Target Accuracy Requirements (TAR) Exercise within WPEC/SG46 and Feedback on Nuclear Data Needs

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Abstract: A Target Accuracy Requirements (TAR) exercise is presented which aims at quantifying nuclear data needs, in terms of uncertainty reduction, to meet target accuracies on specific integral parameters driven by reactor and fuel cycle designs.

A first TAR exercise was performed at NEA in the period 2005-2008 within the framework of WPEC/SG26 on "Uncertainty and target accuracy assessment for innovative systems using recent covariance data evaluations" [1]. The WPEC/SG26 exercise did provided a total of 15 entries to the NEA High Priority Request List (HPRL) [2] which served as guidance for new experiments and data evaluations.

In 2018, a second TAR Exercise was launched in the framework of the WPEC/S46 on "Efficient and Effective Use of Integral Experiments for Nuclear Data Validation" [3].

Firstly, participants in the 2nd TAR Exercise reviewed the status of design target accuracies and their potential evolution for both traditional systems and new reactors concepts. Participants provided the definition of models and sensitivity profiles for the key integral values in a set of new reactor designs.

Then, a new TAR methodology was defined within WPEC/SG46 considering nuclear data corelations in energy, reactions and isotopes in the inverse-optimization problem. Moreover, covariance data from recent nuclear data evaluation projects were processed in only seven energy groups which were defined on physical considerations.

Results of the 2nd TAR Exercise will be presented demonstrating the effectiveness of the TAR outcomes to provide new requirements of nuclear data uncertainty reduction for the NEA- HPRL. The work will have a significant impact in prioritizing new experiments, both differential and integral; as well as in fostering international collaboration.

References:
1. M. Salvatores, R. Jacqmin, *WPEC/SG26 Report: Uncertainty and target Accuracy Assessment for Innovative Systems Using Recent Covariance data Evaluations*, OECD/NEA. No.6410 (2008)
2. E. Dupont et al., *HPRL – International cooperation to identify and monitor priority nuclear data needs for nuclear applications*, EPJ Web Conf. **239**, 15005 (2020)
3. WPEC/SG46 official website: https://oecd-nea.org/download/wpec/sg46/