



**RIC 2009
PRA Standards –
Promise, Progress & Peril**

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March 10, 2009

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PRA Standards: Status

- ASME/ANS RA-Sa-2008 Combined Standard – Addendum A to 2008 Revision (April 2009)
 - At Power, Internal Events
 - At Power, Internal Hazards - FLOOD
 - At Power, Internal Hazards - FIRE
 - At Power, External Hazards – SEISMIC, etc
- ANS LPSD, Internal Events - draft
- ANS Level 2 & 3 - draft

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PRA Standards: PLUS / DELTA

PLUS

- Indication of the maturity of PRA methodology
- Process for consensus building
- Identifies necessary & sufficient requirements
- 3 capability categories provide a gradation in requirements to support different applications

DELTA

- PRA "ideal" does not fit in standards-world very well.
 - Search for undiscovered sequences / dependencies / vulnerabilities that may be important to risk
 - Apply PRA resources commensurate with risk significance of the hazard in an iteration process

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At-Power, Internal Events Standard

PLUS

- Developed over ~10 years with large number of contributors - true consensus standard.
- CAT 2 is a clear target for PRA capability. CAT 1 & CAT 3 provide boundaries that help define CAT 2.
- Has been used by a number of utilities – self assessments & peer reviews.

DELTA

- Some SRs still have unclear requirements, that can be interpreted quite differently.
- Some SRs have limited value (although they address completeness & uncertainty issues)
- Cost to demonstrate compliance with Standard
- Potential for use by unqualified personnel

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At Power, Internal Hazards - FIRE

PLUS

- Standard has a methodology (how to do) that goes hand-in-hand
- Written by a group of experts

DELTA

- May be difficult to meet standard without fully implementing the methodology
- Standard is written at a finer level of detail than internal events requirements.
- Not clear what the target should be (is it appropriate to expend such resources on risk that previous analyses have shown to be small contribution to total CDF?)

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At-Power, External Hazard Events

PLUS

- Written by a (small) group of experts
- Being piloted (first application)

DELTA

- Very little experience applying this standard.
- May be difficult for PRA analysts to use without experts
- Not clear with the target should be (is CAT 1 adequate for anticipated applications?)

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Low Power Shutdown (LPSD) Draft

PLUS

- Identifying issues that should be considered for the At-Power PRA standard (e.g., operator-induced IEs and dependency with post-IE actions)
- Writing Group includes contributors with experience in LPSD analyses & Outage risk management tools

DELTA

- Difficult to reach consensus within PRA community
- Challenge to incorporate QLRA with PRA in a standard
- Not clear where the divide is between LPSD standard and At-Power standard (where does low power start)

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Peer Review Process

PLUS

- Good process for calibrating PRA with regard to rest of the industry
- Good means for cross-fertilization of PRA groups
- Provides specific issues to address to provide desired capability

DELTA

- Resource intensive
- May be driven by compliance-oriented peer reviewer
- Differences of interpreting requirements can siphon resources away from significant modeling issues.

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Conclusions

- PRA Standards are here to stay.
- PRA Standards have helped to improve PRA capability across the industry .
- The at-power / internal events standard is a mature set of consensus requirements – but that was the “easy” standard to write.
- PRA community needs to take a long view with regard to Standards.

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