

LESSONS JAPAN DISASTER FOR WHOLE WORLD

**Most disasters = natural phenomena +
inadequate human planning to mitigate risk**

So can we apply lessons learned from latest disasters, to mitigate next crisis?

Alister William Macintyre research notes

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INTRODUCTION (1 APR 27)

I split this info from my larger collections of Japan and nuclear notes, to group info of significant volume on one of many specialized interest areas. I may never be caught up digesting the tsunami of additional information.

I post interesting news to my Facebook wall ... one was about Japan drop in production due to the mega disasters ... one of my contacts there asked me what I thought the factory of the future would look like ... my short answer = EMPTY because in my study of disasters past present and future, it is becoming increasingly obvious that most disasters were predicted, but not mitigated, so I am also studying predictions of tomorrow's disasters (I am not talking about Terminator Judgment Day, alleged God return next month, or implications

of end of Mayan calendar), rather disaster predictions rooted in sciences of seismology, weather, industrial commodities.

There are many reasons certain commodities are increasing in price. One is we have run out of easy ways to get them. The reason BP was drilling such a huge distance under water, with the platform that had the Gulf Oil Spill is the easy ways to get oil have been used up. The risks and costs will only increase. I watched the hearings on that disaster. The prospects, for avoiding future repeats, are not promising.

The Caribbean has regular major tropical storms. This is not rocket science. Frequency probability and wind intensity is totally predictable. Over 2 million Haitians are in tent cities, wooden shacks, and other housing which cannot withstand a level 2 hurricane.

Parts of USA are overdue to get major quakes, comparable to what just hit Japan ... e.g. Cascadian – near Seattle ... and the USA, if anything, is even less prepared than Japan was.

Version sharing (1 May 16)

I periodically upload my research notes documents to various public sites where my friends and contacts may freely cherry pick which of my efforts to download copies for themselves. These include:

- Box net on Linked In¹
- E-mail to some contacts (Macwheel99 is a play on my surname)
- Facebook = I am [Alister Wm Macintyre](#) there
- [Haiti Rewired](#)² / For other than Haiti, see group = Current Events
- [Japanese Resilience](#) (I am user AlMac99)³
- Linked In / my profile = [Al Macintyre](#) / my box net files / folders by general topics⁴
- [Plan Haiti](#) has some of my early Haiti research⁵
- [Prizm](#) – so far mainly Haiti research⁶
- [Rebuild Haiti Back Better](#)⁷
- [Scribd](#) (I am user AlMac99)⁸

¹ See below for link info.

² <http://haitirewired.wired.com/profile/AlisterWmMacintyre>

³ <http://japan.resiliencesystem.org/nuclear-engineering-issues>

⁴ Outside the folders are documents which cross topics, such as Maps Directory of sources relevant to Haiti, Japan, Middle East, and more.

⁵ <http://sites.google.com/site/planhaiti/home>

⁶ <http://www.haiti.prizm.org/>

⁷ <http://rebuildhaitibetter.net/forum/topics/navigation-resources>

- [Yahoo HDRR](#) – only Haiti here, and disaster relief in general, where it applies to Haiti⁹

After sharing, I usually increment version # to make it easy for people to see which latest version in later uploads. But you can also see by verifying table of contents up-to-date, then date in parentheses at ends of headings to see which got most recently updated.

I am a member of **Linked In**, which is a network for professionals.

<http://www.linkedin.com/in/almacintyre>

Anyone can access [my public profile](#) (above link) but if you go to full profile, and you are not already a member of Linked In, there will be a rigmarole about joining.

When at the full profile, see if you can see my box net files, where I have folders for my notes on: Haiti; Japan; Economy; other interests, many of them with sub-folders.

Feel free to connect to me there. If you have a [Box Net](#) account, but are not on Linked In, you may be able to access the same stuff there¹⁰ ... my user id is ALMac99.

Acknowledgements (1 May 16)

Some of my research content is direct quotes from other sources. I try to give credit every time I do this. Also thanks to:

- [MPHISE-Japan](#)¹¹ participants.
- Stuart Leiderman, a specialist on environmental refugees and ecological restoration.
- Kathy Gilbeaux, who finds many of the sources, linked to in here.
- Bob Speth, illuminates when foot in my mouth, so I know to improve my clarity.

SCOPE (1 MAY 16)

As we have observed with the Haiti disaster, and other disasters in humanitarian history going back several decades, the disaster relief and avoidance industry is extremely experienced in developing lessons learned, but the state of art of our civilization is that we have been totally incompetent, when it comes to implementing lessons learned.¹²

In USA 2011 Midwest Flooding, we see government must react rapidly to a situation somewhat familiar from prior years' similar crises. We wonder if there's more which ought to be done to mitigate or abate repeat of history in the years ahead.

⁸ <http://www.scribd.com/explore>

⁹ <http://groups.yahoo.com/group/HaitiDisasterRecoveryResearch/>

¹⁰ <http://www.box.net/>

¹¹ <http://japan.resiliencesystem.org/>

¹² See my 1 year Haiti reviews here, and other places: <http://www.haiti.prizm.org/>

At the end of my “**Nuclear Time Line**” notes, there used to be a section on “**Lessons Learned**” (but not much hope they will be implemented). I have now moved that info to this separate document initially called “**Lessons Japan**,” although many of the disaster avoidance planning lessons apply to other nations, the events occurred in Japan, that are the impetus to this discussion evaluation. Over time, there will be additions to this evaluation.

In contemporary academia,¹³ the severity, of many disasters, is related to human failure to adequately manage risk. In poorer nations, the finances are not there to do an adequate job. In complex business and industry, cost cutting pressures tend to impose a group think to ignore risks.

Economy notes (1 May 16)

We see similar challenges with both natural disasters, and purely man made. See my “**Economic Disasters – past present future**,”

previously named FCIC after US gov report on causes of latest financial crisis.

As we study causes of recent disasters, we learn that there were red flags warning of danger ahead, and then it becomes controversial who should have mentally recognized what they signified, and taken mitigating action. Since recent disasters had such flags, which were ignored, what flags exist today, which might warn of us of future chaos?

I started these research notes April 2011, when I stumbled over FCIC report at bookstore, as I was looking for another publication.

<http://www.linkedin.com/in/almacintyre> - full profile - box net – Economy / FCIC name

Japan notes (1 Apr 24)

Sometimes when I add new info one place, another section of my notes has an older story.

- Acronyms Glossary for Haiti – many of the acronyms are relevant to many disasters.
- EOJ = naming convention for my Earthquake Japan documents, to distinguish them from Haiti notes.
- EOJ Japan Overview = non-nuclear focus ... earthquake and tsunami recovery.¹⁴
- EOJ Nuclear News = make sense of what’s going on with the nuclear power plants. – many topics which I am splitting into more focused notes areas
- EOJ Nuclear Time Line = visualize progression of events and trends, to help make sense without the distortion of the many news media actors with an agenda.

¹³ According to Wikipedia <http://en.wikipedia.org/wiki/Disaster> and other sources.

¹⁴ Info on Mapping sources got moved into Maps Directory document so in one place are where to find Maps about Haiti, Japan, other disasters, and also regarding Democracy seeking a foothold in the Middle East.

- EOJ SitReps = Japan Situation Reports¹⁵
- Japan Nuclear Accidents Glossary of Terminology and Acronyms = Try to explain specialized geek language associated with the Japan nuclear disaster, and related recovery. A person working with any of my EOJ documents also ought to get a copy of this.
- Japan Nuclear Info Navigation Guide = Identifying “The Horse’s Mouth” for people who have been overly dependent on the other end of the horse (the news media), and are starving for better information.
- Lessons Japan Disasters for the whole world = what we should have learned from Japan’s disasters, to apply to rest of world to mitigate risk of something similar happening some place else.
- Map Directory includes Haiti & Japan disasters, other disasters, Democracy foothold in Middle East, how to use some mapping resources.
- I have also downloaded some OFFICIAL documents, named them with a mixture of EOJ, what they are about (e.g. Map), date vintage and organizational source.

Haiti notes (1 Mar 17)

I have a score of research notes on the Haiti disaster. The following are of relevance to lessons (which should be) learned:

- 1 year reviews
- Cholera FAQ
- Glossary Housing
- Land Ownership Documentation
- Rubble
- T-Shelter progress
- Weather Science

I have several “**1 year reviews**”, on various aspects of the aid to Haiti recovery.

What good done so far, where the aid inadequate, what’s needed to fix that.¹⁶

¹⁵ Mainly non-nuclear, what I consider to be the bigger disaster for the people more due to tsunami than earthquake.

¹⁶ <http://www.linkedin.com/in/almacintyre> - full profile - box net – Haiti – 1 year

<http://rebuildhaitibetter.net/forum/topics/navigation-resources>

<http://www.haiti.prizm.org/>

The bare facts have been in my “**Cholera FAQ**” for several months:

- How do people catch this thing?
- What works as good protection, and what guidance is misleading?
- Responsibilities for volunteers on the ground.

What I have more recently added is in the controversy over origins of the disease, what should be done long term, and outbreaks in other nations.

“**Glossary Housing**” (and other) “**Challenges in Haiti**” attempts to lay out what has not been getting resolved, various proposed solutions, their pros & cons.

“**Land Ownership Documentation**” explains one of the significant problems which have been a barrier to serious rebuilding in Haiti.

“**Rubble**” looks at what progress is being made clearing it. That’s another impediment to serious rebuilding.

“**T-shelter**” documents “progress” building these (not much better) replacements for the tents and tarps.¹⁷

What we know about coming seasons, changes in patterns, climate from year to year, etc. is in my “**Weather Science Haiti**” notes.¹⁸ I have been adding bits of info on multiple topics such as:

- 2010 quake was accompanied by tsunamis – here’s links to particulars
- Many different natural phenomena are NOT getting worse, but human mitigation is going BACKWARDS, so the disasters are getting worse thanks to actions or inactions by mankind

¹⁷ <http://groups.yahoo.com/group/HaitiDisasterRecoveryResearch/files/Recovery%20Challenges/>

<http://www.linkedin.com/in/almacintyre> - full profile - box net – Haiti – Housing+Shelter

<http://rebuildhaitibetter.net/forum/topics/navigation-resources>

<http://haiti.mphise.net/attachments-al-mac-quality-life>

<http://www.haiti.prizm.org/>

¹⁸

<http://groups.yahoo.com/group/HaitiDisasterRecoveryResearch/files/Next%20Disaster%20Protection%20/>

<http://www.linkedin.com/in/almacintyre> - full profile - box net - Haiti

<http://www.scribd.com/AlMac99>

<http://www.haiti.prizm.org/>

Document Structure (1 Mar 16)

Topic sub-titles end in a date signifying when that info last updated, so by viewing table of contents, we see where most recent input to these research notes, especially aiding people with copy of an earlier version. Digit 1 in front of month means 2011.

Version numbers are incremented, with this document periodically uploaded various places for convenience of other people who can then pick and choose which of my research efforts they wish to download.

Users of my research hold Alister Wm. Macintyre harmless, and also the places I upload my research to, and agree that my copyright is reserved and that the information is available for the intended purpose of helping in the recovery of Haiti and Japan.

MY RESEARCH NEXT (1 MAY 17)

Where should I go next in studying this stuff?

Well for one thing, information is flowing in faster than I can adequately digest and organize it, so I need to periodically step back and try to do a better job of structuring what I have here.

When the landscape is devastated, from whatever disaster, does it make sense to rebuild in the same place, like is happening with Katrina survivors and in Haiti?¹⁹ Transitional repair support is needed in short term, so people have a place to live, jobs, economic activity. But they also need to build back better, so the region is better protected against when history repeats.

The news media paints every disaster as the worst ever. Statistically, they will occasionally be correct, like a stopped clock is correct twice a day. What is ominous is the notion that around the world, the reaction is to have discussion of what can we learn from this, then get nothing accomplished to do anything about it for so many years, that there will be many more disasters, which really are the worst ever, worse than we have seen in Haiti earthquake, Pakistan floods, and Japan tsunami.

Jan 2010 was the start of a Mega Disaster for Haiti. In terms of proportion of the population, and infrastructure, seriously harmed, it was the worst in the world since European medical plagues. Their capital city was destroyed, and that was not the epicenter. Capital Cities are host to a wide range of resources not replicated in rest of the nation.

March 2011 was the start of a Mega Disaster for Japan,²⁰ the biggest compound disaster they have faced since WW II. It is one which many nations around the world have not yet faced, but may have to face tomorrow, because very few have done a quality job preparing for the inevitable. Cities around the world are just as vulnerable as Japan was, on the eve of this

¹⁹ The same place is at risk of similar intensity natural phenomena again in the future.

²⁰ Already I am imagining the naming which will be used for Geography Channel presentations.

disaster. They do not have all the time in the world to figure out what needs to be done for better protection, then implement it.

In very recent times, we have seen other mega disasters around the world:

- Earthquakes in Chile, Haiti, Japan, New Zealand;
- Flooding in Australian and Pakistan;
- Tropical storms like Katrina.

Is the average risk of natural disaster increasing? Or do a few similar disasters sensitize us? Human population growth, in areas at high risk of earthquake or serious disaster, means that when history repeats, there are more victims dependent on services disrupted by the disaster.

Some of these disasters have been in heavily populated areas. Population density is apparently increasing, without commensurate growth in defenses, in areas of high risk of natural disaster.²¹ I suspect formerly under-developed world's industrial process has not set aside adequate profits to protect what they have built, partly out of a lack of respect for their people, and partly for lack of good records on these risks.

What's the worst earthquake we should mitigate against with building codes?²²

What's the largest altitude tsunami we can normally expect?

Is it economically feasible to have sea walls to protect major coastal cities from 50 foot high tsunamis, just like cities along rivers have levee walls to protect against highest rise in water level that they can imagine? Is 50 feet high enough?

Do major cities have:

- High ground people can get to in time, when a tsunami is expected;
- A Tsunami alarm system at least as good as Japan's which gave the people an hour's warning, but thousands of people did not receive the alarm;
- Buildings sturdy enough to survive major quakes, whose population know they need to get to the 4th floor (without elevators), within 15 minutes of any serious quake, so they are high enough up when tsunami arrives;
- Roads which can accommodate evacuation, when the roads are damaged from the quake, before water arrives from burst dams.

In areas of frequent earthquakes, like on the San Andreas, and in Chile, the steady bombardment of quakes leads the population to demand competent protection via

²¹ When Cascadian II strikes US-NW Canada-SW destroying roads, buildings, dams; sending tsunami down west coast, and overloading inland rivers; millions of people will have no exit route. We know it is coming, don't know when, are doing nothing to protect those victims, whose population continues to grow.

²² See Asteroid Strike chapter. That should be mitigated via space science.

government building standards. But where quakes are less frequent, such as in Cascadian²³ and Haiti, the people tend to forget the need for protection, and request limited government budgets go to other priorities.

Is the mental health community able to cope with the increased demand, in any nation, after a mega disaster? And how about the debilitating effect on professionals who collectively saw disaster ahead but were not influential enough, in their respective societies, to dampen or deflect the amount of risk-taking from political and economic institutions at all levels?

LESSONS HOPE LEARNED (1 MAY 18)

This topic impacts energy (and other) policies for all nations. There are some disturbing indications.²⁴

- Around the world, the Japanese have earned a reputation as first rate scientists and engineers. If this can happen to them, it can happen to any nation. In fact some nations may be even more vulnerable, than they previously realized.
- In earlier disasters, I had pointed to some early warning systems in Japan, which I thought were just great. Those systems worked in the 2011 quake, except the general public did not “hear” the tsunami warnings, and act on them. Had the people acted promptly, tens of thousands more lives would have been saved. The warnings went out a good hour before tsunami arrived, correctly predicted times of arrival to various communities, had height wrong, but not by much. The sea wall heights of defenses against nuclear power plants and other critical infrastructure were known to Japanese government, so from the tsunami forecast it was predictable one hour in advance which walls not high enough. Apparently this correlation was not made until after the nuclear accidents started. When seconds count, rescue can be too late.
- In many nations, there’s *a revolving door* between industry professionals and government oversight. This undermines whistle blower protection and worker safety. Some critical infrastructure should have higher priority that checks & balances are working properly. It’s bad enough that the revolving door contributes to oil spills²⁵ and coal mine cave-ins; or Air Traffic Control with no Cyber Security. It’s another order of magnitude when the revolving door gives us world wide economic melt-down, and more Chernobyl’s. Thanks to national security censorship of information surrounding critical infrastructure (a defense against terrorist attacks

²³ The Cascadian fault line is north of California’s San Andreas fault.

²⁴

<https://netfiles.uiuc.edu/mragheb/www/NPRE%20402%20ME%20405%20Nuclear%20Power%20Engineering/Fukushima%20Earthquake%20and%20Tsunami%20Station%20Blackout%20Accident.pdf>

²⁵ The Gulf Oil Spill was not the first of that magnitude for those actors, just the first to get significant US news media coverage. It may not be the last.

is security by obscurity), it is even less obvious to the general public when our security is gutted by the revolving door.

- Cascading failures in multiple nuclear power plants, with the same pattern occurring again and again in different nuclear power reactor units, indicate design weaknesses, faulty emergency procedures, broken communications, lack of worker training, or some combination.
- Failure to rapidly adapt to new circumstances indicates a lack of nuclear power plant understanding, and lack of training to deal effectively with what can go wrong.
- A question has been “What is the worst earthquake we should be prepared for?” I found the worst quake in Earth history had been in excess of 10.0, which led to other questions, in need of answers, to guide policies for adequate protection.
- Some of the reported events have yet to be explained.
- News media painting everything as worst possible consequences, sensationalizing instead of informing.

Mitigation takes money. Most enterprises feel that government mandates are a too costly interference with the cost of doing business, and making short term profits, so there’s lots of push back against government regulations.

1. There are 126 agencies in the US federal government ([LINK 1](#))²⁶
2. There are now well over 17,000 lobbyists based in Washington D.C. knocking on the doors of those agencies with prospective legislation ([LINK 2](#)).²⁷
3. Recommendations from the agencies, influenced by the lobbyists, then goes to Congress along with a great deal of political contribution in the form of big bucks.
4. Then the TV show among our elected representatives vying for reelection and the big bucks starts for our entertainment. The administration is the band leader in the orchestra pit for this show. The major instruments are out of tune and harmony is difficult to reach.
5. In the mean time the national debt clock continues to run ([LINK 3](#))²⁸
6. Addressing latest disaster is complex: how best to mitigate vs. when history repeats – that focus lasts until news media “history” brings us many new hot topics. Fixing unemployment, housing market, food prices, gas prices, deficit, may or may not be practical.

²⁶ <https://www.fbo.gov/?s=agency&mode=list&tab=list>

²⁷ http://en.wikipedia.org/wiki/Lobbying_in_the_United_States

²⁸ <http://www.usdebtclock.org/>

They're all important, and inter-connected. We should not fix one area, at the expense of others.

RISKY TRADE-OFFS (1 MAY 07)

There's a mentality I saw with the Shuttle disaster (the one launched when weather too cold for the O rings), again with the BP Gulf Oil spill (if you can't do it right, then do it wrong, because doing it is most important), and with what went wrong in several nuclear accidents (with all the money at stake, they take short cuts to save pennies by comparison to what they are risking).

In any business or government enterprise, there are imperatives to:

1. Get the job done;
2. Reduce cost of getting the job done;
3. Ensure quality and safety in the job which is to be done.

The third imperative is frequently overlooked.

Planning before Disaster (1 May 17)

Disaster probability can be calculated, and miscalculated by people who do not understand the inter-relation of relevant sciences. Are an earthquake and consequential tsunami unrelated events? Is the probable height of a tsunami related to the magnitude of the quake, the type of quake, proximity to ground surface, and shape of nearby land? Because the 9.5 Chile quake created a tsunami of 10.5 feet, Japanese presumed they were well protected, did not expect a 9.0 quake to generate a tsunami of 33 feet.²⁹

This combination of what nuclear power plant design engineers seemed reasonable to plan for, and what really happened, led a Tepco official to say it was “sotegai” = “outside our imagination.”³⁰ I have yet to hear if it was outside the imagination of seismologists or tsunami scientists, and whether or not they were consulted in the design criteria for the nuclear power plants. It also sounds that it was outside the imaginations of revolving door personnel the world over, which is a scary revelation.

If nuclear fuel rods have sustained melting damage from inadequate cooling, then introduction of sea water has predictable chemical then isotope reactions with chlorine and sodium in the salt. If no radiation yet, or later, then the only result is salt residue on what was being cooled.

²⁹ There's no evidence, in reports so far on Japan nuclear disasters, that seismologists (earth quake scientists) or tsunami experts were consulted in the design of the doomed power plants.

³⁰

<https://netfiles.uiuc.edu/mragheb/www/NPRE%20402%20ME%20405%20Nuclear%20Power%20Engineering/Fukushima%20Earthquake%20and%20Tsunami%20Station%20Blackout%20Accident.pdf>

Disaster severity is a combination of natural phenomena (severe weather, upheavals of our active planet earth, solar winds, large meteors) and human insufficient preparation in anticipation of what we ought to be able to predict the risks better, and do something to mitigate them.³¹ How many hundreds of years do we need to store spent fuel from nuclear reactors safely, and how severe can we expect earthquakes to get in the next 500 years? Will future science be able to relocate them to the Moon, or drop them into our Sun?

While I am seeing multiple instances of a severe disaster, which was predicted in advance, yet inadequate or no efforts were taken to protect people and property from that scenario, what I do not know is how many predictions there have been of disasters, which did not come to fruition.

I believe government policy for all nations:

1. We must do a better job of acting on the information available, as science improves its predictions of the risks facing our future.
2. We must continue to fund research into further improving our understanding, of the risks, and how best to protect ourselves against them.
3. When planning critical infrastructure vs. various risks, measurement of the risks should include people who are professionals associated with those risks, not rely on recent years statistics, whose picture may be incomplete.
4. When red flags warn of danger ahead, instead of ignoring or attacking the messengers, these warnings should be coupled with credentials of info source, correlated with leaders of relevant science, foment investigation, not group think.

The risks include terrorism and other man made disasters.³² There are UN programs to mitigate disaster intensity, and work towards disaster recovery.³³ Unfortunately UN performance in Haiti has not been impressive. Some agencies seem to do better than others.³⁴ When I have lamented about specific patterns of humanitarian aid failing to apply lessons learned, informants have told me this is what they also have been seeing for the past 50 years of humanitarian aid to other disasters around world history.

Cascading Infrastructure Failures (1 May 05)

In the face of increasingly more complex infrastructure systems, what risk management strategies are necessary to prevent (or mitigate risk of) cascading failures? This is one of the many key questions that Richard Little seeks to answer in a recently contributed chapter in

³¹ More on this concept in my research notes: **Weather Science Haiti.**

³² http://channel.nationalgeographic.com/series/naked-science/5120/Overview#tab-Videos/08889_00
<http://precedings.nature.com/documents/4745/version/3>

³³ <http://www.unescap.org/idd/pubs/Asia-Pacific-Disaster-Report-2010.pdf>

³⁴ http://www.searo.who.int/LinkFiles/EHA_CRD.pdf

*Disrupted Cities: When Infrastructure Fails.*³⁵ Infrastructure is complex, interconnected, and inter-dependent.³⁶

The term “**vulnerability of complexity**” was coined by the Yale sociologist Charles Perrow and refers to the failure nodes that are repeatedly created at the intersections of our interdependent and highly sophisticated transportation, electric power, and telecommunications systems. Their interdependence makes these core infrastructures vulnerable both to failures in each other and in the information systems and software that support their operations. Unfortunately, although we depend completely on these closely coupled systems in our everyday lives, we really don’t yet understand all the ways in which they can fail.³⁷ This makes guarding against failure quite a challenge.

Next Mexico earthquake (1 May 15)

Urban leaders from around the world recently met at a United Nations conference in Geneva to discuss how cities can better prepare for natural disasters and reduce the risk to human life and property.³⁸ There have been lots of such meetings, but some urban leaders are getting more interested in doing something constructive, having seen the horrible consequences for other cities recently with earthquakes for which they had inadequate preparation.

One of those woken-up political entities was Mexico City. They now have a plan to try to protect their 20 million citizens, better than in the Sept 1985 quake. Here it is summarized:

Risk mapping: We undertake extensive risk mapping to identify high-risk areas of damage resulting from an earthquake, using historical data to more accurately predict future danger zones and in determining real estate and development considerations.

Early warning system: We have developed the world's “first” earthquake warning system,³⁹ known as [Sistema de Alerta Sísmica](#). The system is capable of generating warning signals of an average of 60 seconds before the "S" waves first arrival in Mexico City by detecting strong earthquakes occurring 280 km. away in the "Guerrero Gap" along Mexico's Pacific

³⁵ <http://go.worldbank.org/J99OFGA7D0>
http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/EXTEAPREGTOPRISKMGMT/0,,contentMDK:22907219~menuPK:4078302~pagePK:2865114~piPK:2865167~theSitePK:4077908,00.html?cid=EAP_EAPDMEN_Q_EXT

³⁶ Also see my research notes on “*Economic Disasters*”, past present and future.

³⁷ I disagree. Modern business does not want to expend the money to find out about the risks, then mitigate them.

³⁸ http://www.huffingtonpost.com/marcelo-ebrard/preparing-for-the-next-earthquake_b_860086.html

³⁹ I believe Japan also developed and implemented an earthquake warning system several decades ago. The further away the epicenter (under ground) the better the lead time warning is. Japan’s was also billed as the world’s first. It uses sensors buried deep below the ground, which were very expensive to install. The info is communicated to people at the speed of electricity which is much faster than ground movement, so often people have 15-20 minutes warning before earthquake arrives.

Warning time varies depending on depth of quake, and type of quake, but even a few seconds count towards stopping trains, elevators, people diving for cover.

coast. Since August 1991, the system has detected 656 seismic events along the Guerrero Coast; nine strong enough to trigger early warning signals in Mexico City.

Emergency personnel: We have a highly-trained, world-class disaster [rescue team](#), known as Los Topos (The Moles), which has offered its expertise in rescue efforts around the world, including during recent tragedies in Haiti and Japan.

Schools: Mexico City's Department of Civil Protection conducts earthquake drills in all Mexico City schools.

Construction: Public and private buildings in Mexico City are required to be part of the city's civil defense program. We conduct structural reviews, gas and electricity installation reviews, and identify assembly points and evacuation routes. There are strict building requirements and inspection procedures during construction, and earthquake-resistant engineering is utilized in new construction. Mexico City has also created the Institute for Structural Security, which is responsible for providing recommendations on new construction.

Training: Last year, we began training 10,000 civil servants who would play a critical role during a disaster. Training involves four groups: [1] member of the Cabinet and senior government officials, [2] service providers, including hospital workers, electricity and water officials, [3] rescue workers, and [4] educators.

Public drills: Mexico City conducts regular earthquake drills, the largest of which takes place annually on September 18, anniversary of the 1985 quake. Last September, more than six million citizens participated in a drill that involved 13,000 public and private buildings and 12,000 law enforcement and emergency personnel. It was an extraordinary demonstration of government and citizen collaboration. The drills educate citizens on evacuation routes and response plans. When people know what action to take, the cost in human lives can be dramatically reduced. These drills also enable us to measure our response capacity and identify high-risk locations through GIS-data technology.

Security cameras: Mexico City is [installing a network](#) of 8,000 video cameras in high-traffic locations throughout the city. The system is integrated with command, control and communications centers. It is the most comprehensive and modern video monitoring system in the world. Each video unit includes a loudspeaker for use during emergencies. While the system is used daily to monitor and respond to criminal activity, it will be an essential communications tool during a time of crisis. We have invested USD 800 million in this initiative.

New technologies: Finally, we are developing a program to send earthquake warnings [directly to citizens](#) through their mobile phones, a warning reaching them seconds before an earthquake hits. The technology will be place within the next few months. Providing a warning directly to citizens -- even just a few seconds before an earthquake strikes -- can save many lives. We are also using social media tools such as Twitter to communicate directly to citizens in real time.

Through these critical investments, training and public education, our goal has been to make Mexico City the most prepared megacity in the world for such a disaster.

Worst earthquakes in history (1 May 17)

Worst quake can be measured in magnitude, and in amount of damage and deaths. An intense quake in the middle of the ocean, with no tsunami vs. a milder quake in a highly populated area, might not have been noticed before our science advanced to have instruments all over our planet.

http://en.wikipedia.org/wiki/Lists_of_earthquakes#Largest_earthquakes_by_magnitude

Here's [a map](#) showing locations of largest earthquakes in the world since 1900.⁴⁰

Prior to 1900, magnitude data was not generally available, so some are estimates. Even after 1900, some magnitudes have been computed differently, or recomputed, so some records may have the older figures, before they got corrected.⁴¹

- 9.5 Chile in 1960 (since then, Chile has had several other big ones)
- 9.3 (or 9.1)⁴² cause of the 2004 Indian ocean Tsunami which caused so much damage, mainly due to timing ... alerts arrived at government offices, with everyone gone home for the weekend, and the people doing the alerts did not know where else to send them.⁴³
- 9.2 Alaska in 1962 (3 years later there was an 8.7)
- 9.2 Sumatra in 1833
- 9.2 US-Canada Pacific coast Cascadia 1700 (seismologists indicate this area is overdue for another major quake, but in the mean time the population in the target area has exploded ... casualties could be in the millions)
- 9.0 Japan 2011 March latest disaster (volume of aftershocks staggered imagination)
- 9.0 Russia (then USSR)⁴⁴ 1952
- 9.0 Chile in 1730
- 8.8 Chile in 2010 (50 years after 9.5)
- 8.8 Ecuador-Columbia 1906
- 8.7 Alaska in 1965

⁴⁰ http://earthquake.usgs.gov/earthquakes/world/10_largest_world.php

⁴¹ http://earthquake.usgs.gov/earthquakes/world/10_largest_world.php

⁴² Precise #s in dispute.

⁴³ Structure of alerts often trigger false-positives by anti-spam.

⁴⁴ I think maybe this? http://earthquake.usgs.gov/earthquakes/world/events/1952_11_04.php

- 8.7 Portugal in 1755
- 8.6 Sumatra 2005 (Japan nuclear power plants designed for 8.6)
- 8.6 Alaska 1957
- 8.6 Tibet 1950

Alaska, Chile, and Sumatra obviously have gotten more than their fair share of large magnitude quakes in the last 400 years. So perhaps the risk of heavy magnitude is not evenly distributed around the world. But when it comes to lack of preparedness for the general population, much smaller magnitude have contributed to massive death rates.

http://en.wikipedia.org/wiki/List_of_deadly_earthquakes_since_1900

- 830,000 dead 1556 China 8.0
- 779,000 dead 1976 China 7.8
- Uncertain 2010 Haiti 7.0
- 250,000 dead 0525 Byzantine 8.0
- 235,500 dead 1920 China 7.8
- 230,210 dead 2004 Indian Ocean 9.3
- 230,000 dead 1138 Syria unknown
- 200,000 dead 0856 Iran 7.9
- Don't know yet 2011 Japan 9.0

EARTHQUAKE AND TSUNAMI RISKS (1 MAY 17)

[Planning in advance](#),⁴⁵ so that individually, we are better prepared. Also see

- **Natural Phenomena Disasters** within my **Navigation Guide to Japan Nuclear Info**.
- **Earthquakes** within my **Weather Science Haiti**, where the needed standard is mitigation from lower intensity earthquake risks than in Japan, and better understanding of storm surge and tsunami risks. There were in fact tsunamis associated with the Jan 2010 Haiti earthquake, but many officials were in denial.
- I have a **time line of red flags** (warning of disasters) in **Economy Disasters** – past present future. Notice expected Asteroid near-miss of planet Earth in 2029.

⁴⁵ <http://www.fema.gov/hazard/earthquake/>

There are dual issues of knowing what is the most powerful natural disaster possible, which ought to be protected against, and how best to do so.

Both New Orleans (Katrina) and Japan had walls high enough for the size of the water waves, but not strong enough to protect them.⁴⁶

The [Council on Foreign Relations](#) via OCHA Relief Web⁴⁷ shares [Lessons for Japan in 2004 Tsunami](#). To be sure, not all of them could help Japan: The creation of a better early-warning system across Asia, a result in part of the 2004 tsunami, still did not give many Japanese enough time to flee the rising wall of water.⁴⁸ But some of the most important lessons from 2004 could be useful to Japan, a country far richer and better prepared than the nations hit hardest in 2004--Thailand, Indonesia, Myanmar, India, and Sri Lanka--as it tries to rebuild its economy and environment.

- Preserve Natural Barriers – Japan, like the USA, has business lobbies, more interested in developing shorelines, than using them to protect national interior.
- Official Secrecy is Corrosive - leaders, and corporations, do have an unsettling history of favoring secrecy over transparency, which means the people do not believe what they have to say in a serious crisis.
- The United States Remains the Critical Foreign Player – while the US has been trying to get out of the world policeman role, and other powers seek more influence, in a crisis it is the USA which (appears to) know what to do, rapidly. However, the US economic situation is rapidly approaching point of incapacity to help in the future.
- Give Local Authorities Power (and access to relevant resources) – they can be more agile and focused. Japan will need to create one agency, near the center of the damage, which can take responsibility for organizing relief and rebuilding.⁴⁹
- The Power of Reconciliation - many Japanese are fed up with the nation's political class, yet they feel like they have nowhere to channel their unhappiness. Both parties seem unable to provide strong leadership and decisive responses to serious long-term problems, including an aging society, a lack of immigration, an economy being hollowed out, a long-term security challenge from China, and an alliance with the United States unpopular with many younger Japanese. The tsunami could provide the opportunity for a kind of reset in Japanese politics and society, as well as a chance for more decisive leadership, since the country will need it in the coming months.

⁴⁶ <http://edition.cnn.com/2011/WORLD/asiapcf/03/31/japan.tsunami.village/index.html?iref=NS1>

⁴⁷ <http://www.reliefweb.int/rw/rwb.nsf/db900sid/EGUA-8F7M7K?OpenDocument&rc=3&cc=jpn> OCHA Relief Web

⁴⁸ See IEDM chapter: Japan gave the citizenry one hour advance warning of tsunami coming, but communications impaired, many thousands failed to “hear” warning, and consequently died, as was learned later from surveys of survivors.

⁴⁹ See the time line. Japan did in fact establish emergency command and control centers very rapidly.

How bad can they get? (1 May 16)

I watched **Mega Quake** on **The History Channel**, and gained the following understandings, added to what I previously knew about the subject:

- There are different types of causes of earthquakes, which contribute different ranges of shock wave intensities and violence.
- The risk of earthquake severity is not changing, most weather threats are about the same, what is changing is the vulnerability of human beings, exposed to the natural phenomena risks.
 - More people density in mega cities.
 - More vulnerable buildings.
 - Impoverished people often in substandard buildings.
 - Fewer resources to protect us.
 - Result, same intensity quakes do much more damage.
 - Buildings are often designed to withstand a particular intensity quake, but we have before-shocks, main event, after shocks, hitting the buildings again and again. Early shocks can weaken buildings enough so later shocks knock them down.
 - When we need to evacuate, the transportation network becomes a bottleneck, more so when the disaster has damaged it.
 - Lots of people don't watch TV radio etc. news 24x7 so they might not see the alerts of impending bad weather, flooding.
- The strongest quake in recent history was the 9.5 in Chile. The strongest in Earth Geological history was larger than 10.0 (see Asteroid chapter below).
- Based on current earthquake theory, without an extinction event giant rock from the sky, the largest possible is 10.4, which would involve fault lines all the way around the planet. This is considered so unlikely, that 10.0 is considered to be the worst possible. It would come from the confluence of several faults acting up at the same time.

Asteroid strike low risk of high damage (1 May 15)

There is geological evidence. The worst the planet ever experienced was via a collision with one or more large rocks from the sky which wiped out the dinosaurs.⁵⁰ The resulting earthquakes were in excess of 10.0 on the Richter scale.

⁵⁰ <http://rainbow.ldeo.columbia.edu/courses/v1001/23.html>

Many people believe that astronomers can see such trouble coming in time for the military to do something about it.⁵¹ I am not one of those people.

The asteroid which hit Tunguska, Siberia on June 30, 1908 was a tiny asteroid, only about 30 to 60 meters across, i.e., difficult and unlikely to be detected by even the most modern ground-based telescope in existence today.⁵² For a long time, scientists had a hard time figuring out what exactly happened there. It missed destroying the city of Saint Petersburg by only seconds. If something like that had happened during the Cold War, the assumption would have been that Russia was under nuclear attack from the west, so time to retaliate with all the nuclear weapons.

I remember some have passed between the Earth and the Moon,⁵³ some of them big enough to kill off all humans, and which astronomers discovered, after they had threaded the needle.⁵⁴

On March 23, 1989, an asteroid with a kinetic energy of over 1,000 one-megaton hydrogen bombs (i.e., about 50,000 times more powerful than the bomb dropped on Hiroshima) was recorded to have passed very close to Earth, discovered using new technology equipment recently emplaced. Named 1989FC, this asteroid was detected only well after its point of closest approach, and we found out it had passed so close only after calculating backwards its orbital path after realizing its nearness. This was a key event that brought near Earth asteroids into the political arena.⁵⁵

There was one in 2009 which came closer to the Earth than our geosynchronous satellites.⁵⁶ If it had hit, it would have been no big deal, but astronomers only saw it coming with 15 hours warning.⁵⁷ It seems to me that with current technology, we need YEARS of advance warning, to prevent this kind of disaster. I think we have the scientific know how, but not the political will, to improve our space defenses.

Latest estimates project that there are about 300,000 near-Earth asteroids over 100 meters in diameter, and about 2,000 over 1 kilometer in diameter.⁵⁸

If an asteroid of size 200 meters hit the ocean (which covers 70% of the Earth), the tsunami (i.e., giant wave) it would create, would inflict catastrophic destruction of coastal cities and substantial worldwide human casualties along coastlines. If an asteroid of size 1 kilometer hit

<http://www.csmonitor.com/From-the-news-wires/2010/0309/What-s-to-blame-for-dinosaur-extinction-Asteroids>

⁵¹ http://en.wikipedia.org/wiki/Asteroid_impact_avoidance

⁵² <http://www.permanent.com/a-impact.htm>

⁵³ <http://www.realufos.net/2010/04/near-miss-asteroid-passes-between-moon.html>

<http://blogs.abcnews.com/scienceandsociety/2010/10/close-shave-asteroid-passes-a-tenth-of-distance-to-moon.html>

⁵⁴ <http://www.permanent.com/a-impact.htm>

⁵⁵ <http://www.permanent.com/a-impact.htm>

⁵⁶ <http://wattsupwiththat.com/2009/11/07/close-call-asteroid-near-miss-for-earth-yesterday/>

⁵⁷ <http://www.godlikeproductions.com/forum1/message918443/pg1>

⁵⁸ <http://www.permanent.com/a-impact.htm>

Earth, it would cause a dust cloud which would block out sunlight for at least a year and lead to a deep worldwide winter, exhausting food supplies. The latter is what caused the dinosaur extinction, as well as other major extinctions of smaller creatures in geologic time scales.

It would be worse, if the asteroid strike cuts a hole into the earth's magma, like a volcano in reverse.

Nuclear energy from seismically active areas (1 May 17)

Japan designed nuclear plants to be secure against 8.2 quake, which the Gov of Japan thought was worst case scenario. But as we have seen from world history, much worse have in fact occurred.

The 9.0 which Japan received, was 8 times more powerful than the 8.2 they had designed for. Maybe it is reasonable to design buildings more inexpensively, so they fall down if worse than 8.2, but nuclear power plants should be designed for a REAL worst case scenario.

There are lots of new reactor designs, much safer, but they are also much more expensive. How much more is not yet known. Europe is currently building two of them, which are way over budget.

Of the 62 nuclear power plants, currently under construction, 2/3 are in Asia.

According to Wikipedia, there have been 7 quakes of 9.0 or higher in the last 400 years. How many years do the spent fuel rods have to be kept safe? Obviously Chile Alaska and Sumatra get more than their fair share of high magnitude quakes, but there certainly is evidence that quakes higher than 8.2 to 8.6 (which various different Japan power plants were designed for) do occur, can occur. IAEA⁵⁹ says 20% of world's nuclear power plants are in seismically active areas.

For seismic risk assessments, we look at how many earthquakes occur in a region within a certain period. A delayed tsunami coming from Chile would be small when arriving at the Japanese coastline, in contrast to a tsunami triggered by a M9 event near the coast of Japan. 80% of the nuclear power plants are in stable or inactive continental regions (SCR),⁶⁰ e.g., Indian Point near New York City. SCR-earthquakes tend to be shallow and nucleate close to the surface. Regional seismic networks such as from the USGS, however, detect these earthquakes in much greater depth than they really are. As a result, ground motion is much stronger than anticipated. More details [here](#).⁶¹

Until the 2011 March 11 Japan crisis, the worst nuclear mess was Chernobyl (containment broken) and Hanford in Washington State. Hanford used to make plutonium for America's

⁵⁹ IAEA = International Atomic Energy Agency

⁶⁰ SCR's = Stable Continental Regions

⁶¹ <http://srl.geoscienceworld.org/cgi/content/short/78/5/554>

nuclear weapons, now has spent 20 years and counting (trying to clean up the mess), with nothing to show for the effort.

According to this [Wikipedia](#) write-up,⁶² posted on Facebook [Geo-Hazards](#) Wall,⁶³ seismologists believed that a magnitude 9.0 was unlikely.

But, when we look at history of world, there have been a handful up to 9.5 in the last 100 years. Perhaps we should look at WHERE there have been the very big ones and consider probabilities. If the nuclear power storage of spent fuel pools are supposed to last over 100 years (maybe 300 or more), and 20% of them in seismically active areas, and there will be several 9.5 every 100 years, do we have any way of predicting WHERE those very intense might happen? So that only the places, with the highest probability of getting 9.5 or higher, would be the places needing sufficient protection to weather that risk?

Would regions of the world, which are not seismically active, and not at other severe risks, be willing to store the spent fuel rods of other nations for 500 years, and what would they be expected to be paid for this service?

Know where high risk, and do something constructive (1 May 17)

Earthquake prediction science needs to be better funded, so it can improve, but more importantly, politicians need to PAY ATTENTION when seismologists warn that some geography is overdue to get a nasty big one. Perhaps the general public needs a map showing where high risk, so that THEY can better be prepared, since their governments are not paying attention to these updated risk assessments.

Earthquake predicting: Science is constantly improving. It cannot predict WHEN one will come, like with weather prediction, but scientists have been predicting WHERE there is a high risk of one coming soon.

Haiti had a nasty quake Jan 2010, a couple years after earthquake scientists predicted that Haiti was overdue to get a serious one, right around where it actually arrived.⁶⁴ So the quake was a shock to everyone, but not a surprise to earthquake scientists. Two years was not enough time for a lot of preparation, but it was time to improve critical infrastructure such as buildings where fire engines and ambulances parked (so they would not be crushed by those collapsing buildings).

⁶² http://en.wikipedia.org/wiki/2011_T%C5%8Dhoku_earthquake_and_tsunami

⁶³ Thanks to Christian D. Klose
<http://www.facebook.com/profile.php?id=100002279110451> for drawing my attention to this GeoHazards page

<http://www.facebook.com/pages/Think-GeoHazards/150224655042515?sk=wall>

⁶⁴ <http://www.pbs.org/wgbh/nova/earth/earthquake-detection.html> Also see links in my **Weather Science Haiti** research notes document.

According to 2011 March 19 Economist magazine, Japanese seismologists had warned in Jan 2011 that NE Japan was overdue for a large quake. They calculated that there was a 99% chance of an 8.0 or higher quake in the next 30 years off the Miyagi coast. They were not surprised March 11 by a quake coming pretty close to where they had predicted one, only by its size. Two months advance warning probably was not enough time for a lot of preparation, but it was enough time to build higher sea walls for nuclear power plants, and improve inland tsunami warning systems, only if immediate response taken to red flags.

NUCLEAR ACCIDENT RISKS (1 APR 02)

Arnie Gundersen is Chief Engineer of Fairewinds Associates. The organization has vast experience in nuclear energy,⁶⁵ while Arnie Gimdersen is an energy advisor with 39-years of nuclear power engineering experience. A former nuclear industry senior vice president, he earned his Bachelor's and Master's Degrees in nuclear engineering, holds a nuclear safety patent, and was a licensed reactor operator. During his nuclear industry career, Arnie managed and coordinated projects at 70-nuclear power plants around the country. See the footnoted links for more info on this guy's qualifications.

In this March 31 video,⁶⁶ Gundersen describes the Fukushima plant as stable, but precarious.⁶⁷ In this update, he discusses the high levels of radiation (2 Million disintegrations/second being found on the ground as far as 25 miles from the plant site.) He also addresses a New York Times report of hundreds of tons of water being put into the reactors each day. Gundersen points out that all of the water going in to the reactors is being irradiated, leaking out, and polluting the Ocean. He concludes by discussing the differences between the accident scenarios that the nuclear industry previously planned for and what has actually happened.

There's lots more⁶⁸ reports⁶⁹ on their site,⁷⁰ about Japan nuclear crisis.⁷¹

USA nuclear accidents (1 May 11)

Mississippi River is now (a little) Radioactive.⁷² This is thanks to the same company which is doing nuclear power plants in NE USA such as Indian Point. A major oil pipeline is a few yards from the power plant. Lake Michigan may be next to become (a little) Radioactive.⁷³

Earthquakes, floods, airplane crashes, mass evacuations, terrorist attacks, hurricanes, tornadoes -- all are disaster scenarios deemed a risk to reactor safety. However, the most

⁶⁵ <http://www.fairewinds.com/content/who-we-are>

⁶⁶ Thanks to [Lee Vanderheiden](#) on Facebook, for bringing this to my attention.

⁶⁷ <http://www.fairewinds.com/multimedia>

⁶⁸ <http://www.fairewinds.com/news>

⁶⁹ <http://www.fairewinds.com/reports>

⁷⁰ <http://www.fairewinds.com/updates>

⁷¹ <http://www.fairewinds.com/multimedia>

⁷² <http://www2.wjtv.com/news/2011/may/02/radioactive-substance-found-mississippi-river-ar-1793435/>

⁷³ <http://www.commondreams.org/newswire/2011/05/05-1>

frequent risk, in USA, is from the places catching on fire, on average 10 times every year. "The NRC is to nuclear power today, what the SEC was to Wall Street three years ago." (There were red flags about an impending financial crisis, and federal regulators ran interference for Wall Street.)⁷⁴

Maybe we need to revise the public severity ratings to include near misses, where nuclear disasters were narrowly averted, and how often that happens with various facilities. Remember that for several years before the VA security breach of 100% of the nation's veterans, the VA was getting "F" in all cyber security audits. Well there are nuclear power plants in America getting "F" in safety audits, and they are allowed to continue operating.

RETHINKING RISKS (1 MAR 31)

Around the world, several nations are seeing the situation in Japan as a wake-up call to review their vulnerability to something similar, the need to upgrade their protection against similar risks and exposure.

- Government of India:⁷⁵ [This link](#) includes some pretty horrific photos from Japan.
- Reviews of existing emergency procedures, and operational safety design of existing and planned nuclear sites, are now being conducted in China, Germany, Switzerland, and USA.⁷⁶

Managing Design Risks (1 May 17)

Have we learned anything about Nuclear Power Plant design from the recent news out of the Japan accidents? Gov of Japan has learned, after this disaster, is insisting on upgrades to various other nuclear plants.

In a general wide area emergency, rescue services may have multiple responsibilities, not able to devote full time and resources to the nuclear power plants. Communication services may be impaired. Computer records may not be accessible.

Near modern apartments, there are lock boxes containing information about the layout of the buildings, who is where, power lines, plumbing, keys to all the doors. These lock boxes are maintained by apartment management, with keys supplied to local police and fire department. This is so, in an emergency, rescue services have access to all the info they may need. Isn't something similar done with critical infrastructure? It would appear that rescue forces for the nuclear power plants were lacking in critical know-how needed to avoid making things worse.

⁷⁴ http://www.huffingtonpost.com/the-center-for-public-integrity/a-more-likely-nuclear-nig_b_860379.html

⁷⁵ <http://www.trust.org/alertnet/news/stop-a-disaster-prevent-a-crisis-first/>

⁷⁶

<https://netfiles.uiuc.edu/mragheb/www/NPRE%20402%20ME%20405%20Nuclear%20Power%20Engineering/Fukushima%20Earthquake%20and%20Tsunami%20Station%20Blackout%20Accident.pdf>

With water for cooling so critical, should the places needing the water be built below the level of local river water supply, so that in an emergency, can open water doors, and just let river pressure supply what is needed? Should spent fuel ponds be inside containment?

Inside of Japan nuclear reactor, and spent fuel ponds, both need water for cooling. When electric power for the pumps is lost, such as due to earthquake, there are over a dozen diesel generators. However they were located outside, behind a sea wall approx 1/2 as high as was needed to protect against the tsunami which wiped them out. Which would have been more economical? Sea wall higher than anyone thought needed, or diesel generators located higher than anyone thought they needed to be?

Batteries, good for 8 hours, kept the pumps going. Military helicopters could have delivered replacement batteries, but the decision was to truck in replacement diesel generators. They got setup, ran fine, but there was a problem hooking them up to the pumps. Wrong plug sizes. I imagine the mega disaster striking Japan was such that redundancy of protection for the nuclear power plants was not on their radar screen, until the situation got much worse.

Most US spent fuel ponds are at ground level. Are they in buildings which will fall down on top of them in a severe earthquake? Japan's spent fuel ponds are on top floor of reactor buildings, outside of any containment. Had they been at ground floor level, the tsunami would have picked up that radioactive material and distributed it throughout the countryside, so we all can be glad Japan was not using USA design. How many of USA over 100 nuclear power plants are located by sea shore where a tsunami risk exists? Probably that info is hidden from public view, because of efforts to hide info about critical infrastructure from possible terrorist threats.

However, the ceilings over Japan's spent fuel ponds have had holes broken in them by workmen, for those buildings whose roofs have not yet been blown off by hydrogen build up to explosion. The holes are to let the hydrogen escape without explosion, but those holes can also let the radiation escape from the spent fuel ponds whose water has steamed away due to lack of working pumps. There's got to be a better way to deal with the hydrogen.

This means that until electricity delivered to the pumps, water had to be delivered via helicopters and fire department trucks. All that water would become radioactive, and maybe unwise to dump into the sea. What is to be done with that water runoff? Doesn't the plant already have facilities to remove radioactivity from water? Eventually power is restored to the plants, but that equipment may need repair, and the interior is thoroughly radioactive.

There also needs to be better protection for whistle blowers and assurance that government regulators are doing their jobs properly. In the USA, the economic melt down was partly due to government regulators doing nothing, when there was overwhelming evidence of blatant illegality on Wall Street.⁷⁷ In Japan, there have been multiple accusations that nuclear safety was violated, with regulators in collusion with the industry, to cover them up.⁷⁸

⁷⁷ See my research notes on the Economic train wreck.

⁷⁸ <http://japan.resiliencesystem.org/japans-nuclear-nexus-safety-left-out>

Some answers, to questions, may have to wait until disaster recovery is further along.

Stop ignoring recommendations (1 Apr 02)

Various US commissions have been making nuclear recommendations for YEARS, which have yet to be implemented. Nuclear is perhaps more critical than other areas of safety.

We have an airplane crash, which kills a few hundred people. The NTSB figures out what causes it, and recommends certain safety improvements. Nothing happens because they are too expensive. Another crash kills a few hundred more people. NTSB figures out it was same cause, repeats what solution is needed. Nothing happens. Finally after we have over 1,000 dead people, the authorities finally decide we need to fix this problem.

The same kind of thinking is across a lot of USA industry. All sorts of investigations have found all sorts of problems in need of fixing, but nothing happens for a variety of reasons. I hope we don't wait on a bunch more financial disasters before fixing what caused the latest.

One year before Hurricane Katrina there was Hurricane Pam, which was a simulation, what would happen if the Gulf Coast got the most powerful Hurricane then known to man. Pam exactly predicted Katrina, and what needed to be done to protect the people. When Katrina came along, none of the protections had been implemented, and all the lessons of Pam had fallen out of authorities brains.

When asked about this afterwards, we were told that Pam recommendations were on the drawing boards and budget requests to implement. But officialdom had been acting like they had all the time in the world to do this, not matter if it take years. Hurricane seasons are very predictable. Risk existed that Pam predictions might happen in any hurricane season. They did happen in the very next one. These recommendations are being taken entirely too lightly.

IEDM EVALUATION (1 APR 24)

See my **Maps Directory** section on Japan disasters, where I give info about the **Kyoto University** evaluation⁷⁹ March 25, 2 weeks after the Earthquake Tsunami and start of Nuclear crisis.⁸⁰

Koyoto University published a 2 week IEDM⁸¹ report on the Japan earthquake, tsunami, and nuclear crisis.⁸² The aim of their report was to synthesize existing data with basic situation analysis. They note that the disaster posed a major challenge to the disaster risk reduction community.⁸³

⁷⁹ <http://japan.resiliencesystem.org/2-week-report-kyoto-university-synthesis-and-initial-observations>

⁸⁰ I downloaded a copy, naming it **IEDM 25 March Japan**.

⁸¹ IEDM = International Environment and Disaster Management Laboratory

⁸² <http://japan.resiliencesystem.org/2-week-report-kyoto-university-synthesis-and-initial-observations>

⁸³ <http://www.iedm.ges.kyoto-u.ac.jp/>

Japan already has an excellent understanding of coordination and cooperation needs, between the entire community of volunteers and government actions. This understanding is still lacking with UN hosted efforts in Haiti, 16 months after the Jan 2010 quake. A big difference Japan vs. Haiti is the speed with which critical mapping resources and statistics became available, and apparently got used productively.

For example, city or town X outside of the disaster area “adopts” as a sister city, a similar sized community inside the disaster area, to provide essential services which the victim community is unable to provide for itself.

Several disasters co-existed to complicate recovery: earthquake; tsunami; nuclear crisis; cold weather; aftershocks; infrastructure damage huge implications; multiple industries disasters. Disaster planning has often projected “worst scenario” to anticipate. In this mixture, they had “worse than expected” in several areas concurrently. There was also a people shock or paralysis, thanks to abundance of multi-disaster surprise inter-relationships which they had not anticipated. There were people buried under earthquake debris, when the tsunami warnings were sounded, they could not escape. We saw from helicopters flying over the advancing tsunami, that cars were not driving away fast enough to escape it.

There have been lots of tsunami drills in Japan, but there are still people who travel to the beaches, to be spectators, thinking they can decide when it arrives whether they need to evacuate or not. In 1960 a Chile earthquake sent a tsunami to Japan, where over 142 such spectators got killed.

14.46 earthquake occurred March 11, 2011

14.49 tsunami alert went out

14.50 tsunami heights and arrival times estimated

15.12 average time for most Japanese to realize there was a tsunami alert (according to surveys of survivors)

Their 81 page report⁸⁴ includes:

- Disaster scope maps;
- Tsunami statistics and map;
- Nuclear evacuation area maps;⁸⁵
- Aftershocks summary and maps;
- Helicopter pictures of devastated area;
- Rescue effort pictures;
- Fires statistics due to the earthquake and tsunami (325 thru March 19);
- Infrastructure damage statistics;
- People killed, injured, missing statistics;
- Evacuation and shelter statistics and maps;

⁸⁴ I downloaded a copy, naming it **IEDM 25 March Japan**.

⁸⁵ Note excess radioactivity has been measured OUTSIDE the evacuation zones.

- International assistance effort statistics;
- Schools statistics – diverted to shelters, too damaged for education to continue;
- Economic consequences speculation;
- Electric Power rationing, as high as 25% reduction in some areas;⁸⁶
- Impact on critical supplies to people, thanks to damaged roads, electrical supply;

Japan has an urgent need to import fossil fuels (coal, oil, natural gas) to replenish energy lost due to the nuclear accidents, but damage from the earthquake tsunami has severely constrained storage facilities.

Many public utilities are severely damaged, including delivery of water.

Debris from the Tsunami will take a long time to clean up.

Submergence, of some land, means coastal tides, future storm surges, will have different impacts than Japanese people are accustomed to.

Weather, and disaster damage, impedes ability of rescue efforts to get where they need to go. This parallels situation in early days of Haiti disaster relief, when there was a lack of fuel, thanks to the disaster's severity, and choices of what international forces brought to the nation.

As we have observed with the Haiti disaster, and other disasters in humanitarian history going back several decades, the disaster relief and avoidance industry is extremely experienced in developing lessons learned, but the state of art of our civilization is that we are totally incompetent, when it comes to implementing lessons learned.⁸⁷

It appears evident from this report, that there has been a repeat of a previous quake, lessons learned and forgotten. Several years ago, Japan cornered the market on certain components essential to various world markets, and concentrated all production in small areas, for economy of scale. Along comes an earthquake and wipes out all of it, in that case LED's which are the red light indicators found in many displays. It was over a year until the world had LED production again.

One lesson from this was as follows:

- If you are going to corner the market on something, and put all production in one place, there's a risk that it will be wiped out by a disaster. Is that a risk worth taking?

Well Japan took that risk again, and once again a disaster ended production of some critical components of industries which have a world wide need for those components, which means that factories around the world have shut down, or sharply reduced production, which means supply chain of ALL commodities to those factories, such as Asian auto manufacturers in USA, have had to reduce their production of the other components.

⁸⁶ Areas served by TEPCO account for approx 40% of Japan production.

⁸⁷ See my 1 year Haiti reviews here, and other places: <http://www.haiti.prizm.org/>

Some of the production was lost due to the earthquake tsunami, some due to the nuclear evacuation area, and some due to the power supply rationing.

WASEDA U STATISTICS (1 MAY 18)

Basic Statistics, of the Devastated Coastal Areas by the 2011 Tohoku-Pacific Ocean Earthquake and Tsunami, shared by Waseda University's Long-term Socio-economic and Environmental Resilience Strategy Research Team.⁸⁸

MIDWEST US FLOODING (1 MAY 18)

Rising levels of Mississippi river, threatening major cities with flooding, have led the US Army Corps of Engineers to deliberately flood areas of low population, and farm lands, so as to protect larger cities from the floods. Most communities are either saved, or flooded.

LOCAL INTERMEDIATE (1 MAY 18)

I live in an area which escaped most of this year's flooding, but has approx 20 roads closed, due to high water. The precise roads, and locations, fluctuate daily as water rises and falls, then debris needs cleanup. This means motorists never know, until we go out driving traffic jams trying to reach common destinations, what routes may be open to get us to our favorite retail sites (Bank ATM, grocery store, Post Office, etc.)

I'd like the Internet mapping services (Google, Yahoo, MapQuest, etc.) to tie into local county highway dept info on these road closings and openings, so map advice from point A to B is informed on latest conditions.

⁸⁸<http://japan.resiliencesystem.org/waseda-university-long-term-socio-economic-and-environmental-resilience-strategy-research-team>