

## Contingency planning for earthquakes in Asia

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### ABSTRACT

*For private sector business continuity managers and public sector emergency managers alike, the potential risk and impact of a catastrophic earthquake in one of Asia's manufacturing centres, such as the Philippines, or in one of Asia's financial centres, such as Singapore, are hard to ignore. This paper examines the state of preparation, mitigation, response and recovery (the phases of emergency management) and analyses the risk and impact (phases of business continuity management) of an earthquake in Asia. The paper concludes that companies and communities in Asia will recover from a catastrophic seismic event only if business continuity and emergency management professionals can learn from one another.*

**Keywords:** *earthquake in Asia, supply chain risk, evacuation time, emergency management in Asia, business continuity in Asia, BCM in Asia, EM and BCM, earthquake impact*

### THE RISK

In 14 years of practising business continuity management in Asia, I have never

seen a corporate contingency plan for an earthquake. There is also no evidence of public sector emergency preparation for earthquakes in South-East Asia, except in Taiwan, where earthquakes are a regular occurrence. Government health and emergency response authorities have focused on fighting fires and terrorism — and recently, infectious disease — giving little consideration to the consequences of low-probability, high-impact events like earthquakes. The risk of earthquakes in Asia seems obvious, as there is considerable history, some of it very recent, of earthquakes in the region.<sup>1</sup> Recent earthquakes have been more frequent and more serious, and have occurred in unexpected places. More are certainly coming.

China suffered the deadliest earthquake in human history little more than 30 years ago. At 3:45 am on 29th July, 1976, an earthquake that lasted just 15 seconds officially killed 242,000 people (estimates run to 750,000) around the city of Tianjin, the 20th largest city in the world. Seven thousand families were wiped out and 160,000 people were severely injured. At 8.2  $M_w$  on the Richter scale, followed by a 7.1  $M_w$  aftershock the same day, the Tangshan earthquake was the first in Asia to score a direct hit on a major city.

The 2004 earthquake (9.1  $M_w$ ) in the Indian Ocean<sup>2</sup> near the island of Sumatra which caused the Boxing Day tsunami

was the strongest earthquake in Asia in 40 years. Since then, according to commercial property reinsurance giant Munich Re,<sup>3</sup> Sumatra has accounted for nearly 25 per cent of all earthquakes measuring at least 6.9  $M_w$  (the magnitude at which earthquakes are considered destructive) in the world; in the previous 30 years it accounted for just 2 per cent of them.

The 2008 Wenchuan earthquake<sup>4</sup> (7.9  $M_w$ ) in China's Sichuan province showed the impact of a major earthquake on communities in Asia: 70,000 people killed, 18,000 missing, 375,000 injured, 5 million people homeless. For seismologists, the surprise was that Wenchuan had 'never been considered high-risk compared to cities near other fault lines'.<sup>5</sup>

In the year since the Wenchuan earthquake, the US Geological Survey has recorded 13 earthquakes of 7  $M_w$  or greater. Eleven of these were in Asia or the west side of the Pacific Rim from New Zealand in the south to the Sea of Okhotsk in the north.

The Indian Ocean and Wenchuan earthquakes both occurred in previously-unexpected locations. Primarily because they struck rural (Sichuan) or poor (coastal Indonesia and India) areas, the international business impact of those earthquakes was very low; resort hotels in Phuket, Thailand were exceptions to that generalisation, of course. Victims of those events relied, in the main, on emergency authorities, disaster relief agencies and non-governmental organisations to respond and recover from those events.

The Philippine Islands, on the other hand, host the factories and outsourced call centres of many multinational companies. The province of Laguna, 40 miles south of Manila, is home to industrial parks like Laguna Technopark (LTI), a duty-free export zone operated by the

Philippine Economic Zone Authority (<http://www.peza.gov.ph>). LTI was built by Japanese and Philippines developers and is occupied by 84 manufacturers, many of them large Japanese household names.<sup>6</sup>

Only 30 km (18 miles) from LTI is the Ta'al volcano, classified by the International Association of Volcanology and Chemistry of the Earth's Interior as one of 16 volcanoes in the world 'being worthy of particular study in light of their history of large, destructive eruptions and proximity to populated areas'.<sup>7</sup> Ta'al has erupted 33 times in the last 400 years — about once a decade — including 1965, 1968, 1969 and 1977. The statistical risk of eruption, then, is 100 per cent every 12 years, or 8 per cent each year.

Exacerbating the risk posed by a volcanic eruption so close to the factories of Laguna, the Philippine Institute of Volcanology and Seismology estimates that the Philippine Islands also experience up to ten earthquakes *a day*, although most are too deep or too small to be felt. In 2008, the area around the Ta'al volcano alone recorded ten volcanic earthquakes in just one day.<sup>8</sup> The potential impact of an earthquake or volcanic eruption on the global supply chain for a single consumer electronics product is described later in this paper.

Professor Kerry Sieh, Director of Singapore's Nanyang Technological University Earth Observatory, provides some context to the present situation:

'We have a geological record that goes back 1,000 years. It shows the region [South-East Asia] being hit by major quakes every 200 to 300 years. The last cluster of powerful quakes happened about 200 years ago. We are entering a new cluster.'<sup>9</sup>

Does this mean there is also a credible

earthquake risk to the urban centres of Asia — Hong Kong, Kuala Lumpur, Bangkok and Singapore?

‘What is certain is that our buildings are not designed to withstand earthquakes’, Munich Re’s Dr Michael Spranger says of Singapore’s high-rises.<sup>10</sup> In September 2008, Singapore’s *Straits Times* newspaper reported that Nanyang Technological University had two government-sponsored earthquake studies in progress to assess the impact of natural catastrophes on the financial sector.<sup>11</sup>

Singapore’s Building and Construction Authority (BCA) funded an earthquake vulnerability study in 2008 as part of its review of ‘building codes and regulations after several major earthquakes in the region’.<sup>12</sup> The potential business impact: if building codes were revised to mandate greater resistance to horizontal ground motion through the installation of lead dissipaters or lead and rubber bearings, commercial construction costs would increase, pushing up office rents in the middle of a global recession.

Professional contingency planners in Asia, then, might reasonably consider what the impact of a destructive earthquake in Asia might be, particularly on a built-up manufacturing or urban area. Public and private sector planners take very different approaches to planning for catastrophic events, so it will be instructive to examine earthquake risk as an emergency manager would, through the four phases of emergency management — mitigation, preparedness, response, recovery — while also considering the risk and impact of an earthquake, as a business continuity (BC) planner would.

Neither emergency managers nor business continuity managers can do anything to mitigate the *likelihood* of an earthquake, but they can certainly mitigate the impact, and prepare for the consequences.

## PREPAREDNESS

Public sector preparation:

- the priority is public safety;
- obstructions and obstacles are expected;
- training in first-aid and triage is provided;
- fire and rescue equipment is on hand;
- staff with appropriate experience for dealing with trauma are in place;
- property managers are relied on for information.

Private sector preparation:

- staff are trained to evacuate;
- there is no provision for first-aid or medical training;
- there is no provision for emergency equipment or supplies;
- there are no staff with relevant trauma experience;
- lightly-trained fire wardens are used;
- property managers are relied on for information.

To greatly simplify for purposes of comparison, emergency management (EM) is taken to refer to a public sector activity, while business continuity management (BCM) is a private sector activity. EM is for communities, BCM is for companies. Cities, provinces and federal governments have emergency managers; companies have business continuity managers. Emergency managers manage consequences; BC managers manage business impact. Many factories and most hazardous process industries in Asia have emergency managers. No bank in Asia has an emergency manager, but most banks now have someone responsible for BCM, if not a full-time business continuity manager. A BC manager has to understand ‘the business’; an emergency

manager has to understand ‘the territory’.

A business continuity plan (BCP) focuses on one company, sometimes just one building, often just an office. No matter how large the company, its BCP covers the people, processes and infrastructure of only that company (and perhaps, in some cases, its suppliers). An EM plan coordinates the responses of multiple agencies providing emergency response, communication, medical care, water, food, shelter, power, sanitation, victim assistance, management of volunteers, search-and-rescue, debris removal, identification of casualties, mortuary service, site security and forensic investigation over an area as large as the Irrawaddy region of Burma (2008 typhoon), or as small as Kuta in Bali (2002 Sari Club bombing).

In the public sector, EM funding is driven by social and political considerations (revising the building code in Singapore during a recession to mandate earthquake resistance, for example). BCM funding decisions may also be ‘political’, but the considerations are primarily commercial (stakeholder value or customer retention, for example) or compliance with regulations, or both. BCM is still an optional activity in most parts of the private sector; EM is not supposed to be an option, at least in the public sector. BCM is investment dollars at work; EM is tax dollars at work.

An emergency manager assumes there is no way to avoid the consequences of an earthquake, no matter how much time and resources are spent. A business continuity manager assumes there will be some way, given sufficient time, money and thought, for a business to recover, even from an earthquake.

Yet South-East Asia’s companies simply do not prepare for catastrophic earthquakes. Private sector BCM has

focused on a few, generalised risks: denial-of-access to a designated location, electric power outages, computer system failures, and recently, infectious disease. The Singapore Government is pushing the republic’s small and medium-sized enterprises (SMEs) to develop BCPs, threatening to withhold government contracts from companies that do not have plans. The Singapore Government has even developed a BCM standard, SS540, and promised to fund up to 70 per cent of the cost of developing plans that comply with it, but has struggled to articulate the benefits for the SMEs at which the programme is targeted. Trying to persuade SMEs in Singapore to prepare for an earthquake would be challenging, and probably futile.

Corporate BCPs in South-East Asia proceed from the assumption that the building has stopped shaking, that the injured have been transported to hospitals (by public ambulances), that fires have been put out (by public fire fighters), that broken electric cables will be restored (by public utilities), that ruptured gas lines will be repaired (also by public utilities), and that mobile or fixed-line phone service will be restored (by publicly-regulated telcos). Business activities will be resumed by employees surprisingly unaffected by the destruction and mayhem the earthquake has left around them. Banks, brokers and fund managers, which are required by regulators in Hong Kong, Kuala Lumpur and Singapore to have BCPs, do not tend to keep medical equipment in their offices, have environmental health and safety officers, and rarely provide first-aid training to their fire wardens. At non-manufacturing companies in Asia, wardens are barely trained. Some cannot *lift* a fire extinguisher, let alone aim or discharge it. Emergency response is considered outside the scope of nearly all corporate BCM programmes in Asia.

Companies in Asia that have BCPs do not generally have EM plans, and vice versa. Some organisations have elements of both EM and BCM: hospitals and hotels come to mind. Companies in manufacturing and process industries in Asia usually have EM plans and EM teams, often under an environmental health and safety department. Manufacturers in Laguna's LTI industrial park in the Philippines, for example, have fire and spill response plans and designated emergency managers and response teams, but do not have, experience suggests, crisis management teams, crisis command centres or BCPs.

Public sector emergency preparedness in Asia has focused overwhelmingly on fire prevention. As in North America and Europe, preparation responsibilities have nominally expanded in Asia since 2001 to include preparing for random acts of terrorism. However, a shelter-in-place strategy in response to an improvised explosive device is never rehearsed, and assembling next to a building — where occupants would be targets for a secondary explosion — is still the default reaction to any alarm.

The large number of languages spoken in Asia presents an obstacle to BCM planning. Simple verbal and written communication about concepts like recovery time objective (RTO) and minimum operating requirement (MOR) are challenging in a region where 2,000 languages and dialects are spoken in just 27 countries. As an example, the people of Indonesia speak 742 languages and dialects. Imagine what it would be like to try to manage a BCM programme if every US state was a separate island, and the people in *each* of those 50 states spoke 15 different languages. Such is the case in Indonesia, except that Indonesia has 7,000 islands, not 50. Now consider how to explain the Business Continuity Institute's

concept of 'maximum tolerable period of disruption' in 742 languages across 7,000 islands. The difficulty of emergency and business continuity planning in such a culture must be obvious.

## RESPONSE

Public sector priorities:

- management of site access;
- unified incident command system;
- staging and evacuation;
- medical services;
- search and rescue;
- press corps management.

Private sector priorities:

- activate CMT;
- IT disaster recovery;
- business continuity;
- voice and data channels;
- customer relations;
- account for staff.

Emergency managers aim to protect lives and property, while business continuity managers aim to protect the ability to conduct commerce. Immediately after an earthquake, public sector emergency response will be a higher priority than private sector business continuity management. Emergency response will precede and take priority over security, business continuity, crisis management, disaster recovery, risk management and disaster relief. The basic premise of an emergency plan is that everything else is secondary to life, health and safety. There is immediate danger to life and health in an emergency, response that supersedes all other considerations. An EM plan assumes there will be injuries or casualties.

There is one, widely-accepted US emergency management system (and several international variants) known as

the incident command system (ICS) for scaling a response up or down as the scale of an event increases or decreases (see below). ICS coordinates the responses of agencies that have different bosses, different budgets and different briefs.

Business continuity commences, conceptually, *after* an emergency has been managed. BC managers coordinate the responses of individuals who, whatever the differences in their responsibilities, have the same company name on their business cards, are working under the same corporate budget, and ultimately have one boss. But there is no single, internationally-accepted BCM organisational response structure. A BCP assumes that most of the people who must execute it will be alive and safe, competent for active duty. The basic premise of a BCP is that an organisation will have sufficient human resources to continue, sooner or later.

Private sector emergency response rehearsals in Asia, inappropriately called ‘fire drills’, are always announced well in advance, and so cannot be relied on as assessments of either preparedness or response time. In these annual rituals — required by regulation in Singapore but not elsewhere in Asia — occupants learn to evacuate and assemble next to their buildings, where they would be killed or injured by falling glass and debris during an earthquake. Diligent property managers have had time to place signs at the assembly points designating floor locations. Fire wardens have carried to assembly points printed employee lists that have been conveniently updated just before the drill. Employees performing functions deemed too important to stop — the ‘critical’ functions listed in BCPs — are permitted to skip the exercises entirely. And fire drills are never conducted in the presence of actual fire.

Of more concern, the private sec-

tor in Asia depends for its safety on first-responders who are compensated egregiously compared with their counterparts in the West. The average starting salary of a fireman in India is INR 3,000 (US\$61) per month.<sup>13</sup> Even in well-developed Singapore, a Singapore Civil Defence Force cadet starts at US\$1,200 per month.<sup>14</sup> A fireman in Hong Kong starts at a comparatively-high HKD 14,275 (US\$1,840.00) per month.<sup>15</sup>

### Evacuation

Consider the simple act of evacuating a high-rise building if the lifts were not working after an earthquake. The Capital Tower, Singapore’s fourth tallest building, is 52 storeys and houses JP Morgan, BHP Billiton, Cisco Systems and the Government of Singapore Investment Corporation. The building has approximately 3,500 occupants. There are two stairwells, down which every person in the building will have to walk after the lifts shut down automatically in an earthquake.

Assume the occupants could divide themselves evenly in an evacuation, so that half of the 3,500 occupants walk down each stairwell. Assume also that each person will need an average of three seconds to exit through the stairwell doorways at ground level. This gives:

- 3,500 occupants;
- two stairwells;
- 1,750 people down each stairwell;
- three seconds per person.

The time to evacuate, then, will be:

$$1,750 \times 3 = 5,250 \text{ seconds} = 87 \text{ minutes}$$

So, it will take 1.5 hours to clear the building — if the stairwells are not blocked, if the emergency lights are on, if

no one stumbles or breaks a heel, and if everyone is orderly and calm. So, if a company in Capital Tower had tasks with RTOs of four hours (likely for banks), more than one-third of that time would be spent just getting out of the building.

### THE IMPACT

The potential global impact of a catastrophic event in Asia is illustrated in this true story about a very popular consumer electronic product that is sold throughout the world. Many products are made or assembled in the Philippines, including the disk drives for some models of Apple Computer's iPod music player. In 2006, Apple relied on Toshiba and Hitachi for the disk drives in its iPods. Each company had a factory in the Philippines.

One of those factories, in Laguna Technopark, manufactured 20,000 disk drives each day. It employed 6,000 people and ran 24 hours-a-day. The factory contracted a fleet of 80 buses to transport employees — almost entirely young women with high manual dexterity — to and from work because few of its workers could afford to own cars on the average salary of US\$120 per month.

At the time, Toshiba and Hitachi each had only one factory in the world making iPod disk drives. The one I visited kept two or three days of finished inventory stored on site, waiting for shipment; finished disk drives were too valuable to keep large numbers in inventory. If either factory had been destroyed, half of Apple's 1.8-inch disk drive supply chain would have been wiped out, instantly.

It takes at least 18 months and several hundred million dollars to build a new assembly line from scratch. If one of the companies had built a second, backup production line in, say, Ireland, and tried to recoup its investment by increasing the

prices of its disk drives, that company would have been at a severe competitive pricing disadvantage, and so would never choose to build that backup facility.

Asked about the business impact on his company's relationship with Apple if his factory could not deliver those drives, the general manager of one of those factories responded, 'Well, they [Apple] would just buy drives from their other supplier'. He knew that Apple split its disk drive orders between his company and his competitor, presumably to reduce dependence on a single source of supply. Considering the huge capital investment to build another disk plant, this represented an apparently thoughtful strategy for Apple.

On asking the plant manager where his competitor's factory was located, he responded, 'Oh, right over there', pointing to a building across the street from where he was sitting.

It turned out that four other manufacturers that supplied the same components to both factories were also located in LTI. For manufacturing efficiency, the proximity of these factories to one another was an obvious advantage. But it was difficult to imagine an eruption of the Ta'al volcano or an earthquake in Laguna that would have affected only one of them. Either event would have had a direct, catastrophic impact on Apple's global supply of disk drives.

This particular factory did have property and casualty insurance against earthquake damage; its competitor probably did, too. That insurance may also have covered damage from the Ta'al volcano, as it is hard to imagine excluding a risk so obvious or running a microelectronics plant near a volcano without insurance. Earthquake 'cover' is routinely included in commercial property insurance policies in Singapore, Hong Kong and Kuala Lumpur, and property owners effectively pay nothing

extra for it. ‘We’re giving it away almost for free!’, one insurance claims manager in Singapore lamented.<sup>16</sup> No insurance company wants to be the first to add an earthquake premium. The financial impact on the insurers and reinsurers after an earthquake in Singapore or Hong Kong is therefore likely to be staggering, as the risk has not yet been priced into the premiums paid by companies in those cities.

## RECOVERY

Public sector priorities:

- site security;
- morgue and mortuary services;
- managing the media;
- protecting evidence;
- forensic investigation;
- removing debris.

Private sector priorities:

- RTO, MOR, recovery point objective (RPO);
- retrieving data and documents;
- damage assessment;
- confidential information;
- office security;
- insurance claims.

These lists show how differently businesses and governments tackle the recovery phase of an emergency, in Asia and elsewhere. Cooperation in emergency management and business continuity between the public and private sectors has been a challenge in Asia, particularly in non-manufacturing companies, for several reasons.

Every disaster has some impact on a community and its businesses, no matter how large or small those communities and businesses may be. The magnitude of the impact might be greater in financial capitals like Singapore than in rural Sichuan,

China, but with high-tech manufacturing outsourced to places like the Philippines, earthquakes and disasters in rural areas of Asia can and will have unexpectedly large business and financial impact.

An emergency manager focuses on the human consequences of an event: water, food, shelter, medical care, sanitation and casualty management. Companies routinely delegate such concerns to human resources (HR) departments that are under-trained and under-equipped, and probably understaffed, to deliver any such services to fellow employees in a disaster. Most HR professionals in Asia are not trained to bandage a wound, give cardiopulmonary resuscitation, provide psychological first-aid or tell an employee’s next-of-kin that the employee died at work. An HR professional is no substitute for an emergency medical technician or a trauma counselor.

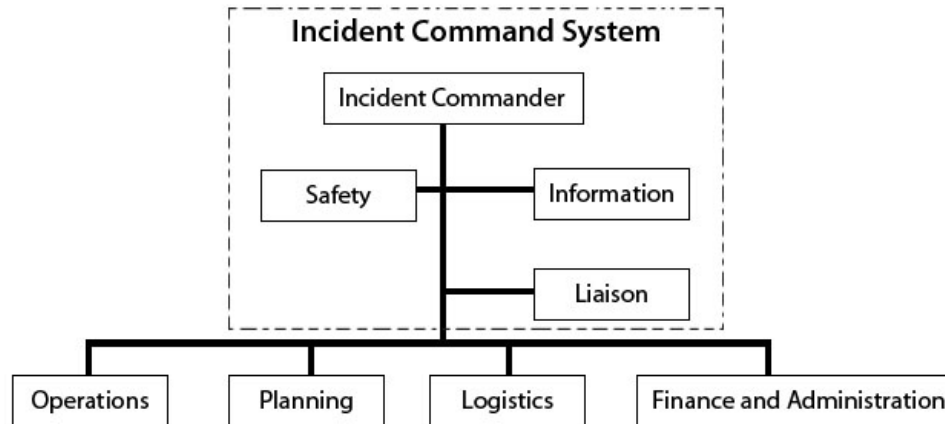
A business continuity manager, by comparison, focuses on commercial impact: lost sales, failed transactions, broken supply chains, crashed computers, network failures, irate investors (and their lawyers) and unhappy customers. Understanding information technology is probably essential for most BC managers; understanding human psychology is probably essential for most emergency managers.

Emergency managers in Asia have generally worked for police or fire agencies, or have military experience. Business continuity managers have often worked in IT before migrating to the business side (whether voluntarily or involuntarily). As a further sweeping generalisation, a BC manager is likely to be a university graduate; an emergency manager might very well not be, although this is changing.

In the USA, the ICS (Figure 1) is the standard emergency response command



Figure 1 The incident command system



Source: [http://www.osha.gov/SLTC/etools/ics/what\\_is\\_ics.html#Command](http://www.osha.gov/SLTC/etools/ics/what_is_ics.html#Command)

structure for police, fire and government departments, serving the same purpose as the UK's Gold-Silver-Bronze command structure.

After an evacuation like the one described above from Capital Tower, tenants in office buildings in Asia are instructed to 'liaise' with their property managers to obtain information and permission to enter their buildings. In the ICS figure, then, who among the emergency responders is responsible for telling a building property manager when it is safe for tenants to get in to assess the damage? If an employee is missing at the assembly point, perhaps trapped inside a building, who in that ICS command structure should the property manager ask to find out if their employee has been taken to a hospital, and if so, to which hospital?

The answer is, no one. That 'liaison' in the figure serves as a coordinator among the responding public agencies, not as a link to the private sector. In fact, because a disaster site is automatically presumed by uniformed services personnel everywhere in the world to be a crime scene until proven otherwise, the immediate impulse of public sector emer-

gency managers is to deny site access to anyone, including private sector business continuity managers.

After the threat of terrorism manifested itself in the USA with the September 11th attacks, public sector officials and private sector executives realised how much they needed each other's help, so public-private partnership initiatives have grown in most major cities in North America.

In 2005, partly in response to banks attempting to comply with Monetary Authority of Singapore BCM regulations, the Singapore Police announced a corporate first-responder scheme (CFRS),<sup>17</sup> modelled after the US Corporate Emergency Access System. The CFRS allows designated, pre-screened individuals from companies to have early — but not immediate — access to a building after it is declared safe to enter, upon presentation of police-issued photo identification. The specific purpose is to permit company representatives to assess damage, to determine what may be salvageable, and to retrieve records — tapes stored in a safe, for example. CFRS is just a first manifestation in Asia of public-private partnership linking emergency management and business continuity. There are sure to be more.

Following recent emergencies in Asia — SARS in 2003, the tsunami in 2004, H5N1 influenza in 2005 and H1N1 influenza in 2009 — employees and their next-of-kin have turned first to their employers, not their governments, for assistance. Employees have come to expect their employers to be able to respond; in many Asian countries, they know they cannot rely on the resources or preparations of their governments. In an emergency, people naturally turn to those whom they believe have the resources and skills to help. In Asia, that is often companies, especially multinational companies. No one in Europe or North America, for example, called the Phuket (Thailand) police department for help finding family members after the 2004 Indian Ocean tsunami. Instead, they called companies where their loved ones were employed, even if those loved ones were in Phuket on personal holidays.

Companies in Asia provide their employees with healthcare, retirement planning and insurance coverage; in the USA, companies even help the tax authorities by withholding income tax from employees' wages. Why should companies not provide emergency response, too? International SOS, offering emergency response to multinational companies, has thrived in the last ten years by monitoring threats around the world, by providing alerts, and by advising, tracking and rescuing travelling employees. Why? Because corporations do the job more effectively than governments.

A community may conduct awareness campaigns, acquire disaster equipment, train its first-responders and cajole its citizens to be prepared, but to be genuinely resilient, a community needs its businesses to do some of the 'heavy lifting'. The financial and human resources available in the private sector in

much of Asia dwarf those of the public sector. The tents, tools and toilets that comprise the basics of emergency response are purchased from or donated by the private sector. Even if they are donated by non-governmental organisations (NGOs), they are manufactured by private sector companies.

A community's first need in the recovery phase is restoration of economic (that is, business) activity: investment, building materials, jobs. Those may initially come from relief agencies, but eventually, they either come from the private sector, or, sadly for many victims in Asia, they do not come at all. They would come faster and more effectively if companies knew how to 'plug in' to a community's recovery effort, if the private sector can link to the public sector, if emergency managers, disaster relief coordinators and BC planners can understand each other. The work of India's Corporate Disaster Resource Network (<http://cdrmindia.blogspot.com/>) is a wonderful example of an attempt to establish such a link.

## CONCLUSION

After thinking about earthquakes in Asia, the three main conclusions are as follows: the public sector will desperately need help and resources from the private sector in a catastrophic earthquake in an urban centre; no EM or BCM professional will have all the necessary professional skills; and the countries most in need may be those with the least ability to respond effectively.

Responding effectively to an earthquake in Asia, when it occurs, will require staggering efforts by public sector EM and private sector BCM professionals. They will all be more effective at response and recovery if they have developed a common understanding of the preparation

and mitigation measures, and the likely corporate and community impact.

Specialisation ensures that professionals are competent and up-to-date in terms of security, disaster recovery, business continuity or emergency response, but professional silos also inherently delay coordinated response to any event. In a catastrophic earthquake, delays could be fatal. Building links between public and private sector professionals will not be as expensive as retrofitting buildings for earthquake resistance, but it will take a lot longer and in Asia it has barely started.

Specialisation will also have the effect of limiting a professional's prospects for advancement in the future. If corporate resilience can be thought of as a combination of risk management, physical and information security, crisis management, disaster recovery and BCM, then the effective chief resilience officer of the future will know something about all of them and be able to integrate them in their head and in the executive suite.

If community resilience can be described as a combination of emergency preparation, mitigation, response, recovery, crisis management and disaster relief, then the effective commissioner of community resilience of the future will know about all of them and be able to integrate them in their head and in the city council chamber.

Understanding of public sector emergency management seems a logical extension for private sector disaster recovery, crisis management and BC professionals. Understanding of private sector business continuity seems a similar logical extension for public sector emergency managers, homeland security and non-governmental disaster relief professionals.

Some companies have already tried to combine some of these: BCM with IT disaster recovery; EM with environment, health and safety; operational risk with

other kinds of enterprise risk. The results of such combinations have not always been excellent, in part because of the differences described above. This does not mean that professional convergence will not happen, or that it should not happen, or that experimental combinations should stop.

To be truly resilient, organisations of all kinds must aim to be self-sufficient in emergencies, because first-responders simply do not have — and never will have — sufficient resources to manage the consequences of a catastrophe, whether in Nepal or in New Orleans.

Asia is the most natural disaster-prone region in the world, and many of the countries in Asia most at risk of earthquakes are home to large populations, many of them very poor, many in enormous urban agglomerations. There is no way that Asia's governments or the many NGOs that provide critical disaster relief will be able to manage the responses by themselves.

Emergency managers, security professionals, risk managers, BC planners, relief workers and disaster responders — from both the private and public sectors — will learn to work together, or everyone will surely all fail together.

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