The Accident at TEPCO’s Fukushima-Daiichi Nuclear Power Plant: Technical Description of What Happened and Lessons Learned for the Future
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Tsunami that followed M9.0 earthquake on March 11th left the Fukushima-Daiichi Nuclear Power Plants without power and heat sink. While water makeup continued by AC-independent systems to keep the fuel core covered by coolant, operating team tried to depressurize and enable low pressure injection to the reactor to avoid overheating but was not successful enough primarily due to limited available resources. This resulted in core melt, hydrogen explosion and release of radioactivity to the environment. Key lessons learned are: 1) safety regulation and safety culture, 2) workable/executable severe accident management procedure, 3) crisis management and 4) design. Implications on security include revealed vulnerability and the nexus of safety and security. Given the scale of damage to the environmental, attention must be paid to defense against it and to societal safety goal of nuclear power by considering offsite remedial costs, compensation to damage, energy replacement cost etc. A sort of root cause analysis first by asking “Why nuclear community failed to prevent this accident?” was initiated by the University of Tokyo.