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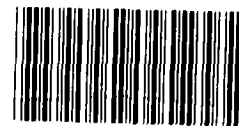
General Accounting Office

Attrition Of Scientists At Three Regulatory Agencies

Changes in the number of scientific personnel employed at the Environmental Protection Agency (EPA), the Food and Drug Administration (FDA), and the Consumer Product Safety Commission (CPSC) from October 1979 through December 1980 were compared to changes occurring in calendar year 1981.

The data revealed that

- In FDA and EPA, total net losses of scientific and technical personnel over both periods were very small. CPSC experienced losses of scientific personnel in both periods with the rate of loss accelerating in 1981.
- RIFs played a negligible role in personnel changes in all three agencies, and there was little change in the rate of separations across the two periods. Declines in 1981 were attributable primarily to not replacing departing scientists and engineers.
- Gains and losses were not concentrated in specific occupational or functional categories.



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PROGRAM ANALYSIS
DIVISION

B-209389

The Honorable Albert Gore, Jr.
Chairman, Subcommittee on
Investigations and Oversight
Committee on Science and Technology
House of Representatives

Dear Mr. Chairman:

This letter responds to your April 27, 1982, letter expressing concern about changes in staffing levels among scientists and engineers at regulatory agencies during 1981. In your request you indicated that budget cuts during this period may have led to reductions in scientific employment, with adverse consequences for effective development and enforcement of scientifically based regulations.

As agreed upon in conversations with your staff director, we are providing three types of information. First, we describe the net changes in employment of scientific personnel that occurred at each of three regulatory agencies--the Environmental Protection Agency (EPA), the Food and Drug Administration (FDA), and the Consumer Product Safety Commission (CPSC)--during calendar year 1981 and compare these changes with those that occurred from October 1979 through December 1980. We could not include the Occupational Safety and Health Administration (OSHA) in our analysis as requested because data on all OSHA employees were not available until the second quarter of calendar year 1981. Second, we describe the extent to which reductions in force (RIFs) and hiring freezes played a role during both periods. Third, we describe how personnel changes have affected the occupational and functional composition of scientific employees at each agency. This review was conducted in accordance with generally accepted government audit standards.

Appendix I presents eight tables that address each of these three points. We prepared these tables from data excerpted by the Office of Personnel Management (OPM) from its Current Status Master File. Our initial analysis of these data disclosed a disturbingly high incidence of incongruities and anomalies. Therefore, we carried out a number of data processing operations that reduced the number of records containing anomalous or inconsistent information to approximately 3 percent of the total. Additional corrections would have involved high costs for only marginal improvements and were therefore deemed unnecessary. More

complete descriptions of the types of problems encountered and the actions taken to correct them can be found in appendix II. The remainder of this letter will be devoted to an analysis of the tables.

Table 1 depicts the changes in permanent, full-time scientific personnel employed in each agency in each of the periods considered and compares them with overall personnel changes in each agency. Both EPA and FDA experienced virtually no change in the number of scientists employed during the entire October 1979 to December 1981 period; net change was about 1 percent in each agency. However, when the changes in periods 1 and 2 are considered separately, the overall absence of change is found to mask a definite reversal in the two agencies in both scientific and overall employment. Both agencies experienced growth in period 1, from October 1979 through December 1980, and both experienced declines in period 2, from January through December 1981. EPA differed from FDA in the way that period 2 losses were distributed; in EPA, reductions among scientists were not appreciably greater than those among all agency employees, while in FDA losses were much lower among scientists than among agency employees generally.

The situation was quite different at CPSC. This agency, which is much smaller than FDA and EPA and has a smaller proportion of scientific and technical personnel, lost about 32 percent of both its scientific and technical personnel and its total workforce during the period under consideration. Staffing levels in this agency were already declining in period 1, and the rate of decline significantly accelerated in period 2, especially among nonscientific personnel.

Table 2 shows that the rate at which scientists left these agencies did not significantly increase from period 1 to period 2. The personnel declines in period 2 are almost entirely due to nonreplacement of departing scientists. All of the agencies in question informed us that their hiring was severely restricted throughout 1981. Initially, this was due to a presidentially imposed Governmentwide hiring freeze that was effective through mid-March. Hiring through the rest of the year was curtailed by the agencies themselves in response to lowered personnel ceilings for FY 1981 and FY 1982. The result of these policies was that accessions at EPA and FDA declined by about half from period 1 to period 2, while CPSC accessions declined by about 70 percent.

Table 2 also shows that only about 1 percent of the scientists at EPA and FDA were RIFed during the entire period, and less than 5 percent of all the separations we examined were RIF-related. Even CPSC experienced only a 5 percent RIF among scientists. It should be noted, however, that there was an overall eightfold increase in RIFs from period 1 to period 2 and that 90 percent of the RIFs that occurred in period 2 took place in the final 6 months of the period. Overall, however, RIFs played a very minor role in personnel changes in all three agencies.

Tables 3 through 8 break down the overall personnel changes in each agency by occupational series and function (see appendix III for a detailed listing of the occupational series and functional classifications included in our analyses). Table 3 depicts changes in EPA by occupational series. In general, occupations that were increasing in period 1 remained stable in period 2, while those that were decreasing in period 1 continued to decrease at an accelerated rate in period 2. As a result, the agency showed increases over the entire period in environmental engineers and in general physical and biological scientists, remained stable in chemists, and decreased in general engineers, chemical engineers, and other occupations.

Table 4 shows changes in the distribution of scientists across functions in EPA. In period 1, most functions remained relatively stable. As might be expected, however, the data for period 2 shows declines in most functions, with research and development and management experiencing the greatest losses.

Tables 5 and 6 describe the changes that took place in FDA. As in EPA, a mixture of gains and losses produced a small change among FDA scientists over the entire period. There was only one large change among occupations--a 90 percent increase in medical officers that was only slightly mitigated by the hiring freeze in period 2. As with EPA, this gain, and those in several other categories, is mainly the result of increases in employment that took place during period 1. Declines are recorded for nearly all categories in period 2.

As previously noted, CPSC experienced much greater personnel losses proportionally than did EPA or FDA, and it experienced losses in both time periods. Tables 7 and 8 show that losses were experienced in nearly every occupational and functional category. The largest proportional losses were among chemists and consumer safety specialists; these categories lost about 55 and 80 percent of their number respectively. Among functional classifications, declines of over 45 percent took place in four of the five most populous categories in the agency, with an overall decline of 87 percent in the number of scientific personnel engaged in regulatory licensing and enforcement.

In summary, the data show that from October 1979 to December 1980, EPA and FDA experienced a general expansion among scientists and engineers followed by a period of declining numbers during calendar year 1981. Overall, this produced little net change in the number of scientific personnel on board from October 1979 to December 1981. On the other hand, CPSC experienced losses of scientific personnel in period 1, and these continued and accelerated in period 2.

RIFs played a negligible role in these changes. Most of the decline in all three agencies can be traced to nonreplacement of departing scientists during calendar year 1981.

Our analyses of changes by occupation and functional classification show that total changes at EPA and FDA are a product of a mixture of gains and losses among different groups of scientists. Only one group--general engineers at EPA--appears to have been noticeably depleted, and some of this change may be due to reclassification rather than personnel turnover.

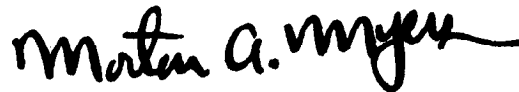
During period 2, nearly all groups at both agencies sustained personnel losses. Attrition at EPA was approximately equivalent for scientists and nonscientists, while nonscientists at FDA suffered greater attrition. Nearly all groups in CPSC sustained losses in both periods, resulting in a substantial depletion of scientific personnel at this agency.

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At your request, we did not seek agency comments on this letter. Also, based on an agreement with your staff, we are sending copies of this letter to appropriate House and Senate committees, Representatives and Senators who have particular interest in the subject, the Director of the Office of Management and Budget, the Department of Health and Human Services, the Environmental Protection Agency, the Food and Drug Administration, and the Consumer Product Safety Commission.

If you have any questions on this data, or if we can be of further assistance to you, please call us.

Sincerely yours,



Morton A. Myers
Director

Table 1: Change in Scientific and Overall Employment by Agency ^{a/}
(Permanent Full-Time Employees)

Agency	Total 10/01/79	Change 10/79 - 12/80		Total 12/31/80	Change 1/1/81 - 12/81		Total 12/31/81	Overall Change 10/79 - 12/81	
		Number	%		Number	%		Number	%
EPA									
Scientific and Technical	4242	+189	+ 4.5%	4431	-248	- 5.6%	4183	- 59	- 1.4%
Other	<u>5788</u>	+ 80	+ 1.4%	<u>5868</u>	-238	- 4.1%	<u>5630</u>	-158	-2.7%
Total	10030	+269	+ 2.7%	10299	-486	- 4.7%	9813	-217	- 2.2%
FDA									
Scientific and Technical	3753	+148	+ 3.9%	3901	-131	- 3.4%	3770	+ 17	+ 0.5%
Other	<u>3393</u>	- 59	- 1.7%	<u>3334</u>	-471	-14.1%	<u>2863</u>	-530	-15.6%
Total	7146	+ 89	+ 1.2%	7235	-602	- 8.3%	6633	-513	- 7.2%
CPSC									
Scientific and Technical	159	- 20	-12.6%	139	- 31	-22.3%	108	- 51	-32.1%
Other	<u>667</u>	- 3	- 0.4%	<u>664</u>	-207	-31.2%	<u>457</u>	-210	-31.5%
Total	826	- 23	- 2.8%	803	-238	-29.6%	565	-261	-31.6%

^{a/}Data in this table are based upon the Office of Personnel Management Current Status Master File. They have not been verified by GAO or the agencies being reported on.

Table 2: Separations Among Scientific Personnel by Type and by Agency ^{a/}
(Permanent Full-Time Employees)

Type of Separation	Change 10/01/79 - 12/31/80		Change 01/01/81 - 12/31/81		Overall Change (10/79 - 12/81)	
	Number	%	Number	%	Number	%
EPA						
RIF-Related	- 8	- 0.2%	- 35	- 0.8%	- 43	- 1.0%
Non-RIF	-505	-11.9%	-558	-12.6%	-1063	-25.1%
Total Separations	-513	-12.1%	-593	-13.4%	-1106	-26.1%
FDA						
RIF-Related	0	0 %	- 32	- 0.8%	- 32	- 0.9%
Non-RIF	-339	- 9.0%	-248	- 6.4%	-587	-15.6%
Total Separations	-339	- 9.0%	-280	- 7.2%	-619	-16.5%
CPSC						
RIF-Related	- 1	- 0.6%	- 7	- 5.0%	- 8	- 5.0%
Non-RIF	- 44	-27.7%	- 31	-22.3%	- 75	-47.2%
Total Separations	- 45	-28.3%	- 38	-27.3%	- 83	-52.2%

^{a/} Data in this table are based upon the Office of Personnel Management Current Status Master File. They have not been verified by GAO or the agencies being reported on.

Table 3: Change in Scientific Employment by Occupation ^{a/}
 Environmental Protection Agency
 (Permanent Full-Time Employees)

Occupation	Total 10/01/79	Change 10/79 - 12/80		Total 12/31/80	Change 1/1/81 - 12/81		Total 12/31/81	Overall Change 10/79 - 12/81	
		Number	%		Number	%		Number	%
Environmental Engineers	1038	+182	+17.5%	1220	-21	- 1.7%	1199	+161	+15.5%
General Physiological Scientists	808	+103	+12.7%	911	-12	- 1.3%	899	+ 91	+11.3%
Chemists	592	+ 11	+ 1.9%	603	-15	- 2.5%	588	- 4	- 0.7%
General Biological Scientists	478	+ 38	+ 7.9%	516	+10	+ 1.9%	526	+ 48	+10.0%
General Engineers	327	-134	-41.0%	193	-93	-48.2%	100	-227	-69.4%
Chemical Engineers	145	- 5	- 3.4%	140	-18	-12.9%	122	- 23	-15.9%
Others	854	- 6	- 0.7%	848	-99	-11.7%	749	-105	-12.3%
Total	4242	+189	+ 4.5%	4431	-248	- 5.6%	4183	- 59	- 1.4%

^{a/}Data in this table are based upon the Office of Personnel Management Current Status Master File. They have not been verified by CAO or the agencies being reported on.

Table 4: Change in Scientific Employment by Functional Classification ^{a/}
 Environmental Protection Agency
 (Permanent Full-Time Employees)

Functional Classification	Total 10/01/79	Change 10/79 - 12/80		Total 12/31/80	Change 1/1/81 - 12/81		Total 12/31/81	Overall Change 10/79 - 12/81	
		Number	%		Number	%		Number	%
Data Collection Processing Analysis	996	+ 95	+ 9.5%	1091	+ 7	+ 0.6%	1098	+102	+10.2%
Research and Development	744	+ 1	+ 0.1%	745	- 79	-10.6%	666	- 78	-10.5%
Regulatory Enforcement and Licensing	590	+ 16	+ 2.7%	606	- 29	- 4.8%	577	- 13	- 2.2%
Planning	268	+ 3	+ 1.1%	271	- 8	- 3.0%	263	- 5	- 1.9%
Management	237	- 2	- 0.8%	235	- 51	-21.7%	184	- 53	-22.4%
Technical Assistance and Consulting	559	+ 26	+ 4.7%	585	- 5	- 0.9%	580	+ 21	+ 3.8%
Other	848	+ 50	+ 5.9%	898	- 83	- 9.2%	815	- 33	- 3.9%
Total	4242	+189	+ 4.5%	4431	-248	- 5.6%	4183	- 59	- 1.4%

^{a/}Data in this table are based upon the Office of Personnel Management Current Status Master File. They have not been verified by GAO or the agencies being reported on.

Table 5: Change in Scientific Employment by Occupation ^{a/}
 Food and Drug Administration
 (Permanent Full-Time Employees)

Agency	Total 10/01/79	Change 10/79 - 12/80		Total 12/31/80	Change 1/1/81 - 12/81		Total 12/31/81	Overall Change 10/79 - 12/81	
		Number	%		Number	%		Number	%
Chemists	967	- 6	- 0.6%	961	- 31	-3.2%	930	- 37	- 3.8%
General Biological Scientists	125	+ 18	+14.4%	143	+ 1	+0.7%	144	+ 19	+15.2%
Consumer Safety Specialists	1618	- 35	- 2.2%	1583	- 50	-3.2%	1533	- 85	- 5.3%
Medical Officers	134	+133	+99.3%	267	- 13	-4.9%	254	+120	+89.6%
Microbiologists	304	+ 5	+ 1.6%	309	- 9	-2.9%	300	- 4	- 1.3%
Pharmacologists	109	+ 12	+11.0%	121	0	0	121	+ 12	+11.0%
Others	496	+ 21	+ 4.2%	517	- 29	-5.6%	488	- 8	- 1.6%
Total	3753	+148	+ 3.9%	3901	-131	-3.4%	3770	+ 17	+ 0.5%

^{a/}Data in this table are based upon the Office of Personnel Management Current Status Master File. They have not been verified by GAO or the agencies being reported on.

Table 6: Change in Scientific Employment by Functional Classification ^{a/}
 Food and Drug Administration
 (Permanent Full-Time Employees)

Functional Classification	Total 10/01/79	Change 10/79 - 12/80		Total 12/31/80	Change 1/1/81 - 12/81		Total 12/31/81	Overall Change 10/79 - 12/81	
		Number	%		Number	%		Number	%
Regulatory Enforcement and Licensing	1870	+ 7	+ 0.4%	1877	- 62	- 3.3%	1815	- 55	- 2.9%
Test and Evaluation	883	- 30	- 3.4%	853	- 44	- 5.2%	809	- 74	- 8.4%
Research and Development	414	+ 15	+ 3.6%	429	+ 12	+ 2.8%	441	+ 27	+ 6.5%
Standards and Specifications	125	- 3	- 2.4%	122	- 5	- 4.1%	117	- 8	- 6.4%
Others	461	+159	+34.5%	620	- 32	- 5.2%	588	+127	+27.5%
Total	3753	+148	+ 3.9%	3901	-131	- 3.4%	3770	+ 17	+ 0.5%

^{a/} Data in this table are based upon the Office of Personnel Management Current Status Master File. They have not been verified by GAO or the agencies being reported on.

Table 7: Change in Scientific Employment by Occupation ^{a/}
 Consumer Product Safety Commission
 (Permanent Full-Time Employees)

Occupational Series	Total 10/01/79	Change 10/79 - 12/80		Total 12/31/80	Change 1/1/81 - 12/81		Total 12/31/81	Overall Change 10/79 - 12/81	
		Number	%		Number	%		Number	%
Chemists	22	+ 1	+ 4.5%	23	-13	-56.5%	10	-12	-54.5%
General Engineers	13	- 1	- 7.7%	12	- 2	-16.7%	10	- 3	-23.1%
Consumer Safety Specialists	35	-20	-57.1%	15	- 8	-53.3%	7	-28	-80.0%
Economists	16	0	0	16	- 5	-31.3%	11	- 5	-31.3%
Mechanical Engineers	15	- 2	-13.3%	13	- 1	- 7.7%	12	- 3	-20.0%
Electrical Engineers	11	0	0	11	- 1	- 9.1%	10	- 1	- 9.1%
Others	47	+ 2	+ 4.3%	49	- 1	- 2.0%	48	+ 1	+ 2.1%
Total	159	-20	-12.6%	139	-31	-22.3%	108	-51	-32.1%

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^{a/}Data in this table are based upon the Office of Personnel Management Current Status Master File. They have not been verified by GAO or the agencies being reported on.

Table 8: Change in Scientific Employment by Functional Classification ^{a/}
 Consumer Product Safety Commission
 (Permanent Full-Time Employees)

Functional Classification	Total 10/01/79	Change 10/79 - 12/80		Total 12/31/80	Change 1/1/81 - 12/81		Total 12/31/81	Overall Change 10/79 - 12/81	
		Number	%		Number	%		Number	%
Regulatory Enforcement and Licensing	31	-18	-58.1%	13	-9	-69.2%	4	-27	-87.1%
Standards and Specifications	27	-3	-11.1%	24	0	0	24	-3	-11.1%
Test and Evaluation	26	-3	-11.5%	23	-10	-43.5%	13	-13	-50.0%
Research and Development	15	-3	-20.0%	12	-4	-33.3%	8	-7	-46.7%
Data Collection Processing and Analysis	15	-5	-33.3%	10	-2	-20.0%	8	-7	-46.7%
Others	45	+12	+26.7%	57	-6	-10.5%	51	+6	+13.3%
Total	159	-20	-12.6%	139	-31	-22.3%	108	-51	-32.1%

^{a/}Data in this table are based upon the Office of Personnel Management Current Status Master File. They have not been verified by GAO or the agencies being reported on.

ANOMALIES IN THE DATA

The data displayed in appendix I are derived from a computer tape provided to GAO by OPM. The tape was produced from the Current Status Master File (CSMF), a subsystem of OPM's Central Personnel Data File (CPDF). The primary goal of the CPDF system is "to provide a readily accessible major data source for meeting the work force information needs of the OPM, other central management agencies, the Congress, the White House, and the public." It includes data on most civilian Federal employees and is supposed to provide "the capability for obtaining status or dynamic outputs in a comprehensive, flexible and timely manner."

When we began this assignment, we investigated the possibility of getting our data directly from the regulatory agencies, but abandoned this idea because the CPDF seemed ideally suited to our needs. At OPM's suggestion, we specified that our tape be created from the CSMF, which records the most recent information available for each individual in each month of the year. The subcommittee requested information on four regulatory agencies--EPA, FDA, CPSC, and OSHA. As previously stated, we could not include OSHA in our analyses because that agency's data were incomplete. OPM officials told us that this was due to the Department of Labor's failure to submit adequately detailed information on OSHA until April 1981.

Our CSMF extract contained 10 files, one for each quarter from the last quarter of FY 1979 to the first quarter of FY 1982. Each file was made up of data elements that reflected the status of each individual on the file at the time of their most recent personnel action.

After some initial data processing, we examined the data to determine whether it would provide reliable counts of accessions and separations by quarter. We found a disturbingly high incidence of anomalies and decided that analyses would have to wait.

A thorough examination of the data showed that out of the approximately 10,000 individuals in the file, about 1,600, or 16 percent, had employment histories that were anomalous in some way. Many had more than one problem. Through our data cleaning operations we were able to reduce the incidence of inconsistencies and anomalies to a more acceptable 3 percent of the cases.

Most of our efforts were concentrated on remedying three problems. We found, first, that our efforts to count accessions and separations in each quarter were hindered by the presence of several hundred individuals who appear on or disappear from agency roles without appropriate accession or separation codes. In each of these cases, we inserted codes that would enable us to count them as incoming or separating employees.

A second factor that complicated our counts was the failure of the system to backdate actions. We found hundreds of cases

where actions that had taken place in quarter 1, for example, were not entered into the system until quarter 2 or later, and were never backdated to quarter 1. In such cases, we performed the backdating ourselves.

The third major problem we corrected was most probably the result of a massive coding error. We found approximately 1,100 individuals with missing data in quarter 7 whose social security numbers differed by only one digit from a like number of cases that had data entered for only the 7th quarter. We resolved the problem in this case by merging the information contained in the two data sets.

Like most computerized data bases, our CSMF excerpt also had a significant rate of random error. A few sets of similar errors within this overall category were identifiable and correctable. Much of it was completely random, however, and presumably makes up the remaining 3 percent error in our data.

OCCUPATIONS AND FUNCTIONS

We obtained from OPM information on all EPA, FDA, and CPSC employees in the occupational series listed below. This list is identical to the one OPM uses to identify the series for which functional classification information is maintained. A list of functional classifications is also included.

Occupational Series

Community Planning	0020	Veterinary Medical Science	0701
Park Management	0025	General Engineering	0801
Social Science	0101	Safety Engineering	0803
Economist	0110	Fire Prevention Engineering	0804
Manpower Research and Analysis	0140	Materials Engineering	0806
Geography	0150	Landscape Architecture	0807
History	0170	Architecture	0808
Psychology	0180	Civil Engineering	0810
Sociology	0184	Environmental Engineering	0819
Social Work	0185	Mechanical Engineering	0830
General Anthropology	0190	Nuclear Engineering	0840
Archeology	0193	Electrical Engineering	0850
General Biological Science	0401	Electronic Engineering	0855
Microbiology	0403	Biomedical Engineering	0858
Pharmacology	0405	Aerospace Engineering	0861
Agricultural Extension	0406	Naval Architecture	0871
Ecology	0408	Mining Engineering	0880
Zoology	0410	Petroleum Engineering	0881
Physiology	0413	Agricultural Engineering	0890
Entomology	0414	Ceramic Engineering	0892
Botany	0430	Chemical Engineering	0893
Plant Pathology	0434	Welding Engineering	0894
Plant Physiology	0435	Industrial Engineering	0896
Plant Protection and Quarantine	0436	Patent Administration	1220
Horticulture	0437	Patent Advisor	1221
Genetics	0440	Patent Classifying	1223
Range Conservation	0454	Patent Examining	1224
Soil Conservation	0457	Patent Interference Examining	1225
Forestry	0460	Design Patent Examining	1226
Soil Science	0470	General Physical Science	1301
Agronomy	0471	Health Physics	1306
Agricultural Management	0475	Physics	1310
Fish and Wildlife Administration	0480	Geophysics	1313
Fishery Biology	0482	Hydrology	1315
Wildlife Refuge Management	0485	Chemistry	1320
Wildlife Biology	0486	Metallurgy	1321
Husbandry	0487	Astronomy and Space Science	1330
Home Economics	0493	Meteorology	1340
General Health Science	0601	Geology	1350
Medical Officer	0602	Oceanography	1360
Nurse	0610	Cartography	1370
Dietitian	0630	Geodesy	1372
Occupational Therapist	0631	Land Surveying	1373
Physical Therapist	0633	Forest Products Technology	1380

Corrective Therapist	0635	Food Technology	1382
Manual Arts Therapist	0637	Textile Technology	1384
Educational Therapist	0639	Photographic Technology	1386
Medical Technologist	0644	Actuary	1510
Pharmacist	0660	Operations Research	1515
Optometrist	0662	Mathematics	1520
Speech Pathology and Audiology	0665	Mathematical Statistician	1529
Podiatrist	0668	Statistician	1530
Dental Officer	0680	Cryptography	1540
Industrial Hygiene	0690	Computer Science	1550
Consumer Safety	0696		

Functional Classifications

Research	11	Standards and Specifications	41
Research Contract and Grant Administration	12	Regulatory Enforcement and Licensing	42
Development	13	Natural Resource Operations	51
Test and Evaluation	14	Clinical Practice, Counseling, and Ancillary Medical Services	81
Design	21	Planning	91
Construction	22	Management	92
Production	23	Teaching and Training	93
Installation, Operations and Maintenance	24	Technical Assistance and Consulting	94
Data Collection, Processing, and Analysis	31	Other — Not Elsewhere Classified	99
Scientific and Technical Information	32		

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