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U.S. DEPARTMENT OF ENERGY

Implementation of NSDD accepted format/policy to the ENSDF database

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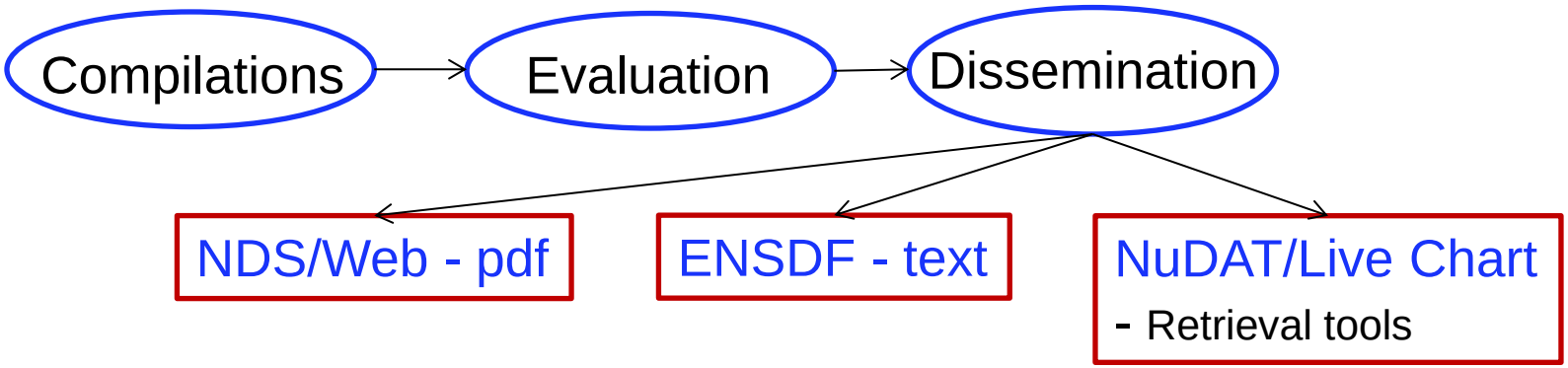
22nd NSDD meeting, May 22-26, 2017

LBNL, Berkeley, CA

Background



- Recently, we have identified a %Ig dissemination issue, which triggers the thought for this proposal
- Format/policy/procedure for data listing, presentation, community needs, etc.
- Sometimes final acceptance timeline is not obvious: Although common practice is to execute for ongoing and future evaluation work.
- Challenge: ~15-year execution time for any adopted policies to reflect on whole database. Yet sometimes slips from sight!

Some facts

PHYSICAL REVIEW C 77, 054610 (2008)

Measurement of the ^{241}Am(n, $2n$) reaction cross section from 7.6 MeV to 14.5 MeV

A. P. Tonchev,[1] C. T. Angell,[2] M. Boswell,[2] A. S. Crowell,[1] B. Fallin,[1] S. Hammond,[2] C. R. Howell,[1] A. Hutcheson,[1] H. J. Karwowski,[2] J. H. Kelley,[3] R. S. Pedroni,[4] and W. Tornow[1]

%Iγ - dissemination received attention

2015 NSDD Action items:

41	Kibedi	Policy implementation.	Modify GABS to generate %Igamma, and include on the continuation record.
42	Tuli	Policy implementation.	Run GABS on ENSDF file.

^{115}In IT Decay (4.486 H): Another %Iγ issue

- Cross section measurements using DD neutron generator at UCB

^{115}In IT Decay (4.486 h) 1974Ha39

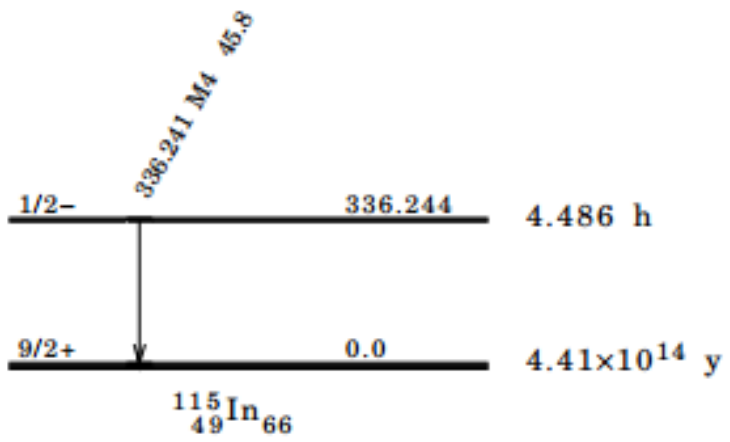
Parent ^{115}In: E=336.244 *17*; Jπ=1/2−; $T_{1/2}$=4.486 h *4*; %IT decay=95.0 *7*.
^{115}In–%IT decay: confirmed by Iβ=5.0% *7* to ^{115}Sn g.s. with negligible Iβ to excited states (see 1974Ha39).
Source: ^{114}Cd(n,γ) ion chem; 99.9% enriched ^{114}Cd.

Eγ	E(level)	Iγ†	Mult.	α
336.241 *25*	336.244	45.9 *1*	M4	1.073 *14*

† For absolute intensity per 100 decays, multiply by 1.00 *5*.

Decay Scheme

Intensity: Iγ per 100 parent decays
%IT=95.0 *7*



%Iγ - 45.9 ± 2.2
Uncertainty 4.8%
NDS 113, 2391 (2012)

Some other facts:

- Other policies:
  - Include total energy in decay data sets using RADLIST
  - Include n-capture state width from 2006MuZX, if available
- Guideline for half-lives, g.s. and isomeric states – NSDD 2015
- Revised Resonance data policy

Revised policy for inclusion of Resonance data in ENSDF

USNDP Nov 4-6, 2009
B. Singh (McMaster)

- Subcommittee at USNDP-08 to reformulate consistent policies for inclusion of resonance data in ENSDF: John Cameron (McMaster), Caroline Nesaraja (ORNL), Chris Ouellet (BNL), B. Singh (McMaster).
- Michael Smith (ORNL) and Alan Chen (McMaster) were consulted about need of such data in nuclear astrophysics context.

- In all cases, the use of SN+…, SP+.. should be avoided
- ~50 datasets in 25 different mass chains remains to apply:
- A=45, 47, 49, 51, **52**, 53, 55, 56, 57, 65, 81, **83**, **87, 88**, **91**, 94, 95, 97, 101, 123, 125, 131, 179, 208, **209**

Accepted format/policies executable by computers – were done in promptly in the past

Proposal:

- Update of related datasets or nuclides in ENSDF within a time frame of two years, based on importance/community needs
- One/two members of NSDD network can be responsible for assessing, tracking, coordinating, and reporting the task
- Report the progress at the following NSDD meeting – as of the current approach for “Action items”
- Participation through center of responsible mass region will be an effective approach, otherwise other option could be explored

Goal: Execute new format/policy to whole ENSDF within a shorter time frame based on importance and user needs

Thank You

Backup slides

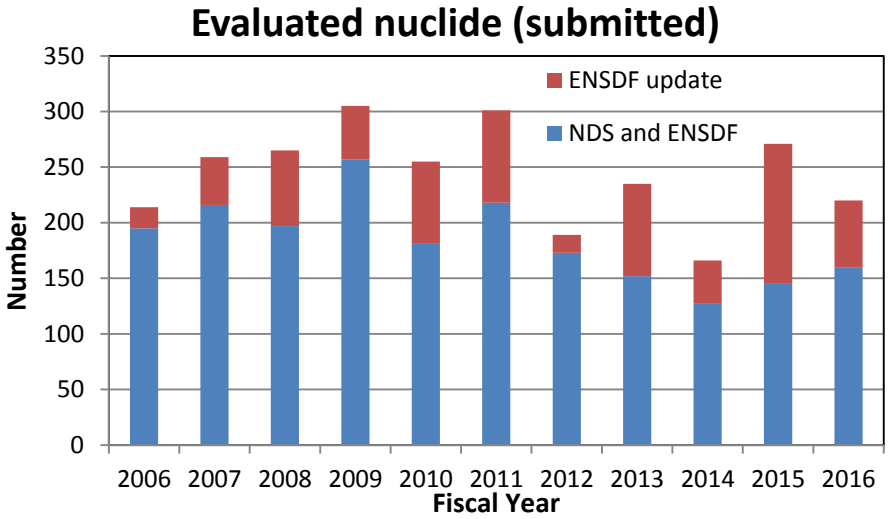
ENSDF status and trend:

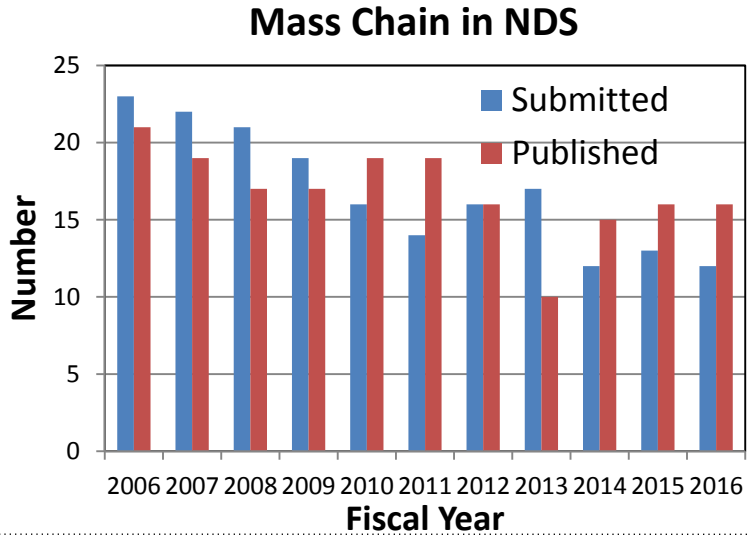
ENSDF

- Evaluated 220 nuclides in FY 2016, including 12 (non-US)
- **11-year average**: 244 nuclides
- ***Nuclear Data Sheets (NDS)*:** Published 16 and submitted 12 mass chains in FY 2016
- **11-year average**: 17 publications and 17 submissions

ENSDF FTE:

- FY2006: 6.7 (US) (5.4 permanent+ 1.3 temp) + 3.5 (non-US)=10.2
- FY2015: 6.5 (US) (4.4 permanent +2.1 contract) + ~1 (non-US)=~7.5





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ENSDF status and trend: Con't

- Target: Average lifetime of a mass chain: 5 to 5.5 years (10-year revision cycle)
- In reality: Average lifetime
  - 6.9 years in FY2004
  - 8.3 years in FY2016
- Total ENSDF size:
  - 148 MB in FY2004
  - 217 MB in FY2016
  - About 47% increase