



# Revisioning Systems for Custom Designed Products

An Online Continuing Education Course for Engineers

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# Revisioning Systems for Custom Designed Products

George Petrescu, P.E., Ph.D.

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# 1 Preliminary Considerations

Design processes for custom designed products typically involve activities such as calculations, creation of specifications, schedules, etc., and culminate with either the creation of electronic files representing parts, assemblies and associated drawings or with specifying off-the-shelf components, or, in most cases, both. Experienced designers appreciate that the process of designing parts and assemblies is iterative: typically, a number of parts and assemblies are created and, as the design process is progressing and as the specifications become clearer, many of those parts and assemblies are discarded, while only a smaller number of components are used in the final design solution. The retained components continue to experience modifications as needed.

Change is a constant feature of the design process: the parts and assemblies adapt as the design matures. The changes can occur not only during the design process, but also during the manufacturing and assembly process and even after the components are released to service. There can be many causes for those changes: “natural” evolution of the components, design re-alignments or mistakes, updates in the final product specifications and updates in the suppliers’ specifications, etc. It is customary that the changes are classified as major or minor, depending on how they affect the final product.

The individuals involved in the product development process need clear guidelines to help them maneuver in such a dynamic environment. The more complex the design and the more regulated the industry under whose auspices the final product is functioning, the more difficult it will be to:

- track the changes implemented in the design;
- understand the evolution of the design;
- make decisions for product improvement.

Skilled, proficient designers know that being able to analyze old versions of the design helps with the understanding of the design intent of the current version. Additionally, when changes happen after the components are released for

manufacturing, other departments, as well as the customers, will have questions like “which one is the latest version of this part?” or “can we use an earlier version instead of the latest one?” that will need to be answered. How many times have you encountered the situation in which a part had several out of order revisions (like: A, B, E and F – missing C and D), some revisions had sub-revisions (like: A, A1, A2, F, F1) and in the end everybody was agreeing that the part to be used was the one at revision B2?

To help the users answer those types of questions with confidence, the Engineering Department will need to employ a Revisioning System that can track the inevitable changes experienced by the designed parts, assemblies and their associated documents. This system needs to be clear, un-equivocal and simple to understand and use. Such a system requires the following characteristics:

- reduces and minimizes the chances of confusion among the various versions of the same parts/assembly
- allows the stakeholders (other departments or product users – clients or internal users) to know which one is the latest revision at all times
- avoids the use of older, superseded revisions

## **1.1 Terminology**

In the following, the “System Designer” refers to the person that is in charge of creating (and sometimes maintaining) the Revisioning System. In some cases the “System Designer” can be a committee, many times including representatives of various departments other than Engineering: Purchasing, Technical Support, Manufacturing, Assembly, etc.

The word “part” will refer to a single piece of material that is designed, manufactured and assembled together with other parts to form an assembly.

The word “assembly” refers to a collection of parts and/or sub-assemblies that are held together by various means. The word “sub-assembly” refers to an assembly that is used in another assembly.

The word “component” refers to either a part or an assembly.

Later there will be references to the “3F Concept”, which stands for “Form Fit and Function”. Here, “Form” represents the overall shape of a component, “Fit” relates to how a component interacts with other components while “Function” represents how the component performs its intended task.

In this text the words “revision” and “version” are used interchangeably, but the System Designer can choose to differentiate between the two as needed. Additionally, some people use the word “release” and “version”. Other sources use the terminology from

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