

Status of the Nuclear Data Advisory Group (NDAG)

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**Fuel Cycle Research and Development
Nuclear Physics Working Group Meeting
Port Jefferson, NY
24-25 June 2010**

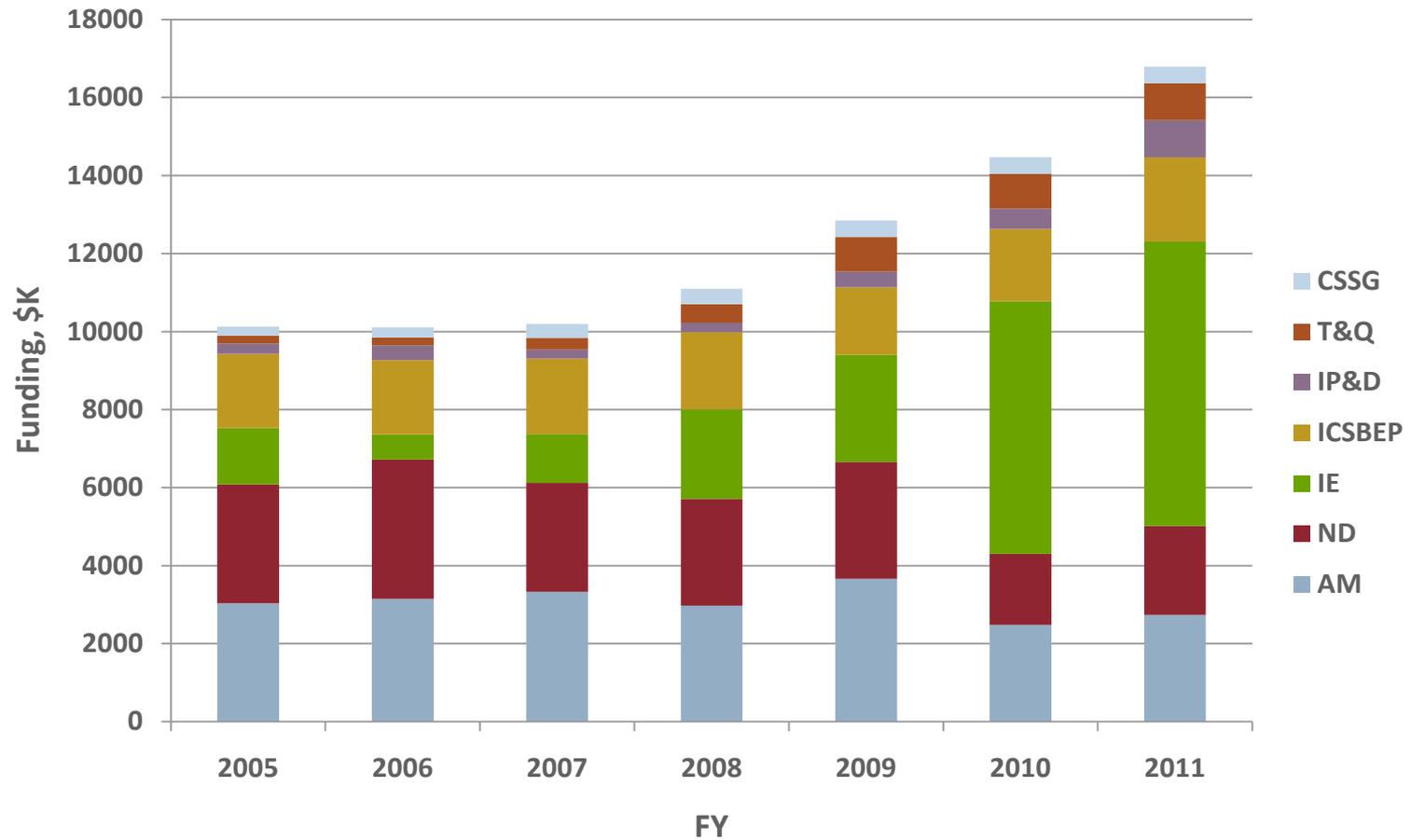
U.S. DOE Nuclear Criticality Safety Program

The six technical program elements are:

1. Analytical Methods (AM)
2. Information Preservation and Dissemination (IP&D)
3. Integral Experiments (IE)
4. International Criticality Safety Benchmark Evaluation Project (ICSBEP)
5. Nuclear Data (ND)
6. Training and Education (T&E)

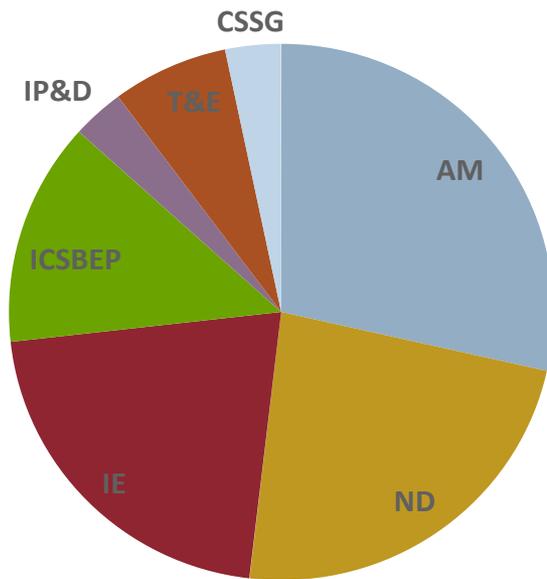


NCSP Funding



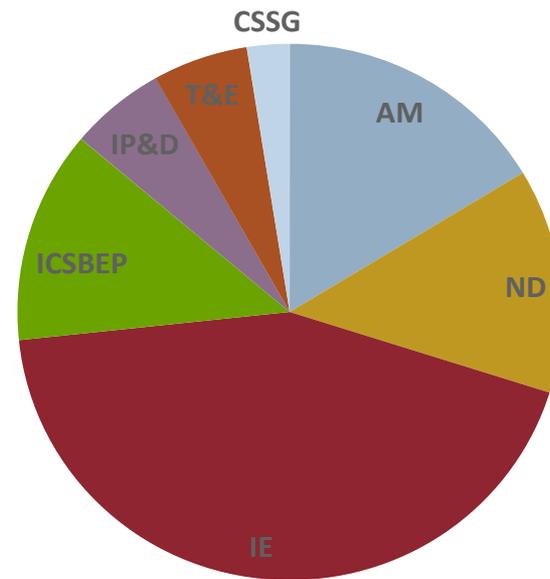
Distribution of Program Funds

Program Elements FY09



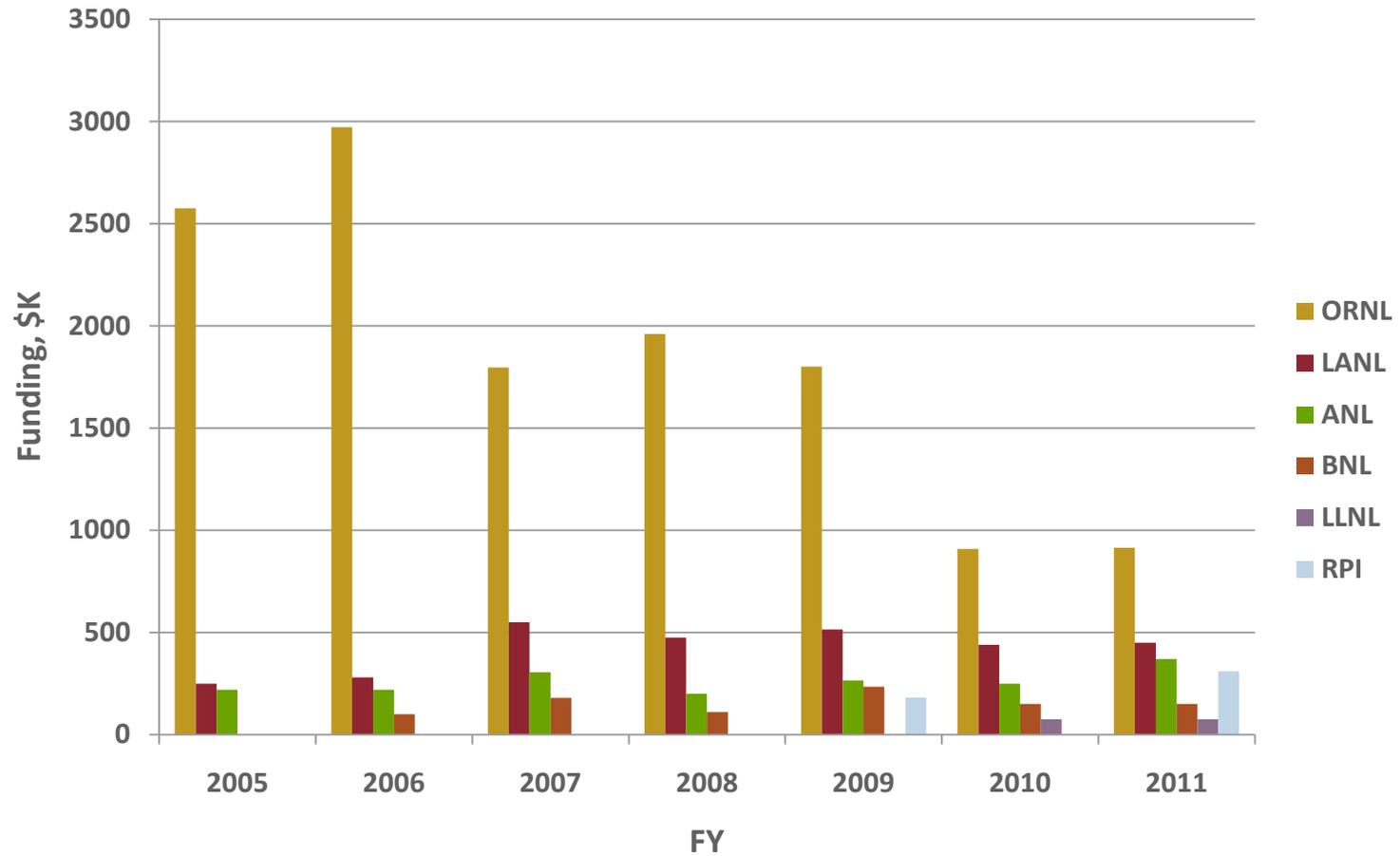
\$12.9M

Program Elements FY11

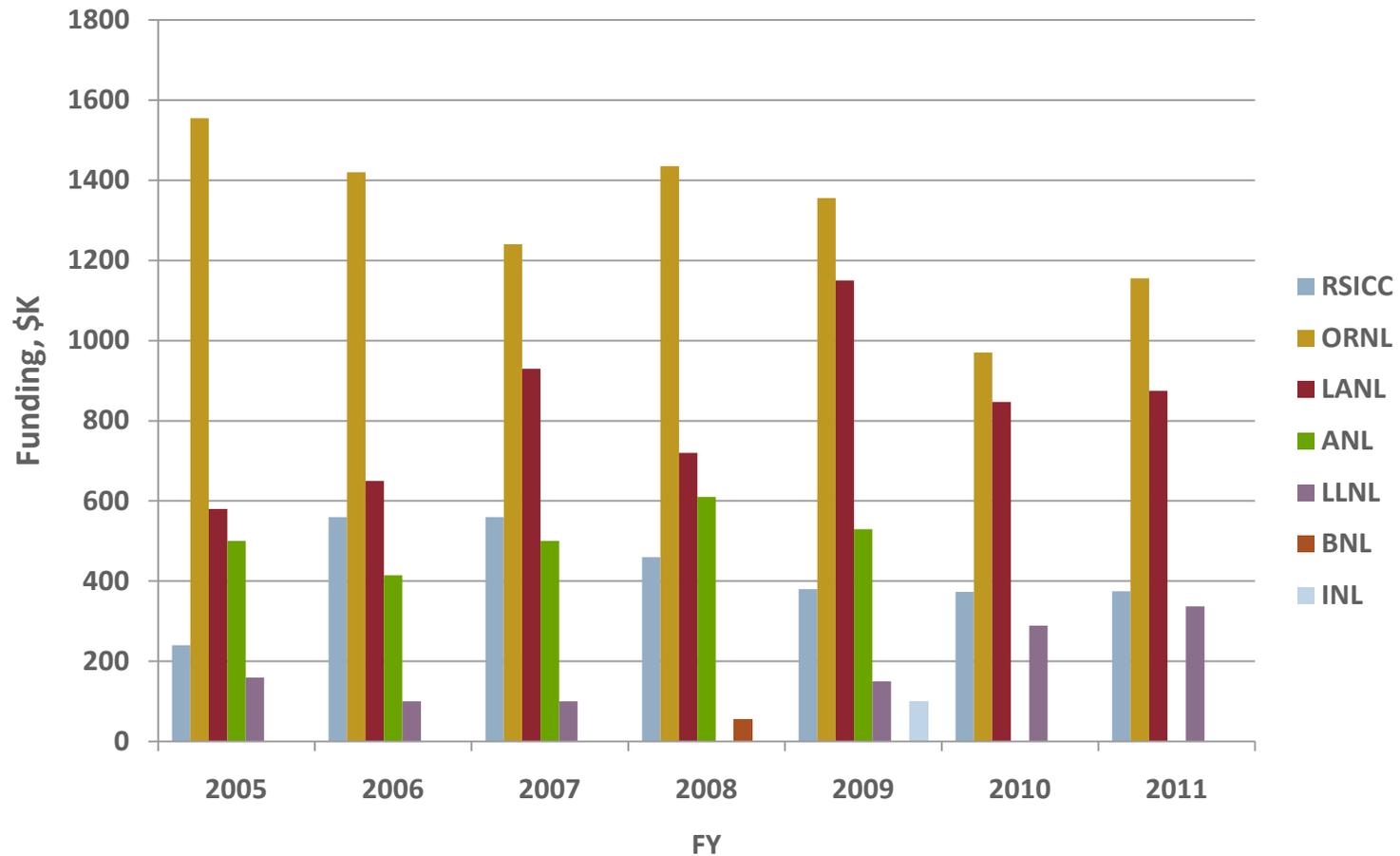


\$16.8M

Nuclear Data Funding



Analytical Methods Funding



Integral Experiment Request (IER) List

Record Number	Date	Name	Affiliation	Experimental Request Title	Status
104	12/4/2007	Heinrichs, David Paul	LLNL	Vanadium as a Reflector, Diluent or Absorber	Approved
105	12/5/2007	Heinrichs, David Paul	LLNL	Spherical Lattice of Alternating HEU and Polyethylene or Lucite Shells	Approved
106	12/19/2007	Mattingly, John Kelly	SNL	Polyethylene-Reflected Plutonium Neutron Multiplicity and Gamma Spectral Data	Approved
107	2/4/2008	Saylor, Ellen Marie	B&W Y12	Use of BoroBond4™ as a Fixed Neutron Absorber	Approved
108	4/15/2008	John, Wagner Charles	ORNL	Fission Products and Minor Actinides for Spent Fuel Burnup Credit	Accepted
109	5/27/2008	Hutchinson, Jesson	LANL	Plutonium Sphere Reflected with Nickel	Approved
110	6/30/2008	Hutchinson, Jesson	LANL	Plutonium Sphere Reflected with Tungsten	Approved
111	6/30/2008	Hutchinson, Jesson	LANL	Plutonium Sphere Reflected with Copper	Approved
112	6/30/2008	Hutchinson, Jesson	LANL	Plutonium Sphere Reflected with Lead	Approved
113	6/30/2008	Hutchinson, Jesson	LANL	Plutonium Sphere Reflected with Manganese	Approved
114	6/30/2008	Hutchinson, Jesson	LANL	Plutonium Sphere Reflected with Acrylic	Approved
115	7/2/2008	Westfall, Robert Michael	ORNL	Mass Limits for U-235 in Landfill Burials	Return to user
116	9/23/2008	Kerr, Brad R	Parsons	Thermal neutron absorption cross-section data for natural sodium.	Pending
117	9/23/2008	Kerr, Brad R	Parsons	Thermal neutron absorption cross-section data for titanium.	Accepted
118	12/15/2008	Sanchez, Rene G.	LANL	Critical Mass Measurement of Np-237	Accepted
119	9/3/2009	Sanchez, Rene G.	LANL	Subcritical Experiments at Cryogenic Temperatures	Accepted
120	9/3/2009	Hutchinson, Jesson	LANL	Water Reflected Metal with Neutron Absorbers	Accepted
121	9/3/2009	Hutchinson, Jesson	LANL	Neptunium Subcritical Measurements	Accepted
122	9/3/2009	Hutchinson, Jesson	LANL	Additional Critical Experiments with the BERP ball reflected by Beryllium	Accepted
123	9/3/2009	Hutchinson, Jesson	LANL	Cadmium Reflected HEU	Accepted
124	9/3/2009	Hutchinson, Jesson	LANL	Daghlian	Pending
126	11/18/2009	Miller, Thomas Martin	ORNL	SILENE Benchmark Measurements for Criticality Accident Alarm System Analyses	Approved
128	1/14/2010	Reynolds, Kevin H	B&W Y-12	Juliett	Accepted

Charter of the Nuclear Data Advisory Group for the DOE Nuclear Criticality Safety Program (NCSP)

Mission: The Nuclear Data Advisory Group (NDAG), through making recommendations to the NCSP Manager, enhances the coordination of the NCSP Nuclear Data Element work program with current and future DOE needs and promotes the integration of this work program with the other elements of the NCSP. Towards these objectives, the NDAG performs the following functions:

1. The NDAG identifies deficiencies in evaluated differential and integral nuclear data and recommends priorities and specific resources for meeting identified DOE criticality safety nuclear data needs. The NDAG supports the NCSP Manager in his approval and prioritization of Integral Experiment Requests and Nuclear Data Requests as implemented on the NCSP website.
2. The NDAG identifies the required resources and unique capabilities for meeting these needs. These may include but are not limited to facilities and scientists to measure differential and integral nuclear data, scientists to evaluate nuclear data including development and use of nuclear model codes, staff and codes to process evaluated nuclear data into the form required by the nuclear analysis codes, and staff to benchmark evaluated differential nuclear data against integral experiments



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3. In performing functions 1 and 2, the NDAG communicates and works with the DOE programs involving fissionable material, with the Integral Experiments, Benchmarking, Nuclear Data and Analytical Methods Elements of the NCSP and the leadership of the National Nuclear Data Center, the Cross Section Evaluation Working Group (CSEWG), and the Working Party on International Evaluation Cooperation (WPEC) of the OECD/NEA Nuclear Science Committee to expedite issuance of new data and methods to the DOE criticality safety user community.
4. The NDAG evaluates and determines high-level concerns (i.e., any data deficiencies/concerns/issues with potential to significantly impact safety or efficiency of current fissile material operations) for immediate or short-term attention and/or correction and communicates these concerns to the NCSP Manager. Subsequently, these issues may be posted to the NCSP web site for dissemination to and use by the criticality safety community.
5. The NDAG assists in NCSP work program planning such that the Nuclear Data work program is successfully integrated into the federal budget cycle.
6. The NDAG shares observations and makes recommendations to the NCSP Manager on additional useful functions that the NDAG could perform for the NCSP.



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7. The NDAG will perform an annual self-assessment of the Nuclear Data Element to identify opportunities for improvement in the Nuclear Data arena and make recommendations to the NCSP Manager regarding responsibility for implementing those improvements, and tracking them to closure. These improvements will be focused on better responsiveness to the DOE line programs at the sites, on identifying improvements in coordination, and on streamlining the process leading to issuing new/improved data to the end-users.

Membership: The NDAG membership benefits from the representation of several important areas of expertise, experience and responsibility:

1. Nuclear data specialists (Experimentalists, Evaluators, Processors).
2. Criticality safety analysts from the major DOE sites.
3. Program management and technical leadership from the NCSP work elements (Nuclear Data, Integral Experiments, Benchmarking, and Analytical Methods).
4. To the extent feasible, individuals with more than one of these areas serve on the NDAG. Alternates back up key areas of expertise and/or activity.



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Leadership: The NDAG chair is approved by the NCSP Manager and has responsibility for the technical leadership of NDAG. The head of the National Nuclear Data Center of Brookhaven National Laboratory serves in a special consultancy to the NCSP on nuclear data matters and assists the NDAG Chair in overall program evaluation and interfacing with the nuclear data community (CSEWG, WPEC, etc).

Meetings: The NDAG will conduct two meetings a year. Scheduling of these meetings will try to take advantage of opportunities when most of the membership is co-located for some other purpose, e.g., the Fall meeting of the CSEWG at BNL or Spring/Summer meeting of the NCSP.



NCSP Five-Year Plan Appendix D Summary

NDAG Review: Priority Needs / Additional Needs		Thermal scattering (BeO, HF, D ₂ O, SiO ₂ , CH ₂ , C ₂ F ₄ , C ₅ O ₂ H ₈ , etc.), ²³⁹ Pu, Cr, ²³⁷ Np, Pb, W, ⁵⁵ Mn, Ti, ²⁴⁰ Pu, Fe, ⁵⁸ Ni, ⁶⁰ Ni, / ²³³ U, Th, Be, ⁶³ Cu, ⁶⁵ Cu, ⁵¹ V, Zr, F, K, Ca, Mo, Na, La				
Activity	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Differential Measurements <i>ORNL, RPI</i>	Dy, Gd ^{182,186} W	^{63,65} Cu thermal scatt SiO ₂	Ca	Ce	V	Zr
Integral Measurements <i>LANL, IRSN, VNIITF</i>	Sub-Criticals: Pu w/Poly Refl Pu w/W Refl Al, Cu, Fe, Ni, Pb, Zr, SiO ₂ , W	Sub-Criticals: Criticals: Start Planet, Comet, Flattop, Godiva	Sub-Criticals: Pu w/Cu/Refl Criticals: Start Planet, Comet, Flattop, Godiva, Borabond	Sub-Criticals: Pu w/Pb Refl Criticals: HEU Sph. Lattice	Sub-Criticals: Pu w/Mn Refl Criticals:	
Complete Data Evaluations <i>BNL, LANL, ORNL</i>	^{52,53} Cr UR ^{58,60} Ni UR ²³⁷ Np, ¹⁶ O, ²⁴⁰ Pu, ⁵¹ V	^{182,186} W RR, ⁴⁸ Ti UR ⁵¹ V, Be, ⁵⁵ Mn ²³⁹ Pu χ	^{63,65} Cu RR ^{182,186} W UR ⁵⁵ Mn, Be, ^{50,52,53,54} Cr,	^{63,65} Cu UR, Gd RR, ²³⁵ U UR ^{50,52,53,54} Cr, ^{58,60,61,62,64} Ni, ²³⁵ U χ	Ca RR, Dy RR, ²³⁸ U UR, assess Hf, La, Nd, Sr ^{58,60,61,62,64} Ni, ^{63,65} Cu	Ca UR, ²³⁹ Pu UR, Ce RR ¹² C, ²³⁸ U χ
Covariance Generation (i.e., improved cov data for existing evaluations) <i>BNL, LANL, ORNL</i>	ORNL: ^{46,47,49,50} Ti, LANL:		ORNL: LANL:	ORNL: LANL:	ORNL: LANL:	

Requests for additional I.E. measurements: Ni, Mo, Cr (Fe-Cr alloys), Mn in intermediate energy range (VNIITF, CEF).

Request for measurements and evaluation of angular distributions at high energy for Cu

Continuing need for thermal scattering data.



Summary

- NDAG supports the NCSP Manager in review and recommendations regarding the six NCSP Technical Program elements as requested.
- Identifying (differential, integral, benchmark) data needs of the Nuclear Criticality Safety community and satisfying those data needs is the highest priority activity for the NDAG.
- A communication channel for the NCS community to identify and submit Nuclear Data Requests (to complement the IER website) will soon be implemented on the NCSP website.



Thank You