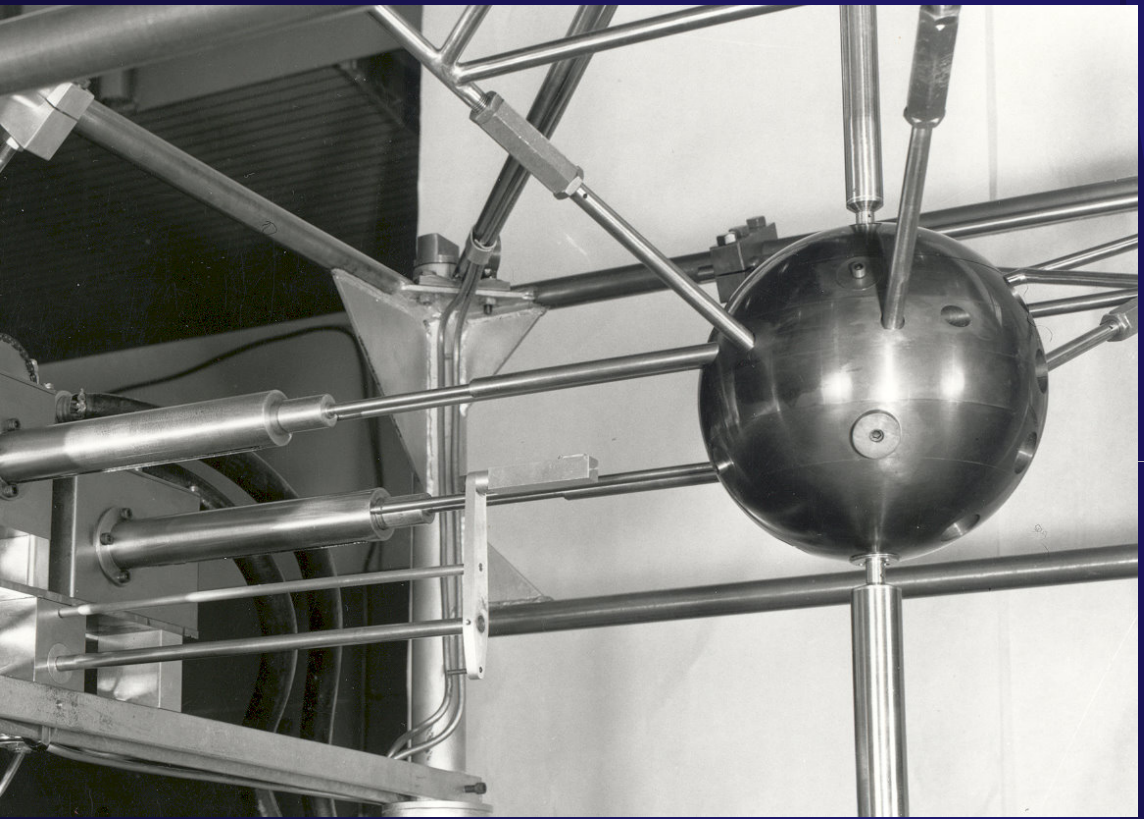


Los Alamos
NATIONAL LABORATORY
EST. 1943

Delivering science and technology
to protect our nation
and promote world stability

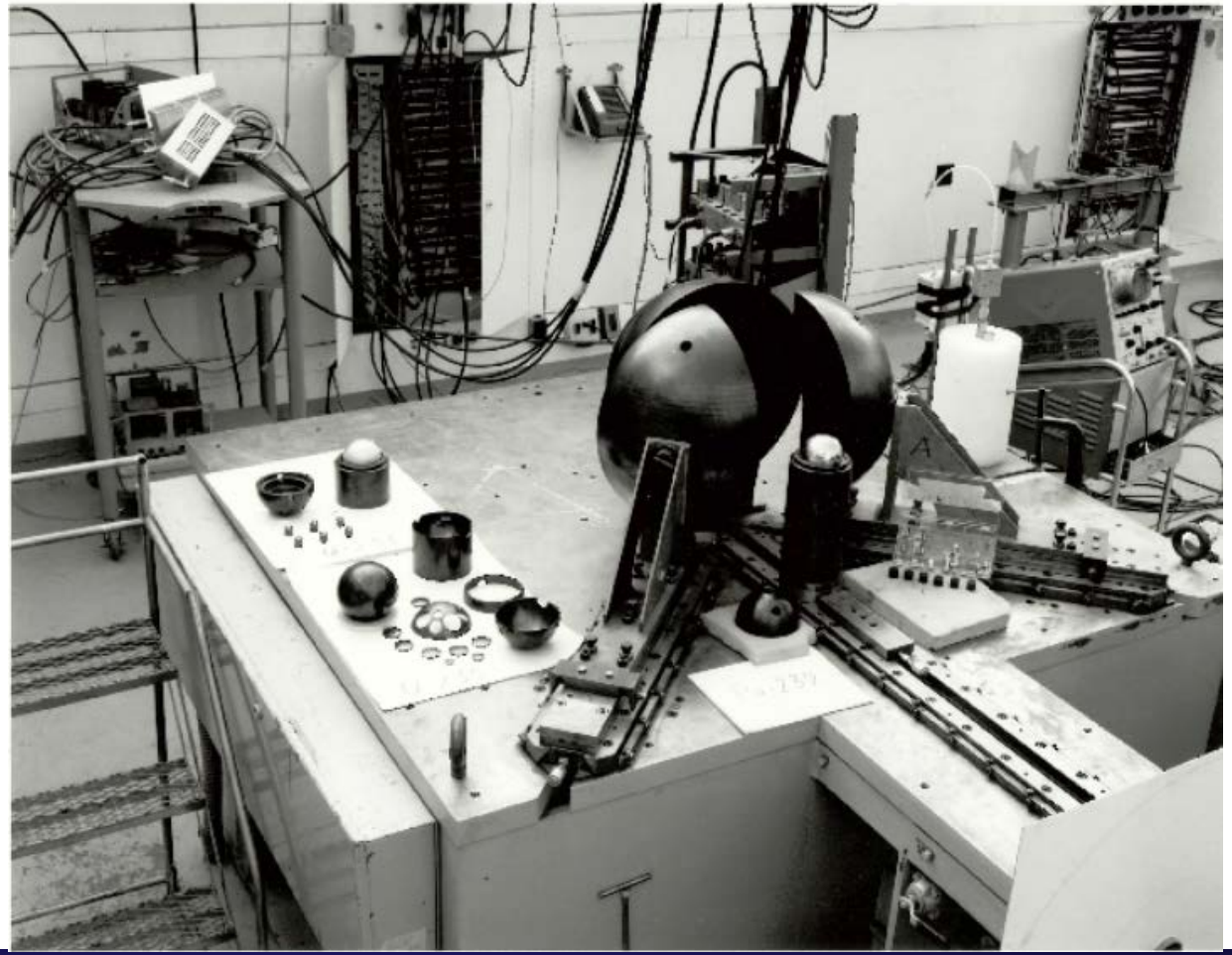
Flat-Top Startup at NCERC

D. K. Hayes, et al

NCSP TPR 14-15MAR17

What is Flat-Top?

- Topsy
- Why?

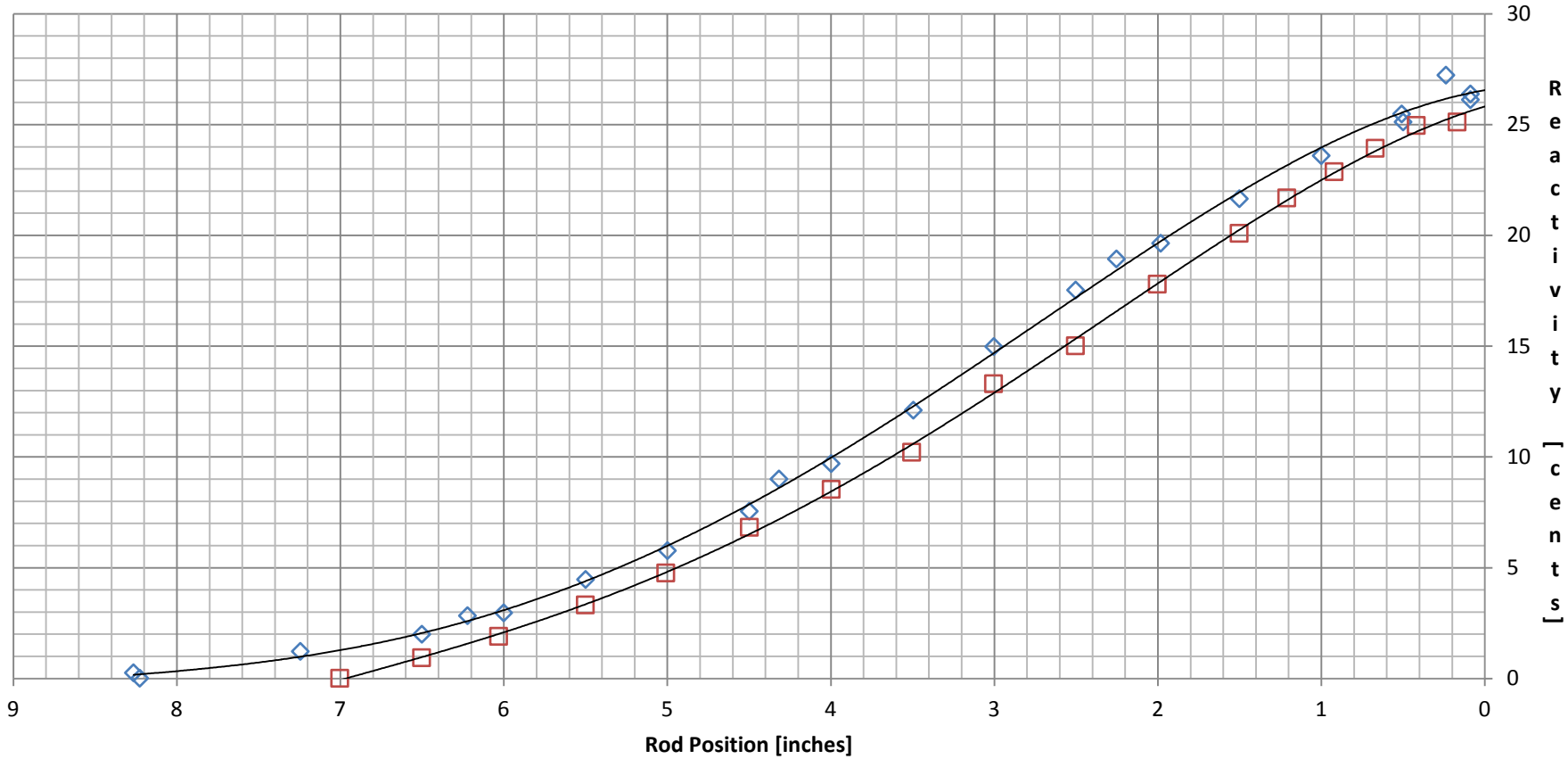


Timeline

- **2009 – Reflectors Installed**
- **2010 – Readiness**
- **2011**
  - May – Startup authorized
  - 29NOV – HEU Core First Critical
  - Pu Operations prohibited, DSA update required
- **2012 – Flat-Top takes leave of senses**
- **2014 – Pu Operations authorized**
- **2015 – All resources dedicated to Godiva restart**
- **2016 – 9AUG Pu core first critical**

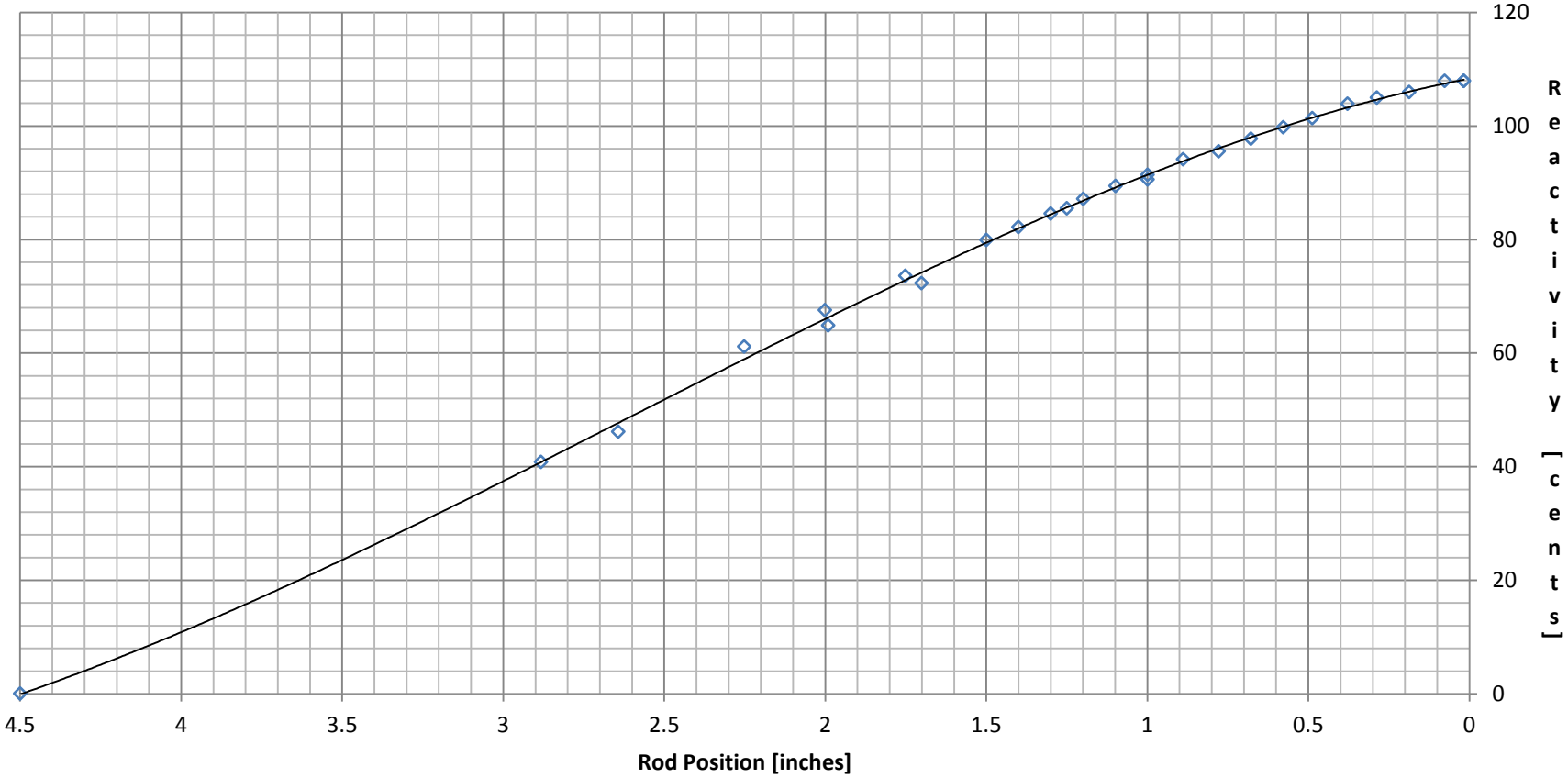
HEU Core

Flat-Top U Core
E and G Rod Worths



HEU Core

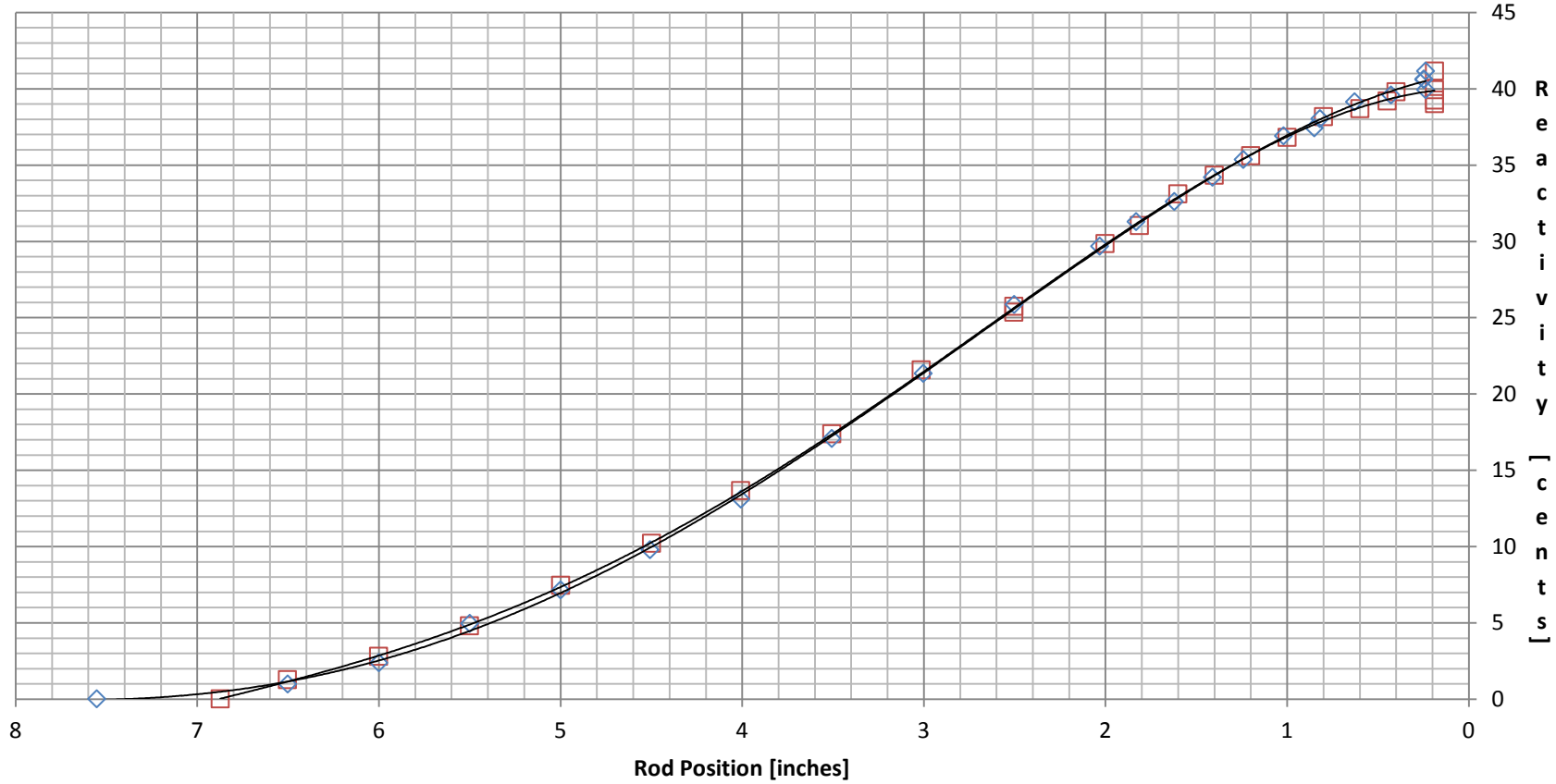
Flat-Top U
F Rod Worth



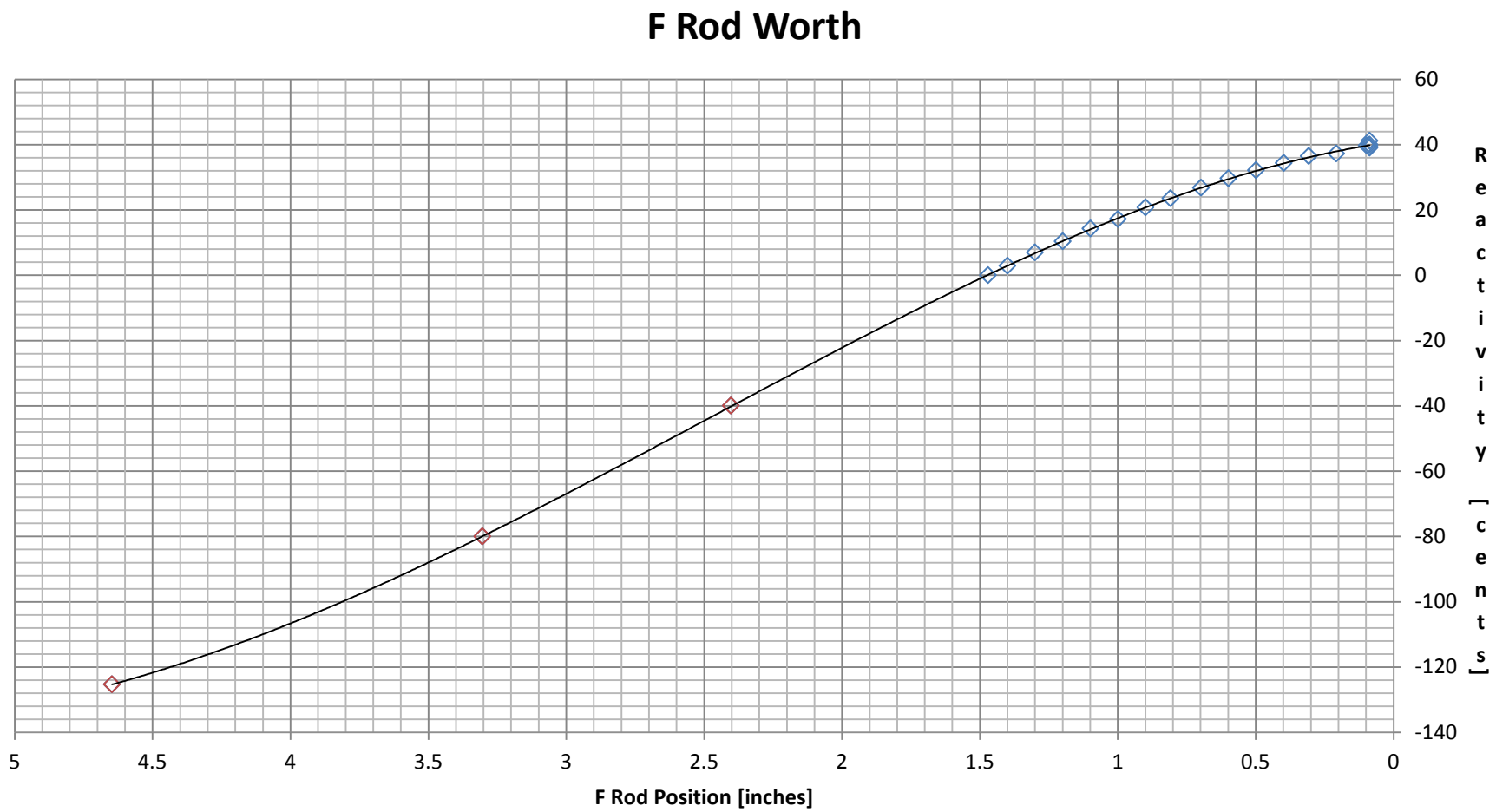
Pu Core

Pu Core

Flat-Top Pu Core
E and G Rod Worths



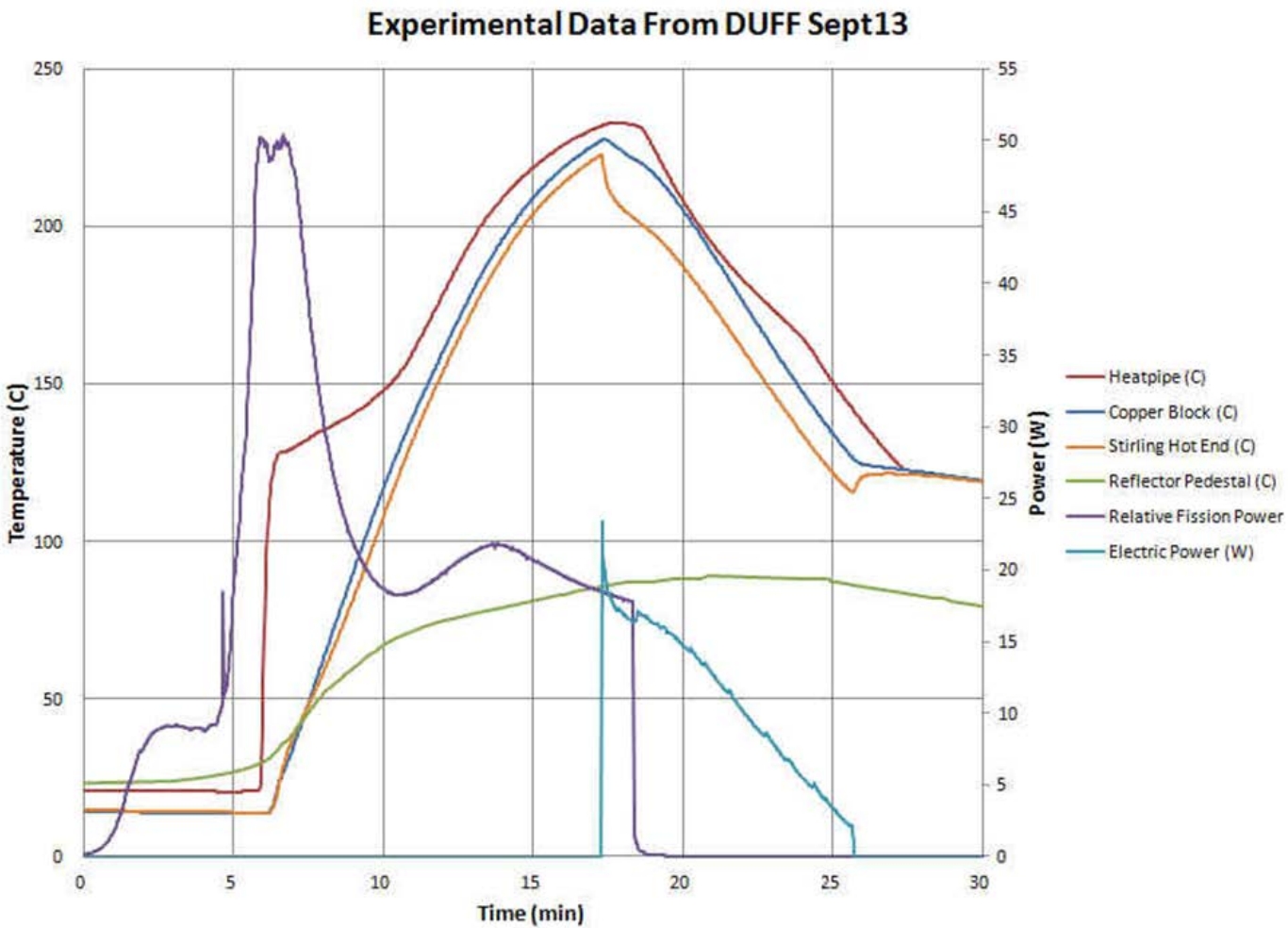
Pu Core


Flat-Top Pu Core
F Rod Worth
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
Reactivity [cents]
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
F Rod Position [inches]

Special Operations

- **NCSP Hands-On Courses**
  - Practitioners, Managers, ad hoc
- **Twelve irradiations for SLFPY, R-Values [destructive chemistry]**
- **DUFF**
  - 24 We, 4kWt
  - Stepping stone to KRUSTy

DUFF


Experimental Data From DUFF Sept13
Temperature (C)
Power (W)
Time (min)
250
200
150
100
50
0
55
50
45
40
35
30
25
20
15
10
5
0
0
5
10
15
20
25
30
Heatpipe (C)
Copper Block (C)
Stirling Hot End (C)
Reflector Pedestal (C)
Relative Fission Power
Electric Power (W)

At the End of the Day

- **Flat-Top is ready for experiments/operations**
- **Future Work**
  - Radiation Field Characterization/Dosimetry Intercomparison
  - Revamp Benchmarks
  - Pu Aging Studies

  - Submit IERs!