

Memo

Date: May 25, 2016

Re: Current status of differences between Federal agency-reported R&D obligations and FFRDC-reported R&D expenditures: FY 2014

From: Ronda Britt and Mike Yamaner

To: John Jankowski

As detailed in our August 27, 2014 memo (Attachment 1), the FY 2014 FFRDC R&D survey instructions were revised to better specify what should be excluded from the total reported for R&D. The items added under the “R&D does not include” box were:

- Routine testing
- Non-R&D program implementation or management
- Policy development

The results of the FY 2014 survey showed a slight reduction in the difference between the two surveys’ totals (down \$182 million to \$6.8 billion); clearly large differences remain (see table 1). We do not have final data for FY 2015 yet, but based on the preliminary data we do not expect large changes in the totals for either survey.

Therefore, we recommend adding a question beginning with the FY 2016 FFRDC R&D Survey requesting specific agency sources and sub-totals for the FFRDC’s federally financed R&D expenditures. These sub-totals by agency will allow us to determine if funding is being received from non-sponsoring agencies, which may not be captured in the Federal Funds for R&D Survey. Also, if the funds reported as obligated by and received from the sponsoring agency are significantly different, we can follow up with the FFRDC and specific agency to attempt to resolve the discrepancy.

FFRDC	All R&D expenditures	Federally financed R&D expenditures	Operating budget	Federal R&D expenditures as % of operating budget	Federal Funds R&D obligations	Federal R&D expenditures as % of obligations	Sponsoring agency obligations	% from sponsoring agency	Federal R&D expenditures - obligations
All FFRDCs	17,718,556	17,331,396	18,245,841	95.0	10,565,430	164.0	na	na	6,765,966
DOD sponsored									
Aerospace FFRDC	838,708	835,600	881,001	94.8	136,385	612.7	116,146	85.2	699,215
Project Air Force	39,351	39,351	39,351	100.0	31,806	123.7	31,806	100.0	7,545
Arroyo Ctr.	33,391	33,391	33,391	100.0	1,973	1,692.4	1,973	100.0	31,418
Ctr. for Naval Analyses	80,283	80,283	109,582	73.3	49,938	160.8	49,938	100.0	30,345
Ctr. for Communications and Computing	63,199	63,199	63,199	100.0	2,060	3,067.9	2,060	100.0	61,139
Lincoln Lab.	830,076	827,461	NA	NA	303,508	272.6	303,508	100.0	523,953
National Security Engineering Ctr.	885,382	885,382	885,382	100.0	184,627	479.6	184,627	100.0	700,755
Software Engineering Institute	123,217	123,217	123,217	100.0	27,926	441.2	27,399	98.1	95,291
National Defense Research Institute	62,073	62,073	62,073	100.0	12,296	504.8	12,296	100.0	49,777
Systems and Analyses Ctr.	145,211	145,211	145,211	100.0	71,542	203.0	71,542	100.0	73,669
DOE sponsored									
Ames Lab.	41,824	40,834	46,366	88.1	22,185	184.1	22,128	99.7	18,649
Argonne National Lab.	719,459	684,987	719,459	95.2	498,393	137.4	481,351	96.6	186,594
Brookhaven National Lab.	573,364	556,024	573,364	97.0	456,835	121.7	439,249	96.2	99,189
Fermi National Accelerator Lab.	334,522	333,870	324,057	103.0	312,443	106.9	312,443	100.0	21,427
ID National Lab.	479,801	460,192	828,725	55.5	232,920	197.6	221,489	95.1	227,272
Lawrence Berkeley National Lab.	762,601	707,540	773,423	91.5	656,740	107.7	620,288	94.4	50,800
Lawrence Livermore National Lab.	1,170,571	1,113,664	1,418,496	78.5	970,973	114.7	866,749	89.3	142,691
Los Alamos National Lab.	1,767,000	1,728,000	2,084,000	82.9	1,035,033	167.0	974,354	94.1	692,967
National Renewable Energy Lab.	359,998	341,042	390,106	87.4	278,676	122.4	277,438	99.6	62,366
Oak Ridge National Lab.	1,293,722	1,258,911	1,293,722	97.3	775,324	162.4	735,972	94.9	483,587
Pacific Northwest National Lab.	1,021,912	1,010,064	1,021,912	98.8	356,998	282.9	312,264	87.5	653,066
Princeton Plasma Physics Lab.	97,768	96,727	101,906	94.9	61,618	157.0	57,318	93.0	35,109
SLAC National Accelerator Lab.	316,646	306,409	386,676	79.2	275,564	111.2	275,564	100.0	30,845
Sandia National Labs.	2,507,099	2,474,159	2,636,331	93.8	1,594,225	155.2	1,245,100	78.1	879,934
Savannah River National Lab.	121,013	121,013	220,990	54.8	25,009	483.9	24,031	96.1	96,004
Thomas Jefferson National Accelerator Fac.	105,868	101,316	142,808	70.9	100,643	100.7	97,546	96.9	673
HHS sponsored									
CMS Alliance to Modernize Healthcare	70,458	70,458	70,458	100.0	15,437	456.4	15,399	99.8	55,021
Frederick National Lab. for Cancer Research	448,500	448,500	500,000	89.7	349,343	128.4	348,858	99.9	99,157
DHS sponsored									
Homeland Security Studies and Analysis Institute	20,866	20,866	24,000	86.9	9,935	210.0	5,985	60.2	10,931
Homeland Security Systems Engineering and Development Institute	94,353	94,353	94,353	100.0	30,720	307.1	13,885	45.2	63,633
National Biodefense Analysis and Countermeasures Ctr.	30,310	30,310	45,389	66.8	18,008	168.3	18,008	100.0	12,302
IRS/VA sponsored									
Ctr. for Enterprise Modernization	158,069	158,069	158,069	100.0	35,621	443.8	0	0	122,448
DOT sponsored									
Ctr. for Advanced Aviation System Dev.	149,054	133,416	149,054	89.5	73,749	180.9	23,907	32.4	59,667
NASA sponsored									
Jet Propulsion Lab.	1,664,539	1,664,539	1,586,000	105.0	1,328,139	125.3	1,306,699	98.4	336,400
NSF sponsored									
National Ctr. for Atmospheric Research	162,259	148,933	162,259	91.8	110,734.0	134.5	90,440	81.7	38,199
National Optical Astronomy Observatory	25,161	21,487	27,828	77.2	25,500.0	84.3	25,500	100.0	-4,013
National Radio Astronomy Observatory	85,327	76,668	86,084	89.1	77,410.0	99.0	77,410	100.0	-742
National Solar Observatory	10,039	10,039	12,037	NA	NA	NA	NA	NA	NA
Science and Technology Policy Institute	10,949	10,949	10,949	100.0	5,240.0	209.0	4,890	93.3	5,709
NRC sponsored									
Ctr. for Nuclear Waste Regulatory Analyses	12,314	10,926	12,314	88.7	6,757.0	161.7	NA	NA	4,169
AOUSC sponsored									
Judiciary Engineering and Modernization Ctr.	2,299	2,299	2,299	100.0	3,200.0	71.8	NA	NA	-901

FFRDC = federally funded research and development center. na = not applicable. NA = not available.

SOURCE: National Science Foundation/National Center for Science and Engineering Statistics.

Attachment 1:
August 2014 Memo

Memo

Date: August 27, 2014

Re: Update: Investigation of differences between Federal agency-reported R&D obligations and FFRDC-reported R&D expenditures: FY 2012

From: Ronda Britt and Mike Yamaner

To: John Jankowski

NSF's Survey of Federal Funds for Research and Development collects data from federal agencies on obligations for R&D for each fiscal year, including a breakout for obligations to federally funded research and development centers (FFRDCs). Respondents are budget and accounting staff at the various federal agencies conducting R&D. Since the respondents on the survey do not actually conduct the R&D, they are limited to the information contained in their agency's accounting system when they complete the survey.

NSF's annual FFRDC R&D Survey collects data from each FFRDC on their R&D expenditures for each fiscal year. The respondents for this survey are budget and accounting staff at the FFRDC itself, or in some cases at the corporate administrative level (e.g. one individual at the MITRE Corporation reports for all five of their FFRDCs). These respondents also rely on the coding in the FFRDC's accounting system and do not usually have firsthand experience with the R&D projects being conducted.

At issue is the fact that the federal obligations data do not correlate well with the FFRDC-reported expenditures data in any given year, and the difference is much greater than would be expected due to the inherent differences between obligations and expenditures.¹ Specifically, the total obligations for R&D are significantly below the expenditures reported each year. In FY 2012 \$10.1 billion was reported by the federal agencies in R&D obligations versus \$17.4 billion in R&D expenditures reported by the FFRDCs, resulting in a difference of \$6.9 billion.

Six FFRDCs contributed 73% to the \$6.9 billion difference in FY 2012. The Department of Energy (DOE) sponsors four of the six FFRDCs with the largest differences in absolute dollars: Los Alamos National Laboratory, Sandia National Laboratories, Oak Ridge National Laboratory, and the Pacific Northwest National Laboratory.

¹ There is a time lag between when funds are obligated by federal agencies and when research funds are actually spent (and reported) by the FFRDCs. Many federal awards are drawn down in increments over the length of the project and span multiple years.

For these four FFRDCs, the primary factor causing the large data differences between the Federal Funds survey and the FFRDC survey is how the respondents interpret what to include as R&D funding. As can be seen by comparing their total operating budget with their reported R&D expenditures, each of the FFRDCs classify most of their expenditures as R&D, including all funding to support the operation of the FFRDC as part of the cost of conducting R&D. The federal agencies responding to the Federal Funds survey interpret R&D more narrowly and do not classify all of the funds obligated to FFRDCs as R&D, instead using other classifications to delineate direct funding for R&D projects from other types of funding for the FFRDC.

If one compares total obligations reported by DOE to the R&D obligations reported on the Federal Funds Survey for two of DOE's FFRDCs, the difference in interpretation in what constitutes R&D funding is stark. For FY 2012 DOE reported \$1.9 billion in total obligations to the Los Alamos National Lab (not shown in table 1) but classified only \$1.0 billion of that total as R&D obligations on the Federal Funds Survey. For Sandia Laboratories DOE reported \$1.6 billion in total obligations (not shown in table 1), of which only \$1.1 billion were R&D obligations.

Some examples of the work that FFRDCs perform that the DOE does not classify as R&D on the Federal Funds survey include environmental cleanup work done for DOE defense programs (e.g. Savannah River at \$1.2 billion and Idaho National Laboratory at \$0.4 billion in FY 2012), nuclear nonproliferation, readiness in technical bases and facilities, international nuclear energy cooperation, and FFRDC management and security. These programs have large appropriations in each of the FFRDC's budgets. Other programs such as Electricity Delivery and Energy Reliability, Energy Efficiency and Renewable Energy, and Nuclear Energy have parts that the DOE interprets as R&D and others that it does not.

There is also an issue with funding received from other agencies via pass-through arrangements that may not be recorded as R&D obligations to the FFRDC on the Federal Funds survey. The extent of this pass-through funding is unknown since we do not request federally funded expenditures by agency on the FFRDC survey.

In terms of reported R&D differences, the remaining two FFRDCs of the top six are both sponsored by DOD: the National Security Engineering Center (NSEC) and Lincoln Laboratory. In these cases, the DOD respondent believes the missing funding may be the "black box" R&D that DOD does not report to NSF's Federal Funds Survey by performer but rather combines for an aggregate R&D obligation total.

The survey manager for the Federal Funds survey contacted each of the remaining agency sponsors of FFRDCs to inquire about the differences in reporting between the surveys. In many of these cases, there were omissions in coding on the agency side that are now being corrected for FY 2013 and beyond, so there should be an improvement in the correlation between obligations and expenditures for many of the remaining FFRDCs.

In order to attempt to encourage greater consistency in what is considered R&D on both surveys, we recommend amending the FY 2014 FFRDC R&D survey instructions to add more specificity on what should be excluded from the total reported for R&D. Currently the instructions state that only the following should not be included:

- Outreach or training programs
- R&D conducted by staff at outside institutions that is not accounted for in your financial records
- Capital projects (i.e., construction or renovation of research facilities)

Our suggestions for additional items to list under the "R&D does not include" box are:

- Routine testing
- Non-R&D program implementation or management
- Policy development

Prior to the launch of the FY 2014 FFRDC R&D Survey, these additional items will be tested with the six FFRDCs with the largest differences and revised as needed. In addition, NSF plans to request clearance to add a question on the agency sources of funding for the FY 2015 FFRDC R&D Su

(Dollars in thousands)

FFRDC	All R&D expenditures	Federally financed R&D	Total operating budget	Expenditures		Expenditures as % of obligations	Sponsoring agency obligations	% from sponsoring agency	Expenditures minus obligations
				as % of operating budget	Federal Funds obligations				
All FFRDCs	17,446,036	17,006,331	19,019,629	89.4	10,058,078	169.1	na	na	6,948,253
DOD sponsored									
Aerospace FFRDC	39,746	1,351	902,600	0.1	173,259	0.8	159,970	92.3	-171,908
Project Air Force	41,031	41,031	41,031	100.0	1,049	3,911.4	1,049	100.0	39,982
Arroyo Ctr.	31,278	31,278	31,278	100.0	22,142	141.3	22,142	100.0	9,136
Ctr. for Naval Analyses	91,628	91,628	92,300	99.3	59,999	152.7	59,999	100.0	31,629
Ctr. for Communications and Computing	62,600	62,600	62,600	100.0	4,994	1,253.5	4,994	100.0	57,606
Lincoln Lab.	873,104	871,380	NA	NA	287,484	303.1	287,484	100.0	583,896
National Security Engineering Ctr.	946,737	946,737	946,737	100.0	182,114	519.9	182,114	100.0	764,623
Software Engineering Institute	113,371	112,583	113,371	99.3	28,852	390.2	27,966	96.9	83,731
National Defense Research Institute	53,832	53,832	53,832	100.0	10,075	534.3	10,075	100.0	43,757
Systems and Analyses Ctr.	149,150	149,150	149,150	100.0	156,986	95.0	75,905	48.4	-7,836
DOE sponsored									
Ames Lab.	33,853	32,884	36,900	89.1	25,173	130.6	24,674	98.0	7,711
Argonne National Lab.	679,387	625,502	721,900	86.6	456,015	137.2	439,478	96.4	169,487
Brookhaven National Lab.	516,921	489,496	516,921	94.7	391,708	125.0	366,518	93.6	97,788
Fermi National Accelerator Lab.	412,438	411,248	374,469	109.8	318,658	129.1	318,574	100.0	92,590
ID National Lab.	536,399	525,734	901,558	58.3	235,716	223.0	225,560	95.7	290,018
Lawrence Berkeley National Lab.	767,554	710,822	779,287	91.2	607,038	117.1	567,007	93.4	103,784
Lawrence Livermore National Lab.	1,353,454	1,301,188	1,658,900	78.4	1,031,589	126.1	960,797	93.1	269,599
Los Alamos National Lab.	2,056,878	2,013,692	2,616,000	77.0	987,848	203.8	939,317	95.1	1,025,844
National Renewable Energy Lab.	398,873	379,950	398,873	95.3	201,230	188.8	200,332	99.6	178,720
Oak Ridge National Lab.	1,553,460	1,511,725	1,553,460	97.3	775,364	195.0	755,506	97.4	736,361
Pacific Northwest National Lab.	1,033,768	1,013,245	1,033,768	98.0	255,585	396.4	225,114	88.1	757,660
Princeton Plasma Physics Lab.	81,389	79,316	88,568	89.6	58,608	135.3	52,974	90.4	20,708
SLAC National Accelerator Lab.	329,747	324,698	375,938	86.4	279,971	116.0	278,488	99.5	44,727
Sandia National Labs.	2,293,307	2,262,162	2,425,054	93.3	1,059,627	213.5	817,746	77.2	1,202,535
Savannah River National Lab.	132,357	132,357	182,701	72.4	21,650	611.3	21,321	98.5	110,707
Thomas Jefferson National Accelerator Fac.	94,167	93,710	99,154	94.5	98,184	95.4	91,708	93.4	-4,474
HHS sponsored									
Frederick National Lab. for Cancer Research	430,100	430,100	500,000	86.0	275,301	156.2	273,477	99.3	154,799
DHS sponsored									
Homeland Security Studies and Analysis Institute	30,213	30,213	38,800	77.9	25,301	119.4	25,301	100.0	4,912
Homeland Security Systems Engineering and Development Institute	77,159	77,159	77,159	100.0	99,608	77.5	81,360	81.7	-22,449
National Biodefense Analysis and Countermeasures Ctr.	31,201	31,201	32,621	95.6	600	5,200.2	600	100.0	30,601
IRS/VA sponsored									
Ctr. for Enterprise Modernization	226,539	226,539	226,539	100.0	34,340	659.7	34,340	100.0	192,199
DOT sponsored									
Ctr. for Advanced Aviation System Dev.	159,311	150,274	159,311	94.3	431,583	34.8	37,100	8.6	-281,309
NASA sponsored									
Jet Propulsion Lab.	1,493,613	1,493,613	1,500,064	99.6	1,320,712	113.1	1,296,191	98.1	172,901
NSF sponsored									
National Ctr. for Atmospheric Research	169,743	151,752	169,743	89.4	111,045.0	136.7	93,191.2	83.9	40,707
National Optical Astronomy Observatory	46,557	42,298	55,767	75.8	30,708.7	137.7	30,708.7	100.0	11,589
National Radio Astronomy Observatory	79,168	78,562	77,272	101.7	71,724.1	109.5	71,724.1	100.0	6,838
Science and Technology Policy Institute	7,547	7,547	7,547	100.0	80.2	9,410.2	0	0.0	7,467
NRC sponsored									
Ctr. for Nuclear Waste Regulatory Analyses	13,147	12,465	13,147	94.8	1,746.6	713.7	1,746.6	100.0	10,718
AOUSC sponsored									
Judiciary Engineering and Modernization Ctr.	5,309	5,309	5,309	100.0	315.8	1,681.1	0	0.0	4,993

FFRDC = federally funded research and development center.

SOURCE: National Science Foundation/National Center for Science and Engineering Statistics.