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03/09/2021

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NRR/DLP/PRLB
3WFN MS 8 C28

SUBJECT: Docket No. 50-602 R-126, 2019 ANNUAL REPORT FOR THE UNIVERSITY
OF TEXAS TRIGA II NUCLEAR RESEARCH REACTOR

Sir:

Attached is the 2020 Annual Report for the University of Texas TRIGA II Nuclear
Reactor. If there are any questions, please feel free to contact P. M. Whaley at
whaley@mail.utexas.edu or 512 232 5374.

Sincerely,

P. M. Whaley

ADZO
NRR

**2020 ANNUAL REPORT FOR THE UNIVERSITY OF TEXAS
TRIGA II NUCLEAR RESEARCH REACTOR (DOCKET 50-602)**

INTRODUCTION

The University of Texas System (UTS) was established by the Texas Constitution in 1876, with the University of Texas at Austin the flagship institution. The Nuclear Engineering Teaching Laboratory was established at the J. J. Pickle Research Campus with a TRIGA II Nuclear Research Reactor, critical in 1992. The reactor is licensed to the University of Texas under USNRC License R-129, a class 104 research reactor. Other activities at the NETL using radioisotopes fall under a broad scope, State of Texas license (L00485).

The NETL TRIGA II Reactor Technical Specifications (section 6.6.1) requires an annual report to the Nuclear Regulatory Commission. This Annual Report covers the period from January through December 2020. The report is organized to summarize the status of current organization during the reporting period (line management organization, oversight committees, and independent oversight activities) followed by the information as detailed in Technical Specifications.

ANNUAL REPORT

Personnel status for the organization during the 2019-2020 reporting year for management, oversight, and operating staff is provided. The Technical Specifications requires “Routine annual reports covering the activities of the reactor facility during the previous calendar year” three months following the end of each prescribed year. The information required in the annual report is addressed as indicated in Table 1.

Table 1: Required Annual Report Information		
Information		Addressed as
a.	A narrative summary of reactor operating experience including the energy produced by the reactor or the hours the reactor was critical, or both.	Narrative Summary
		Energy produced: 14MWD
		Hours critical: 588 h
b.	The unscheduled shutdowns including, where applicable, corrective action taken to preclude recurrence.	Tabulation of Unscheduled Shutdowns
		Analysis and Corrective Action
c.	Tabulation of major preventive and corrective maintenance operations having safety significance.	Statement of Surveillance Activities
		Description of Significant Corrective Maintenance
d.	Tabulation of major changes in the reactor facility and procedures, and tabulation of new tests or experiments, or both, that are significantly different from those performed previously, including conclusions that no new or unanalyzed safety questions were identified.	Description of Facility Modifications
		Description of Procedure Changes
		Description of New Tests/Experiments
		50.59 Summary

e.	A summary of the nature and amount of radioactive effluents released or discharged to the environs beyond the effective control of the owner-operator as determined at or before the point of such release or discharge. The summary shall include, to the extent practicable, an estimate of individual radionuclides present in the effluent. If the estimated average release after dilution or diffusion is less than 25% of the concentration allowed or recommended, a statement to this effect is sufficient.	There were no liquid effluents in 2020 Argon 41 Effluent
f.	A summarized result of environmental surveys performed outside the facility.	Environmental Surveys
g.	A summary of exposures received by facility personnel and visitors where such exposures are greater than 25% of that allowed or recommended.	Exposures

ORGANIZATION

Line Management

Figure 1 presents the four levels of management identified in Technical Specifications.

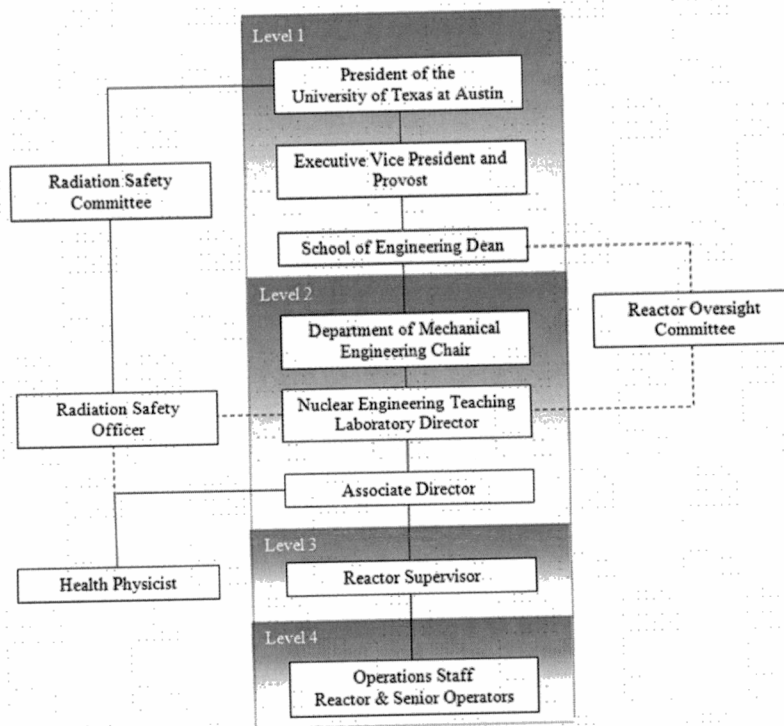


Figure 1: Line Management Organization

Table 2: Level 1

The University of Texas at Austin Administration

J. Hartzell, PhD, President
Daniel Jaffee, PhD, Executive Vice President and Provost
Sharon Wood, PhD, Dean, Cockrell School of Engineering

Table 3: Level 2

Mechanical Engineering and NETL Administration

Dr. Richard Neptune, Chair, Mechanical Engineering Department
Dr. W. Charlton, Director
P. M. Whaley, Associate Director

There were no changes in Level 2 personnel during 2020.

Table 4: Level 3

NETL Reactor Supervisor

Larry Hall, Reactor Manager

There was no change in the reactor manager during 2020.

Table 5: Level 4

NETL Reactor Operators/Senior Reactor Operators

P. M. Whaley: Senior Operator
Larry Hall: Senior Operator
Jim Terry (Electronic Technician) Senior Operator
Tracy Tipping (Health Physicist) Reactor Operator
Walker Payne (Research Assistant) Reactor Operator
Kevin McKay -- *Reactor Operator*
Mark Andrews (Research Associate) – *Reactor Operator*

Oversight Committees

Table 6: 2019-2020 University Radiation Safety Committee

Kevin N. Dalby, Ph.D., Chair, Professor, College of Pharmacy
Alison Preston, Ph.D., Vice-Chair, Office of the Vice President for Research
R. DeWayne Holcomb, ex-officio, Radiation Safety Officer, Environmental Health and Safety
Jack L. Ritchie, Ph.D., Department Chair, Professor, Department of Physics
John Salsman, Director, Environmental Health and Safety (& acting Radiation Safety Officer)
Christopher S. Sullivan, Ph.D., Associate Professor, Department of Molecular Biosciences
J. Steven Swinnea, Ph.D., Texas Materials Institute X-Ray Facility Manager
Tracy N. Tipping, NETL Health Physicist and Laboratory Manager
Karen M. Vasquez, Ph.D., Professor, College of Pharmacy

Table 7: 2019-2020 Reactor Oversight Committee

Derek Haas (ME), Chair
 Kevin Clarno (ME), Chair
 Dale Klein (ME)
 Rick Neptune, ex-officio (ME)
 John G. Ekerdt, ex-officio
 Lawrence R. Jacobi (External Representative)
 Scott Pennington (External Representative)
 Larry Hall, ex-officio (NETL)
 Tracy Tipping, ex-officio (NETL)
 Mike Whaley, ex-officio (NETL)
 DeWayne Holcomb (Radiation Safety Officer)

Independent Oversight Activities

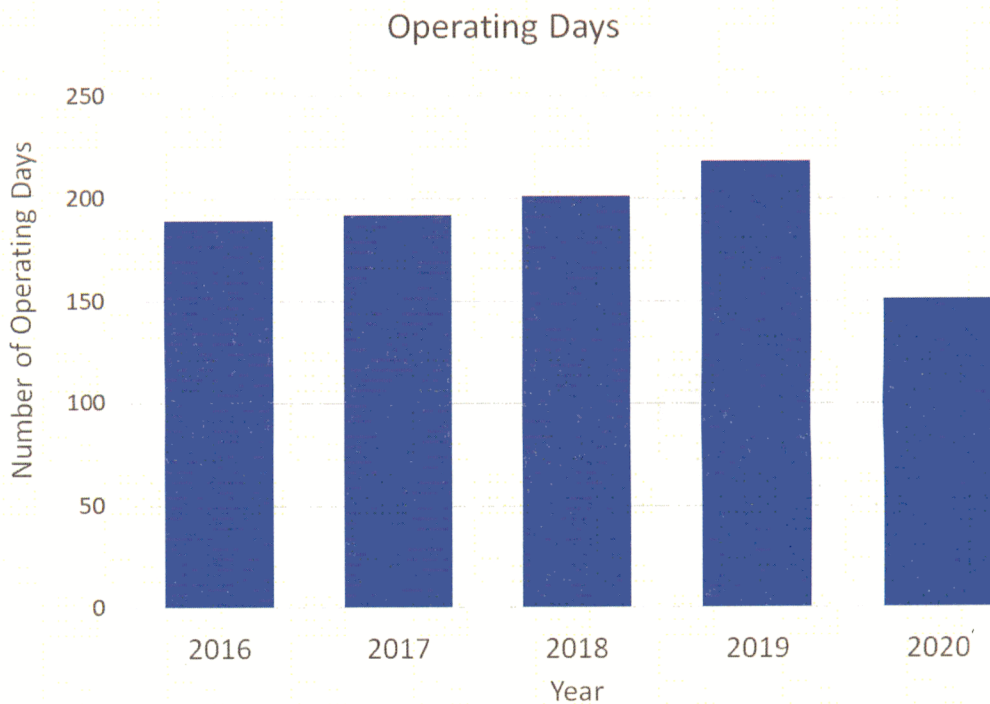
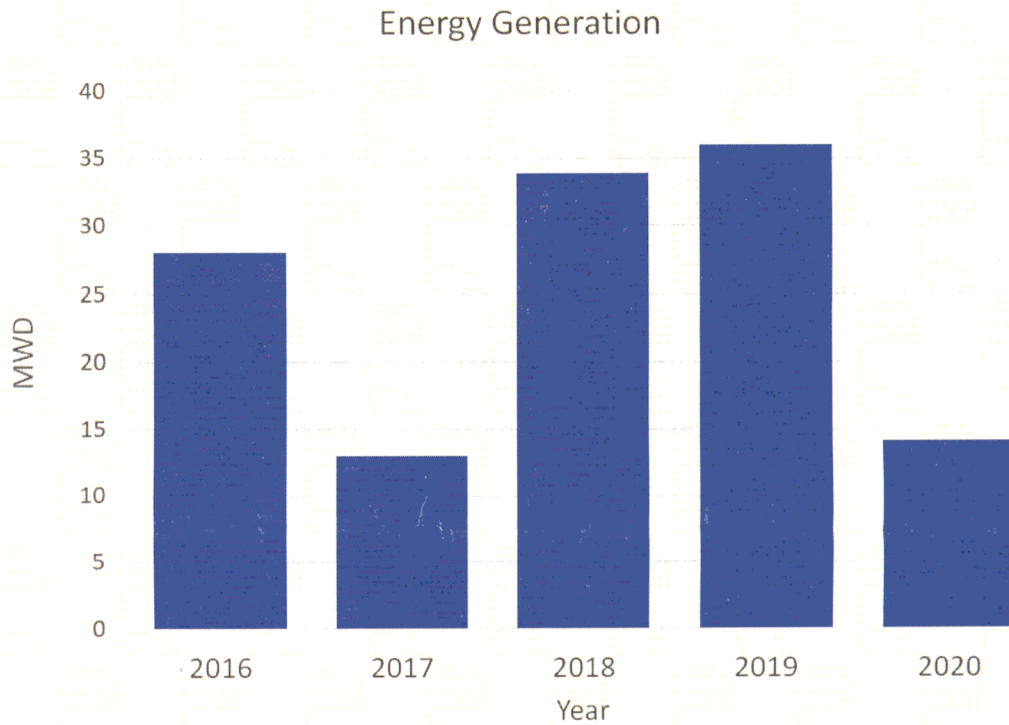
Table 8: Inspections and Reviews

USNRC License(s) Inspection	
R-129	16-18 November 2020
State of Texas License Inspection	
L00485 (89)	None
Reactor Oversight Committee Review	
Semi Annual Review	20 Apr 2020
Semi Annual Review	30 Nov 2020
Other	
UT Fire Marshal Fire Safety	None
UT Fire Safety Systems	None due to installation of new fire alarm and sprinkler system

FACILITY OPERATIONS SUMMARY REPORT

Narrative Summary

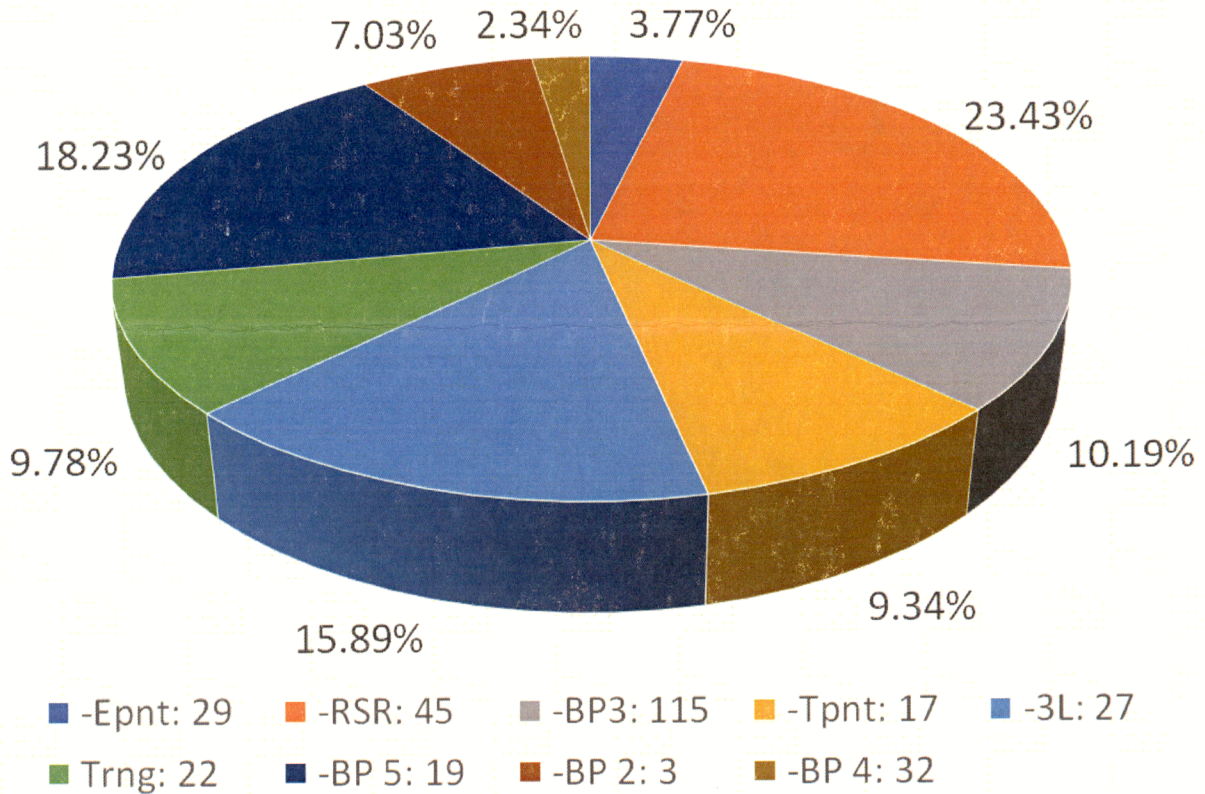
The UT-TRIGA reactor operated on 151 days in 2020, producing a total energy output of 339.5 MWh. There were routine maintenance outages in Jan and July, (Jan maintenance outage was completed in Dec 2019 prior to Christmas break (The University is secured over Christmas break, typically from the Friday before Christmas through January 1) to support an experiment schedule. The COVID 19 pandemic affected the operating schedule, which resulted in limited staff and student ability to enter facility for an extended period of time. Even with the special event that limited reactor operations, the trend of operating hours and energy generation remained relatively high. Sandia National Laboratory performed experiments at the facility during 2020.



There were 20 days of operations for training and education, including preparation for NRC examination and reactor-based laboratory classes. There were 710 samples irradiated during 151 days of experiment operations (31 experiments run: 19 for research, 10 for service work and

2 for internal experiments. The distribution of utilization across experiment facilities is provided below.

Experiment Facility Utilization



Other Significant Operations and Events

Tabulation of Unscheduled Shutdowns

TABLE 9: UNSCHEDULED SHUTDOWNS			
31 Jan 2020	PWR HIGH	Approach 950kW NP spike High	Operator Error
16 Dec 2020	NM%PWR	Playback indicated 98% prior to trip	Spurious NM
16 Dec 2020	NM%PWR	Playback indicated 99% prior to trip	Spurious NM

Analysis and Corrective Actions

Temperature Trips

There were no temperature trips in 2020 a significant change from previous years.

Operator Error

There was a single reactor scram due to operator error. The scram occurred while approaching 950kW.

Spurious NM 1000 Power Level Trips

The NM was responsible for two spurious scrams. Playback allows the operator to witness the highest level of power reached. In all cases, the scram occurred well below the scram limit. This has been a recurring event throughout the history of UT NETL.

Statement of Surveillance Activities

The facility conducts two major maintenance outages each year, one in January (before the start of the spring semester) and one mid-summer. All surveillances and scheduled maintenance activities were completed during the reporting year at the required frequencies. All results met or exceeded the requirements of the Technical Specifications.

Description of Significant Corrective Maintenance

None

Description of Facility Modifications

Fire alarm and sprinkler system completed.

A new roof was installed on the facility. This work included new railings and vent stacks. Vent stacks were tested prior to and after replacement and flow rates remained the same. All specs of the new stacks were complimentary of the original stack.

New alarm and camera software were installed with greater capabilities available on both systems.

Description of Procedure Changes

None

New Tests or Experiments

None

50.59 Summary

Modifications for which no Technical Specifications change is required and the criteria for NRC approval prior to implementation was not met.

10 March evaluation performed for Fire alarm and sprinkler upgrade. No 50.59 required
13 May evaluation performed for RSR motor replacement. No 50.59 required.
28 May evaluation performed for alarms software. No 50.59 required.
13 Dec evaluation performed for roof replacement. No 50.59 required.

The pneumatic facility in a 3-EL canister is in the design phase; a 10CFR50.59 review will be completed following review of final design and prior to installation (ongoing)

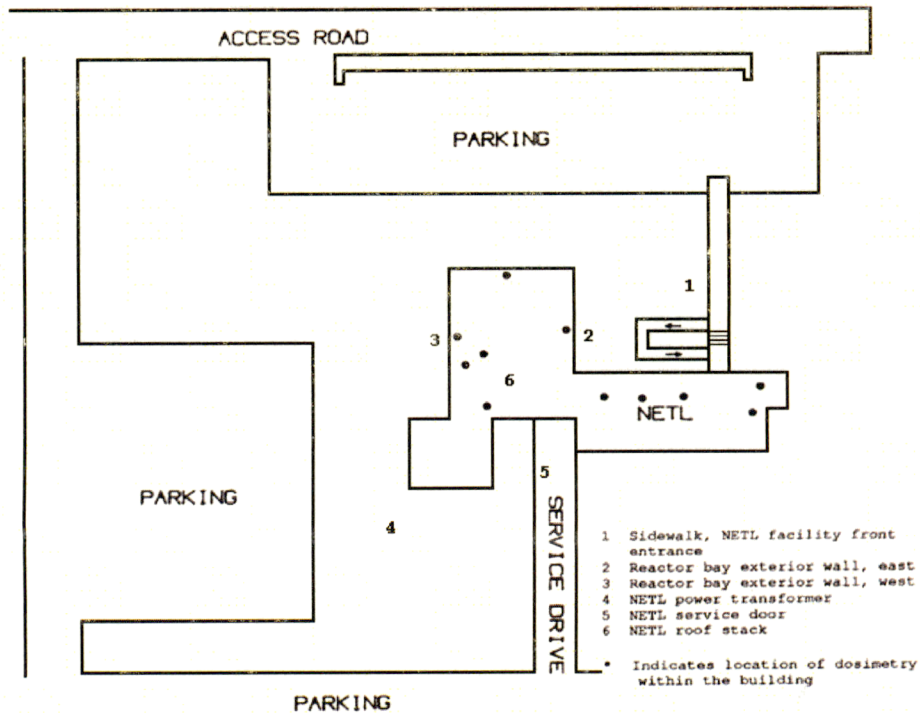
RADIOLOGICAL SUMMARY REPORT

Argon 41 Effluent

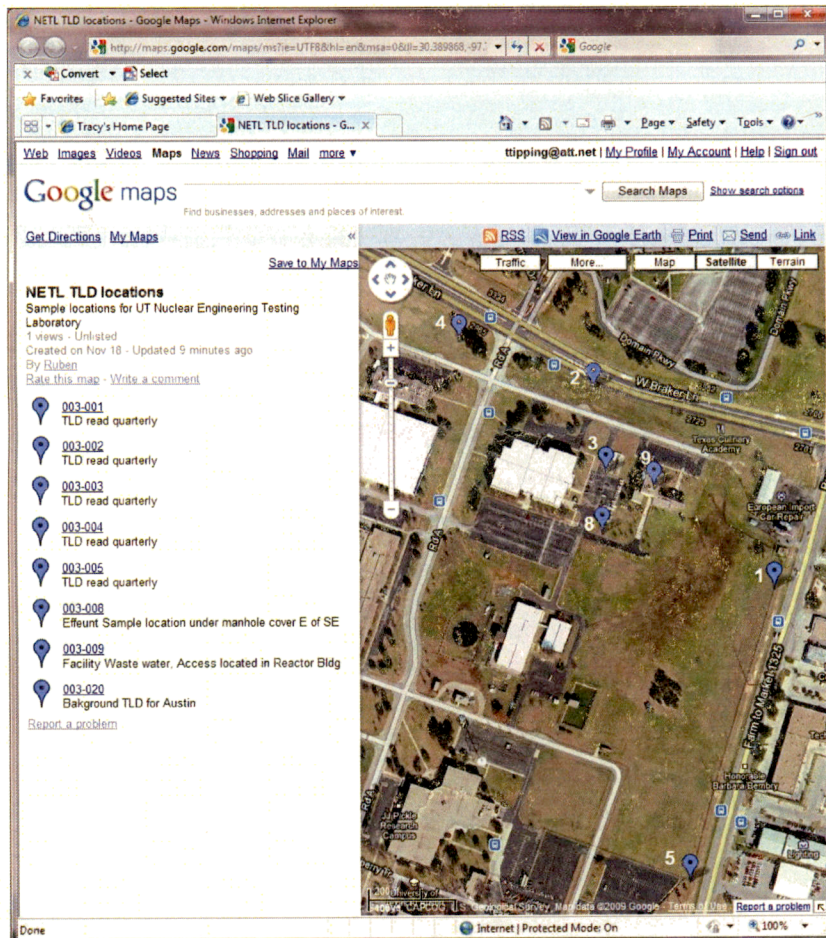
The principal radioactive effluent for the UT reactor is Argon 41. There were 3.3×10^6 μCi of argon-41 discharged during calendar year 2020, approximately 3% of the value permitted by Technical Specifications.

Environmental Surveys

NETL monitors exterior locations indicated as positions 1 through 6 on the exterior dosimeter map. For 2020, “minimal” doses (< 1 mrem) were reported for positions 1, 2, 3, 4, and 6. A dose of two mrem was reported for position 5 for 2020. These doses are well below the 100 mrem annual limit for dose to the general public.



NETL Environmental Monitor Locations (External Dosimeter Map)



The Texas Department of State Health Services monitors exterior locations near NETL indicated as positions 1 through 5 on the TDSHS TLD map. As yet, TDSHS has only reported results for the first three calendar quarters of 2020. For this period, 1 mrem dose was reported for position 1, 2 mrem dose was reported for positions 2 and 3, 8 mrem dose was reported for position 4, and 5 mrem dose was reported for position 5. These doses are well below the 100 mrem annual limit for dose to the general public.

Exposures

No workers or members of the general public received doses in excess of 25% of applicable exposure limits during 2020.