United States Nuclear Regulatory Commission

Protecting People and the Environment

Public Workshop
Changes During Construction and Operation, Tier 2 "Substantial Increase" in Probability or Public Consequences of Ex-vessel Severe Accidents

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Workshop Objectives and Deliverables

- Explore the concept of "substantial increase" in probability and public consequences of ex-vessel severe accidents per Section VIII.B.5.c of Part 52 Appendices
- Provide guidance to staff, reactor designers, and COL holders
- Provide useful examples of what is and is not a "substantial increase"

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Problem Statement #4

Establish guidance that should be used for evaluating changes to the severe accident design features (VIII.B.5.c) of each design certification rule (construction & operation).

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From Part 52 App. A (ABWR)

- **VIII.B.5.c. A proposed departure from Tier 2 affecting resolution of an ex-vessel severe accident design feature identified in the plant-specific DCD, requires a license amendment if:**

  (1) There is a substantial increase in the probability of an ex-vessel severe accident such that a particular ex-vessel severe accident previously reviewed and determined to be not credible could become credible; or

  (2) There is a substantial increase in the consequences to the public of a particular ex-vessel severe accident previously reviewed.

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What is an Ex-Vessel Severe Accident (EVSA) Design Feature?

Per the Statement of Considerations for the ABWR Final Rule, the change process for EVSA applies only to "severe accident design features, where the intended function of the design feature is relied upon to resolve postulated accidents when the reactor core has melted and exited the reactor vessel and the containment is being challenged." ~~It does not apply to those design features intended to meet design basis requirements and resolve severe accidents.~~ In addition, the Commission is cognizant of certain design features that have intended functions to meet 'design basis' requirements and to resolve 'severe accidents.' These design features will be reviewed under either VIII.B.5.b or VIII.B.5.c depending upon the design function being changed.

Similarly, many SSCs may perform functions intended to mitigate transients or design basis accidents but also impact the consequences of an ex-vessel severe accident. This analysis is limited to the *specific* functions performed by SSCs that are solely used to limit the consequences of an EVSA. For example, containment spray pumps may limit the consequences of an EVSA but they are also used to mitigate DBAs. On the other hand, a corium retention system is only used during an ex-vessel severe accident and is therefore within the scope of this analysis.

Example: US-APWR Tier 1 Fire Protection System Table 2.7.6.9-2

Design Commitment	Inspection, Tests, Analyses	Acceptance Criteria
6.b The FPS fire water supply is available to the containment spray system and water injection to the reactor cavity for severe accident mitigation.	6.b Inspection will be performed on the as-built FPS fire water supply.	6.b The as-built FPS fire water supply is provided to the containment spray system and water injection to the reactor cavity for severe accident mitigation.

Tier 1
2.11 Containment Systems

The fundamental design concept of the US-APWR for severe accident termination is reactor cavity flooding and cool down of the molten core by the flooded coolant water.

Reactor cavity flooding to enhance the cool down of the molten core ejected into the reactor cavity is achieved by the CSS, whose operation during a design basis accident is described in Subsection 2.11.3. Drain lines are used to drain spray water, which flows into the SG compartments, to the reactor cavity and cools the molten core. Fire protection system (FPS) water injection may also be used to inject water to the drain lines from the SG compartment to the reactor cavity. The FPS water supply is described in Subsection 2.7.6.9.1.

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Tier 2
9.5.1 Fire Protection Program

9.5.1.2.2 Fire Protection Water Supply System

The fire water supply system is designed in accordance with the guidance of RG 1.189 (Ref. 9.5.1-12) and the applicable NFPA codes and standards. The fire protection water supply system is sized such that it contains sufficient water for two hours operation of the largest US-APWR sprinkler system plus a 500 gpm manual hose stream allowance to support fire suppression activities. Redundant water supply capability is provided. In addition to fire suppression activities, the fire protection water supply system may also supply water for severe accident prevention, for alternative component cooling water, and for severe accident mitigation for the containment spray system and water injection to the reactor cavity, if it is available.

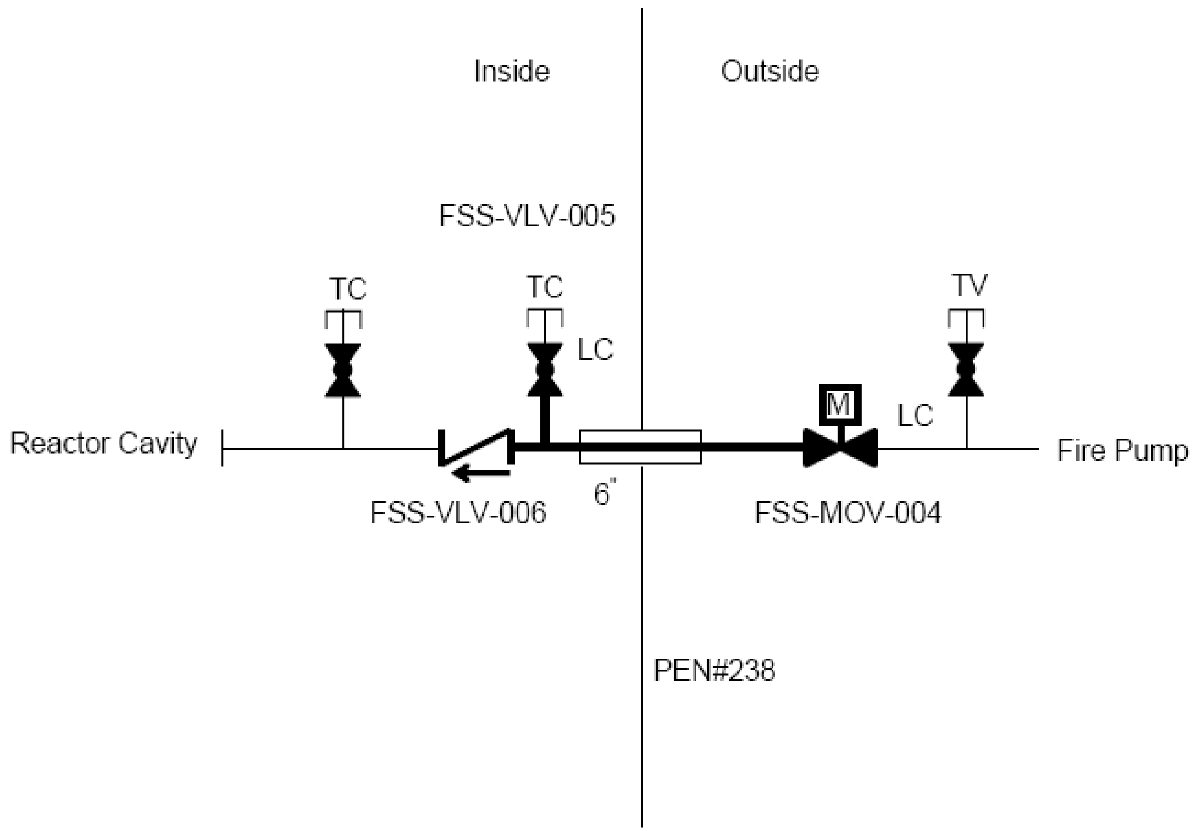
Tier 2
9.5.1 Fire Protection Program

As discussed in Subsection 9.5.1.2, the fire pump arrangement provides two 100% capacity pumps. One is a diesel driven fire pump and the other is an electric-motor driven fire pump. One is designated as the lead fire pump. This system arrangement allows one pump to be out of service and still maintain the capability to provide 100% of the system flow requirements. An electric-motor driven jockey pump (or acceptable pressure source) is used to keep the fire water system full of water and pressurized, as required. Piping between the fire water sources and the fire pumps is in accordance with the guidance of NFPA 20 (Ref. 9.5.1-15). A failure in one water source or its piping cannot cause both water sources to be unavailable.

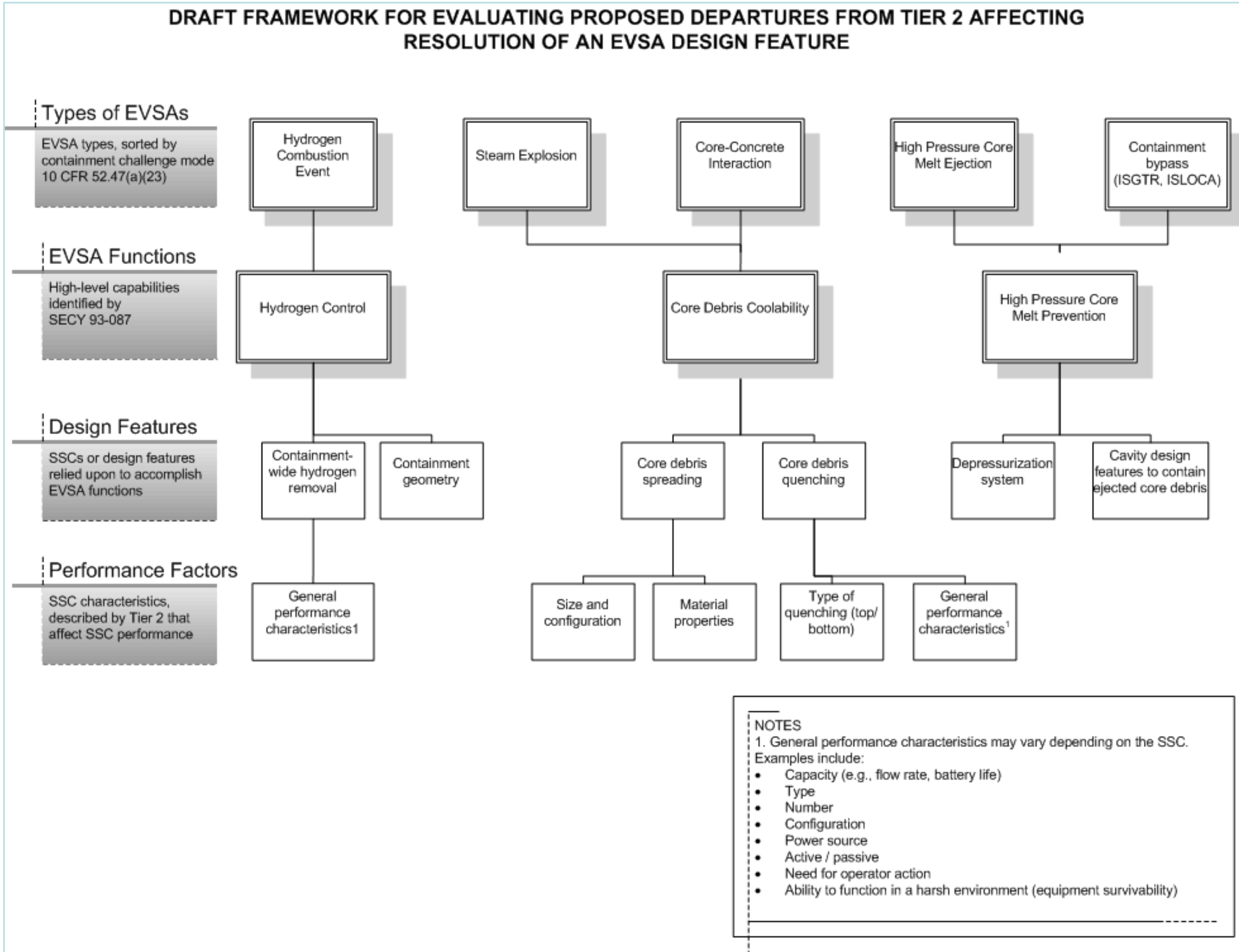
Tier 2
6.2 Containment

Fire Protection Water Supply System

Injection Line to Reactor Cavity



Conceptual framework for guidance



Note: this figure shows the conceptual outline of one possible framework. It does not represent an official staff position or endorsement.

KEY STEPS TO FRAMEWORK

1. Using either deterministic or probabilistic methods, determine which of the top-level EVSAs are CREDIBLE

   a) For non-CREDIBLE EVSAs, justify why the event is not CREDIBLE based on the reliability / effectiveness of the associated EVSA FUNCTIONS.

   b) For CREDIBLE EVSAs, explain how the EVSA FUNCTIONS minimize the PUBLIC CONSEQUENCES of the EVSA type.

2. Determine a pre-change and post-change value for each PERFORMANCE FACTOR associated with any DESIGN FEATURES that would be impacted by the change

3. Using appropriate quantitative or qualitative criteria, determine whether any EVSA FUNCTION is impacted to a degree that alters the conclusions reached during step 1a. If so, stop. Change requires a license amendment.

4. Using appropriate quantitative or qualitative criteria, determine whether any EVSA FUNCTION is impacted to a degree that alters the conclusions reached during step 1b. If so, stop. Change requires a license amendment.

GENERIC EXAMPLE

A COL holder proposes to remove automatic actuation of the primary depressurization system (PDS) valves. Manual actuation at 1200 degrees core exit temperature is proposed.

1. Using level 2 PRA, the COL Holder screened out several EVSAs:
   - frequency (direct containment heating) < 1 E-8 per year → Non-CREDIBLE
   - frequency (containment bypass) < 1 E-8 per year → Non-CREDIBLE

   What EVSA FUNCTION supports this conclusion? High Pressure Core Melt Prevention.

2. DESIGN FEATURES relied upon to accomplish High Pressure Core Melt Prevention:
   a) PDS
   b) Low core power density
   c) Reactor vessel lower head without penetrations
   d) Tortuous pathway from reactor cavity to upper containment

3. Proposed change would impact DESIGN FEATURE (a); therefore, the PERFORMANCE FACTORS for (a) must be quantified. The licensee should provide a comparison of the before and after values of each PERFORMANCE FACTOR.

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EXAMPLE (CONT.)

DESIGN FEATURE: PRIMARY DEPRESSURIZATION SYSTEM		
PERFORMANCE FACTOR	**Before proposed change**	**After proposed change**
Number of valves	2	2
Type of valve	Squib	Squib
Power source	DC	DC
Actuation method	Automatic	Manual
…	…	…
Stroke time	< 15 seconds	< 15 seconds

Does change increase frequency of Containment Bypass or Direct Containment Heating to the point where a previously screened out “Not credible” EVSA becomes “credible”?

Yes: License amendment required per VIII.B.5.c.
No: No license amendment required per VIII.B.5.c. Must also perform 50.59-like screening/evaluation against DBAs per VIII.B.5.b.

Internal NRC Workshop, Aug 2010

- Preliminary thoughts on some definitions:
  - *Ex-vessel severe accidents* - whether these include, for example, bypass events such as interfacing systems loss-of-coolant accidents (ISLOCA) and thermally induced steam generator tube rupture (ISGTR)
  - *Credible* and *not credible* – if there is a design feature that has been installed to address a severe accident issue (e.g., issues identified in SECY-93-087), and the staff has reviewed the design, then to remove or significantly degrade this design feature may be an example of changing a *not credible* severe accident into a *credible* one

Preliminary thoughts (cont.)

- *Public consequences* - early fatalities, latent cancer fatalities, collective dose (person-rem), and other surrogates including large release frequency (LRF) may be appropriate
- *Substantial increase:*
  - The staff reviewed the proposed definition from a 1995 NEI letter related to the ABWR rulemaking, and did not feel comfortable with the following words of what is not a substantial increase: "*de minimus* or within the bound of uncertainty of the probability originally calculated…"
  - Participants did not identify a suitable qualitative definition of substantial increase. Nor was there complete consensus of a quantitative threshold between *substantial* and *not substantial*. The consensus is that the full context of the affected sequences (absolute and relative risk impact) should be considered.
  - Should not be necessary for the COL holder to have to re-run severe accident progression codes or consequence codes to evaluate Tier 2 changes.

Potential Examples of "Substantial Increase" and <u>Not</u> Substantial Increase

Ex 1: Potentially Not a Substantial Increase in Probability

Assume Tier 1 only provides a general description of the severe accident RCS depressurization system for a PWR. The system helps prevent core melt at high RCS pressure, high pressure melt ejection, and temperature induced SGTR (ISGTR).

Assume Tier 2 describes 2 series MOVs. The change is the replacement of an MOV by an AOV with dedicated air bottle. The following failure rate data are available:

– MOV fail-to-open		1.0E-3	EF = 4
– AOV	"	1.2E-3	EF = 4

Ex 2: Potentially a Substantial Increase in Probability

Assume Tier 1 only provides a general description of the severe accident RCS depressurization system for a PWR. The system helps prevent core melt at high RCS pressure, high pressure melt ejection, and ISGTR.

Assume Tier 2 describes 2 series MOVs normally supplied by Class 1E DC power. Also assume that Station AC Blackout is the dominant CDF contributor, but that LRF due to ISGTR is very low (not credible) because of the RCS depressurization capability.

The proposed change is from DC power to Class 1E 480V AC power. Thus the probability (frequency) of ISGTR would be increased many-fold.

Pressurizer

Ex 3: Potentially Not a Substantial Increase in Public Consequences

Assume Tier 1 states:

Reactor cavity floor concrete is provided to protect against challenge to liner plate melt through from ex-vessel core debris.

Assume Tier 2 states that the reactor cavity floor concrete is 45 inches thick.

The as-built thickness is found to have a minimum of 44.25 inches, and assume the change is to accept this as-built condition. A review of previous severe accident analyses indicates that there is adequate margin from molten core-concrete interaction with no measurable impact on early (< 24 hr) or late containment failure performance.

Ex 4: Potentially a Substantial Increase in Public Consequences

Assume Tier 1 states that the fire protection system (FPS) can be used to provide AC independent water addition to the containment via drywell sprays in a BWR.

Assume that Tier 2 states that the FPS consists of an electric and a diesel-driven pump supplying a minimum flow rate to the drywell sprays through locally operated manual valves. This feature provides a means of fission product scrubbing as well as adding thermal mass and delaying containment overpressure for severe accidents by 10 hours or more.

Because of flow restrictions in the as-built connection between the FPS and the RHR system, a departure is proposed that reduces drywell spray flow rate by more than half. Fission product removal rate would decrease and the delay in time to containment overpressure would be reduced from more than 10 hours to 3 hours.

Ex 5: Potentially a Substantial Increase in Public Consequences

Assume the Tier 1 document provides a general description of the severe accident containment venting system (SACVS) for a BWR, and is silent on the failure position of the pneumatic actuation valves.

Assume that Tier 2 describes the pneumatic actuation valves in the system as being fail open on loss of pneumatic pressure or loss of electrical control power. Also assume that Station AC Blackout is the dominant contributor to CDF, and that the SACVS provides a controlled release path preventing containment structural failure and mitigating fission product release.

The proposed change to the pneumatic valve is from fail open to fail close upon loss of pneumatic pressure or electrical power. Thus, the SACVS would not be available for the dominant ex-vessel severe accident sequences.

Ex 6: Potentially <u>Not</u> a Substantial Increase in Public Consequences

A Tier 1 commitment states that a BWR containment is to be deinerted to < 4% oxygen by volume except for limited periods of time. Technical specifications allow deinerted conditions for 24 hours during plant startup and 24 hours during plant shutdown.

A Tier 2 change to the containment inerting system is proposed that would increase the time to establish an inert atmosphere from 4 hours to 5 hours following an outage. Tier 1 commitments would continue to be met and no changes to technical specifications are needed. The PRA identifies that de-inerting during startup and shutdown is an insignificant contributor to LRF and risk based on a nominal cumulative 24 hours per year.

Ex 7: A COL holder proposes a modification to the hydrogen monitoring system that increases measurement uncertainty from +/- 1% to +/- 2.5%, a parameter that is described in Tier 2.

Proposed Methodology

Using results from level 2 PRA, the licensee concludes hydrogen combustion is credible event.

The licensee identifies the following design features relied upon to accomplish hydrogen control and therefore minimize the public consequences of a hydrogen combustion event.

a. Large free volume containment
b. Twenty hydrogen igniters

The proposed change would impact design feature (b), therefore the performance factors for (b) must be quantified.

Ex 7 (continued)

DESIGN FEATURE: HYDROGEN CONTROL SYSTEM		
PERFORMANCE FACTOR	**Before proposed change**	**After proposed change**
Number of igniters	20	20
Location	Azimuthally spaced around containment and in SG and PZR compartments.	Azimuthally spaced around containment and in SG and PZR compartments.
Hydrogen monitor scale and accuracy	0-10% +/- 1%	0-10% +/- 2.5%

Ex 7 (continued)

Hydrogen Monitoring Subsystem

- Measures global H concentration in containment
- 10% → combustion possible
- 8% → igniters actuated (margin to limit)

Measurement Uncertainty

- Max uncertainty of 1% → 10% actual = 9% indicated
- Max uncertainty of 2.5% → 10% actual = 7.5% indicated

Therefore, this modification could constitute a substantial increase in the consequences to the public of an EVSA by reducing protection against a global hydrogen event and increasing anticipated dose. The change would require a license amendment.

Ex 8: A COL holder proposes to modify the hydrogen control system so that actuation occurs at 8.5% hydrogen by volume, rather than 8.0% as described in Tier 2.

Proposed Methodology

Using results from level 2 PRA, the licensee concludes hydrogen combustion is a credible event.

The licensee identifies the following design features relied upon to accomplish hydrogen control and therefore minimize the public consequences of a hydrogen combustion event.

a. Large free volume containment
b. Twenty hydrogen igniters

The proposed change would impact design feature (b), therefore the performance factors for (b) must be quantified.

Ex 8 (continued)

DESIGN FEATURE: HYDROGEN CONTROL SYSTEM		
PERFORMANCE FACTOR	**Before proposed change**	**After proposed change**
Number of igniters	20	20
Location	Azimuthally spaced around containment and in SG and PZR compartments.	Azimuthally spaced around containment and in SG and PZR compartments.
Peak pressure due to combustion event	68 psia	71 psia

The ultimate failure pressure of containment, as described by the DCD is 126 psia. The licensee determines that the small increase does not lead to a significant reduction in margin and would not lead to a substantial increase in consequences to the public. Therefore, the change does not require a license amendment.

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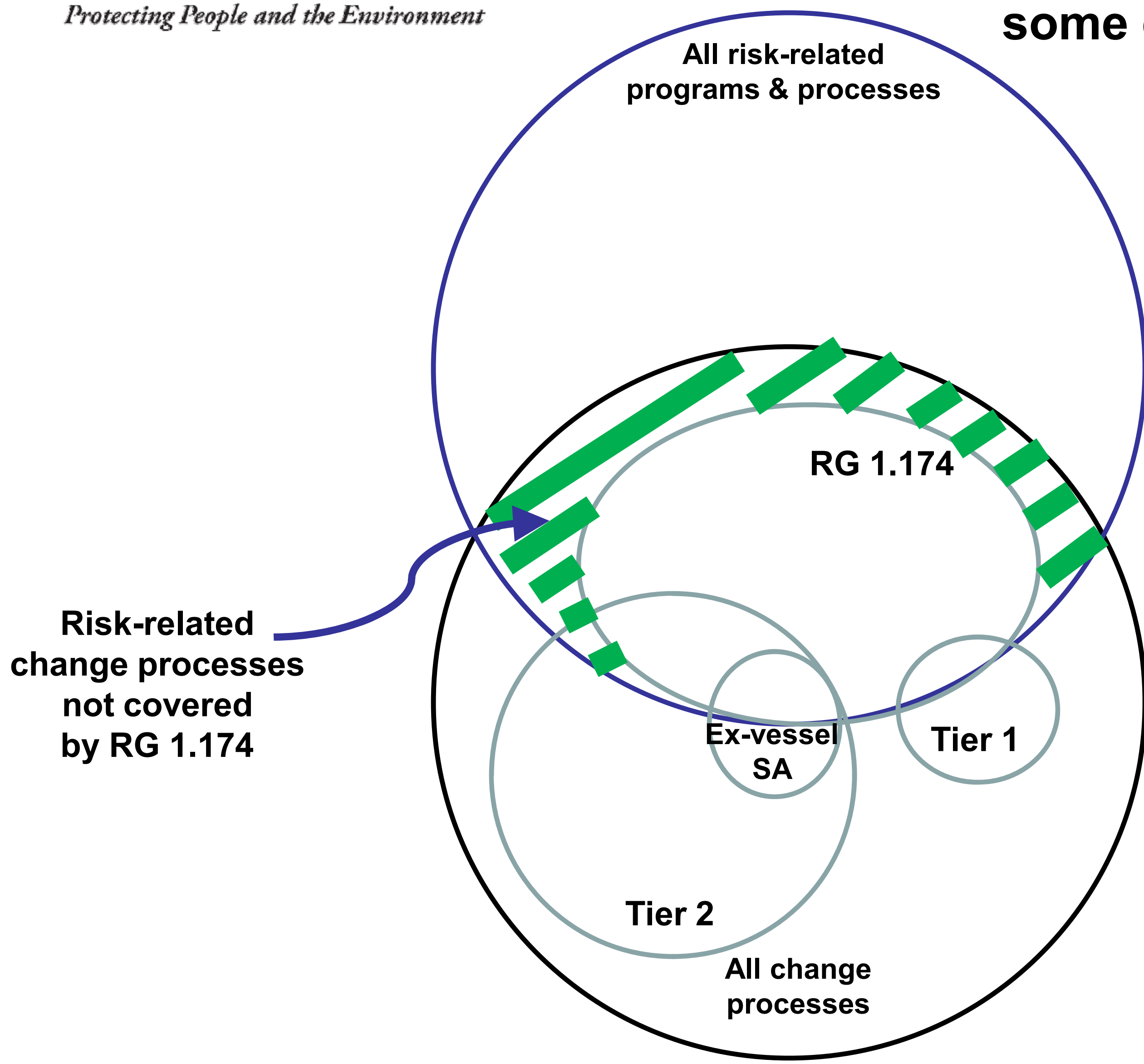
Problem Statement #3

Determine for new plants what revisions to the risk-informed guidance for evaluating changes to the licensing basis should be required and determine the applicability of the 10 CFR 50.59 guidance (NEI 96-07, rev 1).

Observation: RG 1.174 covers most but not all risk-related changes (e.g., some changes under 50.59 potentially are not covered)



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Major Programs & Processes to be Reviewed for "Gaps"

Group	Regulation / Program	Guidance	Industry Document
GROUP 1	50.59 Changes, Tests, and Experiments	Reg Guide 1.187	NEI 96-07
GROUP 2	50.34 Tech Specs	Reg Guide 1.177	NEI 96-09
GROUP 2	52.98 Licensing Changes	Reg Guide 1.174	
GROUP 3	50.65 Maint. Rule	Reg Guide 1.160	NUMARC 93-01
GROUP 3	50.55(a) In-service Testing	Reg Guide 1.175	
GROUP 3	50.109 Backfit	NRO-REG-111	
GROUP 3	50.69 Graded QA	Reg Guide 1.201	NEI 00-04
GROUP 3	50.55(a) In-service Inspection	Reg Guide 1.178	EPRI-TR-112657 & WCAP-14572
GROUP 3	50.48(c) Fire Protection	Reg Guide 1.205	NFPA-805
GROUP 3	50.46a Risk-Informed ECCS Criteria		
GROUP 4	IMC 0609 SDP	ROP Basis Document (IMC 0308 & Attachments)	
GROUP 4	IMC 0608 Perf. Indicators	ROP Basis Document (IMC 0308 & Attachments)	
GROUP 4	MD 8.3 Incident Investigation		
GROUP 4	LIC-504 Emergent Issues		
GROUP 4	MD 6.4 Generic Issues	RES OI TEC-002	

DISCUSSION

RG 1.174 defines defense-in-depth criteria and introduces the concept of an acceptably "small" increase in risk. Together, these are used to ascertain compliance with regulations. Although written for a specific application, the underlying philosophy and principles form the basis of a broad spectrum of regulatory activities. All of the programmatic areas and their guidance documents listed above have an implicit or explicit link to RG Guide 1.174.

For example, the ROP Basis Document (IMC 0308) states that thresholds should be "consistent with other NRC applications...e.g., RG 1.174."

If changes are made to either the deterministic criteria or risk thresholds in RG 1.174, the documents shown above may be affected. <u>NRC staff and managers should evaluate each document to determine the impact and whether changes are appropriate</u>.

SECY-10-0121 defines four categories of guidance documents that may be impacted by changes to RG 1.174:

Group 1. Guidance for changes to a licensee's approved licensing basis without prior NRC approval.

Group 2. Risk-informed guidance to support changes to a licensee's approved licensing basis, including operational programs, with prior NRC approval

Group 3. Guidance to support implementation of risk-informed regulations

Group 4. Guidance to support implementation of the ROP

These categories are important because the roles and responsibilities of NRC technical staff and managers may be different for each category. For example, the Division of Inspection and Regional Support in NRR may have the lead on Group 4 but have limited or no involvement in Group 2. Senior management will be responsible for ensuring a reasonably level of consistency between groups.

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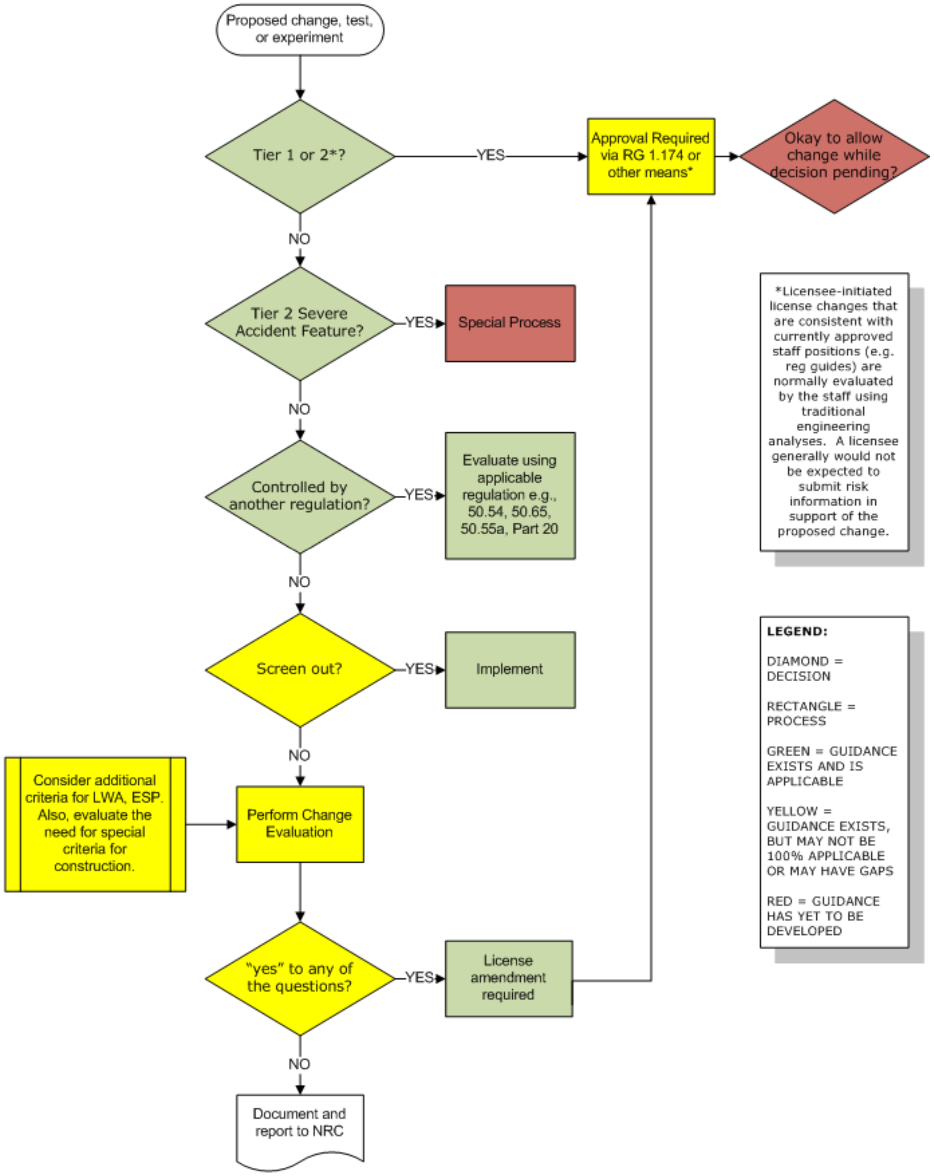
DRAFT FRAMEWORK FOR CHANGES TO PLANTS LICENSED UNDER PART 52



Contact: CJ Fong, Division of Construction Projects

Reference
Examples of Severe Accident Mitigation Features in Tier 2

Design	Design function & SSCs	Affects probability or consequences?	DCD Section
ABWR	AC-independent water addition system (ACIWAS) provides the ability to flood the lower drywell	Consequences (provides primary means of flooding lower drywell, should core relocate into containment)	SSAR (19.8.7) Tier 1, Section 2.4.1 Tier 1, Section 2.15.6 Table 19.8-7
	Lower drywell has design features to limit consequences of a severe accident: 1) Sacrificial concrete 2) Basaltic concrete 3) Pedestal 4) Sump Protection 5) Increased floor area 6) Wetwell-drywell connecting vents 7) Solid vessel skirt	Consequences	SSAR (19.8.7) Tier 1, Section 2.14.1 Table 19.8-7
	Lower drywell flooder system (LDFS), uses thermally actuated flooder valves to provide alternate cavity flooding in the event of core debris discharge and the failure of the ACIWAS.	Consequences	SSAR (19.8.7) Table 19.8-7
	Containment overpressure protection system (COPS) provides a scrubbed release path in the event that containment pressure exceeds design limits.	Consequences	SSAR (19.8.7) Tier 1, Section 2.14.6 Table 19.8-7

Reference
Examples of Severe Accident Mitigation Features in Tier 2

Design	Design function & SSCs	Affects probability or consequences?	DCD Section
AP1000	The PXS provides the ability to cool the outside of the reactor vessel during a severe accident.	Probability (limits the likelihood of vessel failure)	ITAAC 2.2.03.09a.i ITAAC 2.2.03.09a.ii ITAAC 2.2.03.09a.iii Tier 2, 5.3.5 Tier 2, 19.39.10
	The stage 4 ADS squib valves are manually actuated by operators when core exit thermocouple (CET) temperature exceeds 1200 degrees F.	Probability (limits the likelihood of vessel failure)	Tier 2, 19D.4.2
	The [hydrogen igniters and containment penetrations] have sufficient thermal lag to withstand the effects of identified hydrogen burns associated with severe accidents. Hydrogen igniters are manually actuated when CET temperature exceeds 1200 degrees F.	Probability (limits likelihood of hydrogen explosion that could damage vessel) and consequences (limits likelihood of containment breach)	ITAAC 2.2.03.09c Tier 2, 19.39.9 Tier 2, 19.59.9.5.6 Tier 2, 6.2.4.2.3
	Base mat material	Neither. DCD states that " it is not necessary to specify a concrete type for the containment basemat since credible containment basemat failure that could lead to fission product releases to the atmosphere are likely to occur at times well beyond 24 hours."	Tier 2, 19B.4
	The fire protection system provides non-safety containment spray for severe accident management.	Consequences (limits increase in containment pressure following severe accident)	ITAAC 2.3.04.06

Reference
Examples of Severe Accident Mitigation Features in Tier 2

Design	Design function & SSCs	Affects probability or consequences?	DCD Section
EPR	Primary depressurization valves are manually actuated at core exit temperature that is indicative of core damage (1200 degrees F). There are two dedicated trains that are used solely for severe accident mitigation.	Probability* & Consequences *Could affect the probability of a *particular* EVSA, high-pressure melt ejection (HPME) which was previously reviewed and determined to be not credible.	Tier 1, 2.2.1 Tier 2, 19.2.3.3.4
	Combustible gas control system prevents damage to the containment by controlling combustible gases during a severe accident. Includes passive autocatalytic recombiners (PARs), mixing dampers, and hydrogen foils.	Probability & Consequences	Tier 1, 2.3.1 Tier 2, 19.2.3.3.2
	Core melt stabilization system stabilizes corium during a severe accident using: 1) Melt plug 2) Melt discharge channel 3) Spreading area and cooling structure	Consequences	Tier 1, 2.3.2 Tier 2 19.2.3.3.3.1
	Severe accident heat removal system (SAHRS) removes heat and scrubs fission products during a severe accident. Includes the following modes: 1) Passive cooling of molten core debris 2) Active spray for environmental control of containment atmosphere 3) Active recirculation cooling of molten core debris and containment atmosphere 4) Active back-flush of IRWST	Consequences	Tier 1, 2.3.3 Tier 2 19.2.3.3.3.2

Reference
Examples of Severe Accident Mitigation Features in Tier 2

Design	Design function & SSCs	Affects probability or consequences?	DCD Section
ESBWR	Basemat internal melt arrest and coolability (BiMAC) provides a means to stabilize and cool core melt. Includes sacrificial concrete and squib-actuated deluge lines from the gravity-driven cooling system (GDCS)	Consequences	Tier 2, Table 19.2.3.6 Tier 1, 2.4.2 Tier 1, Table 3.8-1
	Containment Inerting System (CIS) performs the non-safety related function of reducing oxygen levels in containment to levels that do not support hydrogen explosions.	Probability & Consequences	Tier 2, 19.3.4.2.8 Tier 2, 19.3.2.1 Tier 1, 2.15.5
US-APWR	Dedicated RCS depressurization valves provide a means to depressurize the RCS following a core damage event. (RCS-MOV-118, 119)	Probability (reduces the likelihood of a HPME and temperature-induced SGTR) & Consequences	Tier 2, 19.1 Tier 2, Chapter 5, Subsection 5.4.12 Tier 2, Table 3.2-2
	External reactor vessel cooling (ERVC)	Probability	Tier 2, 19.2.3.3.1
	Glow type hydrogen igniters are provided to control postulated hydrogen generation during a severe accident.	Consequences	Tier 2, 19.1 Tier 2, Chapter 6, Subsection 6.2.5
	Containment spray system (CSS) and firewater provide a means to flood the reactor cavity	Probability and Consequences (PRA does not credit ex-vessel cooling)	Tier 2, 19.1
	Containment base mat basaltic concrete	Neither. DCD states that basemat material can be	Tier 2, 19.1-12

Reference
Examples of Severe Accident Mitigation Features in Tier 2

Design	Design function & SSCs	Affects probability or consequences?	DCD Section
		selected by COL applicant based on "availability of material at plant location."	
	Lower Rx cavity design	Consequences	Tier 2, 19.1 Tier 2, Chapter 3, Subsection 3.8.5
	Core debris trap	Consequences	Tier 2, 19.1 Tier 2, Chapter 3, Subsection 3.8.5

*By definition, an ex-vessel severe accident (EVSA) can only occur following core damage; therefore, any SSC with non-zero risk significance has at least a marginal impact on this probability. Per the Statement of Considerations for the ABWR Final Rule, the change process for EVSA applies only to "severe accident design features, where the intended function of the design feature is relied upon to resolve postulated accidents when the reactor core has melted and exited the reactor vessel and the containment is being challenged." It does not apply to those design features intended to meet design basis requirements and resolve severe accidents.

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In addition, the Commission is cognizant of certain design features that have intended functions to meet 'design basis' requirements and to resolve 'severe accidents.' These design features will be reviewed under either VIII.B.5.b or VIII.B.5.c depending upon the design function being changed.