No fatalities have yet been directly linked to the March 2011 Fukushima Dai-Ichi nuclear power plant incident (UNSCEAR, 2013; WHO, 2013). Nevertheless, the news of the tsunami-crippled nuclear power plant has dwarfed stories of the thousands killed and displaced by the magnitude 9.0 (Mw) earthquake and its aftermath. Even so, the Fukushima Dai-ichi nuclear power plant’s multiple reactor meltdowns and radionuclide releases are second only to the Chernobyl disaster in severity if we ignore atmospheric tests during the nuclear arms race.

Fukushima Accident, by Povinec, Hirose, and Aoyama, provides an overview of the accident as it unfolded reactor by reactor. They lay out a timeline of each hydrogen explosion and subsequent radionuclide release together with sample data and models of the paths the radionuclides took through the atmosphere and oceans. Their analysis culminates with an assessment of the probable impacts to the environment (including flora, fauna, and food), and an estimate of dose to people from near the plant and those half-a-world away. In addition, Fukushima radionuclide releases are compared to those of other point sources like Chernobyl, Sellafield, and La Hague and the huge releases before the atmospheric nuclear test ban. Lastly, the authors project the impacts of radionuclides released from Fukushima to a time when they, due to decay and dilution, will not be resolvable from the nuclear atmospheric test background. Generally, this text can be a resource to look up research and references in a variety of topics. The extensive information provides useful lessons that justify the upgrading or replacing of older plants with safer, more efficient designs and improving the approaches used for emergency response and recovery.

The breadth of information in the book is substantial; although it must be noted that the responses of the Japanese government and Tokyo Electric Power Company are beyond its scope. Additionally, there are deficiencies with how the information has been presented. In many cases there was considerable redundancy where text was taken verbatim from prior sections. Furthermore, much of the text would have been easier to digest had it been put into table or list format. For example much of Chapter 5, Fukushima Radioactivity Impact, reads as a laundry list of information and references which detracts from the overarching story. Lastly, many of the figures were unannotated leaving the meaning of symbols unclear.

Overall, the authors have put together a comprehensive text that can be used as a reference for the event. For example, if you want an idea of the apparent half-life of $^{131}$I in grass near the plant (which may have been ingested by livestock), the book has information and citations to explore further. The authors appear to have been even-handed in their treatment of the data, which is good for an event that has had many political implications. This book would be useful to a wide range of researchers who want to look up diverse facts on when Fukushima events occurred, of the amount and nature of particular nuclides released, and what their impacts were to the surroundings. For curious parties with particular inquiries, this book is a resource to begin seeking answers.

Review of this book is not intended to imply recommendation or endorsement by the National Institute of Standards and Technology.

References


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