

## **Japan's Nuclear Nightmare: Lessons for Malaysia**

by Dr. Ronald S. McCoy at a public forum on “Eleven Days After Japan’s Nuclear Fallout: Selangor’s Perspective,” organised by the Selangor state government on 22<sup>nd</sup> March 2011 at PJ Hilton.

### **Introduction**

For the past eleven days, Japan has been reeling from an unprecedented human disaster of awesome proportions. First, a record-breaking earthquake, 8.9 on the Richter scale, off the north-eastern coast of the Japanese island of Honshu. Then, a towering ten-metre tsunami which killed tens of thousands of people, destroyed almost everything in its path, and wrecked the cooling systems of a nuclear power plant.

The earthquake automatically shut-down the six nuclear reactors of the Fukushima Dai-Ichi nuclear power plant. But it also knocked out the power grid, forcing operators to use back-up generators to keep coolant flowing into hot reactor cores. Then the tsunami swept in, knocked out the generators, cut off power, and finally knocked out the plant’s cooling systems. All at once, four out of its six nuclear reactors were in dire trouble from overheating and in danger of emitting radioactive particles into the environment. Three reactors are threatening a meltdown and a fourth reactor’s spent fuel storage pool on fire and threatening to release deadly radiation into the environment.

Latest reports indicate that significant levels of radioactive iodine-131 have been detected in Tokyo’s tap water and caesium-137 in soil 40 km from Fukushima.

Radioactivity is the spontaneous emission of particles from the unstable nuclei of atoms, such as uranium. There are three main types of radioactivity, easily distinguished by their different penetrating powers. They are alpha, beta and gamma particles.

There are few environmental dangers more lasting or more fearsome than radiation from a nuclear accident. We have experienced such dangers at Three Mile Island and Chernobyl. The truth of Murphy’s Law has been revealed once again at Fukushima: “If something can go wrong, sooner or later it will go wrong.”

### **Beginning of the nuclear age**

The nuclear age began during the Second World War, when the twin terrors of nuclear weapons and nuclear energy were spawned by scientists working secretly on a military project. The Manhattan Project scientists succeeded in splitting the nucleus of the uranium atom, unlocking a secret of nuclear physics, and releasing the unimaginable power of nuclear energy lurking within. This nuclear energy was then used to prime the two atomic bombs which were dropped on Hiroshima and Nagasaki in August 1945. This indiscriminate, instant obliteration of the two cities was an unpunished war crime by the victors of the Second World War.

### **Nightmare at Fukushima**

Japan, the only country to have experienced nuclear warfare, now faces another nuclear nightmare. Months may pass before we can fully understand and learn from the Fukushima nuclear accident. It has rekindled fading memories of Chernobyl and shifted the balance in the debate on climate change and the risks and benefits of nuclear energy.

It is forcing many countries to review the safety of their nuclear facilities and their energy policies. Germany has responded to strong public anti-nuclear sentiment by reinstating and accelerating its nuclear phase-out policy, and

temporarily shutting down the oldest seven of its seventeen reactors. Both India and China, with their expanding economies and energy needs, are reviewing nuclear safety measures, but have not shelved plans to build more reactors in the next ten years. But there is a growing conviction worldwide that nuclear power should be phased out and a serious commitment made to invest in renewable energy, energy efficiency and energy conservation.

### **Malaysia's nuclear energy plans**

In Malaysia, the government's plan to build two 1,000 MW nuclear reactors continues. In responding to the Fukushima nuclear crisis, the minister of Energy, Green Technology and Water covered his back politically when he said that the decision to build two nuclear reactors will only be made after his colleagues in cabinet have evaluated a paper to be submitted by the new Malaysian Nuclear Power Corporation, a creature of the Economic Transformational Programme.

Questions are in order. Is it possible that the green minister believes that nuclear energy is green? Does the government not think that such a crucial issue as nuclear energy deserves a national debate? Does the government think that it can make a responsible, unilateral decision and then justify it by claiming that it has studied and accepted a report from the very company that will be a beneficiary? How does the government square this with the fact that Malaysia has a forty percent surplus energy supply and does not need nuclear power? Is the government unaware of this fact or is it beginning to believe its own propaganda and misinformation?

### **Public distrust**

The nuclear industry has carried the stamp of secrecy like a birthmark. From its very beginning, the nuclear industry has had a long history of cover-ups and downright deception, with the occasional lapse into silence - the silence of guilt. Public trust in the promoters of nuclear power is almost non-existent. In Britain, America, Germany, Russia, Japan and many other countries, people have not been told the truth about nuclear mishaps and near-misses.

The stricken Japanese population is well aware of the culture of nuclear cover-ups. The Tokyo Electric Power Company (TEPCO), Asia's biggest utility company, owns and operates the Fukushima Dai-Ichi nuclear power plant. In 2002, TEPCO's chairman and senior executives had to resign when the Japanese government discovered that they had covered up the existence of structural damage to reactors. In 2006, TEPCO admitted that it had been falsifying data about reactor coolant materials over a long period.

### **Vexing questions**

Radiation is invisible. In a nuclear crisis, there will be many questions about radiation. As the Japanese people are now discovering, it is a nightmare trying to make sense of the uncertainties.

- How do you know when you are in danger?
- How long will this danger persist?
- How can you reduce the danger to yourself and your family?
- What level of exposure is safe?

- How do you get access to vital information in time to prevent or minimise exposure?
- What are the potential health risks and consequences of exposure?
- Whose information can you rely on or trust?
- How do you rebuild a healthy way of life in the aftermath of a nuclear disaster?

These questions are difficult to answer, and they become even more complicated when governments and the nuclear industry maintain tight control of information, technological operations, scientific research, and the bio-medical lessons that shape public health response.

### **Transparency and accountability**

Transparency and accountability do not sit well with the nuclear industry. The filtering or, in effect, the censoring of information has been present from the beginning. It explains why there is no clear consensus on the local and global health consequences of Fukushima.

Immediately after the earthquake and tsunami, the Japanese government and TEPCO issued statements reporting minor damage to the Fukushima nuclear power plant. Later, government and industry officials reported “venting of hydrogen gas”, but asserted that there was “no threat to health.” When hydrogen gas explosions were announced, there were more reassurances of health safety.

In fact, the hydrogen gas released is tritium water vapour. Tritium, an isotope of hydrogen, is a low-emitter of radiation which can be absorbed into the body through breathing or by drinking contaminated water. Tritium decays by beta emission and has a radioactive half-life of about 13 years. Once tritium enters the body, it is uniformly disseminated and is excreted through urine within a month after ingestion. It is toxic and produces low-level radiation that could damage the kidney. As with all ionising radiation, exposure to tritium increases the risk of cancer.

The claim that exposure to low-level radiation does not pose a risk to health is a myth, generated by governments and the nuclear industry. During the nuclear arms race of the Cold War, scientific findings on health risks from nuclear fallout that contradicted the official narrative were censored. Scientists with integrity were discredited, punished or blacklisted. In 1994, the US Advisory Commission on Human Radiation Experimentation concluded that the literature on radiation and health during the Cold War was heavily sanitised and scripted to reassure and pacify public protests.

Decades of official censorship have reinforced the false core message: Human beings have evolved in a world where background radiation is present and is natural, and that any adverse health effect of radiation exposure is the occasional and accidental result of high levels of exposure.

There are other sources of conclusive data that allow a very different interpretation of the health hazards posed by a nuclear disaster. These are several declassified records of US and Soviet human radiation experiments, Atomic Bomb Casualty Commission records, long-term research on Chernobyl survivors, and proceedings of the Marshall Islands Nuclear Claim Tribunal. From these records, some important facts have emerged. For example, nuclear fallout and radioactive contamination of ocean and land ultimately enter the food chain and the human body, and therefore represent significant health risks. Chronic exposure to radiation does more than increase the risk of cancers. It threatens the immune system, exacerbates pre-existing conditions, affects fertility, increases the rate of birth defects, and can retard physical and mental development.

Japan's ongoing nuclear crisis demonstrates the degree to which the state prioritizes security interests over the fundamental rights of people and their environment. Similar to other government responses to catastrophic events, such as Chernobyl and Katrina, Japan's response to Fukushima has been to control the content and flow of information to prevent panic and the inevitable loss of trust in the government, reduce legal liability, and protect nuclear and other industry agendas.

It is more than likely that the Malaysian government will respond to a similar crisis in the same way. We still remember its disgraceful attempt to cover up the 1992 illegal and reprehensible dumping of radioactive thorium near Bukit Merah New Village by Mitsubishi's Asian Rare Earth company.

There are many lessons to be learnt from Fukushima, not least of which is how to respond, adjust, and adapt to dangers and health risks associated with radiation leaks. At all times, there must be strong public demand for transparency and accountability, which can only come from a government that truly believes in and genuinely secures the fundamental rights of its citizens and the rule of just law.

### **Misleading information**

Nuclear energy is not cheap. It is not clean. It is not safe. Just take the problem of nuclear waste, which remains radioactive for thousands of years. Plutonium has a half-life of 24,000 thousand years. There is absolutely no method of safe disposal. All over the world, lethal radioactive waste is accumulating in open casks in nuclear power plants. If medieval man had used nuclear energy, we today would still be burdened with managing his nuclear waste. This is not a legacy to leave future generations.

Yet, vested interests in the government and the nuclear industry are attempting to override common sense and reason. Nuclear power plants, like nuclear weapons, do not forgive mistakes of judgement, simple human negligence, mechanical error, or human error. Despite dire warnings, the Malaysian government continues to trumpet the virtues of nuclear energy and persists in its plans to build nuclear power plants, on the incredible argument that nuclear energy carries no risks and that no mistakes will be made. No one can guarantee that human error will not cause a nuclear accident in Malaysia, which has a suspect construction safety record and a poor maintenance culture.

The nuclear industry has a history of making misleading claims about nuclear safety that have often confused and misled the uninformed. Genuine debate and critical examination have been avoided, evidence ignored, opponents silenced or marginalized, and critical issues of public health and welfare have been answered with standard bland platitudes. Nuclear regulatory bodies have too often acted out of expediency and ignored the health and protection of the public.

### **Uncertain geological knowledge**

Nuclear power requires stability – political stability and geological stability. Countries considering the option of nuclear power need to soberly assess their plans, particularly if they are located in active volcanic regions.

But geological knowledge is incomplete and imperfect. And we rely on such knowledge too heavily when making policy decisions about locating hazardous technologies, such as nuclear power plants.

Nuclear power plants need geologically stable and physically secure environments in which to operate. And nuclear reactors need to be designed and built to withstand what is termed "design basis accidents". What happened at Fukushima was a "beyond design basis accident." The nuclear industry gauges its design basis accidents on "credible events," which are determined by an analysis of probabilities. The Fukushima disaster

happened because they got their analysis wrong. The “credible event” or the event that was “reasonably expected to occur” in Fukushima was gauged to be an earthquake of a magnitude no greater than 7.9 and a tsunami no higher than 6.7 metres. It was not anticipated that Fukushima would be struck by an 8.9 magnitude earthquake or a 10-metre high tsunami. But geologists, like all human beings, sometimes get it wrong and cannot always be accurate in their predictions.

So, if a nuclear reactor’s safety margin is based on specific predictions of geological phenomena, then there is a problem, because geologists are not always correct in their bounding assessments. In addition, there are a number of geological processes that come into Donald Rumsfeld’s category of “unknown unknowns.” Geologists, and therefore the nuclear industry, do not know what these geological processes are and therefore cannot make accurate predictions about so-called “credible events.” In other words, it’s very much a guessing game. Perhaps intelligent guessing, but nevertheless guessing!

Interestingly, the 6.3 magnitude Christchurch earthquake occurred on an unknown and unexposed geological fault. In fact, damaging earthquakes have been known to originate from unknown faults.

Malaysia has so far not been traumatized by earthquakes or tsunamis, although placed on the western margins of the Pacific Rim of Fire and close to earthquake prone Indonesia and the Philippines. So, the chances of an earthquake and a biblical tsunami occurring together in a Malaysian coastal area containing nuclear reactors are extremely low. But given geological unpredictability, one cannot completely rule out an earthquake or a tsunami.

## **Conclusion**

The Malaysian government has approached the crucially important issue of nuclear energy in its customary authoritarian manner. It smacks of a domineering, arrogant, undemocratic, corrupt government that has been in power for too long.

There has been no attempt to engage the people of this country in a balanced, rational, informed dialogue on a form of energy that could have the same life-threatening consequences of a nuclear accident which Japan now faces.

Going to the polls periodically is not democracy, when freedom of speech and freedom of the press are constrained and intimidated by arbitrary laws such the Printing Press Act and the Internal Security Act.

In the same way, funding of vested commercial and political interests in the local nuclear industry to disseminate misinformation about nuclear energy to captive audiences cannot be equated with public education about one of the most dangerous forms of energy.

Everything is being done to persuade the public that nuclear energy is good for the economy, the climate and the country. Malaysians must insist on their democratic right to an honest, comprehensive national debate and a national referendum on nuclear energy, with independent oversight. I call on the people of Malaysia to form a people’s coalition to mount a national campaign against the introduction of nuclear energy into Malaysia.

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*In addition to these, he is also a member of the Teoh Beng Hock Royal Comission Watch panel alongside Ambiga Sreenevasan, Dr.Azmi Sharom, Irene Fernandez, Toh Kin Woon, Wong Chin Huat and Yeo Yang Poh.*