

Earthquakes and their Effects on Buildings

An Article by EPICCC Director: Sylvie Mercier

With the devastating earthquakes in Haiti and Chile still fresh on our minds, many of us on the West Coast ask ourselves “what would happen if a similar earthquake happened here?”

The answer to this question is multi-faceted. There are so many factors that affect how buildings perform in earthquakes. The first is the earthquake. What is the strength of the earthquake, its proximity to populated areas and depth? Buildings are usually at a distance from the earthquake and the effects diminish, or attenuate, with distance. This means that the building usually undergoes less ground shaking than it would if it were nearer the source.

Then there is the building itself. In Canada, the design of buildings to resist earthquakes is governed by the National Building Code. As engineers and scientists learn more about earthquakes, our Building Codes evolve. Newer buildings are more likely to better perform in a significant earthquake. However, since earthquakes are fairly infrequent events, the Code only requires that buildings be designed to minimize life safety hazards such as collapse.

So what does this mean for our older buildings? They can be seismically upgraded to meet the requirements of the current Code. The extent of seismic upgrading required will be dependent on the original design of the building, the type of construction (such as steel, concrete, wood or masonry), and the ground conditions below the building, just to name a few. Seismic upgrades can be costly and disruptive but that is a small price to pay for the safety of the occupants.



In addition to the seismic force resisting capacity of a building, its non-load bearing parts, also referred to as “operational and functional components” or “OFC,” comprise the majority of the investment when compared to that of the base building. Failure of OFCs can result in significant losses even when the base building remains intact. Examples of OFCs include lights, partitions, ceiling tiles, office equipment, HVAC, piping, electrical panels, generators and telecommunications. In older buildings, OFCs are most likely not seismically

restrained but they can be upgraded to meet the current Code.

So how do you ensure that your building is safe for its occupants? The first step is to assess a building and its components' vulnerability to earthquakes. The seismic assessment should be completed by a structural engineer and should cover both the base building and the OFCs. The assessment should present information on the capacity of the building to resist today's design earthquake and it should also include an opinion of probable cost to upgrade the building and its components. Following the assessment and when budgets are in place, the next steps are to proceed to the design, tendering and the construction phases.

What happens after the earthquake? If one recalls recent earthquakes that have occurred in the US, there are images on TV of buildings being "red-tagged" meaning they are unsafe for occupancy. What has occurred is that officials such as building inspectors and engineers have briefly assessed the buildings and deemed them unsafe. If an earthquake happened here, how long would it take for a building official or an engineer to arrive on site? Obviously there are huge economic benefits to knowing the building is safe and allowing people to re-occupy. Working with an engineer, building-specific post-earthquake response manuals can be developed which assist people familiar with the building to quickly, and with reasonable accuracy, assess the building's structural condition.

Stay tuned for future articles on base buildings and OFC seismic assessments, design, construction and post-earthquake evaluations.

Why follow a standard?

An article by Board Member, Lisa Benini, MBCP

There's a lot of buzz around about standards in the industry right now. So I thought it may be worthwhile to take a closer look at what we have in Canada. I may be biased as I was a member of the technical committee for Canadian Standards Association (CSA) Z1600, a standard for Emergency Management and Business Continuity Programs; but I have spent many years in this industry attempting to follow "some form of a methodology" that could help get business continuity plans into place. Plus I saw what it took to get this standard ready for publication, and it was quite amazing.



Imagine this... take about 30 +- seasoned professionals in emergency management and business continuity field and put them in a room and ask them to define "emergency management" or "business continuity". Depending on what side of the fence you were on, I suspect you would get quite a few different answers. Well that is what happened with this standard. Let me explain.

First of all, the Canadian contingent took the NFPA 1600 Standards as the basis for the Canadian Standard, and there was a lot of debate about this as some organizations were international in nature, and would have to comply with other standards in the countries they had operations. However, since we are so closely linked to the United States, it didn't make sense to start from scratch to develop another standard. So we

thought we would just “*Canadianize*” it by putting a few “*eh*”s at the end of sentences, and a couple of “*u*”s in certain words.

That’s not what happened...as we started to review the NFPA 1600 Standard, we realized that there were some fundamental elements missing. We also knew that there was an effort happening internationally through ISO (International Organization for Standardization) to create a similar standard or what was known as “*ISO/PAS 22399 Societal Security- Guidelines for incident preparedness and operational continuity management.*” As a result of much discussion, the CSA Technical Committee for Z1600 decided to create a framework based on the ISO Methodology and integrate the contents from NFPA 1600 into this framework. This was a tremendous undertaking, but looking back very well worth the effort.

We also reviewed in great detail every single line and discussed how this would affect the typical “business” across Canada. This Standard had to apply to not only large corporations or governments, but to small and medium sized businesses so it had to be flexible, workable and concise. We knew that some organizations would have great difficulties in meeting some of these statements within the Standard, so a lot of attention went into the wording and building a supporting annex section which would provide some background to assist the *average company*.

There was a lot of debate regarding how you take two very distinct disciplines, **emergency management** and **business continuity**, that have worked separately in the past, and bring them together into one standard.

Let me tell you there were a lot of heated discussions in this area. However I am very proud of the work that came out of those discussions because we have enhanced the standard, including, for example, business impact analysis, and allowed an organization liberty to create one or many plans depending on its size and complexity by providing common plan requirements.

We also agreed that any program required certain elements:

- Planning,
- Implementation,
- Exercises, evaluations and corrective actions, and
- Management review.

Finally the overall program management had to ensure the organization is prepared with appropriate resources, and the plans are current and executable. So that’s how we developed the CSA Z1600:2008 version.



I, personally, have used the Standard to assess the readiness of many organizations through my consulting practice since it’s been released, and I am very happy to see many organizations have done substantial work to achieve a good majority of the Standard. Surprisingly most of my clients were very pleased to see that they were very close to being compliant.

The other benefit of using the Standard is that it has been a great marketing tool to move some gaps or shortcomings forward with an organization's management - especially if your management is not totally sold on why you need so much time and money to build an emergency management and business continuity program.

In closing, I would ask that if you are stuck with getting activities going to develop a plan, or plans, for emergency management and business continuity, then get a copy of the CSA Z1600 Standard and assess where your organization is. Use a traffic light concept to determine whether you are "green", "yellow" or "red." Show your Management the results and I'll bet that will get them going... best of luck.

Here's the website for CSA Z1600 Standard for Emergency Management and Business Continuity Program.

<http://www.csa.ca/cm/ca/en/z1600-emergency-management>

Upcoming Event!

Mark your Calendars!

Disaster Forum Conference 2010

May 10, 2010
Banff Centre

www.disasterforum.ca

EPICC FORUM & Workshop Wednesday May 26 2010

"2010 - Lessons from the Real World"

Will take place at the



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of BRITISH COLUMBIA

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this year, this is the one to go to!**

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- * Keynote Address: "Making Big Events Happen"
- * Plenary Panel: "Business Impacts of 2010"
- * Plenary Panel: "People Management During a Pandemic"
- * Plenary Panel: "The Lessons of 2010"
- * Networking Reception & Prize Draw
- * AGM & Exhibits

Don't Miss Out!

EPICC 2010 AGM

Please stop by to learn what's in store for EPICC this year, at our Annual General Meeting. We will be reviewing our Strategic Plan and discussing all we've accomplished in 2009 as an organization.

Date: May 26, 2010

Location: Justice Institute of BC

Time: Immediately following the 2010 EPICC Forum

Coming soon!

Celebrating 20 Years



June 6-9, Toronto Canada

Member News!

EPICC would like to inform all of our members that we are now able to renew memberships on-line. If you renewed your membership in the past 60 days through our on-line membership link, please let us know. We were experiencing website difficulties and would like to ensure your registration went through properly.

Thanks for your patience!

Let us know what you would like to see on this year's Newsletters.

Please submit any comments to

Lesley Carew, Executive Administrator at www.epicc.org

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