MEETING REPORTS

SUMMARY OF THE INTERNATIONAL WORKSHOP ON NUCLEAR DATA FOR FUSION REACTOR TECHNOLOGY, SAN DIEGO, CALIFORNIA, MAY 3–6, 1993

From May 3 to 6, 1993, 65 experts met at the International Workshop on Nuclear Data for Fusion Reactor Technology, which was held in the shadow of the San Diego, California, International Thermonuclear Experimental Reactor (ITER) Co-Center. These experimentalists, evaluators, designers, and other users of nuclear data discussed nuclear data needs, status, and plans. The workshop greatly benefited from the contributions from members of the ITER team.

The workshop was divided into the following subgroups:

1. Nuclear Data Needs—Plenary Session
2. Measurements
   a. Measurement Facilities
   b. Status of International Measurements Program
   c. International Data Measurements
3. Evaluations
   a. Status of Nuclear Data Evaluations for Fusion Applications
   b. Fusion Evaluation Nuclear Data Library (FENDL) Activities
   c. International Cooperation in Data Evaluations
4. Validation of Libraries
   a. Interface Between Experiment and Calculation
   b. Activation Evaluations/Calculations
   c. Integral Measurements and Benchmarking Nuclear Data
5. Validation of Workshop Recommendations.

Major deficiencies were found in the evaluations of various materials considered for applications of ITER. Plans were outlined to correct the deficiencies.

More general concerns were also discussed as follows:

1. More communication must exist between nuclear data generators and processors and the people using the nuclear data such as reactor physicists and safety analysts.

2. There are cases where data are said to be known to 20%, yet evaluations can differ by a factor of 2. Uncertainty bands are extremely important, although they may be difficult to determine. An example is $^{58}Ni(n,p)^{58}Co$.

The workshop learned that the uncertainties in nuclear data lead to uncertainties in nuclear responses, which will lead to concerns in

1. safety (due to uncertainties in radionuclide production)
2. operations (due to uncertainties in the time periods necessary to allow entry into the torus)
3. waste management (due to uncertainties in radionuclide production)
4. heating of critical components such as the superconducting magnets
5. determination of shielding thicknesses.

Experimental facilities were found to be insufficiently supported, and certain important capabilities to meet data needs for fusion development have been lost in recent years. Others are expected to be closed in the near future. There appears to be no organized effort to coordinate facilities internationally so that fusion nuclear data needs can be met in the future.

More reliance is being placed on nuclear models in the preparation of evaluated nuclear data libraries. Modeling approaches have advanced significantly in recent years, and much more is known about the accuracy with which certain nuclear data can be predicted. Still, further model development is essential in providing data with small uncertainties, in particular for reactions that cannot be measured directly such as on radioactive nuclei.

Summaries of the workshop will be available at various regional fusion technology meetings such as the Symposium on Fusion Technology, the American Nuclear Society Fusion Topical Meeting, and the Third International Symposium on Fusion Nuclear Technology.

The next meeting will occur in 1 to 2 yr. Dr. Edward Cheng of TSI Research and Dr. Charles Dunford of the Nuclear Data Section of the International Atomic Energy Agency will coordinate the next meeting with the ITER project.

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