



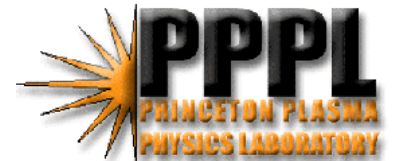
# NSTX Nuclear Facility Hazard Classification -Presently and Post Upgrades-



NSTX ACC Presentation to the PPPL ES&H Executive Safety Board

L. Dietrich, C. Gentile, H. Kugel, J. Lacenere, J. Levine, G. Pitonak, A. vonHalle

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# Outline

- ◆ Regulatory Requirements
- ◆ Nuclear Facility Hazard Classification Criteria
- ◆ Results of Analysis
- ◆ External Evaluation
- ◆ Conclusions

# Regulatory Requirements

- ◆ 10 CFR 830 subpart B, Safety Basis Requirements
  - Defines nuclear facility hazard classification categories (nuclear hazard categories 1,2, and 3).
  
  - If below hazard classification 3, then 10 CFR 830 subpart B does not apply.
  
- ◆ DOE-STD-1027, Hazard Categorization Standard
  - Sets requirements based on quantities of nuclear materials in site inventory.
  
  - Inventory quantities used to determine nuclear hazard classification in accordance with the requirements of 10 CFR 830 subpart B.

# Nuclear Facility Hazard Classification Criteria

- ◆ Hazard Category 1 - Nuclear Facilities which can have potential for a significant off-site consequence ( i.e. > 20 MW(t) ).
- ◆ Hazard Category 2 - Nuclear Facilities which can have potential for significant on-site consequence and have inventories that meet the threshold values of DOE-STD-1027.
- ◆ Hazard Category 3 - Nuclear Facilities which can have potential for significant localized consequence and have inventories that meet the threshold values of DOE-STD-1027 ( TFTR like devices ).
- ◆ Radiological Facilities ( PPPL) have nuclear inventories < Hazard Category 3. Are not subjected to 10 CFR 830 subpart B requirements for Safety Analysis Documentation. Are not subjected to potential Price Anderson Act violations associated with 10 CFR 830 subpart B non-compliance issues.

# Results of Analysis

- ◆ Bounding Condition(s) : PPPL (viewed) and analyzed as a single compartment model. All site nuclear materials : nuclear sources, prompt activation, tritium, used (tabulated) in making determination of NSTX and site category. Currently NSTX (and PPPL) are categorized as a “Below Category 3 Nuclear Facility”. Thus in our case 10 CFR 830 subpart B does not apply.
- ◆ Analysis of NSTX post upgrades, employing current site nuclear inventory values, show that NSTX, as well as PPPL, will remain a “below Category 3 Nuclear Facility”. Assumes that NSTX will be limited to  $4 \times 10^{18}$  DD neutrons / year and the site inventory (non-NSTX radionuclide inventory will remain at the current levels). Post upgrade site will be ~ 0.35 below the threshold for cat. 3 nuclear facility. Full analysis in “Assessment of Applicability of 10 CFR 830 subpart B to NSTX Planned Upgrades” report dated July 7, 2009. J. Levine, J. Menard, et al.
- ◆ If site wide nuclear inventory changes (new machine, new sources) classification could change. In this case the site could be analyzed as a multiple compartment model, similar to what was done at PPPL during TFTR D-T operations.

# External Evaluation (DOE HQ) For Current Conditions

- ◆ External review by DOE HQ (Carol L. Sohn) has recently evaluated the the current condition of the PPPL site for nuclear facility hazard classification, and has determined in a report dated July 8, 2009 that ;
  - \* “PPPL has put into place a robust system to ensure that facilities remain below the DOE-STD-1027 threshold quantities”.
  - “PPPL is a below category 3 nuclear facility”.
- \* some DOE sites have moved into a category 3 nuclear facility classification without knowing it. PPPL site controls are in place to ensure that this not occur here.

# Conclusion

- ◆ Technical analysis shows that with the inclusion of a second NB and new CS, NSTX ( as well as PPPL) will continue to remain a “below Hazard Category 3” Facility. NSTX Safety Certificate post upgrades will limit D-D neutron production to  $4 \times 10^{18}$  n / year.
- ◆ 10 CFR 830 subpart B will not apply to the NSTX upgrades or to the current PPPL (radiological) configuration.
- ◆ The PPPL site will continue to be a “Radiological Facility” post the upgrades (assuming no new D-D or D-T devices or large sources are installed at the site).
- ◆ If new capability / assets are added to the site, re-evaluation of site conditions applicable to DOE-STD-1027 and 10 CFR 830 subpart B will need to be addressed.
- ◆ A documentation package evaluating this issue will be filed in the PPPL Operations Center and available for the CD-1 review.