

NuScale Plant Electromagnetic Pulse Resilience in Reducing the Threat of a ‘Very Bad Day’

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Abstract:

Varied outlooks exist on the severity of societal consequences in the event of a long-term interruption of electricity (months to years) over large geographic regions. Causes of such outages may include nuclear EMP, solar geomagnetic disturbances, cyber, and coordinated physical attacks, which represent arguably the largest-scale common cause failure events affecting electric power grid operations. Nuclear plants that can operate through or rapidly restart can enable near-continuous power to avert social unrest and prevent long-term cascading failures. This talk highlights a recent study of the NuScale plant resiliency to an electromagnetic pulse (EMP) and explores the role of a resilient nuclear plant (rNPP) in enhancing the nation’s critical infrastructure resilience. The various electromagnetic pulse environments will be discussed along with a systems-level analysis of EMP coupling at a notional NuScale plant site. This evaluation led to recommendations that provide NuScale three operational preparedness levels to mitigate the EMP threat, with the highest level of preparedness allowing the plant to *operate through* an EMP. This survivable power source, with continuous fuel supplies, is further considered as a national strategic asset to blackstart the grid, sustain emergency life-support services, and reconstitute local, state, and national infrastructures.

Bio:

Camille Palmer is an associate professor in the School of Nuclear Science and Engineering at Oregon State University. Her professional interests emphasize international nuclear security and nonproliferation where she enjoys interdisciplinary collaborations, such as those with faculty in robotics and public policy. Prior to academics, she was a staff member in the Thermonuclear Applications and Foreign and Improvised Nuclear Design groups at Los Alamos National Lab. She has also supported the nuclear survivability of the Minuteman III delivery systems as an engineer with Northrop Grumman Corporation. Dr. Palmer holds a Ph.D. in nuclear and radiological engineering from the University of Cincinnati.