

# Implementation of DOE NPH Requirements at the Thomas Jefferson National Accelerator Facility (TJNAF), a Non-Nuclear DOE Lab

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# Background



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# Dominant NPH

- Bldg designed for:
  - ground snow load, 15 psi
  - Wind loads, 110 MPH, Exposure B
- Not designed for: Waterspouts moving inland, large sea animal projectiles
  - 95% of White Shark = 6900 lbs @ 301 mph (max EF5)



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# Non Nuclear Design Requirements

Design rqs: section 3.a, 3.b, 3.c (420.1C ch. IV)

- 3.b “[*Design*] Requirements for non-nuclear facilities are described in Section 2.1 of DOE-STD-1020-2012.”

Section 2.1 of DOE-STD-1020-2012

- Use ASCE/SEI 7 **if** NDC < 3 (via section 2.1.5)

## Non-nuc Design Rqs (cont.): Are we NDC < 3 ?

DOE STD-1189, *Integration Of Safety Into The Design Process*

- Rad: Table A-1 of Appendix A
  - << 5 Rem @ 100 meters
  - SDC-1, thus NDC-1
- Chem: Appendix B “... *sense of scale* ...”, S.S.
  - Worker (collocated) < PAC-3;
  - Public < PAC-2
  - < S.S. equiv., thus SDC-1 & NDC-1



## Non-nuc Design Rqs (cont.):

IBC invokes ASCE/SEI 7 (wind, seismic, snow loading, etc)

TJNAF always builds to IBC, so

- DOE-STD-1020-2012 is met; thus,
- 420.1C NPH design Rqs are met

**Conclusion:** Order's NPH Design Rqs applicable, but no action required

# Rqs for NPH Assessments & Upgrade Evaluations

Section 3.d(1) and 3.d(2) of 420.1C ch. IV (**current rev**)

- “section 9.2 of DOE-STD-1020-2012 contains criteria and guidance for performing these reviews [NPH assessments].”
- “Section 9.3 of DOE-STD-1020-2012 contains guidance on performing upgrade evaluations.”

STD-1020, section 9 (inclusive of 9.2 & 9.3)

- If < NPH Design Category 3, go to section 2.1.4.

## NPH Assessments & Upgrade Evaluations (cont.)

Section 2.1.4 of STD-1020

- follow ICSSC RP-8 (to comply with PL 101-614 & EO 12941)

Blanket exemption, section 1.3.a of RP-8

- $S_{DS} < 0.167 \text{ g}$  and  $S_{D1} < 0.067 \text{ g}$

TJNAF too high, #'s won't work

## NPH Assessments & Upgrade Evaluations (cont.)

10 exemption criteria, RP-8

- incidental human occupancy, < 3000 sq ft.  
single story, scheduled for D&D, more

Section 1.3.b, “ ... exempt ... All buildings located where  $S_{DS} < 0.330 g$  and  $S_{D1} < 0.133 g$  unless designated for an occupancy-based performance objective.”

## NPH Assessments & Upgrade Evaluations (cont.)

TJNAF: Soil Site Class D,  $S_{DS} = 0.137$  and  $S_{D1} = 0.08$ .

- The #'s work!

Do we have a *occupancy-based performance objective*?

- assigned by each agency at their discretion.
- more stringent than Life Safety performance
- necessary to control damage to maintain function in the post-earthquake period. (think MEF/PMEFS)
- “essential” facilities, such as fire, rescue, police stations, hospitals, etc.
- **None at TJNAF!**

## NPH Assessments & Upgrade Evaluations (cont.)

Because TJNAF meets the ICSSC exemption criteria

- NPH standards of EO 12941 are not applicable; which means
- DOE-1020-2012, section 2.1.4 NPH review & upgrade criteria for non-nuclear facilities do not apply; thus
- Sections 3.d(1) and 3.d(2) of DOE O 420.1C are not applicable

## Odds and Ends

### Order Section 3.e (Seismic Detection)

- met via access to nearby monitoring at Fredericksburg, VA.

### Order Section 3.f (Post-NPH Procedures)

- met via severe weather inspection procedures, e.g., Management Disaster Recovery Plan, etc.



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