



## Engineering Sciences Section - 2012

### C5 The Use of Regulations, Codes, Standards, and Acceptable Practice in Forensic Architecture and Engineering

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After attending this presentation, attendees will understand the proper (and improper) use of regulations, codes, standards, and acceptable practices in the evaluation and analysis of hazards and defects, with emphasis on premises liability.

This presentation will impact the forensic science community by showing how codes, standards, regulations, and the more amorphous “accepted practice” forms the corpus that allows a practitioner to evaluate whether the hazard of a particular feature is or is not acceptable. Those who attend the presentation will be in a better position to underpin any such evaluations with reasonable certainty, in a manner that can better withstand *Daubert* and *Frye* challenges.

In establishing a breach of duty between parties, it is essential to understand just what duty one party owes to another. One way to establish that is to look at what has been codified in the technical literature. This presentation discusses the use of Regulations, Codes, Standards, and Accepted Practice (RCSAP) in establishing duties between parties and discusses how they should be used and are misused by forensic engineers and architects.

There exist two ways in which RCSAP can be used: (a) directly, by showing a violation of a legally mandated and on-point RCSAP provision, generally the violation of a Regulation; and, (b) indirectly, by showing a non-binding but on-point violation of acceptable practice.

This paper will use staircase elements as examples.

Definitions:

**Regulations** - A Regulation<sup>1</sup> has the force of law behind it. It can be international, federal, state, or municipal in origin. Generally speaking, violations of state and federal statutes can be used to show a violation of duty or, at least, evidence of such a violation. (Check the case law in your venue.) International treaties and municipal ordinances are not generally considered to be capable of generating negligence but can be an element of a violation of acceptable practice.

**Codes** - A code is a document generated by and under a committee of interested parties. For example, the International Building Code has been developed under the auspices of the International Code Council, Inc. Codes are generally far more comprehensive than are standards. There are many different types of codes. For example, building codes relate to construction and alteration of a structure; existing structures codes relate to the maintenance of an already built structure. The violation of a temporally-appropriate code is evidence of a violation of acceptable practice. If the code is incorporated by reference into a regulation, it can also be a direct violation of a regulation.

**Standards** - A standard is a document generated by a group of interested parties. The typical *raison d'être* for standards is to assist in commerce. Standards are generally narrow in scope and standards can range from company-wide to industry-wide to international. Standards are voluntary unless the parties involved agree to be bound by them or the standard is incorporated by reference into a statute or regulation. Standards having the most impact are known as full-consensus standards, meaning that all interested stakeholders are allowed input and substantial agreement must be reached on all of the provisions. On-point temporally-appropriate but non-binding standards may well be evidence of acceptable practice.

**Acceptable Practice** - Acceptable practice is the concrete manifestation of the way things should have been done in the time period and geographical area of interest. It is a catch-all category. The absence of on-point regulations, codes, and standards does not and cannot suggest that anything goes. For example, if a building had been built before the existence of a building code for the geographic area, that doesn't suggest that anything is acceptable. One must look to acceptable practice.

**Appropriate use of RCSAP** - For a regulation code, or standard to be directly used, it must be strictly applied, temporally appropriate and on-point. To show a direct violation, Regulations Codes, and Standards (RCS) must be strictly applied. The use of the document must fall within the ambit of the scope of the document. The timeframe of the RCS must match that of the object under study. Given all of that, violations of not-mandated standards and codes are not *per se* regulatory violations. Unless mandated by law, no one is required to follow a standard or code; however, non-binding documents can give insight into acceptable practice.

Acceptable practice can be developed using (temporally and geographically) “nearby” building codes, by age-appropriate textbooks, by an architectural survey of similar-age buildings, and anything else that can place the analyst into the time and practice mindset of a competent practitioner. Acceptable practice is a more amorphous concept than are RCSs. The thing about Acceptable Practice is that it is far more flexible than is RCS, but requires one to do one's homework.

Here's an example. When one looks at the apartment buildings in New York City built in the early twentieth century, it is clear that the main exits, which typically have one or two steps down to the sidewalk, were simply not built with handrails as the code of the era would appear to require. (The 1916 Building Code of the City of New York states that



## Engineering Sciences Section - 2012

(§154) exterior stairways “shall conform ... to the requirements ... for interior stairs.” Interior-stair requirements (§153.6) requires handrails on both sides” of a stairwell). But if an architectural element is evident in many or most of the built-in-the-same-era buildings, that strongly suggests how that element had been parsed in that era. (It is often the case that neighborhoods develop quickly after the infrastructural elements: water, sewers, electricity, and roads, fall into place. Thus, many of the original buildings in the same neighborhood are architecturally similar). It is clear that the architectural grammar of the teens and twenties of the twentieth century did not require handrails on the main entrances of buildings, notwithstanding what the literal wording of the code suggests. It’s not that architects were ignoring the code; rather, architects did not consider the one or two steps at main entrance of an apartment building to be an exterior staircase.

What acceptable practice is not is something that is based upon “in my experience.” In my experience doesn’t reach the level that *Frye* or *Daubert* requires: as one’s experience in isolation lacks both “general acceptance” and reproducibility. If there is no research backing up an opinion, no discussion in the literature of practice, nothing save someone’s opinion, that opinion should be looked at with circumspection. One obvious issue; how on earth can any person practicing today talk about “in my experience” with respect to a building built in the 1920s?

**Misuse of RCSAP:** *Conflating A Violation With Causality* - One thing that is important to understand is that a “violation” of a regulation, a code provision, or a standard, is not in-and-of-itself tantamount to negligence. One must also establish that the violation is causal in any damages. A classic example of conflation of a violation of a code provision with the issue of negligence concerns handrails in stairs. Specifically, building codes, which were originally developed to ensure fire safety, placed early emphasis on the need to have handrails on both sides of all but the narrowest of stairs, and intermediate handrails on wider stairs. The intermediate handrails are both to channel downward (eliminating side-to-side traffic) rushing-down-the-steps-in-emergency crowds of pedestrians and to provide handrails for at least half of the stair users. But one or two people exiting a building do not need intermediate handrails, because one or two pedestrians can simply avail themselves—if they choose to—of the handrails at the edges of the stair.

*Using Generic Standards To Establish A Specific Violation* - Most building codes have somewhere a section that states that a building must be “reasonably safe and without nuisance.” You must not rationalize that what you think is a hazard, therefore, violates that generic provision. In other words, because you think something is a hazard that doesn’t per se cause a violation of that generic “keep things safe” provision of a code. In short, the RCS should not be used merely to wrap your ideas in the mantle, the imprimatur, of Standard or Code. What you think is a hazard may well be a hazard; but it does not become a hazard by citing to a generic “keep-things-hazard-free” RCS citation.

*Equating Quantity With Quality* - One does not need large numbers of RCS citations to prove a point. The experience here is that there is an inverse correlation between the quantity of standards cited and the relevance and utility of those standards. The plain fact is, two, two dozen, or two hundred not-on-point citations are not-at-all equal to one on-point citation. That said, if one is trying to show the state of accepted practice, the more temporally-appropriate citations, the better. If you are trying to show that large, square newel posts at the top and bottom of a staircase was the custom in 1900, one citation is good, two are better, and three are even better. If the citations are both local and geographically distant, that would be better yet.

Asserting that the absence of an on-point, temporally-appropriate standard implies that “anything goes” is nonsense. Dimensional rules that define how a staircase should be constructed date back to the late 1600s. There has been much written in the early practicum on stair dimensions. Carpentry texts from the late 1800s give suggested dimensions for risers and corresponding treads. Thus, the idea that, before codes had been published, any riser and tread dimensions would be acceptable is cynical nonsense. Again, in the absence of on-point RCS, acceptable practice must be researched. (Do your homework!)

### *Being Dogmatic In Areas Of RCSAP Flux Is Counterproductive*

From at least the 1930s through the 1980s, handrail heights were set at 30–34 inches above stair nosings. From the 1980s, based upon research by Brian Maki, handrail heights were raised to 34–38 inches. Handrails that also serve as stair guards are allowed to be 42 inches high. Given all that, it is absurd to assert that a building built in, say, 1950, is defective because its handrails were 36 inches tall. It is arguably problematic to suggest that a building designed in 2000 that has 33 inch handrail heights, is hazardous because it violates the 2000 building code. It is a code violation, to be sure. But it was acceptable for over fifty years, so it would be hard indeed to establish that handrail height as a causal element in a stair accident.

Similar situations exist when looking at riser and tread dimensions, stair widths, and so forth. Architectural elements that change over time imply that it is no “right” or “optimal” answer. In a situation where codes have changed over time, and within reason (that is, the parameter under discussion is within the range of variation of code and/or acceptable practice), a “code violation” doesn’t per se suggest a hazard.

### **Reference:**

<sup>1</sup> *Regulation* is used in a generic sense in this paper, covering treaties, CFR, statutes, ordinances, etc.

### **Forensic Engineering, Building Codes, Accepted Practice**