
Project Management in the Ring of Fire!

Force Majeure Revisited – Extreme Weather and Natural Disasters are neither Acts of God nor Black Swans!

By David L. Pells

(Originally published as an editorial in *PM World Today*, April 2011)

Introduction

Once again, we are overtaken by events. On 22 February 2011, a 6.5 magnitude earthquake struck near Christchurch, New Zealand, devastating the city and causing massive destruction, dozens killed and injured, and thousands of lives disrupted in the region. The world watched as historic landmarks were toppled, offices and homes destroyed and rescue teams rushed to save lives. We were in touch with friends and colleagues in New Zealand and received a wrenching report from Sean Whitaker, the president of the PMI New Zealand chapter who lives in Christchurch. [1]

Then on Friday, 11 March, a massive 9.0 magnitude earthquake struck near the city of Sendai in northwest Japan, followed by a 40 foot tsunami that leveled cities, towns, farmlands, factories and the countryside for five miles inland from the shoreline. While the earthquake shook the country, with buildings swaying in Tokyo some 200 miles away, the tsunami resulted in nearly 30,000 killed and missing. To further compound the disaster, several reactors at the Fukushima Nuclear Power Plant lost power and emergency cooling, resulting in partial meltdown in at least two reactors. The world again watched the national disasters in Japan unfold.



International Headline on 12 March 2011

In Japan, all life and work in northwestern Japan stopped; communication, power and transportation systems in the region (including Tokyo) were disrupted; supply chains in many key industries including automobiles, electronics and semiconductors were affected, resulting in plant stop-works and parts shortages worldwide; and the Japanese government established national emergency rescue and recovery programs. It is now clear that most life and business in Japan, one of the world's largest and most important economies, were seriously disrupted, with the long term impact on the country's economy and industries yet to be determined. (the nuclear disaster seems to be widening, with high levels of radioactivity detected both farther from the plant and in ocean water.)

A report on the earthquake and disasters in Japan was provided by our international correspondent in Tokyo, Yoshio Satoh, along with a personal report from Hiroshi Tanaka, President of the Project Management Association of Japan and a global advisor to PMForum. [2]

These follow the great 8.6 magnitude earthquake that struck Chile on 27 February 2010, that also caused massive damage and destruction in that country. [3]

What do these three earthquakes have in common? They are located along the rim of the Pacific Ocean, what is commonly referred to as the "ring of fire", where many earthquake fault lines and active volcanoes are located. [3]



In addition to these massive earthquakes and the resulting tsunami in Japan, we have seen devastating rain storms and floods in Australia, Bangladesh, Brazil, Colombia, India, Pakistan, the USA and several other countries in recent months, and now in Thailand as we go to press. In the United States, emergencies have been declared in several dozen states this winter alone due to storms, floods, tornadoes, fires, snow, ice and other weather-related phenomena. The same has been true across Africa, Asia, Europe and Latin America. And what Russian citizen will forget the massive fires burning out of control on the outskirts of Moscow last Summer?

Force Majeure

Those with experience working on construction projects are familiar with the "Force Majeure" clause in contracts and subcontracts, the clauses that let companies and project managers off the hook if an "Act of God" happens. Many contracts contain these clauses, and one of the most common "Act of God" that stops work on a project is an extreme weather event or weather-related natural disaster.

According to the Yale University library online, “Force Majeure literally means ‘greater force’. These clauses excuse a party from liability if some unforeseen event beyond the control of that party prevents it from performing its obligations under the contract. Typically, force majeure clauses cover natural disasters or other ‘Acts of God’, war, or the failure of third parties--such as suppliers and subcontractors--to perform their obligations to the contracting party. It is important to remember that force majeure clauses are intended to excuse a party only if the failure to perform could not be avoided by the exercise of due care by that party.” [4]

Wikipedia defines it this way: “Force majeure (French for ‘superior force’), also known as *cas fortuit* (French) or *casus fortuitus* (Latin), is a common clause in contracts that essentially frees both parties from liability or obligation when an extraordinary event or circumstance beyond the control of the parties, such as a war, strike, riot, crime, or an event described by the legal term “act of God” (such as flooding, earthquake, or volcanic eruption), prevents one or both parties from fulfilling their obligations under the contract. However, force majeure is not intended to excuse negligence or other malfeasance of a party, as where non-performance is caused by the usual and natural consequences of external forces (for example, predicted rain stops an outdoor event), or where the intervening circumstances are specifically contemplated.” [5]

Wikipedia goes on to state: “The importance of the force majeure clause in a contract, particularly one of any length in time, cannot be overstated as it relieves a party from an obligation under the contract (or suspends that obligation)...” [5]

Black Swans

David Hillson, the Risk Doctor in the UK, provided an excellent discussion of this topic in his Risk Doctor Briefing in December 2010 entitled “*When are Black Swans White?*” [6] According to David’s article, “A new term has become popular among people when they talk about risk, including some risk specialists. The phrase ‘Black Swan’ is taken from the title of the 2007 book by Nicholas Nassim Taleb called ‘*The Black Swan: The impact of the highly improbable*’. Unfortunately the way most people use this term is different from Taleb’s original definition. In popular conversation the Black Swan event is something with an extremely low likelihood of occurrence and an extremely high potential effect. It is seen as the thing that we think will never happen, but if it did happen then we would really be affected in a big way. By contrast, in his book Taleb says Black Swans have three characteristics: they are unexpected and unpredictable outliers, they have extreme impacts, and they appear obvious after they have happened.”

He goes on to say, “...Events or circumstances with extremely low probability and extremely high impact are in fact just risks and they can and should be tackled through

the normal risk process. There is no useful reason to give them the special name of Black Swans... [6]

Bob Prieto, Senior Vice President of Fluor Corporation, one of America's largest engineering, construction and project management companies, provided another discussion of Black Swan risks in his January 2011 paper entitled "Black Swan Risks", discussing not so much weather or disaster related unknowns but those associated with increased size and complexity on major programs. [7] In his discussion and by implication, however, Bob raises the scenario of the combination of a "knowable unknown" with complexity that can result in true "unknown unknowns" – a true Black Swan.



Some good further discussion of Black Swans can be found on Wikipedia. [8]

Extreme Weather & Natural Disasters ARE Disruptive Events

Based on David Hillson's definition, and, in my opinion, extreme weather events and natural disasters are not Black Swans, rather they fall into what Dr. Hillson calls "knowable unknowns". These events can be expected to happen, with location and timing much more predictable today than ever before. Extreme Weather and Natural Disasters are, however, VERY DISRUPTIVE.

The impact on programs and projects can often be dramatic, ranging from major schedule delays to huge cost overruns and even total destruction. This topic was discussed in detail in my September 2009 editorial entitled "*Disruptive Events! Are you, your project or your organization prepared?*" [9] The topics of extreme weather, disasters and project management have been of ongoing interest to me for some time, going back to my 1997 and 1998 papers on the topics of the impact of significant events and global trends on the project management profession. More recently I have discussed these topics in a September 2007 article, "*PM for Emergency Response & Disaster Recovery – a Call to Arms!*" [10]; February 2008 paper, "*Climate Change: What it Means to the World of Project Management*" [11]; and June 2008 editorials, "*New Frontiers for Project Management: Earth Sciences, Monitoring the Planet and Climate Control.*" [12]

Extreme Weather and Natural Disasters are Predictable

As I pointed out in September 2009, I believe that disruptive events, and extreme weather and natural disasters in particular, are much more common than most people realize, that they are increasing and that they are predictable. For large programs and projects, such events are more likely to occur than ever before, especially those with

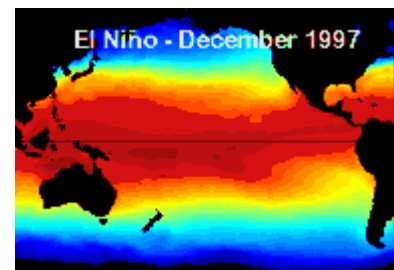
international or global elements. And in some parts of the world, they occur on a regular basis, perhaps even every year. [9] Here are some other points from my 2009 article:

- Believe it or not, weather happens!
- Extreme weather seems to be happening more now on a regular basis. Extreme weather and natural disasters seem to have increased in numbers, severity and impact in recent years;
- Depending on where you, your project or your project team are located, you might expect some impact from an extreme weather event;
- If you live in Japan or around the Pacific Ocean's "Ring of Fire", you can expect earthquakes and the possibility of volcano eruptions;
- If you live on the coast of any ocean, you can expect storms, hurricanes or monsoons;
- If you live on dry land some distance from the coast, you should monitor weather and drought conditions for the possibility of wild fires;
- If you live or work near a major river, then flooding is possible – and certainly after major or unusual rain storms.

These are becoming highly predictable events, with flooding now occurring in parts of Central, North and South America, Eastern Europe, India, Southeast Asia and the United Kingdom every year. It is not a matter of if but rather when an extreme weather event will occur in most parts of the world. Program executives and project managers should plan accordingly. [9]

Today I want to add the following points for some additional and, I think, relevant aspects of this subject:

➤ The impact of El Niño on global weather is well established. According to NOAA, El Niño is characterized by unusually warm ocean temperatures in the Equatorial Pacific and is an oscillation of the ocean-atmosphere system in the tropical Pacific having important consequences for weather around the globe. Among these consequences are increased rainfall across the southern tier of the US and in Peru, which has caused



destructive flooding, and drought in the West Pacific, sometimes associated with devastating brush fires in Australia. Observations of conditions in the tropical Pacific are considered essential for the prediction of short term (a few months to 1 year) climate variations. [13]

➤ Likewise “La Niña” is characterized by unusually cold ocean temperatures in the Equatorial Pacific, compared to El Niño. El Niño and La Niña are opposite phases of the El Niño-Southern Oscillation (ENSO) cycle, with La Niña sometimes referred to as the cold phase of ENSO and El Niño as the warm phase of ENSO. (Further reading on these topics can be worthwhile, see references)[14]

➤ Drought is when there is less rainfall than expected over an extended period of time, usually several months or longer. Drought is a normal part of climate, and it can occur almost anywhere on earth. [15] In the USA, drought conditions are monitored by NOAA. [16] Drought is a normal, recurring feature of the climate in most parts of the world. [17] In other words, droughts are common and occur annually somewhere in the world.

➤ A wildfire is any uncontrolled fire in combustible vegetation that occurs in the countryside or a wilderness area... A wildfire differs from other fires by its extensive size, the speed at which it can spread out from its original source, its potential to change direction unexpectedly, and its ability to jump gaps such as roads, rivers and fire breaks... Wildfires occur on every continent except Antarctica... The four major natural causes of wildfire ignitions are lightning, volcanic eruption, sparks from rockfalls, and spontaneous combustion... The most common cause of wildfires varies throughout the world. In the United States, Canada, and Northwest China, for example, lightning is the major source of ignition. In other parts of the world, human involvement is a major contributor... [18] In other words, wildfires are commonplace worldwide each year.



Fires burned out of control near Moscow, Russia for several weeks in 2010

➤ According to Wikipedia, a flood is an overflow of an expanse of water that submerges land. The EU Floods directive defines a flood as a temporary covering by water of land not normally covered by water... [19] Wikipedia describes some of the most common types of floods, including the following, among others:

- Riverine - Slow kinds: Runoff from sustained rainfall or rapid snow melt exceeding the capacity of a river's channel. Causes include heavy rains from monsoons, hurricanes and tropical depressions, foreign winds and warm rain affecting snow pack. Unexpected drainage obstructions such as landslides, ice, or debris can cause slow flooding upstream of the obstruction. Fast kinds: include flash floods resulting from convective precipitation such as intense thunderstorms or sudden release from an upstream impoundment created behind a dam, landslide, or glacier.
- Estuarine - Commonly caused by a combination of sea tidal surges caused by storm-force winds. A storm surge, from either a tropical cyclone or an extra-tropical cyclone, falls within this category.
- Coastal - Caused by severe sea storms, or as a result of another hazard (e.g. tsunami or hurricane). A storm surge, from either a tropical cyclone or an extra-tropical cyclone, falls within this category [19]

In other words, flooding is common and occurs in many places and for many reasons around the world each year.



Images from massive floods in Pakistan in 2010

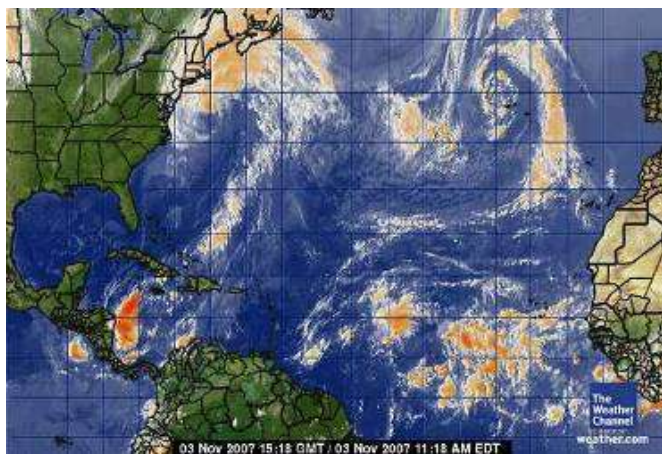
➤ According to the Federal Emergency Management Agency (FEMA) in the USA, "Floods are one of the most common hazards in the United States. Flood effects can be

local, impacting a neighborhood or community, or very large, affecting entire river basins and multiple states. However, all floods are not alike. Some floods develop slowly, sometimes over a period of days. But flash floods can develop quickly, sometimes in just a few minutes and without any visible signs of rain... Overland flooding occurs outside a defined river or stream, such as when a levee is breached, but still can be destructive... Be aware of flood hazards no matter where you live, but especially if you live in a low-lying area, near water or downstream from a dam. Even very small streams, gullies, creeks, culverts, dry streambeds, or low-lying ground that appear harmless in dry weather can flood. Every state is at risk from this hazard.” [20]

➤ According to the American Red Cross, “Floods are among the most frequent and costly natural disasters. Conditions that cause floods include heavy or steady rain for several hours or days that saturates the ground.” [21]

➤ According to the University Corporation for Atmospheric research (UCAR), a U.S. Congress's Office of Technology Assessment stated, "despite recent efforts, vulnerability to flood damages is likely to continue to grow." The factors cited include growing populations in and near flood-prone regions; the loss of flood-moderating wetlands; increased runoff from paving over soil; new development in areas insufficiently mapped for flood risks; the deterioration of decades-old dams and levees; and policies such as subsidies that encourage development in flood plains. [22] In other words, as populations increase, more people live in low lying areas, more land is paved or built over, there will be more flooding problems.

➤ National Geographic presents information about nine types of natural disasters: avalanches, earthquakes, floods, hurricanes, lightning, tornadoes, tsunamis, volcanoes and wildfires. Recent natural disasters such as the one in Japan are featured stories. [23]

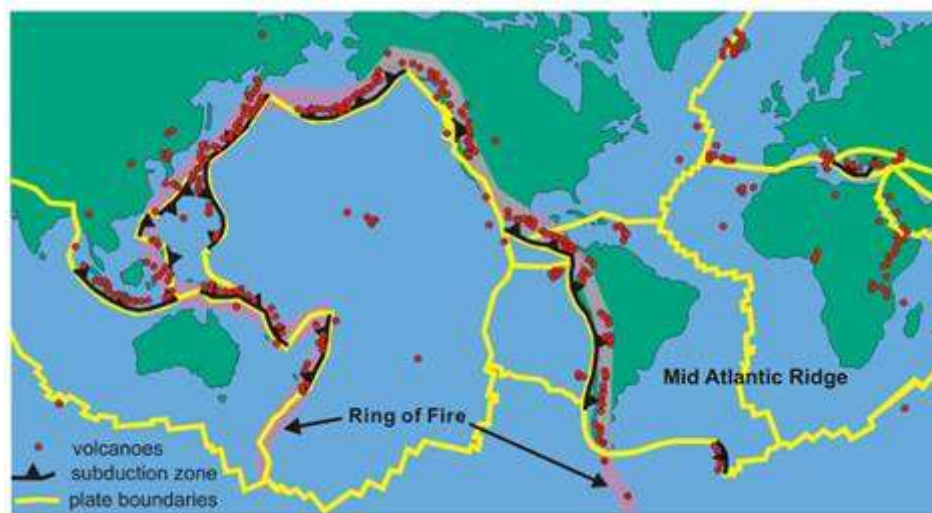


Storms being tracked in the Atlantic Ocean during Hurricane Season in 2007

➤ The Center for Disease Control (CDC) in the USA identifies ten types of natural disasters as follows: earthquakes, extreme heat, floods, hurricanes, landslides and mudslides, tornadoes, tsunamis, volcanoes, wildfire and winter weather. [24] By adding extreme heat and winter weather to their list, CDC shows just how common natural disasters from extreme weather can be. They happen EVERY YEAR now.

➤ With growing population and infrastructures, the world's exposure to natural disasters is inevitably increasing. This is particularly true as the strongest population growth is located in coastal areas (with greater exposure to floods, cyclones and tidal waves). To make matters worse any land remaining available for urban growth is generally risk-prone, for instance flood plains or steep slopes subject to landslides. [25]

➤ Some 80 percent of all the planet's earthquakes occur along the rim of the Pacific Ocean, called the "Ring of Fire" because of the preponderance of volcanic activity there as well. Most earthquakes occur at fault zones, where tectonic plates—giant rock slabs that make up the Earth's upper layer—collide or slide against each other. These impacts are usually gradual and unnoticeable on the surface; however, immense stress can build up between plates. When this stress is released quickly, it sends massive vibrations, called seismic waves, often hundreds of miles through the rock and up to the surface. Other quakes can occur far from faults zones when plates are stretched or squeezed. [26]



Map of Ring of Fire and Mid Atlantic Ridge, courtesy of Natural Resources Canada

➤ With approximately 1,500 active volcanoes worldwide there is bound to be one or more erupting at any given time. In the USA alone there are 169 of which 54 are currently on a very high or high threat to public safety. This threat is the combination of hazards; the destructive natural phenomena and exposure to people and property. [27]

➤ “The tragic earthquake in Greece and the enormous devastation and suffering wrought by the recent earthquake in Turkey are reminders of one of the most pressing challenges of our time: the extraordinary increase in the number and extent of natural disasters. The facts are startling. The costs of weather-related disasters in 1998 exceeded the costs of all such disasters in the decade of the 1980s. Tens of thousands of mostly poor people died during the year, tens of millions have been temporarily or permanently displaced. In the Caribbean, hurricanes designated George and Mitch killed more than 13,000 people, with Mitch being the deadliest Atlantic storm in 200 years. A much less-publicized cyclone in India in June caused damage comparable to Mitch and an estimated 10,000 deaths. Major floods hit India, Nepal, Bangladesh and much of East Asia, with thousands killed. Two-thirds of Bangladesh was inundated for months, leaving millions homeless. More than 3,000 died in China's catastrophic Yangtze River flood, millions were displaced, and the financial cost is estimated at an astonishing \$30 billion. Fires ravaged tens of thousands of square kilometers of forest in Brazil, Indonesia and Siberia, with devastating consequences for human health and local economies. In Afghanistan earthquakes killed more than 9,000 people, while the exact toll of the horrific earthquake in Turkey is still unknown.” Kofi Annan, September 1999 [28]

I think that's enough background information to make the point. There are many extreme weather events worldwide each year, many are common and frequent, and many natural disasters each year as well. Extreme weather and natural disasters have occurred throughout human history. If they seem to be increasing, it may be due to global warming, climate change, better global communications, increasing populations, or many other factors.



If you live or work near any coast, you should expect storms!

But if such events are commonplace, how can they be considered “black swans” or “unknown unknowns”? I don't think they should be, although it might depend on the

location. Some countries have taken great strides to protect their populations from anticipated disasters such as earthquakes and floods – for example, Italy for flooding of Venice, Chile and Japan for earthquakes, the Netherlands for rising ocean levels, Russia for Neva River flooding in St. Petersburg, UK in London (to protect against tidal flooding), and others. In my opinion, it is time for organizations and program/project managers to do the same. And so should the project management professional community start addressing these issues more seriously.

Relevant Issues for Program and Project Management

issues for program and project management related to these topics can generally be grouped into two categories – actions associated with (1) planning and management before an event, and (2) response and recovery.

Program/Project Planning and Management – Here are some topics that I think need more attention, that can seriously affect the success or survival of many programs and projects, and that should be better addressed in both the PM literature and various standards and models:

- **Intelligence Gathering** – most organizations need more and better information about external events, trends and factors that might affect their programs and projects. This is especially true of weather-related trends and conditions, some of the most common causes of serious disruptions.
- **Environmental Awareness and knowledge** – Executives, program managers and project management teams need more knowledge today related to geography, climate change, extreme weather, natural disasters, emergency preparedness and disaster recovery.
- **Emergency Response Decision Models & Plans** – every organization, program and project should have an Emergency Response Plan, one that includes decision making model and process. In addition, business continuity planning needs to be taken more seriously.
- **Reassessment of Force Majeure terms in contracts** – project owners and investors, program managers and project management teams should reassess the force majeure clauses in contracts to better understand what will happen during extreme weather events. More accurate treatment of risks is needed – which risks are truly unknowable risks and which can be prudently planned for?



- **Weather-related Risk Analysis and Planning** – Most large and mature project organizations conduct risk analysis and risk management on a regular basis. But how many risk management plans seriously address extreme weather? In all likelihood, not enough.
- **Supply Chain Risks** – where are the critical suppliers located, and what are their weather and disaster-related risks? Are any located in the “Ring of Fire”? Near a seacoast? In a flood-prone area near a river? These are questions not often considered during contractor and supplier negotiations.
- **Human Factor Risks** – where are project team members located, working and living? With the proliferation of virtual teams, and project participants located around the world, how much do project manager even know about the weather-related risks to the human beings working on their projects?
- **Financial & Schedule Contingencies** – Contingency planning exists for a purpose. How seriously is the contingency budget or schedule contingency taken by executives, or are contingencies the first to go when cutting costs or accelerating schedule planning?

Response and Recovery Actions – the following issues are already addressed by emergency response organizations in many countries, and by those experienced with responding to natural disasters. However, these actions also apply to organization executives, program managers and project management teams that must plan and prepare for responding to emergencies and disasters.

- **Situation Analysis** – when an extreme weather event or natural disaster occurs that affects your project, your team or your suppliers, how do you determine the impact or situation?
- **Emergency Information** – What are information channels and points of contact for every element of the program or project? Are emergency communication roles assigned? How will project team members communicate?
- **Needs Analysis** – What are the local needs? Safety? Medical supplies or services? Food and water? Transportation? Housing and shelter? Equipment? These needs must be determined very very quickly in an emergency. Many, however, can be anticipated and planned for.

- **Program/Project Identification** – What programs and projects must be launched? Just as in strategic and portfolio PM theory, the right programs and projects must be identified, planned, budgeted and resourced.
- **Project Management Needs** – While many general project management principles and processes can be used for emergency response projects, very specialized resources are often needed. Is a doctor needed? Special equipment? Rugged laptop computers? Satellite telephones?
- **Decision Making Models** – Who will be in charge, and how will reporting work? Even in emergency situations, organization is needed along with ‘command and control’ processes. These should already be laid out in Emergency Response plans. This issue gains importance during prolonged recovery programs.
- **Stakeholder Communications** – A focal point and well understood process must be established for communicating with stakeholders during an emergency or response to a natural disaster. This is true not only for public programs but for individual projects and teams. Who are the stakeholders? Project team members, family members, employees of critical suppliers, customers, owners, insurance companies, investors? Who will be responsible for communicating with them?
- **Emergency Supply Chains** – Where will emergency supplies and equipment come from? How will they be purchased, secured and delivered? During the early hours of an emergency, these are critical questions? For longer term recovery programs, the issue remains highly important.



Implications for Executives, Project Sponsors and Owners

Before an emergency, organization leaders need to understand where their weather-related risks are. That is, they should be aware of where their projects, assets, personnel, critical resources and suppliers are located. They should become knowledgeable about the weather patterns and climate history for those locations, and the probability (or possibility) of natural disasters occurring there. They should then ensure that their program and project managers have implemented appropriate risk and emergency preparedness plans, including communication and decision making models.

After a major weather-related event, emergency or disaster, executives must be prepared to take charge and to make decisions. This will require an executive-level emergency response plan, and the information gathering and communication systems to be in place to support timely response and recovery actions. Business continuity planning can also be critical, especially related to the potential loss of key executives, resources or suppliers.

For large organizations, and especially those with global operations and/or supply chains, there is a higher probability that weather-related events will occur each year with some disruptive impact.

Implications for Program Managers

Since programs generally span multiple projects and multiple years, the probability of disruption by a weather-related event or disaster is high. This is especially true of projects with international elements, teams or suppliers. This is also true if the impact of heavy rainfall, flooding, extended periods of high heat, drought, extreme cold during winter and similar 'heavier than normal' occurrences of seasonal weather are considered. If your program spans 2-3 years anywhere in the world, in my opinion, you will have one or more weather-related emergency to deal with.

Pre-emergency considerations – Program managers must have an intelligence gathering process related to the external environment for each of his or her projects, and the geographic locations involved. There should be a program-level risk management plan, emergency response & disaster recovery plan, business continuity plan, and stakeholder communication plan. Steps should be taken to ensure that project managers and project teams have adequate knowledge and training in these areas, have project-specific risk and emergency response plans, and have detailed weather-related risk management strategies and recovery plans. Program managers must ensure that their project managers address contract, supply chain, human factors, financial and schedule risks associated with extreme weather scenarios. Most importantly, program managers must ensure that project budgets and schedules contain adequate contingencies for those risks.

Emergency response and recovery considerations – In all likelihood, program managers will assume the leadership role when emergencies actually occur. Therefore, program emergency preparedness planning must include situation analysis, access to information, needs analysis, emergency project management, and the associated decision making models and processes required for both response and recovery projects. Program managers will work with both project teams and organization executives to implement appropriate response projects, and to ensure that appropriate resources and suppliers are available. For global programs and projects, these are not easy tasks and may require a team effort and significant investment.

Implications for Project Managers

If your project is only six months long, with all team members in one place, and that one location is in a highly stable location, with all personnel living near the office, then you should have minimal weather-related risks. However, if your project has multiple offices in multiple geographic locations, with staff and contractors located in various multiple locations, and team members commuting to their work locations (which is very common in many countries and large cities), then the probability of weather-related problems can increase dramatically. If your project has teams or suppliers located in multiple countries, and any of those locations has a history of extreme weather or natural disasters, and if your project spans more than 12 months, I would bet on a weather-related emergency occurring.

Pre-emergency considerations – First, project managers must understand everything about his or her project, including the location and duties of all project staff, and the location and importance of all project suppliers (the entire supply chain, if possible!)

Second, because extreme weather and natural disasters, if they occur, tend to hurt people first, these must receive full and immediate attention first. That is, the project manager must know as much as possible about the location, lives and life styles of employees (and any consultants or contract labor) at those locations – no matter where they are in the world. If extreme weather occurs, the project manager must know how the team, and individual team members are affected. In addition, in most countries, it is also necessary to understand the potential impact on the families and communities of project team members. Human factors must be the first consideration, during both planning and emergency responses.

Third, the supply chain can be critical for continuity of most projects. Project managers must know where critical suppliers are located, and geography and weather related factors associated with delivery of critical supplies.



Since extreme weather and natural disasters can hit the supply chain as well, these are absolutely critical issues. This has been one of the most immediate lessons learned from the disaster in Japan in March, as many suppliers for the automotive and semiconductor industries were affected by the earthquake and tsunami there.

Every project manager should fully understand the supply chain, not just key suppliers but also sub-contractors and sub-suppliers, any one of which may be the source of a project-critical part, piece of equipment or raw material.

Fourth, in the context of weather-related risks to the supply chain, the force majeure clauses of contracts should be carefully studied, adjusted and monitored. This is because it is the contractors who will implement these clauses, with potentially devastating impact on project schedules and profitability. Extreme weather, especially severe spring and winter storms, can be anticipated and should be addressed like any other risk, not with catch-all force majeure clauses in contracts but with schedule contingencies. Such natural disasters as floods, mudslides, wildfires, droughts, ice storms, tornadoes and hurricanes occur every year. They are not 'once-in-a-lifetime' events, which is the expectation underlying force majeure clauses.

Fifth, after first emphasis on people and suppliers, project managers should then address the general topics of gathering intelligence and information about those locations, preparing risk management and emergency response plans, and establishing appropriate contingencies in their project budgets and schedules.

Emergency response and recovery considerations – When a weather related event or emergency occurs, the project manager must determine the status and conditions of all project team members, assets, and critical suppliers at project locations worldwide. He or she will then work closely with program and organizational executives, and public officials as necessary, to assess the situation, determine needs, establish an emergency response project, establish decision making models or implement emergency response plans, establish a reliable emergency supply chain, and then accomplish the recovery.

Of course, if you are an emergency response or disaster recovery project manager, you will be responsible for all of the above – assessing, planning and implementing project requirements to save lives, rescue survivors and rebuild communities.

Implications for Project Management Professional World

Referring to my model for the World of Project Management [29], here are some considerations:

➤ **PM Research** – undoubtedly, more research is needed in this area, especially related to weather-related program risks, emergency response models for project and program managers, rapid response tools and techniques, leadership in emergency situations, and other topics.

➤ **PM Body of Knowledge** – The current PM bodies of knowledge can be characterized as follows: (a) several good generic PMBoKs exist for general project management, but without much attention given to emergency PM outside of risk management; (b) project management for specific industries (such as construction, defense, aerospace, pharmaceuticals, etc.) and applications are very robust, with much written information available; and (c) there is very little in the professional literature specifically dealing with planning for and managing weather-related emergencies, or the impact of extreme weather on existing programs, projects and organizations. This is my opinion, of course. Some useful resources, however, can be found on Disaster.Zunia.org. [30]

➤ **PM Publishing** – more articles, papers and books on the subjects addressed in this paper are needed. More books are needed on planning and managing disaster response and recovery projects. A book is needed specifically on how program and project managers, and project based organizations, should plan for climate change, extreme weather and natural disasters.

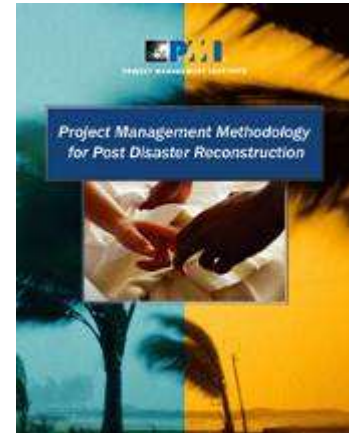
➤ **PM Education & Training** – I think that there is little training available worldwide related to intelligence gathering, planning for or dealing with climate change, extreme weather or natural disasters for program and project managers. In all likelihood, any such training is conducted within global organizations that have already recognized these growing risks. (If anyone knows of any such training, please let me know.)

➤ **PM Practice & Experience** – As with most aspects of program and project manager, there are many organizations and individuals in government and industry, and within non-governmental organizations (NGOs), that have a lot of experience with emergency response and recovery projects. In addition, many specific industries have experience, lessons learned and best practices. Such government agencies in the USA as the Center for Disease Control (CDC), Federal Emergency Management Administration (FEMA), National Oceanic and Atmospheric Administration (NOAA), and various state and local emergency management agencies have extensive experience and expertise in these areas. However, I think that dealing with extreme weather emergencies and natural disasters by all program/project managers and project-based organizations, as outlined in this paper, is plowing new ground.

➤ **PM Products & Services** – While many products, tools and technologies already exist that can be used for planning and responding to emergencies, they need

to be better adapted for emergency response projects. This is probably the most mature element of the PM world; most issues are related to planning and human actions.

➤ **PM Profession** – The Project Management Institute (PMI®) Education Foundation deserves credit for developing and making available a *Project Management Methodology for Post Disaster Reconstruction* for global application by relief agencies, non-governmental organizations (NGOs) and/or governments following a major disaster. The methodology has been made available to various organizations over the last five years, for both training purposes and use on actual projects. [31]



In addition, there have been various PMI member-based initiatives to support disaster relief and recovery programs and projects, for example, following Hurricane Katrina in Louisiana and the earthquake and tsunami in Aceh, Indonesia. PM for emergency response and disaster recovery has been the subject of articles in professional journals and presentations at conferences. In addition, risk management per se has been fully embraced by PM professional bodies and addressed in various PM standards, qualifications and guides. However, dealing specifically with extreme weather and natural disasters as a subset of risk management is not well covered in my opinion and represents an important subject that needs more attention.

- **PM Employment & Careers** – This field is wide open! There should be many opportunities for professionals with experience and expertise related to emergency project management, disaster recovery program and project planning, project and program risk management, scenario analysis and the other topics of this paper. More organizations will need information, tools and resources related to planning and responding to extreme weather-related emergencies. Every global organization should be addressing these issues, so they should be looking for resources to help them do so.

- **PM Communities** – This is an exciting topic, as social networking technologies and options can provide virtual communities where professionals with emergency response experience can network. I suggest a global community be established related to developing and sharing knowledge and experience associated with dealing with climate change, extreme weather, emergencies and natural disasters.

Implications for Governments and Society

I do not want to lecture any governmental agency on emergency program and project management; there is certainly more experience and expertise among various

government emergency response and international aid agencies. I do, however, want to offer three main points.

First, the modern project management profession is waking up to the need for more and better emergency response and disaster recovery projects and project management. The PM field can offer a wide variety of useful methodologies, technologies, tools and applications related to planning and implementing projects. While the PM field has been slow to recognize the unique requirements of emergency and rapid response projects, we can offer many resources, experiences and best practices related to disaster recovery and rebuilding efforts, which lend themselves to more traditional PM approaches. At the same time, the PM profession has a lot to learn from emergency response organizations and experiences. It can go both ways.

Second, organizational approaches such as program and project portfolio management would appear to be very applicable for governmental agencies and NGOs that are engaged in emergency response and disaster recovery programs and projects. There are some obvious organizational and operational benefits, including economies of scale, that come into play when programs and projects are well aligned with missions and strategies. The modern PM profession has a lot to offer on these topics.

Third, responses to climate change, extreme weather and natural disasters must involve international and often global cooperation. More and more people are recognizing that we are all on this planet together. As our economies, politics and societies become ever more intertwined, and as we work together on virtual teams on more and more projects, it is becoming clear that we are all related as human beings.

We need to share information and technologies related to climate change, weather predictions, extreme weather events and potential disasters. And when disasters strike, we need to help each other. Climate change, extreme weather and natural disasters affect us all. So let more government, private sector and NGOs work together to address such needs.



Conclusion

Let us remember the victims of the recent disasters in Australia, Brazil, Colombia, Japan, Myanmar, New Zealand and other countries hit by earthquakes, tsunamis, floods and other natural disasters. These events have had a tragic human cost, with serious ramifications for local economies and societies. Of course, all programs and projects in those locations were seriously affected, if not totally destroyed. The impact on the local project management field is obvious.

Last night, a strong thunderstorm rolled through our town. Strong winds! Heavy rainfall! We were awake half of the night due to thunder, lightening and loud noises from the storm. It was very disconcerting! If our building had been badly damaged or destroyed, then all of our projects would have stopped, our organization seriously affected, and the lives of everyone involved highly disrupted.

Are you, your project team and organization prepared for the next severe storm, extreme weather or natural disaster? It is no longer a question of IF such an event will occur that affects you, but WHEN!

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David L. Pells is Managing Editor of the **PM World Journal**, a global eJournal for program and project management, and Executive Director of the PM World Library. He is also the president and CEO of PM World, the virtual organization behind the journal and library, and of PM World Services, an executive P/PM advisory firm. David is an internationally recognized leader in the field of professional project management with more than 35 years of experience on a wide variety of programs and projects, including engineering, construction, defense, energy, transit, high technology, and nuclear security, and project sizes ranging from several thousand to ten billion dollars. He has been an active professional leader in the United States since the 1980s, serving on the board of directors of the Project Management Institute (PMI®) twice. David was awarded PMI's Person of the Year award in 1998 and Fellow Award in 1999. He is an Honorary Fellow of the Association for Project Management (APM) in the UK; Project Management Associates (PMA - India); and of the Russian Project Management Association SOVNET. From June 2006 until March 2012, he was the managing editor of the globally acclaimed *PM World Today* eJournal. He is currently an advisor to several government organizations related to P/PM on global programs. David has published widely, speaks at conferences and events worldwide, and can be contacted at editor@peworldjournal.net.

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