OAK RIDGE National Laboratory

ORNL NCSP FY 2023 Budget Summary and Highlights

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Oak Ridge National Laboratory

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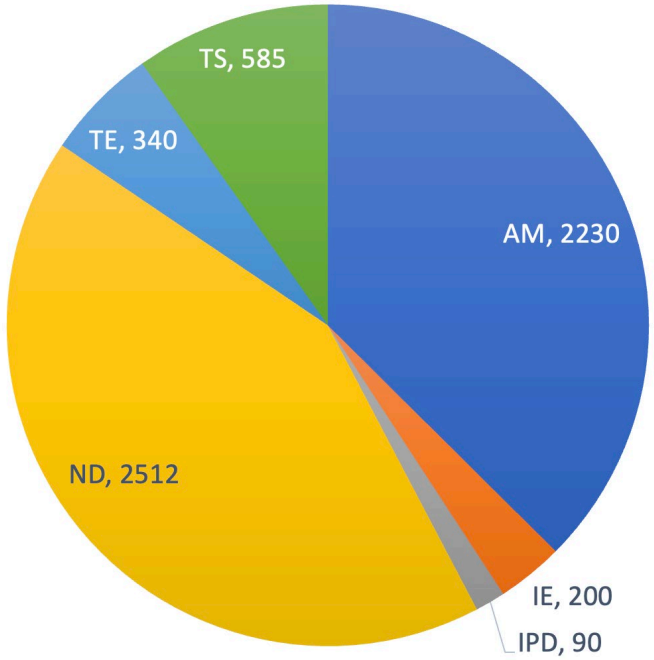
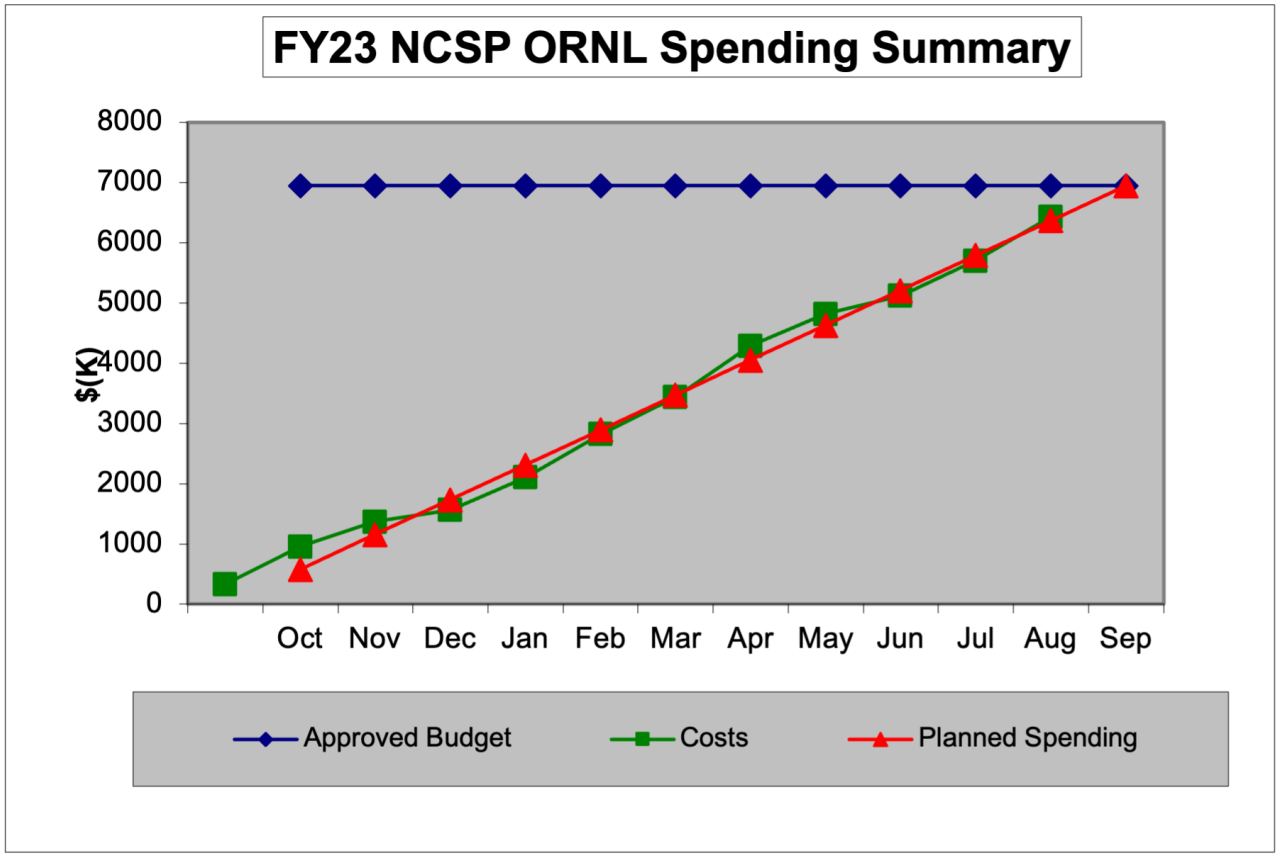
U.S. DEPARTMENT OF ENERGY

Budget and Spending



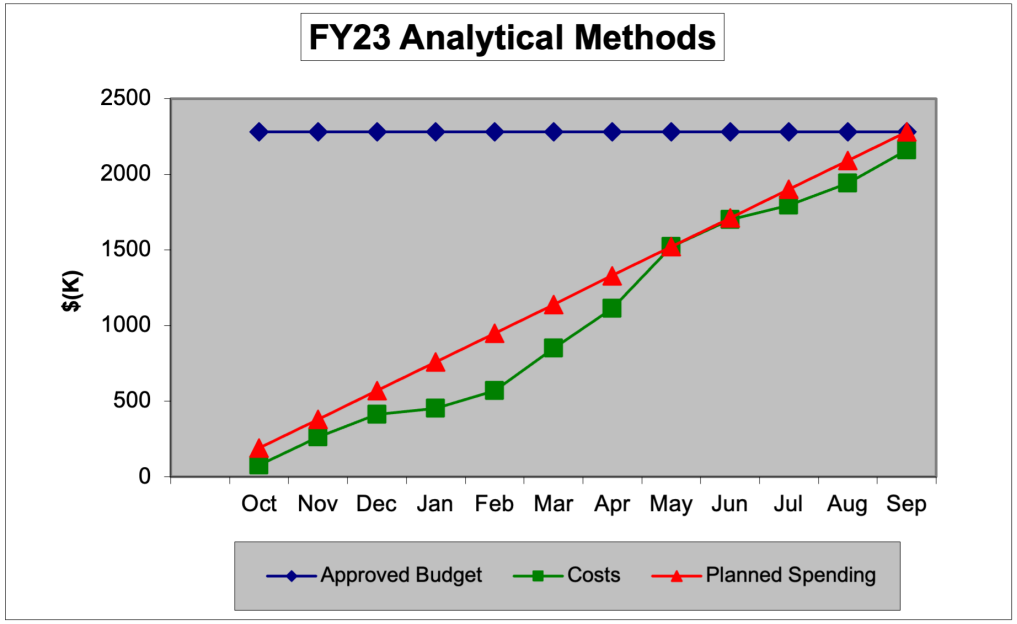
FY2023 Budget Breakdown by TPE

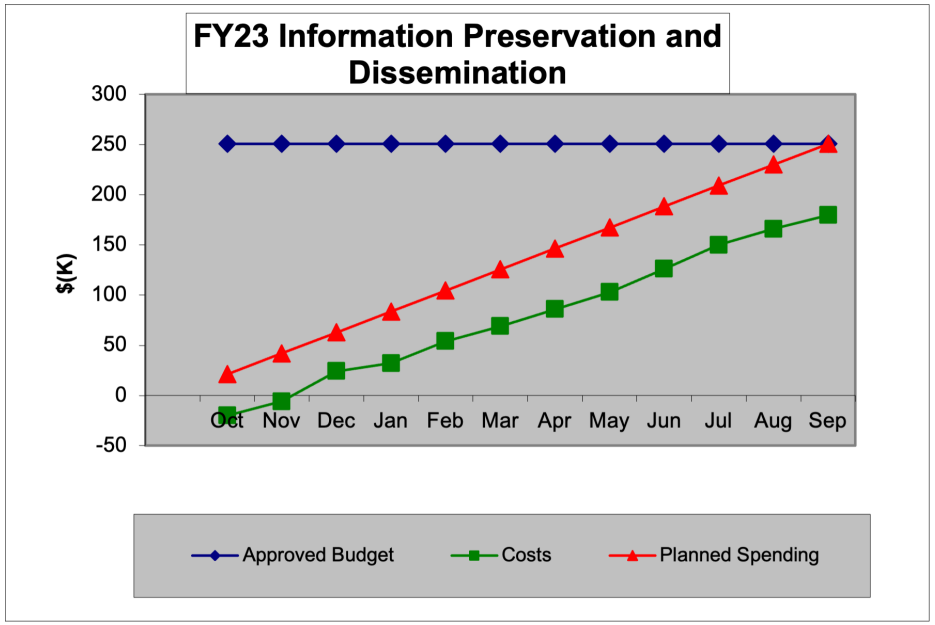


- FY 2022 Carryover: $886K
- Final FY 2023 Budget: $6,948K
- FY 2023 Carryover: $522K
- Spending accelerated as we went into Q2

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)





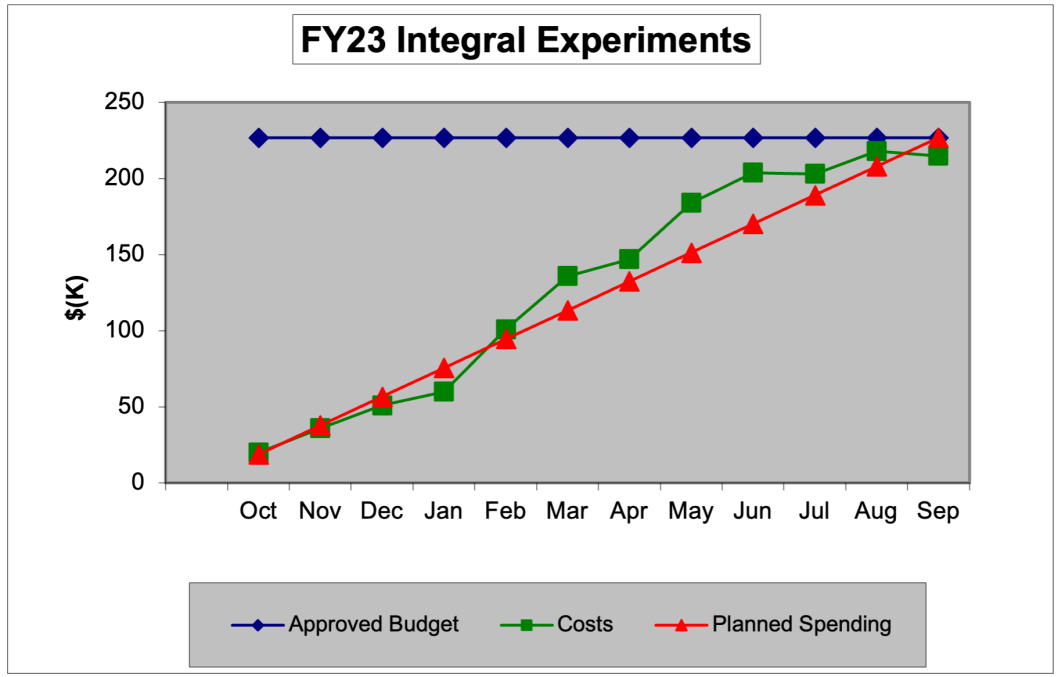
	FY23 ($k) Adj
⊟ORNL	2230
⊟AM	2230
⊟ORNL-AM1	
Radiation Safety Information Computational Center (RSICC)	600
⊟ORNL-AM10	
Proposed Benchmark Intercomparison Study	50
⊟ORNL-AM17	
Expansion of the Verified, Archived, Library of Inputs and Data (VALID)	50
⊟ORNL-AM18	
Determination of Appropriate Integral Parameters 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**

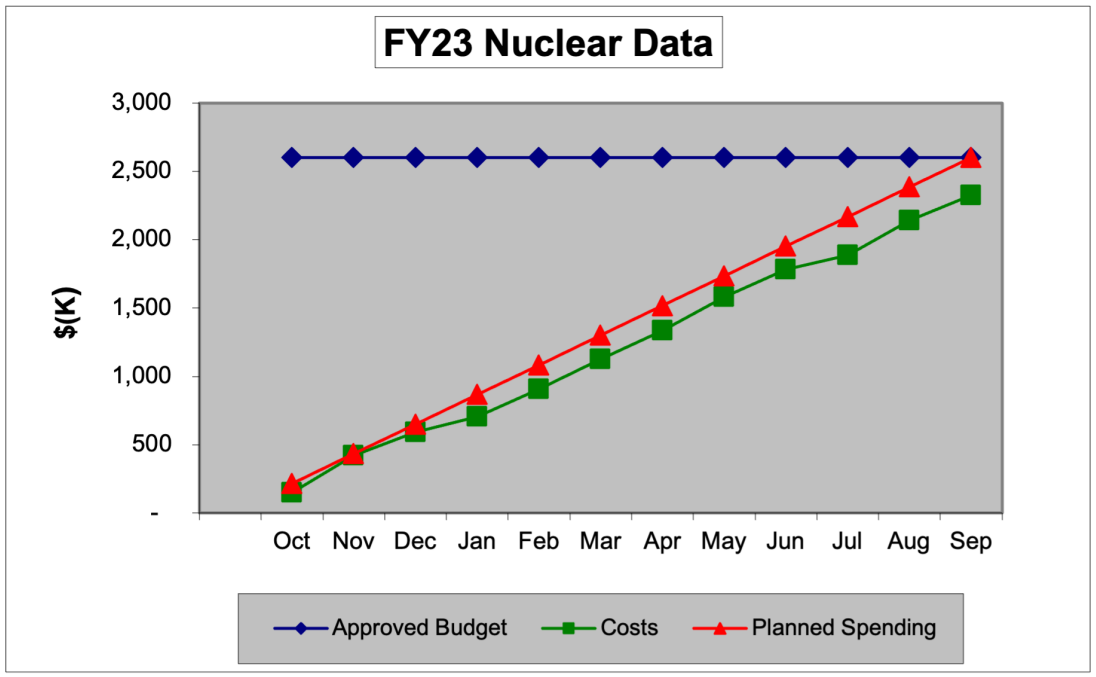
FY22 Carryover	$50K
FY23 Approved budget (inc. C/O)	$2,280K
Actual spending for Q1	$414K
Actual spending for Q2	$438K
Actual spending for Q3	$849K
Actual spending for Q4	$457K

	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)





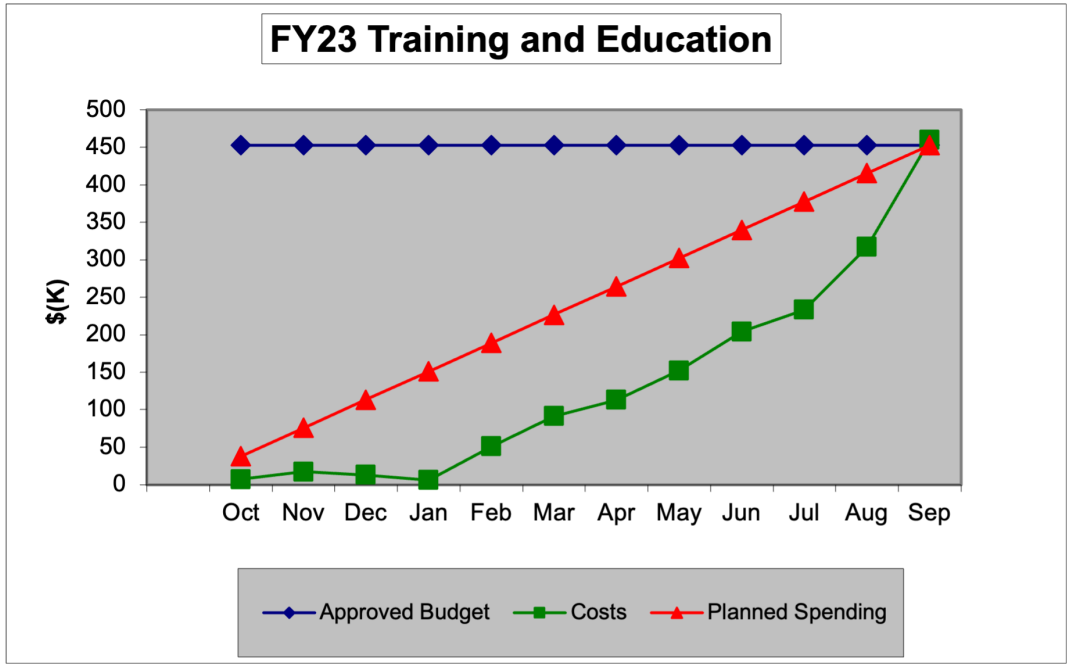
	FY23 ($k) Adj
⊟ ORNL	200
⊟ IE	200
⊟ ORNL-IE1	
IE CEDT Support	200
⊟ ORNL-IE2	
Provide Safety Committee Support at DAF/NCERC	0
⊟ ORNL-IE4	
Funding to support U-233 ZPPR plate shipments to DAF NCERC	0
Grand Total	**200**

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**

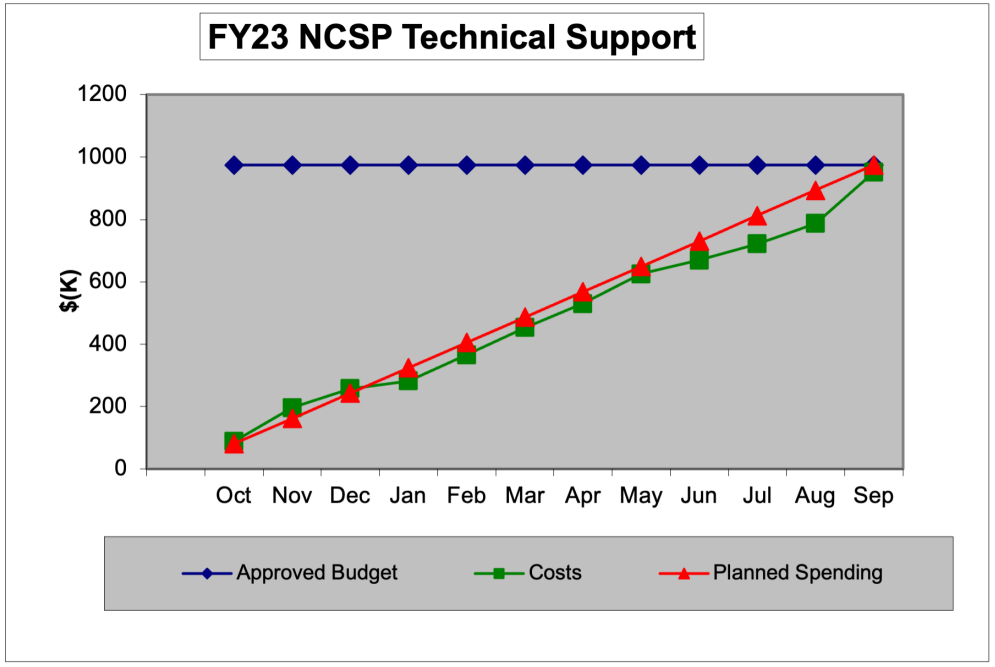
FY22 Carryover	$89K
FY22 Approved budget (inc. C/O)	$2,601K
Actual spending for Q1	$591K
Actual spending for Q2	$534K
Actual spending for Q3	$656K
Actual spending for Q4	$544K

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-TE13	
NDA NCSET Module	0
ORNL-TE14	
Nuclear Criticality Safety Training and Pipeline Development	100
ORNL-TE5	
On-Site Introductory Training for the NCS Practitioner on Modern Approaches to Validation using Sensitivity and Uncertainty Analysis Tools	0
ORNL-TE6	
SlideRule NCSET Module	0
ORNL-TE7	
Criticality Safety Tutorials - CAAS	0
ORNL-TE8	
Criticality Safety Tutorials - D&D	0
Grand Total	**340**

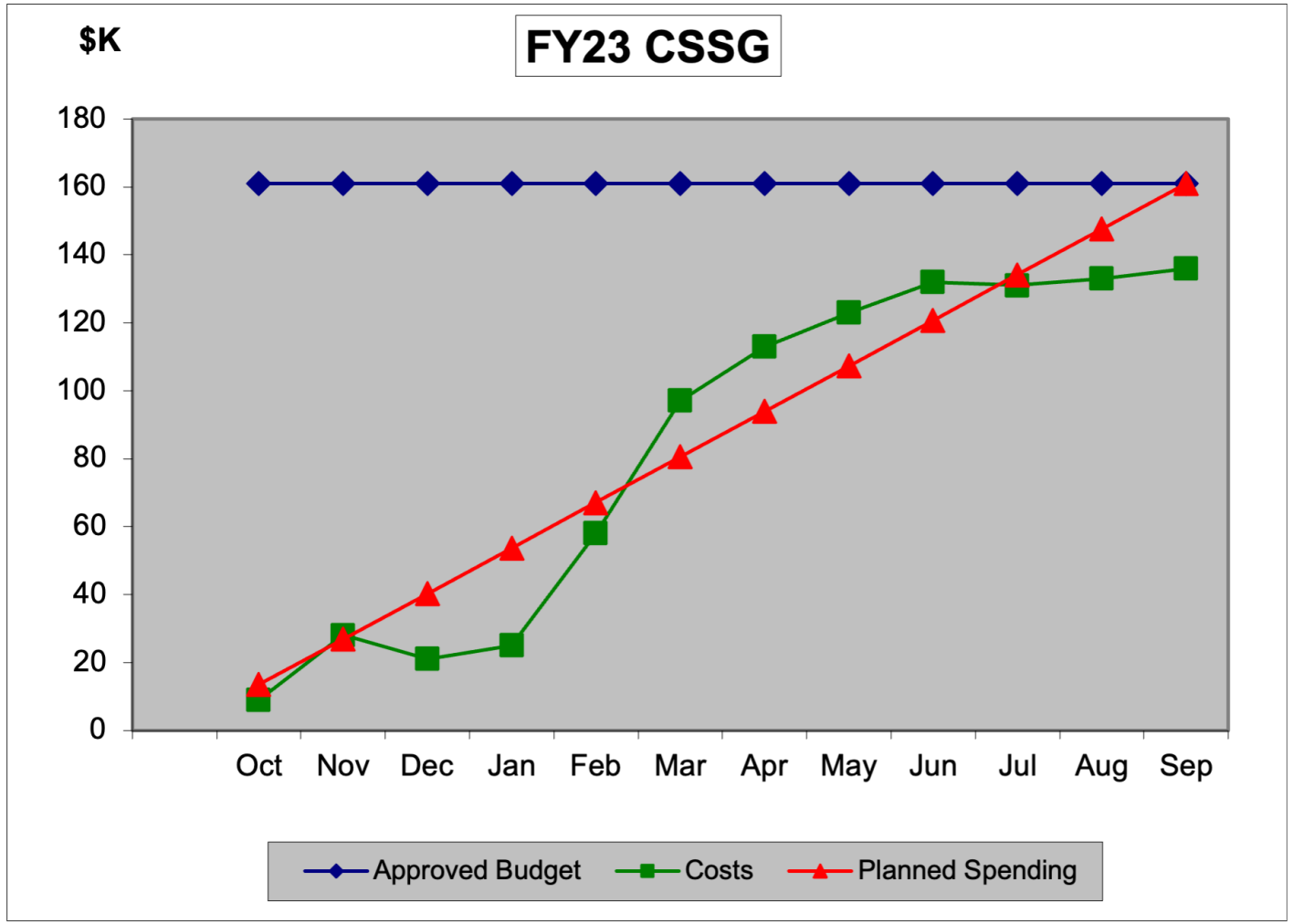
FY22 Carryover	$113K
FY23 Approved budget (inc. C/O)	$453K
Actual spending for Q1	$13K
Actual spending for Q2	$78K
Actual spending for Q3	$113K
Actual spending for Q4	$256K



	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

FY2023 ORNL Highlights

- **AM**
  - AM1 – RSICC
    - RSICC code distributions: 510 SCALE, 1051 MCNP, 1,464 University Requests, and 184 NCSP direct requests
  - 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)
  - AM6 – Slide Rule
    - Criticality Slide Rule collaborations with IRSN and LLNL continue with planned completion of slide rule documents in FY2024
  - AM10 – Benchmark Intercomparison Study
    - Supported Beta-eff computations alongside IRSN and LLNL
  - AM17 – Expansion of VALID
    - 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

FY2023 ORNL Highlights

- **ND**
  - ND1 – Nuclear Data Measurements
    - 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
    - ^{51}V capture and transmission evaluation has been completed
    - ^{239}Pu evaluation for RRR updated
    - ^{88}Sr evaluation completed - (ORNL/LTR-2023/3004), “Resonance Parameter Evaluation ofn+88Srreactions for ENDF/B-VIII.1 Library”
    - ^{140,142}Ce evaluation completed; covariance libraries updated for ENDF/B-VIII.1 release
    - ^{181}Ta – collaboration with NNL; evaluation completed in early FY23
    - ^{63,65}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
  - 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

FY2023 ORNL Highlights

- **IE**
  - Dupont, Marshall, McDonnell, Celik & Cumberland provided IER team support
  - IER-554, CED-2, completed; IER Team Lead: Mathieu Dupont
- **IPD**
  - IPD3
    - OSTI completed searching for all LLNL bibliography records – gaps determined. NCSP deliverables are being added each quarter.
      - OSTI progress
        - From the total 23,136 records analyzed from the bibliography document, there are 17,305 records with potential matches in OSTI's Repository.
  - IPD5
    - 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.

FY2023 ORNL Highlights

- **TE**
  - ORNL successfully executed 4 NCSP 1- and 2-week training courses; 84 students completed the courses successfully (43 @ Sandia and 41 @ NCERC)
  - Completed final design of a subcritical assembly
  - Hand Calculation Primer Revision, ORNL/TM-2022/2747, published in Q1; added to NCSET module 9 along with LA-14244-M
  - 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
- **TS**
  - Executed FY23 NCSP Technical Program Review in Feb. 2023; Sandia hosted
  - 5-year plans published on schedule by August 6th + all related activities conducted successfully
  - 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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