

55th EOQ Congress
World Quality Congress
Budapest, Hungary - June 20-23, 2011

"Navigating Global Quality in a New Era"



June 21, 2011 (Tuesday) 55th EOQ Congress

CONCURRENT SESSIONS
KEMPINSKI HOTEL CORVINUS

Tuesday 13:30 – 17:30
Erzsébet tér 7-8, Budapest V.

REGINA BALLROOM II.

Tuesday 13:30 – 15:00

11.1. REPOSITIONING QUALITY FOR MANUFACTURING I.

13:30 – 15:00

Session Chair: *Hans Dieter Seghezzi, University St. Gallen, Switzerland*

13.30 Quality First – Zero Defect Strategy

Willfried Heist, Knorr-Bremse Systeme für Nutzfahrzeuge GmbH, Germany

Heist, Willfried (Germany)

Willfried Heist is Vice President of Group Quality, Product Safety and HSE (Health & Safety Executive) Management and authorized representative at KNORR-BREMSE Systeme für Nutzfahrzeuge GmbH in Munich, Germany since 1997. Before that he was Head of Quality at Fichtel & Sachs AG, Chassis Division; at Zeppelin Metallwerke GmbH and Manager Quality Management at Daimler Benz AG in Germany and Overseas. Willfried Heist has comprehensive experience in creation, realization and further development of Quality Management and Product Safety Systems and QM/Product Safety Strategies.

Quality First – Zero Defect Strategy



June, 2011

Content

Introduction Knorr-Bremse

Q-Strategy

Roadmap

Product Safety Audits

Q-First KB-Maturity Model

Content

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Q-Strategy

Roadmap

Product Safety Audits

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Answers for a World of Mobility

Knorr-Bremse is the world's leading manufacturer of braking systems for rail and commercial vehicles



Rail Vehicle Systems

- Metros
- Streetcars
- Multiple units
- High-speed trains
- Locomotives
- Passenger rail cars
- Freight cars

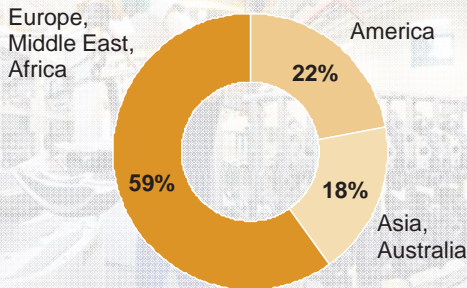
Commercial Vehicles

- Trucks
- Buses
- Engines
- Special vehicles



Workforce acc. to divisions and regions

Workforce distribution 2009 *



	2008	2009
Knorr-Bremse Group	14,999	14,432
Rail Vehicle Systems	7,688	8,256
Commercial Vehicle Systems	7,160	6,014

* Deviation from 100% results from rounding

Quality Policy

Quality Is A Core Value and Product Safety is a critical success factor with Individual Responsibility And Ownership being Essential!

Quality is a Core Value!

- We are committed to continuously advance the quality of our products and services.
- We are a customer driven company providing the most beneficial solutions for our customers.
- We work with the conviction to combine all resources to the effectiveness of our products and services.

Product Safety is a Critical Success Factor!

- We strive to design and produce products with Zero Defects through the entire supply chain, becoming the benchmark in quality and product safety .
- We are committed to be the technology and market leader for product safety over the full product life cycle.
- We develop and provide products that enable our customers to operate vehicles safely to protect human life.

Responsibility and ownership are essential!

- We accept that the responsibility and ownership for quality and product safety rests collectively with each and everyone one of us.
- We gain from individual knowledge, experience, and competencies across global businesses and cultures.



Quality Management

Without safety no Knorr-Bremse

Also slight carelessness at the supplier, at development or production which are not detected will challenge the success of Knorr-Bremse.

No safety without Quality

As manufacturer of safety systems for commercial vehicles and rail it is our obligation to deliver high standard products.



Quality – its in your hand

Our Way – Zero Defect

Content

Introduction Knorr-Bremse

Q-Strategy


Roadmap

Product Safety Audits

Q-First KB-Maturity Model



Become worldwide Benchmark in Quality and Product Safety

	Strategic Focus
<p>Global</p> 	<ul style="list-style-type: none"> ▪ Establish “Zero Defect & Product Safety” awareness in the whole CVS group and through all layers ▪ Ensure that within our new ventures, JV and LCC operations the same high Quality and Product Safety rules are applied ▪ Fully satisfy our customers by ensuring the reliability of our products in the field through systematic warranty analysis & integrating problem solving process and lessons learned. ▪ Reinforce our preventive Quality and Product Safety strategy by strictly following the PDC-APQP process throughout the complete CVS group and supply chain ▪ Execute global management system (KE CVS) ▪ Execute supplier quality management, with preventive quality planning and LCC supplier development ▪ Don’t repeat mistakes: Further implementation of the Problem Solving process and Claim Handling Process with a lessons learned, proactive/preventative approach supported by SIX SIGMA methodology ▪ Support BRIC locations during the implementation of KB standards



Worldwide Benchmark in Quality and Product Safety

<p>Management</p> <p>Consequent focus on product safety and progress controlling</p>	<p>Field actions</p> 	<p>Zero mileage</p> 	<p>People</p> <p>Strengthen the "Zero Defect & Product Safety" awareness in the whole group</p>
<p>Design</p> <p>Focus on preventive action in Engineering, robust design and Reliability Management</p>	<p>Customer satisfaction index</p> 	<p>Rate of Quality</p> 	<p>Supplier</p> <p>Dramatic improvement of supplier quality w/ preventive quality planning, LCC supplier development</p>
<p>Customer</p> <p>Global Application of the Problem Solving Process & Lessons learned</p>	<p>Warranty costs</p> 	<p>Supplier ppm: Ready to assembly</p> 	<p>Production</p> <p>Zero Defect Production throughout the whole supply chain</p>



Content

Introduction Knorr-Bremse

Q-Strategy

Roadmap

Product Safety Audits

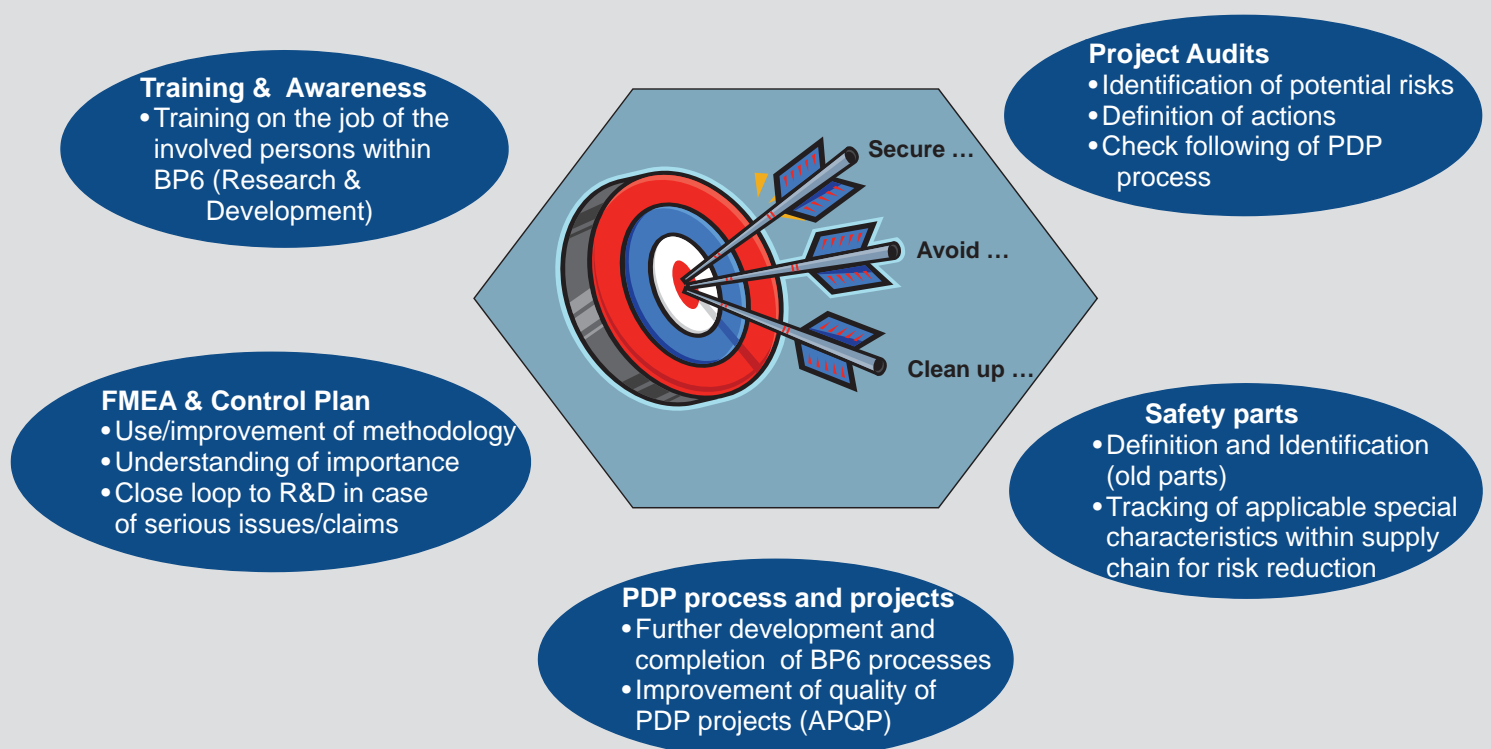
Q-First KB-Maturity Model



Bloc Management

		Responsible
1	World-wide realization of the PSA audits	<ul style="list-style-type: none"> According to Board released planning New audits and Re-Audits Central Quality Board
2	Regular Q-Review and Tracking of Main Q-Projects & Actions	<ul style="list-style-type: none"> Regular Follow up in Management Quality reviews Paretos Stringent follow up of actions Central Quality Locations CoCs
3	Regular control of Q-First by the Steering Committee	<ul style="list-style-type: none"> Q-First Steering Committee Meetings every 8 weeks Board
4	Execution of the new CVS Quality Policy within Q-First	<ul style="list-style-type: none"> Roll out and Communication campaign Training of the new policy Q-First promotion material Central Quality Communication Locations CoCs
5	Q-First KB Maturity Model	<ul style="list-style-type: none"> Carry out of Q-First Assessments in Locations Deployment of actions Central Quality
6	Standardization of Lessons Learned?	<ul style="list-style-type: none"> Data Base for Lessons Learned Roll out of identified Lessons Learned Central Quality T/BZ Locations CoCs?

5 Mains aspects to drive the achievement of Q-First Design targets



Supplier Excellence Structure

Global Supplier Excellence

Process & Contract Management	Quality Development	Risk Management	Trainings	Supplier Reduction
<ul style="list-style-type: none"> Purchasing Processes SPP 4.4.1, 4.4.2, 4.4.3 - KE, PDC integration, Change process Contracts General Contracts plus add-on modules, and XL Liability Insurance Target Agreement Track the current Target Agreement with suppliers 	<ul style="list-style-type: none"> New QMPP 2008 Compliance Evaluat., Feasibility Agreement Classification Quality Perf. (QP) Delivery Perf. (DP) Productivity Perf. (PP) PAVE 1: Claim Mt. regular claim management by SQD PAVE 2: Imp. Proj. improvement plan needed Audits VDA6.3, project PSA 	<ul style="list-style-type: none"> Selected Safety Suppliers Follow up results under 50%, QMPP Compl. Evaluation Financial Risk Management Purchasing Risk Evaluation (PRE), D&B and Schneck Rating PAVE 3: High Risk Management Not capable suppliers, Not feasible parts 	<ul style="list-style-type: none"> Supplier trainings yearly training plan per location 	<ul style="list-style-type: none"> Outsourcing C-part Management due to low volume Phase Out projects due to low volume due to PAVE 3 status due to performance due to financial risk
% signature rates of Q-contracts	Supplier PPM (raw & rfa)	Supplier audits plan fulfillment	Supplier training plan fulfillment	# of suppliers
Review by KPI system, Steering structure				
Communication via integrated Database, PARIS and SourcingParts (SIS)				



Content

Introduction Knorr-Bremse

Q-Strategy

Roadmap

Product Safety Audits

Q-First KB-Maturity Model



Well structured approach to product safety in 4 elements...

Safety management

- Clear documentation of product safety requirements
- Intensive training of employees
- Carry out of product safety audits to identify risks and systematically deploy actions incl. stringent follow up
- 8D approach + risk analysis in case of safety related issue/claims
- Collection, analysis, monitoring of information about product safety issue/claims

Manufacturing & assembly

- Clear identification and visualization of s/c and c/c on production documents
- robust assembly & manufacturing process with strong technical securing on s/c and c/c characteristics (e. g. by Poka Yoke)
- monitoring of s/c and c/c during production
- process capabilities

Product & process development

- Identification & deployment of s/c and c/c parts during design
- Robust product design
- Consistent validation during design (DVP)
- Focus on reliability
- Use of tools and methods (PDP, APQP, FMEA's, Design Reviews etc.)
- Regular agreement with customers

Supplier Chain Management

- Product Safety audits at selected suppliers with consequent follow up of actions and regular feedback reviews
- identification and development of safety parts suppliers
- systematical approval of safety parts suppliers (PPAP, level 3, on site sign off)
- „safety guidelines agreement“ for suppliers



Cross functional PSA helps to identify risks systematically



- Improvement of PSA Scoring results over the year
- Exchange of experience and reciprocal learning
- Increase of KB product safety awareness worldwide

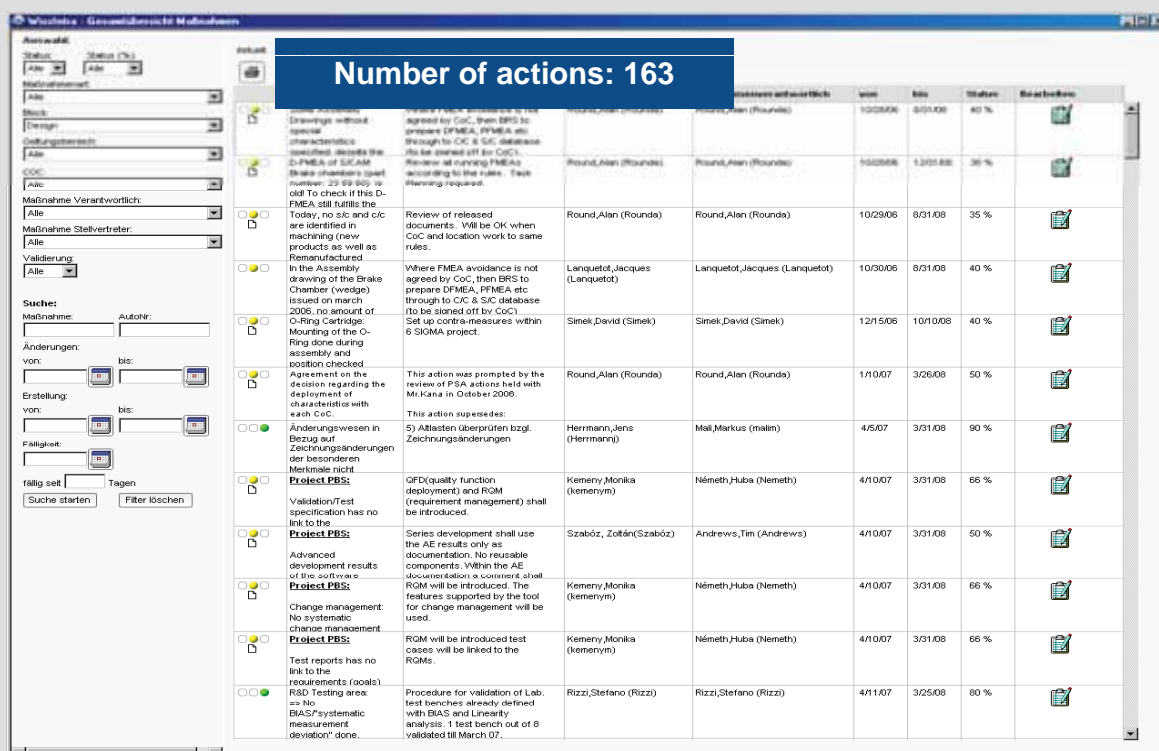
- Cross functional teams with product experts
- Integration of the functional Safety Management (FSM) according to the IEC 61508
- Deployment of standards
- Derivation of main projects



A tool with escalation level and lessons learned for all locations helps to monitor necessary actions...



... and to define a clear structured list to manage actions!



Content

Introduction Knorr-Bremse

Q-Strategy

Roadmap

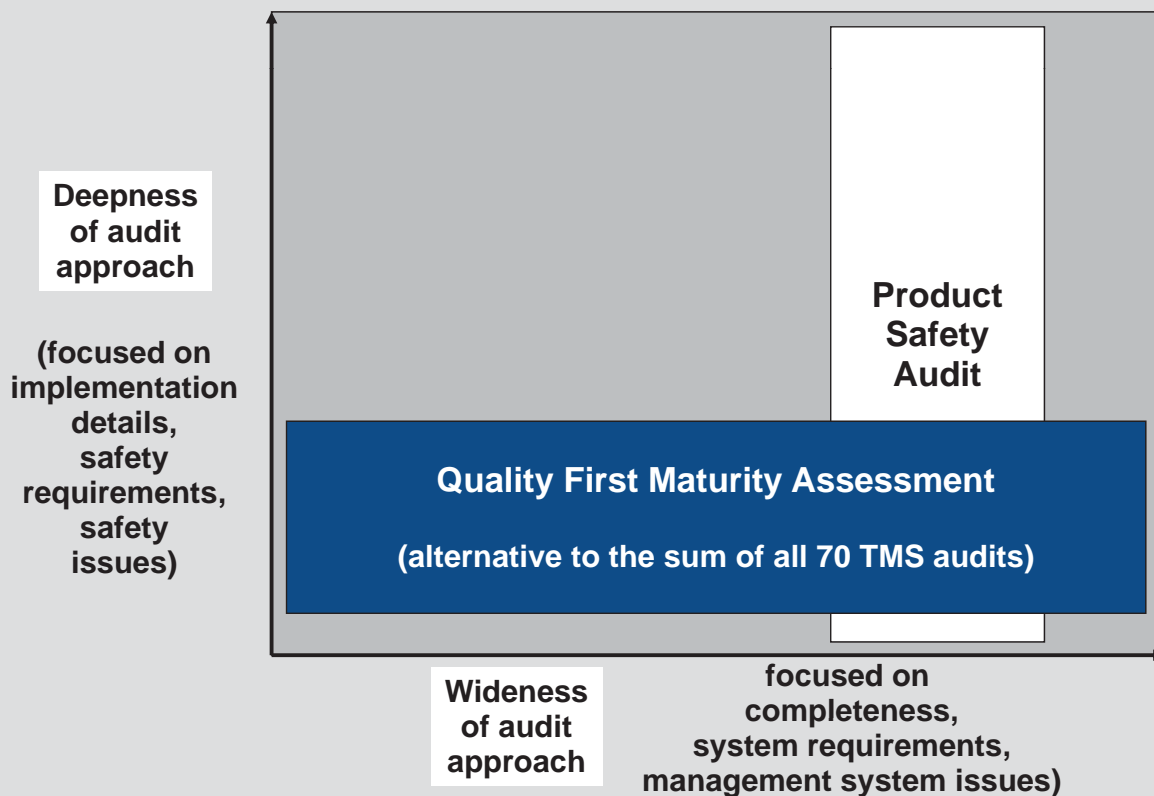
Product Safety Audits

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Q-First Maturity Model

Focus of Q-First Maturity Assessment vs. Product Safety Audit



Quality First Maturity Model - complete overview

Management	People	Design	Supplier	Production	Customer
Management Responsibility	Competency Management	Design & Development Planning	Supplier Quality Management	Control of Production & Control Plan	Review of Product Requirements
Management Review	Special Knowledge	Design & Development Input	Purchasing Information	Validation & Monitoring of Processes	Corrective & Preventive Actions
Management System	Product Safety Awareness	Design & Development Output	Incoming Product Conformity	Logistics & Inventory	Rejected Product Analysis
Internal Audits	Employee Motivation & Empowerment	Design & Development Review	Supplier Risk Management	Production System	Customer Feedback
Continuous Improvement	Work Environment	Design & Development Changes	Supplier Monitoring	Measuring & Production Equipment	Intercompany Claim Management



Quality First Maturity Model - 20 areas to assess

Management	Area	Area	Area	Area
Management Responsibility	Product Safety Policy & Q-First Roadmap	Target Deployment & Review	Product Safety Responsibility	Product Safety Communication
Management Review	Quality Performance Reviews	Process Management Reviews	Risk Analysis	Quality First Action Database
Management System	Process Management	Audit & Review Planning	Document & Records Control	PROGRESS
Internal Audits	Product Safety Audits	Project Audits	VDA 6.3 Process Audits	VDA 6.5 Product Audits
Continuous Improvement	Six Sigma	Kaizen Teams	FTF Reduction	Statistical Methods



Quality First Maturity Model - Maturity Levels

Maturity Level	Deployment & Requirements	Reviews & Improvement	Performance & Effectiveness
Not Applicable	Deployment is not applicable to the assessed unit.	Reviews are not applicable to the assessed unit.	Performance measurements are not applicable to the assessed unit.
Not Started	No evidence of deployment. The practice is not found or not yet started.	No reviews or poor monitoring. No action planning.	No effectiveness measurements or poor performance. No targets or objectives.
Baseline	Deployment of process. Risk that TS 16949/Customer requirements are not fulfilled.	Process reviews or monitoring. Risks out of missing action plan or of actions behind schedule.	Low effectiveness. Targets or objectives not achieved. Risk of customer claims.
Improving	Deployment of process. Requirements are fulfilled. Improvement necessary.	Review of process deployment. Improvement Plan is defined. Actions are on track.	Effectiveness measurements or performance indicators show improvement.
Succeeding	Deployment of process as proven practice and requirements are fulfilled.	Review of process deployment. Improvement Plan is defined. Actions are implemented.	Performance and effectiveness show improvement and targets are achieved.



Operative deepness of analysis supported through 9 How

	Deployment & Requirement		
How we have it defined?	Approach & Documents		
How we fulfill the TS 16949 requirements?	Requirements Fulfillment		
How we practice the process?		Process Deployment	

process documents

requirement matrix

evidence of implementation

	Reviews & Improvement		
How we review?	Review & Monitoring		
How we deploy actions?	Action Plan Definition		
How we execute the defined actions?		Action Plan Execution	

frequency and meeting minutes

action planning, schedules

timely action follow-up

	Performance & Effectiveness		
How we observe effectiveness?	Effectiveness Measurements		
How we perform?	Performance Measurements		
How we achieve the targets?		Target Achievement	

any figure or performance indicator

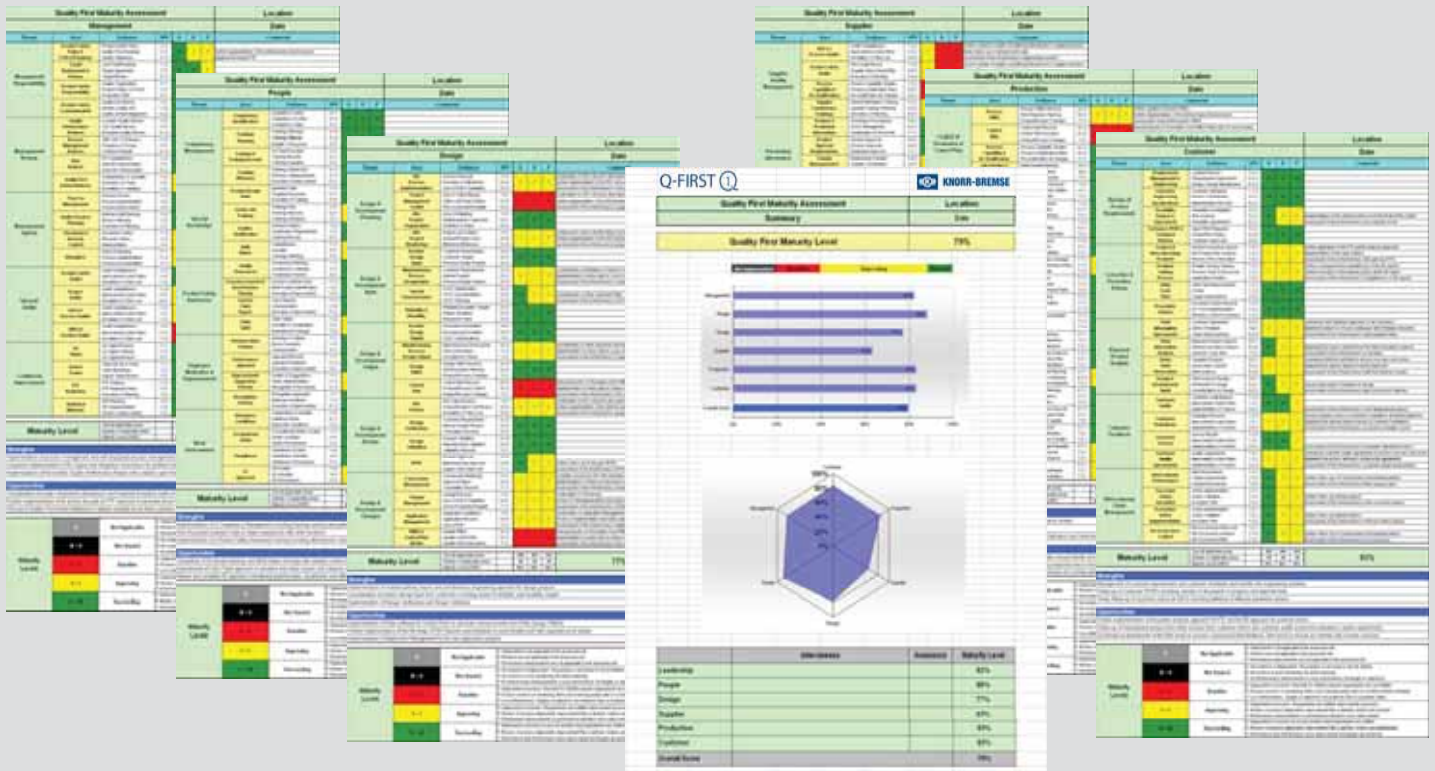
performance over the time

targets set and targets met

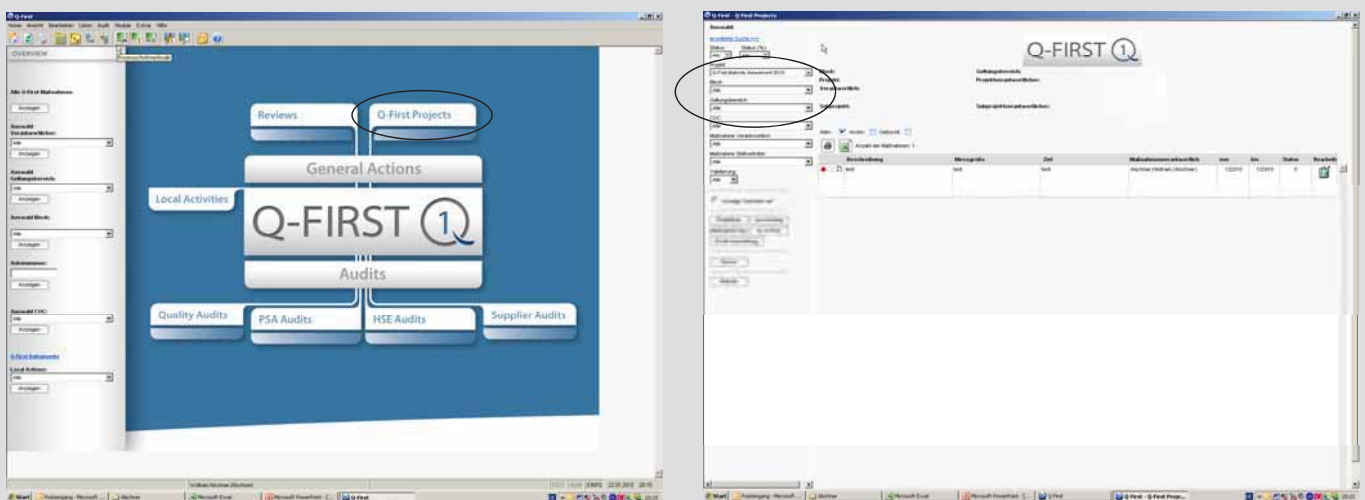
▪ For each of the 140 areas the P-D-C-A cycle is checked to identify risks of low performance



Assessment Notes for the 6 blocs of Quality First Maturity Model



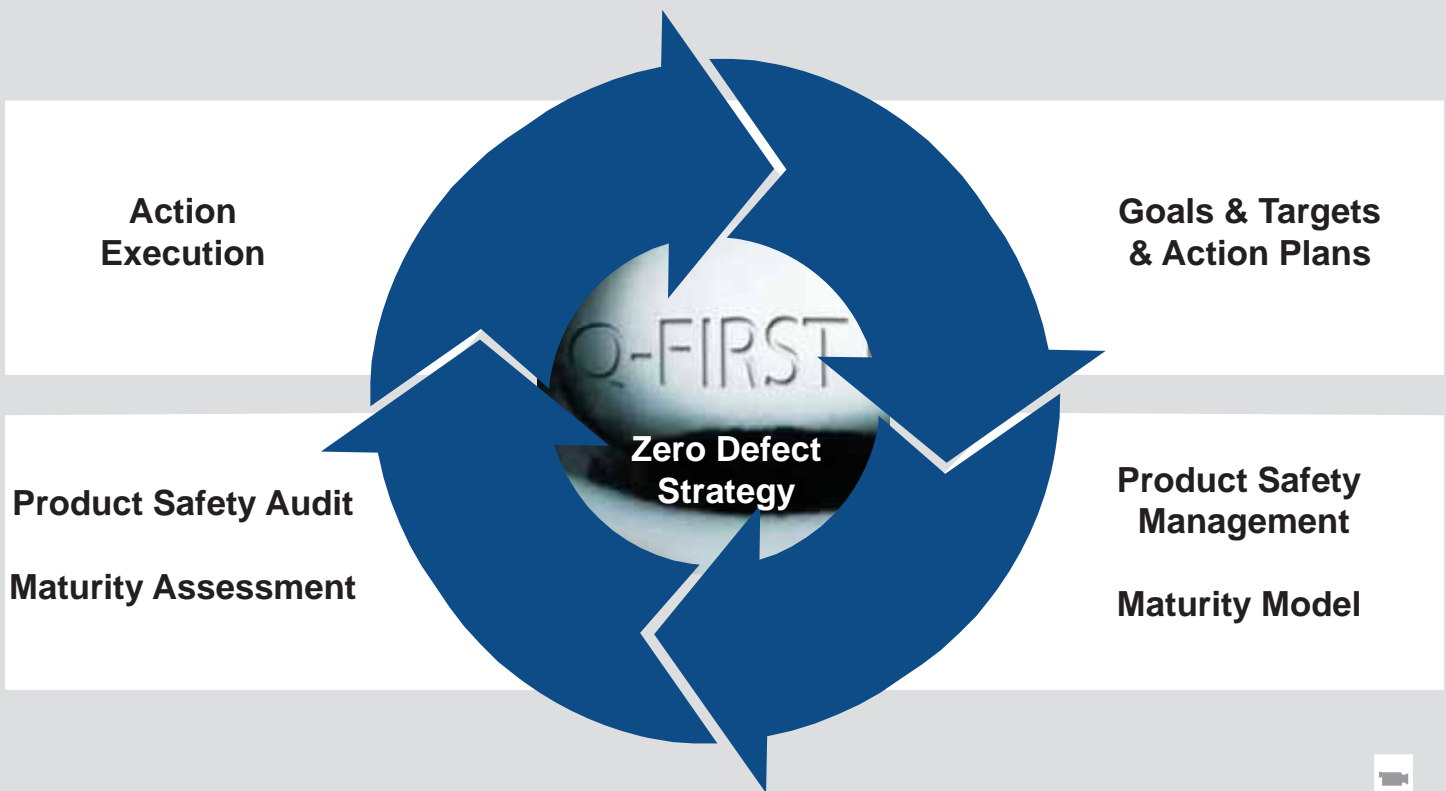
Follow-up of actions at the Q-First Action Database



The identified 18 improvement opportunities at each location will be followed-up at the Quality First Action Database.

Actions will be stored under "Other Audits + Location + Bloc"

Continuous Improvement of Q-First



Future perspectives

KE brings together ten Group-wide campaigns aimed at process optimization



- Q-FIRST ** **Quality First:** Measures to implement the “zero defects” principle
- SCE ** **Supply Chain Excellence:** optimization of the entire chain from suppliers to customers
- COPE ** **Competence in Product Engineering:** Standardization of product development processes worldwide
- KPS ** **Knorr-Bremse Production System:** standardized processes across the global production network
- GPE ** **Global Purchasing Excellence:** Supplier management
- gps ** **Global Project Management System:** Optimizing project management
- PROGRESS ** **Progress:** introduction of SAP at all sites
- PEX ** **People Excellence:** Implementation of HR roadmap and further development of leadership culture
- ECCO₂ ** **Efficient Cut of CO₂:** Campaign to conserve energy and resources
- FIT ** **Finance & IT Excellence:** Development of „best in class“ finance and IT organization and processes



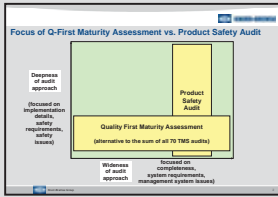
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Backup



Quality First Maturity Assessment to review Q-First and TEX implementation



1. Decision to replace Business Process Audits (1998-2009) through QFMA
 - 50% resources saving to do the audits
 - complete system audit within 3 days
 - merge of TEX and Quality First initiative

2. Quality First Maturity Assessment at all European locations in 2010
 - check of requirements fulfillment
 - check of action plan execution
 - check of effectiveness and efficiency



3. Follow-up of improvement actions at special section at the Q-First Database
 - TOP 18 improvement areas (6 blocs)
 - monthly review of action execution
 - validation in 2011 at Surveillance Review

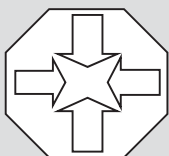
2011:

1. Surveillance Review at all locations involved at QFMA in 2010 (9 locations at Europe) to check execution and efficiency
2. Further roll-out to Pune and Bendix (Bowling Green)
3. Adaption of the global TEX documents to the Quality First Maturity Assessment
4. Update of the Maturity Model to integrate new requirements

▪ Further roll-out of the Quality First Maturity Assessment in 2011 + 2012 to America and Asia

Tasks & Responsibilities

Responsibilities for quality issues within KB organisation



Central function Quality Group

- **Guideline responsibility**
- Quality and Product Safety Management System and Guidelines
- Standards and methods, process mgt.
- Customer Quality Representatives

- Claim Management
- Guidelines Supplier Quality Management
- Quality controlling and reporting
- Assessments, Audits
- Strategic planning

CoC

- **Product quality** and responsibility for corrective actions
- Quality planning (APQP, PPAP), VDA 6.3. Audits PDP
- Continuous product and process improvement
- Co-ordination and introduction of systematic improvement activities based on customer complaints and product checks as well as proof of the effectiveness of the introduced actions



Location

- **Operational product quality**, Management of internal & external non-conformities (CAR, 8D)
- Supplier quality assurance, VDA 6.3 Audits local and supplier
- Quality service (acceptance, co-ordination, treatment) for own products and 1st findings for inter-company products

