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|  | National Center for Science and Engineering Statistics |

Memo

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| 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.

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| R&D expenditures, operating budgets, and obligations at federally funded research and development centers, by FFRDC: FY 2014 | | | | | | | | | |
| (Dollars in thousands) |  |  |  |  |  |  |  |  |  |
| 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 |
| 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. | | | | | | | | | |
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Attachment 1:

August 2014 Memo

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|  | National Center for Science and Engineering Statistics |

Memo

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| 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]](#footnote-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.

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

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R&D expenditures, operating budgets, and obligations at federally funded research and development centers, by FFRDC: FY 2012 | | | | | | | | | |
| (Dollars in thousands) |  |  |  |  |  |  |  |  |  |
| FFRDC | All R&D expenditures | Federally financed R&D | Total operating budget | Expenditures as % of operating budget | Federal Funds obligations | Expenditures as % of obligations | Sponsoring agency obligations | % from sponsoring agency | Expenditures minus 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. | | | | | | | | | |
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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. [↑](#footnote-ref-1)