Subgroup 33 meeting on June 2nd, 9 am to 5 pm

9 am – 9.20 am Welcome, approval of agenda, action items from last meeting. (M. Salvatores)

1. Summary presentations (15 minutes max each) of adjustment methodologies key features: e. g mathematical method, input data (type of uncertainties, systematic bias, method uncertainties, etc.), output data (new covariance on adjusted data and/or experiments, etc.), computing requirements, etc.

9.20 am – 9.35 am ANL (R. McKnight)
9.35 am – 9.50 am NRG (D. Rochman)
9.50 am – 10.05 am CEA (C. De Saint Jean)

2. Discuss on how to assess methodologies for deliverable

10.05 am – 10.30.00 am Comparison of Methodologies (M. Ishikawa)
10.30 am – 10.45 am Break
10.45 am – 11.30 am Criteria for comparison and deliverable (C. de Saint-Jean, M. Ishikawa, and G. Palmiotti drive discussion with all participants)

3. Presentations of preliminary adjustment results if available and compatibly with distribution of models of benchmark experiments.

11.30 pm – 12.00 pm Input and output formats (E. Dupont)

12.00 pm – 1.30 pm Lunch break

1.30 pm – 1.50 pm Corrective factors and model of experiments (G. Palmiotti)
1.50 pm – 2.10 pm Corrective factors and model of experiments (K.Sugino)
2.10 pm – 2.30 pm Integral experiment covariance matrix methodology (M. Ishikawa)
2.30 pm – 2.50 pm Integral experiment covariance matrix methodology (R. McKnight).
2.50 pm – 3.20 pm Adjustment methodology used at JAEA and preliminary adjustment results (K.Sugino)

3.20 pm – 3.40 pm Break

4. Presentations of preliminary uncertainty evaluation of integral parameters on target systems (ABR oxide fuel, and JAEA FBR). This evaluation should be limited to Keff of the BOC core and to Na void (fuel core regions only voided) reactivity. This evaluation should be done by each participant using their uncertainty covariance data. A short description of the uncertainty data used is expected.

3.40 pm – 4.10 pm AFCI 1.3/2.0 new covariance data (M. Herman)
4,10 pm – 4.25 pm Preliminary uncertainty analysis results for ABR (G. Palmiotti)

5. Discussion on next steps.

4.25 pm – 5.00 pm Next steps, schedule, and next meeting (All)

Actions from previous meeting

NEA (E. Dupont) Update the subgroup web page with materials from this meeting and other participant contributions.

CEA/Cadarache To provide, before the end of the year 2009, INL with the ENDF/B-VII.0 33-group data library for the ERANOS code.

CEA/Cadarache To consider providing a fast reactor core concept for testing.

G. Palmiotti E. Dupont To provide, before the end of January 2010, the participants with format specification for the benchmark input/output.

All participants To provide, before the end of February 2010, the coordinators (copy NEA) with the simplified integral experiment models and associated specifications to be used in the benchmark exercise.

All participants To provide, before the end of March 2010, the coordinators (copy NEA) with a paper describing the adjustment methodology to be used in the exercise.

G. Palmiotti C. de Saint-Jean M. Ishikawa To critically review the participants papers describing the adjustment methodology and to write a report of the findings by June 2010. This is the first deliverable requested to the subgroup.

All participants To start the benchmarking of adjustment methodologies in April/May 2010 the latest. The preliminary results should be discussed at the next SG33 meeting in June 2010.

Benchmark proposal

A “benchmark” exercise is proposed. …. The benchmark will make use of a single, limited set of integral experiments and measurements.

The final results will be tested on a model of the Advanced burner reactor (ABR) with plutonium oxyde fuel or/and a model of the JAEA FBR core….

To facilitate comparisons, a common 33 group structure (available on the subgroup webpage) is adopted for the benchmark input/output. …

The ANGELO code can be used to convert covariance matrices from one group structure to another (cf. presentation by I. Kodeli).

The coordinators and the NEA secretariat will send format specification to the participants. All benchmark input/output will be available on the subgroup webpage.

Benchmark input

Isotopes
10-B
16-O
23-Na
56-Fe, 52-Cr, 58-Ni
235-U, 238-U
239-Pu, 240-Pu, 241-Pu

Nuclear data

Elastic scattering infinite-dilution cross section,
Total inelastic scattering infinite-dilution cross section,
Capture infinite-dilution cross section (this includes 10B(n,α) reaction),
Fission infinite-dilution cross section,
Average prompt fission neutron multiplicity (Nu-bar),
Normalized prompt fission neutron spectrum,
Average cosine of elasticaly scattered neutrons (Mu-bar),
Average delayed fission neutron multiplicity (Nu-d)

Nuclear data covariances

Every participant will use its own nuclear data covariances (step 1, see below). However, in step 2 of the exercise, for comparison purpose and to disentangle effects from different *a priori* cross sections or covariances, it was decided that one common set of covariance data would be used by all the participants, in addition to their own specific sets. The 33-group AFCI-1.2 covariance matrices will be used, if available (see presentation later on)

Integral data

Jezebel 239-Pu configuration: 1 critical mass, 3 spectral indices: F28/F25, F49/F25, F37/F25,
(240-Pu configuration: 1 critical mass),

Flattop Pu configuration: 1 critical mass, 2 spectral indice: F28/F25, F37/F25,

ZPR6-7 Standard configuration: 1 critical mass, 3 spectral indices: F28/F25, F49/F25, C28/F25,
(High 240Pu content: 1 critical mass),

ZPPR9 1 critical mass, 3 spectral indices: F28/F25, F49/F25, C28/F25,
2 Na voids: central void and leakage-dominated configurations,

Joyo 1 critical mass.

Integral data covariance

The subgroup coordinators will provide the participants with an integral data correlation matrix for testing purpose.

Sensitivity coefficients

Every participant to the benchmark exercise will use its own sensitivity coefficients. Some comparisons of sensitivity profiles will be performed on a case by case basis.

Benchmark exercise

Every participant to the benchmark exercise will use the same integral experiment values (E) and uncertainties, but their own calculated value (C), sensitivity coefficients, and adjustment/assimilation method.
The benchmark will consist of a three-step exercise using:

1. own initial cross sections, own nuclear data covariances, w/wo integral correlation

2. own initial cross sections, same nuclear data covariances, w/wo integral correlation

3. same initial cross sections, same nuclear data covariances, w/wo integral correlation

Benchmark output

The main benchmark results relevant for comparison are,
- Adjusted nuclear data,
- Final nuclear data covariances,
- Initial and final integral C/E values and associated uncertainties,
- Initial and final results of reactor project calculations including uncertainties.

The initial/final nuclear data and covariance matrices will be tested on the ABR (start up) configuration. In order to test the ability to extrapolate the results, it has been suggested to consider also a different target design. As possible candidates: ABR at equilibrium, JAEA FBR

Time-schedule as originally proposed (to be updated at the end of this meeting)

Time-schedule

1. The following time-schedule for the subgroup deliverables was agreed:

Second half of 2009:	1. Provide feedback on the specifications for the benchmarking of adjustment methods and finalise the specifications for the benchmarking of adjustment methods 2. Write papers on the different adjustment methodologies used.
First half of 2010:	1. and start the benchmarking of adjustment methodologies. 2. Review and document the pros and cons of the different adjustment methods used, based on the submitted papers (see above).
Second year	Complete adjustment exercise and compare results
Third year	Complementary analysis and write the final report.