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Product Certification and Evaluation:

A Comparison of Approaches to Building Product Approval

by The Federation of American Scientists

Behind the built environment lies a complicated series of legal regulations, created to specify the minimum acceptable level of safety for constructed assemblies and products as they relate to the construction and occupancy of buildings and structures. This is where product evaluation and certification lies, as every building component specified must be shown to meet the applicable building codes and to perform as equivalent to the prescriptive method outlined. This paper will explain two processes for manufacturers to demonstrate this compliance, as well as the costs and benefits of each. By making these distinctions clear, a product manufacturer will be able to optimize the process of product certification and significantly reduce the amount of time and money spent.

Code Compliance – Where the Pieces Fit

While final decisions of code compliance on all levels are left up to local code officials, several avenues have been created to aid this decision process. These options can be seen as two basic approaches: product evaluation, and product certification. Two subsidiary companies of the International Code Council (ICC)¹ – the ICC-Evaluation Service (ICC-ES) and the International Accreditation Service (IAS) – each provide manufacturers with one of these methods to demonstrate to builders and code officials that their product meets applicable standards. As subsidiaries of the ICC, they both carry the weight of an industry recognized, impartial third party dedicated to ensuring building safety through building codes. The two provide a similar outcome, but the process and approach of each makes them very distinct and separate services.

Product Evaluations and The ICC-ES Evaluation Report

As its name suggests, the ICC-ES is an example of a product evaluation service. Essentially, the organization verifies that specified testing has been done to show a building product, component, method, or material performs at a level compliant with applicable codes. If this is found to be the case,

¹ The ICC is a non-profit organization dedicated to consolidating building codes. It has created a series of comprehensive codes (the I-codes), most notably the International Building Code (IBC) and the International Residential Code (IRC). Most U.S. cities, counties, and states have adopted and ratified the I-Codes, modifying them to reflect local circumstances as needed. This allows code enforcement officials, architects, engineers, designers and contractors to work with a consistent set of requirements throughout the United States.

the ICC-ES issues a report to this affect, acting as a credible argument to agencies that enforce building regulations to help determine code compliance. This is valuable to a product manufacturer, as it allows for the easy implementation of their product within the scope of the I-Codes (codes used in the majority of the country that are developed by the ICC).

The process of obtaining an evaluation report begins long before a company submits an application to the ICC-ES. Prior to this point, a product manufacturer must select a testing laboratory, contract and direct the appropriate testing, and procure an engineer to evaluate the results. For new and innovative products where accepted testing criteria does not exist, the applicant must work with the ICC-ES Technical staff and the industry to establish one.² These test results are then documented, compiled, and submitted to the ICC-ES. If the product is new or innovative, the burden of what to submit to the ICC-ES also falls on the company's hands.

Upon receipt of this information, the ICC-ES evaluates the data to check compliance with either the building code or the ICC-ES acceptance criteria provided. All data submitted by the manufacturer and each decision made by the applicant in the testing process is scrutinized. Anything that is deemed inadequate or incomplete must be redone, revised, and resubmitted for re-evaluation. Depending on the product, the manufacturers grasp on required testing procedures, and existing precedents for a product, this process can be especially long and circuitous. Once the applicant has satisfactorily answered all questions posed by the ICC-ES and has fulfilled other applicable requirements, an evaluation report is issued lasting for one year (and reissued at one or two year intervals).³

This end product is a positive step for a manufacturer, but there are sacrifices of time and effort made in this process. The length of the evaluation process depends heavily on such factors as the

Manufacturer identifies required testing. If there is no acceptance criteria, he must work with the ICC-ES and the industry to develop one.



Manufacturer contracts and directs the appropriate testing, and procures an engineer to evaluate the results.



Compiles test results, fill out ICC-ES application, and submit to the ICC-ES for Review.



ICC-ES reviews the submitted data. Anything that is deemed inadequate must be redone, revised, and resubmitted for re-evaluation.



If the manufacturer has satisfactorily answered all questions posed by the ICC-ES and has fulfilled the applicable requirements, an evaluation report is issued.

ICC-ES Product Approval Process

² ICC-ES Criteria Development: http://www.icc-es.org/Criteria_Development/

³ More information on the ICC-ES approval process can be found online at <http://www.icc-es.org>

complexity of the product under consideration; whether an acceptance criteria needs to be developed and approved; and the applicant's promptness and thoroughness in submitting data. For new or innovative technologies, a lengthy wait is all but ensured. Even with these variables in a manufacturer's favor, there is likely a long turnaround that is both costly and draining for the manufacturer. According to the ICC-ES, the average time required to get a new ICC-ES report ranged from three months to 23 months during the organizations first two years. The average evaluation time for products ultimately found to meet code was 11 months.⁴

In addition to these holdups, this evaluation report merely provides a "snapshot" in time. It only shows that at the moment the testing was conducted, the product performed at a level that is acceptable by code. While this is a good thing to show, it is far from ideal. It does not assess ongoing quality standards, and does not verify that the product delivered will be comparable to the one tested. In addition, this approach does not allow a manufacturer to easily adapt his certification with changes to a product, code requirements, etc. All things considered, an important end goal is reached for a manufacturer by obtaining an ICC-ES report, but the path taken to get there is far from optimal.

Product Certification, the IAS, and ISO Guide 65 Product Certification Agencies

The other route provided to manufacturers is product certification. One means of doing this is through a program conducted by the International Accreditation Service (IAS). Through a program initiated in early 2007, IAS accredits testing agencies as Product Certification Agencies (PCAs) under International Organization for Standardization/International Electrotechnical Commission (ISO/IEC) Guide 65, *General Requirements for Bodies Operating Product Certification Systems*. With this accreditation, these PCAs are able to offer a much different avenue for manufacturers to demonstrate their products meet applicable codes on an ongoing basis.

This difference stems from the basic relationship between the evaluation agency and the manufacturer, especially in regards to who must demonstrate a product's compliance. While the ICC-ES requires that the manufacturer prove to an evaluation service that a product performs up to code, the ISO sponsored route places that burden on the certification agency. The PCA is directly responsible for all aspects of the evaluation process, from identifying and



⁴ <http://www.icc-es.org/Help/about.shtml#reports>

running the appropriate tests (i.e. following the I-code acceptance criteria) to documenting the results and delivering final product review and final product certification. The slow and bothersome back-and-forth process of identifying and filling in data gaps present in the ICC-ES approach is eliminated, significantly expediting the process and reducing the expense of obtaining a certification report (depending on lab turnaround time and schedules). This allows manufacturers to concentrate on their core competency rather than on product certification.

In addition to a more efficient delivery of an accepted initial certification, future certification measures are optimized by this process. By being so heavily involved in the entire process, the certification agency becomes intimately aware of the product's configuration, uses, and limitations. This allows the certification agency to respond quickly and competently to changes in the product, to changes in applicable codes, or to inquiries by the end user. Also, the PCA has the ability to pull a report, putting a company in bad standing and effectively cutting off their ability to sell a code compliant product if they deviate from the certification report, the in-plant quality control program, or take shortcuts that subvert the life safety goals outlined by the I-codes.⁵

Case Study: Florida

This important distinction between product evaluation and product certification is shown in the state of Florida's Building Code. The state of Florida's Building Code is independent from the IBC or IRC, and does not refer to the ICC-ES or the IAS, but still clarifies the different routes for product approval and treats each differently. Within the Florida code, a building product must receive local code approval to be used (statewide approval is an optional secondary measure). There are several acceptable methods for demonstrating this: a test report, an evaluation report from an evaluation entity (ICC-ES, Miami-Dade, etc.), an evaluation report from a Florida architect or engineer, or a certification mark or listing. If the evaluation report includes engineering analysis of any kind--which most do--then it must be sealed by a FL registered Engineer. Seen simply, these are essentially two methods: evaluation processes, and a certification process, each roughly comparable to the ICC-ES and the IES/ISO Guide 65 routes.

The first three methods are product evaluation approaches, in many ways comparable to the ICC-ES route. A product must be tested to specified conditions in a standardized way, and then the ICC-ES, a Florida architect, engineer, or testing agency must sign off on the product's compliance to code. To do this, however, the testing agency or evaluating architect or engineer must certify independence from the manufacturer. Also, products will only be accepted if manufactured under a properly audited quality assurance program. Any changes to approved products or installations must also be approved by a testing agency, architect or engineer. This is essentially this allows another independent party to take assume the role of the ICC-ES, and this evaluation becomes a piece of the argument for a product's local approval.

⁵ More information about IAS/ISO Guide 65 Product Certification can be found at http://www.iasonline.org/Product_Certification_Agencies/guide65.html

The fourth option is that of a certification agency. Like the ISO Guide 65 program run by IAS, this approach consolidates all the necessary components in one place. In this case, a certification agency evaluates products based on test results and/or rational analysis; conducts quality assurance; certifies compliance with standards; and lists and labels products. For all purposes, this is identical to the IAS Product Certification Agency, as an agency must follow the same set of guidelines (ISO Guide 65) to be approved in the state of Florida. This streamlines the process, as products bearing a listing or label from an approved agency require no further documentation to establish compliance with the code.⁶

While this may seem small, this approach to product certification in the Florida building codes demonstrates the important distinctions between both product approval options. It also shows the extra steps required to verify an evaluation process, further evidence of the different level of ease and simplicity inherent in each model.⁷

Impact Potential

Seen simply, the two product approval processes are similar. In each case, a manufacturer receives an industry recognized and respected verification that his product performs up to code, allowing for easy local approval and use under the I-Codes. However, the balance of responsibility and the short and long term value of each process is significantly different. ICC-ES product evaluation requires more effort on the part of the manufacturer, takes longer to complete, but is currently more readily recognized throughout the industry. The IAS's PCA certification takes less effort on the part of the manufacturer to "figure things out," is typically completed faster, and the ongoing relationship between the testing facility and the manufacturer expedites future developments. However, IAS/ISO Guide 65 certification is a relatively new option, making it less recognizable throughout the industry (although no less legitimate). Regardless of a manufacturer's decision and circumstances, having multiple options allows for the optimization of the evaluation and certification process, and a means for potentially drastic savings in both time and money.

⁶ http://www.dca.state.fl.us/fbc/committees/product_approval/Local_Product_Approval0606.pdf

⁷ More information about Florida code approval can be found at:

http://www.dca.state.fl.us/fbc/committees/product_approval/2_product_approval.htm