National Nuclear Data Center and Nuclear Energy

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Brookhaven Science Associates
National Nuclear Data Center
Probably the oldest active organization at BNL

History
- Founded in 1952 as Sigma Center, neutron cross sections
- Changed to National Nuclear Data Center in 1977
- 40 staff members in good old times
- 12 staff members + 2 postdocs today

Mission
Compile, evaluated and disseminate nuclear physics data for basic nuclear physics research and applied technologies

Funding, close to $4M
- DOE-Office of Science, ~85%
- DOE-NNSA (‘Defense’) and DOE-Nuclear Energy
Stories to tell

How BNL high flux research reactor was shut down

Why electricity cost on Long Island is the highest in the United States

How can one learn about US nuclear ‘secrets’

How the Russian submarine fleet in Murmansk with Pb-Bi cooled reactors got rescued
Special training is needed to pronounce correctly some tricky nuclear data abbreviations!
Usage of NNDC services grows rapidly
New neutron cross section library in 2006
Workhorse behind all reactor calculations for next ~100 years!

ENDF/B-VII.0 developed by CSEWG with a significant contribution from several national labs. “Big paper” published, more than 50 citations in 2 years. Strongly related to up-to-date nuclear reaction physics.

**Principal advances** over ENDF/B-VI library

- Many new cross sections for major actinides
- New set of fission product evaluations
- Improved thermal neutron scattering
- More precise standards
- New radioactive data
- Photonuclear reactions
- New methods for uncertainties and covariances

**Validation** carried out in US and Europe (hundreds of integral experiments) proved absolute superiority of the ENDF/B-VII.0 over precedent libraries.