Asia-Pacific Research

Fukushima: Uranium and Plutonium Contamination of Large Areas of Oceans, Ground-water, Soils.

By Edmondo Burr

Asia-Pacific Research, March 29, 2015
Your News Wire

Scientists have raised concern over the rate of radioactive contamination of the Pacific, due to the Fukushima nuclear accident.

- Expert : Plutonium-241 from Fukushima nearly 70,000 times more than atomic bomb fallout in Japan.
- Officials : Molten fuel now 'particle-like', contains 'special' nuclear materials.
- Gov't Labs : Large areas of oceans contaminated by plutonium from events such as Fukushima; Build-up in biosphere expected; Considerable hazard to humans.

Energy News statement :

> Detection of long-lived plutonium isotopes in environmental samples by Accelerator Mass Spectrometry (AMS) — **Plutonium** isotopes 239Pu, 240Pu and 242Pu are anthropogenic radionuclides **emitted into the environment** by nuclear activities. Pu is accumulated in the human body and hence, **poses a considerable hazard to human health**. Due to the long half-lives, these isotopes are **present in the biosphere on large time scales** and a **build-up can be expected**. Therefore it is important to study the contamination pathway of Pu into the drinking water... a method to detect long-lived Pu isotopes by Accelerator Mass Spectrometry (AMS) is being developed. AMS requires only few milligrams of sample material... Consequently, more samples from different locations can be taken which is **essential when searching for locally increased Pu concentrations as in the Pacific Ocean after the Fukushima accident**... Samples from different locations in the Pacific Ocean and from the snow-hydrosphere are planned...

Statement by: *Taeko Shinonaga, head of Radioanalytical Laboratory at Helmholtz Zentrum Munchen (research institution founded jointly by Germany's Federal Ministry of Education & Research and Bavaria's Finance Ministry), scientists from Technische Universitat Munchen (Germany), Verhandlungen der Deutschen Physikalischen Gesellschaft 2013 meeting (emphasis added)*

Presentation by: Taeko Shinonaga, head of Helmholtz radioanalytical lab (pdf), Nov 2014:
Comparison of activity between [nuclear bomb testing] fallout Pu particle and Fukushima origin Pu particle:
Global Fallout Pu in Japan [GF]

> Pu240: 1,360 Bq
> Pu241: 645 Bq
> Total: 208,005 Bq

Fukushima Pu found in our study
> Pu240: 197,000 Bq [145 times GF]
> Pu241: 43,700,000 Bq [67,752 times GF]
> Total: 44,061,000 Bq [212 times GF]

Scientists from Lawrence Berkeley National Lab and Univ. of Notre Dame, 2014: Interstitial incorporation of plutonium into a low-dimensional potassium borate...

> [E]vents such as the catastrophe at the Fukushima Daiichi nuclear plant in Japan [have] resulted in the **contamination of large areas of oceans**, ground-water, soils, and sediments **by actinides, such as uranium and plutonium**... migration of actinides [is] an important environmental concern... Knowledge of the incorporation mechanisms of actinides into... natural materials is therefore required... for predicting the migration of radionuclides...

European Commission Joint Research Centre (pdf), 2014:

> [The Joint Research Centre] is studying emerging safety issues...examining mixed oxide (MOX) properties [and] preparing further severe accident studies on specific aspects of the Fukushima accident [such as] off-vessel fuel-concrete interactions... Japanese Atomic Energy Agency (JAEA) selected a JRC-developed method as one of the most suitable approaches to characterise [Fukushima's] molten fuel... This characterisation is an international obligation during the decommissioning phase, according to IAEA safeguards. Japanese researchers are now developing and optimising the methodology to quantify **special nuclear materials in particle-like debris of the molten reactor fuel**.

The original source of this article is Your News Wire

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