Idaho National Laboratory

2014 Status Report

DOE Research Reactor Infrastructure Program

Douglas Morrell

August 5, 2014

www.inl.gov

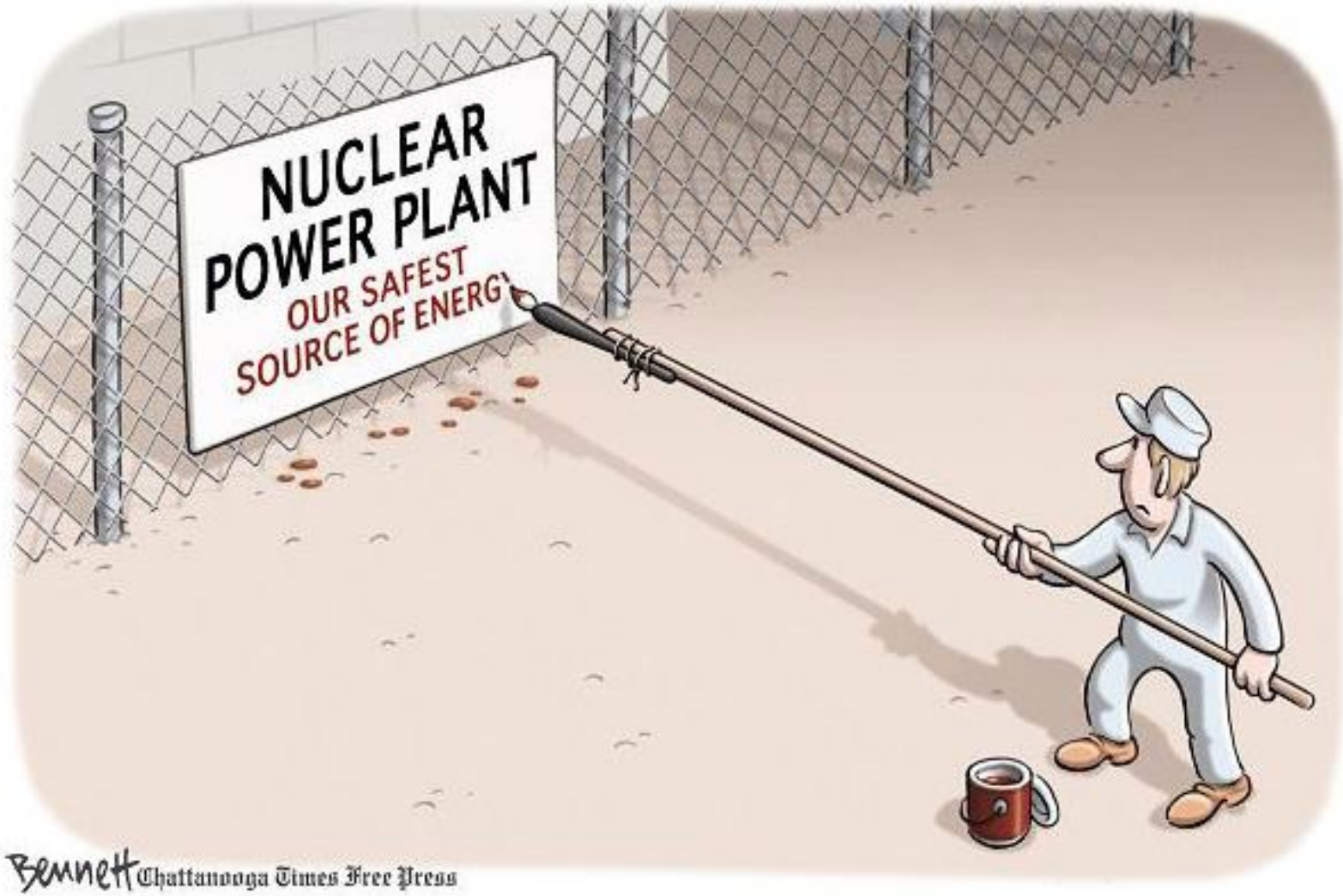
Idaho National Laboratory

Department of Energy
Nuclear Energy University Program

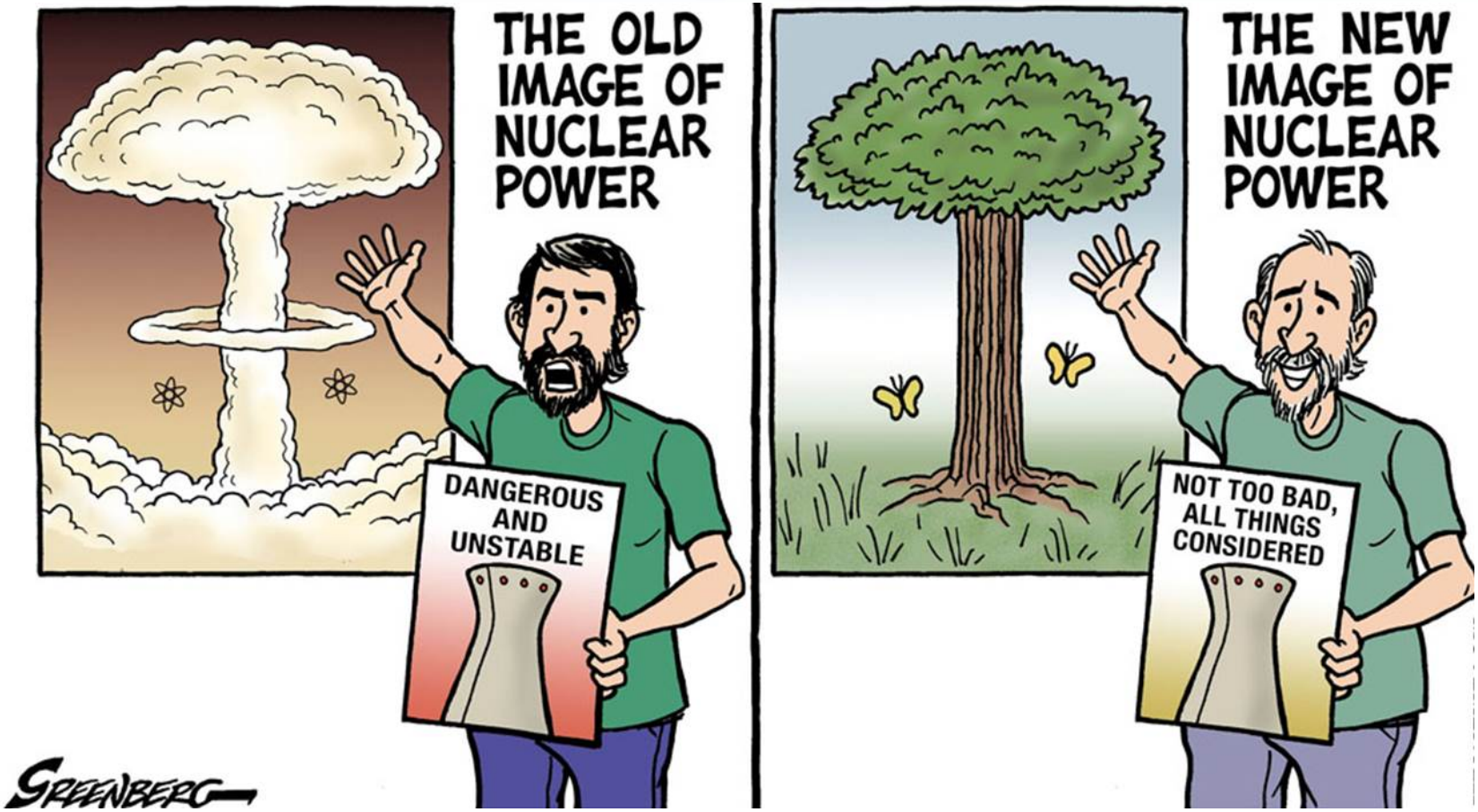
Investing in the next generation of nuclear energy leaders and advancing university – led nuclear innovation is vital to fulfilling the Office of Nuclear Energy's (NE) mission. This is accomplished primarily through NE's Nuclear Energy University Programs (NEUP).

NEUP engages U.S. colleges and universities to conduct research and development (R&D), enhance infrastructure and support student education thereby helping to sustain a world class nuclear energy and workforce capability.

NEUP Nuclear Energy University Programs
U.S. Department of Energy

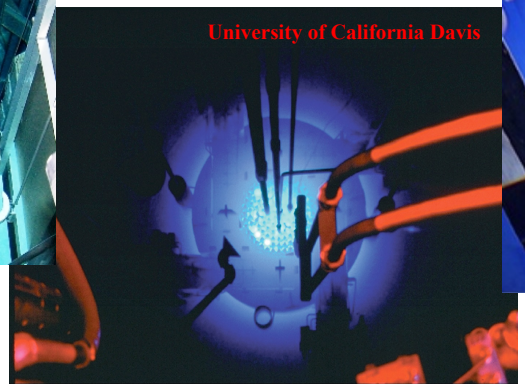

NUCLEAR
POWER PLANT
OUR SAFEST
SOURCE OF ENERG
Bennett Chattanooga Times Free Press

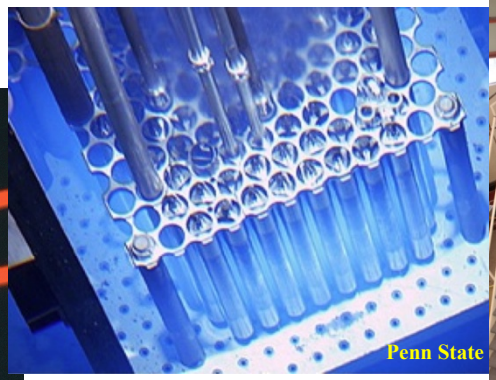

THE OLD IMAGE OF NUCLEAR POWER
DANGEROUS AND UNSTABLE
GREENBERG

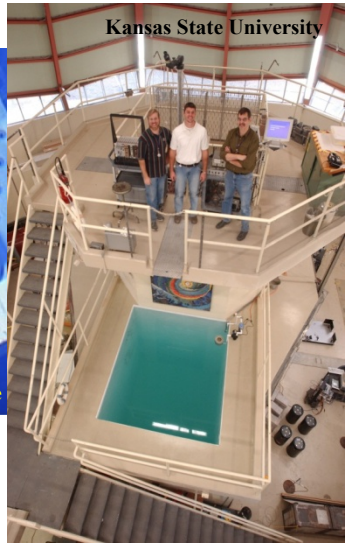

THE OLD IMAGE OF NUCLEAR POWER
DANGEROUS AND UNSTABLE
THE NEW IMAGE OF NUCLEAR POWER
NOT TOO BAD, ALL THINGS CONSIDERED
GREENBERG

Purpose of the RRI Program

The purpose of the United State Domestic Research Reactor Infrastructure Program is to provide fresh nuclear reactor fuel to United States universities at no, or low, cost to the university. The title of the fuel remains with the United States government and when universities are finished with the fuel, the fuel is returned to the United States government.







Program Management

DOE HQ	**Kenny Osborne**
	Derick Ogg
DOE Idaho Operations Office	**Brad Heath**
Idaho National Laboratory	
Project Manager	**Doug Morrell**
Quality Engineer – in Idaho	**Dana Cooper**
Quality Engineer – in Virginia	**Dave Capp**
Nuclear Materials Management	**Michelle Wilkinson**
Subcontract Administration	**Elise Miller**

Points of Contact

Points of Contact	Organization	E-Mail Address	Phone Number
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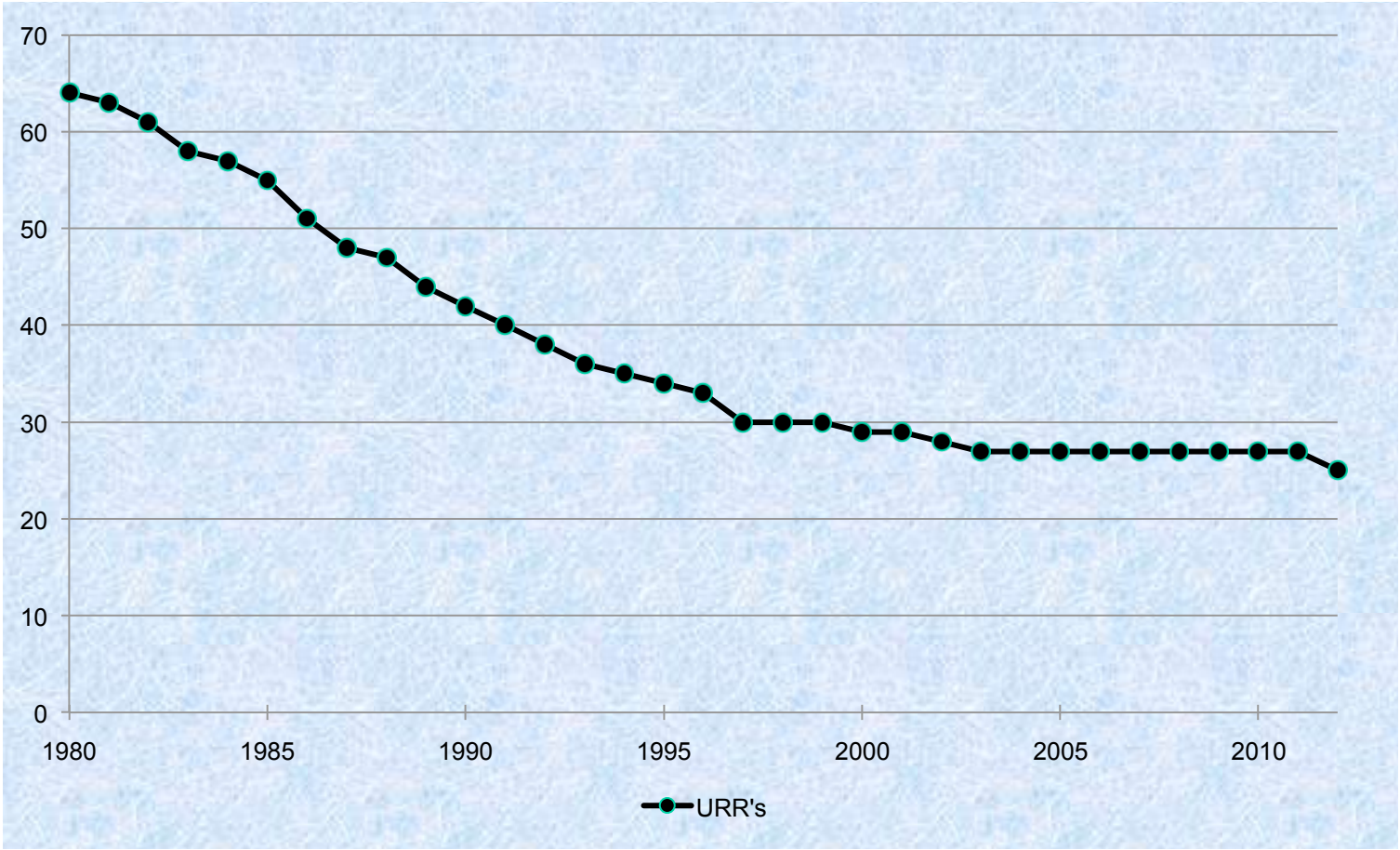
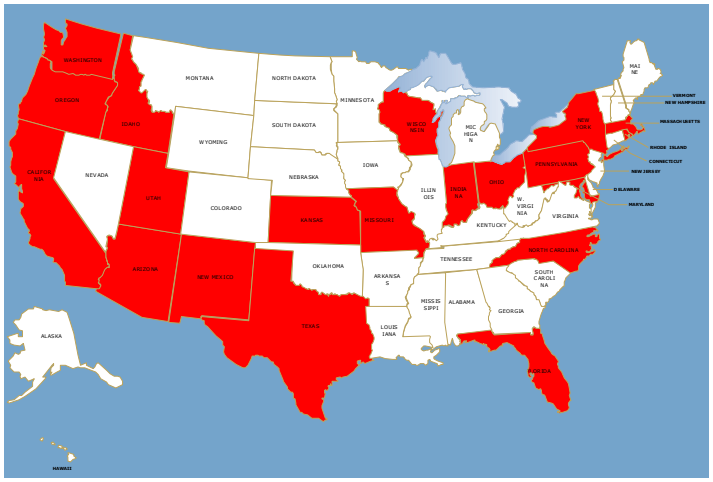
Michelle Wilkinson	INL	d.wilkinson@inl.gov	(208) 526-3322
Elise Miller	INL	elise.miller@inl.gov	(208) 526-2196

Operating University Reactor Facilities



The Research Reactor Infrastructure Program

- Funded by the U.S. Department of Energy
- Managed by DOE-ID Operations Office
- Contracted to the INL's Management and Operations Contractor – Battelle Energy Alliance
- Program has been at Idaho since 1977
  - INL subcontracts with 24 U.S. universities to supply fresh nuclear reactor fuel for operations
    - Twelve TRIGA facilities
    - Eight plate fuel facilities
    - Three AGN facilities
    - One Pulstar fuel facility
    - One Critical facility



University TRIGA Reactor Facilities

- Kansas State University
- Oregon State University
- Penn State University
- Reed College
- Texas A&M
- University of California Davis
- University of California at Irvine
- University of Maryland
- University of Texas at Austin
- University of Utah
- University of Wisconsin
- Washington State University

University Plate Fuel Reactor Facilities

- Massachusetts Institute of Technology
- Missouri University of S&T - Rolla
- Ohio State University
- Purdue University
- Rhode Island Nuclear Science Center
- University of Florida
- University of Massachusetts – Lowell
- University of Missouri – Columbia

Other University Reactor Facilities

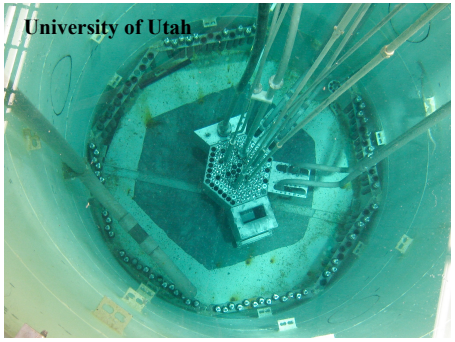
Idaho State University

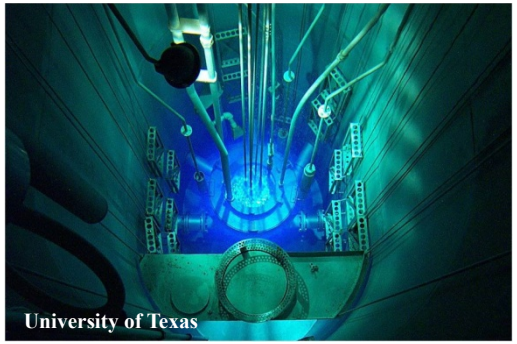
- AGN Reactors
  - Idaho State University
  - Texas A&M
  - University of New Mexico
- Pulstar Reactor
  - North Carolina State University
- Critical Facility
  - Rennselaer Polytechnic Institute

Reactor Power Levels

Facility	Power
University of Missouri – Columbia	10 MW
Massachusetts Institute of Technology	6 MW
University of California – Davis	2 MW
Rhode Island Nuclear Science Center	2 MW
Kansas State University	1.25 MW
Oregon State University	1 MW
University of Texas, Austin	1 MW
North Carolina State University	1 MW
Pennsylvania State University	1 MW
Texas A&M University	1 MW & 5W
University of Massachusetts – Lowell	1 MW
University of Wisconsin	1 MW

Facility	Power
Washington State University	1 MW
Ohio State University	500 kW
Reed College	250kW
University of California – Irvine	250 kW
University of Maryland	250 kW
Missouri University of S&T	200kW
University of Florida	100 kW
University of Utah	100 kW
Purdue University	1 kW
Idaho State University	5 W
University of New Mexico	5 W
Rennselaer Polytechnic Institute	1 W





Projected Fresh Fuel Needs

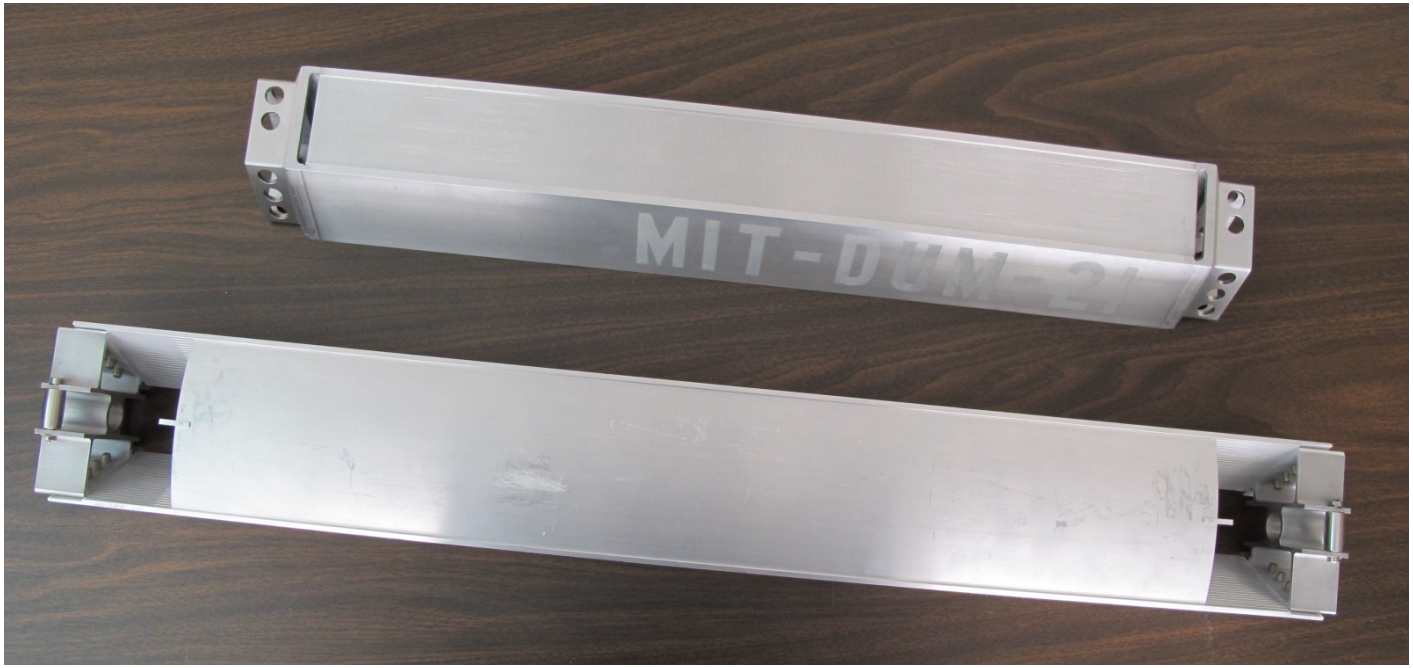
University	Next Five Years	Lifetime of Core
MURR	X	X
MIT	X	X
Rhode Island	X	X
Kansas State University	X	X
Penn State University	X	X
Texas A&M	X	X
University of California at Davis	X	X
University of Texas	X	X
University of Utah	X	X
Washington State University	X	X
Reed College		X
University of California at Irvine		X

Spent Nuclear Fuel

- **Spent Fuel Transfers to DOE Facilities**
  - **Routine Shipments – MURR, MIT**
  - **Other Shipments – Texas, Penn State, UC Davis**

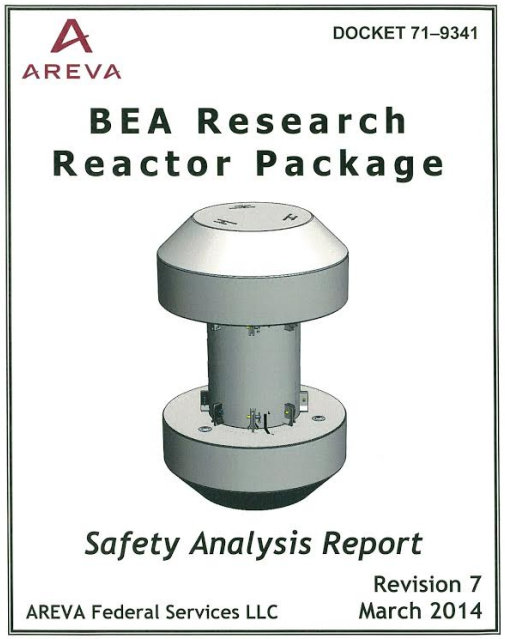
2014 Accomplishments

- **Provided fuel to maintain university reactors with sufficient fuel to operate at current power levels – MURR, MIT**



2014 Accomplishments

- **Revised BRR Cask SAR to streamline vacuum drying and leak testing procedures**
- **Initiated revision of the BRR Cask SAR to include all university payloads**



2014 Accomplishments

- **Four shipments of spent nuclear fuel from MURR and MIT to Savannah River Site receipt facility**

2014 Accomplishments

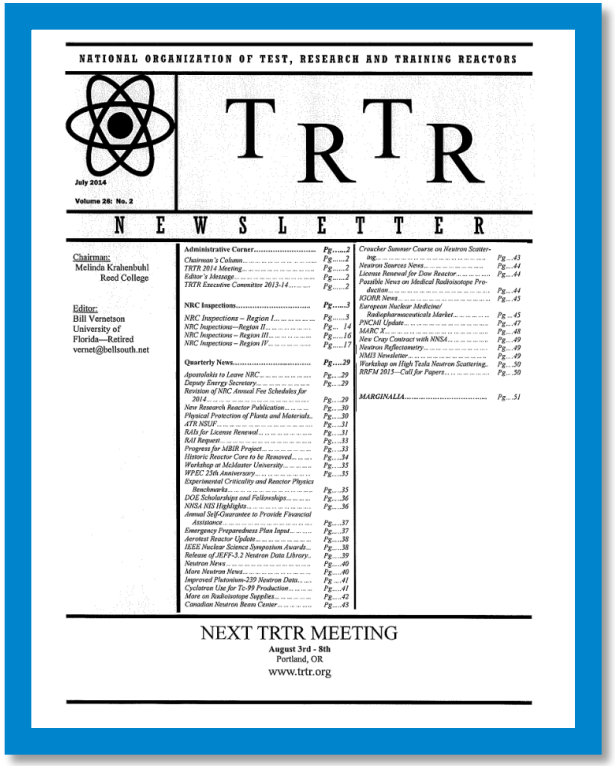
- **Completed fabrication of twelve Rhode Island Nuclear Science Center fuel elements**

2014 Accomplishments

- **Assisted in fabrication of ten zircaloy fuel boxes for NC State**

2014 Accomplishments

- **Continued the distribution of the TRTR Newsletter**



NATIONAL ORGANIZATION OF TEST, RESEARCH AND TRAINING REACTORS

TRTR

July 2014

Volume 26: No. 2

NEWSLETTER

Chairman:
Melinda Krahenbuhl
Reed College

Editor:
Bill Vernetson
University of
Florida—Retired
vernet@bellsouth.net

NEXT TRTR MEETING

August 3rd - 8th

Portland, OR

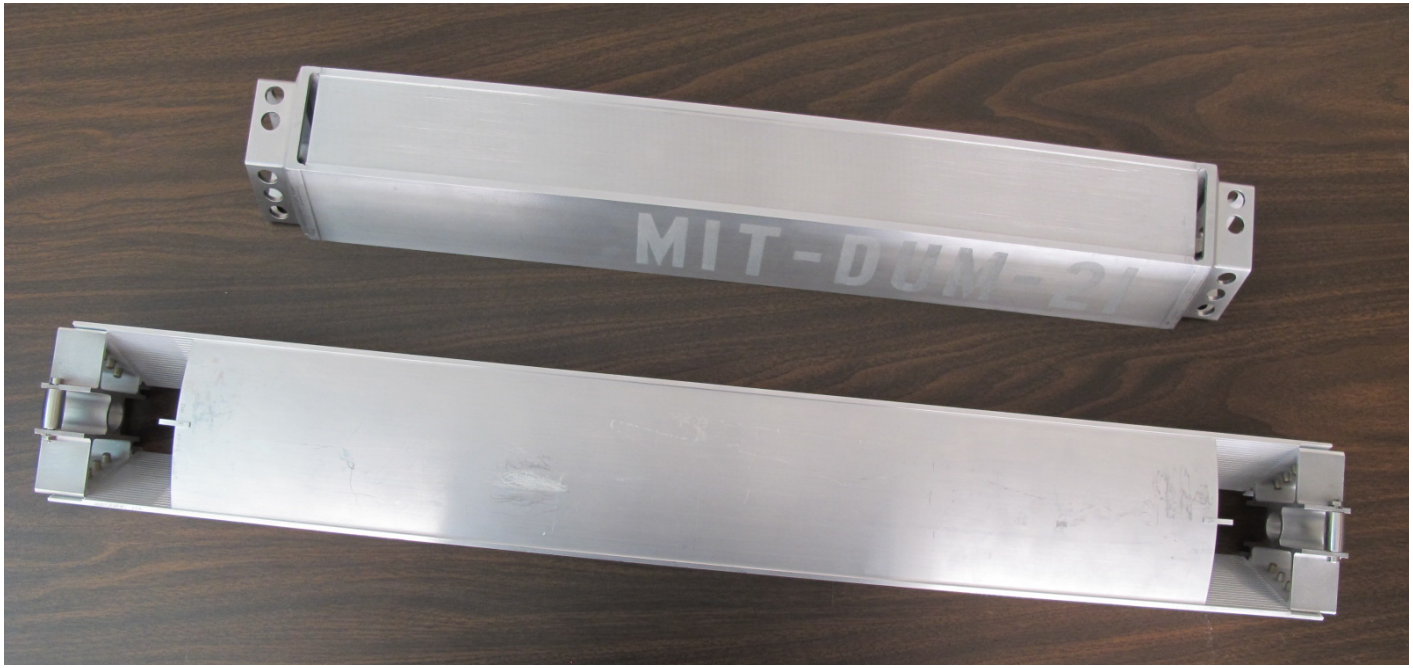
www.trtr.org

2015 Forecast

- **Research Reactor Infrastructure Program Annual Report**

2015 Forecast

- **Provide fuel to maintain university reactors with sufficient fuel to operate at current power levels – MURR, MIT**

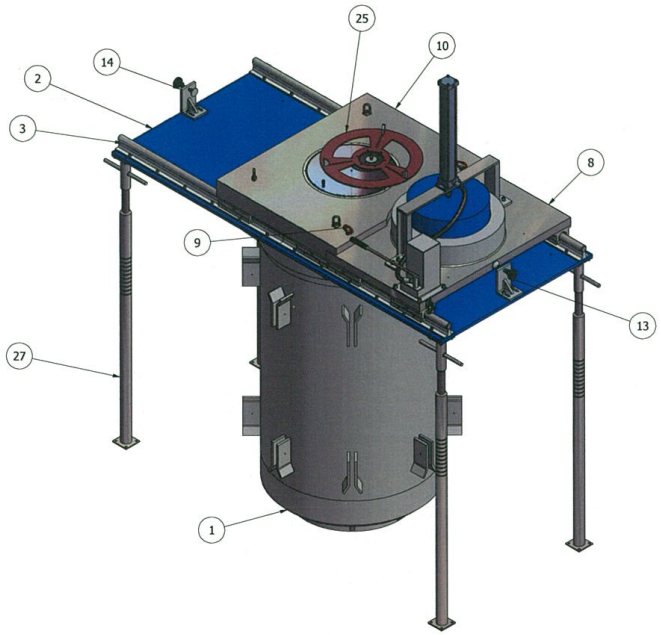


2015 Forecast

- **Ship spent nuclear fuel from MURR, MIT**

2015 Forecast

- **Fabricate dry transfer system for the BRR cask**



ISO View BRR Cask and Slide System
SCALE 1/15

2015 Forecast

- **Prepare the Irradiated Fuel Storage Facility at the INL to both receive and retrieve fuel using the BRR Cask.**

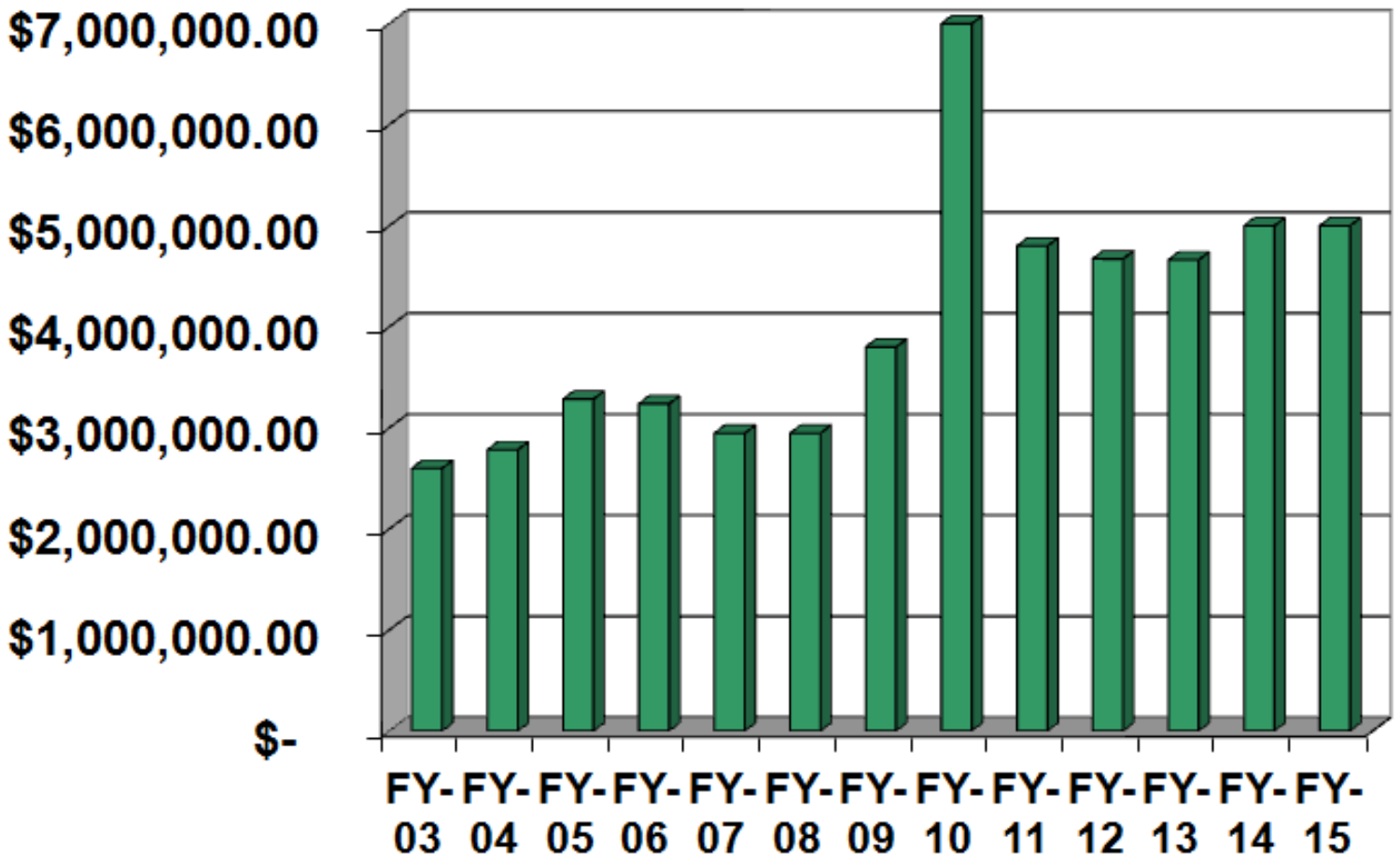
Requests for Assistance

- **Future requests for fresh fuel or spent fuel shipments need to be communicated to program office – Provide documentation to justify request (E-mail or official letter notification preferred)**
- **Other university concerns or assistance requests should be communicated to program for consideration as part of future budget planning activities.**

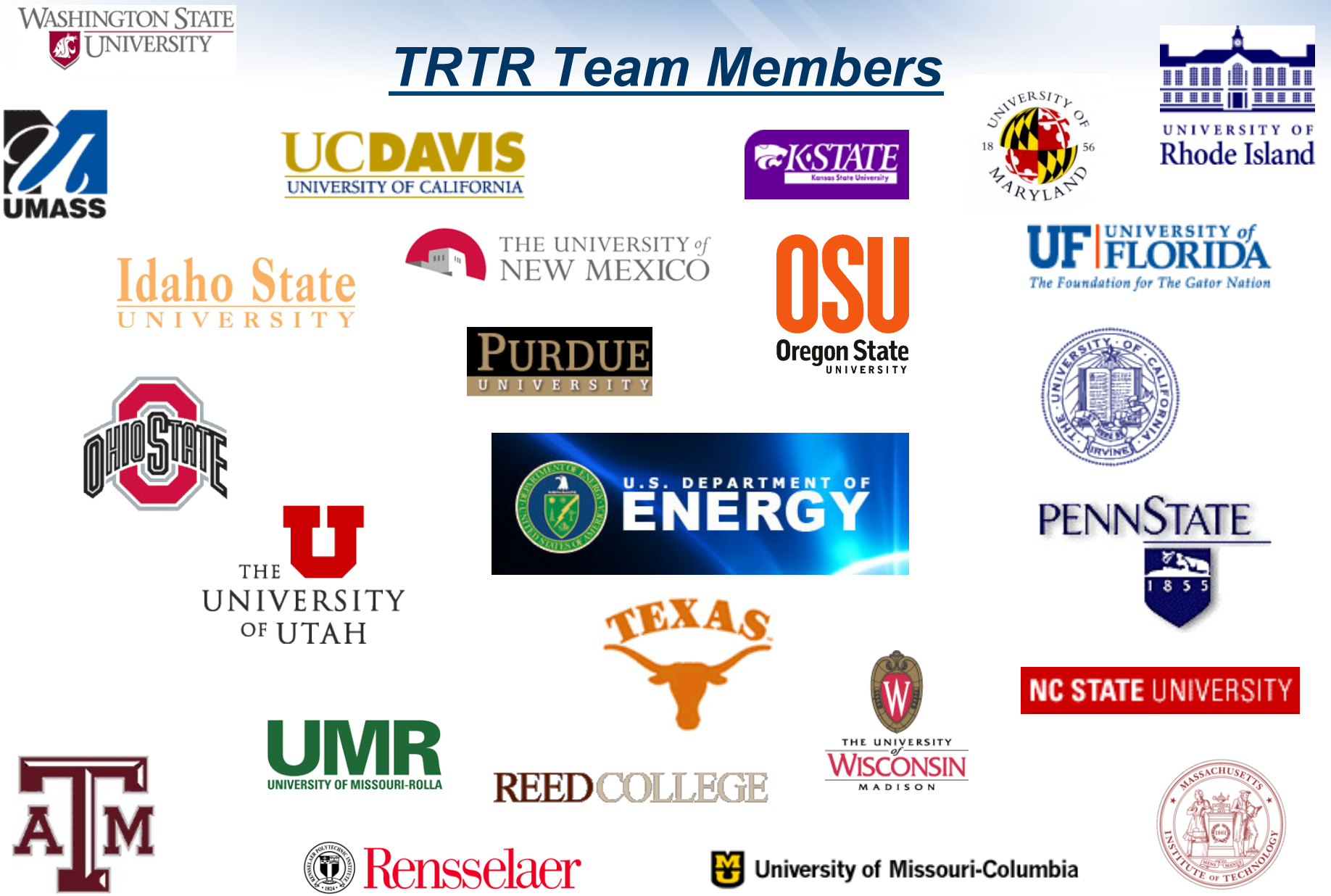
Future Challenges

- Adequate Funding
- Fabrication and supply of TRIGA fuel elements
  - Fabrication of fuel by TRIGA International
  - Reallocation of fresh fuel inventory
  - Reuse of lightly irradiated TRIGA fuel elements currently held in the DOE Receipt Facility at the Idaho National Laboratory
- Conversion of MURR and MIT from HEU to LEU fuel type

Funding Profile



TRTR Team Members



Thank You!

Questions?

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