WWW.BITRON.NET

12th Automotive SPIN Italy Workshop

BITRON
Unità di GRUGLIASCO

Str. del Portone 95 - 10095 Grugliasco (TO) Italy
Tel.: ++39/011/4029111 - Fax: ++39/011/781364
e-mail: grugliasco.info@bitron-ind.com

CSQ UNI EN ISO/TS 9001: 2008
IQNet CERTIFIED MANAGEMENT SYSTEM
CSQ AUTO UNI EN ISO/TS 16949:2002
CSQ eco ISO 14001

BITRON Industrie S.p.A.

info.bitron@bitron-ind.com

The hidden costs of an ASPICE compliant project

- A true case
- OEM requirements
- Assessors opinions
- TIER1 (Supplier) activities
- Safety targets
- Quality goals
- Comments & Conclusions (?)

A TRUE CASE (1)

- Bitron has developed an ECU for a Californian OEM, who didn't require big documentation effort: just functional and requirements specifications and SW test plan/report (both in charge of Bitron).
- Result:
  - quick development and validation
  - great attention of the developers to the code
  - very few bugs discovered during validation and during Customer integration
  - Time and cost contained : Customer and Bitron both glad.
  - Development process in any case followed but without «interference» by the customer

A TRUE CASE (cont'd)

- On the other side : European OEM, same type of ECU, big effort in documentation and SWQA assessment held by the customer itself every three months. Phone meetings every week, travels every month. Considered irrelevant the SPICE certification obtained from third party assessor.
- Result:
  - big effort of design and validation engineers for documentation, for phone conferences, travels, assessment participation …
  - Less time left to put attention to the code
  - Much more people to work on the same project to maintain the delivery dates : (internal) costs increased dramatically

A TRUE CASE (cont'd)

- SW Development hours spent for:
  1. An "easy" customer: 4900
  2. A high demanding customer: 10400
  3. A customer with poor specification : 19900
- Same V model applied: SRS, SAD SWTP/R, VDD for all projects but: much more specific documents required by customers 2 and 3
- Many iterations in documents preparation due to customer's templates or guidelines unavailability.
- Forced usage of specific tools for SW design and validation (imposed toolchain).
- Many meetings, assessments, «corrective» actions to implement and document to assess them.

Is all this really improving the product quality ?

FCA

FIAT CHRYSLER AUTOMOBILES

The (hidden) costs of SW quality

OEM CONCERNS

Alessandra Mitidieri Costanza

SW Quality

Turin, Italy

October 30th 2014

EMEA

REGION

Index

- FCA strategy
- Reasons and goals
- Results and effects

FCA Strategy

- First phase
  - Checking the Suppliers «status»
- Second phase
  - Setting FCA internal standard applicable to any Supplier/ECU sourcing
- Third phase
  - Adjusting FCA request based on the past experience and setting threeshold to be «acceptable» for FCA.

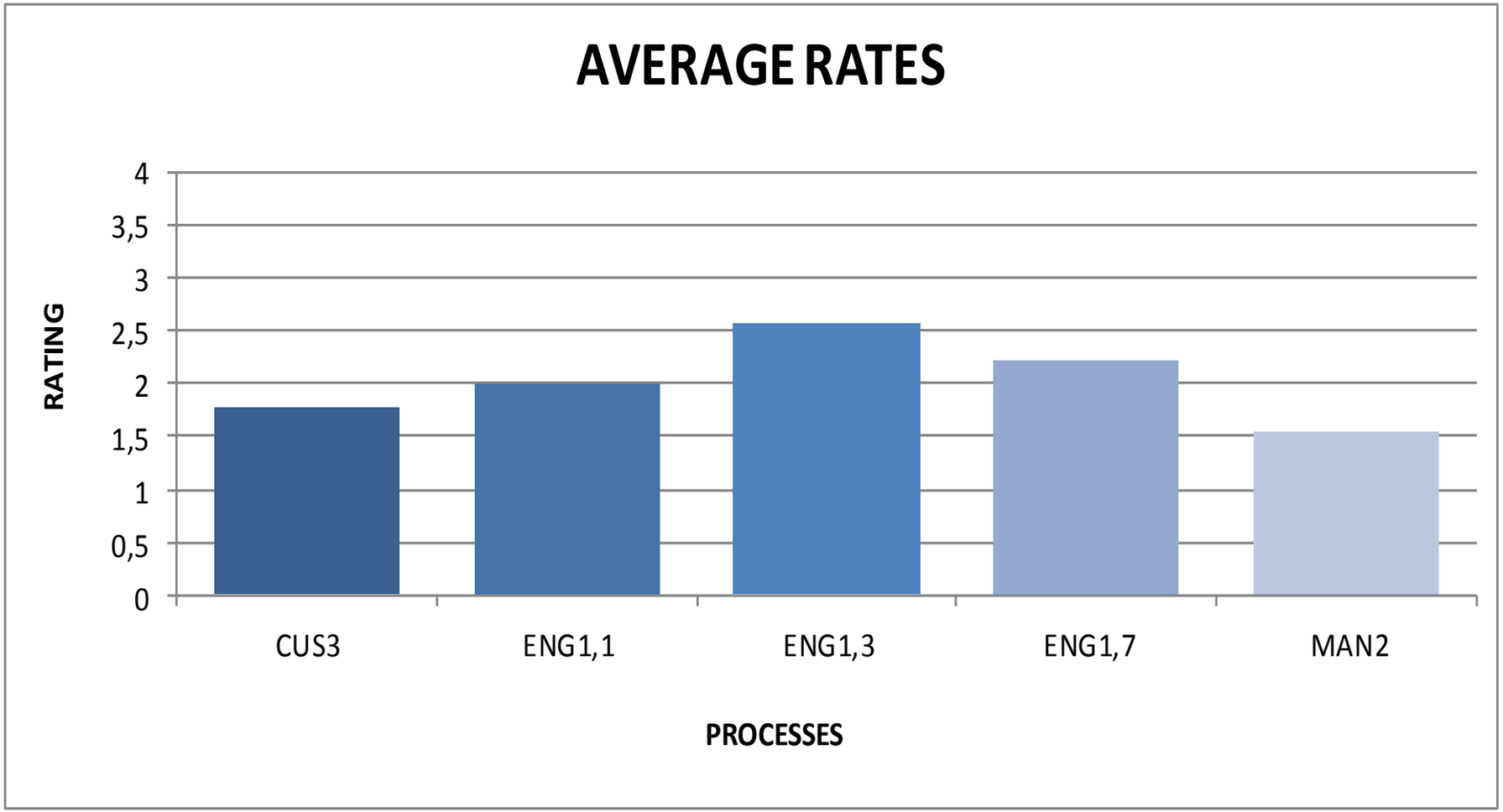
FCA Strategy – first phase

FCA organized and sponsorized assessments to some of the main Suppliers (~ 15).

Cost of assessment in charge to FCA

- Assessment scope was limited to 5 processes: ENG.1.1, ENG.1.3, ENG.1.7, CUS.3 and MAN.2.
- The result showed higher capability levels on technical processes (ENG.1.1, ENG.1.3, ENG.1.7, compared to supporting processes (CUS and MAN).
- This could be expected, since the necessity for supporting and managing technical processes is greater than supporting and managing the management processes themselves.

First phase - summary result



FCA Strategy – Second phase

Setting FCA internal norm, applicable to any Supplier/ECU sourcing

- Based on the result of first phase, FCA set an internal standard including.
  - Scope
  - Minimum level
  - Expected level

Cost in charge to Suppliers and indirectely to FCA

- No real improvement was seen in Supplier status

FCA Strategy – Third phase

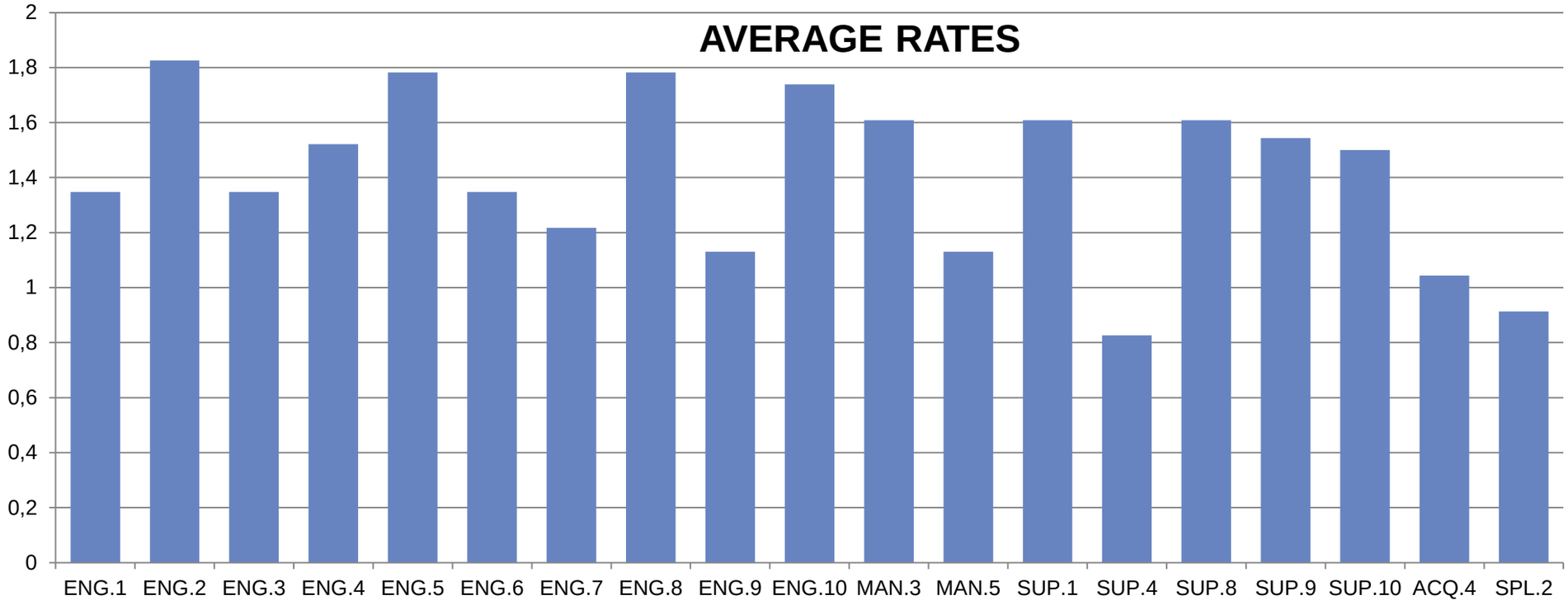
Adjusting and enforcing FCA request

No additional cost for Suppliers already conformant (also CMMI level 3 is acceptable).

Cost in charge to Suppliers (and indirectely to FCA) if improvement is necessary (in this case ASPICE to be applied).

- Based on the result of previous phase and experience in the field, FCA norm was **Enforced** and **Updated**.
  - strong agreement with purchasing → Being not conformant to the norm is a technical blocking issue
  - New scope (all the ENG processes, MAN.3, MAN.5, SUP.1, SUP.4, SUP.8, SUP.9. SUP.10, ACQ.4, SPL.2)
  - New levels schema: a unique minimum level for the processes in the scope
  - New approach for evaluations
    - FGA trust on previous assessments (covering FGA scope, not older than 3 years, level not lower than 2 on FGA scope
    - Weaknesses to be solved during/applied to the specific vehicle project and checked by FGA during the project development;
    - Previous results influence future sourcing

Third phase - summary result



Note: ~ 30 Suppliers but excluding Suppliers who have chosen CMMI

Backup

The hidden costs of an Automotive SPICE compliant project

An Assessor's perspective

12° Automotive SPIN Italia Workshop

Milan, Ottobre 30, 2014

Use of Automotive SPICE in Practice

- ⇨ Automotive SPICE for Organizational Unit's Software Process Capability Determination
- ⇨ Automotive SPICE for Software Process Improvement
- ⇨ Automotive SPICE for Monitoring/Evaluating single software projects

All the above uses are acceptable, but the validity of assessments results varies

- ⇨ There is a lack of uniformity in criteria for Automotive SPICE Assessment preparation and performance;
- ⇨ Automotive SPICE Assessments differ in terms of:
  - Number of process instances (project) used
  - Composition of the assessment team (number, competence, independence)
  - Duration
  - ….

There is the need of making the picture more clear

Assessment validity

- **ISO/IEC 33002**: “Process Assessment – requirements for performing an assessment”
- **ISO/IEC 29169**: “Process Assessment – The appplication of conformity assessment methodology to the assessment of process quality characteristics and organizational maturity”

ISO/IEC 33002

Class 1 assessment: the purpose is:

- "To provide a level of confidence in the results of the assessment such that the results are suited for comparison across different organizations
- To enable assessment conclusions to be drawn as to the relative strenghts and weaknesses of the organizations complared
- To provide a basis for process improvement, external benchmarking and capability determination"

Class 2 assessment: the purpose is:

- "To provide a level of confidence in the results of the assessment that may indicate the overall level of performance of the key processes in the OU, which are suitable for comparison of the results of an assessment across an organizational or product line scope.
- To enable assessment conclusions to be drawn about the opportunities for improvement and levels of process-related risks
- To provide a basis for an initial assessment at the commencement of an improvment program."

Class 3 assessment: the purpose is:

- "To to generate results that may indicate critical opportunities for improvement and key areas of process-related risks
- To be suitable for monitoring the ongoing progress of an improvement program , ot to identify key issues for a later C1 or C2 assessment."

ISO/IEC 33002
Class 1 Assessment Specific Requirements

Assessment planning

- The type and level of independence of the body performing the assessment, the lead assessor and the other members of the assessment team shall be recorded
- The assessment team shall contain **at least two assessors who are independent of the organizational unit being assessed**. One assessor shall be the lead assessor
- **A minimum of four process instances** (where possible) shall be identified for each process within the scope of the assessment. If there are fewer than four process instances, then all process instances shall be selected

Process attribute rating and reporting

- Where a process attribute rating cannot be characterized for the highest process attribute rating for any instance, the issues resulting in the lack of achievement shall be documented as a gap in performance;
- The assessment report shall be approved by the lead assessor and confirmed by all the members of the assessment team
- ....

ISO/IEC 33002
Class 2 Assessment Specific Requirements

Assessment planning

- The type and level of independence of the body performing the assessment, the lead assessor and the other members of the assessment team shall be recorded
- The assessment team shall contain **at least two assessors** .One assessor shall be the lead assessor
- **A minimum of two process instances** (where possible) shall be identified for each process within the scope of the assessment. If there are fewer than four process instances, then all process instances shall be selected

Process attribute rating and reporting

- Where a process attribute rating cannot be characterized for the highest process attribute rating for any instance, the issues resulting in the lack of achievement shall be documented as a weakness and retained in the assessment record
- ...

Conclusions

A strong need of a clear definition of Automotive SPICE assessment performance rules and validity mechanism exists

Customer – Supplier agreements are out of the scope of Automotive SPICE

TIER1 (Supplier) ACTIVITIES

Let’s give a sight to what a supplier has to do:

- To fill many technical and quality documents (already at RFQ phase)
- To hold SW process assessments with customers
- To have (buy) tools compatible with the customers
- To have many iterations in development and validation to comply with increasing requirements arose from customers assessments
- To have big teams even for small projects, since customer’s technical department wants the ECU asap, with the maximum of contents, while customer’s quality department wants a full process with so many activities that are incompatible with so short development time.
- In other words : a complete V model development takes time and cannot be compressed in two or three months : (SRS+SAD+SDDD+CODE+SWTP(1,2,3)+SWTR+VDD+DR’s)

SAFETY TARGETS

Everything described in the previous page has to be duplicated for safety requirements.
Let' consider that a parallel V model has to be applied for the safety related requirements:
though those requirements could be treated as a part of the standard V model, it is better to maintain them separated to avoid too big documents to update whenever a requirement changes in the safety/non safety areas.
These documents can be owned by the same developer, but this increases his job.
Again, this is reasonable and feasible, but it cannot be done in the same (short) time that the customer wants.

QUALITY GOALS

It seems that quality goals are detached from the technical ones or that technical people are interested in fast results, while quality people are more interested in a good (theoretical) process.

The amazing thing is that at the end all parties want a high quality product:

- Customer’s technical and quality guys & purchasing department
- Supplier’s technical and quality guys & sales department
- End users (don’t forget them!)

COMMENTS & CONCLUSIONS

- A poor quality product will give up (hidden) costs, sooner or later, because of problems that will arise, for sure
- A good quality product costs a bit more because of more activities that are done during the development (a good V process with complete documentation set)
- A product with continuous officiousness by the customer can rise up to a «multiplied by four» cost.
- How to survive to this situation, when the time to market is reducing every day and costs are a major concern ?
- The solution is… let's continue this discussion at the round table !