West Consult
We can help from any compass direction....

Special challenges for Fukushima and Japan

Julia West
West Consult

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

MANCHESTER 1824

2nd Caesium Workshop:
Meeting challenges for Fukushima recovery
6 – 9 October 2014

The Good News

Courtesy: Getty Images

Courtesy: thinkstockphotos

Courtesy: Associated Press

Courtesy: stockclip.com

Fukushima: Successful Clean-up

Outline of presentation

- 2013 workshop.
- Some current perceptions of:
  - Fukushima
  - Windscale
  - Chernobyl.
- Other industries.
- Lessons for Fukushima.
- New ways forward…

1st Workshop – Summary of concerns

- Extremely high national and international profile (Unchanged in Japan but perhaps lower priority in many countries – news agenda).
- Extensive (and justified) criticism of poor communication/management (is this changing?).
- Sensitivity to contamination for significant regional agriculture & aquiculture (unchanged).
- Recovery is possible and there must be interaction with local people: communication must be a focus for all work carried out (Prof Oba-sensei).
- Technically (and will require good communication too!) (changing?):
  - Inventories for all wastes on site and those distributed through areas considered for regional clean-up.
  - Forms the basis of an efficient and structured remediation programme.
  - Integrated assessment needs to consider also marine releases.

We also noted that…

- 'The consequences of the negligence at Fukushima stand out as catastrophic, but the mindset that supported it can be found across Japan…'

  Kiyoshi Kurokawa, Chairman, Fukushima Nuclear Accident Independent Investigation Commission
- Defensive, paternalistic attitudes in many countries.

This must stop!

- This statement is a huge step forward.

Time Magazine 21 August 2014

“The World’s Most Dangerous Room –
Three and a half years after a
Catastrophic Meltdown,
Fukushima is far from fixed”

… more effective to tell bad news than good news…
… health fear is predominant.

Let’s quickly look at Windscale and Chernobyl again…

Windscale - forgotten?

- Nuclear included in 18 Sept 2014 Scottish Independence referendum debate.
- UK nuclear deterrent based at Faslane, Clyde Estuary.
- Dounreay remediation – fate of waste and site.
- Influenced by nuclear history - including Windscale accident?

Courtesy: bbc.co.uk

Courtesy: sundaypost.com

Courtesy: scotland.gov.uk

Chernobyl

- Fearful fascination remains.
- “Top Gear” – BBC car programme sold to 200 countries.
- 2014 visit to Chernobyl to test 3 cars!
- https://www.youtube.com/watch?v=jxrAfAD_GSo

Other technologies have problems…

Carbon capture and storage (CCS)

Courtesy: Demotix.com

Waste disposal in quarry

Courtesy: Western Evening Press

Activists view: 'Climate Camp' Wales August 2008

Fracking

Courtesy: telegraph.co.uk

The start of ‘communicating contested geoscience’

- Emerging scientific area.
- Scientists from different technologies now starting to compare experiences and techniques.
- Recent conference at Geological Society of London (June 2014) - Communicating Contested Geoscience: New Strategies for Public Engagement (Prof Iain Stewart – convenor).
- THE WAY FORWARD IS TO LEARN FROM EACH OTHER’S MISTAKES AND SUCCESSES.
- INTERACT WITH THE PUBLIC.

What does all this mean for Fukushima?

In 2013 - How can international experience be used?

- Learn from experiences and new communication approaches being adopted elsewhere (must be put into Japanese context).
- Realise that other industries are having the same communication experiences (needs dialogue and networking).
- Use communication professionals.
- Develop a strategy for communication. Don't be reactive!

Specifically:

- Put releases into context and help communicate remediation requirements to local populations.
- Show strategies that improve remediation (holistic planning).
- Talk about pros and cons of specific remediation approaches and technologies.

THIS WORKSHOP – INTEGRATING RESULTS/AGREEING MESSAGES

This is difficult!

Courtesy tofugu.com

Likely Concerns of people involved

“WORKERS”	“THE PUBLIC”	“DECISION MAKERS AND INFLUENCERS”
Are there enough resources to do a good job in the time required? **Is this possible given large amounts of waste generated?**	**Radiation and my health and the health of my family.** I want my home/forest/ land, water to be returned to what it was. Where do I go for answers?	The environment must be returned to pre-Fukushima as quickly as possible. Use MoE Guidelines for options.
Will the scope of the job change? e.g scale of work, timescales	What are they doing?	The demands of the people are growing. Budget concerns.
What should I do if I make a mistake or don’t know the answer?	Are they lying? Are they listening?	Am I being given the right information?
How do I deal with concerned people (work and home?)	Can I trust them? Do I trust them? Who do I trust?	How do I deal with concerned people (including political opponents)
What do I do about the media?	Do I listen to the media? Am I the media?	What do I do about the media?

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EFFECTIVE COMMUNICATION

Let's look at everyone in this room

- How many are here?
  - Workers (scientists, technical staff, academics, managers)
  - Public (non technical individuals, teachers, media)
  - Decision makers/influencers (policy makers, politicians, media)
- How many have dealings with the media?
  - Conventional use (radio, TV, newspapers, magazines)
  - Social media (Tweets, Facebook)
- Do you interact with other groupings? e.g. workers teaching at schools; decision makers/public visiting remediation activities
- Are you proactive with your concerns? Are you heard? If not, why not?
- WHAT DO YOU NEED?

Some suggestions for “workers”

- Development of strategy for communication – does this exist?
- Culture of communication. Everyone involved is expected to be open and transparent about their work.
- Some will be champions!
- Effective communication – know your audience, the importance of language.
- What is the Story? Agree messages based on excellent science.
- Tell the Story.

How to do this…

- Workshops/ training courses / Networking
- Techniques – role-play is particularly effective.
- Development of different communication techniques – proactive, interactive, responsive and interesting.

Yui-san wants to prepare a Press Release describing the findings from this meeting

SO TO HELP HIM

Thinking of your own area of expertise

In **ONE** sentence only

TELL THE PERSON NEXT TO YOU…

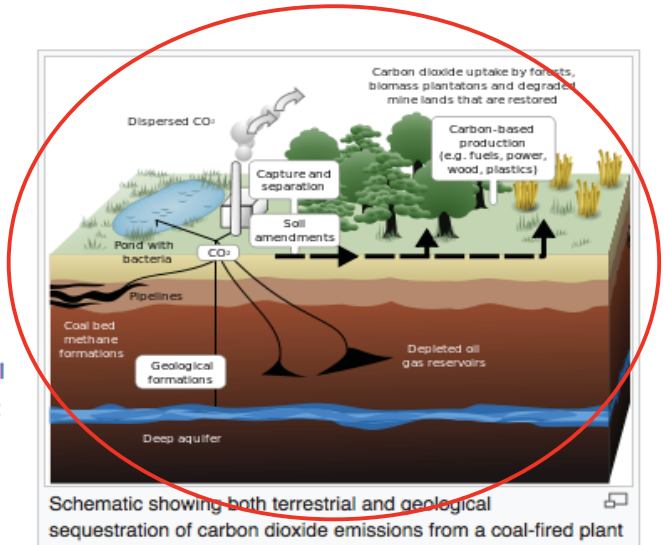
HOW YOUR WORK IS HELPING FUKUSHIMA CLEAN UP

Carbon capture and storage

From Wikipedia, the free encyclopedia

Not to be confused with Carbon capture and utilization.

Carbon capture and storage (**CCS**) (or **carbon capture and sequestration**) is the process of capturing waste carbon dioxide (CO_2) from large point sources, such as fossil fuel power plants, transporting it to a storage site, and depositing it where it will not enter the atmosphere, normally an underground geological formation. The aim is to prevent the release of large quantities of CO_2 into the atmosphere (from fossil fuel use in power generation and other industries). It is a potential means of mitigating the contribution of fossil fuel emissions to global warming[1] and ocean acidification.[2] Although CO_2 has been injected into geological formations for several decades for various purposes, including enhanced oil recovery, the long term storage of CO_2 is a relatively new concept. The first commercial example was Weyburn in 2000.[3] 'CCS' can also be used to describe the scrubbing of CO_2 from ambient air as a geoengineering technique.



Schematic showing both terrestrial and geological sequestration of carbon dioxide emissions from a coal-fired plant

An integrated pilot-scale CCS power plant was to begin operating in September 2008 in the eastern German power plant Schwarze Pumpe run by utility Vattenfall, in the hope of answering questions about technological feasibility and economic efficiency. CCS applied to a modern conventional power plant could reduce CO_2 emissions to the atmosphere by approximately 80–90% compared to a plant without CCS.[4] The IPCC estimates that the economic potential of CCS could be between 10% and 55% of the total carbon mitigation effort until year 2100.[4]

Capturing and compressing CO_2 may increase the fuel needs of a coal-fired CCS plant by 25–40%.[4] These and other system costs are

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Fukushima Daiichi nuclear disaster

From Wikipedia, the free encyclopedia

"Fukushima Nuclear Disaster" redirects here. For the incidents at Fukushima Daini (Fukushima II), see Fukushima Daini Nuclear Power Plant.

See also: Timeline of the Fukushima Daiichi nuclear disaster and Fukushima disaster cleanup

The **Fukushima Daiichi nuclear disaster** (福島第一原子力発電所事故 *Fukushima Daiichi (pronunciation) genshiryoku hatsudensho jiko*?) was a catastrophic failure at the Fukushima I Nuclear Power Plant on 11 March 2011, resulting in a meltdown of three of the plant's six nuclear reactors.[6] The failure occurred when the plant was hit by a tsunami triggered by the Tōhoku earthquake.[7] The plant began releasing substantial amounts of radioactive material on 12 March,[8] becoming the largest nuclear incident since the Chernobyl disaster in April 1986 and the second (after Chernobyl) to measure Level 7 on the International Nuclear Event Scale,[9] initially releasing an estimated 10-30% of the earlier[*which?*] incident's radiation.[10] In August 2013, it was stated[*by whom?*] that the massive amount of radioactive water is among the most pressing problems affecting the cleanup process, which is expected to take decades. There have been continued spills of contaminated water at the plant, and some into the sea. Plant workers are trying to lower the leaks using measures such as building chemical underground walls, but they have not improved substantially.[11]

Although no short term radiation exposure fatalities were reported,[12] some 300,000 people evacuated the area, 15,884 (as of 10 February 2014[13]) people died due to the earthquake and tsunami, and as of August 2013 approximately 1,600 deaths were related to the evacuation conditions, such as living in temporary housing and hospital closures.[14] The exact cause of the majority of these evacuation-related deaths were unspecified because that would hinder the deceased relatives' application for financial

Fukushima Daiichi nuclear disaster


Image on 16 March 2011 of the four damaged reactor buildings. From right to left: Unit 1,2,3,4. Hydrogen-air explosions occurred in Units 1,3,4 causing the building damage, while a vent in Unit 2's wall, with water vapor and "steam" clearly visible, preventing a similar explosion.

Date	11 March 2011
Location	Ōkuma, Fukushima, Japan
Coordinates	37°25′17″N 141°1′57″E
Outcome	INES Level 7 (Major accident)[1][2]
Injuries	37 with physical injuries,[3][*not in citation given*] 2 workers taken to hospital with

Comparison of Fukushima and Chernobyl nuclear accidents

From Wikipedia, the free encyclopedia

The following table compares the nuclear accidents at Fukushima Daiichi (2011) and Chernobyl (1986) nuclear power plants.

Plant Name	Fukushima Daiichi 	Chernobyl 
Location	Japan 37.6665°N 141.0208°E	Soviet Union (Ukrainian Soviet Socialist Republic) 51.38946°N 30.09914°E
Date of the accident	March 11, 2011	April 26, 1986
INES Level	7	7
Plant commissioning date	1971	1977
Years of operation before the accident	40 years	9 years
Electrical output	4.7 gigawatts	4 gigawatts
Type of reactor	Boiling water with containment vessel	Graphite moderated without containment
Number of reactors	6; 4 (and spent-fuel pools) involved in accident	4; 1 involved in accident
Amount of nuclear fuel in reactors	1,600 tons	180 tons

Radioactive waste

Uranium is used as a nuclear fuel in nuclear reactors. It is a non-renewable resource. Plutonium is a waste product from nuclear reactors. It is used to make atomic bombs and sometimes as a nuclear fuel in nuclear reactors.

Calder Hall nuclear power station

Waste from nuclear reactors does not cause global warming. On the other hand, it is radioactive and harmful. It needs to be disposed of very carefully.

Disposal

Low-level radioactive waste, such as contaminated gloves, can be disposed of in landfill sites. Higher level waste, which may be dangerously radioactive, is more difficult to dispose of. It can be reprocessed to extract nuclear fuel or encased in glass and left deep underground.

Now try a Test Bite - foundation.

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Interactive role playing exercises

- ‘Quarry or Not’ example run by BGS for 17/18 year olds students.
- A 1 day role playing exercise.
- Students acting as different stakeholders in a simulated mineral planning process finishing with a planning inquiry.
- Approach has also been used for Masters students for radioactive waste.

https://www.youtube.com/watch?gl=GB&v=A3VBAE0UzaM&hl=en-GB

Courtesy: Getty Images

Courtesy: thinkstockphotos

Courtesy: Associated Press

Courtesy: stockclip.com

Fukushima: Successful Clean-up