FINAL WORKSHOP REPORT

RESILIENCY METRICS

STANDARDS, TEST LABS AND METHODS, AND MEASURING TOOLS

A PUBLICATION OF THE
ANSI HOMELAND SECURITY STANDARDS PANEL

NOVEMBER 2012
1.0 Background

Since 2003, the American National Standards Institute (ANSI) Homeland Security Standards Panel (HSSP)\(^1\) has worked to accelerate the development of voluntary standards for homeland security and emergency preparedness in support of the U.S. Department of Homeland Security’s (DHS) Science and Technology Directorate.

As part of that continuing effort, the HSSP convened the workshop: *Resiliency Metrics: Standards, Test Labs and Methods, and Measuring Tools*, on August 22, 2012, in New Orleans, LA. This interactive workshop provided an opportunity for all participants – government, standards developers, program developers, and small businesses – to engage in an open dialogue regarding resiliency standards.

2.0 Opening Remarks

Peter Shebell, the workshop chairman, made opening remarks regarding DHS’s investigation into a labeling program for resilience modeled after the U.S. Environmental Protection Agency’s ENERGY STAR program. The program, while still under development at DHS, is looking at community resilience in terms of its structures. Also, DHS is looking to expand the concept to include lifelines, as well as transportation and the commercial sector. The program would be based on standards and will need metrics and a methodology for measuring resilience.

Mr. Shebell indicated that the workshop is intended to be a conversation with attendees about what would make sense in such a program and to investigate what standards are already being used to measure resilience. Mr. Shebell posed the following questions to the audience:

- What is the art of the possible?
- Can we develop a framework for resiliency standards that would support a meaningful measure of resilience?

\(^{1}\) http://www.ansi.org/hssp
In the context of building codes, Mr. Shebell also proposed the concept of “pulling from above” through a “code-plus” program. Such an approach might provide an incentive for a lagging community to meet existing codes just to keep from falling further behind.

### 3.0 Standards in All Aspects of Resilience

The standards developing organizations (SDOs) in attendance made the point that bringing all buildings up to existing codes would provide the level of resilience that is sought by DHS. Regarding the code-plus approach, SDOs felt that current codes are more than satisfactory; however, attendees acknowledged that the challenge is motivating communities to meet the current model codes.

To illustrate their point, SDOs noted that the results from two earthquakes – one in Haiti and one in Chile – had two different outcomes. Chilean buildings that were up to earthquake code saw far less devastation than Haitian building, which were not.

In addition, local government can opt out of adhering to code and/or sections of a code. This is one of the reasons why buildings have issues during disasters. In order to address this challenge, several organizations involved in building codes including the National Fire Protection Association (NFPA) and the International Code Council (ICC) have formed a coalition aimed at advancing safety by advocating for the adoption of current building, sustainability, electrical, and life safety codes. This Coalition for Current Safety Codes² is intended to create more public awareness and broader support for the adoption of the codes that protect the health and welfare of our society. All participants in the coalition endeavor to explain the benefits of public-private partnerships that provide the United States with a robust system of codes and standards development involving industry, manufacturers, code administration professionals, and the public. The coalition states that adopting and enforcing the latest codes and standards is the most efficient and effective method of creating safe, sustainable, and affordable communities. However, attendees pointed out that only new buildings must be built to the latest codes, and that older buildings can be the issue during disasters. A solution for this challenge was not discussed.

Better community preparedness is an important aspect of resilience, and attendees discussed the need for more public education on this front. The Red Cross and the Federal Emergency Management Agency (FEMA) were both suggested as entities that could provide such education; however, attendees noted

² [http://www.coalition4safety.org/](http://www.coalition4safety.org/)
that funding is limited for such initiatives. One suggestion was to train the influencers in a community on disaster preparedness, instead of focusing on a broad – and expensive – public education campaign.

While cultural change is always possible through education, attendees pointed out that without sufficient demand drivers and business incentives, meaningful change is unlikely to occur. Attendees raised some examples of where business incentives exist for resiliency, including FM Global’s insurance program for commercial buildings. In this example, FM Global will only assume the risk of insuring a commercial building once that building’s management has demonstrated that it meets FM Global’s resiliency standards. Because customers are eager to retain insurance, they are willing to comply with the required standards.

4.0 Measuring Resilience

Once community awareness is raised, the next challenge becomes how to most effectively measure resilience. NFPA described its Firewise Communities\(^3\) program, which encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in the effort to protect people and property from wildfire risks. Attendees suggested that DHS look into other programs that already exist and leverage them as well.

If new resilience measurement mechanisms need to be developed, attendees felt that a framework or checklist-based approach would be most effective. Another suggestion was to define levels of resilience, starting with a foundational level and then looking at what challenges or milestones could mark each subsequent level. Some felt that a program could not prescribe exactly what would need to be done, but could suggest a framework or possibly a compendium of standards.

5.0 Exploring Public-Private Partnerships for a System to Designate Resilience

Attendees evaluated existing rating systems, and discussed whether these could be leveraged to include resilience. Many cautioned that if a labeled or qualified product failed there could be large public perception problems. For example, the main distinction between building products and ENERGY STAR, which mainly certifies consumer products for energy efficiency, is in the installation. ENERGY STAR products are mostly “plug in,” whereas building products would need proper installation. For example, windows could be qualified as being “resilient” under the DHS proposed program, but if installed improperly they still could fail, which might discourage consumers from purchasing such products especially if they carried a premium as a result of being qualified. Some felt that DHS should avoid qualifying or rating products or structures in terms of their resilience.

\(^3\) [http://www.firewise.org/about.aspx](http://www.firewise.org/about.aspx)
The Leadership in Energy Efficiency and Design (LEED) program was mentioned and some attendees felt that this program did not have enough specificity and sometimes was at odds with safety codes. There seemed to be a preference for a standards-based resilience designation. Again, attendees suggested that a framework or compendium of standards might suit the need.

6.0 Closing Remarks

Mr. Shebell thanked the participants for their thoughts and contributions to the discussions. It was noted that participants would be welcome to submit further ideas to the HSSP Secretariat at any time.

7.0 Acknowledgements

Recognition and appreciation are due to the following:

- Peter Shebell, U.S. Department of Homeland Security (DHS), for his leadership of this workshop.
- All of the attendees for sharing their expertise and introducing key ideas and concepts utilized during the discussions.

8.0 Next Steps

If buildings were built and inspected to current code, and if the public was more aware and educated, communities would be elevated to a higher level of resilience. However, bringing older buildings up to current code will continue to be an issue, and will require a plan of action.

<table>
<thead>
<tr>
<th>Focus on current codes</th>
<th>The resilience building issue could be largely addressed through existing codes and bringing all buildings – whether new construction or existing – up to the current building codes.</th>
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</thead>
<tbody>
<tr>
<td>Educate the public</td>
<td>Resilience education and training needs to be explored through community, government, and industry-led initiatives.</td>
</tr>
<tr>
<td>Benchmark programs</td>
<td>DHS should explore current initiatives like the Coalition for Current Safety Codes, Firewise Communities, and other similar programs.</td>
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### Agenda

**ANSI Homeland Security Standards Panel (ANSI-HSSP)**

**Draft Agenda**

**August 22, 2012 New Orleans, LA**

In Conjunction with SES Conference

**Workshop Co-Chair:**
Peter Shebell  
Standards Policy, Office of Policy, Department of Homeland Security

**Wednesday – August 22, 2012**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>8:30 am</td>
<td>Refreshments Available</td>
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</table>
| 9:00 am – 9:15 am | **Welcome and Opening Remarks**  
- Michelle Deane  
ANSI Director of Homeland Security Standards  
- Peter Shebell  
Standards Policy, Office of Policy, Department of Homeland Security |
| 9:15 am – 10:00 am | **Topic 1 – Standards in All Aspects of Resilience**  
Resilience is the ability of a system (examples: organizational, structure, hardware, software) to mitigate the severity and likelihood of failure or losses, to adapt to changing conditions and to respond appropriately after the fact. Standards touch all aspects of resilience, e.g. Information Technology, structure and related systems, transportation.  
Questions for discussion:  
- What standards address the various areas?  
- Are there known standards gaps?  
- How to collate them?  
- Categorize them in Homeland Security Standards Database (HSSD)? |
| 10:00 am-10:15 pm | **Break**                                      |
| 10:15 am-11:45 pm | **Topic 2 – Measuring Resilience**  
There are ways to measure resilience in all systems. And there are already existing programs established to measure resilience of systems (all kinds).  
Questions for discussion:  
- Which organizations are in the business of measuring resilience?  
- Collate a list of test labs?  
- What standards are they using? |
<table>
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<tr>
<th>Time</th>
<th>Session Topic</th>
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| 11:45am – 12:45pm | **Topic 3 – Exploring Private/Public Partnerships for Potential System for Designating Resilience**  
There are many well-known certification and rating systems, such as Energy Star, LEED, and the 5-star crash test ratings. As the next step in measuring and promoting resilience, this topic will explore the possibility of leveraging existing rating systems to include resilience.  
Questions for discussion:  
• What designation/certification systems exist for resiliency?  
• Do any exist in other aspects of that can be leveraged?  
• Private Sector thoughts on rating systems  
• Gather ideas for new one? |
| 12:45pm – 1:00pm | **Closing Remarks/Adjournment**                                               |
## Appendix 2  Roster of Attendees

### In Person

<table>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michelle</td>
<td>Deane</td>
<td>American National Standards Institute (ANSI)</td>
</tr>
<tr>
<td>Chris</td>
<td>Dubay</td>
<td>National Fire Protection Association (NFPA)</td>
</tr>
<tr>
<td>Gordon</td>
<td>Gillerman</td>
<td>National Institute of Standards and Technology (NIST)</td>
</tr>
<tr>
<td>Nicole</td>
<td>Ishmael</td>
<td>Emergency Management Accreditation Program (EMAP)</td>
</tr>
<tr>
<td>Molly</td>
<td>Jones</td>
<td>NORC at the University of Chicago</td>
</tr>
<tr>
<td>Matthew</td>
<td>Marheine</td>
<td>Oregon Emergency Management</td>
</tr>
<tr>
<td>Mark</td>
<td>Roberts</td>
<td>International Code Council (ICC)</td>
</tr>
<tr>
<td>Alvin</td>
<td>Scolnik</td>
<td>National Electrical Manufacturers Association (NEMA)</td>
</tr>
<tr>
<td>Peter</td>
<td>Shebell</td>
<td>U.S. Department of Homeland Security (DHS)</td>
</tr>
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### Via Teleconference

<table>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lou</td>
<td>Gritzo</td>
<td>FM Global</td>
</tr>
<tr>
<td>Dan</td>
<td>Howell</td>
<td>FM Global</td>
</tr>
<tr>
<td>Dae</td>
<td>Kim</td>
<td>PCI Business Analyst</td>
</tr>
<tr>
<td>Rick</td>
<td>Lake</td>
<td>ASTM International</td>
</tr>
<tr>
<td>Franco</td>
<td>Tamanini</td>
<td>FM Global</td>
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<tr>
<td>Penny</td>
<td>Tisdale</td>
<td>Etegrity LLC</td>
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