Fukushima and Nuclear Power: Beyond the Headlines

By Utsav Gandhi
CAMPUS EDITOR

As engineers continue to work to stabilize the unfortunate situation at the Fukushima I Nuclear Power Plant in Japan, which suffered a string of failures, explosions, and radiation leaks following the earthquake and tsunami on March 11, people around the world are asking questions, raising concerns and discussing the safety of nuclear power. The IIT Armour College of Engineering and College of Science and Letters organized a forum this past Thursday, "Fukushima and Nuclear Power: Beyond the Headlines," in Wishnick Hall Room 113. At the forum, Vice President of the National Center for Food Safety and Technology (NCFST) Robert Brackett, Armour Dean Natacha DePaola, and CSL Dean Russell Betts were present, and Professor of Physics Christopher White delivered a presentation and discussion that provided much-needed information and background on the situation at Japan's nuclear plants, and nuclear power in general. Topics discussed included fission, radioactivity, radiation, health effects of radiation, and some basic nuclear engineering.

After the disaster, legitimate questions have been pouring in as to what the consequences are for many different industries. Unfortunately the media has reported information ranging in nature from misleading to downright incorrect. Professor White, who was in China, and living right on the coast next to the South China Sea while the earthquake happened and the tsunami warning was issued, started off his presentation with some basic information about what radiation is – basically, any energy that is transmitted as rays or waves. Using iClickers to gauge the audience's conceptions about what kind of awareness exists about harmful and harmless radiation, Professor White said exposure to radiation mostly does NOT make objects radioactive themselves, with some exceptions (after all, we use radiation to keep food safe and storable!). Explaining the concept of half-life, he said that though the I-131 isotope released from nuclear fission processes in Japan (which has an 8 day half-life, and is feared to cause thyroid cancer) has been released, a very large sample is required to actually pose any kind of threat if it enters the food chain. Most of the audience acceded via a poll that though they respect both beta and gamma radiation (which are most commonly released as fission by-products), they don't fear them – though some also said that they worry about unnecessary radiation that could affect them if they were to come in contact – which is a perfectly plausible concern to have. Professor White stressed that internal organs are much more sensitive than external muscles – but also that eliminating exposure is neither possible nor desirable. The concern in Japan currently is because due to the processes ongoing at the time of the earthquake, the fission processes haven't completely stopped – in fact, there are statistics to prove that even after a week, 4MW, or 4 million joules joules of energy per second, are being produced – which is getting the public worried.

Showing an extraordinary BBC online presentation titled 'Fukushima: Dealing with disaster,' Professor White then explained that due to the tsunami, the reactors got hot and there was no flow of water. The hydrogen gas produced went into the exterior building where it exploded due to increased pressure. As a desperate measure, on the 17th of March, helicopters were used to drop water. Despite these extreme measures, the US Department of Energy has said that we, as currently unexposed individuals, need to spend two complete weeks at the disaster site to reach the US DoE exposure limit. The plant is currently shut down, as one would expect, but there are concerns that an additional release of isotopes is possible. 4% of the US's food imports come from Japan, and this number will probably drastically reduce in the forthcoming months (although Hawaii and California have a larger demand). Multinational food companies are implementing their own food safety inspection techniques. The presentation concluded with a reiteration of the fact that the radiation released at the disaster site is not in levels high enough to cause any concern, and efforts are underway to ensure that legitimate concerns are pacified soon enough before a panic attack.

An aerial view shows the quake-damaged Fukushima nuclear power plant in the Japanese town of Futaba, Fukushima prefecture on March 12, 2011. (Photo credit: STR/AFP/Getty Images)