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Some comments about the elaboration of PIRTs

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COMMENTS ON IN-VESSEL & EX-VESSEL PIRTS

Methodology = evaluation of uncertainties & impact for individual phenomena
→ ranking = (uncertainties + impact) or (uncertainties * impact)?

- “Impact” is design-dependent (related to a safety margin) → it is very (too?) difficult to elaborate a “generic” PIRT
- Sometimes confusion made by the experts between “phenomenon” and “impact”
- Apparently, a “bias” to rank higher the “new” issues and new fuels: it does not seem justified in many cases

- a PIRT which is presented simply as a collection of numbers is not very useful.
- The main interest of a PIRT is that it generates discussions between high-level experts, which can be summarized with sentences, as an explanation of the rankings → educative dimension

USEFUL REFERENCES

Wilson, G. E., & Boyack, B. E. (1998). **The role of the PIRT process in experiments, code development and code applications associated with reactor safety analysis**. Nuclear Engineering and Design, 186(1–2), 23–37. https://doi.org/10.1016/S0029-5493(98)00216-7

PIRTs were initially derived as support to the BEPU licensing approach

A PIRT must have objectives: designing experiments, improving code models, assessing safety margins.

The usefulness of PIRTs tend to increase with their specificity to each particular application and objective

Henry, R. E. (1995). **How to Use Expert Judgement to Assess Uncertainties**. *International Conference on Probabilistic Safety Assessment Methodology and Applications*.

One of the tasks is to « find problems » and evaluate uncertainty bands

Experts should also have a propensity for « solving problems » i.e. not overestimating uncertainties

Meaningful hand calculations are necessary when a new situation/phenomena is not covered by existing codes

RECOMMENDATIONS

- “Explain” the rankings with sentences
- Make distinctions between reactor designs (and maybe scenarios too)
- Try to be more quantitative in the evaluation of uncertainties in data/models
- Clarify the impact on safety barriers and on Source Term