

ORNL NCSP FY 2023 Budget Summary and Highlights

Doug Bowen

ORNL NCSP Task Manager

Section Head | Nuclear Data, Criticality Safety & Radiation Transport

Nuclear Fuel Cycle and Energy Division

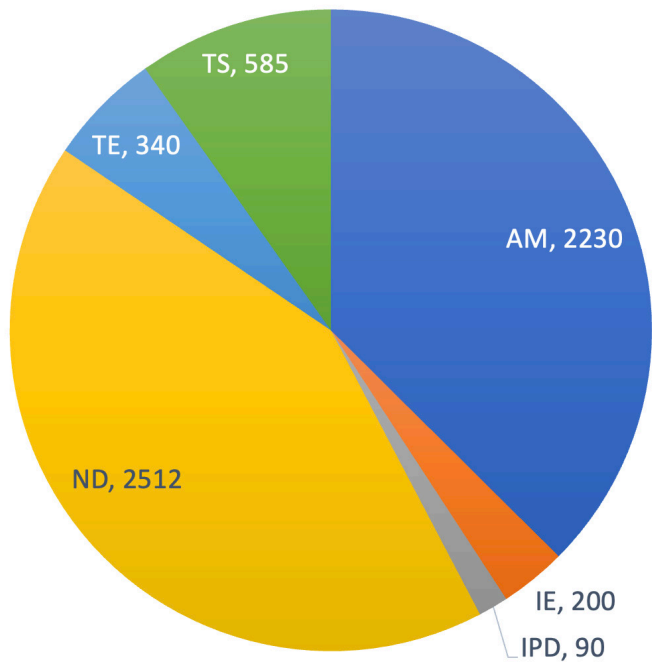
Oak Ridge National Laboratory

NCSP Technical Program Review

February 20, 2024

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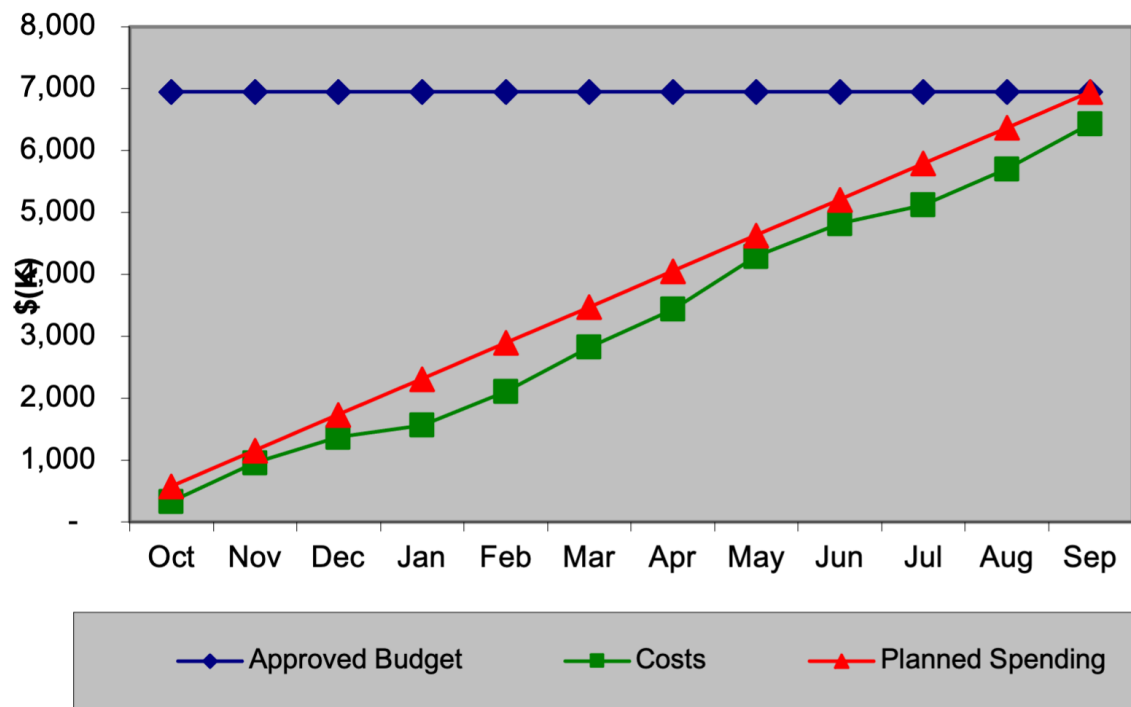
Budget and Spending



FY2023 Budget Breakdown by TPE

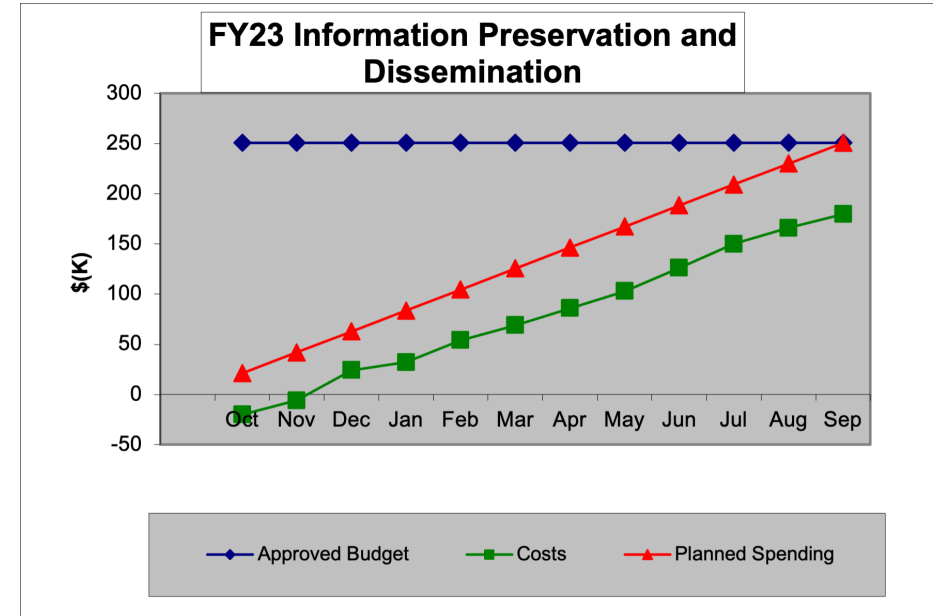
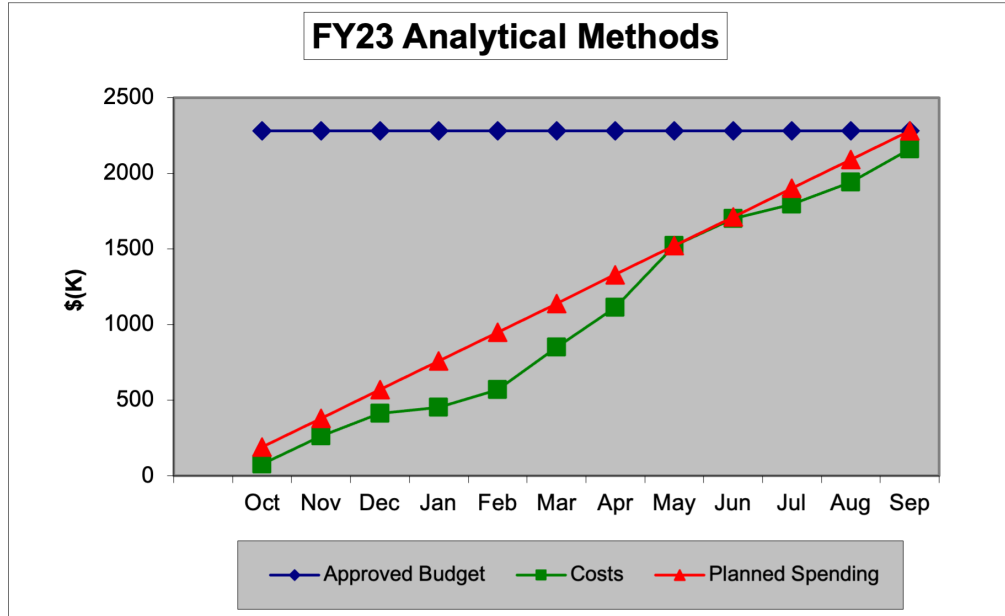
- FY 2022 Carryover: \$886K
- Final FY 2023 Budget: \$6,948K
- FY 2023 Carryover: \$522K
- Spending accelerated as we went into Q2

FY23 NCSP ORNL Spending Summary



FY22 Carryover	\$886K
FY23 Approved budget (inc. C/O)	\$6,948K
Actual spending for Q1	\$1,372K
Actual spending for Q2	\$1,452K
Actual spending for Q3	\$1,994K
Actual spending for Q4	\$1,608K

Spending Details (1)



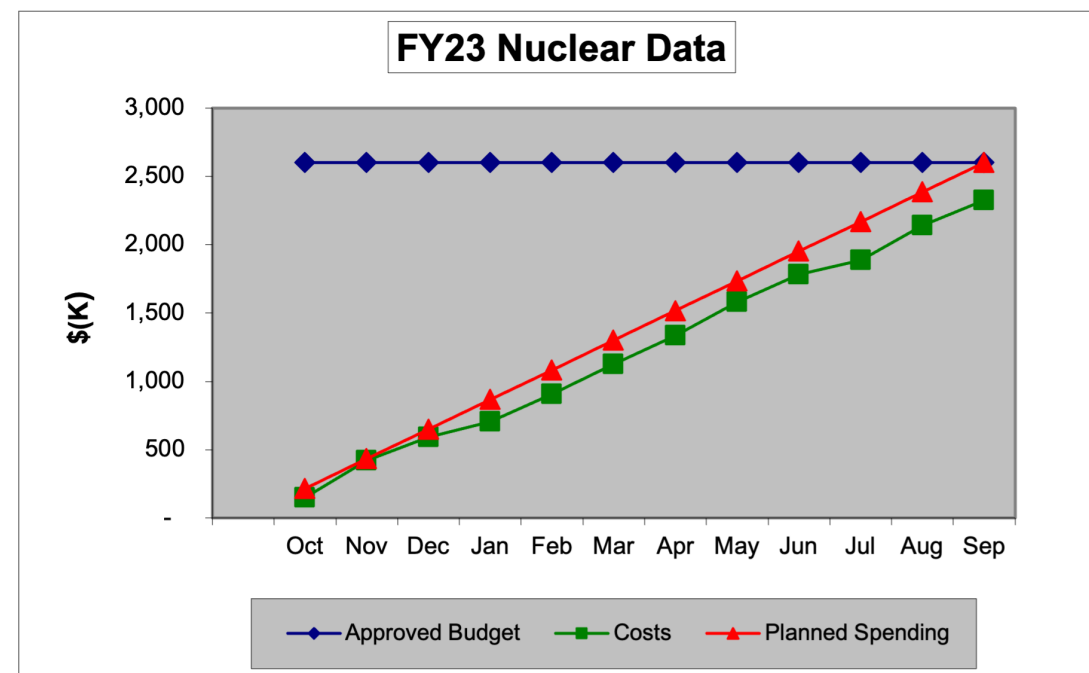
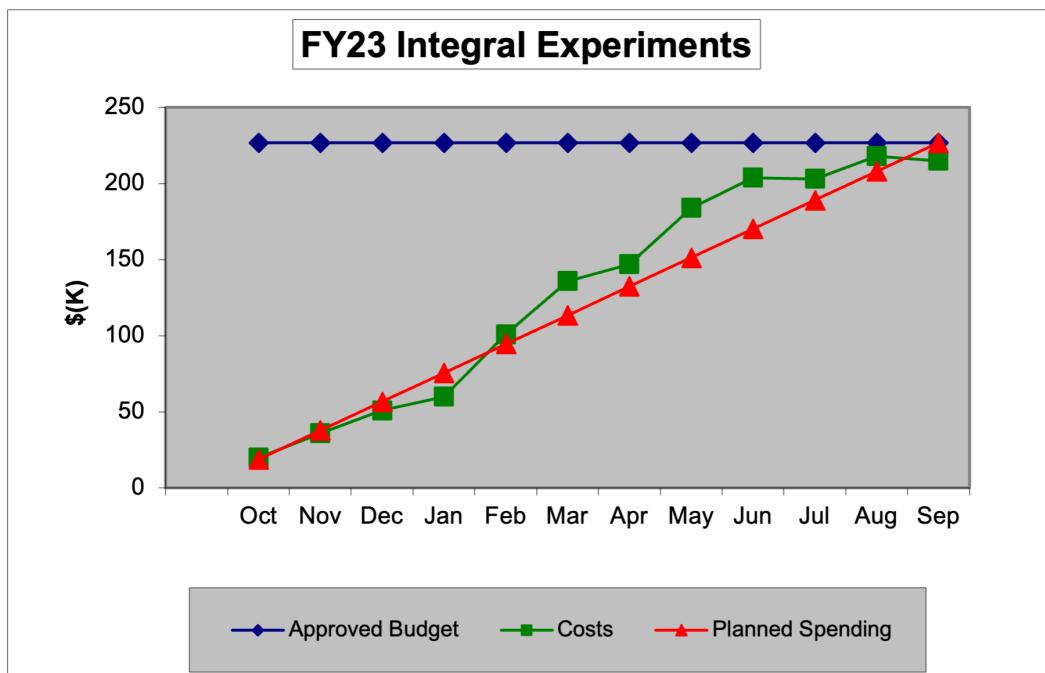
	FY23 (\$k) Adj
= ORNL	2230
= AM	2230
= ORNL-AM1	
Radiation Safety Information Computational Center (RSICC)	600
= ORNL-AM10	
Proposed Benchmark Intercomparison Study	50
= ORNL-AM17	
Expansion of the Verified, Archived, Library of Inputs and Data (VALID)	50
= ORNL-AM18	
Determination of Appropriate Integral Parameters for Critical Experiment	50
= ORNL-AM19	
Analysis of Sum-of-Fractions for Nuclide Mixtures	40
= ORNL-AM2	
SCALE/KENO/TSUNAMI Maintenance and Support/Cross-Section Generation/Modernization/etc.	1090
= ORNL-AM3	
AMPX Maintenance & Modernization	300
= ORNL-AM6	
Slide Rule Application	50
Grand Total	2230

FY22 Carryover	\$50K
FY23 Approved budget (inc. C/O)	\$2,280K
Actual spending for Q1	\$414K
Actual spending for Q2	\$438K
Actual spending for Q3	\$849K
Actual spending for Q4	\$457K

	FY23 (\$k) Adj
= ORNL	90
= IPD	90
= ORNL-IPD3	
Nuclear Criticality Safety Repository	40
= ORNL-IPD4	
Nuclear Criticality Safety - Learning From Experience (LFE) Database	50
= ORNL-IPD5	
Oak Ridge Health Physics Research Reactor CAAS Benchmark Evaluation	0
Grand Total	90

FY22 Carryover	\$161K
FY23 Approved budget (inc. C/O)	\$251K
Actual spending for Q1	\$24K
Actual spending for Q2	\$45K
Actual spending for Q3	\$57K
Actual spending for Q4	\$54K

Spending Details (2)



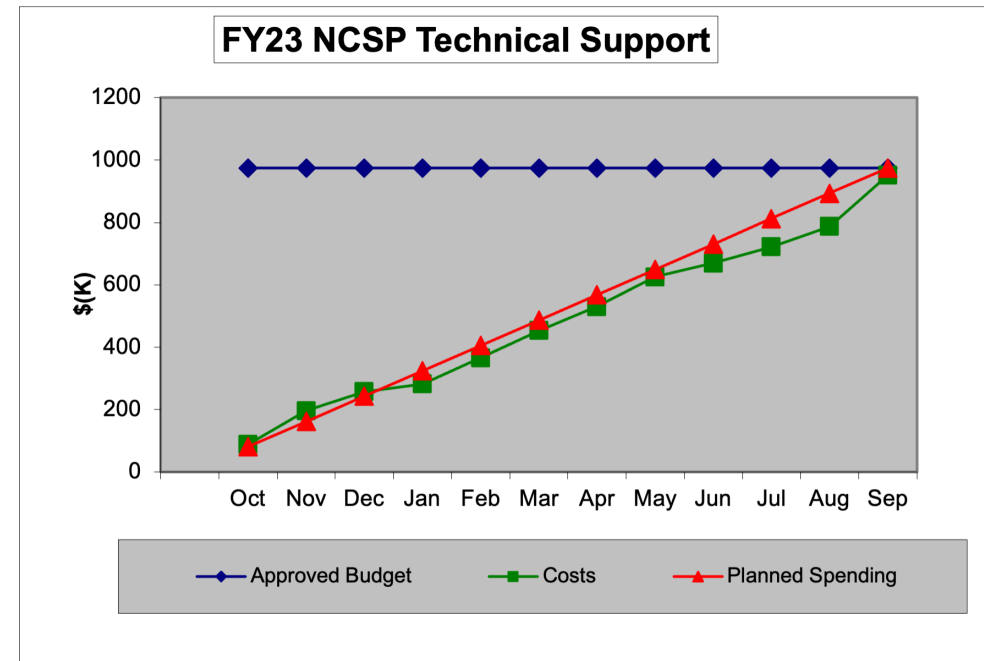
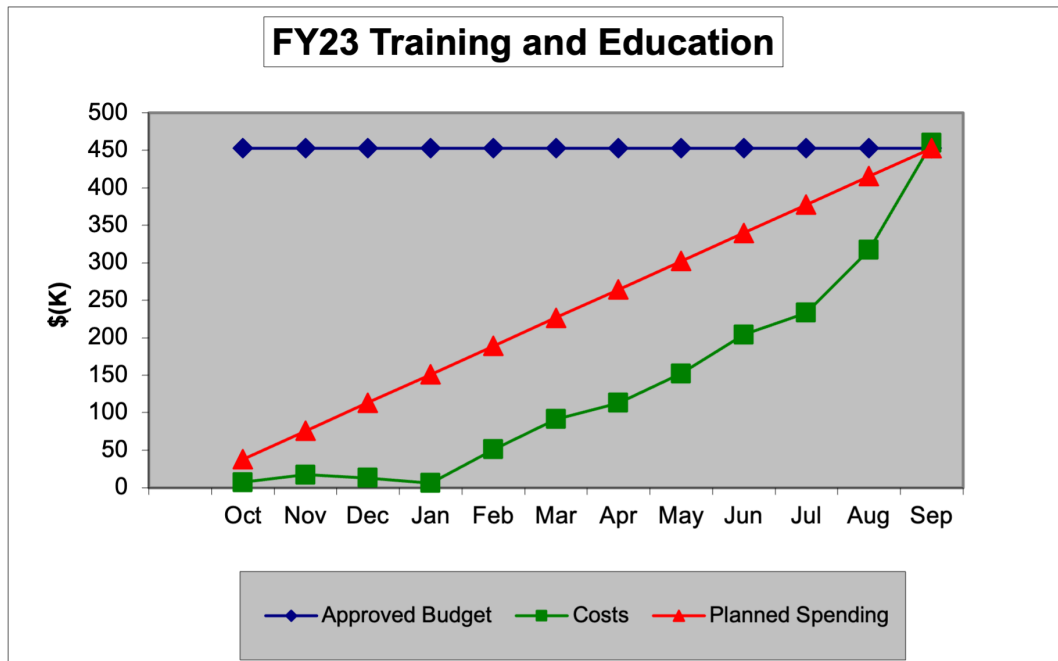
	FY23 (\$k) Adj
ORNL	200
IE	200
ORNL-IE1	
IE CEDT Support	200
ORNL-IE2	
Provide Safety Committee Support at DAF/NCERC	0
ORNL-IE4	
Funding to support U-233 ZPPR plate shipments to DAF NCERC	0
Grand Total	200

FY22 Carryover	\$27K
FY23 Approved budget (inc. C/O)	\$227K
Actual spending for Q1	\$51K
Actual spending for Q2	\$85K
Actual spending for Q3	\$68K
Actual spending for Q4	\$11K

	FY23 (\$k) Adj
ORNL	2512
ND	2512
ORNL-ND1	
Nuclear Data Measurements	600
ORNL-ND11	
Thermal neutron scattering measurements and evaluations for DHS applications at temperature	621
ORNL-ND2	
Nuclear Data Evaluations and Testing	600
ORNL-ND3	
Isotopic Sample Leases to Support ND1 ND Measurements	41
ORNL-ND4	
Thermal Neutron Total Cross Section Measurements for Improvement of Criticality Calculations and Propagation of Scattering Kernel Uncertainties	0
ORNL-ND6	
SAMMY Nuclear Data Evaluation Code Modernization	400
ORNL-ND9	
Evaluation of Thermal and Resolved Resonance Ranges of UO2 and PUO2	250
Grand Total	2512

FY22 Carryover	\$89K
FY22 Approved budget (inc. C/O)	\$2,601K
Actual spending for Q1	\$591K
Actual spending for Q2	\$534K
Actual spending for Q3	\$656K
Actual spending for Q4	\$544K

Spending Details (3)



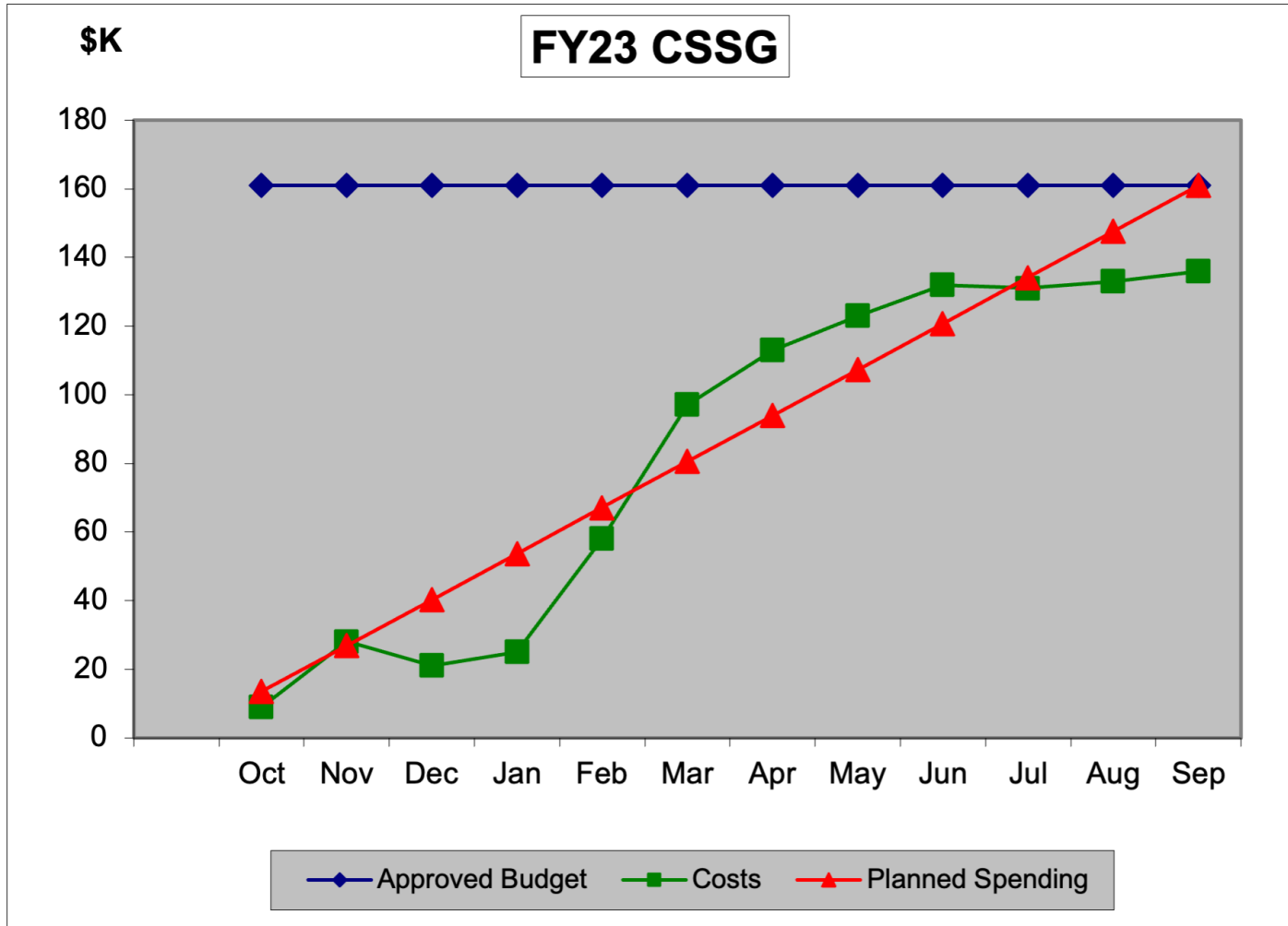
	FY23 (\$k) Adj
ORNL	340
TE	340
ORNL-TE1	
Manage and Provide Instruction for the DOE Nuclear Criticality Safety Training & Education Program	240
ORNL-TE11	
Revision of the LA-12808 Nuclear Criticality Safety Guide	0
ORNL-TE14	
Nuclear Criticality Safety Training and Pipeline Development	100
Grand Total	340

FY22 Carryover	\$113K
FY23 Approved budget (inc. C/O)	\$453K
Actual spending for Q1	\$13K
Actual spending for Q2	\$78K
Actual spending for Q3	\$113K
Actual spending for Q4	\$256K

	FY23 (\$k) Adj
ORNL	585
TS	585
ORNL-TS13	
NDA Technical Support Group and NDA Technical Infrastructure Project	100
ORNL-TS2	
Technical Support	295
ORNL-TS7	
AM, ND Succession Planning	170
ORNL-TS8	
NCSP Program Management Tools Development	20
Grand Total	585

FY22 Carryover	\$391K
FY23 Approved budget (inc. C/O)	\$975K
Actual spending for Q1	\$258K
Actual spending for Q2	\$196K
Actual spending for Q3	\$216K
Actual spending for Q4	\$282K

Spending Details (4)



FY22 Carryover	\$55K
FY23 Approved budget (inc. C/O)	\$161K
Actual spending for Q1	\$21K
Actual spending for Q2	\$76K
Actual spending for Q3	\$35K
Actual spending for Q4	\$4K

- CSSG Tasking 2023-02 Response
- Deputy Chair transition

FY2023 ORNL Highlights

- **AM**
 - **AM1 – RSICC**
 - RSICC code distributions: 510 SCALE, 1051 MCNP, 1,464 University Requests, and 184 NCSP direct requests; **Tim Valentine provided a report**
 - **AM2 – SCALE**
 - SCALE 6.3.1 released to RSICC for distribution; export control issues delayed release; SCALE 6.3.2 release to come out soon; SCALE 7 under development (beta testing in progress); **Report to be provided by Will Wieselquist**
 - **AM3 – AMPX**
 - **Report to be provided by Jordan McDonnell, Jesse Brown and Doro Wiarda**
 - **AM6 – Slide Rule**
 - Criticality Slide Rule collaborations with IRSN and LLNL continue with planned completion of slide rule documents in FY2024; **Report to be provided by Sophie Pignet, IRSN, for the team.**
 - **AM10 – Benchmark Intercomparison Study**
 - Supported Beta-eff computations alongside IRSN and LLNL; **Report to be provided by IRSN – Romain Vuiart.**
 - **AM17 – Expansion of VALID libraries at ORNL**
 - 25 models added for LEU-SOL-THERM-016, -017, -018, and -019; 28 models added for LEU-COMP-THERM-060; 19 models for LEU-COMP-THERM-096, -097
 - **Report later by Travis Greene**
 - **AM19 – Sum of Fractions Method**
 - Completed validation computations to support PNNL work; **Travis Zipperer to talk about the closure of this project.**

FY2023 ORNL Highlights

- **ND**
 - **ND1 – Nuclear Data Measurements** (Report to be provided by Klaus Guber)
 - Zr-91 stable isotope measurements completed; Zr-91 shipped back to ORNL isotopes in Q1
 - Zr-92 measurements delayed due GELINA issues (budget and equipment issues); sample shipped to GELINA in March 2023
 - **ND2 – Nuclear Data Evaluations** (Report to be provided by Marco Pigni)
 - ^{51}V transmission, capture yield data from GELINA used to extend the evaluation up to 200 keV; improved benchmark results
 - ^{103}Rh transmission, capture data from GELINA used to extend the evaluation up to 8 keV; comparable RPI data used to extend the evaluation to 2 keV; improved benchmark results
 - ^{239}Pu evaluation for RRR updated
 - ^{88}Sr evaluation completed – submitted to ENDF/B repository – (ORNL/LTR-2023/3004), “Resonance Parameter Evaluation of n+88Sr reactions for ENDF/B-VIII.1 Library”
 - $^{140,142}\text{Ce}$ RRR evaluation completed; covariance libraries updated for ENDF/B-VIII.1 release
 - ^{181}Ta – collaboration with NNL; evaluation completed in early FY23; (ORNL/NNL < 2.5 keV – RRR, ORNL – URR, LANL > 100 keV)
 - $^{63,65}\text{Cu}$ – Completed evaluation and covariance analysis to the ENDF/B-VIII.1 library
 - ^{139}La – progress made to extend the resolved resonance range from 20 keV to 40 keV (GELINA transmission & capture data – Guber)

FY2023 ORNL Highlights

- **ND Continued...**

- **ND3 – Isotopic Sample Leases for ND1**

- Obtained Zr-94 lease approval from DOE

- **ND4 – Thermal Neutron Total Cross Section Measurements for Improvement of Criticality Calculations and Propagation of Scattering Kernel (RPI measurements/ORNL evaluation)**

- Task complete; **Report to be provided by Chris Chapman.**

- **ND6 – SAMMY Modernization**

- **Report to be provided by Doro Wiarda.**

- **IE**

- **IE1 – ORNL CEDT Support**

- Dupont, Marshall, McDonnell, Celik, & Cumberland provided IER team support; IER-554, CED-2, completed; IER Team Lead: Mathieu Dupont; **Mathieu Dupont to provide a report.**

- **IE2 – Provide Safety Committee Support at DAF/NCERC**

- No significant work performed

- **IE4 – U-233 ZPPR Plate Shipments to DAF/NCERC**

- Supported the MOU between the US DOE Oak Ridge Office of Environmental MGT & the NCSP

FY2023 ORNL Highlights

- **IPD** (Report to be provided by Doug Bowen)
 - **IPD3 – NCS Repository at OSTI**
 - OSTI completed searching for all LLNL bibliography records – gaps determined. NCSP deliverables are being added each quarter
 - **IPD4 – Nuclear Criticality Safety - Learning From Experience (LFE) Database**
 - Planning efforts commenced details of the event/LFE database; Prichard subcontract completed; ANS Annual Meeting panel session conducted to get feedback from the NCS community
 - **IPD5 – Oak Ridge Health Physics Research Reactor CAAS Benchmark Evaluation**
 - Health Physics Research Reactor shielding benchmark report defended at the ICSBEP TRP meeting with completed resolutions; however, the TRG rejected it. Worked to reformat with additional NCSP funds for the SINBAD database.
- **TE** (Report to be provided by Doug Bowen)
 - **TE1 – Manage and Provide Instruction for the DOE NCS Training & Education Program**
 - ORNL successfully executed 4 NCSP training courses (two 1-week & two 2-week); 84 students completed the courses successfully (43 @ Sandia and 41 @ NCERC)
 - **TE14 – NCS Training & Pipeline Development**
 - Course agenda and a significant fraction of course material was completed for the ORNL, Texas A&M, and GA Tech pipeline collaboration for the new NCS certificate program task
 - **FY22 Task – TE3 Hand-Calculation Primer Expansion (LA-14244-M)**
 - Hand Calculation Primer Revision, ORNL/TM-2022/2747, published in FY23Q1; added to NCSET module 9 along with LA-14244-M

FY2023 ORNL Highlights

- **TS**
 - Executed FY23 NCSP Technical Program Review in Feb. 2023; Sandia hosted
 - Executed FY23 NCSP Budget Execution Meeting in July 2023
 - Supported IER database mods in G2 as necessary
 - Kicked off NCSP Mission and Vision 2024 revision at the LLNL TEX 2.0 meeting
 - 5-year plans published on schedule by August 6th + all related activities conducted successfully; supported multiple 5YP revisions
 - NDA Program: Second Uranium Holdup Measurements Course held at ORNL Sept. 11-14, 2023



Workshops in progress – 2-week hands-on course – lecture portion Aug. 2023

2023 TPR in Albuquerque, NM (Sandia Hosted)



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