

Order 420.1B *Facility Safety* Natural Phenomena Hazard Requirements



Office of the Chief of Nuclear Safety



Why NPH

- Importance recognized through DOE's DSA development process.
- Significant events local and worldwide have helped to shape and refine our understanding.
- DOE has had its share of significant problems with some major construction projects.

O 420.1B Chapter IV: NPH Mitigation

- This chapter of the Order applies to all DOE facilities and sites (nuclear and non-nuclear) with only limited exceptions.



O 420.1B Chapter IV Requirement

“DOE facilities and operations must be analyzed to ensure that SSCs and personnel will be able to perform their intended safety functions effectively under the effects of NPH.”



During NPH Events SSCs to ensure

- Confinement of hazardous materials
- Protection of workers and the public
- Continued operation of essential facilities
- Protection of government property





Facility Design Requirements

- Consider potential damage to SSCs from both direct and indirect NPH events.
- Consider common cause failures and interaction effects from failures of other SSCs.
- Any facility modifications must not degrade SSC performance during NPH events.



NPH Assessment Requirements

- Consider all potential NPH.
- Perform assessment using graded approach appropriate for facility hazards.
- Basic steps:
 - Estimate annual frequencies at which hazards exceed a certain magnitude.
 - More important SSCs must be designed to withstand lower frequency NPH events (e.g., 10^{-3} or 10^{-4} annual frequency of exceedance).

NPH Assessment Reviews

- “NPH assessments must be reviewed and upgraded as necessary for existing site/facilities following significant changes in NPH assessment methodology or site-specific information.”





Ten-Year Updates

- “An NPH assessment review must be conducted at least every 10 years and must include recommendations to DOE for updating the existing assessments based on significant changes found in methods or data.”
- “If no change is warranted from the earlier assessment, then this only needs to be documented.”

Keep In Mind...

- A 10-year review does not mean NPH must be re-assessed every 10 years.
- These reviews should not be burdensome, although seismic reviews can be challenging.





What Can FRs/SSOs Do?

- Ask about NPH assessments, particularly seismic, their vintage, and any 10-year reviews.
- How thorough are the 10-year reviews, and are the reviewers qualified to perform such reviews?
- Did the contractor make recommendations to DOE on the need for assessment updates?

Order 420.1C is Coming...

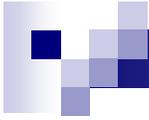
- A significant revision to O 420.1 is currently in RevCom. The Chapter IV NPH requirements have some wording changes, but their intent is essentially unchanged.





Available Resources

- In 2007, CNS established a Seismic Lessons Learned Panel to share lessons across DOE projects.
- The panel advises DOE on seismic hazard characterization and design issues affecting DOE nuclear facilities.
- Composed of 7 internationally recognized experts with vast experience on DOE and commercial nuclear projects.



Holy Cow!
What
happened?