Lessons from Japanese earthquake , tsunami and Nuclear disaster-2

By
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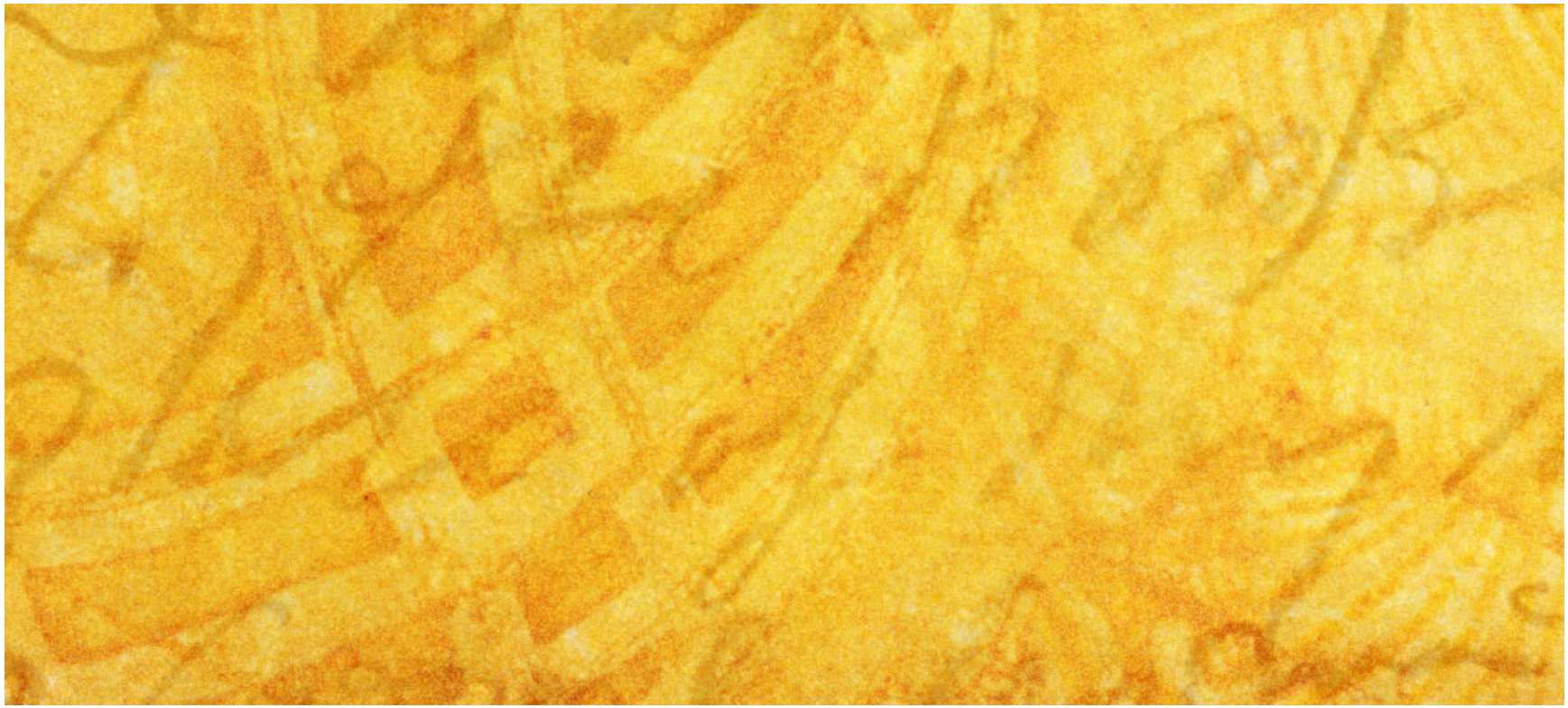

How did the redundancies in the nuclear power plant fail?

- The back up power was in the form of diesel generators and normally they should have kicked in, when power failed
- However these had been placed in a low lying area, again due the misplaced confidence that sea walls would protect the plant
- In the Tsunami, the diesel generators were submerged
- Emergency cooling system on batteries soon got depleted.
- In a desperate move to cool the core the authorities decided to use sea water.
- They alternately cool the fuel and let out the steam by venting- a process called ‘feed and bleed’
- This will essentially disable the plant and it will have to be abandoned. May also lead to fission..

Lessson-6

- **Prepare for the real worst case scenario;**
- **Safety should not take back seat to energy production and speed in project implementation etc**
- **Spend adequate time and money on spent fuel and waste management and emergency preparedness.**
- **Use latest technology and modern reactors-** reassess the importance of replacing old technology as this is very critical and crucial.
  - The Japanese reactors now involved in the disaster are 40 years old.

Lesson-7

- **A disaster can lead to unexpected consequences**
  - and make people behave irrationally!
  - Ex: Potassium Iodide tablets are nowhere available in USA now as it protects the thyroid in case of radiation exposure.
  - The likelihood of people in USA needing this is very remote –but such is the way people react when exposed to risk.
- A very interesting piece of news shows the degree of unexpectedness of consequences. I thought this disaster would prove to be good for the US automakers, till I read:
  - General Motors is halting output at a pickup-truck plant in Louisiana next week because it is running low on an unspecified part from Japan, with ripple effects on other G.M. operations!
- World is truly flat!

Lesson-8

- **Look at your own DRP/BCP**
- Disaster recovery expert Regina Phelps says in a podcast:
  - "I encourage people to look at their business continuity plans, their disaster recovery plans and say, 'If even 25 percent of what happened to Japan were to happen to us, could we even recover?'"
  - She says that if the same earthquake /tsunami had happened in any other place including California , the consequences could have been much worse.
  - She suggests a serious assessment/ relook at:
    - Frequent earthquake drills, fire drills and education
    - In respect of all mission critical processes, clear plan of what needs to be done in 24, 48, 72 hrs etc and then in next few weeks/ months
    - Mitigate even seemingly minor risks e.g:-whether your servers will topple over in the shaking
    - Communication related issues -contact info. mobile phone numbers etc in an emergency
    - Supply chain issues
    - Total preparedness

Lesson-9

- **Key is communication.**
  - **Clear, concise, factual and timely**
- Every one is angry about:
  - The Japanese authorities' failure to communicate clearly and promptly about the nuclear crisis.
  - They point to conflicting reports, ambiguous language and a constant refusal to confirm the most basic facts.
  - They suspect officials of withholding or fudging crucial information about the risks posed by the ravaged Daiichi plant.

Lesson -10

- **Half measures may lead to double whammy**
  - In the affected location the Japanese had a 3 meter wall instead of the 10 meter at other locations
  - So what happened?
    - It was ineffective to stop the waves
    - People were complacent that the wall will protect them!
    - The Double whammy was that once water entered, it did not have way to go back!
  - What could have been the solution?
    - May be we could have taken lessons from nature (called Bio mimicry)
    - There are many natural protectors against tsunami/ storm like casuarina trees, mangroves, coral reefs etc ; benefit is water can flow back to sea
    - In 2004 Tsunami M.S.Swaminathan said: “Dense mangrove forests stood like a wall to save coastal communities living behind them.”

Parallels to the Icelandic volcanic eruption

- **Striking parallels to Icelandic Volcano eruptions**
  - **Event of low probability but very high ferocity/effect**
  - **Comes out of nowhere!**
- **Kevin Knight on the Iceland disaster:**
  - It wreaked havoc on airports across Europe and had significant global effect.
  - Led to cancellation of hundreds of thousands of flights
  - Cost many billions of dollars
  - Impacted global tourism
  - Affected every thing from flowers and fresh vegetables to garments in Bangladesh to electronic components in the Far east…
- **Such a risk did not feature as a risk that airlines and other cos needed to manage at all!**

How UPS managed this crisis?

- Kevin says: UPS was one of the few who were prepared!
- United Parcel Service (UPS) quickly redirected air freight bound from Asia to Europe to Istanbul and then loaded it onto trucks for delivery to its final destination!
- UPS was one of the few exceptions as most sat and wondered when the ash would blow away and aircraft would resume flying!
- Kevin Knight says : **ISO 31000 can help**
  - ISO 31000:2009 is clearly different from existing guidelines on the management of risk in that the emphasis is shifted from something happening **– the event** – to the effect **of uncertainty on objective**

Planning to counter the uncertainty on objectives- another example

- Goldman Sach's bid to manage the $100B assets of Indian EPFO (Employees provident fund organisation) was missed due to fog!
- The flight carrying the qualification documents and cheque in the hands of an employee was late- thus not meeting the 5 pm deadline on feb 17,11!
- What a costly miss!
- On the other hand it is worth noting what Tatas did in the Corus deal. They had a guy ready with a two wheeler to go and deposit the document in time, in case the roads got clogged due to a traffic jam.

Lesson-11

- **Either imagine worst case scenarios very well**
  - E.g: As FBI/CIA decided post 9/11, take the help of risk advisers, authors of fiction books , Hollywood scrip writers and directors to imagine apocalyptic scenarios
- or
- **Shift the focus from predicting disasters (which are increasingly unpredictable; think meteorite hit) to seeing how to achieve your objectives, whatever be the risk**

Ignoring/side stepping expert reports

- Wikileaks report:
  - An IAEA expert expressed concern that the Japanese reactors were only designed to withstand magnitude 7.0 tremors
  - Also, the presenter noted recent earthquakes in some cases have exceeded the design basis for some nuclear plants.
- The government responded by building an emergency response centre at the Fukushima site, but the plant was still only designed to withstand a 7.0 quake!

Lesson-12

- **Whether external or internal, expert's reports should not be brushed away or actioned in a half hearted way.**

Lesson-13

- **Technology is not always the answer**; solutions could be simple – actually very simple like walking to a higher location or using bells or sirens.
- In Samoa, many more people could have been saved if they had just walked to the nearby hills ; instead they evacuated by car- a sea of cars ended up as cars in the sea. In some cases the hill was just 300 meter away!
- In Sumatra Tsunami warnings were being given on TV screens by interrupting broadcasts; but many villages did not even have electricity! What would have helped in good old war sirens!

Sources (for part 2)

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