

USNDP Annual Meeting, BNL, Nov 9-11, 2005



**NNDC Report to
USNDP Meeting 2005**

Pavel Oblozinsky

**National Nuclear Data Center
Brookhaven National Laboratory**

NNDC Operations



Personnel

- Vicki McLane retired in Dec 04, replaced by Dimitri Rochman (PhD nuclear physics) in Nov 04 (CSISRS compilation, ENDF evaluations)
- Charlie Dunford retired in June 04, not replaced due to the lack of funding
- Nedy Santiago (secretary) replaced Gail Brown since Feb 2005
- Current staff level **11.6 FTE** = 8.0 PhD + 1.0 Professional + 2.6 Support

Coordination and reporting

- CSEWG-USNDP Annual Meetings'04 held (Nov 2004)
- Minutes of Meetings'04 issued, talks & reports on Web (Dec 2004)
- USNDP Annual Report 2004 issued (Jan 2004)
- USNDP Workplan 2006 issued (Feb 2005)
- **USNDP Budget Briefing** held at DOE-SC (Feb 2005)
- **No work yet on Annual Report 2005 (in past done by Charlie!)**

Databases and Services



Database management

- NSR, XUNDL, ENSDF, NuDat maintained and distributed regularly (1-6m)
- CSISRS maintained and distributed regularly (1-2m), ENDF as necessary
- Includes processing and checking (structure data, reaction data)

NNDC web service

- Data retrievals increased by **62% in FY05** (compare with 46% increase in FY04, 17% in FY03), still impact of migration project, new service started in April 2004
- Several new products: NuDat 2.1, Empire-2.19, Q-calc, Nuclear Wallet Cards, and more ...
- NNDC Web service, **Boris Pritychenko** (USNDP talk)
- USNDP Database Computer System Upgrade, **Ramon Arcilla** (USNDP talk)

Nuclear Structure Data



ENSDF evaluations

– Completed and submitted 113 nuclides

- $A = 67$ (collaboration, 4 nuclides Tuli)
- $A = 153$ (collaboration, 10 nuclides Helmer & Tuli)
- $A = 169$ (14 nuclides Reich)
- $A = 233$ (collaboration, 4 nuclides Tuli)
- $A = 252$ (8 nuclides Nica)
- $A = 254$ (collaboration, 10 nuclides Tuli)
- $A = 266-294$ (63 nuclides Gupta & Burrows)

– Published 5 mass chains

- $A = 67, 233, 254$ (Tuli)
- $A = 88$ (Sonzogni)
- $A = 160$ (Reich)

– Reviewed 13 mass chains

- $A = 105, 165, 181, 185$ (Reich)
- $A = 54$ (Sonzogni)
- $A = 67, 109, 115, 241, 243, 252, 254$ (Tuli)

Nuclear Structure Data, ctn'd



NuDat

- Upgrade to NuDat 2.1
- The most successful web product
- **138% increase of retrievals in FY05 compared to FY04**
- Featured in Physics Today and Science

ENSDF processing

- Processed 26 new mass-chains, several individual nuclides and datasets
- Processing includes file checking, corrections and manuscript preparations

Nuclear Data Sheets

- Published 12 ENSDF issues

Nuclear Structure Data, ctn'd



Nuclear Wallet Cards

- Nuclear Wallet Cards 7th edition issued in April 2005
- Printed 10,000 copies, so far distributed ~6,000 copies
- Update on Nuclear Wallet Cards for Homeland Security, **Jag Tuli** (talk)

ENSDF analysis and utility codes

- BRICC-2.0 code for conversion coefficients (collaboration with Kibedi, Australia) released

Nuclear Science References

- Over 80 journals scanned, input from 74 journals by NNDC (Dave Winchell), small input from non-NNDC compilers
- Compiled 4,756 new references, including 3,383 with keywords

Nuclear Reaction Data

CSISRS compilation and ENDF management

- CSISRS data compiled (Dimitri Rochman) from 447 publications (1,550 reactions)
- 280 charged particle papers, 124 neutron papers, 43 photonuclear papers
- ENDF/B-VIIbeta0 released in March 2005, webpage maintenance, library assembly, phase 1 testing
 - Presentation by **Mike Herman** (CSEWG talk)

Model code development

- EMPIRE-2.19 released in March 2005
 - Presentation by **Mike Herman** (USNDP talk)
 - Many new features, powerful tool for evaluation

Nuclear Reaction Data, ctn'd



Evaluation work

- Complete re-evaluation of priority fission products: 20 nuclides by BNL-KAERI, always 6 reaction channels (total, elastic, capture, nn' , $n2n$, np)
- V-51 update of 2 reactions (hydrogen production for fusion community)
- Submitted to ENDF/B-VII beta 1 for testing
- Other evaluations (Gd) started but not completed in FY05
- Common project on covariances with LANL started (Gd) but not completed

Library of fission product neutron cross-section evaluations

- International project (WPEC SG23) lead by the NNDC
- Initial library with 164 materials prepared and reviewed
 - Presentation by **Pavel Oblozinsky** (CSEWG talk)

Atlas of Neutron Resonances

- Book submitted (Elsevier 2006, S. Mughabghab)

FY05 Metrics



NNDC metrics for FY05 (tentative)

- Compilations 6,306 (4,756 NSR + 1,550 CSISRS)
- Evaluations 175 (113 nuclides ENSDF + 62 reactions ENDF)
- Dissemination 778k (increase by 62% compared to FY04)
- Reports 37 (includes 29 in ND-2004 Proceedings)
- Papers 9
- Invited Talks 7

Comments:

- Evaluations considerably higher than in FY04 due to 63 super-heavies (ENSDF) and 62 reactions (ENDF/B-VII) → unlikely to be repeated in FY06
- Considerable increase in dissemination, consequence of entirely new service launched in April 2004, much slower increase expected in 2006
- Publications high due to ND-2004 Proceedings, for full list see NNDC Recent Papers www.nndc.bnl.gov/articles/jsp/references/formrefs.jsp