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New Comments

- Peer review process does not seem to reflect the discussion from our last meeting. It still seems to be overly prescriptive and not focused on those aspects of the IA that are unique or new. Conventional engineering methods should not require a peer review. Utility App B controls should be sufficient in these cases. Basically if a plant is in the lower left corner of the graded approach chart – component level evaluation using conventional engineering methods – or if a plant is following the "high reliability and margin" side of Figure 1.

Comment [JT1]: Switch ordre of words to "margin and high reliability"

- Several terms in the document that are used to determine course of action or decision points need to be defined or their attributes described:
    - High reliability and margin (used in several flow charts) – perhaps they can be tied to meeting the acceptance criteria in specific sections of the document like Appendix C and the text at the end of this document.
    - High confidence (that CCDP is low) – scenario based approach description
    - Significant reliance (on OMA) – scenario based approach description
- Performance criteria that demonstrate high reliability must be clearly defined for operator actions. The attributes described in Appendix C should be sufficient when the operator actions are evaluated and performance documented in an engineering evaluation – no PRA techniques are necessary.
- Criteria that can be used to demonstrate high reliability of active components must be defined (section A.1.2). Industry recommends the approach at the end of this document. These considerations and attributes are similar to what is in plant equipment reliability programs and in the FLEX Implementation Guide (NEI 12-06).
- The limits on application of the scenario based approach are so restrictive they may not allow the approach to be used very often and as written, may not allow the use of FLEX for mitigation. The paragraph in the overview where the limits appear should be deleted as the acceptability of the scenario based approach will have to be demonstrated. In addition, the sentence contains several broad, undefined terms (i.e., complex interactions and interdependencies, significant reliance on operator manual actions). Alternately, suggest the following "softer" wording (but the terms will still need to be defined):

> A scenario-based evaluation is acceptable for evaluating the mitigation capability of plants, but it becomes more difficult to use when (1) the plant systems affected by flood protection failure are associated with complex interactions and interdependencies, and (2) any credited mitigation actions are associated with significant reliance on operator manual actions.

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- Referring to a 10^{-2} CCDP criterion for scenario based approach does not make sense since the approach is at least in part, qualitative. In addition, the basis for the 10^{-2} CCDP criteria is not clear. How was the basis determined and how can it be applied to a qualitative method? Suggest removing the specific CCDP number

  > The evaluation of plant capability to maintain key safety functions using available resources (box 7) should demonstrate that core damage will not occur.

- The margins based approach to evaluating mitigation does not include any criteria for acceptable CCDP or CLERP or concepts for what would be considered acceptable. A 10^{-1} CCDP value should be acceptable since the margins approach considers the whole plant, is more rigorous than the scenario based approach, and the probable maximum flooding event frequencies are on the order of about 10^{-4}.

- Examples should be provided. Can industry help develop the examples for the document for the NRC?

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A.1.2 Evaluation of active flood protection and mitigation features

As discussed in Sections 6.2.1, 6.2.2, and 6.3 active flood protection features used with exterior features, incorporated features or temporary barriers should be evaluated to assess reliability. Reliability may be quantified based on operating experience and other data or information where these are available. Alternatively reliability performance characteristics are provided (see below) for use in evaluating reliability of an active flood protection feature (for example in situations when applicable operating experience and other data or information is not available or limited).

Similarly active flood protection features discussed in Section 7.2, scenario-based evaluation of mitigation capability (applicable to systems without complex interactions and interdependencies), should be evaluated to assess reliability. Active features that are incorporated in normal plant systems with reliability attributes already characterized in information such as the plant's internal events PRA should be evaluated using this information. Reliability of other active features may be quantified based on operating experience and other data or information where these are available. The alternatively reliability performance characteristics (see below) are provided for use in evaluating reliability (for example in situations when applicable operating experience and other data or information are not available or limited).

High equipment reliability has been associated with use of industrial equipment with high intrinsic reliability and programmatic actions to ensure appropriate monitoring, maintenance and testing of the equipment. Additionally defense-in-depth in the form of equipment redundancy adds to system reliability. The Reliability Performance Characteristics described below provide the programmatic elements specific to flooding protection and mitigation provide the basis for high reliability. Determination of reliable equipment performance should incorporate the following demonstrable characteristics.

<u>Reliability Performance Characteristics for Credited Equipment</u>

Functional characteristics:

1. There is an engineering basis for the functional requirements for the equipment which:
    a. Is auditable
    b. Is consistent with generally accepted engineering principles
    c. Defines incorporated functional margin
    d. Is controlled within the configuration document control system.
2. Functionality of the equipment may be outside the manufacturer's specifications if justified in a documented engineering evaluation.
3. Equipment redundancy shall be provided for equipment
    a. Required to operate in an active manner throughout a flooding event
    b. Required to frequently change state (control functions) during a flooding event.

Operational characteristics:

1. Testing (including surveillances)

a. Equipment should be initially tested, to verify performance conforms to the limiting performance requirements.
b. Periodic tests and test frequency should be determined by an engineering evaluation based upon equipment type and expected use.
c. The testing basis shall be documented.
d. Periodic testing should address both storage / standby conditions and in-service conditions (if applicable).
e. Testing records shall be retained.
f. Equipment issues identified through testing shall be incorporated into the corrective action program.

2. Preventive maintenance (including inspections)
    a. Preventive maintenance tasks and task intervals should be determined by an engineering evaluation based upon equipment type, expected use and industry guidance for beyond design basis equipment.
    b. The preventive maintenance basis shall be documented.
    c. Preventive maintenance should address both storage / standby conditions and in-service conditions.
    d. Preventive maintenance records shall be retained.
    e. Equipment issues identified through preventive maintenance shall be incorporated into the corrective action program.

3. Corrective and elective maintenance
    a. Corrective and elective maintenance records shall be retained including the reasons for the corrective or elective maintenance performed.
    b. Equipment issues identified through corrective or elective maintenance shall be incorporated into the corrective action program.

Unavailability characteristics:

4. The unavailability of equipment should be managed such that loss of capability is minimized. Equipment that is expected to be unavailable for more than 30 days or during forecast site specific external events should be supplanted with alternate suitable equipment.
5. A spare parts strategy should be developed to support availability considerations.

Equipment storage characteristics:

1. Portable equipment should be stored and maintained in a manner that is consistent with assuring that it does not degrade over long periods of storage and that it is accessible for periodic maintenance and testing.
2. Credited active equipment should be stored in a location that protects it from the flooding event but can be accessed during a flooding event.
3. If B.5.b equipment is credited, it must meet the above storage requirements.

Operator manual actions associated with active flood protection and mitigation features should be evaluated in accordance with A.1.4 using the guidance contained in Appendix C.

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