

**CODE TECHNOLOGY COMMITTEE**

**AGENDA ITEM  
4.0**

**“BALANCED FIRE PROTECTION”**

**STATEMENT  
OF  
SUPPORT**

**By  
Jon S. Traw**

**July 20, 2005**

## **Introduction**

The purpose of providing this statement is to express my support for the International Code Council's (ICC) creation of the Code Technology Committee (CTC) and more specifically my strong support for the agenda item "Balanced Fire Protection" and the continued efforts to develop mechanisms and tools by which participants in the code development process may be better prepared to judge the merits of fire protection features of both the current and future editions of the International Codes promulgated by the ICC.

This activity is perhaps one of the most critical ever undertaken by the ICC. As the choice of adoptable codes shrinks, the tendency for complacency increases. Let's only do what we have to do. Codes have long been labeled as reactive rather than proactive in addition to being considered as barriers to innovation. The regulatory entities around the world are proactively moving to performance-based approaches where buildings are considered from a holistic rather than an individual component or system myopic viewpoint. We in the United States are lagging behind while others like Canada have seized the opportunity to truly examine the way we regulate construction in the interest of public safety.

While the agenda item is narrower in scope than what needs to be considered (i.e. does not include things such as structural, sanitation, environmental and societal topics), it does represent a start and can be used as the model for future efforts. It may be of interest to the committee to know that the development of performance-based seismic design guidelines is well underway through the efforts of a projected ten year FEMA funded project. Although only certain portions of the final documents would ever be adopted as part of a regulatory document, the overall project when completed will provide the necessary information to clearly understand the level of protection provided for the variety of possible structural systems and sub-systems.

This same level of understanding of what is being achieved is absolutely necessary for fire protection systems or the ultimate balance desired. Arguments among the various factions about specific changes, substitutions or deletions of individual components or features continue to take place within a forum where the amount of time allotted to debating merits is totally inadequate. The end result is even more debate and less understanding of the true impact on achieving a building that accomplishes the desired levels of public safety.

We have achieved the goal of a single model code adopted by most of the jurisdictions across the country. In my opinion, to accomplish this goal, we did not have the necessary mindset or energy to also critically examine the end result. This does not mean that the attributes or content of the current codes are necessarily inadequate. What it does mean is that it is now time to take a few steps back and look at the results and determine whether the fundamental mission of achieving an effective and balanced level of public safety have be attained.

## **Historic Perspective**

Since the inception of the three individual legacy codes from the early 20's until the decision to consolidate and create a single set of model codes, the three individual codes developed what is properly described as prescriptive detail regulations intended to achieve a desire goal. The individuals that participated in the revisions to these prescriptive regulations brought forward their own specific interests and perceptions of the appropriate prescriptive regulations that should be placed within the codes. Each of these individual's conclusions as to what would be appropriate were influenced by the Scope, Purpose and Intent sections of the model codes. In addition, they brought their own biases based on experience, political pressures and economic impact. For anyone who observed or participated in the decades of code development activity, one could without doubt conclude that opinions and biases varied significantly across the board on many issues including fire safety. The purpose of pointing out this fact is not to draw any conclusions about the efficacy of the content of the legacy codes but merely to bring forward the fact that diverse opinions were an integral component of the code development debates within the code development process for each of the legacy codes.

In the mid 90's when the organizations that promulgated the three legacy codes agreed to create a single set of model codes to be called the I-codes, one of the most daunting tasks faced by the organizations was how to effectively take the three legacy codes and pull them into one, as Mr. Heilstedt described, single set of contemporary and comprehensive model codes. In order to accomplish this task, the drafting committees were charged to consider the content of each of the three legacy codes but not venture into a debate on new concepts not presently covered by one of the legacy codes. The committees were also charged to not delay the consolidation process by entering into lengthy debates about whether any of the legacy code provisions were conceptually adequate or appropriate. In fact, the record will show that the methodology used by the various drafting committees was to create a side-by-side matrix of the provisions contained in the three legacy codes and that matrix would be used by the drafting committees in their selection of what legacy provisions would be included in the draft of the single set of codes. There was debate by the combined membership as the draft progressed towards final acceptance but such debate was limited both by time and topics related to written comments. This approach was necessary in order to accomplish the timelines for producing the single set of codes.

Because of the limitations placed on the committees, the debates on many of the provisions to be included in the new codes was limited to the preference of one over another rather than any debate as to the efficacy of any of the provisions. This does not mean that the resulting document is flawed. It does however mean that any significant debate about the resulting code provisions being both defensible and consistent with the scope, purpose and intent statements contained in the very front of the new I-codes. The time limits imposed on the code development process both in the past and the near future do not allow for the level of debate necessary to take a look not only at individual code changes but the end result of individual code changes and the current code provisions when viewed in a broader context. Understandably, there are those who feel the current

content is good enough and there is no need to take a step back and take a fresh look. There are others who firmly believe that there is a need to take a step back and look at what level of safety is being achieved by the current code provisions. Candidly, the position taken by the various interests has more to do with either they got or did not get what they wanted in the current code.

At least one group, the AFSCC, has been extremely active in raising concerns about the current content and asking repeatedly for the ICC to allow their points of concern to be debated in a forum where the time constraints of the code development process do not restrict their ability to present their case. At the March 2001 ICC Code Development Hearings in Portland, Oregon, the IBC Fire Safety Committee considered an item of business in response to a request from the AFSCC to establish an ad hoc committee on "Guidelines for Balanced Fire Protection Design and the Management of Fire and Smoke in the I-Codes". The IBC Fire Safety Committee took action to recommend to the ICC Board of Directors that the ad hoc committee not be created. The reasons given for the disapproval were essentially only two; 1) the current code development process works to allow full and impartial consideration of fire and life safety philosophies which evolve from code changes, and 2) the volume of code changes is decreasing each year, an indication that the code is not seriously flawed.

The most interesting document bearing on the issue was an April 13, 2001 ICC Memorandum sent from the ICC staff to the ICC Executive Vice President. This document contains not only the communication of the action of the IBC Fire Safety Committee but also a listing of points in favor and opposition to the creation of an ad hoc committee. The points are worth revisiting relative to the consideration of the item before the CTC.

*The following is a summation of the salient points raised in the Fire Safety Forum:*

***Issues in support of an ad hoc committee:***

*The request stems from the perennial code changes regarding smoke migration abatement in the IBC. The scope of this effort has been expanded to all matters regarding the balance of active and passive fire protection, coupled with the need for a set of fire protection philosophies to be established.*

*Ad hoc committee efforts are healthy processes, with the end result being an improvement of the code.*

*This effort should have been undertaken in concert with IBC development 4 years ago. The relationship of balanced issues is needed as a baseline to support code development. The IBC must have an established fire protection philosophy in order to evaluate issues such as smoke migration, as evidenced by perennial elevator lobby code changes.*

*An ad hoc committee provides more time to study the issues when compared to the*

*current code development hearings. This is necessary in order to thoroughly discuss the issues.*

*The creation of the IBC, based upon an amalgamation of the 3 separate model codes and their different philosophies, results in a distinct lack of fire protection philosophy associated with the IBC.*

***Issues in opposition of an ad hoc committee:***

*The scope of the effort is more appropriately addressed in the ICC Performance Code.*

*The scope, as proposed, is too broad. Such an effort could take 10 years and there is no evidence that the code is flawed, thus necessitating such an effort. Limit the scope of ad hoc efforts to specific issues like smoke migration.*

*Issues such as sprinkler trade-offs (active protection) are handled adequately on a case-by-case basis with the membership ultimately deciding. The current sprinkler trade-offs have been debated in the IBC development stage as well as subsequent code change cycles.*

*Effectively, the membership creates the goals and objectives in the I-codes with their approval and disapproval of code changes.*

*The creation of such a broad scoping ad hoc committee may be perceived that the IBC is technically flawed, which it is not. Such an effort may be exploited by others in an effort to compel jurisdictions not to adopt the IBC.*

Examining the reasons given for opposition to the ad hoc committee yields some interesting parallels with some of the reasons given by the written materials given to the CTC members. The code is not flawed and the code development process adequately handles the issues on a case-by-case basis. At least two of the reasons seemingly support the need but question the magnitude and who performs the effort.

An additional fact that has not been advanced is the action of the ICC Board of Directors at their Portland meeting to approve an activity to perform a “bottom-up” analysis of the I-Codes. This action was specifically announced at the code development meeting and was taken by the AFSCC as a means to incorporate their proposal into a much larger task of the “bottom-up” analysis. That approved action has yet to be implemented.

**Code Technology Committee Agenda Item 4.0**

The focus of my comments is on Agenda Item 4.1, Scope and Objectives. I am strongly supportive of the Code Technology Committee (CTC) moving forward with this activity. The scope as presently written elicits the polarization of interest groups and thus if adopted tends to focus the activity in the wrong manner. While many may assume there

is a clear differentiation between active and passive systems, the absence of definitions will undoubtedly lead to potential confusion among participants in the real debate which should be “meeting the fire and life safety objectives of the IBC”. The focus of active and passive is really unnecessary. The scope should be revised to read:

**Scope:**

***To investigate what constitutes an acceptable balance in fire protection measures with respect to meeting the fire and life safety objectives of the IBC.***

For similar reasons as stated above, remove the references to “active” and “passive” within the Objectives portion of the draft. It is interesting to note that the terms only appear in the third paragraph of Item 1 and do not appear in Item 2.

While there will obviously be debate over specifics of the language contained in the objectives, these objectives will ultimately be revisited from time to time as the activity progresses.

The bottom line is that this activity will result in the necessary efforts to allow the appropriate consideration and debate amongst the various interest groups to take place without the current constraints of the code development process. Recommendations emerging from this CTC effort would ultimately be put through the normal code development process so the effort should not be perceived as bypassing the ICC process.

**Comments on Submitted Materials**

Since I am in favor of the CTC activity moving forward, comments will be confined to rebuttal of comments not in support of the CTC activity.

Sam Francis

With all due respect to my colleague, his arguments regarding the four points are all underpinned by the same assumption that the previously existing legacy codes were balanced and met public expectations therefore the IBC does the same thing. Even if the IBC was identical to one of the legacy codes, this presumption of adequacy is just that, a presumption. If we empirically look at the performance data over many decades of the legacy codes being in place, we might possibly come to his conclusion or presumption although when a comparison with performance data from other countries is included in the consideration, we might conceivably question whether we truly have achieved the expectations of the general public. I know of many cases where the public’s expectations and the code performance are widely disparate.

Remember that the IBC is an amalgamation of the three legacy codes and to that point everyone agrees. The end result in some cases was the lowest common denominator for which consensus could be obtained. That is a fact for which many examples can be cited. This does not mean that the IBC is necessarily flawed any more than one or all of the

previous legacy codes. What it does mean is that at the very least, we do not have decades of data to show that the IBC will meet expectations whether they be the expectations of the general public or the elected officials responsible for their adoption. It raises a question about meeting levels of performance which have been raised by a few for at least a decade.

The third issue outlined in his letter is somewhat mystifying to me since he must have a crystal ball to project the results of the effort. The exact work products outlined in the proposal before the committee are at this point a best guess. Based on other efforts of a similar nature, adjustments will have to be made to achieve the overall objective. As an example, the ATC-58 activity to develop "Performance Based Seismic Design Guidelines" has experienced at least three changes in direction of work product since initiated several years ago. That fact does not in any way change the ultimate objective, only the method to achieve the objective.

My colleague in his last reason is attempting to incite the membership into thinking that if approval of this activity is undertaken, it is a condemnation of their knowledge and capabilities. From my discussions with code officials over the past several years, they are the ones asking for information about what can be expected in terms of performance as compared to the legacy codes.

David Collins

I am pleased to say that there is at least two points in my colleague's materials for which I agree. Any discussion about reliability must include the reliability of all types of systems. In addition, a point which he does not raise is the inter-relationship amongst various fire protection systems that affect reliability. Also, the best regulations not properly enforced do little to achieve code intended fire and life safety goals.

While agreeing on those points, I take issue with the remaining points.

He presumes that the CTC effort will result in additional items in the code, specifically what he refers to as "passive" systems. I think he shares Mr. Francis crystal ball on this one. I am not ready to presume the end results anymore than predicting the winner of a football game. If the systems he describes as "passive" are so bad, I assume he does not rely on them in his designs. It is counter productive to make generalizations about how bad certain types of protection perform. If there are specific problems with reliability regardless of the system, then that should be factored into the consideration. Engineers have been using reliability analysis for decades. He may not be familiar with the term "robustness" used in the euro-codes but in fact the point of trying to accommodate the potentially predictable events is a part of good design. In my early career doing structural design of commercial aircraft components, the term redundancy was a key to any design. Ask passengers of airlines if that is important to them. How much redundancy was the key question and I believe the CTC effort could help in sorting through this question. Without the effort, we will remain with claims thrown about from all sides attempting to get their little pieces here and there.

He cites past fire data as evidence of adequate performance of codes as they have changed although he makes the same error as Mr. Francis by assuming that same fire data will emerge over the next several decades using the IBC.

As I read the comments, there emerged an obvious bias regarding what is termed “passive” systems. As a result of his comments, I wonder why he would not be in favor of the effort to review all systems which should seemingly surface the defects he has stated. He talks about antiquated test facilities. He indicates that joints are somehow not examined which only shows that he has not followed the ASTM E-05 development activity for testing of joints. The CTC effort would surely bring to the forefront most if not all of the concerns express and be the impetus for improvement. God forbid that should ever happen.

The last point to make is to raise the question about whether his comments represent the position of AIA or his own personal views. If his comments are indeed the position of AIA, then they must have changed their organizational position concerning supporting performance-based codes development. The CTC effort is a fundamental part of what is needed to progress further towards a performance-based regulatory environment.

**Conclusion:**

In conclusion, I believe strongly that this CTC activity should go forward. To claim that we explicitly understand and are able to quantify the level of performance of any of the model codes including the IBC or NFPA 5000 is not justified. It is time to recognize, like our neighbors to the north, we have not performed a sufficient review or analysis of the new IBC to determine whether we are truly achieving the desired level of fire and life safety. This does not as some have proclaimed imply that the IBC is flawed. It would show the confidence that the leadership of the ICC understands the need to be proactive rather than reactive in the quest for appropriate code content. It is time to honor the action taken by the ICC Board of Directors in approving the “bottom-up” analysis effort.