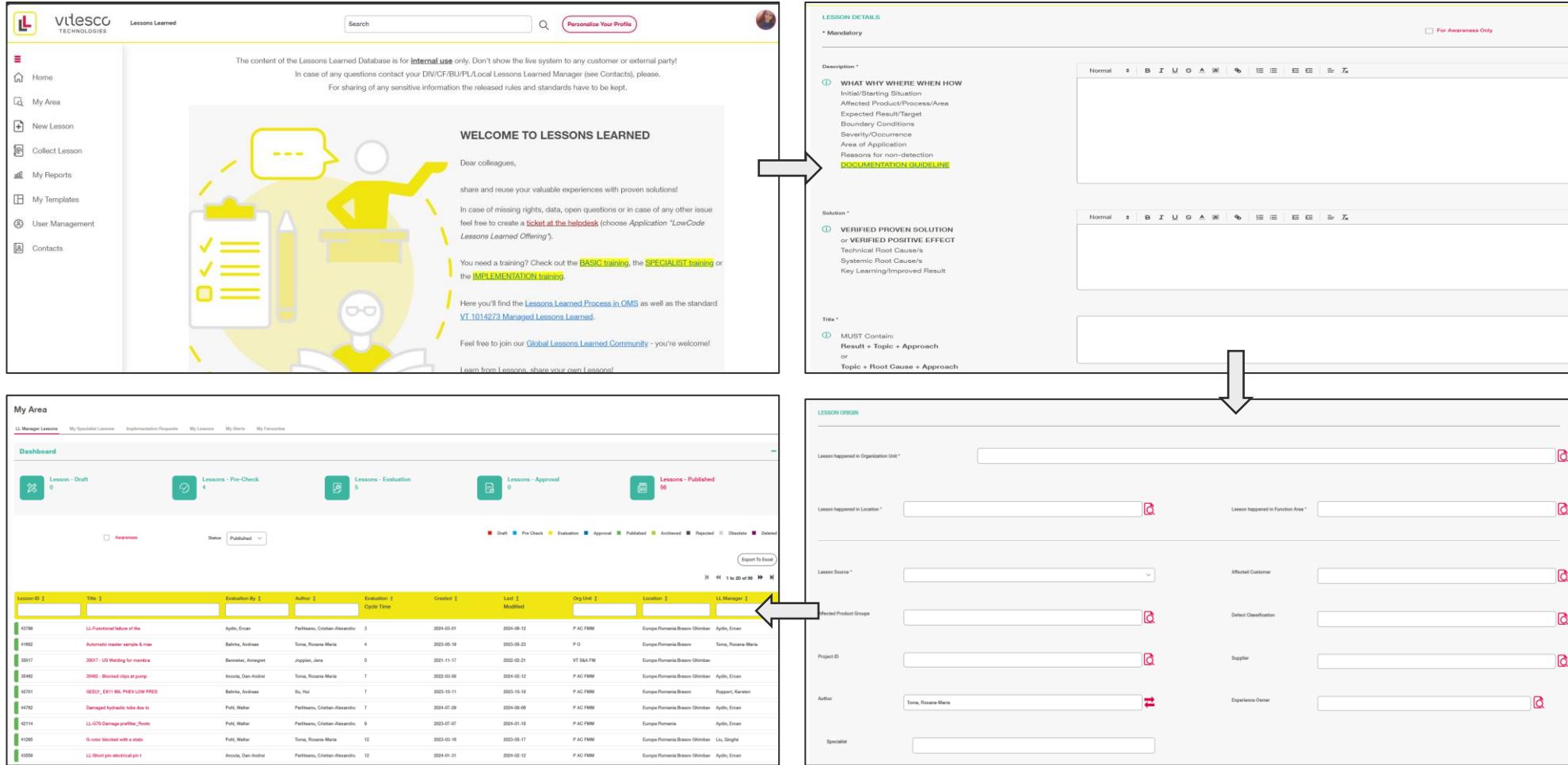


No.	Roles/Organizational Units R: Responsibility, A: Approval, S: Support, I: Information						Input	Activities	Output	Applicable Documents
	User	E/PE	SLM/NPLM (Implementation responsible)	LL Manager in plant	Quality Production	SU LL Specialist				
1	R						Improvements Best practices Workshop Initial findings Customer claims Supplier issues Audits	Collect positive or negative experience that can be transferred in a lesson learned proposal	Lessons Learned proposals	
2	R	S		S	S		Lesson Learned proposals	Document the lesson learned proposal and send it to evaluation & publishing	Lesson Learned proposal documented	VT 0905094-A01
3	I			R			Lesson Learned proposal documented	Evaluate and publish the Lessons Learned	Lessons Learned registered	Lessons Learned Global Database
4	I			R		A	Lessons Learned registered	Propose Lessons Learned to be implemented in other plants	Lessons Learned sent to evaluation	Lessons Learned Global Database

No.	Roles/Organizational Units R: Responsibility, A: Approval, S: Support, I: Information						Input	Activities	Output	Applicable Documents	
	User	E/PE	SLM/NPLM (Implementation responsible)	LL Manager in plant	Quality Production	SU LL Specialist					
The following steps are performed after the Lessons Learned registered is registered in Lessons Learned Global Database											
5				I		R	Lessons Learned sent to evaluation	Evaluate and publish/reject the Lessons Learned	Approve Lessons Learned - notification via e-mail Reject Lessons Learned - (stop the process)		
6			I	R			Approve Lessons Learned - notification via e-mail	Open the Lessons Learned registered in Global database and add implementation request for other departments from Vitesco Technologies, Plant Brasov	Notification received via e-mail with read across feedback decision		
7	S	R		S			Notification received via e-mail with read across feedback decision	Take the Lessons Learned and decide the applicability Add the feedback inside the tool	Read across recorded in the Lessons Learned Global Database		
8			R		R		Read across recorded in the Lessons Learned Global Database	Verify the decision from the Lessons Learned Global database	Read across done	Lessons Learned Global Database	

☐ Lessons Learned Local Process definition

EL2 - #4 - Global Knowledge Transfer / Lessons Learned / Local Process



❑ Lessons Learned Tool In-place

EL2 - #4 - Global Knowledge Transfer / Lessons Learned / Local Process

- For each project, in Brasov Plant have been created teams that are responsible for Lessons Learned Implementation. The team is composed from SLM (Serial Life Manager), that coordinate the process, Quality Engineer and Process Engineer.
- After one LL is published, the LL Specialist / BU LL Manager sent to each Plant Implementation request (automat e-mail from the LL Tool). The LL Manager from the Plant receive the notification (via e-mail).

The screenshot shows the 'User Management' section of the Vitesco Lessons Learned tool. It displays a grid of implementation status for different projects across various departments. The columns include 'Project', 'Implementation Status %', 'Implementation Name %', 'Implementation %', 'Implementation %', and 'Comments %'. Projects listed include Electrification Solutions (4) and Powertrain Solutions (18). Each row provides details for specific components or sub-projects within these main categories.

The screenshot shows an email from 'Lessons Learned <lessonslearned@vitesco-te...' to 'Toma, Roxana-Maria' with the subject '+++ New Lessons Learned Implementation Request is assigned to you +++'. The email body contains a message asking the recipient to review the Lessons Learned and provide feedback within 2 weeks. It also includes a link to the implementation request and an important note about reoccurrence.

- LL Manager from Plant Brasov sent to all teams created the new LL and request to add the feedback in the tool.

The screenshot shows an email response from 'LL-43919/IR-41123' to 'P AC FMM BMW'. The message starts with 'Thank you!', followed by 'Dear all,' and the date '2024-08-23'. It includes a note asking the recipient to check the applicability of the LL and add feedback. The email concludes with 'Please check the applicability of this LL and add your feedback in the tool.' and 'Thank you!'

❑ Lessons Learned implementation process

EL2 - #4 - Global Knowledge Transfer / Lessons Learned / Local Process

IMPLEMENTATION PROCESS – EXAMPLE 1 – LL NOT APPLICABLE

FDM DUPLICATED FLANGE

- One LL created in Wuhu has sent to Plant Brasov for implementation.
- The LL was sent to the team
- Meeting with the team in order to analyze the applicability of the LL
- Decision taken in the team.
- Feedback documented in the tool.
- Release person, release date, verified person, verified date completed automatically by the tool.

FF2 0KM INCIDENTS
US-YAPP B-SUV FDM DUPLICATED FLANGE LABEL_20PCS QN:500000340033

Problem Description, Picture [D2]	Fact and Figures (D2/D3/D4)
<p>When: 3/1/24 Where: US-YAPP Production line What: US-YAPP SIE Whilst B-SUV FDM have duplicated flange FDM: A3C0416810130 How many: 20pcs Failure FDM batch: 2023/11/18 Product line : L134</p> 	<ol style="list-style-type: none"> After investigation, confirm failures caused by YF production line; Wuhu plant have 2 production lines have ability to produce B-SUV export fuel pump, one is L112, the other is L134, L112 is the original production line, L134 is the proposal line to replace L112, which had been approved by VW on 9/2/2023; Both L112 and 134 have flange label content poka-yoke, one label can't be used twice in each line, but 2 lines EOL databases are separated and can not detect if one label had been used in other lines; L134 start to produce B-SUV fuel pump on 11/18/2023, duplicate labels comes from this shift due to there is no control method to use different labels with another line since this failure was not identified, draft risk parts quantity is 720pcs; In Jan., due to L134 automatic label printer fault and need to be repaired outside, considering delivery requirement, transfer some shifts B-SUV FDM to L112 line, draft risk parts quantity is 7000pcs.
Root Causes[D4]	Further Proceeding, Measures (D5/D6/D7)
<p>Occurrence root cause :</p> <ul style="list-style-type: none"> 2 production lines produce one product, L112 print label manually with an off-line printer, L134 print label automatically in production line, these 2 printer are separated and have no label information share; <p>Escape root cause :</p> <ul style="list-style-type: none"> EOL test data of L112 and L134 are separated, EOL can only compare is one label had been used in its own line, can't compare between 2 production lines since old line have no MES. 	<p>Short and Long actions:</p> <ol style="list-style-type: none"> Define L134 production line as B-SUV production line, B-SUV fuel pump will not be allowed produced in L112 line. Update the change management, and define must not move product production line after changed the line. Done All of FSU production line add MES system to avoid the issue happen again in customer and process side. Done

IMPLEMENTATION REQUEST: LL-43919/IR-41123

Created	In Progress/Future	Released	Verified
IMPLEMENTATION REQUEST FEEDBACK			
P AC FMM BMW			
IR Status <input type="text" value="Verified"/>			
Last Update : 2024-08-26			
Mandatory			
Implementation * <input type="text" value="No, Implementation not possible / necessary"/>			
Implemented Why Not? <input type="text" value="Not necessary"/>			
Detailed explanation * <small>For BMW1 camline available on the station P50 where the label is printed and stick on the flange. For BMW2 the flange assy are assembled on a subassy line where camline is available, duplicated flange label not possible.</small>			
Lesson Title 43919 - US-YAPP B-SUV FDM duplicated flange label			
Implementation request <small>Dear all, Please check the applicability of this LL and add your feedback in the tool. Thank you!</small>			

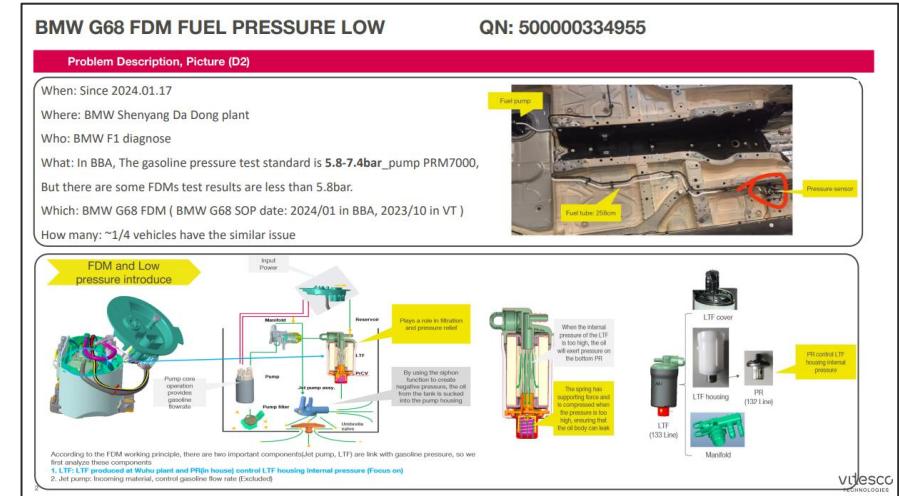
Attachments
<input type="text"/>
Released By
Zaplaic, Maria-Adriana
Release Date
2024-08-23
Verified By
Toma, Roxana-Maria
Verified Date
2024-08-26

EL2 - #4 - Global Knowledge Transfer / Lessons Learned / Local Process

IMPLEMENTATION PROCESS – EXAMPLE 2 – LL APPLICABLE

LTF CALIBRATION

- One LL created in Wuhu has sent to Plant Brasov for implementation.
- The LL was sent to the team
- Meeting with the team in order to analyze the applicability of the LL
- Decision taken in the team.
- Feedback documented in the tool.
- Release person, release date, verified person, verified date completed automatically by the tool.
- The LL is applicable for Plant Brasov, Implementation decision has been taken in the team. Implementation due date is end of year 2024.



Created	In Progress	Assigned	Verified
IMPLEMENTATION REQUEST LL-40809-4100 F.D.M. - BBA Date: 2024-01-17 Implementor: <input type="checkbox"/> No Implementor, searching the request Implementation status: Implementation details: Implementation notes: Implementation plan: Implementation team: Name: Name: Name: Name: Name: IMPLEMENTATION REQUEST Requester: <input type="checkbox"/> Requester is a Database Application User Management Module Requester ID: <input type="checkbox"/> Requester Name: <input type="checkbox"/> Requester Email: <input type="checkbox"/> Requester Phone: <input type="checkbox"/> Requester Address: <input type="checkbox"/>			

EL2 - #4 - Global Knowledge Transfer / Lessons Learned / Local Process

IMPLEMENTATION PROCESS – EXAMPLE 3 – LL CREATED BY BRASOV

BLOCKED FLANGE

- LL created by Brasov team
- LL approved in the Global tool in 09.09.2024
- LL sent for implementation to : Dortmund, Bebra, Juarez, Wuhu, back to Brasov

LESSON LEARNED		Internal no:	Global database no:	Status:
Title of lesson learned: FUEL PUMP DELIVERY RATE TOO LOW DUE TO BLOCKED SAE CONNECTOR				
Part/ Topic customer product type affected area: F 660 559 101 BMW G60/70 Flange A3C0609800100				
Problem description/ effect / Root cause (occurrence, non-detection): Hydraulic Connector Blocked -presence of plastic material-				
<p>Process before - description:</p> <ul style="list-style-type: none"> ➢ Visible burr in the hydraulic connector ➢ Parts are passing the flow test ➢ No data available for the flow test results ➢ One program available for all variants (5 variants available with multiple connectors) ➢ Manual selection of the port done by setter at each change-over ➢ Change over time is about 10 minutes per port ➢ Missing Poka-Yoke system on the rod from the fix side of the molding tool <ul style="list-style-type: none"> ➢ Possibility to rotate the rod during change-over 		<p>Process before - pictures:</p> <p>Issue:</p>		
<p>Process after - description:</p> <ul style="list-style-type: none"> ➢ No burr in the hydraulic connector ➢ NOK Parts are not passing the flow test ➢ Data available and stored for flow test ➢ Dedicated programs and master samples for each variant ➢ Automatic selection of the port done directly by the program that was selected ➢ Dedicated master samples for all variants ➢ Poka-Yoke system on the rod from the fix side of the molding tool to prevent the rotation of the rod during change-over 		<p>Process after - pictures:</p> <p>Dedicated Master sample for each variant</p> <p>Poka Yoke system</p> <p>Flow Data Stored - Scada system</p>		
<p>Contact: Name: Jing Ma Email: jing_ma@vitesco.com</p>				
Vitesco TECHNOLOGIES				

IMPLEMENTATION REQUEST PROPOSAL			Add Implementation Request
IR Proposal Number	Departments	Request	
1147	P AC FMM - DTM/Bebra, P AC FMM - JUA, P AC FMM - WUH, P AC FMM Molding	<p>Check feasibility of implementation for ALL existing tools & processes with hydraulic connectors for:</p> <ul style="list-style-type: none"> - Change-over set-up risk assessment, including mechanical change over process and software program loading - Use dedicated programs and master samples for each variant that has different connector configuration - Start-up process include check of functionality of test station - POKA YOKE implementation for interchangeable parts / inserts 	<input checked="" type="checkbox"/> <input type="button" value="Delete"/>

EL2 - #4 - Global Knowledge Transfer / Lessons Learned / Local Process

FOLLOW-UP MEETING

Follow-up meeting – local with implementation responsibles

Juganaru, Alexandra (uids2783) ✖ Suciu, Ovidiu-Virgil (uiv21499) ✖ : These recipients are sending automatic replies.
 Occurs the third Wednesday of every 1 month(s) effective 1/17/2024 until 12/31/2024 from 2:00 PM to 3:00 PM
 Attendee responses: 4 accepted, 1 tentatively accepted, 0 declined.

Title Lessons Learned-Monthly Review (RA)

Send Update

Required Zaplaic, Maria-Adriana (uids3757); Csuka, Roland (ua97528); Juganaru, Alexandra (uids2783); Damian, Viorica Adina (uidk6610); Jinga, Marius-Bogdan (uiv09382); Avram, Mariana Loredana (uidd7205); MR_GX_Oltenia

Optional Parlitescu, Cristian-Alexandru (uiv10320); Suciu, Ovidiu-Virgil (uiv21499)

Start time Wed 10/16/2024 2:00 PM All day Time zones

End time Wed 10/16/2024 3:00 PM

Location MR_GX_Oltenia

Salutare,
 Setează această sedință pentru a ne întâlnii și discuta lunar statusul LL pe care îl-ai primit pentru Read Across.
 Structura:

- FM 1 (Create, future, released, verified)
- FM 2 (Create, future, released, verified)
- SCR (Create, future, released, verified)
- HVE (Create, future, released, verified)
- Molding (Create, future, released, verified)
- Components (Create, future, released, verified)

 De asemenea, dacă aveți puncte bolcante, erori sau întrebări, le vom discuta și încercă să le rezolvăm împreună.
 Multumesc!

Follow-up meeting – Global with Lessons Learned Managers

Occurs the fourth Thursday of every 1 month(s) effective 1/06/2023 until 11/28/2024 from 9:30 AM to 10:30 AM
 Accepted on 9/18/2023 10:34 AM.
 This meeting has been adjusted to reflect your current time zone. It was initially created in the following time zone: (UTC+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna.

VT Lessons Learned Manager/Coordinator Call - Option AS/EU - series for 2024

Organizer Lechner, Regina (uid3540) Sent: Tue 11/22/2022 10:05 AM

Time Thursday, September 26, 2024 9:30 AM-10:30 AM

Location Microsoft Teams Meeting

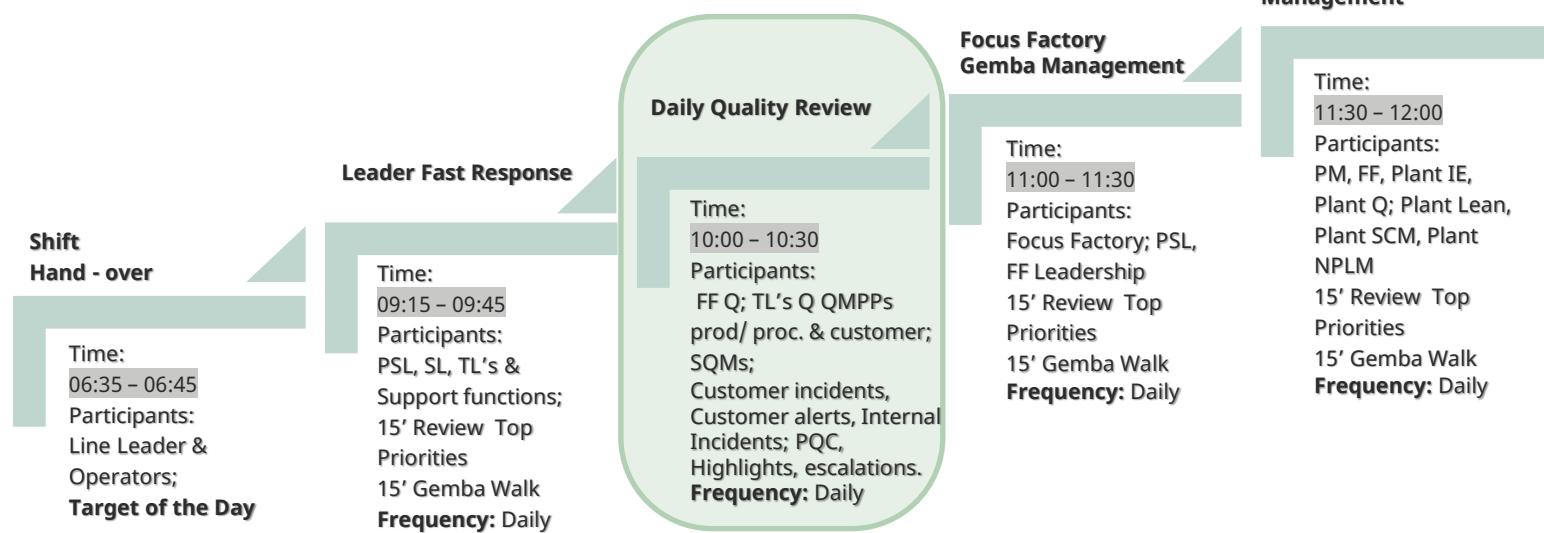
Response ✓ Accepted [Change Response](#)

UPD 07.09.2023: participants updated
 UPD 17.05.2023: participants added
 UPD 18.04.2023: participants updated

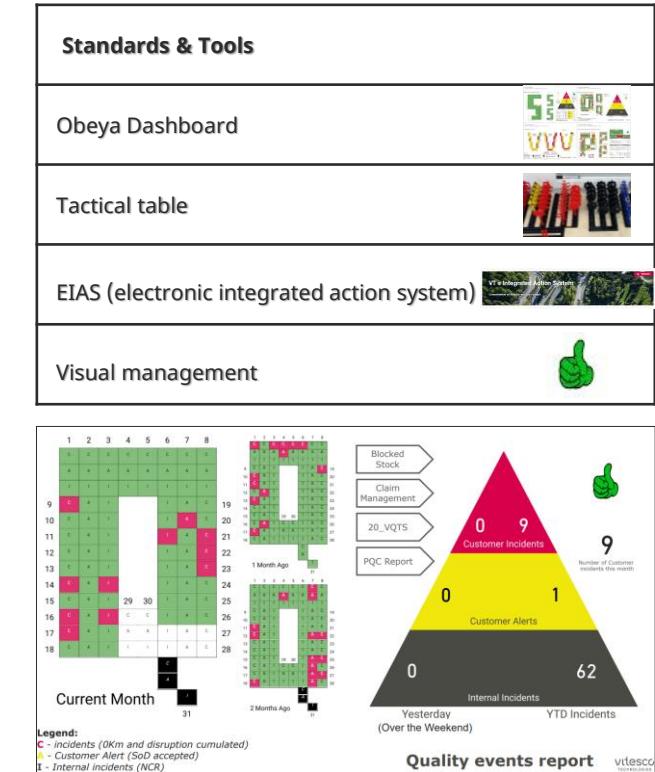
 Dear LL Manager/Coordinator,
 this is our monthly call on Lessons Learned topics within Vitesco.
 There are two options offered: AS/EU and EU/AMERICAS. Please accept whichever suits to your calendar.
 There will be information shared from the Program Management as well as information exchange between Locations and Org.Units. We are also taking decisions on LL topics in our meetings. Therefore kindly ensure to read our meeting minutes and deliver your input/decisions upfront in a timely manner.
 Kindly prepare [your input regarding local/Org.Unit LL status beforehand](#) our meetings here in our OneNote [LL Manager Calls](#) ([Web view](#)). Thank you.
 Looking forward to a fruitful exchange on Lessons Learned.
 Mit freundlichen Grüßen / Best regards,
 Regina Lechner
 Program Manager Lessons Learned
 Quality Management System
 Lessons Learned Tool <https://link.vitesco.io/lessonlearned>
 E-Mail: LessonsLearned@vitesco.com

EL2 - #4 - Global Knowledge Transfer / Lessons Learned / Local Process

NCR/ 8D READ ACROSS PROCESS – SEGMENT/ PLANT LEVEL



- ⇒ 4M People Arrangement
- ⇒ After Break Alignment
- ⇒ End of Day Follow up



PLANT LEVEL GEMBA MANAGEMENT
Why? Leadership GROWTH & OBSTACLE REMOVAL

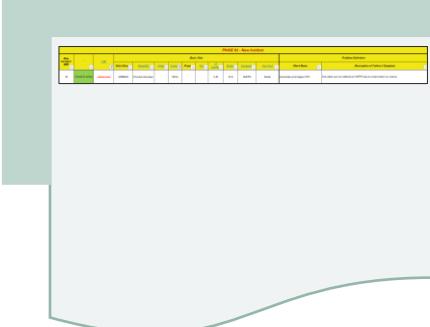
EL2 - #4 - Global Knowledge Transfer / Lessons Learned / Local Process

NCR/ 8D Read across process

A. ISSUE IDENTIFIED IN OTHER PLANT

**Issue identified in other plant:
e.g. Juarez issue (One cable
was not soldered on MAPPS due
to contamination on ceramic)**

**Issue addressed to the Brasov
team via email**



**Evaluation of the risk in Brasov
site from the interdepartmental
team: quality, process engineers,
production, maintenance.**

PHASE #2 - Initial Assessment							
Plant Teams (Name)				Preliminary - Plant Feedback Is location at Risk?			
BSV	DTM	CUS	WME	BSV	DTM	CUS	WME
Laura	Hasek & Böhmer	Christian	Lu Shen	No	RISK	RISK	RISK

Document the evaluation

**Upload the documents n
Yokoten data based**

Corrective Actions PCA			
Link Dortmund	Link Brasov	Link Juarez	Link Wuhu
Dortmund cross check	Brasov cross check	Juarez issue	Wuhu cross check

EL2 - #4 - Global Knowledge Transfer / Lessons Learned / Local Process

NCR/ 8D Read across process

B. ISSUE IDENTIFIED IN BRASOV PLANT

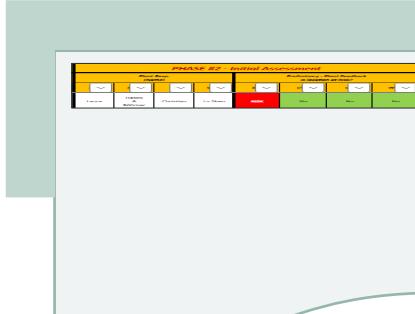
NCR is raised in Brasov Plant(BMW2, Damaged electric cable connector)



NCR presented in Yokoten meeting and based on the evaluation transferred in Yokoten data base

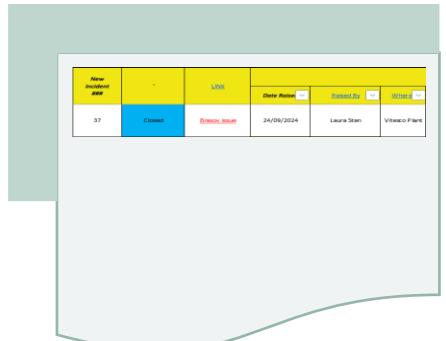
INTERNAL INCIDENTS								
#	Area	SOO	Severity	Severity Detail	Comments	Problems Description	Status	MECI Effects
1	BRASOV	Logistics	Low	Minor defect	No parts produced with this kind of defect	BMW-M5 Audit time filter damaged	Open	0
2	SIPump	SQH	Low	Minor defect	100% Surface	COPM 3L Audit Q3 Ring was bent on the plastic area	Component 1000 pieces -> 38 NOK	0
3	SIPump	SQH	Low	Minor defect	No parts produced with this kind of defect	BMW-M5 Audit time filter damaged	Open	0
4	SIPump	SQH	Low	Minor defect	No parts produced with this kind of defect	BMW-M5 Audit time filter damaged	Open	0
5	SEDFOM	FDM	Low	Minor defect	No parts produced with this kind of defect	FOM L102 M2B Electrical connector	No FOM produced with this kind of defect	0

Other plants evaluate the impact in their plant



Plants upload in the Yokoten data base their evaluation/ implementation of corrective actions

Topic is closed in Yokoten data based



Quarterly Management Meeting

Q - PERFORMANCE

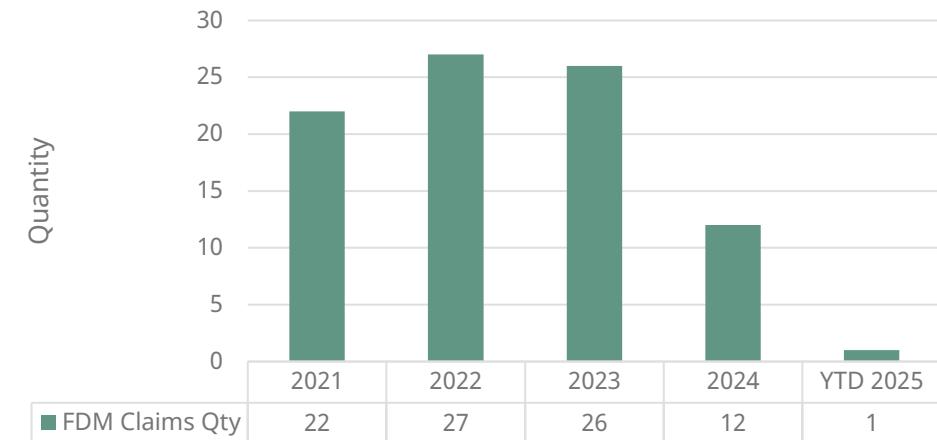
5

Q - PERFORMANCE - OVERVIEW CLAIMS FDM

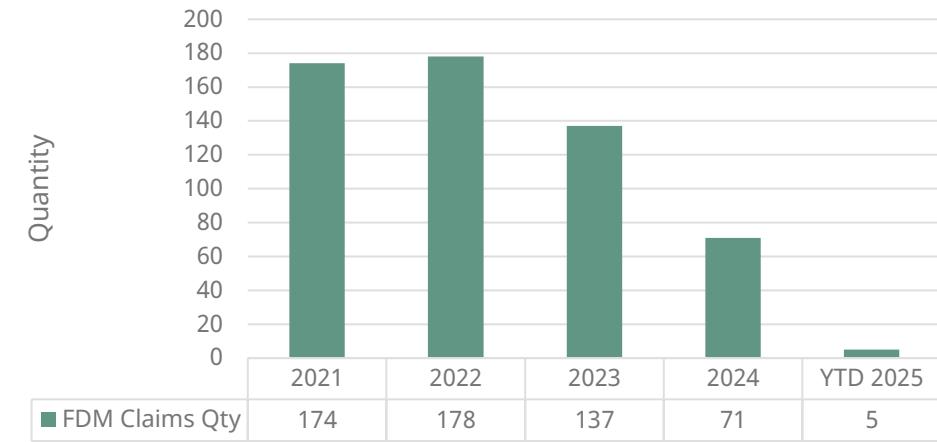
0 KM	0km Justified	0km Unjustified	0km In clarification	0km Total
2021	22	17	0	39
2022	27	11	0	38
2023	26	26	0	52
2024	12	6	0	18
YTD 2025	1	1	1	3
FIELD	Field Justified	Field Unjustified	Field In clarification	Field Total
2021	174	297	0	471
2022	178	279	0	457
2023	137	228	0	365
2024	71	255	0	326
YTD 2025	5	29	21	55

Remark: All received parts are going to analysis according to Test plan agreed with BMW for each individual project (GS 95004/ FFA)

FDM 0km Claims 2021 - YTD 17.03.2025



FDM Field Claims 2021 - YTD 17.03.2025

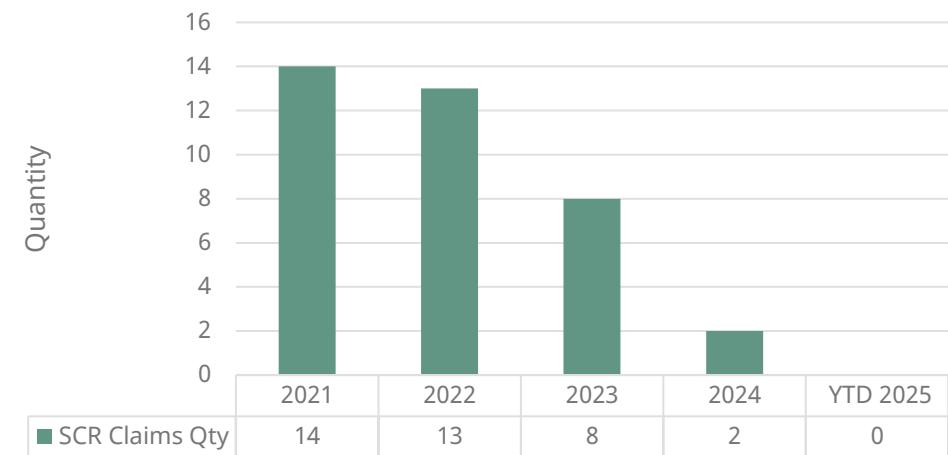


Q - PERFORMANCE - OVERVIEW CLAIMS SCR

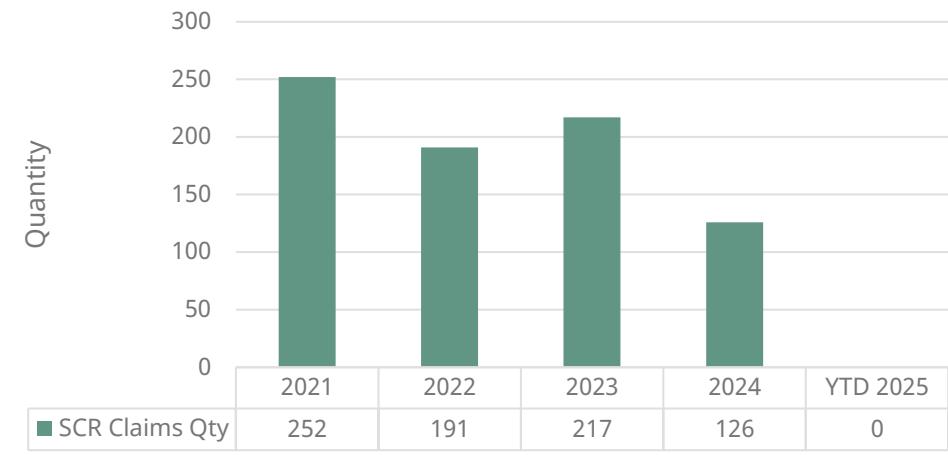
0 KM	0km Justified	0km Unjustified	0km In clarification	0km Total
2021	14	2	0	16
2022	13	6	0	19
2023	8	4	0	12
2024	2	7	0	9
YTD 2025	0	1	0	1
FIELD	Field Justified	Field Unjustified	Field In clarification	Field Total
2021	252	212	0	464
2022	191	153	0	344
2023	217	132	0	349
2024	126	212	130	468
YTD 2025	0	0	67	67

Remark: All received parts are going to analysis according to Test plan agreed with BMW for each individual project (GS 95004/ FFA)

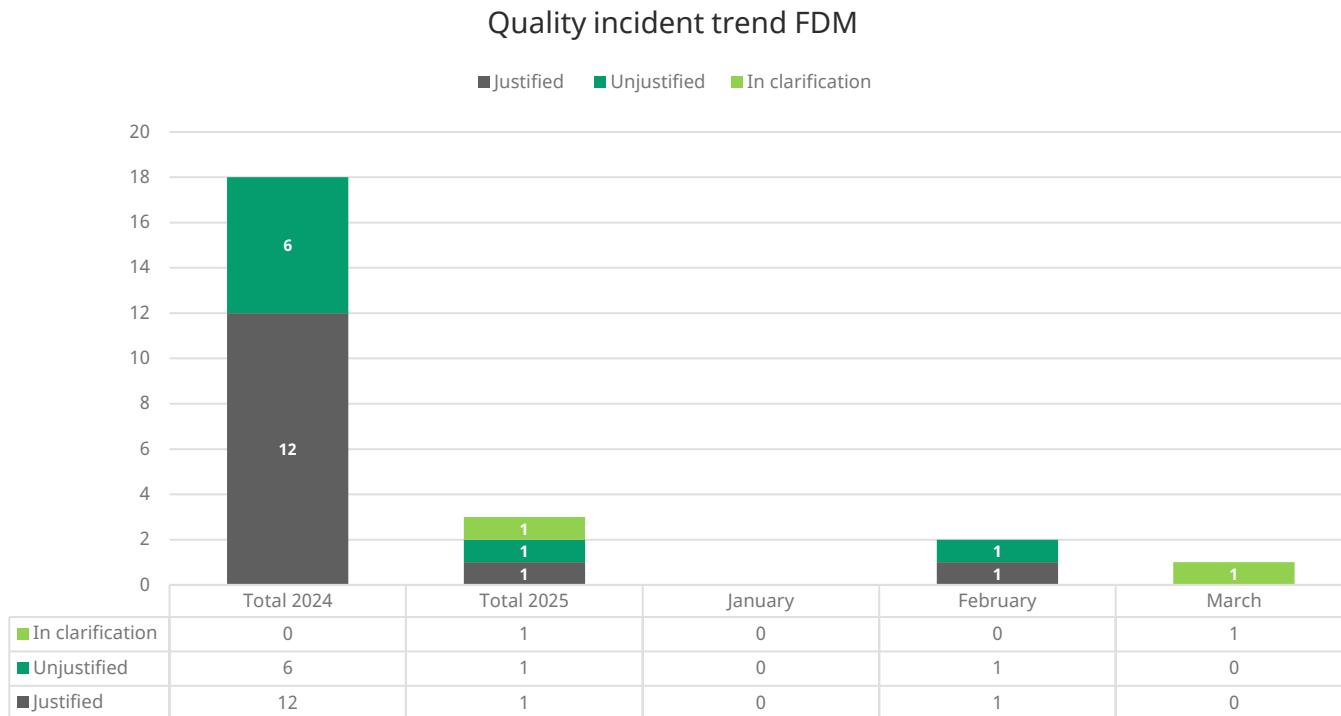
SCR 0km Claims 2021 - YTD 17.03.2025



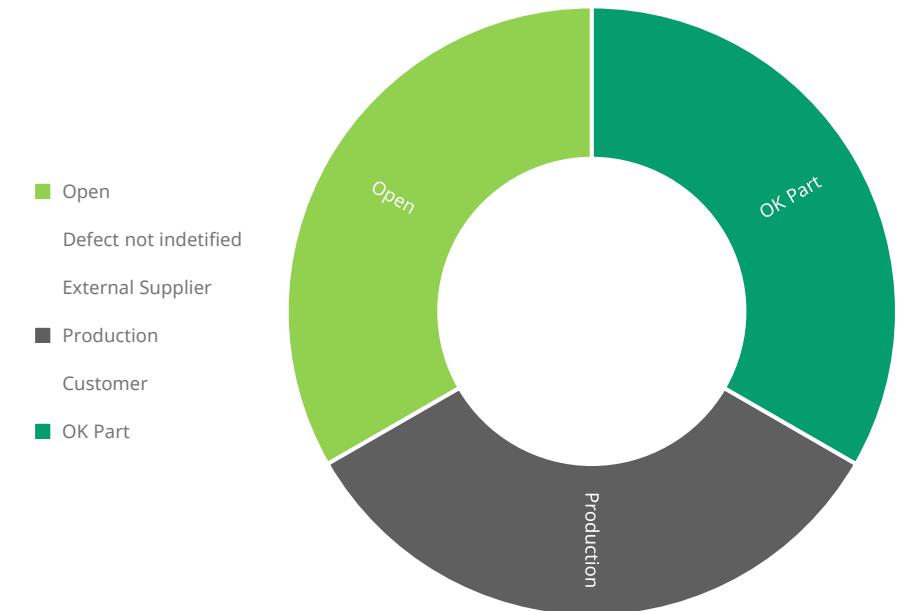
SCR Field Claims 2021 - YTD 17.03.2025



Q - PERFORMANCE - 0 KM COMPLAINTS FDM – 2024 - 2025 YTD MARCH



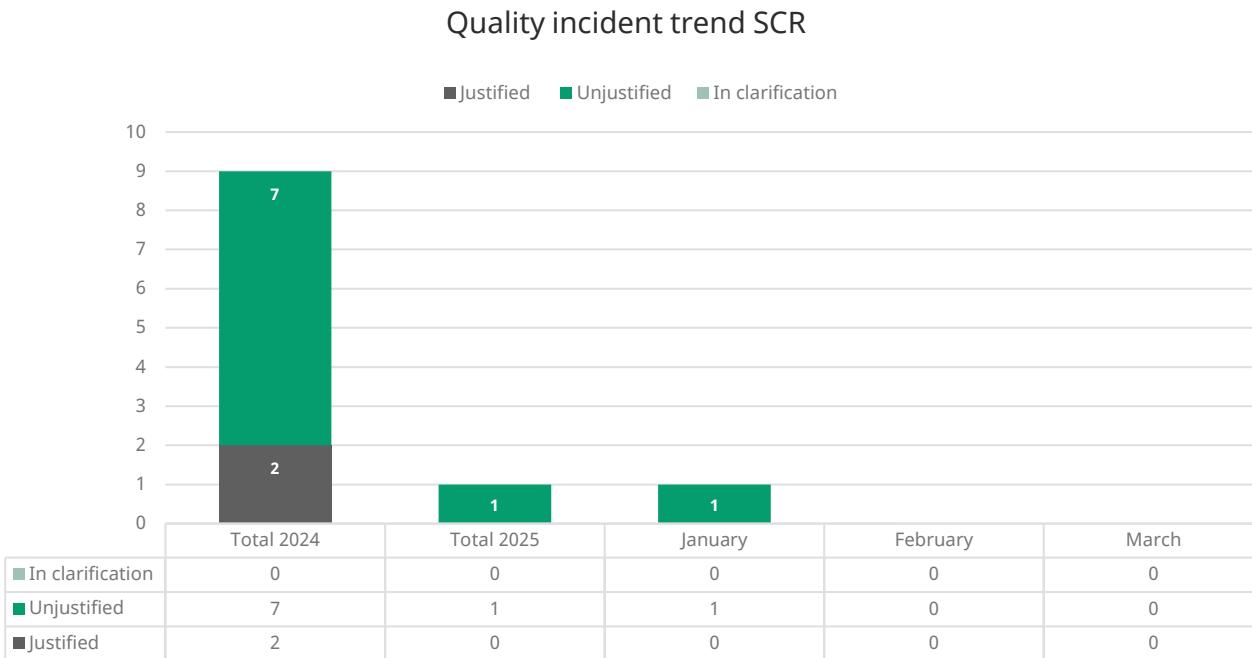
Incidents over SOD



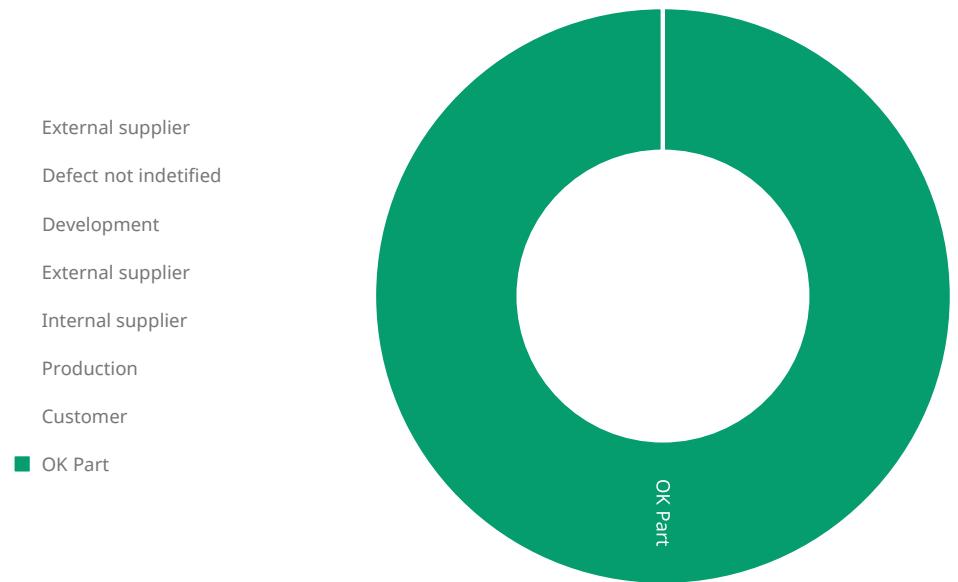
0Km quality incidents registered in 2025 for FDM - 3 ; incidents are divided into the following categories:

- **Justified - 34%**
 - Production - 1 incident -> 33%
- **Unjustified - 33%**
 - OK part - 1 incident -> 33%
- **In clarification - 33%**
 - Open - 1 incident -> 33%

Q - PERFORMANCE - 0 KM COMPLAINTS SCR – 2024 - 2025 YTD MARCH



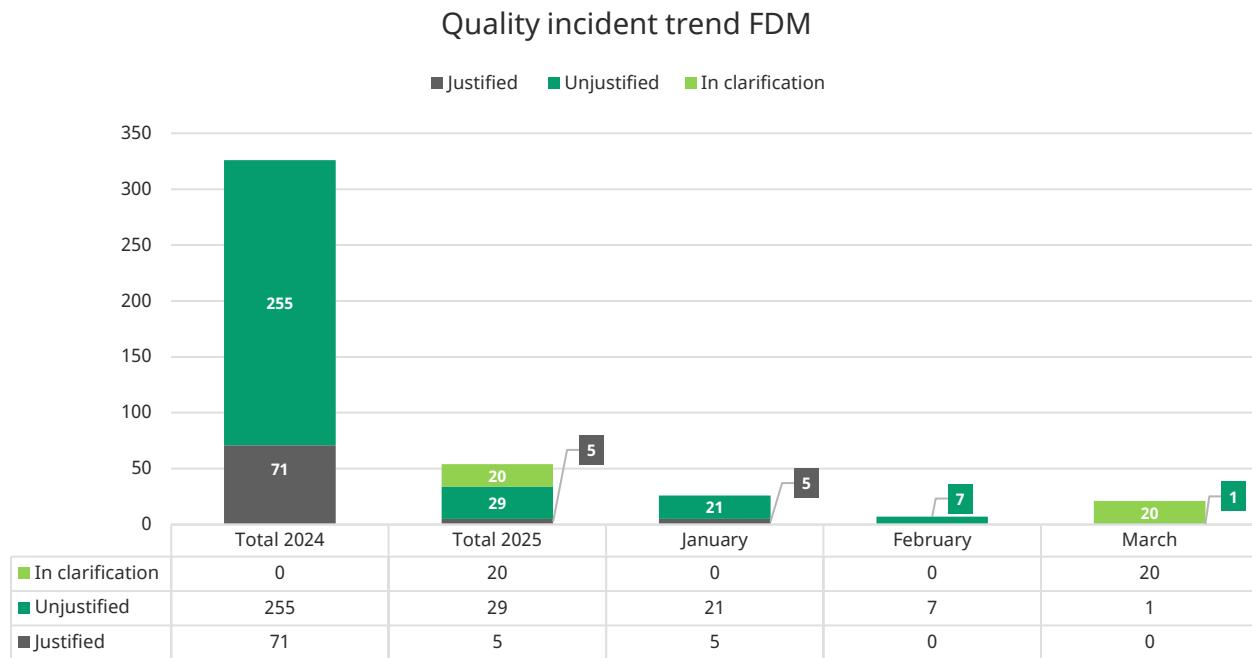
Incidents over SOD



1/ 0Km quality incident registered in 2025 for FDM; claims are divided into the following categories:

- **Unjustified - 100%**
 - OK part - 1 incident -> 100%

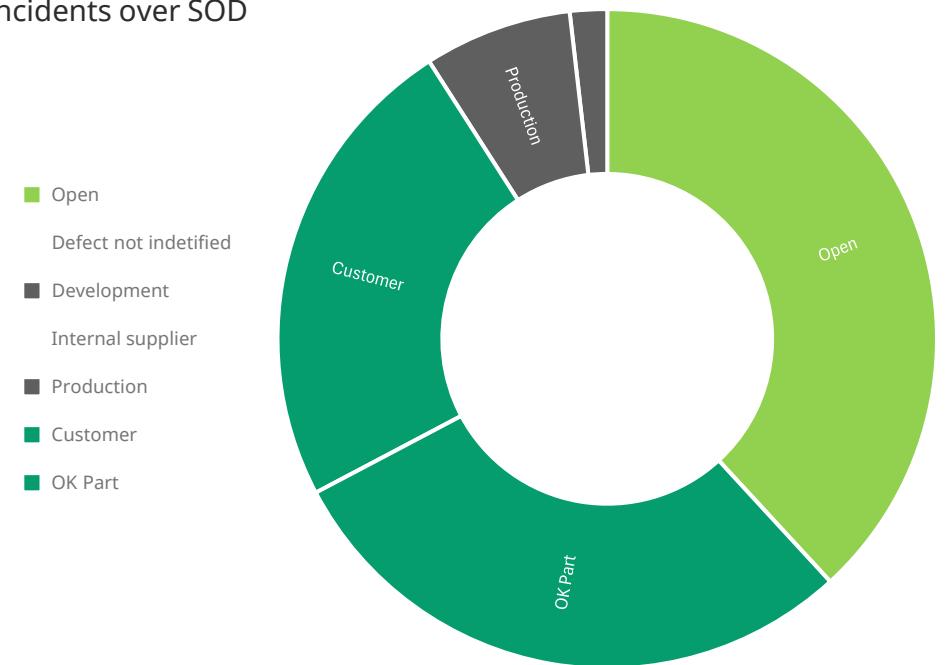
Q - PERFORMANCE - FIELD COMPLAINTS FDM – 2024 - 2025 YTD MARCH



55/Field quality incidents registered in 2025 for FDM; claims are divided into the following categories:

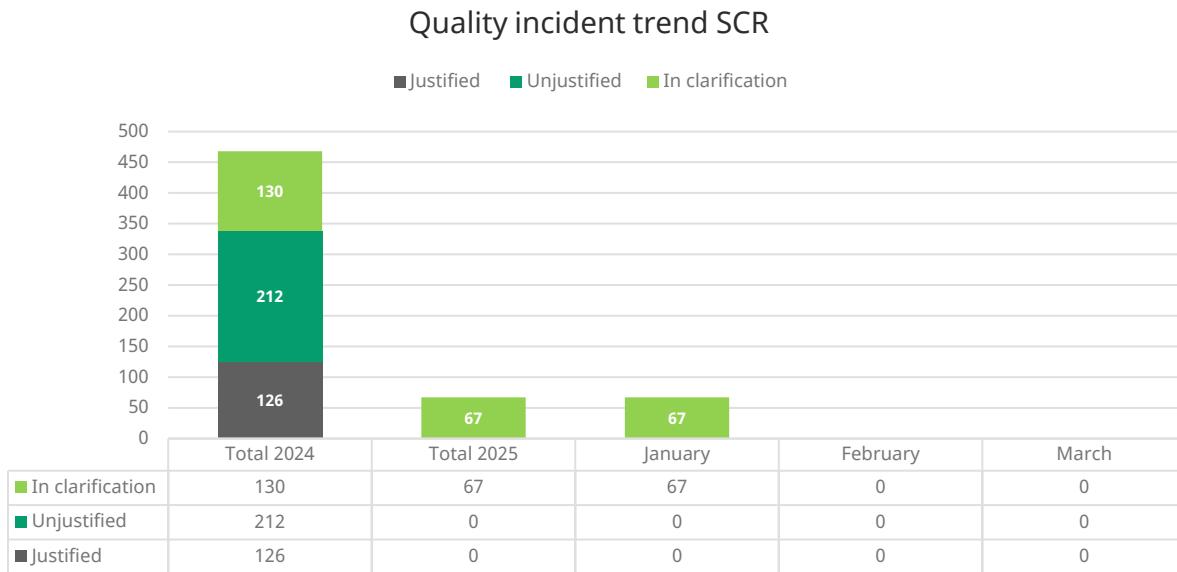
- Justified - 9%**
 - Production – 4 incidents -> 7%
 - Development – 1 incidents -> 2%

Incidents over SOD

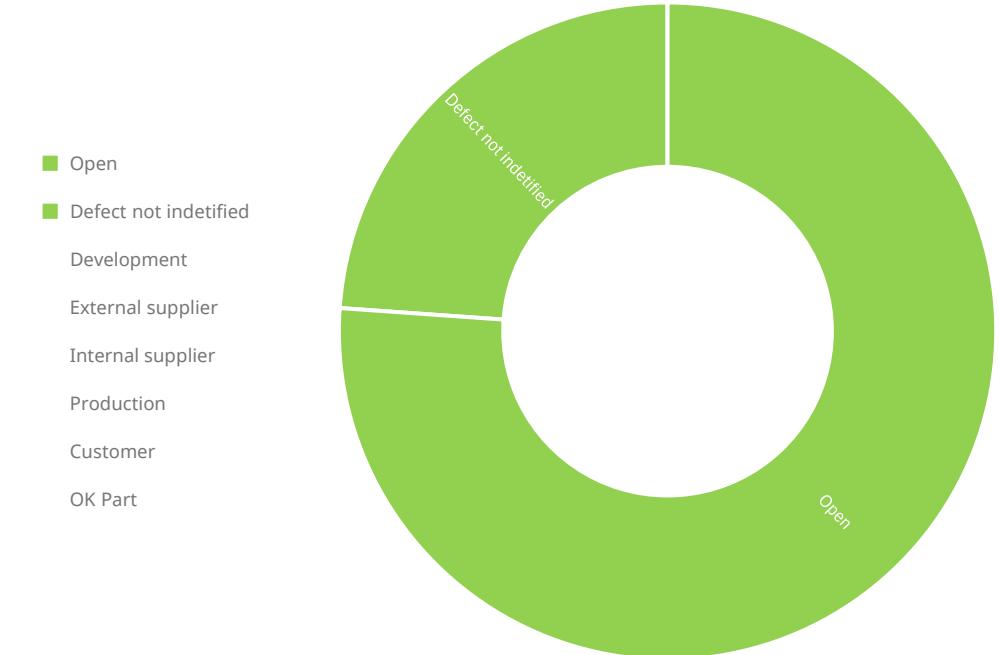


- Unjustified - 53%**
 - OK part - 16 incidents -> 29%
 - Customer - 13 incidents -> 24%
- In clarification - 38%**
 - Open - 21 incidents -> 38%

Q - PERFORMANCE - FIELD COMPLAINTS SCR - 2024 - 2025 YTD MARCH



Incidents over SOD

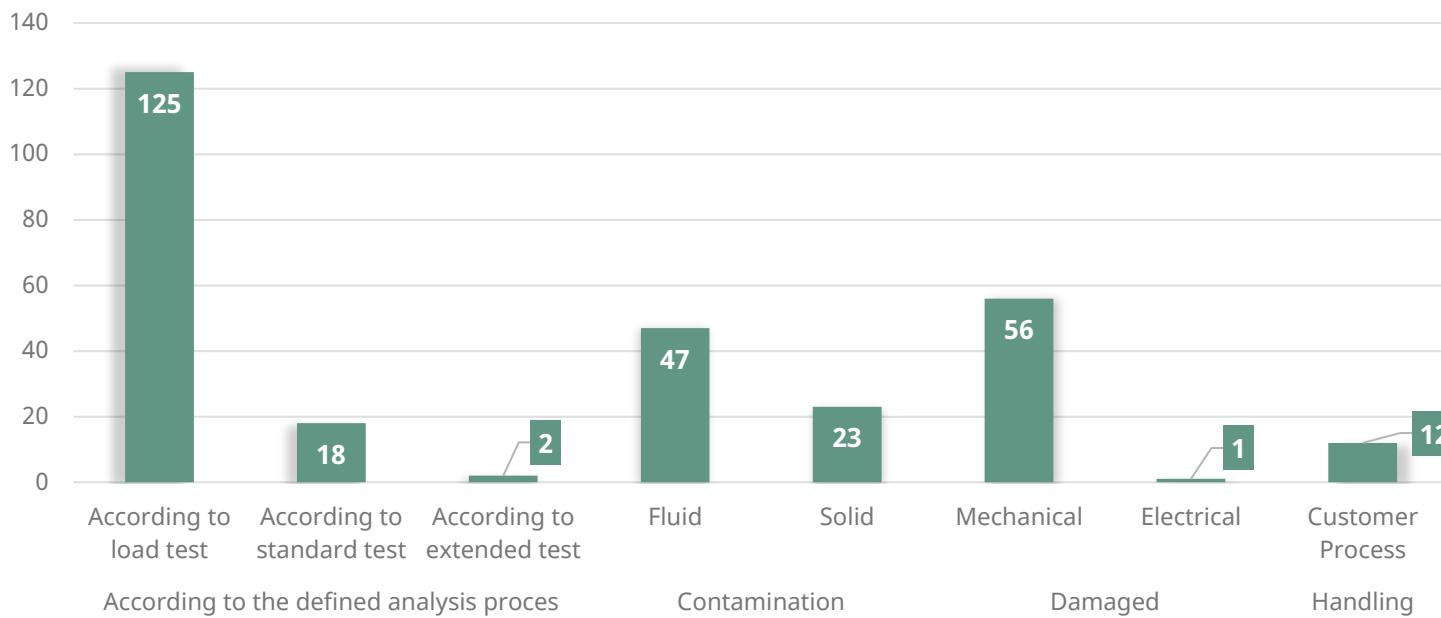


67/Field quality incidents registered in 2025 for SCR; claims are divided into the following categories:

- **In clarification - 100%**
 - Open - 51 incidents -> 76%
 - Defect not identified - 16 incidents -> 24%

Q - PERFORMANCE - FIELD COMPLAINTS FDM – 2024 - 2025 UNJUSTIFIED

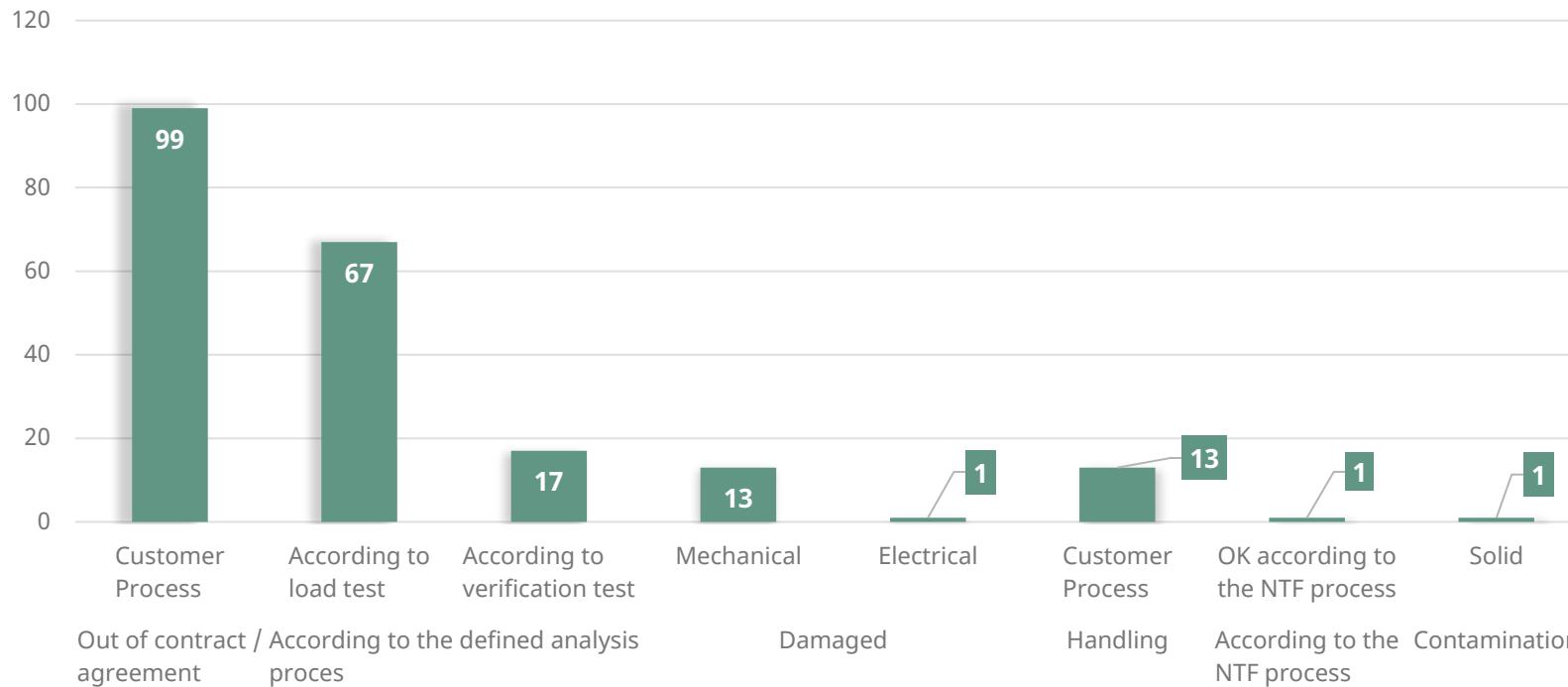
Field complaints top contributors for FDM



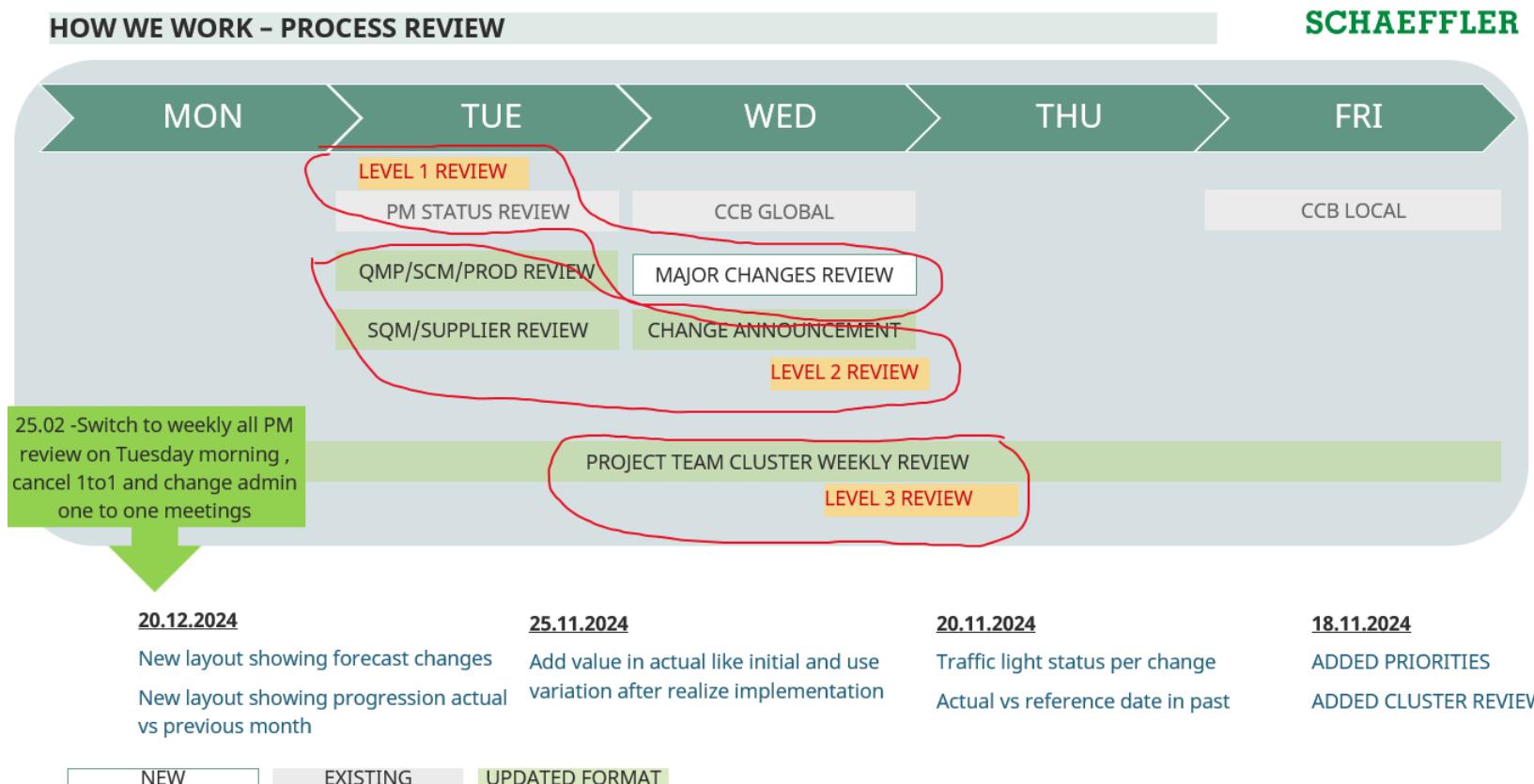
Decision	Count of C1_QN_NUMBER
According to the defined analysis process	30
According to load test	18
According to standard test	12
Contamination	21
Fluid	18
Solid	3
Damaged	19
Mechanical	19
Handling	1
Customer Process	1

Q - PERFORMANCE - FIELD COMPLAINTS SCR - 2024 - 2025 UNJUSTIFIED

Field complaints top contributors for SCR



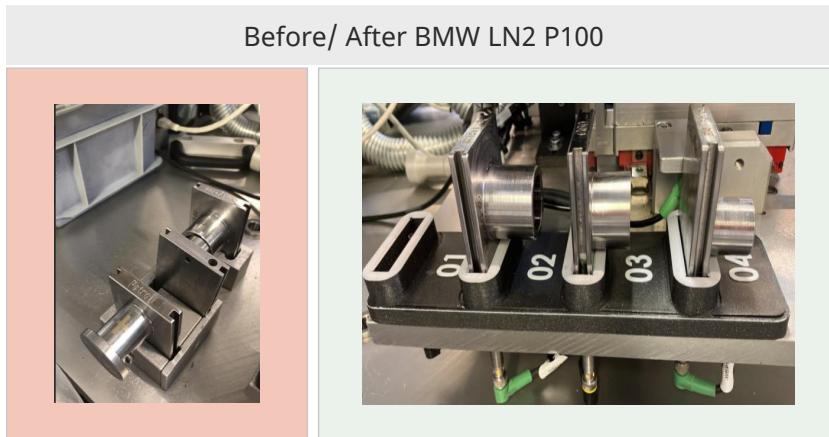
Decision	Count of C1_QN_NUMBER
Out of contract / agreement	99
Customer Process	99
According to the defined analysis process	84
According to load test	67
According to verification test	17
Damaged	14
Mechanical	13
Electrical	1
Handling	13
Customer Process	13
According to the NTF process	1
OK according to the NTF process	1
Contamination	1
Solid	1

CHANGE TRACKING SYSTEM**DATA ACCURACY MGMT**

- One entry point
- Double check on daily summary
- LEVEL 1 PM status update
- LEVEL 2 TEAM status update
- LEVEL 3 Cluster /Customer update

Q1 2025 PROGRAM

ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION



Implement new design for poka-yoke fixture
(assembly pump with the filter)

Area	Number of improvement actions identified	Update documentation	Poka-Yoke design	Master samples
FDM	25	0	5	20
SCR	2	2	0	0
Components & Molding	38	28	6	4
Total	65	23	11	22

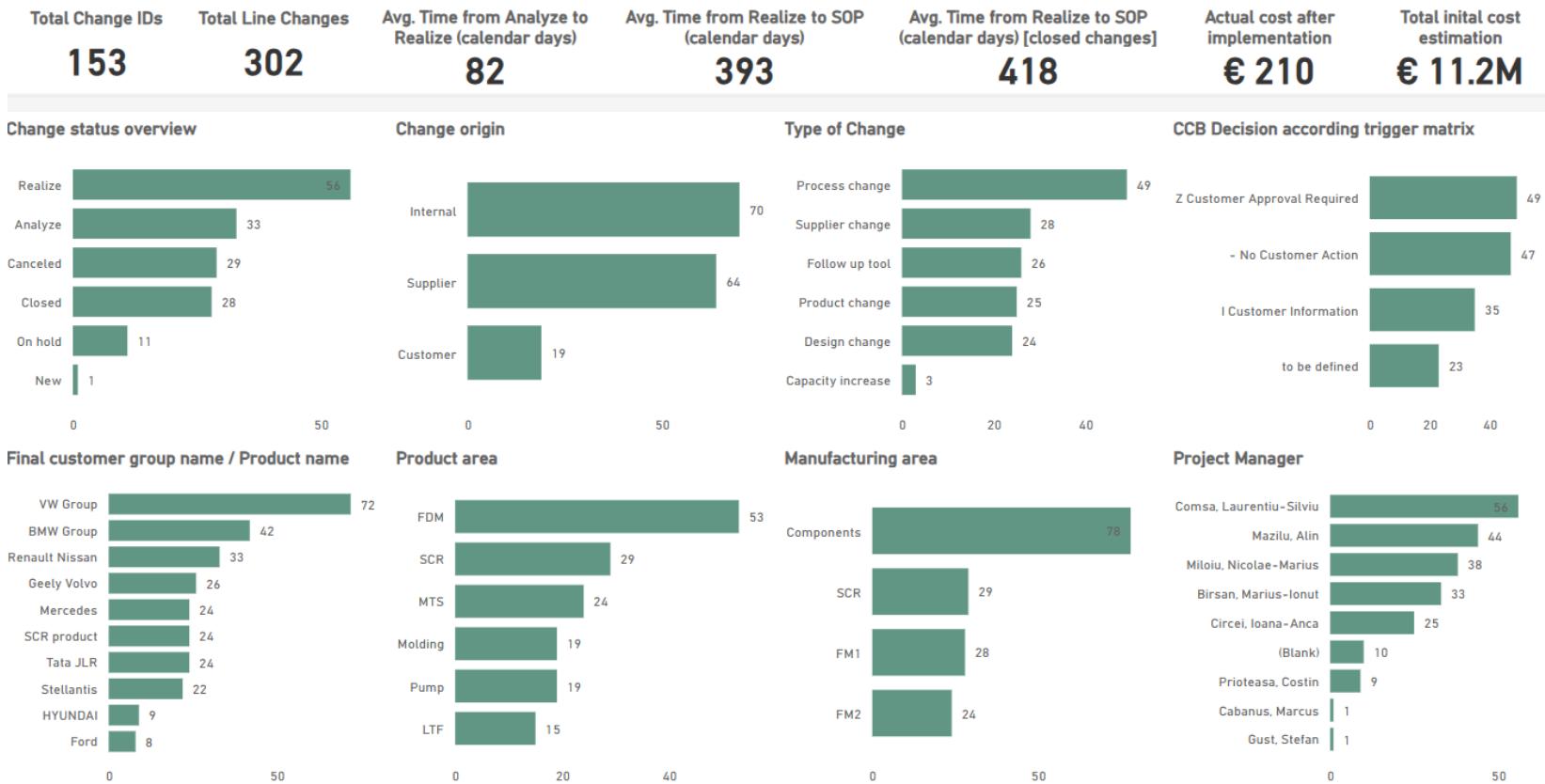
Establish Global Team	Best Practice Reverse Poka Yoke	Training of Standard VT 0608010	Implementation of Poka Yoke Management	Improvement & Deployment Tracking	Lessons Learned to all plants
<ul style="list-style-type: none"> ✓ Establishment of Global cross functional team. ✓	<ul style="list-style-type: none"> ✓ Share of experiences & knowledge from other locations (Juarez & HQ). ✓ How & why to classify. ✓ Master Part Management. ✓ Poka Yoke Lists per area and production line. ✓ Poka Yoke sticker/ marking on the lines. ✓	<ul style="list-style-type: none"> ✓ Review, update and the local standard. ✓ How & why to classify. ✓ Master Part Management. ✓ Recording of all Poka Yokes incl. its classification. ✓ Review of Poka-yoke with master parts. ✓ Filling Lists and marking of the Poka Yokes. ✓ Recoding improvement ITEM's. O	<ul style="list-style-type: none"> ✓ Implement improvements. ✓ Prepare usage as living standard. O	<ul style="list-style-type: none"> ✓ Global transfer of activities & results. ✓ Establishment of sustainable and living standard. P	

Summary:

- Improvement actions identified 65 ITEM's; 21% from them closed

MANAGEMENT STATUS REVIEW MARCH 2025

Change Status Overview FMM



DATA SUMMARY

- 58% status analyze & realize
- 18% Completed
- 18% cancelled
- 42% supplier (PTN/PCN)
- 48% internal (line changes/layouts)
- 54% with customer involvement
- 50% Components related 50% assembly

Q1 2025 PROGRAM

ROADMAP FOR SYSTEMIC IMPROVEMENTS ACTION IMPLEMENTATION

