A feasible SPICE Level 3 Quality Assurance process

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SWQA Responsible

Powertrain

Topics

- Company Overview
- Team organization
- SWQA Plan
- Quality Gates
- Reviews
- Assessment
- Process Improvement Plan
- SWQA Management
- SWQA Configuration Management
- QA Reporting and trend analysis
- Next improvement activities
- SWQA reference documents

Company overview

Magneti Marelli is an international company committed to the design and production of hi-tech systems and components for the automotive sector.

AUTOMOTIVE LIGHTING

POWERTRAIN

ELECTRONIC SYSTEMS
(Instrument clusters, Infotainment & Telematics, Lighting & Body Electronics)

SUSPENSION SYSTEMS
(Suspension Systems, Shock Absorbers, Dynamic Systems)

EXHAUST SYSTEMS

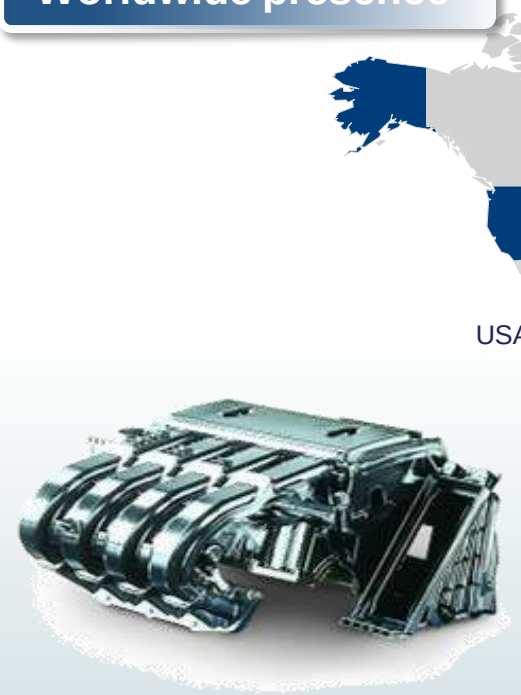
PLASTIC COMPONENTS AND MODULES

AFTERMARKET PARTS & SERVICES

MOTORSPORT

Powertrain

Worldwide presence



Sales	**967 mio €**
R&D (of sales)	**7.3 %**
Investments (of sales)	**5.3 %**

Act 2010

Powertrain – Main products & technologies

GASOLINE ENGINE CONTROL



- ECUs
- Injectors
- Throttle bodies
- Intake manifolds
- Fuel rails
- Multifuel systems
- GDI pumps

DIESEL ENGINE CONTROL

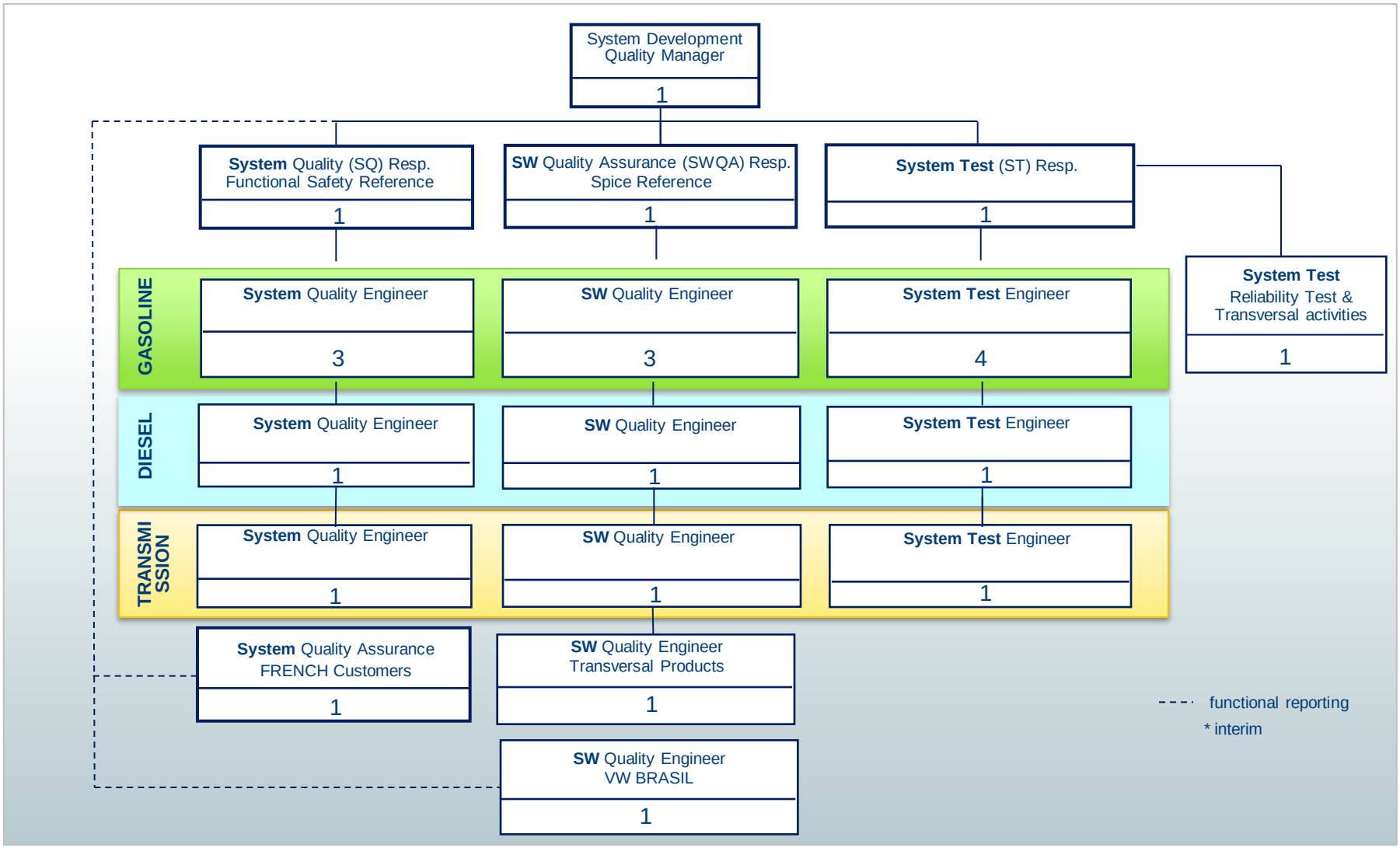


- ECUs
- Low pressure parts
- Mechatronic throttle bodies
- Intake manifolds with variable swirl control

TRANSMISSIONS free choice

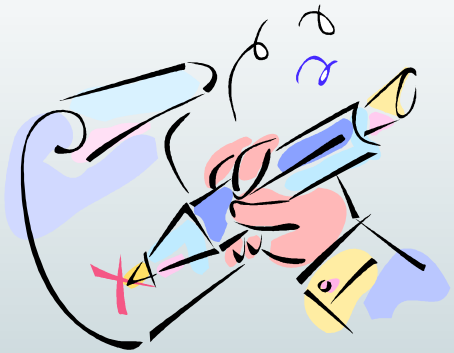

- Freechoice AMT
- ECUs
- Hydraulic power units
- DTC

System Development Quality - Organizational Chart



Approaching a project: the SW Quality Assurance Plan

SW Quality Assurance Plan



SW Quality Assurance Plan: Purpose

- establishes the **goals**, **processes**, and **responsibilities** required to implement effective quality assurance functions for the **project**.
- provides the **framework** necessary to ensure a consistent approach to software quality assurance throughout the **project life cycle**.
- defines the approach that will be used by the SW Quality engineer to **monitor** and assess software development **processes** and **products** to provide objective insight into the maturity and quality of the software.
- systematic monitoring of products and processes ensures they meet MMP and customer requirements and comply **MMP policies**, **standards**, and **procedures**, as well as other standards (IEEE, ISO, …).

SW Quality Assurance Plan: Activities

- assures the quality of both the project's work-products (***SW product quality***) and the processes which produce them (***SW process quality***)
- the **Quality Gate** carrying out during the different phases of the development is oriented both to the SW process quality, through the check of WP's existence, and to the SW product quality, through the check of some specific WP's characteristics.
- the **Review** carrying out (both by SWQA and by the SW product team) is oriented to the improvement of the SW product quality.
- the **Assessment** carrying out on the whole SW development process or on a part of it, is focalized to the improvement of the SW process quality.

SW Quality Assurance Plan: template

Plan

SW QUALITY ASSURANCE PLAN <project name>

Abstract:
[The PQSW describes the organization and the activities to guarantee the quality of <project name> development process and his artefacts]

Last modification description:
<last modification>

Edited by	Role	Date	Sign
<SWQE name>	SW Quality Assurance Engineer	<date>	

Approved by	Role	Date	Sign
<PJLS name>	PJLS <project name>		
<PJM name>	PJM <project name>		
<DPM name>	DPM		
<Resp QSS name>	Responsabile QSS		

<revision number>

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SWQA Plan attachments: Monitoring table

Powertrain Systems

SWQA PLAN Tracking Table			M.M. project name:		Customer:		MM development site:
			Customer project name:		Document number:		Revision:
							Date:
Project Phase	**Action**	**Responsible**	**Action output**	**Start date**	**Closed date**		**Note**
					target	end date	
Project Conception	PR0	PJM	PR0 Report				CM code PR0 result open action completion date
Project Conception	QGK PR1	PJLS	PR1 SW Report				CM code PR1 result open action completion date
System Conception	QGC	SWQA	QGC record				CM code RISK: OpenPoints id
System Conception	Review Project Handbook	SWQA	Review Protocol				CM code Review type Reviewer
SW Development	Assessment	SWQA	Assessment report PI action plan				CM code Remarks
SW Development	QGP sw xx_yy	SWQA	QGP record				CM code RISK: OpenPoints id
SW Development	QGI sw xx_yy	SWQA	QGI record				CM code RISK: OpenPoints id
SW Development	QGR sw xx_yy	SWQA	QGR record				CM code RISK: OpenPoints id
SW Development	xx_xx sw release	PJLS	Release document				Release Milestone type (PK
SW Validation	QGV 01	SWQA	QGV record				CM code RISK: OpenPoints id
SW Validation	Sw Validation Notif.	SWQA	SW Validation Notif. document				CM code Result
System Validation	PR2 Sistema	PJM					
System Delivering	SOP	PJM					

SWQA Plan attachments: Open Point list

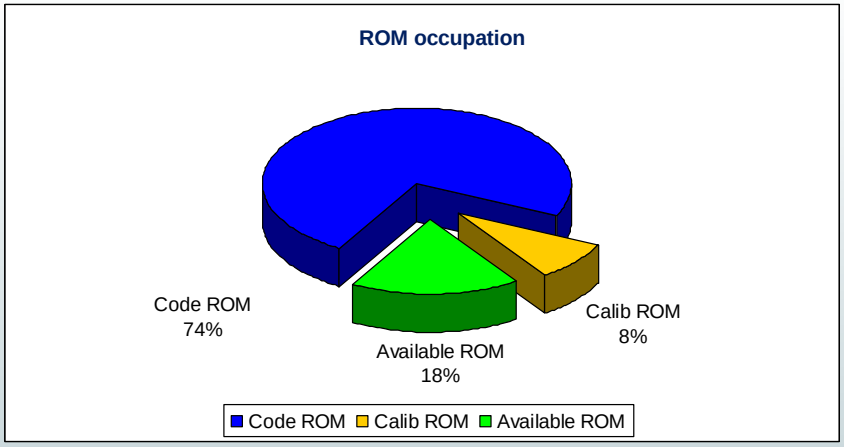
QA Open Points List						Project Date	8DF-8DF2 20/01/2009				
QA Id	Project Oplist ID	SQA activity	SW release / WP	Project / Application	Status	Open Date	Target date	Description	Action/Solution	Responsible	Risk
QGI_85_50_3	Non previsto	QGI	85_50	IDEA/MUSA	closed	22/06/2007	29/06/2007	I test di integrazione non sono stati completati.	I test di integrazione saranno completati entro la fine del rilascio.	Enrico Baraldi	M
QGI_85_50_4	Non previsto	QGI	85_50	IDEA/MUSA	closed	22/06/2007	29/06/2007	I test di analisi statica non sono stati eseguiti.	I test verranno eseguiti entro la fine del rilascio.	Enrico Baraldi	M
QGI_85_50_5	Non previsto	QGI	85_50	IDEA/MUSA	open	22/06/2007	29/06/2007	Le misurazioni di SW performance non sono state eseguite.	Le misurazioni di SW performance verranno eseguite entro la fine del rilascio.	Enrico Baraldi	M
QGI_85_50_6	Non previsto	QGI	85_50	IDEA/MUSA	closed	22/06/2007	26/06/2007	La documentazione di rilascio lato BAS non è completa, mancano i TD e i TR delle prove eseguite, di conseguenza non è possible verificare le attività svolte sugli open item (IR 369, 370).	Rendere disponibili i TD e i TR delle prove eseguite lato BAS.	Marcello Sciuto	M
QGI_85_50_7	Non previsto	QGI	85_50	IDEA/MUSA	closed	22/06/2007	29/06/2007	La definizione del livello di criticità del punto aperto bs2bo~1237 risulta non chiara.	Da chiarire la criticità del punto aperto bs2bo~1237	Elena Dalla Villa / Marcello Sciuto	L
QGR_85_41_1	Non previsto	QGR	85_41	199	closed	22/06/2007	Week 26	Il doclink del modulo hpsd non è allineato con la distinta base aggiornata. (DBF: cod. Proteo 00080056-A2, Codice: 00060747-A34).	Il doclink verrà allineato entro week 26.	Enrico Baraldi	L
QGR_85_41_2	Non previsto	QGR	85_41	199	frozen	22/06/2007	-	Mancanza di SDTs / Functional Checklists / Test Descriptions/ Test Report	Questa mancanza era presente anche nei rilasci precedenti. Era già stata inoltrata una richiesta di risorse per risolvere questo problema. Nessuna nuova azione.	Enrico Baraldi	M
QGR_85_50_1	Non previsto	QGR	85_50	IDEA/MUSA	closed	29/06/2007	06/07/2007	I doclink dei moduli mmux_old e pmux_old non sono allineati alla DBF consuntiva.	I doclink verranno aggiornati entro 06/07/2007.	Enrico Baraldi	L
QGR_85_50_2	Non previsto	QGR	85_50	IDEA/MUSA	open	29/06/2007	30/07/2007	Mancano i TD/TR relativi alla verifica totale della mappa messaggi.	Le attività di testing e redazione dei TD/TR sono ancora in corso, verranno completate entro la fine di luglio.	Enrico Baraldi	M

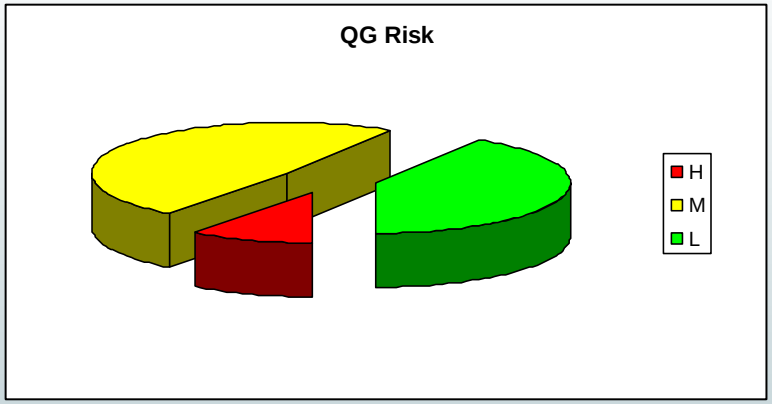
- tracks all the open items found during SWQA activities

SWQA Plan attachments: Metrics sheet

Metrics Recording Table

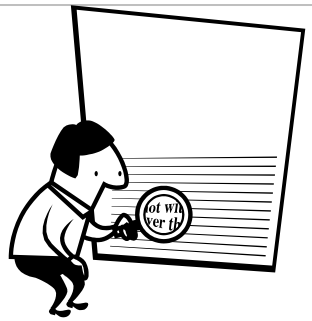
		Metric ID (see PQSW)	PSM10	PDM1	PDM2	PDM3	PDM4	PDM5	PDM6	PDM7
SWQA Activity	Project	SW Release/ Document	QGx Risk	CPU load (%)	FLASH occ. (%)	RAM occ. (%)	NRF High (Nb)	NRF Medium (Nb)	NRF Low (Nb)	LIN severity score (Nb)
Review	7GV	PQSW								
QGRI	7GV	00_03	M	*	*	*	0	0	4	*
QGRI	7GV	00_04	M	83,0	67,0	45,0	0	0	4	*





- records all the measurements carried out during SWQA activities

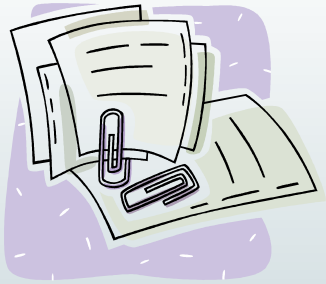
SWQA Activities: Quality Gate



Quality Gate

covers

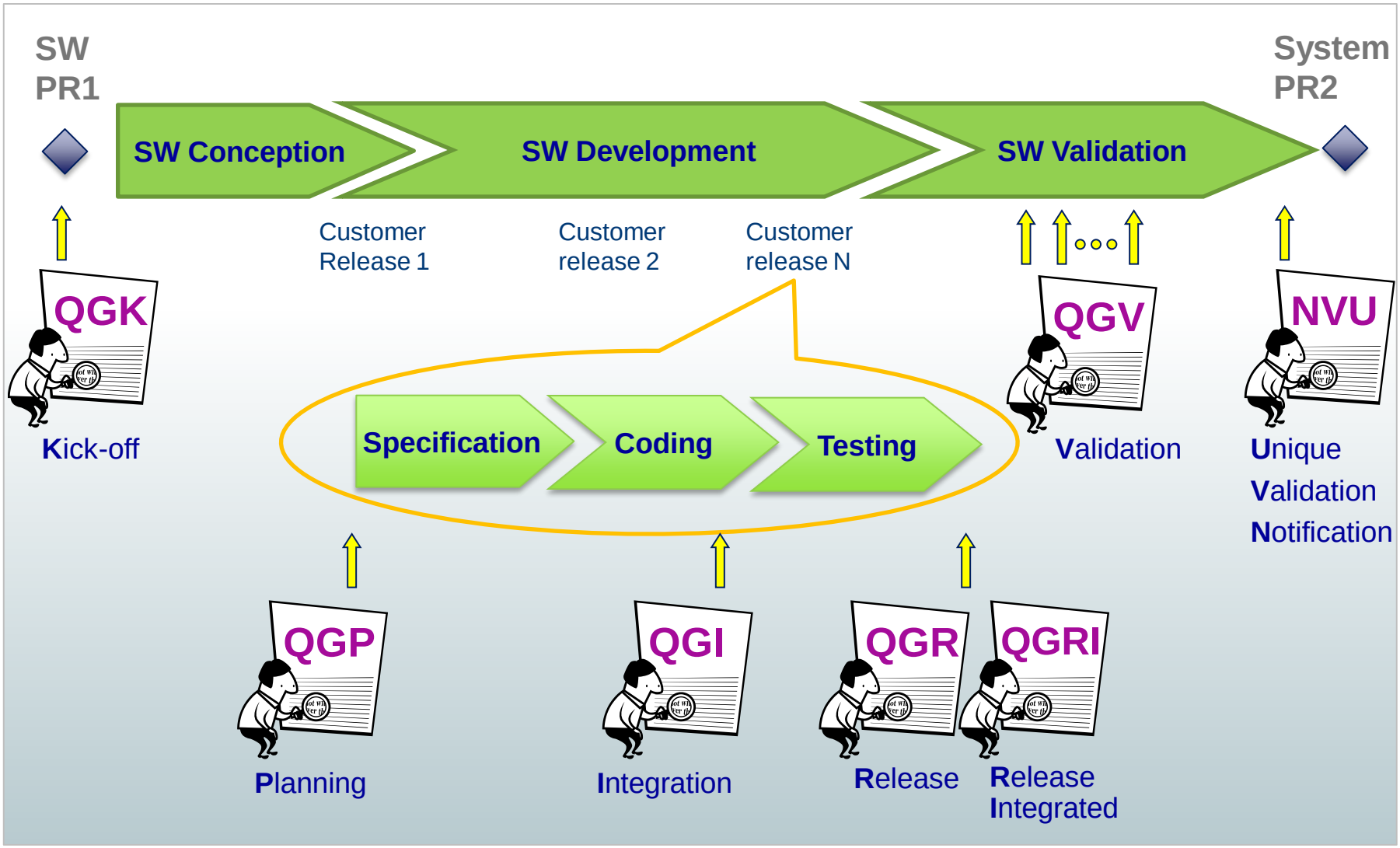
covers



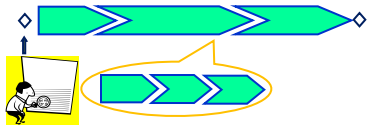
Process Quality

Product Quality

Quality Gates in the SW development life-cycle



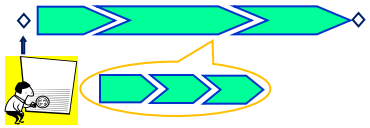
Quality Gate on Kick-off - QGK



SWQE:

- assures the execution and the effectiveness of the **PR1 SW** meeting
- participates to the formal meeting
- verifies the correct application of the checklist defined in the procedure
- assesses the outcomes
- makes available the SW Quality Assurance Plan (also in draft version)
- performs impact analysis of internal and customer quality requirements
- tracks the open points found during the PR1 SW in the SWQA plan

QGK checklist (PR1-SW)

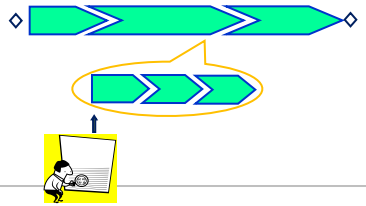


Powetrain	MEETING REPORT	PR1 SW (ref. to work instruction IODVP20001)	PDM REF	<pdm ref>
	SYSTEM/VEHICLE	<system / vehicle>	SW PROJECT	<sw project>
	CUSTOMER	<customer>	ECU / TCU	<ECU/TCU>

PR1 SW CHECKLIST

PROCESS / ACTIVITY		Status			Reference / Evidence			Notes
		YES	NO	NA	APPL	BAS	FAD	
A 1	**TAILORING OF DEVELOPMENT PROCESS**				**PJLS/SWQE**	**BAS A&PD/SWQE**	**FAD A&PD/SWQE**	
A 1.1	Is the development process compliant with the tailoring rules applicable for the project tipology ?							
A 1.2	Have the derogations to the tailored SW development process been shared with PRM and QSS responsible ?							
A 2	**SYSTEM MASTER PLAN**				**PJM**			
A 2.1	Is the System Master Plan with highlighted the milestones related to software available ?					NA	NA	
A 3	**SW PROJECT PLAN**				**PJLS**	**BAS A&PD**	**FAD A&PD**	
A 3.1	Is the SW project plan available ?							
A 3.2	Is the SW Handbook related to the project available ?							
A 3.3	Has the SW Test plan definition activity been planned ?							
A 3.4	Has the CM plan definition activity been planned ?							<for light delta project only CM table is required>
A 3.5	Has the FAD SW Design Review been planned ?				NA	NA		
A 4	**PROBLEM AND RISK MANAGEMENT**				**PJLS**	**BAS A&PD**	**FAD A&PD**	
A 4.1	Has a way been established to manage problems issued during the development ?							<Customer / Internal OP list, SCR, RCR, IR ...>
A 4.2	Has a risk assessment table been issued at SW level ?							
A 5	**SW QUALITY PLAN**				**SWQE**	**SWQE**	**SWQE**	
A 5.1	Is the SW quality plan available ?							<for light delta project only PQSW table is required>

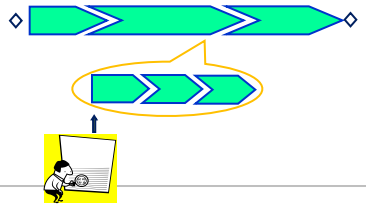
Quality Gate on Planning - QGP



SWQE:

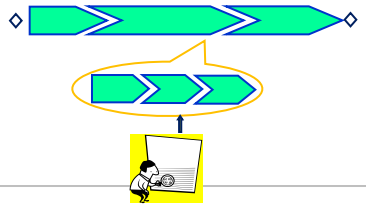
- verifies the correct planning of a certain SW release identifying possible delays or lack of resources and corresponding corrective actions
- verifies the alignment of the contents planned in the Sw plan with the customer requests and with the Master Plan
- verifies the allocation of needed resources for the execution of the activities of the release
- verifies the planning of formal/peer review foreseen for the specific project
- verifies the consistency of the timings and of the resources with the internal and customer milestones
- verifies the availability or the updating date of provisional SW architecture

QGP checklist



QGP Checklist		Project:		<project name>
ID	**WP/Process Check**	**Yes**	**No**	**If Yes**
1	**Customer requests**			
1.1	The customer requests for this release are known and frozen			CM code/link and version of: <Customer request doc>
1.2	The customer requests are analysed (effort estimation, risks, …)			<SDE plan CM code / link and version>
2	**Problem resolution**			
2.1	Foreseen problem's resolutions are considered (OPL, defects)			<CM code / link and version>
3	**SW Specification and Architecture**			
3.1	The list of all the SW detailed specification (SRO, …) to be modified is available (preliminary DBF, nomenclature, …)			<CM code / link and version>
4	**SW Plan**			
4.1	SW release contents listed in the plan are aligned to the customer requests and foreseen problems (see 1.1;2.1)			CM code/link and version of: <SW release plan>
4.2	Foreseen reviews are planned			< nothing>

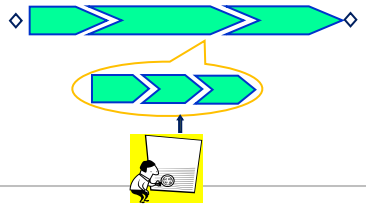
Quality Gate on Integration - QGI



SWQE:

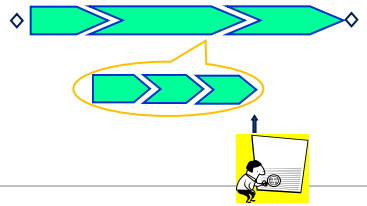
- checks the consistency of the integrated contents to the Sw Plan
- verifies the execution of the unit test of the contents planned for this release
- analyzes the static analisys report of the integrated code
- analyzes the metrics recorded (memory occupation, CPU load, stack occupation ,…)
- verifies the planning of all the test activities on the release
- checks the existence and the update of the test description (SDT, test pattern, …) and/or functional checklists requested for a correct validation
- verifies the completeness of the planned review activities

QGI checklist



QGI Checklist		Project:		<project name>
ID	**WP/Process Check**	**Yes**	**No**	**If Yes**
1	**SW Detailed Specification**			
1.1	All the SW detailed specifications (SRO, …) related to the requests are updated and frozen			<check the updated documents>
2	**SW Construction**			
2.1	The starting baseline used for this release is defined			<starting baseline>
2.2	Release note or Integration IR (SW integrated code) is aligned to SW Project plan			<nothing>
2.3	All the foreseen unit tests are performed			<check the existence>
2.4	The unit test reports are available			<check the existence>
2.5	Changes status are updated in the tool			<nothing>
3	**SW Integration Test**			
3.1	All the foreseen integration tests (static analysis, interface check …) have been performed			<check the existence >

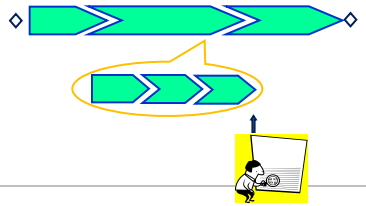
Quality Gate on Release - QGR



SWQE:

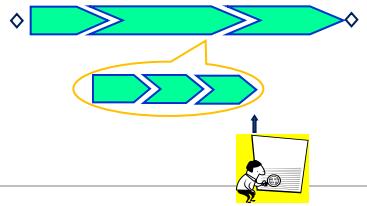
- verifies the closure of the activities performed during the construction of the official SW release
- checks the existence and the update of the final bill of material (DBF) and the alignment to the SW product implemented
- ensures the completion of the planned tests and the availability of their reports with the results analysis
- analyzes customer/internal open items with the risk evaluation and the definition of possible corrective actions

QGR checklist



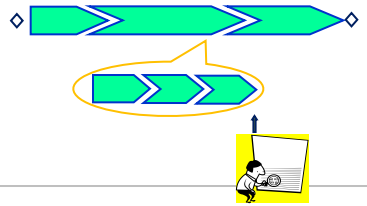
QGR Checklist		Project:		<project name>
ID	**WP/Process Check**	**Yes**	**No**	**If Yes**
1	**SW Release**			
1.1	The SW Plan is updated and without delay			<CM code/link and version>
1.2	Release note or Integration IR (SW integrated code) is aligned to SW Project plan			<nothing>
2	**SW Architecture**			
2.1	DBF / Nomenclature is updated and congruent with the release contents			<CM code / link and version>
2.2	The traceability attribute of each module is aligned to the updated DBF/ nomenclature			<nothing>
3	**SW Test**			
3.1	Functional tests of new contents have been performed (more attention to safety relevant or reliability content)			<check the existence >
3.2	Functional test specifications and related reports are available			<check the existence >

Quality Gate on Integration - QGRI



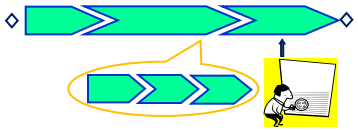
- QGRI is the merge of QGI and QGR checks
- It’s performed when the testing phase is very short so integration and release phase are overlapped

QGRI checklist



QGRI Checklist			Project:	<project name>
ID	**WP/Process Check**	**Yes**	**No**	**If Yes**
1	**SW Release**			
1.1	The SW Plan is updated and w ithout delay			<CM code/link and version>
1.2	Release note or Integration IR (SW integrated code) is aligned to SW Project plan			<nothing>
2	**SW Detailed Specification and Architecture**			
2.1	All the SW detailed specifications (SRO, …) related to the requests are updated and frozen			<check the updated documents>
2.2	DBF / Nomenclature is updated and congruent w ith the release contents			<CM code / link and version>
2.3	The traceability attribute of each module is aligned to the updated DBF/ nomenclature			<nothing>
3	**SW Construction**			
3.1	The starting baseline used for this release is defined			<starting baseline>
3.2	All the foreseen unit tests are performed			<check the existence>

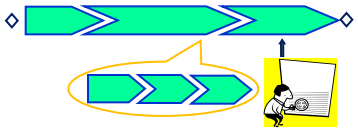
Quality Gate on Integration - QGV



SWQE:

- checks and monitors the SW Test Plan
- checks the test reports performed
- analyzes the impact of activities not performed
- assesses the risk of the open item

QGV checklist



QGV Checklist				Project: <project name>
ID	**WP/Process Check**	**Yes**	**No**	**If Yes**
1	**SW Test plan**			
1.1 (*)	The starting baseline is tested			<starting baseline>
1.2	SW test plan is updated: current date, activities completion percentage updated, delayed activities rescheduled			<SW test plan CM code / link and version>
1.3	Test activities scheduling is on time			< w rite completion percentage>
2	**Test Report**			
2.1	For all the test activities performed exist TRs or other evidences			<nothing>
3	**Open NRF list**			
3.1	The open NRFs found during test activities are know n and listed			<nothing>
3.2	The corresponding risks are analysed			<nothing>

Quality Gate report

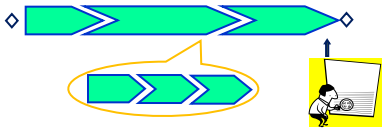
- **SW risk** is estimated through Quality Factor
- **Escalation** mechanism is applied depending on risk level
- **Approval** is required
- **Action item** list is issued

The QGRI is done for the **official release** to the customer just before the release to check if the **WP**'s of the integration and release phases are **complete and updated** and if the planned **activities** has been performed.

Risk of SW Quality Factors	
Functionality	**MEDIUM**
Efficiency	**HIGH**
Reliability	**LOW**
Maintenability	**MEDIUM**
Usability	**LOW**

Issued by:		
SWQE	<name>	
Approved by:		
PJLS	<name>	
SWQA resp	<name>	
PJM	<name>	
QSS resp	<name>	
Distributed to:		
SQE	<name>	
DPM	<name>	
PM	<name>	

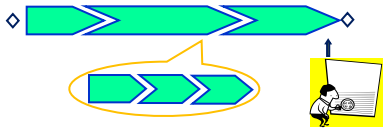
Unique Validation Notification



SWQE:

- makes a balance of the SW validation activity
- checks the test reports performed
- analyzes the impact of activities not performed
- assesses the risk of the open item
- gives a POSITIVE / POSITIVE with DEROGATION / NEGATIVE outcome

Unique Validation Notification checklist



Validation Notification		Project:		<project name>
		Vehicle/Engine/Gear:		<vehicle / engine / gear name>
ID	**WP/Process Check**	**Yes**	**No**	**If Yes**
1	**SW Test activities**			
1.1	The documents containing SW test activities are updated: current date, activities completion percentage updated			<Insert references to all documents related to SW Test activities>
1.2	All foreseen tests have been performed completely			<nothing>
1.3	All foreseen tests have been documented			<nothing>
2	**PVI Test activities**			
2.1 (*)	The documents containing PVI test activities are updated: current date, activities completion percentage updated			<Insert references to all documents related to PVI Test activities>

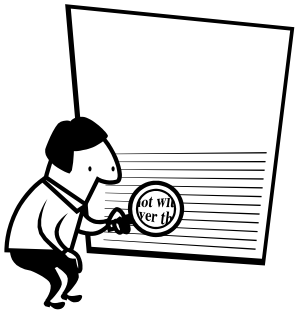
QA Activities: coverage through the V-cycle

Quality Assurance checks throughout the V-cycle								17/06/2011
	Development phase	System Conception		SW Development				
V-cycle Process	QA Activity	System PR0	SQGC n	SW PR1	QGP n	QGI n	QGR n	QGRI n
	QE involved	SQE	SQE	SQE, SWQE	SWQE	SWQE	SWQE	SWQE
	WP	System Project Review 0	System Quality Gate on Conception	SW Project Review1	Quality Gate on Planning	Quality Gate on Integration	Quality Gate on Release	Quality Gate on Release Integrated
PMNG Project Management	System PR0 report		Update	none	none	none	none	none
	SW PR1 report	Scheduling	none		none	none	none	none
	Project Handbook	ne	Update Maturity	none	none	none	none	none
	Master plan	Existance	Update Maturity	Update Light Review	none	none	none	none
	Risk Management table	Strategy	Update	Existance	none	none	none	none
	SW Handbook	ne	none	Update	none	none	none	none
	SW Plan	ne	none	Update	Partial Review	none	Partial Review	Partial Review
	SW Test plan	ne	none	Scheduling	none	none	none	none
	System Integration Validation Plan	ne	Existance Scheduling	none	none	none	none	none
	System Validation Plan	ne	Existance Scheduling	none	none	none	none	none
	Function Development Plan	ne	Update Light Review Maturity	Update	none	none	none	none
	Application Plan	ne	none	none	none	none	none	none
PCM Problem & Change management	Open Point list	none	Existance Update	Strategy	none	none	Update	Risk
	Bugs list	none	none	none	Partial Review	none	Risk	Risk

- Complete file: QA assurance checks through the V cycle

Microsoft Excel 97-2003 Worksheet

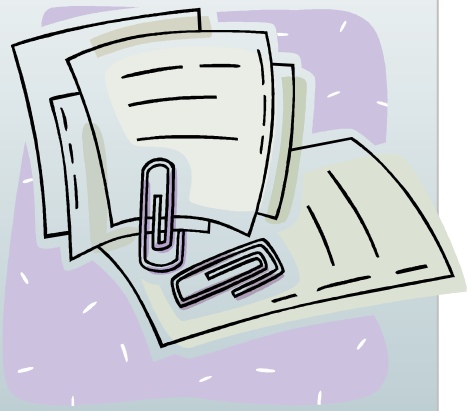
QA Activities: Review



Review

covers

Product Quality



QA Activities: Review

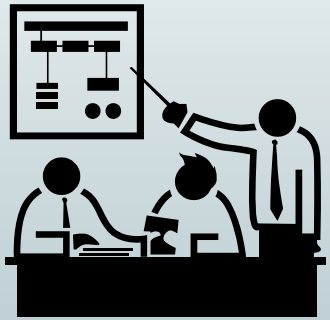
- **What**: brand new work products
  heavy modified work products
  safety relevant work products
- **When**: before passing the work product to the next process
  planned on SW Plan
- **Who**: development team for ENG work products
  QA team for SUP and MAN work products
- **How**: FORMAL review
  PEER review

SWQA Activities: Assessment

Assessment

covers

Process Quality



Assessment objectives

- **Class A**
  - SW supplier evaluation
  - Initial / Final assessment of a process improvement
  - Comparison across an organizational unit (platform, product line)
  - Preparation to an assessment by customer
  - Synonim of Full internal / external assessment

- **Class B**
  - Initial / Final assessment of a process improvement
  - Synonim of Process analysis, Pre-assessment, Maintenance assessment, Gap Analysis

Assessment classes

Standard: **ISO 15504** Assessment model: **Automotive SPICE**

Attributes	Class A	Class B
Process scope (typ.)	HIS scope	1 or more processes from HIS scope (MAN, SUP, ENG)
Maturity level (max.)	SPICE level 2 (measured)	SPICE level 2 (estimated)
Num. of assessors (min.)	2	1
Evidence type	Work Product, Testimony	No constrain
Rating	Process Attributes (F,L,P,N)	No rating
Reporting	Assess.feedback (ppt), report (doc), PI plan (xls)	PI plan (xls)
Effort (HIS scope)	4 days	1-2 days

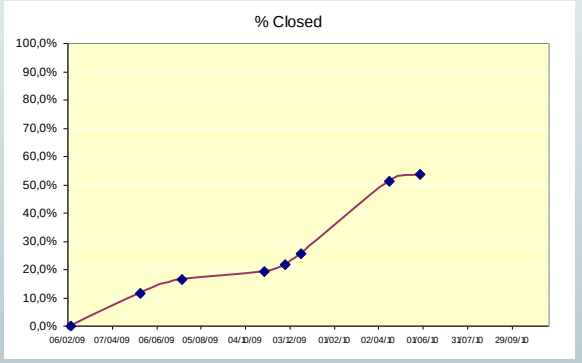
Process Improvement plan

Magneti Marelli Powertrain

PI Actions Plan

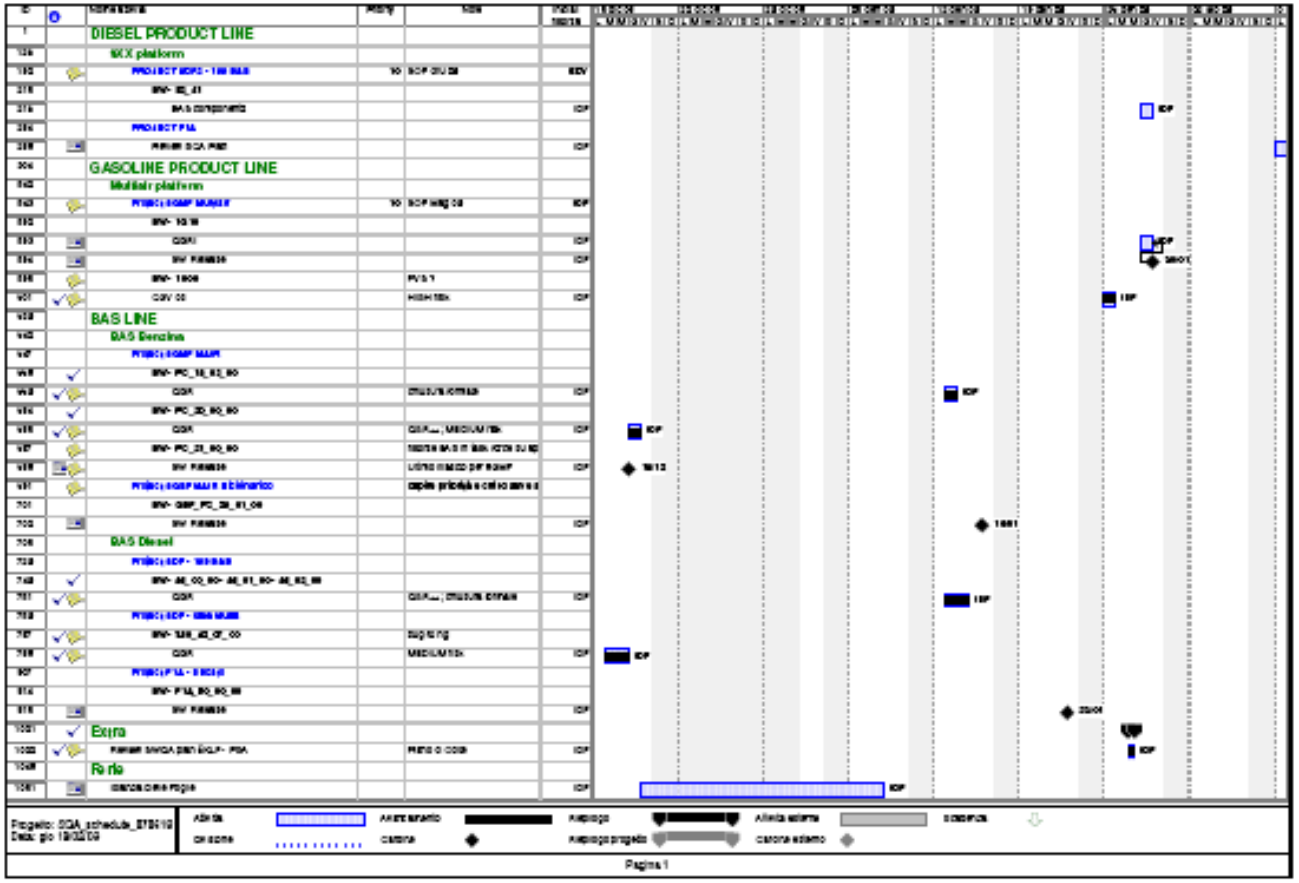
date: 28-mag-10 rev. A.8

#	Process	Practice	*Comments / Questions / Decision reached*	*Follow-up action*	*Work Product*	*Responsibility*	*Deadline*	*Priority*	*Status*
1	MAN.3	BP1	PJ HB in draft	Completare PJ HB	PJ HB	Tomasi	15-mag-09		closed
2	MAN.3	BP4	Piano fabbisogno vetture per altri mercati	Completare nel PJ HB il piano per gli altri mercati	PJ HB	Tomasi	~~9-lug-09~~		closed
3	MAN.3	BP5	Skill richiesti dalle figure professionali	Completare tabella skill con skill richiesti	PJ HB	Tomasi	15-mag-09		closed
4	MAN.3	BP7	Definizione interfacce / responsabilità con il cliente	Migliorare tale parte nel PJ HB	PJ HB	Tomasi	15-mag-09		closed
5	MAN.3	BP10	Monitoraggio dei costi interni (timesheet) non ben definito	28/05/10: ricominciato monitoraggio da Febbraio; update trimestrale chiedere ad altri progetti come fanno (Mair)	Timesheet	Giuliani	30-giu-10	M	open
6	MAN.3	GP2.1.2	Non si capisce se i PJx hanno tempo per gestire tutti i loro progetti	Fare macro-stima e monitoraggio delle attività dei PJx 28/05/10: aggiungere nel LPB_project.xls gli effort dei PJLS e PJM	Stima effort PJx	Giuliani	30-giu-10	M	open
7	MAN.3	GP2.1.5	Disponibilità mezzi	Compilare il capitolo dei mezzi di prova del PJ HB	PJ HB	Tomasi	30-set-09	L	closed
8	MAN.3	GP2.2.2	Manca formalizzazione delle regole di gestione dei documenti (solo lista nel PJHB)	Formalizzare nel SCMP	SCMP	Gianotti	30-mar-10	L	closed
9	MAN.3	GP2.2.4	QGP fa review specifico rilascio, ma i QGP non sono fatti su 4HV / 7GV	Pianificare ed eseguire QGP (SWQA); deciso di farlo durante i team meeting con freq. stabilita nel PJHB	SWQA plan	Ricci	9-lug-09		closed
10	MAN.3	GP2.2.4	Review pianificate	Revisionare PJHB	PJ HB	Ricci	30-lug-09	M	closed
11	MAN.3	GP2.2.4	Review pianificate	28/05/10: Revisionare SW Plan	SW plan	Ricci	30-giu-10	M	open



- managed by SWQA engineer
- periodically updated with the team

SWQA Management: activities scheduling



- managed by SWQA responsible
- bi-weekly updated during team meeting

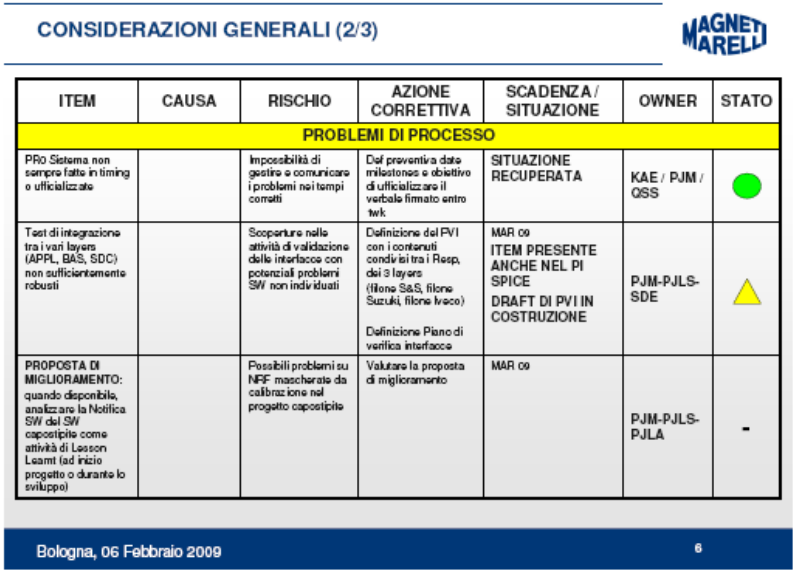
SWQA Configuration Management: items

SWQA Configuration Management items

Process	Description	Language	Class	Tool	Reference	Owner	Adressed To	Naming Convention	Format
SWQA	SW Quality Assurance Plan	English Italian	work instruction	TCE	IODVP20131	SWQA team responsible	All MM	Quality System rules	.doc
SWQA	QG Definition for SW development	English Italian	work instruction	TCE	IODVP20134	SWQA team responsible	All MM	Quality System rules	.doc
SWQA	SW Notification Validation	Italian	work instruction	TCE	IODVP20185	SWQA team responsible	All MM	Quality System rules	.doc
SWQA	Gestione Fornitori SW	Italian	guideline	TCE	00039323	SWQA team responsible	All MM	na	.doc
SWQA	SW Quality Assurance Plan template	English Italian	template	TCE	MDDVP20241	SWQA team responsible	All MM	Quality System rules	.doc
SWQA	QGC report template	English	template	TCE	MDDVP20243	SWQA team responsible	All MM	Quality System rules	.doc .xls
SWQA	QGP report template	English	template	TCE	MDDVP20244	SWQA team responsible	All MM	Quality System rules	.doc .xls
SWQA	QGI report template	English	template	TCE	MDDVP20245	SWQA team responsible	All MM	Quality System rules	.doc .xls
SWQA	QGR report template	English	template	TCE	MDDVP20246	SWQA team responsible	All MM	Quality System rules	.doc .xls
SWQA	QGRI report template	English	template	TCE	MDDVP20327	SWQA team responsible	All MM	Quality System rules	.doc .xls
SWQA	QGV report template	English	template	TCE	MDDVP20247	SWQA team responsible	All MM	Quality System rules	.doc .xls
SWQA	SW Notification Validation template	English	template	TCE	MDDVP20284	SWQA team responsible	All MM	Quality System rules	.doc .xls
SWQA	SWQA Team Scheduling template	English	template	TCE	MDDVP20266	SWQA team responsible	All MM	Quality System rules	.mpp
SWQA	SWQA Monitoring Table and OPList template	English	template	TCE	MDDVP20242	SWQA team responsible	All MM	Quality System rules	.xls
SWQA	Review Process	English	guideline	TCE	00064361	SWQA team responsible	All MM	Review_Process_<CM code>_<CM version>	.doc

- contains all the SWQA work products management rules
- defines and documents the baselines

QA reporting and trend analysis



CONSIDERAZIONI GENERALI (2/3)

ITEM	CAUSA	RISCHIO	AZIONE CORRETTIVA	SCADENZA / SITUAZIONE	OWNER	STATO
PROBLEMI DI PROCESSO						
PRo Sistema non sempre fatto in timing o ufficializzato		Impossibilità di gestire e comunicare i problemi nei tempi corretti	Del preventiva date milestones e obiettivo di ufficializzare il verbale firmato entro twk	SITUAZIONE RECUPERATA	KAE / PJM / QSS	
Test di integrazione tra i vari layers (APPL, BAS, SDC) non sufficientemente robusti		Scoperture nelle attività di validazione delle interfacce con potenziali problemi SW non individuati	Definizione del PVI con i contenuti condivisi tra i Resp. dei 3 layers (filone S&S, filone Suzuki, filone Iveco) Definizione Piano di verifica interfacce	MAR 09 ITEM PRESENTE ANCHE NEL PI SPICE DRAFT DI PVI IN COSTRUZIONE	PJM-PJLS-SDE	△
PROPOSTA DI MIGLIORAMENTO: quando disponibile, analizzare la Notifica SW del SW capostipite come attività di Lesson Learnt (ad inizio progetto o durante lo sviluppo)		Possibili problemi su NRF mascherate da calibrazione nel progetto capostipite	Valutare la proposta di miglioramento	MAR 09	PJM-PJLS-PJLA	-

Bologna, 06 Febbraio 2009 6

- reports the projects status from Quality point of view
- performed with System Quality responsible
- monthly communicated to all the projects responsible (PM, DPM, PJLx)

SWQA process : next improvement activities

- **Baseline audit** defined
  - it will check the application of CM rules defined in the project
  - first application started
- **Process reviews** defined
  - it will check the conformance to the MM standard processes
  - first application planned
- **New metrics** identification and implementation

SWQA reference documents

SW Quality Assurance Plan	IODVP20131
SW Quality Assurance Plan template	MDDVP20241
SWQA Monitoring Table and OPList template	MDDVP20242
SWQA Team Scheduling template	MDDVP20266
QG definition on SW development lifecycle	IODVP20134
QGK (PR1 SW) template	IODVP20001
QGP report template	MDDVP20244
QGI report template	MDDVP20245
QGR report template	MDDVP20246
QGRI report template	MDDVP20327
QGV report template	MDDVP20247
Unique Validation Notification	IODVP20185
Unique Validation Notification template	MDDVP21104
Review Process	00064361
SW Supplier Management	00039323

Thank you !

Leonardo Ricci

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