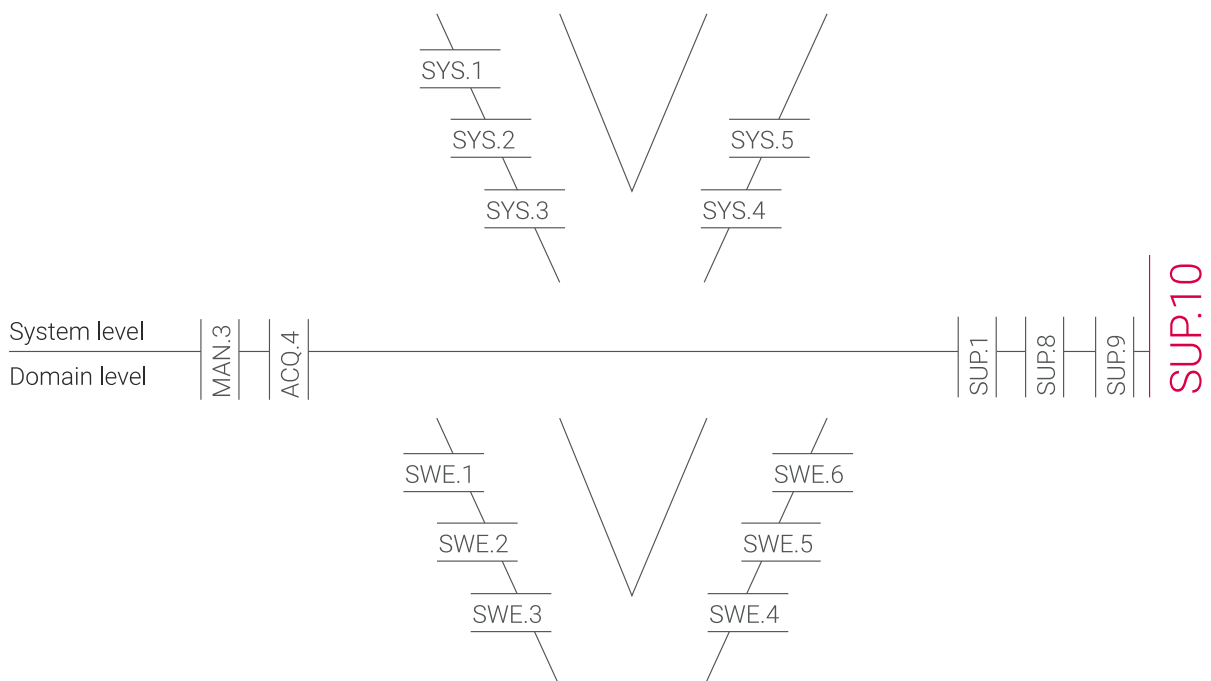# CHANGE REQUEST MANAGEMENT – SUP.10

in Automotive SPICE®

an introduction

Dr. Klaus Hoermann

Learn Automotive SPICE® with Kugler Maag Cie GmbH

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About this white paper

This white paper extends the materials I've covered in my Automotive SPICE® tutorial for Beginners on YouTube.

https://youtu.be/CMBNPXaGlpk

Both the YouTube tutorial and this document cover the core concepts and they are not complete by any means. This publication has been prepared for general guidance only. Please do not act according to any information given in this document without receiving specific professional consultancy. The publisher, KUGLER MAAG CIE GmbH, shall not be liable for any damages resulting from any use of the information contained in this report.

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About the author

Hi! I'm Klaus and I started with SPICE back in 1998. Since then I have done hundreds of assessments and trainings. It is my passion to bring hard-to-understand models to life so that normal people can understand them.

I am one of the founders of Kugler Maag Cie and work there as a principal and partner.

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Short summary of the YouTube tutorial

https://youtu.be/CMBNPXaGIpk

The Change Request Management process in Automotive SPICE® (also known as SUP.10) helps your organization to ensure that change requests are managed, tracked and implemented.

Change requests are required if your project scope or requirements are to be changed. Chargeable changes represent a chance to increase your project turnover and also your personnel capacity. Change requests are also very important for the customer. If you process change requests quickly and effectively, you will make your customers happy.

The following are the most important aspects of Change Request Management in Automotive SPICE®:

- **Set up a great Change Request Management strategy.** A change request needs to be processed through all engineering processes without getting stuck. This involves dozens of people in different teams and locations. If you don't coordinate these people and track the status of change requests as they flow through the different steps, it will never work. A good strategy makes it clear to all involved how the workflow is, how progress is controlled and who is responsible for what. Here is your solution for the contents of a great strategy:

1. Define the categories of change requests you want to deal with, such as chargeable change requests, non-chargeable change requests, system level change requests, software requests and so on.

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2. Define your input channels - who can submit change requests.
3. Define the tools to be used to process change requests.
4. Define the status that change requests will have during processing.
5. Define how and by whom progress will be tracked.

A typical solution is a CCB that stands for Change Control Board. This will help all people to do the right things. That is what counts!

- **Analyze and approve change requests.** One problem I sometimes see is that projects start uncritically and immediately with the processing of change requests. Don't do that! You may miss out on financial compensation or overburden your project team. This is what I recommend:

  1. In your CCB you check whether this change request is chargeable and, in this case, whether this person is allowed to submit this change request.
  2. Change requests often require a more detailed feasibility analysis by experts. If they are chargeable, you need to estimate the effort, prepare a quote and negotiate with the customer.
  3. You also need to check whether the desired implementation date is realistic or not. This avoids endangering the previously agreed releases and their contents.

  In this way, you present yourself as a reliable partner for the customer and other stakeholders.

- **Implement change requests.** Implementing change requests increases the workload of your teams and requires careful planning and monitoring. Otherwise, either the change requests or the normal

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development tasks may hang or be late. Let's have a look at how to get that solved. The point is that change requests and normal development tasks compete for resources and delivery dates. If you don't have many buffers or can increase staff capacity, these are your options:

1. Move features to a later release

2. Move bug fixes and gain more capacity for the change request.

Both have the potential to annoy the customer and must therefore be negotiated with the customer in advance. Once this is resolved, treat the change requests like any other development task.

But one more thing: Automotive SPICE requires that change requests be traceable to all affected work products. This is easy to solve if you use a life cycle management tool that is linked to your configuration management tool. A change request leads to a series of development tasks and each development task is traceable to all resulting changes to work products.

That is Change Request Management in short.

If you follow these points

1. you will implement powerful change request management functionality,
2. you will keep control of your releases,
3. and you will avoid having disappointed customers.

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Change Request Management – the process according to Automotive SPICE®

The purpose of the Change Request Management Process is to ensure that change requests are managed, tracked and implemented.

BP1: Develop a change request management strategy. Develop a change request management strategy, including change request activities, a status model for the change requests, analysis criteria, and responsibilities for performing these activities. Interfaces to affected parties are defined and maintained.

NOTE 1: A status model for change requests may contain: open, under investigation, approved for implementation, allocated, implemented, fixed, closed, etc.

NOTE 2: Typical analysis criteria are: resource requirements, scheduling issues, risks, benefits, etc.

NOTE 3: Change request activities ensure that change requests are systematically identified, described, recorded, analyzed, implemented, and managed.

NOTE 4: The change request management strategy may cover different proceedings across the product life cycle, e.g. during prototype construction and series development.

BP2: Identify and record the change requests. Each change request is uniquely identified, described, and recorded according to the strategy, including the initiator and reason of the change request.

BP3: Record the status of change requests. A status according to the status model is assigned to each change request to facilitate tracking.

BP4: Analyze and assess change requests. Change requests are analyzed according to the strategy including their dependencies to affected work products and other change requests. Assess the impact of the change requests and establish criteria for confirming implementation.

BP5: Approve change requests before implementation. Change requests are prioritized based on analysis results and availability of resources before implementation and approved according to the strategy.

NOTE 5: A Change Control Board (CCB) is a common mechanism used to approve change requests.

NOTE 6: Prioritization of change requests may be done by allocation to releases.

BP6: Review the implementation of change requests. The implementation of change requests is reviewed before closure to ensure that their criteria for confirming implementation are satisfied, and that all relevant processes have been applied.

BP7: Track change requests to closure. Change requests are tracked until closure. Feedback to the initiator is provided.

BP8: Establish bidirectional traceability. Establish bidirectional traceability between change requests and work products affected by the change requests. In case that the change request is initiated by a problem, establish bidirectional traceability between change requests and the corresponding problem reports.

NOTE 7: Bidirectional traceability supports consistency, completeness and impact analysis.

Output Work Products: Change management plan, Change request, Change control record,

Advanced tutorial about Change Request Management

What is the benefit of Change Request Management?

When used properly all changes to baselined items are managed and controlled. There is agreement on what to change and when it will be changed.

What is the content of the Change Request Management Process?

- The activities, responsibilities, resources required, and an organization-specific lifecycle model for the states of a change are defined in the change management strategy and implemented in the project (BP1).
- Each change request is recorded (BP2) and its status updated as it moves through the lifecycle, (BP3) see the following picture as an example.
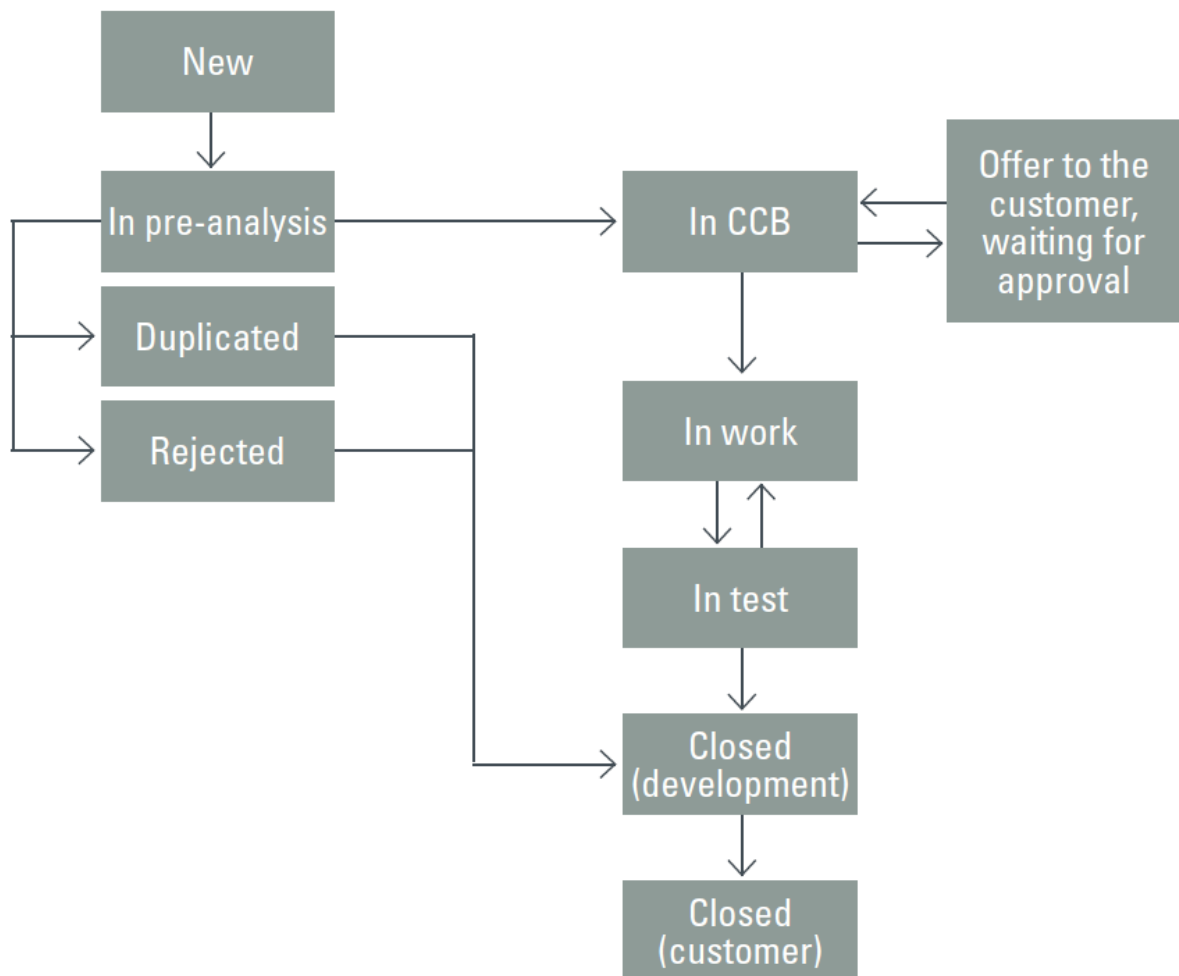
Example of a status workflow of change request management

- The effects of the changes are analyzed and prioritized for impact, benefit, resources, urgency, schedule and risks. Also, the types of verification activities needed are defined (BP4).
- Each change request is approved before it is implemented (BP5).
- Changes are tracked until completion. Prior to completion, their correct and purposeful implementation is examined. The submitter is informed of the status regularly (BP6, BP7).

- Bidirectional traceability between the change request and all work products affected is established (BP8).

Experiences, problems and hints:

- Change management is closely related to problem resolution management (SUP.9), since solving problems can cause changes. It also depends on the requirements processes, (SYS.2 and SWE.1) since changes to requirements can cause changes elsewhere and vice versa.

- Tool support in this process is indispensable to allow structured processing of changes. The tool needs to have a good integration into the engineering tool suite to allow seamless implementation of traceability (BP8).

- The interface between customer and the subcontractor regarding problem management tools and procedures should be defined (typically in the strategy).

- Projects should have clear definition of change request approval, to prevent work proceeding on unapproved changes.

- Similarly, there should be an explicit and conscious approval in cases like this: although a customer change request has not been supported with a commercial order, but the team decides to proceed with development at their risk, but to the likely advantage of all parties.

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