A Performance-Based Quality Assurance System

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ABSTRACT

Many consumers bought Swedish, German, and Japanese cars because these cars were perceived as longer lasting and having superior quality to the average American car, despite the extensive use of statistical product control by American car manufacturers. It appears that the problem was not in the technology, but rather in the paradigm of thinking.

Taguchi stated (Ross 1996):

> *Today in America it is quite popular to take a very strict view of what constitutes quality. In his book, Crosby supports the position that a product made according to print, within permitted tolerance, is of high quality. This strict viewpoint embraces only the designers and the makers. This is a "goal post" syndrome. What is missing from this philosophy is the customer requirements. A product may meet print specifications, but if the print does not meet customer requirements, then true quality cannot be present. For example, customers buy televisions with the best picture, not ones that necessarily meet the specifications.*

While the car industry has learned this lesson, the construction industry has not. The construction industry performs a lot of market studies and product testing. But does this testing predict long-term performance of a building? The linkage between the testing to qualify materials and components and the overall performance of the building is provided by the engineering experience and understanding of scientific principles. Without this linkage, material qualification alone is not sufficient to predict performance for the different climate and service conditions.

The issue of quality assurance (QA) in the construction process is inseparable from objective- or performance-based building codes. A quality assurance system makes sure that starting from the concept and going through the design, construction, and commissioning stages, the process will deliver the performance that we initially specified (requested). Many environmental control failures are caused by a lack of communication between different groups of professionals and by a lack of understanding of the interactions between various subsystems. The presence of a formal QA system could alleviate most of these problems.

The development of such a QA system has been presented in a recent series of articles on performance of building envelopes (Bomberg and Lstiburek 1998). One of these articles explains the performance-based quality assurance (PBQA) system in the context of building science.

The PBQA system starts with customer requirements and goes through all stages of design and construction, ensuring that the initially specified performance objectives are met. Observations that most comfort and durability failures were caused by poor understanding of interactions between various subsystems and that there was a need to improve communication between different groups of professionals led to development of this quality assurance system.

REFERENCES

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