



FNP NFPA 805 LAR Submittal Overview

March 19-21, 2013

Nuclear Safety Capability Assessment

Summary

- NSCA Methodology & Development
- Governing Criteria
- Fault Tree Implementation
- Computer-Based Analysis Process
- Compliance Strategies & VFDR Identification
- Table B-3 Developments
- Fire Risk Evaluations
 - Recovery Actions
 - Defense-in-Depth

NSCA Methodology

- Performed IAW governing documents and project instructions
- Strict and formal analysis conventions
- Emphasis on consistency and standardization
- Analysis driven by Function States, not just equip ID
- Appendix R analysis used as basis
- Integration of graphical analysis tools (ARCPPlus)

NSCA Development

- NSCA model based on NFPA 805 performance criteria implemented via CAFTA fault tree
- Detailed development and mapping of vital auxiliaries
 - Clearly defined support system impacts
 - Automatic generation of cascading power supply impacts
- **Safe and Stable**
 - Encompasses Modes 1-3
 - Long-term Mode 3 capability addressed
- **Incorporated Off-site Power**

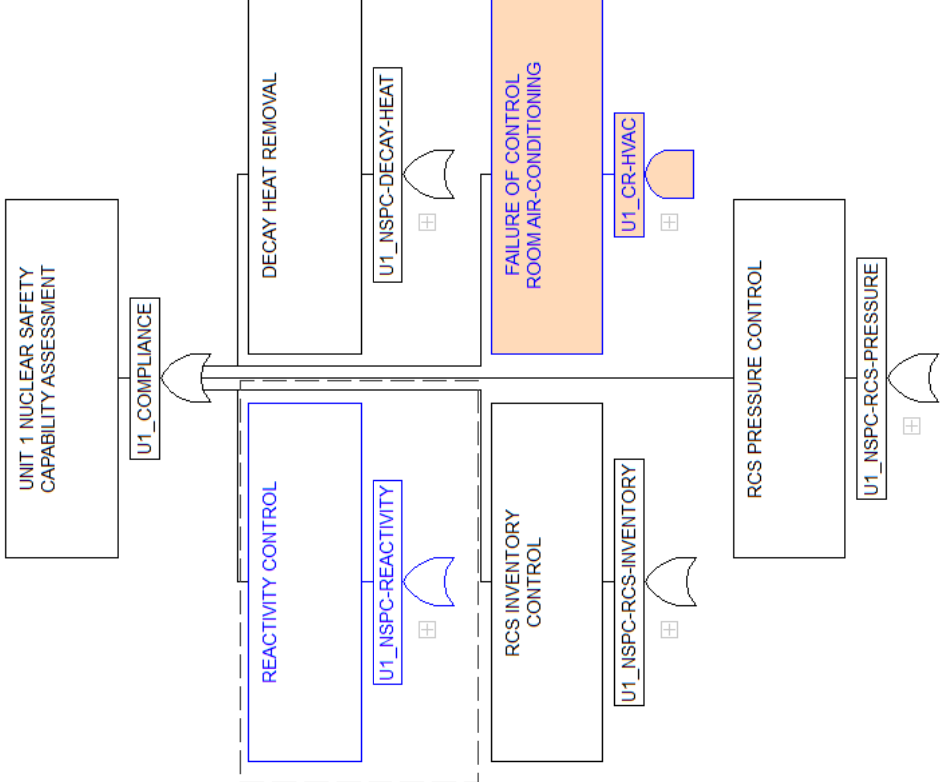
Governing Criteria

- NEI 00-01, Rev.1
 - Initial Work to Rev.1
 - Gap analysis performed to Rev. 2 (per Generic RAI 10 and RG 1.205)
 - MSO to Rev. 2/3
- NFPA 805
- Applicable FAQs
 - FAQ 07-0030 FAQ 07-0038 FAQ 09-0057
 - FAQ 08-0054 FAQ 07-0039
- NEI 04-02, Rev. 2

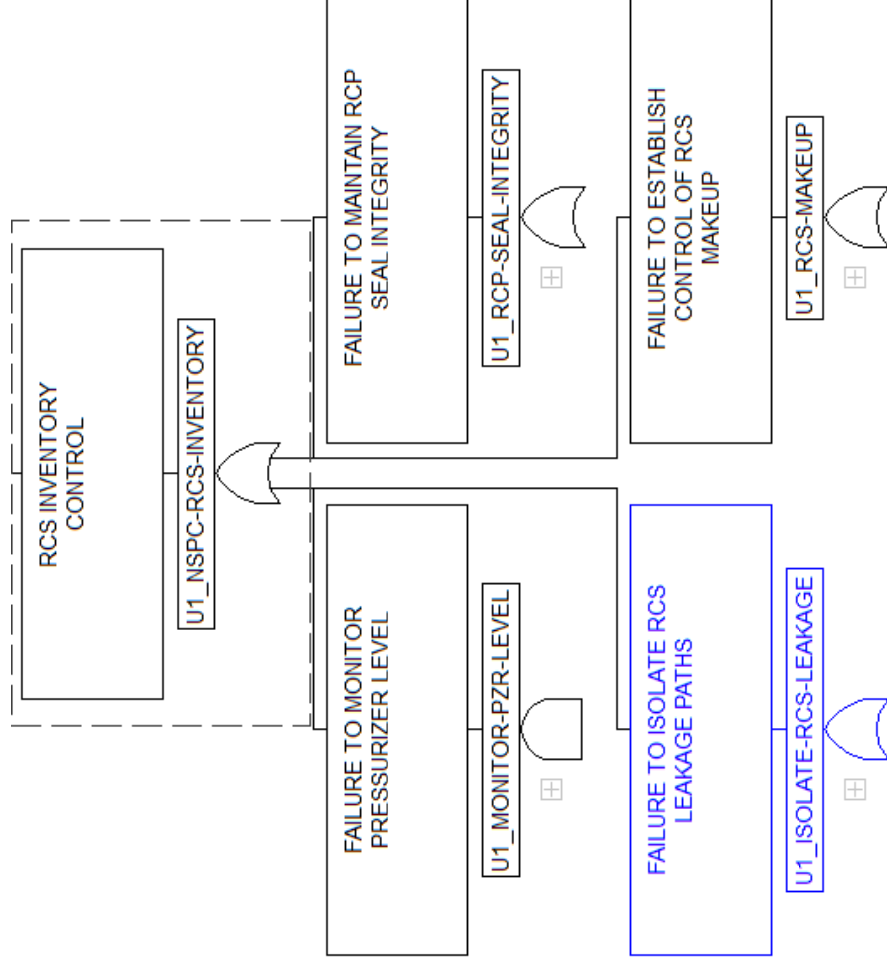
NSCA Fault Trees

- Top-down development based on NFPA 805 Performance Criteria
- Strict mapping to circuit analysis via Basic Event-to-Function State Matrix
- All equipment dependencies built into model
 - Eliminate manual assessment of support system failures – Avoid missing dependencies
 - Significantly improved analysis fidelity
 - More precise failure identification
- Highly intuitive understanding of losses

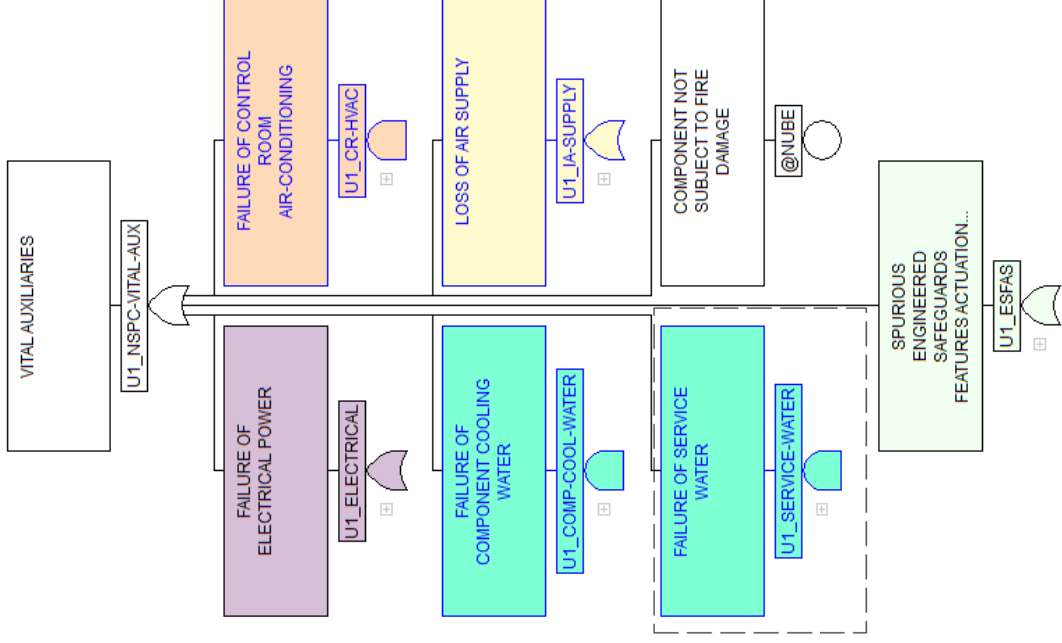
NSCA Fault Trees



NCSA Fault Trees



NSCA Fault Trees



Computer Analysis Process

- Equipment / Circuit Analysis / Fire Area data superimposed on CAFTA model
- Software produces area-by-area failures and graphically depicts on fault tree
- Analyst dispositions failures
 - Identifies and documents deterministic compliance basis
 - Identifies and documents VFDR based on intended method of accomplishment

Deterministic Compliance & VFDRs

- Basis for deterministic compliance
 - Cable protected
 - Detailed circuit analysis
 - Licensing action
 - Approved exemption
 - Etc.
- VFDRs
 - Explicitly documented in software using defined binning method and conventions
 - Exported to Table B-3

VFDRs and Table B-3

- VFDRs Written at “low Level” instead of summary level
 - Provides higher precision and better understanding of failures
 - Precludes “masking” of compounded failures
 - Potentially perception that extent of problems are greater than they actually are (i.e., more VFDRs documented than method which documents at system level)
- Table B-3
 - Captures all VFDRs
 - All pre-transition OMAAs treated as VFDRs
 - Documents methods of accomplishment

Fire Risk Evaluations

- Extensive effort to assure alignment between PRA and NSCA
 - Ensure accurate treatment of VFDRs
 - More realistic delta CDF values
 - Examples - MSO, cascading failure, HVAC, etc.
- Recovery Actions
 - Feasibility assessments per FAQ 07-0030
 - DID RAs for Alternate shutdown areas
- Units 1 and 2 analyzed separately, but cross unit impacts considered

Questions ?

NSCA

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