Comparison of Radioactive Fallout in the United States from the Fukushima and Chernobyl Accidents

Jason T. Harris, Ph.D.
Assistant Professor, Idaho State University, Department of Nuclear Engineering and Health Physics, and C0-Associate Director & Analytical Instrumentation Laboratory Lead at the Center for Advanced Energy Studies

On March 11, 2011, an earthquake and tsunami of unprecedented magnitude led to significant damage at the Fukushima Daiichi Nuclear Power Plant in Japan. This damage resulted in both controlled and uncontrolled releases of radioactivity from multiple reactors at the plant. These releases have been considerable enough to be detected in several locations throughout the world. Due to the significance of this event and the widespread release of radioactivity, the Fukushima accident is now being compared in several aspects to the Chernobyl accident that occurred in 1986.

In the United States (US) and several other countries, radioactivity was beginning to be detected within a few days after the start of the Fukushima accident. In particular, commercial nuclear power plants detected radioactivity in multiple sample types as part of their operational radiological environmental monitoring programs (REMP). This was similar to what was seen from the radioactivity released as a result of the Chernobyl accident.

The purpose of this presentation is to give and compare the radioactivity concentrations detected in the entire commercial US nuclear power plant REMP samples from the Fukushima fallout. In addition, these concentrations and levels are compared to what was detected, and when, by US commercial nuclear power plants from the Chernobyl accident. Data was compiled and analyzed from all 104 US nuclear power plants in a variety of sample media types including air samples (particulates and iodines), drinking water, vegetation, food items, and milk. The Fukushima and Chernobyl sample data timeframes were 15/3/2011 to 14/4/2011 and 10/5/1986 to 25/6/1986, respectively. The principle radionuclides detected from both accidents included I-131, Cs-134, and Cs-137. Both the I-131 and Cs-134/137 radioactivity concentrations were roughly one order of magnitude less in the Fukushima samples.

Bio Sketch

Present

Assistant Professor of Health Physics and Nuclear Engineering at Idaho State University (research in nuclear power occupational and public dose and environmental studies, accelerator applications and radiation detection and measurement)
Director, ISU Environmental Monitoring Laboratory; Associate Director, Analytical Instrumentation Laboratory Lead, and Nuclear Science and Engineering Initiative Lead for the Center for Advanced Energy Studies (CAES); Senior consultant for the North American Technical Center (nuclear power plant radiation protection and environmental studies).

**Education**

Ph.D. in Health Physics from Purdue University

M.S. in Nuclear Engineering from the University of Illinois at Urbana-Champaign

B.S. in Biology and Chemistry from the University of Tampa

**Recent previous experience**

Research fellow, Los Alamos National Lab (radiation dosimetry and luminescence dating).

Research Scientist, Clean Energy technologies, Inc. (nuclear waste amelioration, fuel cell development and retrospective dosimetry).

Instructor of Health Physics at Purdue University

**Recent professional service**