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Emergency Preparedness Requirements for Small Modular Reactors and Other New Technologies

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Submitter Information

Name: Thomas Mc Kenna
Address:
Auhofstrasse 28
St. Andrae Woerdern, Austria, 3423
Email: iaeamckenna@hotmail.com
Submitter's Representative: none

General Comment

Protective actions for the public taken in accordance with these proposed requirements and guidance in the event of the even the most severe emergencies could result in far more deaths than would have occurred due to radiation exposure even if no protective actions were taken.

Fukushima nuclear power plant NPP accident, US hurricane experience and subsequent analysis indicates that evacuation or sheltering in the event of a General Emergency (core damage accident) at a large NPP could result in far more deaths, as a consequence of those protective actions, than could have resulted from radiation exposure. This disparity would most likely be greater for small modular reactors (SMRs) and other new technologies (ONTs),

such as non-light-water reactors (non-LWRs) and certain non-power production or utilization facilities (NPUFs).

Furthermore protective actions taken following EPA Protective Action Guides (PAGs) (e.g. evacuations at 10 mSv) may cause 24 to 600 times more excess deaths among the general public and 30 to 750 times more excess deaths among residents of facilities for long stays and the elderly than the excess radiation-induced deaths prevented by the protective actions.

A fundamental principle of radiation protection according to the National Council on Radiation Protection and Measurements (NCRP) and International Commission on Radiological Protection (ICRP) is justification. Justification is defined as Any decision that alters the radiation exposure situation should do more good than harm (ICRP). These proposed requirements, supporting analysis and guidance were developed without considering this fundamental principle.

Under Title 10 of the Code of Federal Regulations an operating license for a NPP requires that a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. Obviously protective measures would only be considered adequate if they do more good than harm in terms of public health and safety consistent with the NRC Mission.

Therefore I recommend these amendments to the requirement, guidance, and supporting analysis need to be revised to ensure adequate protective measures is interpreted to mean taking protective actions that do more good than harm, considering both the health hazards of radiation exposure and the health hazards of protective actions taken to reduce that exposure.

For a further discussion of this issue see my June 1, 2020 Petition for Rulemaking to ensure that the response to protect the public in the event of a General Emergency at a nuclear power plant (NPP) does more good than harm which can be accessed at https://www.regulations.gov, by searching on Docket ID NRC-2020-0155 and then downloading Incoming Petition for Rulemaking - PRM-50-123.