

1. Documentation of Operability / Functionality Determinations
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2. Documentation
 - a. Discussion of documentation was added to the revised guidance, Section 5.8, to address comments from the previous workshop. Examples of comments include 1) threshold for when operability determinations need to be documented, 2) level of information included in documentation, 3) engineering judgement, and 4) inclusion of supporting calculations.
3. Immediate and Prompt Determination Documentation
 - a. Two types of operability determinations have different documentation expectations.
 - b. Immediate determinations - simple documentation such as checking a box or plant logs. Includes brief explanation of reasonable expectation of operability.
 - c. Prompt determinations - more detailed documentation.
4. Engineering Judgement Documentation
 - a. Engineering judgement can be used but should be documented. The licensee should document the judgement in sufficient detail so that an individual knowledgeable in the technical discipline of the judgement would be able to review and understand its basis.
5. Example 1
 - i. Immediate Operability Determinations
 - a. During modification planning the licensee discovers that a computer monitoring interface installed under a prior modification to the vital DC busses was installed with non-safety fuses as the interface and this modification similarly impacts all the DC busses.
6. Example 1 - NRC Expectation
 - i. Immediate Operability Determination
 - a. The NRC preferred level of documentation would include a brief explanation of reasonable expectation of operability based on 1) an existing calculation, 2) an engineering walkdown, and 3) information on the fuses.
7. Example 2
 - i. Immediate and Prompt Operability Determinations
 - a. During the EDG run there was a fuel oil leak (22 drops per minute) on the #9 Cylinder Fuel Injector supply line.
8. Example 2 Continued
 - i. Immediate Operability Determination
 - a. Immediate Operability Documentation
 - i. The location of the leak
 - ii. Discussion with other groups such as Engineering
 - iii. Results of PT
9. Example 2 Continued
 - i. Prompt Operability Determination

- a. Prompt Operability Documentation
 - i. The supply volume of the high pressure fuel line
 - ii. Reduction of leakage due to tightening of the nut
 - iii. Design of the fuel pump compartment
 - iv. Significant leak needed to impact the short/long term operation of the engine or its fuel tank
10. Example 3
- i. Prompt Operability Determination
 - a. Degraded Condition
 - b.
 - c. On 1/1/03, a through-wall leak (weepage) was found on the SW line supplying (alternate supply line) the "A" Charging Pump Oil Coolers. This piping is ASME Section XI, Class 3 piping.
11. Example 3 - NRC Expectation
- i. Prompt Operability Determination
 - a. Sufficient detail in prompt operability determination documentation would include:
 - i. A description of the function of the line
 - ii. A description of the leak
 - iii. Leak rate impact
 - iv. Structural Integrity of the Line
 - v. Repair
12. Example 4
- i. Engineering Judgement
 - a. The licensee identifies that one bolt in a 10-bolt flange for the Safety Injection (SI) pump discharge check-valve has only partial thread engagement. Is the SI pump operable-but-degraded, or inoperable?
13. Example 4 - NRC Expectations
- i. Engineering Judgement
 - a. Weak application of engineering judgement principles: Documentation states that bolt will perform its intended function because the threads on all other bolts and 50% of the threads on this bolt are engaged.
 - b. Preferred application of engineering judgement principles: Documentation states that ACME Engineering report 1996-01, performed for generic bolting issues, indicates that flanges of 8 or more bolts may have one bolt removed and remain operable.

14. Example 5
 - i. Engineering Judgement
 - a. The licensee identifies that a linkage on a safety related damper had become stripped of threads and will not remain open and provide SI room cooling under accident conditions. As a compensatory measure and because it is summertime, the licensee wires open the damper until repair parts can be obtained. Is the SI room cooling operable-but-degraded, or inoperable?
15. Example 5 - Preferred application of engineering judgement principles
 - i. The damper may be wired open because modulating functions is not required in summertime.
 - ii. A back of the envelope calculation demonstrates the maximum closing force on the damper during design basis conditions.
 - iii. The "Marks Standard Handbook for Mechanical Engineers" indicates that the wire type that was used to hold the damper open has a tensile strength in excess of the potential worse case closing force.
16. Example 6
 - i. Engineering Judgment - Expert Testimony
 - a. During a boroscope inspection of the Emergency Diesel Generator carbon is identified on the cylinders. Based upon a compression test the carbon buildup is attributed to excessive cylinder ring wear. Is the EDG operable-but-degraded or inoperable?
17. Example 6 - NRC Expectation
 - i. Engineering Judgement - Expert Testimony
 - a. For expert testimony, the expert's credentials should be adequate to justify the expertise and the basis for the conclusion documented.
 - b. Preferred expert testimony - A vendor technician who has repaired hundreds of this model diesel documents that the EDG will run for thousands of hours beyond the mission time that is required for these EDGs.
18. Documentation
 - a. Questions?