



2020 Status Report - Research Reactor Infrastructure Program

September 2020

Changing the World's Energy Future

Douglas K Morrell



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September 2020

**Idaho National Laboratory
Idaho Falls, Idaho 83415**

<http://www.inl.gov>

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September 28, 2020

Douglas Morrell
RRI Project Manager

2020 Status Report

DOE Research Reactor Infrastructure Program

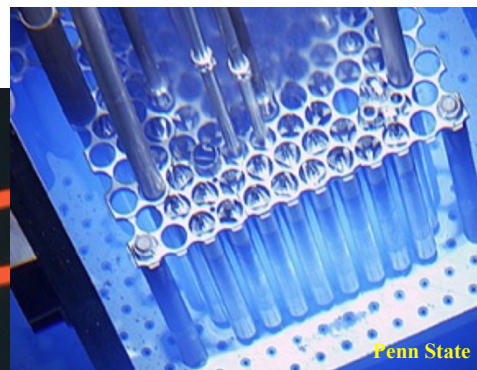
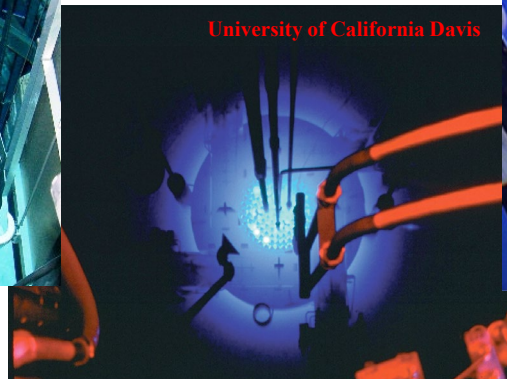
Topics for Discussion

- **Overview of the Research Reactor Infrastructure Program**
- **Accomplishments during the past year**
- **2021 Forecast**
- **Future Challenges**



Purpose of the RRI Program

The purpose of the United States 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

Won Yoon

DOE-ID

Carl Friesen

Idaho National Laboratory

Project Manager

Doug Morrell

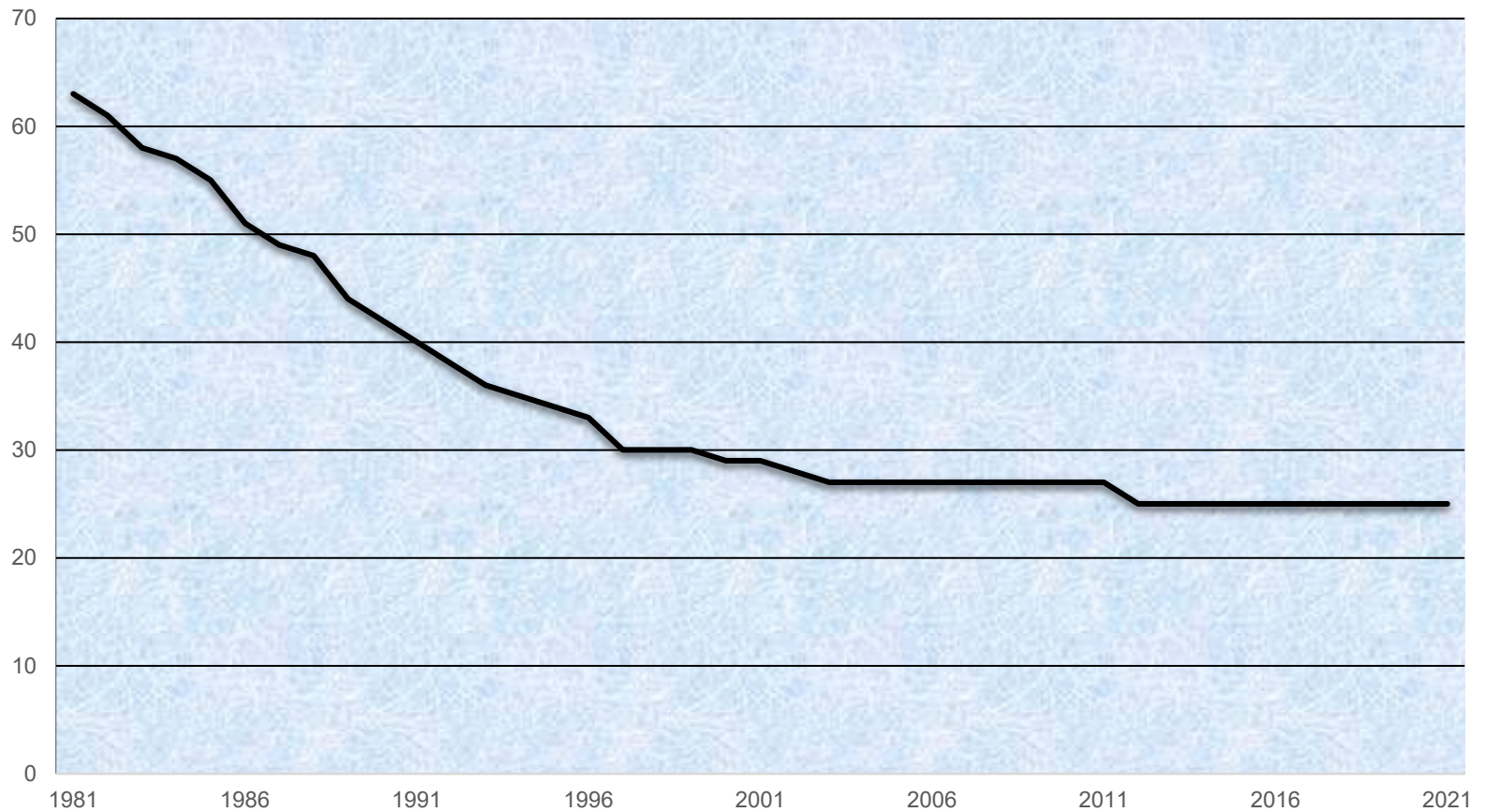
Quality Engineer – in Idaho

Dana Cooper

Quality Engineer – in Virginia

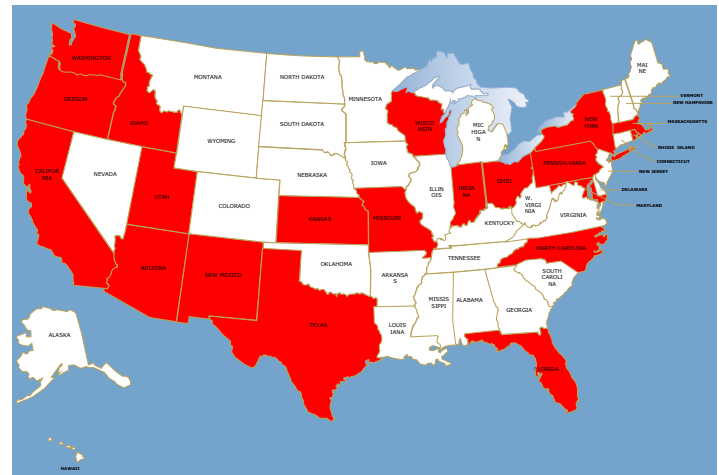
Tom Chambers

Operating University Reactor Facilities



The Research Reactor Infrastructure Program

- **Funded by the U.S. Department of Energy**
- **Managed by DOE-HQ and 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 Pulsar 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



NC STATE UNIVERSITY



Rensselaer

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

Reactor Power Levels

<u>Facility</u>	<u>Power</u>
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

<u>Facility</u>	<u>Power</u>
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	10 kW
Idaho State University	5 W
University of New Mexico	5 W
Rennselaer Polytechnic Institute	1 W

2020 Accomplishments

- Provided fuel to MURR and MIT allowing them to maintain operations at current power levels



2020 Accomplishments

- **Three shipments of spent nuclear fuel from MURR to Savannah River Site receipt facility**
- **One shipment of spent nuclear fuel from RINSC to Savannah River Site receipt facility**



2020 Accomplishments

- **Assisting TRIGA International with the modifications and upgrades of the TRIGA fuel fabrication line**



TRIGA
INTERNATIONAL



2020 Accomplishments

- **Major Equipment Replacement for TRIGA Fabrication Line**



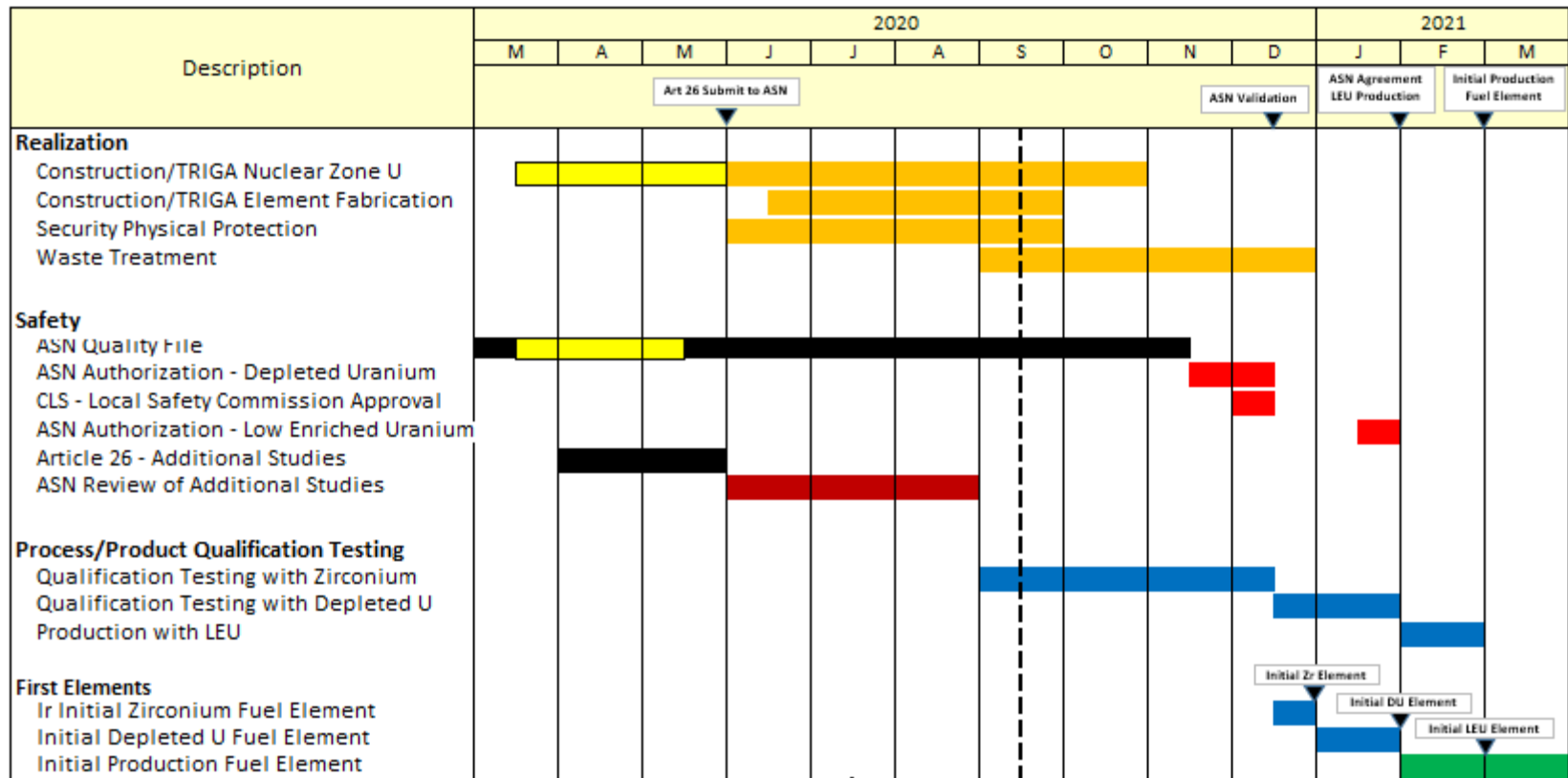
Fusion furnace



Hydride furnace

TRIGA Fuel Fabrication Facility Upgrade Schedule

TRIGA International S.A.S. (TI)
Fuel Fabrication Facility Upgrade/Restart Project



Legend:

Manufacturing
 Covid 19
 Testing
 Production
 Regulatory (Framatome)
 Regulatory ASN
 Time Now

2021 Forecast

- **Issue Research Reactor Infrastructure Program Annual Report by December 31st**
 - **Fuel and usage data**
 - **Reactor Accomplishments and Highlights**
 - **Impacts of COVID19 on reactor operations**



2021 Forecast

- Provide fuel to MURR and MIT to maintain current operating power levels
- Restart fabrication of TRIGA Fuel Elements, first elements fabricated



2021 Forecast

- **Complete three spent fuel shipments from MURR**
- **Complete two spent fuel shipments from MIT**



Requests for Assistance

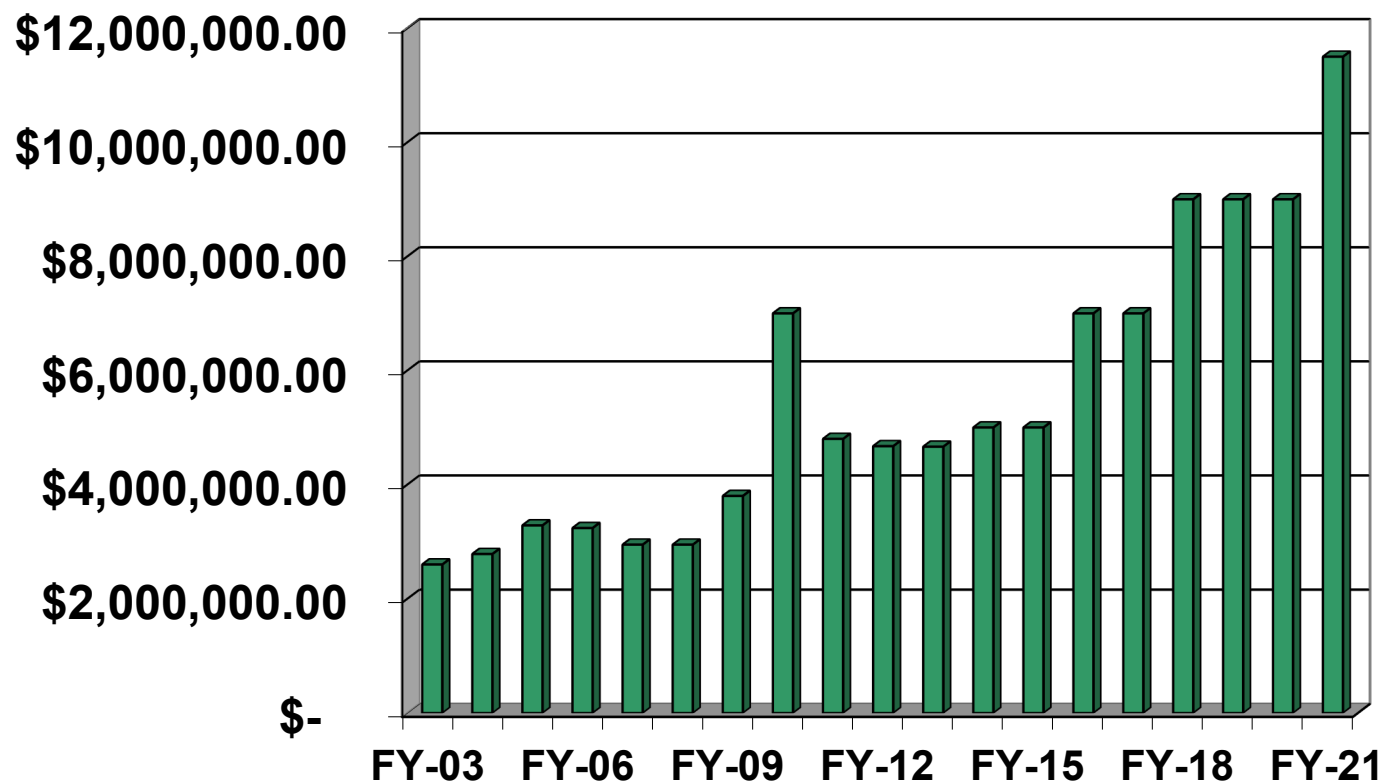
- **Future requests for fresh fuel or spent fuel shipments need to be communicated to program office – Provide documentation to justify request (E-mail or official letter notification preferred)**
- **Other university concerns or assistance requests should be communicated to program for consideration as part of future budget planning activities.**
- **Doug Morrell (208) 201-6595**



Future Challenges

- **Receipt of additional Irradiated TRIGA fuel at the Irradiated Fuel Storage Facility located at the Idaho National Laboratory**
- **Conversion of MURR and MIT from HEU to LEU fuel type**

Funding Profile



RRI Team Members





Thank You!

Easy Questions?