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Multi-hazards such as natural hazards (floods, earthquakes, severe storms and wildfires) or manmade disasters (nuclear disaster, oil spills, and terrorist attacks) lead to substantial damage on critical infrastructures and communities and have social, economic and environmental consequences. The immediate impacts on multi-hazards include loss of human life and damage to infrastructures. Multi-hazard mitigation for nuclear power plants forms a vital input in disaster management, the design of development strategies and emergency response forecasting. In this lecture, we will present how to develop a robust and cost-effective real-time carbon nanofiber aggregate (CNFA) sensor system that can be embedded at nuclear power plants for damage detection during events such as earthquakes, nuclear disasters, and missile attacks, and for water level monitoring in nuclear power plants during flooding. A real-time multi-hazard alert software system will also be developed to monitor the