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General Comment

I, Eric Holdeman, hereby submit comments to the Nuclear Regulatory Commission (Commission), per Docket NRC-2012-0068.

The Proposed Rule is inadequate and needs to be modified as follows:
A. An 'All-Hazard Approach' is needed for emergency planning in the Proposed Rule. B At least five (5) hazards having the potential of national or continent wide catastrophic impacts are not addressed in the Proposed Rule hazard list that only focuses on hazards impacting local areas vs nationwide impacts. Thus, claiming to provide for 'out-of-impact-area' fuel and services to support licensed facilities experiencing a beyond-design-bases (BDB) external event (BDBEE).

Five (5) hazards, including extreme solar storms (aka space weather and solar-geomagnetic disturbances) ("solar storms") are not addressed in the Proposed Rule but have been identified by federal and science entities as having the potential for national and even continent wide long-term electric power outages (at least for the 48 contiguous States- so that out-of-impact-areas regarding these hazards are not expected to exist, unless efforts in particular areas were made to adequately mitigate against these hazards. These 5 hazards are:
1. Extreme solar storms
2. Coordinated physical attack on a few critical electric grid substations; e.g. the Federal Energy Regulatory Commission found attack on 9 select substations potentially causing an 18 month national power outage.
3. Coordinated high-power microwave devices to attack same targets as in #2 and also has the potential of

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S. Philpott (SXP7)
E. Bloom (EBB1)

directly sending strong damaging electric currents into electrical circuits in supervisory control and data acquisition (SCADA) devices and computer components, e.g. as in nuclear facility control centers and control process points, potentially rendering such devices and computers to be non-functional. Targeting can occur about half a mile from a facility or more depending on signal power and by targeting distant wires leading into facility electrical components.
4. Coordinated cyber technology to attack same targets as in #2
5. High-altitude electromagnetic pulse (EMP) nuclear detonation

The National Science and Technology Council (NSTC), chaired by President Obama, reported (2015) its National Space Weather Strategy" referring to solar storms and the other 4 above hazards stating, "The primary risk from an extreme space-weather event is the potential for the long-term loss of electric power and the cascading effects that it would have on other critical infrastructure sectors. Other high-impact events are also capable of causing long-term regional or national power outages." [emphasis added] Also, the Executive Order 13744 on October 13, 2016, titled "Coordinating Efforts To Prepare the Nation for Space Weather Events", reports "Extreme space weather eventsthose that could significantly degrade critical infrastructurecould disable large portions of the electrical power grid, resulting in cascading failures that would affect key services such as water supply, healthcare, and transportation. Space weather has the potential to simultaneously affect and disrupt health and safety across entire continents." [Sec. 1]. [emphasis added].

This Order requires, "The heads of all agencies that support National Essential Functions, defined by Presidential Policy Directive 40 (PPD-40) of July 15, 2016 (National Continuity Policy), shall ensure that space weather events are adequately addressed in their all-hazards preparedness planning, including mitigation, response, and recovery, as directed by PPD-8 of March 30, 2011, (National Preparedness)." I understand this is relevant to the Commission being required to address this Order, taking into account that all of the United States may be impacted by the potential of a long-term power outage - so 'out-of-impact-area' off-site sources of fuel and other back-up supplies should not be expected - and so Phase 3 of the Commission's proposed rule that expects the existence of off-site fuel sources is not relevant to hazard planning for such hazards with potentially national impact of long-term power outages.

Instead, the Commission should follow the lead of the Defense Threat Reduction Agency (DTRA) within the Department of Defense (DOD). It issued DTRA152 that contains RFP152-006, to create Island-mode Enhancement Strategies and Methodologies for Defense Critical Infrastructure, including through pilots. http://www.acq.osd.mil/osbp/sbir/solicitations/sbir20152/dtra152.pdf

Thus, the Commission must fulfill its statutory obligations to protect public safety and welfare and economic prosperity by recognizing and reporting that its Phase 3 expectation of ensuring long-term electric power from off-site fuel sources in the event of the 5 hazards discussed above is both not a reliable plan, nor is it cost effective, that much more economical and reliable sources of long-term electric power are possible. Full comments are attached.

Attachments

Eric H v2

I, Eric Holdeman, hereby submit comments to the Nuclear Regulatory Commission (Commission), per Docket NRC-2012-0068, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, Interim Staff Guidance, Draft Revision 2 (Proposed Rule).

The Proposed Rule is inadequate and needs to be modified as follows:
A. An 'All-Hazard Approach' is needed for emergency planning in the Proposed Rule. B
At least five (5) hazards having the potential of national or continent wide catastrophic impacts are not addressed in the Proposed Rule hazard list that only focuses on hazards impacting local areas vs nationwide impacts. Thus, claiming to provide for 'out-of-impact-area' fuel and services to support licensed facilities experiencing a beyond-design-bases (BDB) external event (BDBEE). For example, during Hurricane Katrina or Sandy, much of the United States was 'out-of-impact-area' so that fuel and supplies could be provided to the impacted areas.

Five (5) hazards, including extreme solar storms (aka space weather and solar-geomagnetic disturbances) ("solar storms") are not addressed in the Proposed Rule but have been identified by federal and science entities as having the potential for national and even continent wide long-term electric power outages (at least for the 48 contiguous States- so that out-of-impact-areas regarding these hazards **are not expected to exist**, unless efforts in particular areas were made to adequately mitigate against these hazards. These 5 hazards are:

1. Extreme solar storms
2. Coordinated physical attack on a few critical electric grid substations; e.g. the Federal Energy Regulatory Commission found attack on 9 select substations potentially causing an 18 month national power outage.
3. Coordinated high-power microwave devices to attack same targets as in #2 and also has the potential of directly sending strong damaging electric currents into electrical circuits in supervisory control and data acquisition (SCADA) devices and computer components, e.g. as in nuclear facility control centers and control process points, potentially rendering such devices and computers to be non-functional. Targeting can occur about half a mile from a facility or more depending on signal power and by targeting distant wires leading into facility electrical components.
4. Coordinated cyber technology to attack same targets as in #2
5. High-altitude electromagnetic pulse (EMP) nuclear detonation which also has the damage potential in #3, but simultaneously up to over all 48 contiguous States.

The National Science and Technology Council (NSTC), chaired by President Obama, reported (2015) its National Space Weather Strategy" referring to solar storms and the other 4 above hazards stating, *"The primary risk from an extreme space-weather event is the potential for the long-term loss of electric power and the cascading effects that it would have on other critical infrastructure sectors.* ***Other high-impact events are also capable of causing long-term*** *regional or* ***national*** *power outages."* [emphasis added] Also, the Executive Order 13744 on October 13, 2016, titled "Coordinating Efforts To Prepare the Nation for Space Weather Events", reports "*Extreme space weather events—those that could significantly degrade critical infrastructure—could disable large portions of the electrical power grid, resulting in cascading*

failures that would affect key services such as water supply, healthcare, and ***transportation.*** *Space weather has the potential to simultaneously affect and disrupt health and safety* ***across entire continents.*** *"* [Sec. 1]. [emphasis added].

This Order requires, *"The heads of all agencies that support National Essential Functions, defined by Presidential Policy Directive 40 (PPD–40) of July 15, 2016 (National Continuity Policy), shall ensure that space weather events are adequately addressed in their all-hazards preparedness planning, including mitigation, response, and recovery, as directed by PPD–8 of March 30, 2011, (National Preparedness)."* So I understand this is relevant to the Commission being required to address this Order, taking into account that all of the United States may be impacted by the potential of a long-term power outage - so 'out-of-impact-area' off-site sources of fuel and other back-up supplies should not be expected – and so Phase 3 of the Commission's proposed rule that expects the existence of off-site fuel sources is not relevant to hazard planning for such hazards with potentially national impact of long-term power outages. Thus, the Commission's proposed rule needs to be modified by giving guidance on the non-relevance of its Phase 3 to the 5 hazards above that have the potential to cause national long-term power-outages.

Instead, the Commission should follow the lead of the Defense Threat Reduction Agency (DTRA) within the Department of Defense (DOD). It issued DTRA152 that contains RFP152-006, to create Island-mode Enhancement Strategies and Methodologies for Defense Critical Infrastructure, including through pilots.
http://www.acq.osd.mil/osbp/sbir/solicitations/sbir20152/dtra152.pdf
Mr. Charles Manto, who is one of this RFP's awardees submitted a comment to the Commission in which he reports, "*70 technology innovations in electromagnetic shielding methods, energy generation, energy storage, energy savings, energy controls and communications that would make it possible to provide EM protected microgrids offering energy generation and energy storage systems so that nuclear power plant safety could be maintained without any outside resources such as fuel oil. Those same locally sourced microgrids could supply the entire amount needed for black start generation. Pathways to loads could be similarly supported so that loads could also be maintained.*"

Thus, the Commission must fulfill its statutory obligations to protect public safety and welfare and economic prosperity by recognizing and reporting that its Phase 3 expectation of ensuring long-term electric power from off-site fuel sources in the event of the 5 hazards discussed above is both not a reliable plan, nor is it cost effective, given the report of Mr. Manto, that much more economical and reliable sources of long-term electric power are best provided by on-site renewable or other long-term electric power options – such as the important support the Commission is giving to advancing the use of small module reactors (SMRs) which the Commission reports "could be used for generating electricity in isolated areas", such at licensee site that have lost electric power." http://www.nrc.gov/reactors/advanced.html. Please contact DTRA to learn more about the options, so the Commission can best advise its licensees, for now, on a case-by-case basis how to be compliant with its Order EA-12-049 to mitigate its licensee facilities from hazards, including the 5 hazards noted above that can have nationwide

impacts, by issuing guidance on establishing on-site, economical cost-saving power sources and making its facilities resilient against the direct damage from EMP that otherwise can directly destroy electronic control systems that maintain the safety of Commission licensed facilities.