

# RERTR 2012 — 34<sup>th</sup> INTERNATIONAL MEETING ON REDUCED ENRICHMENT FOR RESEARCH AND TEST REACTORS

October 14-17, 2012  
Warsaw Marriott Hotel  
Warsaw, Poland



The U.S. Department of Energy / National Nuclear Security Administration's Office of Global Threat Reduction in cooperation with the International Atomic Energy Agency will host the "RERTR 2012 International Meeting on Reduced Enrichment for Research and Test Reactors." The meeting is being organized by Argonne National Laboratory, Poland's National Centre for Nuclear Research (NCBJ) and Idaho National Laboratory and will be held in Warsaw, Poland from October 14-17, 2012. This will be the 34th annual meeting in a series on the same general subject regarding conversion of reactors within the Global Threat Reduction Initiative.

## Technical Program (Final)

Last modified: Oct. 4, 2012

This document is to be considered as **FINAL**. If there any adjustments to the Program because of the unavailability of presenters or the need for substitution of co-chairs, they will be announced at the RERTR-2012 International Meeting.

The Meeting Organizers:



**RERTR 2012 — 34<sup>th</sup> International Meeting on Reduced Enrichment for Research and Test Reactors**  
 Warsaw, Poland — October 14-17, 2012

**PROGRAM**

**Sunday**

Registration: 3:00 – 6:00 p.m., Grand Ballroom Foyer  
 Reception: 6:00 – 10:00 p.m., Baltic Ballroom, Warsaw Marriott Hotel  
 Sponsored by: National Centre for Nuclear Research, UChicago Argonne LLC, B&W Y-12, Battelle Energy Alliance

Session	Time	Paper Title	Authors
<b>Monday Meeting Room: Grand Ballroom C&amp;D, Warsaw Marriott Hotel</b>			
<b>Welcome</b>	<b>8:00 a.m.</b>	Opening and Introductions	J. Roglans-Ribas, G. Krzysztozek, RERTR-2012 Co-Chairs Professor Grzegorz Wrochna, Director NCBJ
		Welcome to Poland and RERTR-2012	Hanna Trojanowska Poland, Plenipotentiary for Nuclear Energy
<b>Global HEU Minimization Efforts</b>		1 IAEA Welcome to RERTR-2012	Juan Carlos Lentijo IAEA
		2 Nuclear Security Summit Perspectives	Melissa Krupa U.S. White House, National Security
		3 NNSA's Role in HEU Minimization	Andrew Bieniawski U.S. DOE-NNSA
		4 U.S. and Russian Cooperation on Converting Research Reactors in Russia	Jeffrey Chamberlin U.S. DOE-NNSA
		5 Russian Federation Perspective and Progress in HEU Minimization	Nikolay Arkhangelskiy Russian Federation, State Atomic Energy Corporation
<b>10:00 - 10:30 am Coffee Break and Refreshments</b>			
<b>1 Recent International HEU Minimization Efforts, Progress in Nuclear Security</b> <i>Chair: A. Bieniawski</i>	<b>10:30 a.m.</b>	1 Summary of Works Over MARIA Reactor Core Conversion from HEU to LEU Fuel	W. Mielezczenko, K.Pytel, G. Krzysztozek, M. Dorosz, J. Lechniak, A. Moldysz, K. Andrzejewski, T. Kulikowska, Z. Marcinkowska, A. Wocial, E. Hajewska, J. Maurin
		2 IAEA Activities in Support of HEU Minimization: 2012 Update	P. Adelfang
		3 Main Activities Performed for TRIGA Reactor Core Conversion From HEU 8.5/70 / LEU 8.5/20 to LEU 30/20	J. Callejas
		4 Global Threat Reduction Initiative's Reactor Conversion Program	C. Landers
		5 INFCIRC 225/rev 5 and INS Cooperative Efforts in Nuclear Security	S. Ortiz
<b>12:00 - 1:30 pm - Lunch Break</b>			
<b>2 HEU Minimization, Fuel Disposition, Uranium Supply and Export</b> <i>Co-Chairs: P. Adelfang, G. Gruber</i>	<b>1:30 p.m.</b>	1 From HEU Minimization to HEU Elimination	S. Hustveit, O. Resitad
		2 Going Dutch: HEU Minimization Goals for the 2014 Nuclear Security Summit	M. Pomper
		3 The United States Foreign Research Reactor (FRR) Spent Nuclear Fuel (SNF) Acceptance Program: 2012 Update	C. Messick, J. Galan
		4 The IAEA Activities in Supporting Long Term Interim Storage and Take-Back Programs of RR SNF	S. Tozser, P. Adelfang, E. Bradley, B. Yuldashev
		5 Research Reactor Uranium Supply and Export from the Y-12 National Security Complex	T. Nelson, B. Eddy
<b>3:30 - 4:00 p.m. Coffee Break and Refreshments</b>			
<b>3 Russian-Designed Reactor Conversion</b> <i>Co-Chairs: N. Arkhangelskiy, J. Chamberlin</i>	<b>4:00 p.m.</b>	1 Conversion of the Russian Federation ARGUS Solution Reactor to LEU Fuel: Results of Feasibility Studies and Schedule	S. Myasnikov, A. Pavlov, N. Petrulin, V. Pavshook
		2 State of Work on Calculation Feasibility of the IR-8 Reactor Conversion to LEU Fuel	D. Erak, V. Nasonov, Y. Pesnya
		3 Conversion of MIR.M1 Reactor to LEU-Fuel	A. Izhutov, V. Starkov, V. Pimenov, V. Fedoseev, S. Maynskov
		4 Progress in Conversion Analysis of IRT MEPhI Reactor	V. Alferov, E. Kryuchkov, M. Shchurovskaya
		5 NNC's Research Reactors IGR and IVG.1M Conversion Feasibility: Main Results of the Studies	V. Gaidachuk, P. Garner, N. Hanan, V. Ignashev, R. Irkimbekov, E. Kenzhin, A. Kolbaenkov, A. Kolodeshnikov, E. Kozlovski, I. Prozorova, V. Zuev, A. Vurim
<b>6:00 p.m. Adjourn</b>			
<b>Tuesday Grand Ballroom C and D, Warsaw Marriott Hotel</b>			
<b>4 Perspectives on Fuel Development and Performance Issues</b> <i>Co-Chairs: P. Lemoine, R. Finlay</i>	<b>8:00 a.m.</b>	1 U-Mo Fuel Development at AECL Chalk River Labs	N. Wang, S. Hibbins, D. Sears
		2 U.S. Progress in the Development of Very High Density Low Enrichment Research Reactor Fuels	M. Meyer, I. Glagolenko, D. Keiser, P. Medvedev, F. Rice, B. Rabin, A. Robinson, D. Wachs, N. Woolstenhulme, G.Hofman, Y.S. Kim
		3 Analysis of Fuel Failures in Experimental Fuel U-Mo Dispersion Fuel Plates	G. Hofman, Y.S. Kim
		4 Multi-Physics Simulation of the E-FUTURE-1 Fuel Irradiation Experiment	A. Tentner, A. Bergeron, Y.S. Kim, G. Hofman, J. Stevens, S. Berghe
		5 Blister Threshold Based Thermal Limits for the U-Mo Monolithic Fuel System	D. Wachs, F. Rice, I. Glagalenko, A. Robinson, B. Rabin, M. Meyer
<b>10:00 - 10:30 a.m. Coffee Break and Refreshments</b>			
<b>5 U.S. High-Performance Reactor Conversion</b> <i>Co-Chairs: J. Stevens, F. Hernandez</i>	<b>10:30 a.m.</b>	1 Continuing LEU Conversion Activities at the High Flux Isotope Reactor	D. Renfro, D. Bowen, D. Chandler, D. Cook, J. Freels, G. Ilas, P. Jain, D. Pinkston, J. Sease, K. Smith
		2 Activities in Support of Conversion of the MIT Nuclear Reactor to LEU Fuel	T. Newton, Jr., G. Kohse, M. Ames, Y. Ostrovsky, L. Hu, E. Wilson, F. Dunn, J. Stevens
		3 The University of Missouri Research Reactor HEU to LEU Fuel Conversion Project Status	L. Foyto, K. Kutikkad, J.C. McKibben and N. Peters, E. Feldman, J. Stevens, J. Stillman

			4 Progress with the Conversion of the NIST Research Reactor	D. Diamond, A. Hanson, J-S Baek, N. Brown, A. Cuadra, L-Y Cheng, S. O'Kelly, R. Williams, J. Rowe
			5 Conceptual LEU Fuel Design for the Advanced Test Reactor without Burnable Absorbers	M. DeHart, S. Morrell
<b>12:30 - 2:00 p.m. Lunch Break</b>				
<b>6</b>	<b>Fuel Development - Fabrication Technology</b> <i>Co-Chairs: J.M. Park, J. Snelgrove</i>	<b>2:00 p.m.</b>	1 Update on the Low Enriched Uranium – Molybdenum Fuel Fabrication Capability for GTRI	D. Burkes, H. Longmire, D. Dombrowski, and L. Cole
			2 Low Enriched Uranium-Molybdenum Coupon Fabrication at the Y-12 National Security Complex	L. Jollay, H. Longmire, A. Moore, M. Gambrell, J. Gooch, A. DeMint
			3 Overview of LANL Progress in Process Development, Advanced Characterization Methods and Prototype Fabrication	D. Dombrowski
			4 The SELENIUM Fuel Experiment – Progress Report after Two Cycles	S. Van den Bergh, A. Leenaers, C. Detavernier
			5 Dispersion Fuel Miniplates Based on UMo Powder Produced by Centrifugal Atomization	L. Olivares, J. Marin, M. Barrera, C. Gutierrez, J. Lisboa
<b>3:30 - 4:00 p.m. Coffee Break and Refreshments</b>				
<b>7</b>	<b>Conversion Analysis and Methods Part I</b> <i>Co-Chairs: Y. Calzavara, K. Pytel</i>	<b>4:00 p.m.</b>	1 Optimized BR2 Core Configuration	S. Kalcheva, E. Koonen
			2 Neutronic Analysis Capabilities for Conversion of the MIT Reactor to LEU Fuel	E. Wilson, T. Newton, Jr., N. Horelik, T. Gerrity, H. Connaway, and B. Forget
			3 Progress Report on Activities for the Core Conversion in Jamaica	C. Grant
			4 Neutronic Analysis for Utilization of Low Enriched Uranium Fuel At Light Water Moderated / Reflected Core of Kyoto University Critical Assembly (KUCA)	H. Unesaki, T. Misawa, C. Pyeon, T. Sano, Y. Takahashi, K. Nakajima
<b>5:30 p.m. Adjourn 6:00 – 8:00 p.m. Reception and Poster Session, Baltic Ballroom — Sponsored by AREVA-CERCA, Grupa Powen-Wafapomp SA, UChicago Argonne LLC</b>				
<b>8</b>	<b>HEU Minimization Poster Session</b> <b>Baltic Ballroom, Warsaw Marriott Hotel</b> <i>Organized by: J. Holland</i>	<b>6:00 - 8:00 p.m.</b>	1 Using PARET Code for Analyzing Research Reactor Cores with Two Fuel Geometries	F. Badry, M. Gaheen
			2 Temperature in Situ X-Ray Diffraction Study of $\gamma$ -U(Mo) Phase Stability for Powders Obtained Via "Classical" and "Novel" Routes	G. Champion, M. Pasturel, O. Tougait, X. Iltis, J. Richard, R. Belin, H. Rouquette, F. Charollais, M. Anselmet, B. Stepnik, W. Petry
			3 Hydriding of $\gamma$ -U(Mo) Alloys: An Experimental Study to Support an Alternative Process for Powder Fabrication	G. Champion, M. Pasturel, O. Tougait, H. Noël, B. Stepnik, C. Jarousse
			4 Development of Aluminum-Clad Fuel Plate Processing Through Canned and Canless Hot Isostatic Pressing (HIP), and Studies of Aluminum Cladding Grain Growth during HIP	K. Clarke, C. Cross, R. Hackenberg, R. McCabe, J. Montalvo, M. Dvornak, R. Edwards, J. Crapps, R. Trujillo, B. Aikin, V. Vargas, K. Hollis, B. Mihaila, D. Hammon, R. Hudson, T. Tucker, J. Scott, A. Duffield, R. Weinberg, D. Dombrowski
			5 Performance Requirements of Research Reactor Protection System	M. Gaheen, F. Badry
			6 The Mexican TRIGA Mark-III Reactor with TRIGA Fuel Type 30/20	F. Hernández
			7 Plasma Spraying of Diffusion Barrier Coatings for LEU Monolithic Fuel	K. Hollis
			8 Radiological Safety Analyses for MNSR LEU Conversions	J. Liaw and J. Matos
			9 First Results of Scanning Thermal Diffusivity Microscope (STDM) Measurements on Irradiated Monolithic and Disperse Fuel	T. Huber, W. Petry, M. Fig, J. Kennedy, A. Robinson, D. Wachs
			10 U-Al CALPHAD Phase Diagram: A Comprehensive Description of Thermal and Constitutional Point Defects Concentrations in $UAl_4$	L. Kniznik, P. Alonso, P. Gargano, G. Rubiolo
			11 Evaluation of Irradiation Conditions after LVR-15 HEU to LEU Conversion	M. Koleška, M. Vinš, J. Ernest, M. Marek
			12 Transformation Behavior of the $\gamma$ U(Zr,Nb) Phase Under Continuous Cooling Conditions	V. Komar, L. Gribaudo, R. González, S. Aricó S
			13 Experimental Investigation of Bonding Strength and Residual Stresses in LEU Fuel Plate	C. Liu, M. Lovato, D. Alexander, K. Clarke, N. Mara, M. Prime, and D. Brown
			14 The Program of Experiments at the Critical Assembly "Giacinti" Using LEU Nuclear Fuel on the Basis of UZrCN	S. Sikorin, S. Mandzik, S. Polazau, T. Hryharovich
			15 Evaluation of Fuel Plate Integrity at a Fuel Assembly Drop Accident Using Energy Method	J.S. Yim, H.J. Kim, Y.W. Tack, J.Y. Oh, B.H. Lee
			16 History and Present Situation of Kinki University Reactor (UTR-KINKI)	G. Wakabayashi, T. Itoh, K. Hashimoto, S. Ito, H. Yamanishi, W. Sugiyama, T. Horiguchi, S. Hohara
			17 Negotiation Experience in the Fuel Conversion for the TRIGA Reactor in Mexico	J. R. Mota
			18 Industrialization of LEU Mo-99 Target Production in AREVA-CERCA	B. Stepnik, G. Bourdat, C. Blay, P. Colomb, C. Jarousse, A. Kocher, D. Geslin
			19 Electrochemical Studies on Mo-99 Target Materials: Acidic Deposition of Uranium Compounds	A. Saliba-Silva, L. Valerio, E. Carvalho, H. Riella
			20 Recent Developments in Fuel Modeling and Simulation at INL	H. Ozaltun, S. Miller
			21 Laser Shockwave Technique for Characterization of Nuclear Fuel Plate Interfaces	M. Perton, D. Lévesque, J-P. Monchalain, M. Lord, J. Smith, B. Rabin
			22 Comparative Analysis of Structural Changes in U-Mo Dispersed Fuel of Full-Size Fuel Elements and Mini-Rods Irradiated in the MIR Reactor	A. Izhutov, V. Iakovlev, A. Novoselov, V. Starkov, A. Sheldyakov, V. Shishin, V. Kosenkov, I. Dobrikova, A. Vatulin, V. Suprun, G. Kulakov
			23 Synchrotron X-ray Diffraction Analyses of Silicide or Nitride Coated U-Mo Particle Dispersion Fuel after Out-of-pile Annealing	W.J. Kim, J.M. Nam, H.J. Ryu, J.M. Park, H. Palancher, F. Charollais, A. Bonnin, V. Honkimäki
			24 Development of High Density Mo-99 Targets using Atomized Uranium Alloy Powder	H.J. Ryu, C.K. Kim, Ryu, M. Sim, C.G. Seo, J.M. Park
			25 Alkaline Dissolution of Atomized Uranium Dispersion Targets for Fission Mo-99 Production	C.K. Kim, H.J. Ryu, M. Sim, J.M. Park, Y.R. Uhm, S.H. Jung, S.J. Choi
			26 Summary of the BER II Reactor Upgrade	S. Welzel

Wednesday Grand Ballroom C and D, Warsaw Marriott Hotel					
9	<b>Conversion Analysis and Methods Part II</b> <i>Co-Chairs: H. Unesaki, C. Grant</i>	8:00 a.m.	1	Neutronics Analysis of LEU Fuel Assemblies Based on UO <sub>2</sub> in MARIA Reactor Core	Ł. Koszuk, T. Kulikowska, M. Łuszcz, Z. Marcinkowska
			2	An Analysis of Oxide Layer Influence on Heat Transfer Conditions in MARIA Reactor	S.Suchcicki, S. Kubacki, K. Pytel, W. Mieleśczenko, A. Moldysz
			3	An Evaluation of Subcooled CHF Correlations and Databases For Research Reactors Operating at 1 to 50 Bar Pressure	M. Kalimullah, E. Feldman, A. Olson, J. Stevens, and J. Matos
			4	Improvements in Predictions of the Estimated Critical Blade Positions Due to Control Blade Depletion Corrections at MURR	N. Peters, K. Kutikkad
			5	Thermal Hydraulic Study of Utilizing Unfinned Plate Fuel in the MITR	E. Forrest, J. Buongiorno, T. McKrell, L. Hu
<b>10:00 - 10:30 a.m. Coffee Break and Refreshments</b>					
10	<b>Conversion Analysis and Methods Part III</b> <i>Co-Chairs: S. Kalcheva, B. Dionne</i>	10:30 a.m.	1	Analysis of KUCA Type-A Cores	G. Aliberti, H. Unesaki, C. H. Pyeon
			2	Activity of Regulatory Authority for Granting Permission for Loading LEU Fuel to the MARIA Reactor	A. Mikulski, M. Dąbrowski
			3	Study of Neutron Fluxes Before and After the Change of HEU to LEU Fuel of TRIGA Mark III Reactor of Mexico	H. Cruz-Galindo, R. Raya-Arredondo
			4	HEU/LEU Conversion of TRIGA Reactors	A. Veca, J. Bolin, C. Ellis, D. Geslin
			5	Upgradation of Apsara Reactor	A. Bhatnagar, P. Mukharjee, S. Chafle, V. Raina
<b>12:30 - 2:00 p.m. Lunch Break</b>					
11	<b>Fuel Development - Irradiation Testing, PIE and Analysis</b> <i>Co-Chairs: A. Leenaers, M. Meyer</i>	2:00 p.m.	1	Recent Accomplishments in the Irradiation Testing of Engineering-Scale Monolithic Fuel Specimens	N. Woolstenhulme, D. Wachs, M. Meyer, H. Glunz, R. Nielson
			2	Mechanical Analysis of Fuel Swelling in Monolithic Plates	Y.S. Kim, J. Cheon, G. Hofman, A. Robinson, D. Wachs
			3	Post Irradiation Examination Results of the RERTR-12 Campaign	A. Robinson, F. Rice, M. Meyer, D. Wachs, D. Keiser, D. Perez
			4	Lattice Characteristics and Activity Analysis of U <sub>3</sub> Si <sub>2</sub> and U-Mo Plate Type Fuel Assemblies with SCALE6 Code	C. Park and B. Lee
<b>3:30 - 4:00 p.m. Coffee Break and Refreshments</b>					
12	<b>Safety Analysis</b> <i>Co-Chairs: Y. Pesnya, T. Newton</i>	4:00 p.m.	1	Safety Analysis for the Institute of Nuclear Physics Critical Assembly with LEU Fuel	F. Arinkin, P. Chakrov, L. Chekushina, Sh. Gizatulin, S. Koltochnik, D. Nakipov, N. Hanan, P. Garner, J. Roglans-Ribas
			2	Conversion of International MNSR – Reference Case of Ghana MNSR	H. Odoi, E. Akaho, B. Nyarko, R. Abrefah, E. Ampomah-Amoako, R. Sogbadji, S. Birikorang, J. Matos, J. Liaw
			3	Steady-State Safety Basis and Performance Evaluation of the BR2 Core Using UMo Dispersion Fuel	B. Dionne, A. Olson, J. Stevens, S. Kalcheva, G. Van den Branden, E. Koonen
13	<b>Summary and Closure</b> <i>Co-Chairs: J.Roglans, G. Krzyszczoszek</i>	5:15 p.m.			
6:00 p.m. Adjourn					