Principles of guideline

- Reg guide 1.174 principles
- Use all available risk information
- Rely on qualitative information if PRA information not available
- Determine SSC attributes of importance
- If no engineering basis developed, no change to classification

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Attachment 2

Categorization

- Sequential consideration of internal events, fire, seismic, external events, shutdown
- Importance measures and sensitivity studies
  - Details still under development
- Use of FIVE, Seismic margins, NUMARC 91-06 if necessary
- Integrated decisionmaking panel

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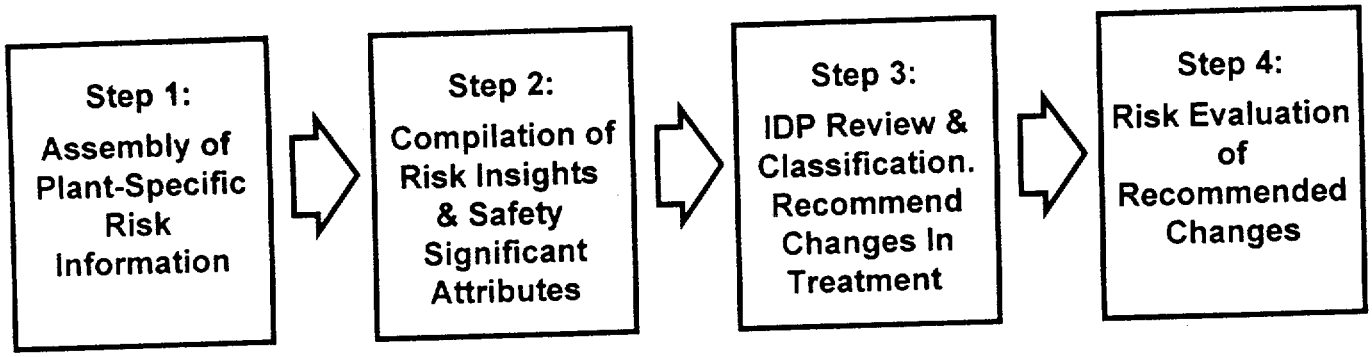
Risk-Informed Classification Process



Resources:

- ✓ Internal Events PRA
- ✓ Fire PRA/FIVE
- ✓ Seismic PRA/Seismic Margins
- ✓ External Events PRA/ IPEEE Screening
- ✓ Shutdown PSA/ Shutdown Safety Management
- ✓ SSC Design Basis Information

Includes:

- ✓ Risk Significance Assessments
- ✓ Integrated Risk Significance Assessment
- ✓ Initial Identification of Safety Significance
- ✓ Identification of Safety Significant Attributes
- ✓ Basis for Low Safety Significance for Safety Related SSCs

Considers:

- ✓ Risk Insights
- ✓ Safety Significant Attributes
- ✓ Operating History
- ✓ Deterministic Considerations
- ✓ Defense-in-Depth
- ✓ Safety Margins

Determines:

- ✓ Specific Changes In Treatment
- ✓ Monitoring

Includes:

- ✓ Qualitative Assessment of Treatment Impacts
- ✓ Risk Sensitivity Studies
- ✓ Evaluation of Monitoring Effectiveness

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Figure 2.4-1
OVERALL SAFETY SIGNIFICANCE PROCESS

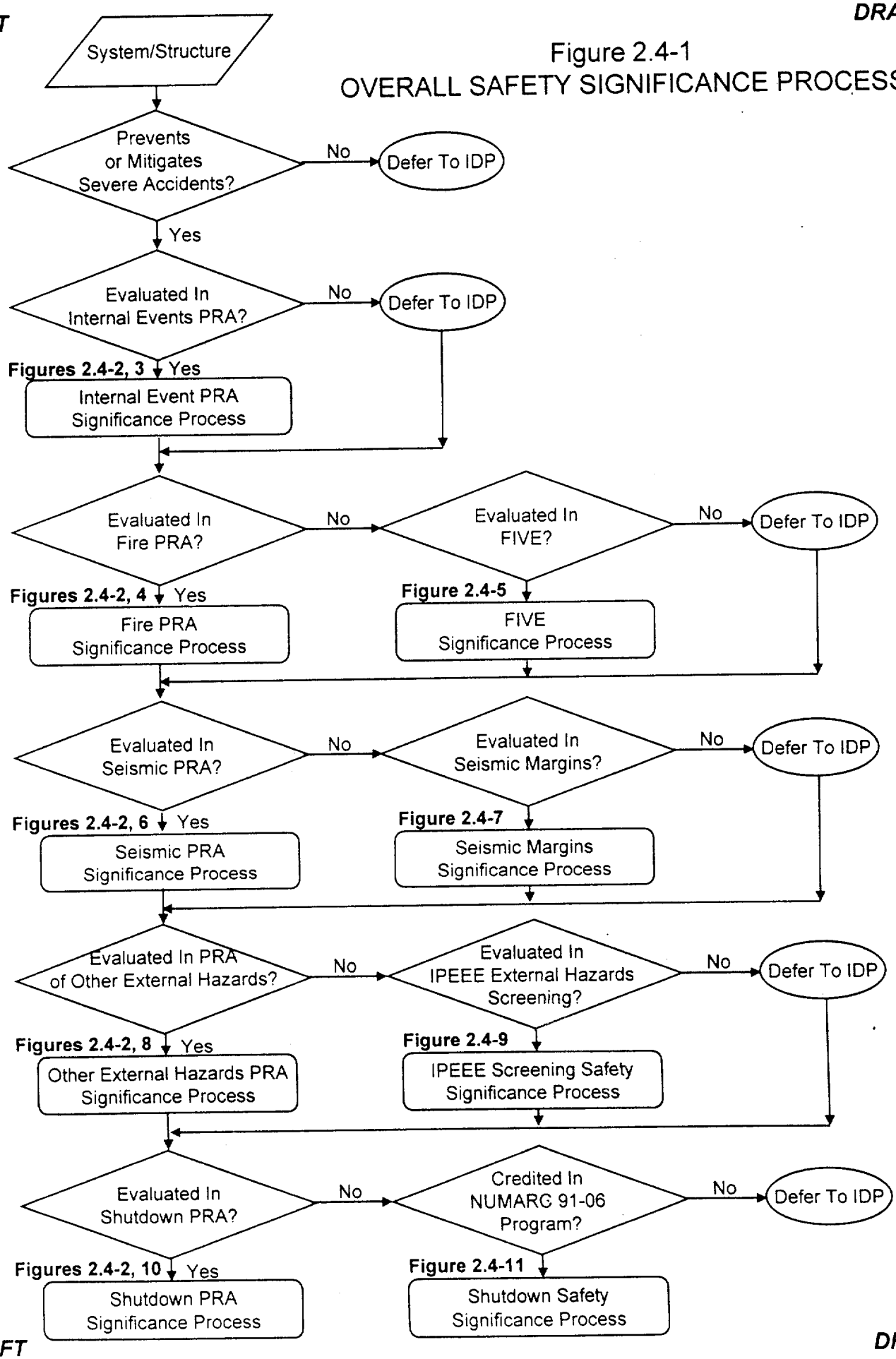

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Figure 2.4-2
GENERALIZED SAFETY SIGNIFICANCE PROCESS FOR SYSTEMS AND COMPONENTS ADDRESSED IN PRA

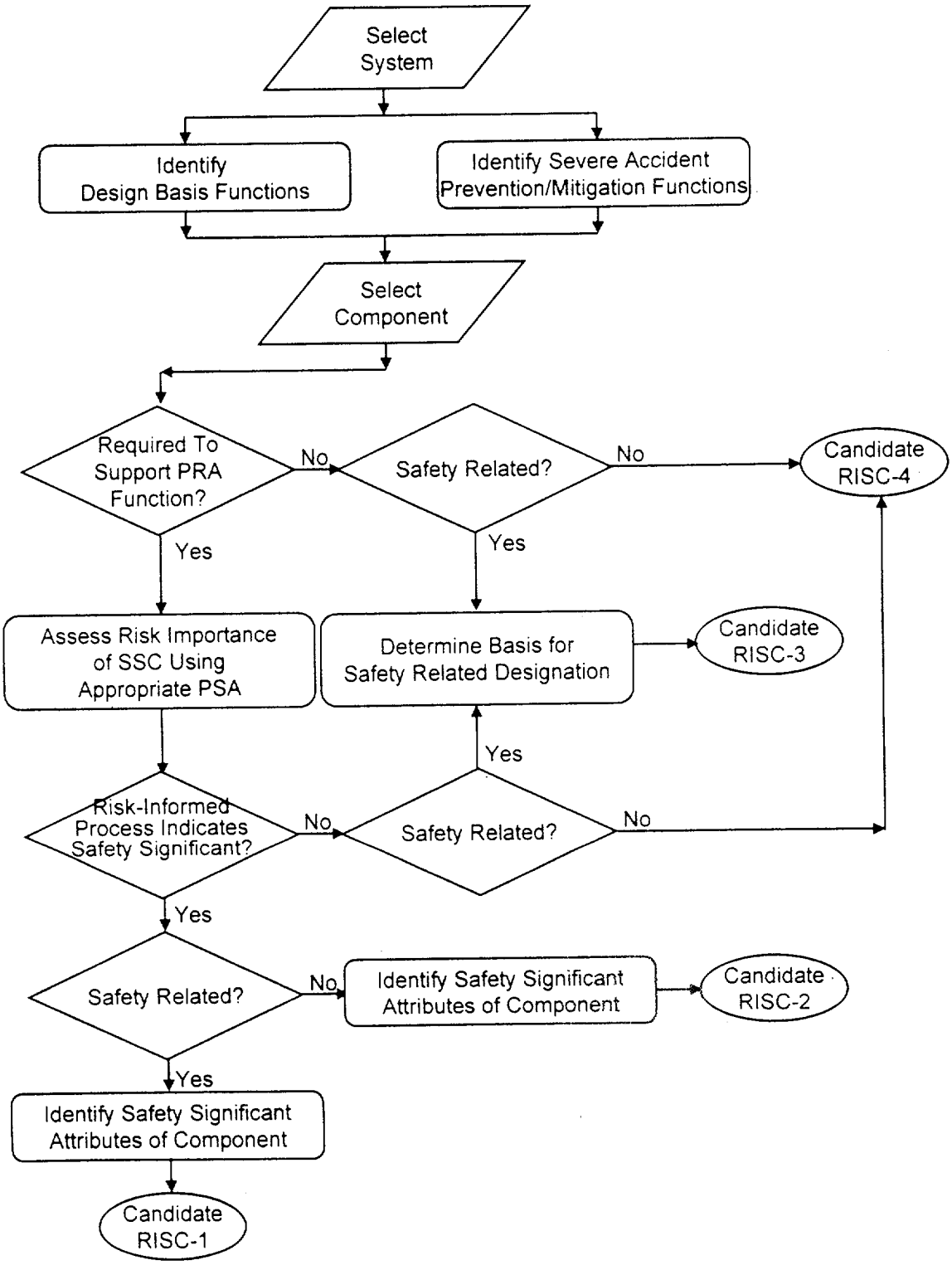

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Figure 2.4-3
RISK IMPORTANCE PROCESS FOR COMPONENTS ADDRESSED IN INTERNAL EVENTS AT-POWER PRAs

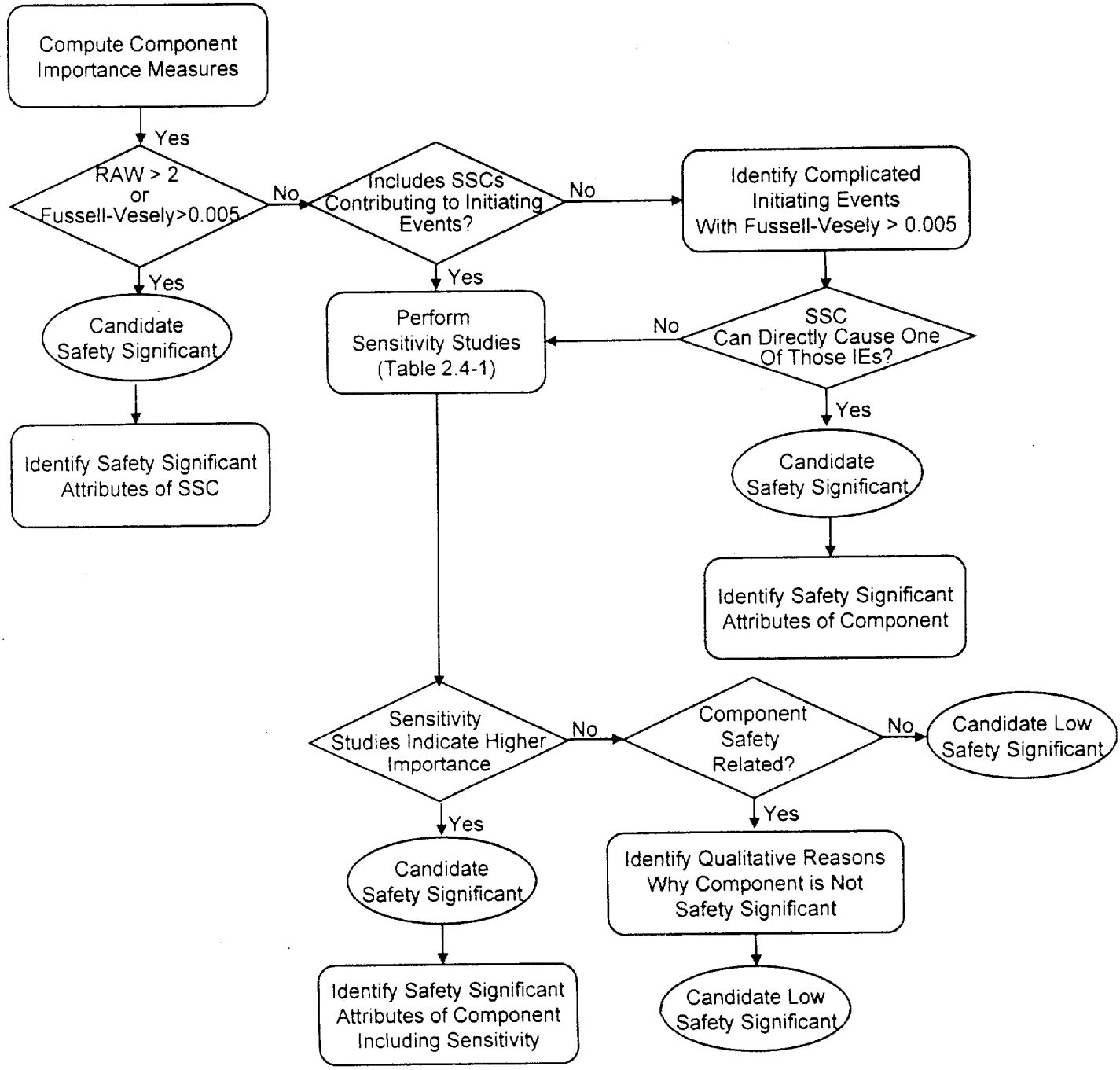

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Figure 2.4-4
RISK IMPORTANCE PROCESS FOR COMPONENTS ADDRESSED IN FIRE PRAs

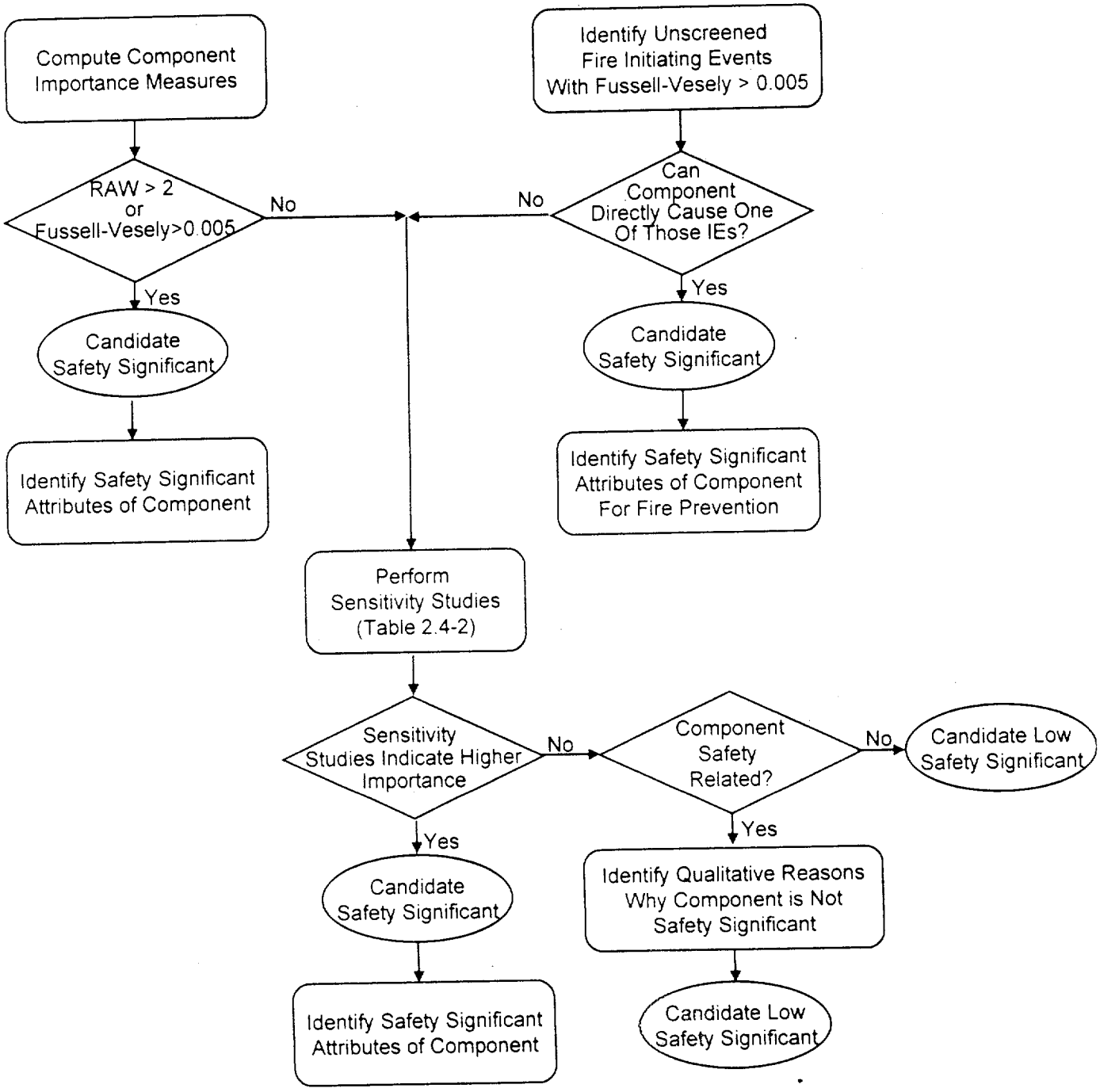

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Figure 2.4-5
SAFETY SIGNIFICANCE PROCESS FOR
SYSTEMS AND COMPONENTS ADDRESSED IN FIVE

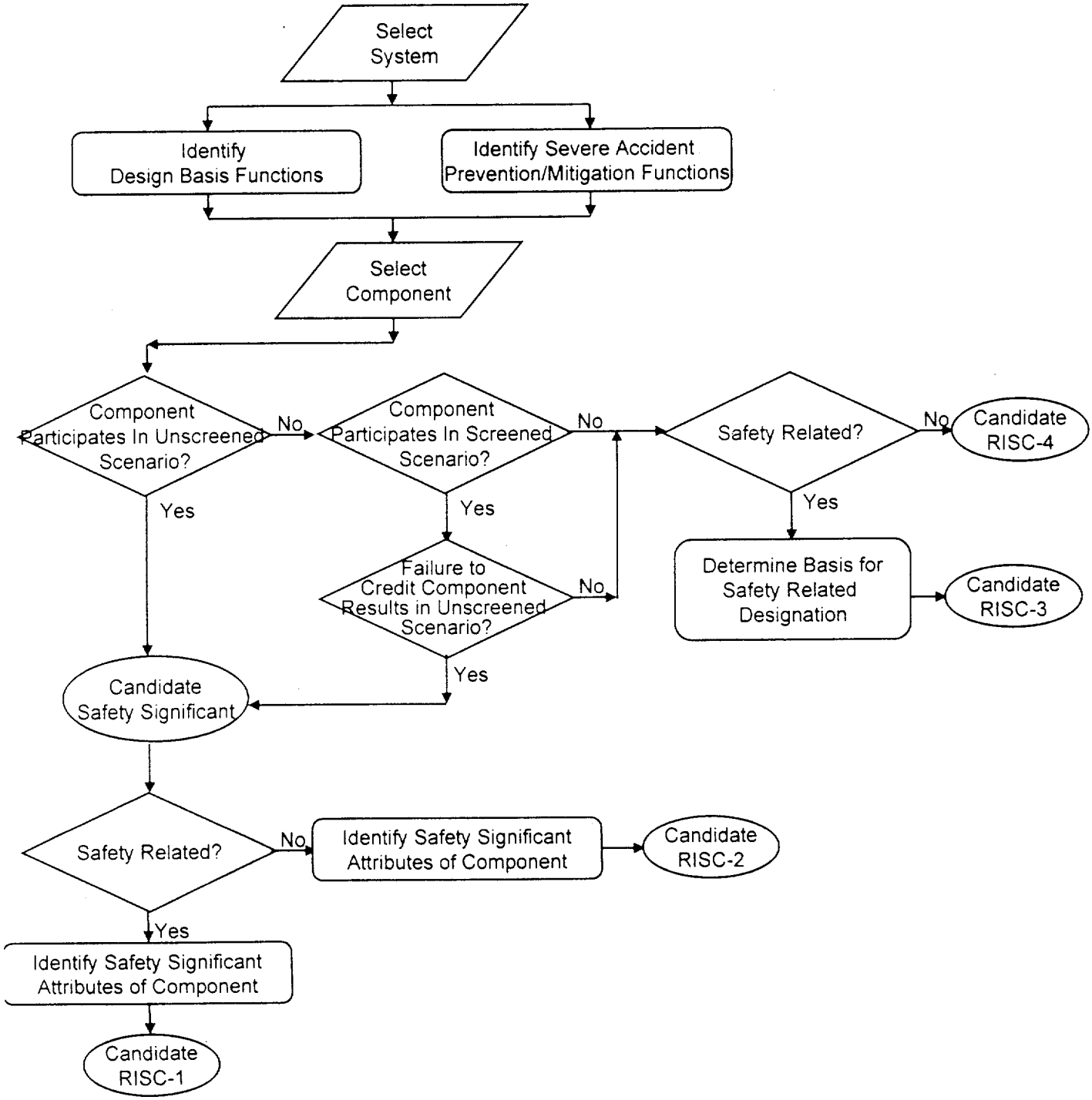

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Figure 2.4-6
RISK IMPORTANCE PROCESS FOR COMPONENTS
ADDRESSED IN SEISMIC PRAs

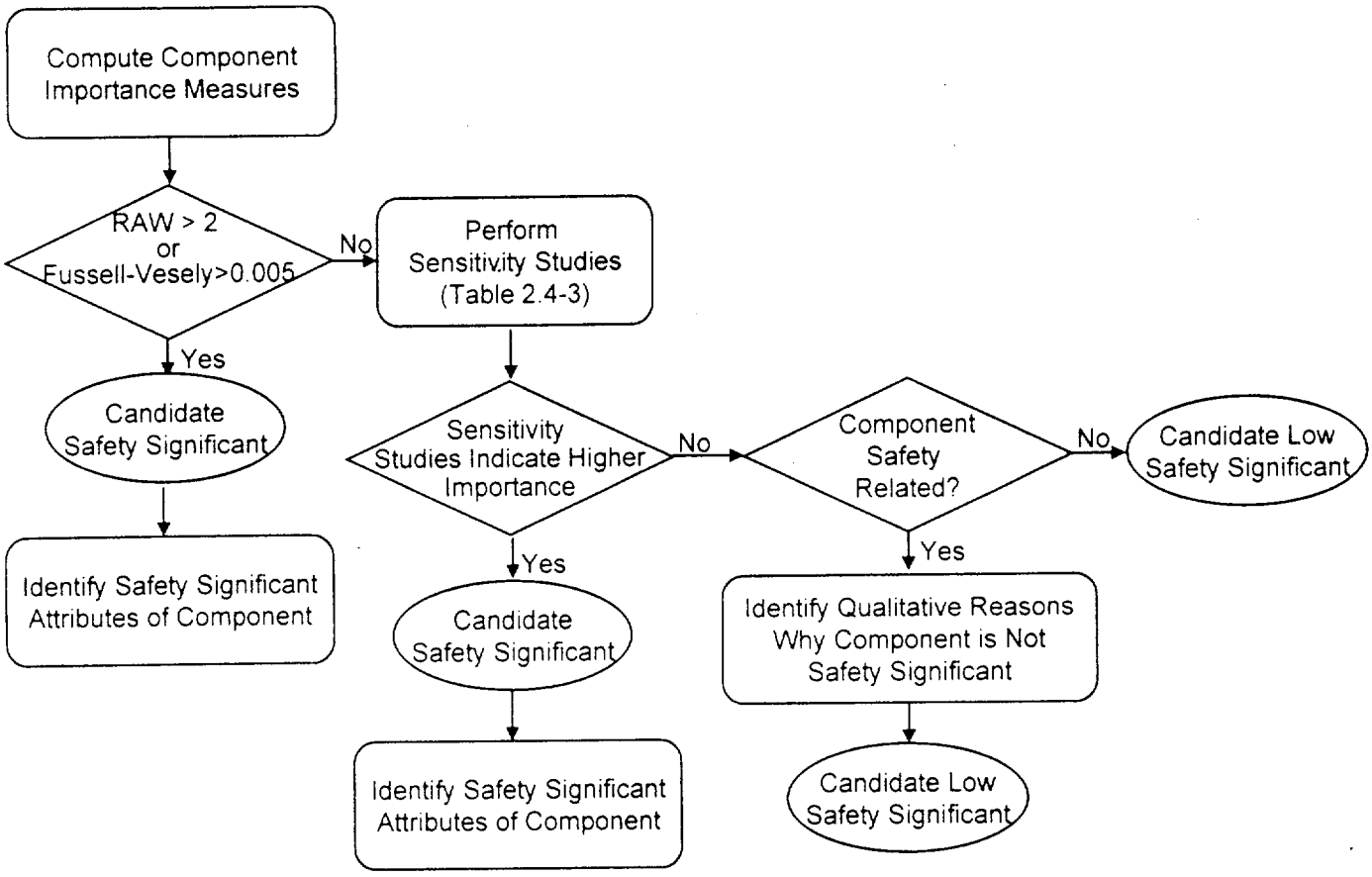

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Figure 2.4-7
SAFETY SIGNIFICANCE PROCESS FOR
SYSTEMS AND COMPONENTS ADDRESSED IN SEISMIC MARGINS

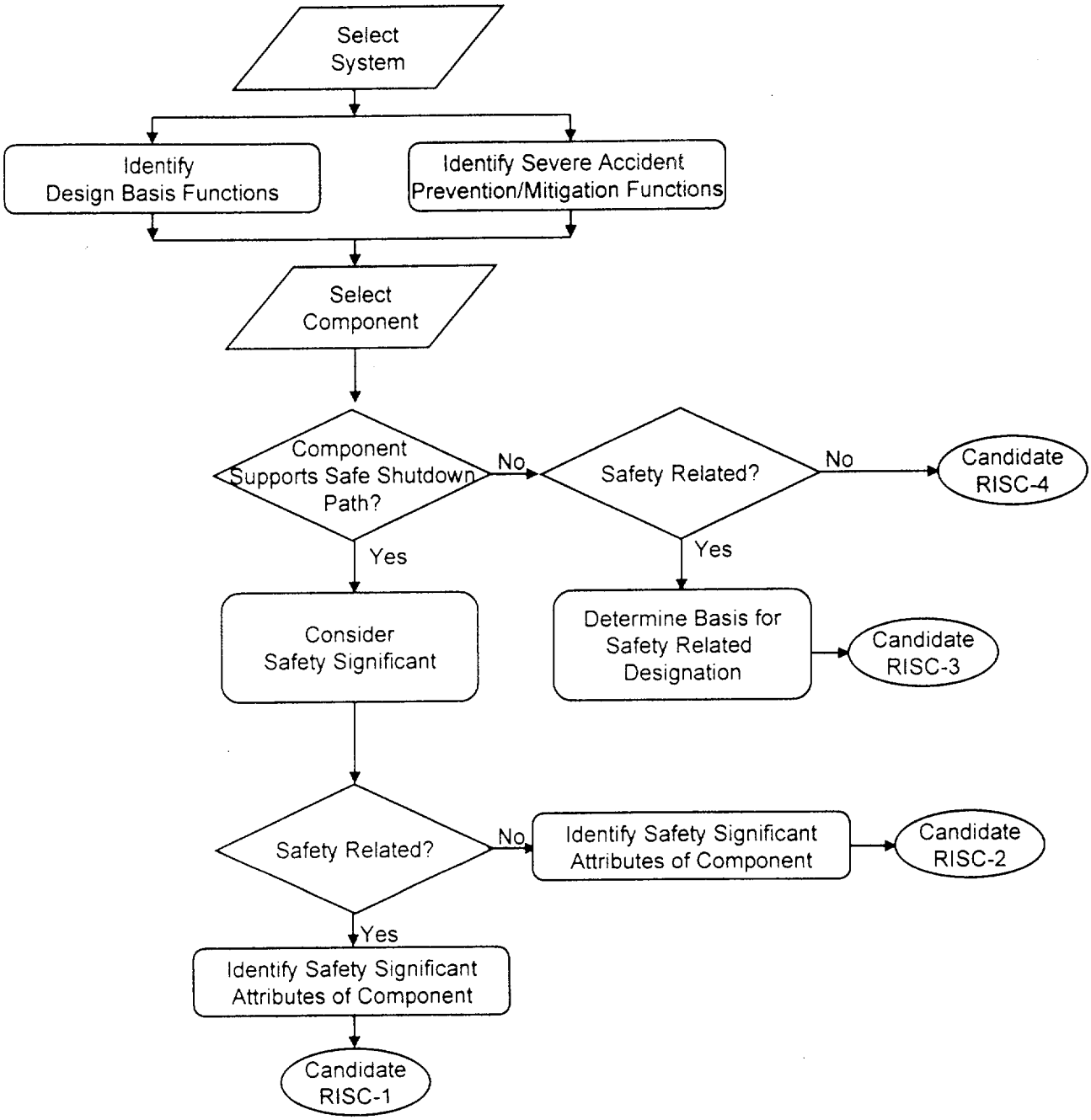

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Figure 2.4-8
RISK IMPORTANCE PROCESS FOR COMPONENTS
ADDRESSED IN EXTERNAL EVENT PRAs

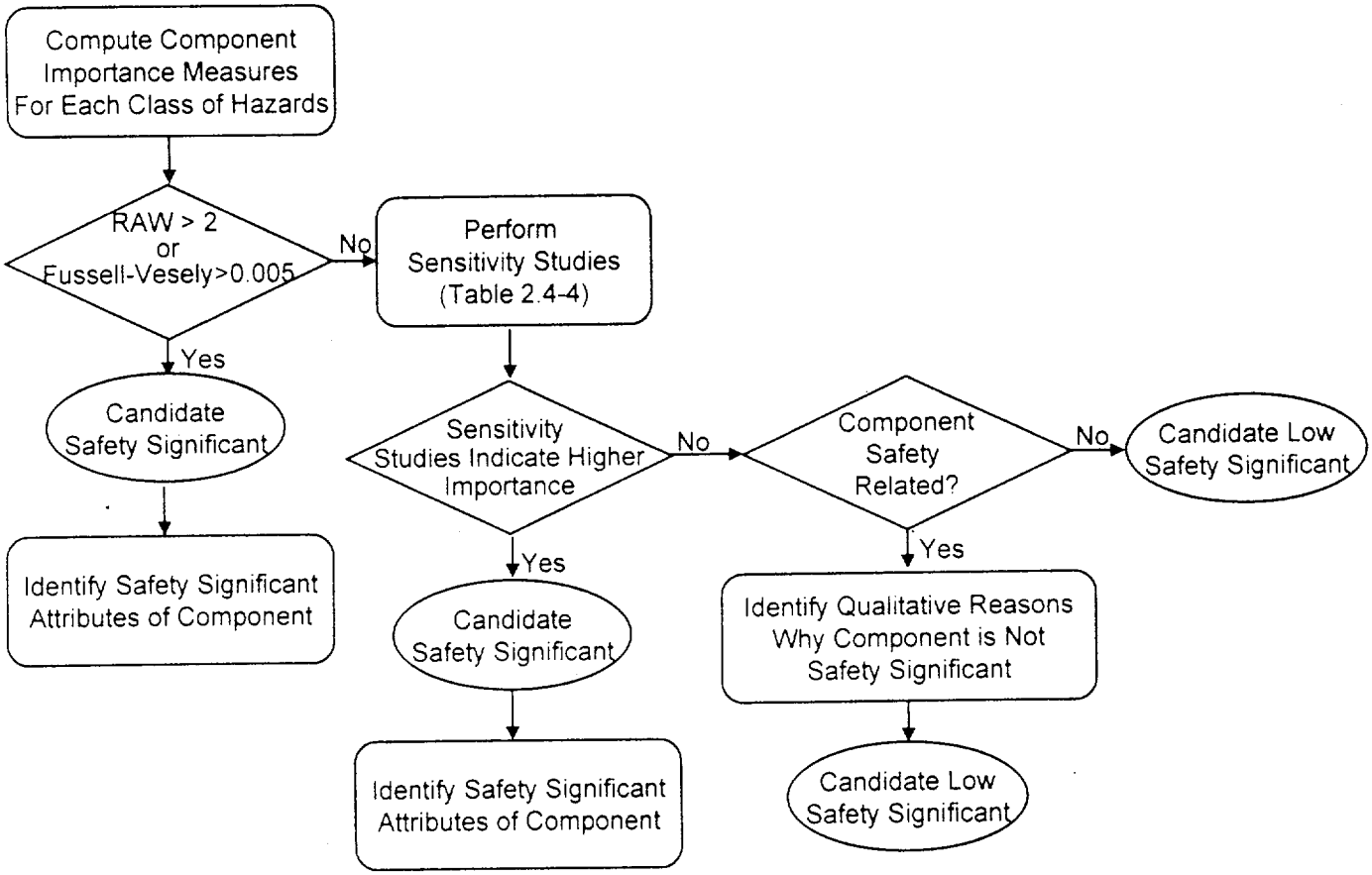

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Figure 2.4-9
SAFETY SIGNIFICANCE PROCESS FOR SYSTEMS AND COMPONENTS ADDRESSED IN EXTERNAL EVENT SCREENING

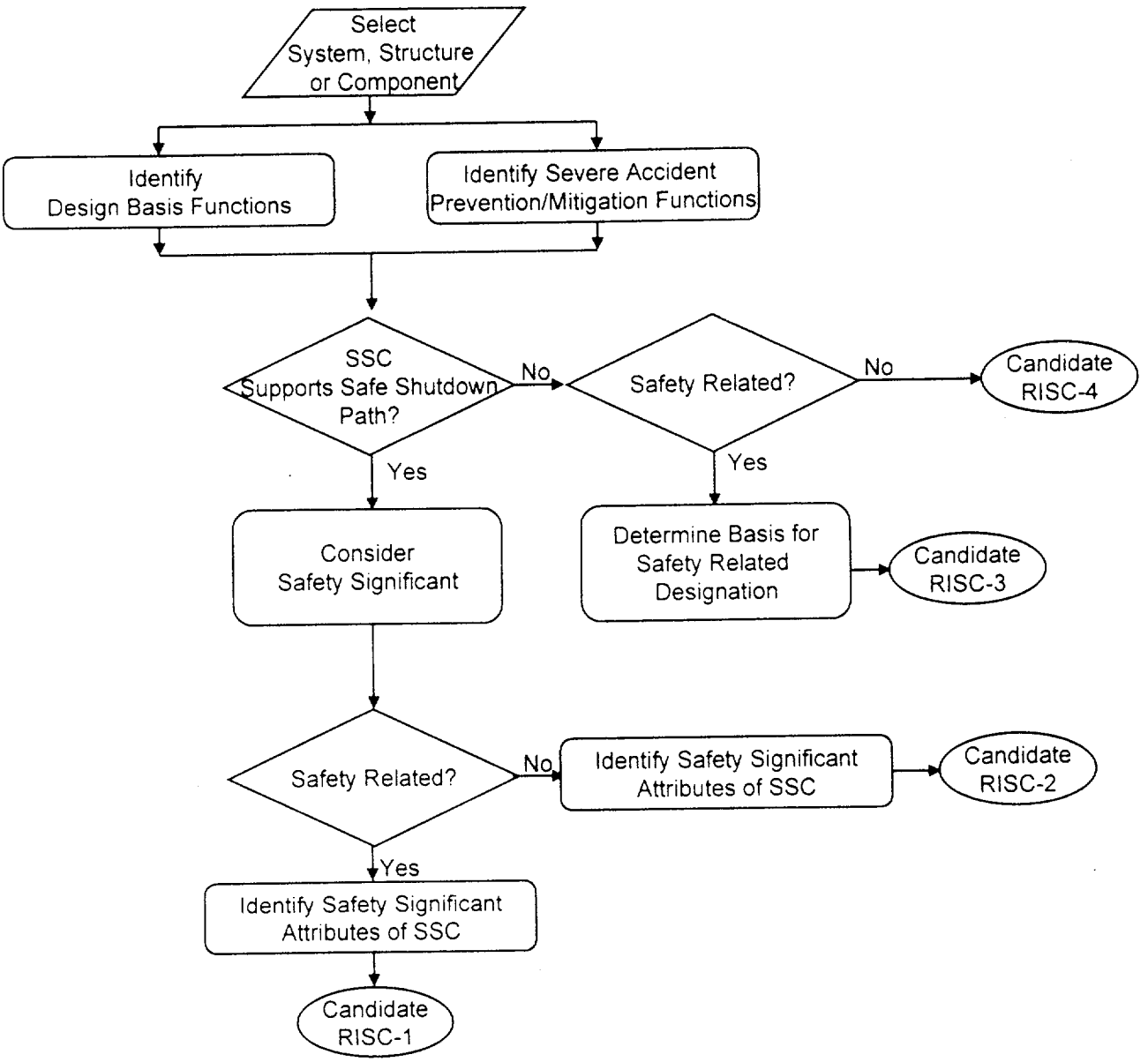

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Figure 2.4-10
RISK IMPORTANCE PROCESS FOR COMPONENTS ADDRESSED IN LOW POWER/SHUTDOWN PRAs

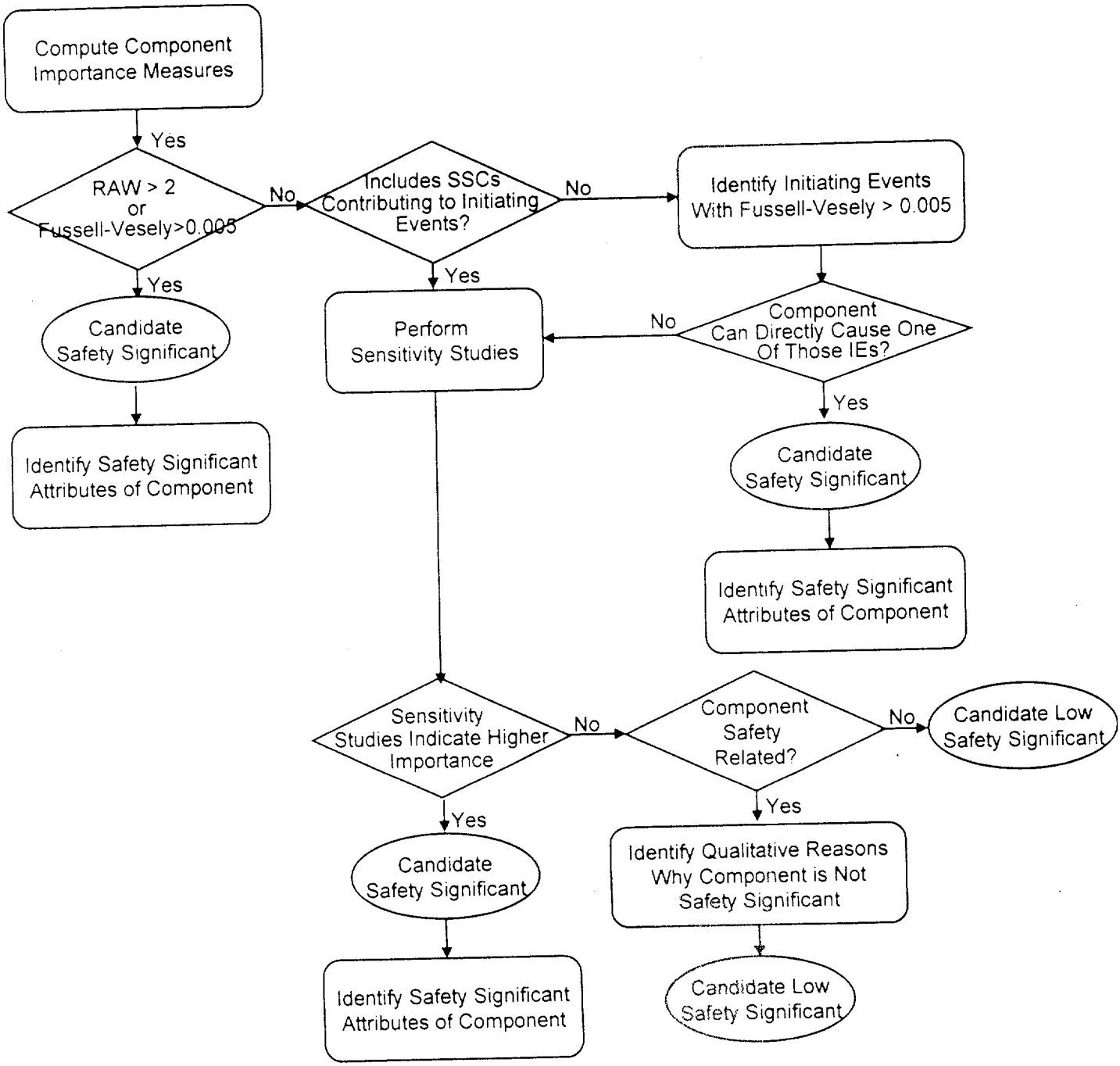

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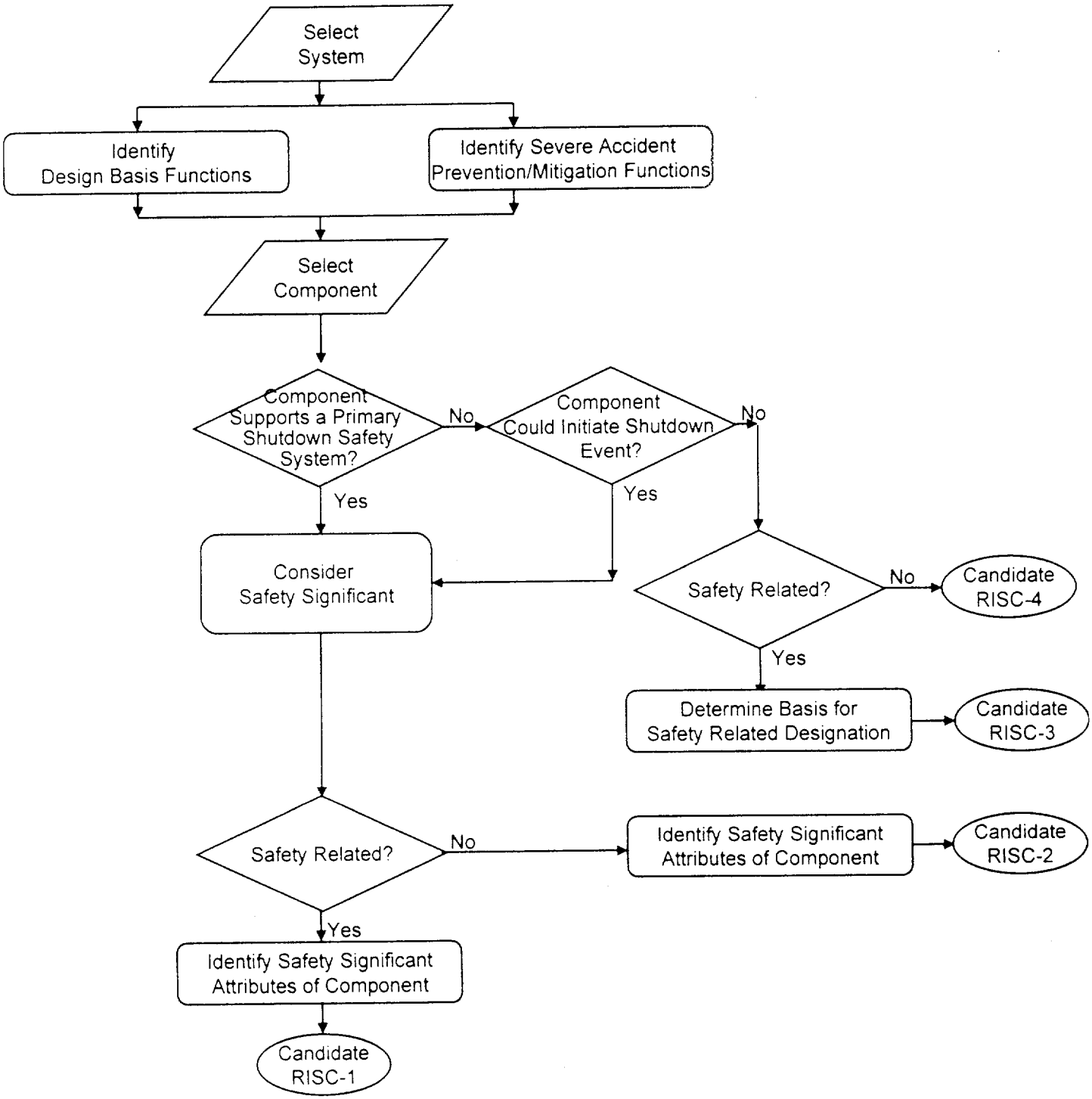
Figure 2.4-11
SAFETY SIGNIFICANCE PROCESS FOR
SYSTEMS AND COMPONENTS CREDITED IN NUMARC 91-06 PROGRAM



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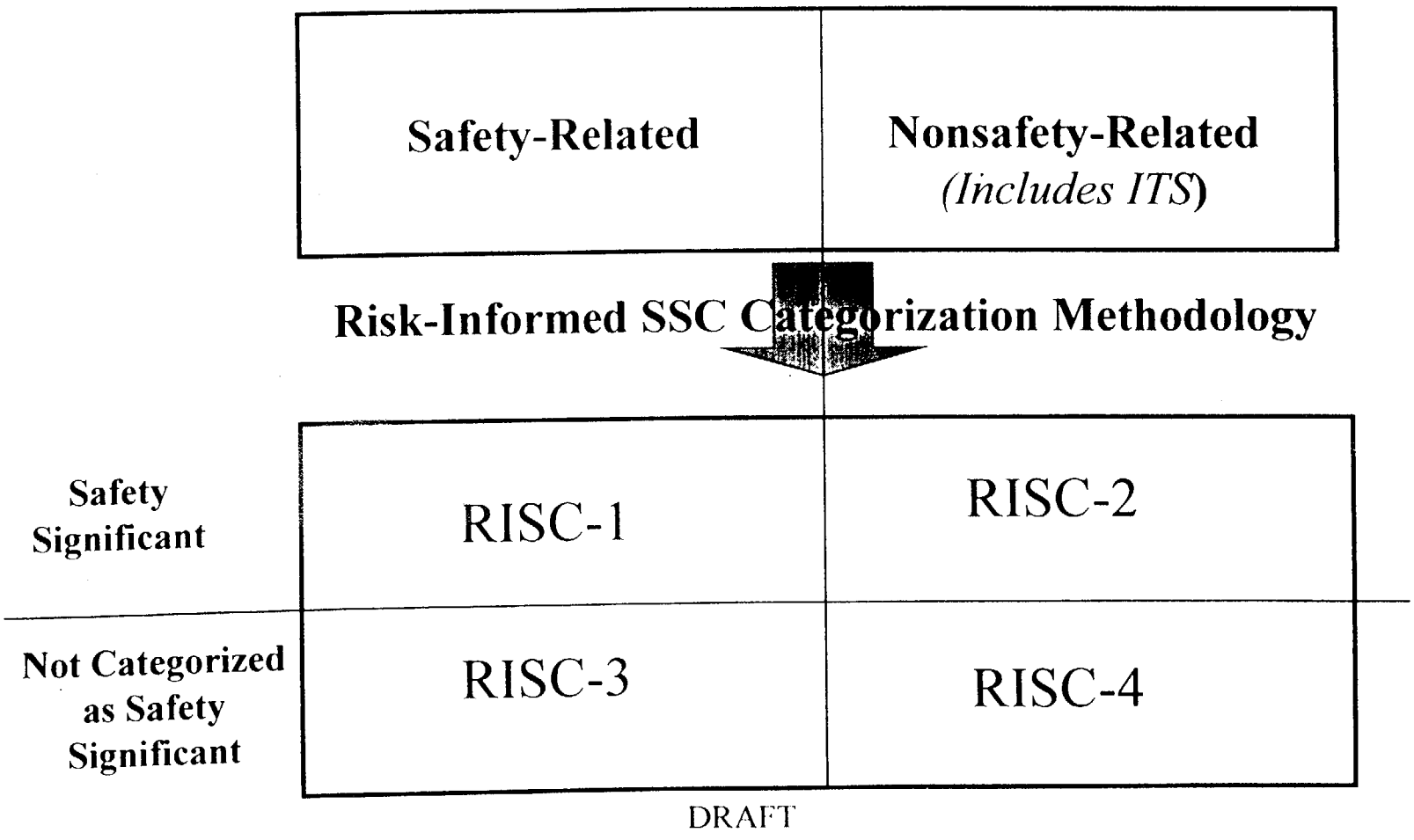
Risk-Informed Categorization



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Risk-Informed Safety Category - 1

Existing Safety-Related, Safety-Significant SSCs

- ***Existing safety-related SSCs & safety-related attributes/functions***
  - No change, as per existing safety-related SSCs requirements
- ***Existing safety-related SSCs & new attributes/functions***
- For beyond design basis events
  - Inclusion in plant programs such as design and testing, to provide assurance of operation to satisfy assumptions in the risk-evaluation methodology

Risk-Informed Safety Category - 2

Existing Nonsafety-Related, Safety-Significant SSCs

- **NONSAFETY-RELATED SSCs**
- **ITS, SAFETY-SIGNIFICANT SSCs**
- *Subject to the maintenance rule, including its corrective action element, §50.65(a)(1)*
- *Assumptions and conclusions of the risk-informed SSC evaluation satisfied*
- *Reasonable commercial assurance standard -- commercial practices*
- *As necessary, assess environmental, seismic, or other attributes to provide a commercial level of assurance that the equipment would operate under the defined conditions*

Risk-Informed Safety Category - 3

Existing Safety-Related/ITS SSCs

NOT Categorized as Safety-Significant SSCs

- *For SSCs directly credited in the regulations*
  - *Monitoring or commercial controls and procedures*
  - *Maintenance rule performance thresholds are sufficient for monitoring, (system/train level)*
  - *Reasonable commercial assurance standard to satisfy the assumptions in the applicable regulations*
  - *Existing licensing commitments superceded by a commitment to monitor or adopt attribute controls (commercial standards)*
- *For SSCs directly credited in the regulations, cont'd*
  - *Environmental or seismic considerations based on commercial practices, vendor certification, design, testing or analyses*
  - *Not subject to NRC reporting requirements*
- *For other RISC - 3 SSCs*
  - *Commercial level programs*
  - *RISC-4 candidates*

Risk-Informed Safety Category - 4

- SSCs not categorized as safety-significant and are nonsafety-related SSCs
- Not subject to NRC regulations
- Subject to new NRC oversight process
  - e.g., a failure of RISC - 4 SSC results in a unit trip
- Licensing commitments are no longer applicable
  - Adjust via Commitment Management Guideline

Pilots

- Funding targeted for BWR "systems pilot"
  - core spray (RISC 2) and feedwater (RISC 3)
  - define attributes, treatment
  - Consistent with industry guidance
- Other OG considering similar efforts

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TREATMENT of RISC-2 and RISC-3 SSCs in a RISK-INFORMED PART 50

OBJECTIVE

Identify typical commercial standards or processes (e.g., design, procurement, qualification, quality assurance) that could be used to provide confidence that the functionality of RISC 2 and RISC 3 systems, structures and components (SSCs) will be maintained.

GENERAL APPROACH UNDER CONSIDERATION

- Identify the processes (e.g., design, procurement, qualification, quality assurance processes) that are affected by the special treatment rules
- Identify the principal attributes of the affected processes that are required by the special treatment rules, for example;
  - ❑ Independent design verification
  - ❑ Vendor audits
  - ❑ Seismic qualification by test or dynamic analysis
- Compare the process attributes required by the special treatment rules to those typically used in commercial engineering standards or practice
- Identify the commercial standards or process attributes that could be used to provide confidence that the functionality of RISC 2 and RISC 3 SSCs will be maintained.

Attachment 3

ASME Presentation

For
RIP50 Meeting At White Flint
23 February 2000

By
C. W. Rowley, PE
Chairman, BNC&S TG on RIP50

ASME Disclaimer

- The following thoughts on RIP50 are just that.....thoughts, which have not been approved by the ASME technical consensus process
- The presenter has worked within the ASME nuclear codes and standards process for over 25 years, so he may be able to offer some ASME perspectives

RIP50 Issues

- Risk-informed categorization process into HSSCs and LSSCs
- SSC scope
- Special treatment requirements for LSSCs

RI Categorization (thought #1)

- ASME OMN-3 Code Case (for P&V IST)
- ASME N-560, -577, and -578 (for ISI)
- ASME OMN-10 Code Case (Snubber IST)
- 10 CFR 50 Appendix T (draft for Option 2)
- NEI Guideline (under development)

RI Categorization (thought #2)

- Is the RI categorization process unique to certain "components"?
- Or can the RI categorization process be generic for all "components"?
- Can a generic RI categorization process be applied at the systems level (accepting that perhaps this may be conservative)?

RI Categorization (thought #3)

- Each plant does have a PRA
- Some plant PRAs are "better" than others
- None of the PRAs are perfect
- Some components are not modeled
- Thus we need to blend the deterministic and the probabilistic information in the Expert Panel (integrated decision-making)

RI Categorization (thought #4)

- Today our mechanism to perform RI categorization is the Expert Panel
- Thus we need "controls" on the Expert Panel integrated decision-making process
- Tomorrow, as we get our PRAs better and better, we will be able to rely more and more on the qualitative results of the PRA

SSC Scope (thought #1)

- Safety related vs non-safety related
- SSCs important to safety
- ASME Code Class 1/2/3
- Active components vs pressure boundary

.....in the past
-safety related
-important to safety
-safety significance

SSC Scope (thought #2)

Number	Description
– ASME Code Class 1	– RCS pressure boundary
– ASME Code Class 2	– components in systems connected to RCS
– ASME Code Class 3	– systems that affect the function of RCS (e.g., cooling, aux FW, radioactive waste)

SSC Scope (thought #3)

RISC-2 SSCs HSSCs / NSR	RISC-1 SSCs HSSCs / SR
RISC-4 SSCs LSSCs / NSR	RISC-3 SSCs LSSCs / SR

Special Treatment Requirements for LSSCs (thought #1)

- System functionality
- Performance monitoring
- Component reliability
- Commercial practice

.....where does formal corrective action fit?

Special Treatment Requirements for LSSCs (thought #2)

- 10 CFR 50.65 (Maintenance Rule) is already providing a performance incentive for those systems "in scope"
- How do we handle seismic, fire, and environmental qualification of the LSSCs?
- What about 10 CFR 21 requirements relating to the dedication of commercial grade items to safety related service?

Special Treatment Requirements for LSSCs (thought #3)

- Commercial practice still uses design codes
- Commercial practice has been quite ad hoc in the RRM area
- ASME Post Construction Committee are currently developing Repair, Testing, & Inspection Standards
- Commercial owner typically creates his PM program based on incentives.....plant safety, plant economics (predictive maintenance programs are widely used in non-nuclear industry)

Special Treatment Requirements for LSSCs (thought #4)

- The nuclear industry is a maze of inter-woven requirements
- For Option #2 we have no choice but to disentangle these interwoven requirements.
- That has already been done by ASME for IST and for ISI (part of Option #1 effort)
- ASME is now looking at design, RRM, QME, air & gas treatment, cranes.....

Special Treatment Requirements for LSSCs (thought #5)

- 10 CFR 50 Appendix B provides for GQA
- Some plants have converted to the ASME NQA-1 Standard for their QA Program
- NQA-1 does provide for Graded QA
- Wonder if one of those NQA-1 plants should be one of our pilots in this area?

Final Thought

- We created a sledgehammer approach to risk in the early days of nuclear power
- We have tacked on many deterministic (and prescriptive) band-aids over the years
- Option #3 is our opportunity to completely change our approach to risk
- Option #2 needs to be the bridge between the past and Option #3