

**Nuclear Criticality Safety Professionals
Compensation Study
October 2016**



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Summary

The highly educated and experienced Nuclear Criticality Safety (NCS) professionals examined in this study are commanding healthy salaries, an attractive array of benefits and they appear to have satisfaction in their overall compensation. Their salaries are higher than that of all engineers when adjusting for years of experience, which can be attributed to a number of factors including:

- Large portion of respondents with advanced degrees (66%)
- Significant professional experience: 21.9 years on average
- Significant experience in NCS: 14.6 years on average
- Expertise in NCS, where 65% (on average) of respondents' time is devoted to NCS

The following is a detailed report of the findings of this study.

Background

The Nuclear Criticality Safety Division (NCSD) requested that the Membership and Marketing Department of the American Nuclear Society assist in fielding and reporting a compensation study for those professionals in NCS. Working with the NCSD's officers, a questionnaire was designed to be relevant and specialized for those in the NCS field.

The first wave of the study was fielded via email in late November 2015 and mailed to all members of the NCSD. When this first wave yielded only 142 usable responses, it was decided to mail again; this time requesting recipients to forward the link to the survey to non-member professionals in NCS. The second emailing was sent in early March 2016 and generated an additional 98 usable returns for a more representative sampling of the market. In total 240 usable responses were received.

Profile of Respondents

To better interpret compensation data, the profile of those responding to the survey is described. As mentioned earlier, those asked to complete the survey were members of the NCSD of the American Nuclear Society and non-member colleagues of NCSD members who work in the NCS field. In tabulating the data, only those individuals who were employed or actively seeking employment were included in figures shown in this report:

Employment Status	
Employed	97.9%
Seeking employment	2.1%
Total	100.0%
Base	240

NCS professionals are a highly educated group of people with nearly two-thirds holding advanced degrees.

Highest Degree Held	
PhD	18.8%
Master's	45.0%
Bachelor's	35.4%
Other	0.8%
Total	100.0%
Base	240

Half of the respondents report working for a government contractor such as a national lab. A minority of respondents (16.3%) hold a professional certification, most often the Professional Engineer.

Employer Type	
Gov't Contractor	50.4%
Subcontractor/Consultant	19.1%
Private Company	18.3%
Government	8.7%
Other	3.5%
Total	100.0%
Base	230

Few survey respondents were self-employed (3.5%).

The respondent base is fairly seasoned, with the mean years of experience at 21.9. Experience in the nuclear criticality field is significantly lower, although respectable, at mean years of experience of 14.6 years. While a quarter of the base has been with their current employer two years or less, tenure with current employer is fairly stable at 10.9 mean years. Respondents, on average, have worked for four different employers.

Years	Professional Experience	In NCS	Current Employer
0 to 2	7.6%	18.4%	24.0%
3 to 5	8.4%	10.5%	18.6%
6 to 10	13.4%	18.0%	22.2%
11 to 20	17.6%	26.8%	18.1%
21 to 30	23.5%	18.4%	10.4%
31+	29.4%	7.9%	6.8%
Total	100.0%	100.0%	100.0%
Mean	21.9 yrs	14.6 yrs	10.9 yrs
Base	238	239	221

Consistent with the higher number of years of experience in the sample, higher level positions are reported. Nearly two-thirds (64.7%) indicate being an engineer. A little less than a third (28.2%) are responsible for managing others, the average number managed standing at 2.1.

Job Function	
Senior Engineer	21.0%
Engineer	17.2%
Principal Engineer	14.3%
Technical Lead Manager	8.4%
Consultant	8.4%
Engineer in Training	6.7%
Chief Consulting Engineer	5.5%
Analyst with modeling focus	5.0%
Project Manager	5.0%
Personnel Manager	2.9%
Educator	1.3%
Program Manager	0.8%
Executive	0.8%
Other	1.3%
Total	100.0%
Base	238

About half of respondents devote the majority (80%+) of their working time to NCS, with the average time spent in NCS standing at 64.5%:

Time in NCS	
<10%	10.5%
10%	5.9%
20%	6.7%
30%	8.8%
40%	1.7%
50%	5.9%
60%	3.3%
70%	4.6%
80%	5.4%
90%	10.5%
100%	36.8%
Total	100.0%
Mean	64.5%
Base	238

Compensation – Salary and Bonus

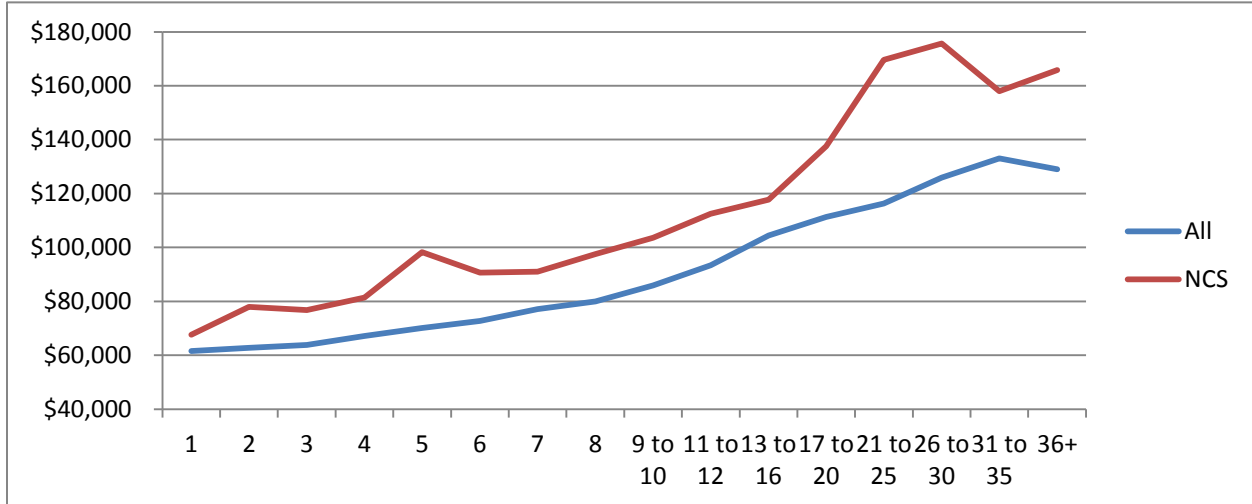
Overall, we find the NCS professionals in our sample very well compensated. This can be attributed to a number of factors including:

- Large portion of respondents with advanced degrees (66%)
- Significant professional experience: 21.9 years on average
- Significant experience in NCS: 14.6 years on average

- Expertise in NCS, where 65% (on average) of respondents' time is devoted to NCS

This holds true when comparing NCS base salaries to that of the engineering profession at large. Normalizing for years of professional experience, NCS professionals as compared to all engineers command higher average salaries across all experience levels:

**Salary by Years of Experience
NCS Professionals vs. All Engineers**



Source: 2015 Engineering Salary Survey, Engineering Workforce Commission, American Association of Engineering Societies, Inc.

Looking across the employment sectors, Government Contractor/National Lab employees are commanding the highest compensation. This segment also reported higher years of both professional and NCS experience, a higher portion of their time dedicated to NCS and a higher percentage holding an advanced degree.

Of the factors examined, years of professional experience has the highest positive correlation with cash compensation.

Compensation	Average					NCS Percent	Advanced Degree	Base
	Salary	Bonus	Total Comp	Years Exp.	NCS Exp.			
Gov't Contractor	\$141,139	\$4,080	\$ 145,219	23.2	15.4	69%	73%	108
Private Industry	\$139,947	\$4,090	\$ 144,037	20.1	13.9	54%	49%	40
Subcontractor	\$124,446	\$3,010	\$ 127,456	19.1	12.2	67%	71%	38
Government	\$128,639	\$6,644	\$ 135,283	18.6	13.5	66%	65%	*17
All Other	\$149,205	\$6,985	\$ 156,190	25.3	15.9	56%	50%	*18
Total	\$138,301	\$ 4,843	\$ 143,144	21.9	14.6	65%	66%	221
Correlation Coefficient (r²)				0.637	0.616	0.009	0.195	

*Very small sample

The calculations for the averages in the bonus figures expressed above include those that receive no bonuses so that true average compensation could be presented. We found, however, that slightly over half of the respondents receive bonuses as noted below:

Receive a Bonus	Yes	Average Bonus*	Base
Gov't Contractor	50.5%	\$ 8,160	110
Private Industry	55.0%	\$ 7,436	40
Subcontractor	42.1%	\$ 7,623	38
Government	76.5%	\$ 8,688	**17
All Other	61.1%	\$11,430	**18
Total	52.7%	\$ 8,323	223

*Among those receiving a bonus

**Very small sample

As mentioned earlier, 28.2% of respondents indicated they were in a staff management position. And, those who are in management command compensation approximately 15% higher than those who have no staff management responsibilities. This difference, however, can be attributed primarily the greater average number of years' experience in that more experience corresponds to both higher salaries and the likelihood of being in a staff management role.

	Staff Management		
	Total	Yes	No
Avg. Compensation:			
Base Salary	\$138,301	\$154,927	\$131,962
Salary + Bonus	\$143,144	\$158,767	\$137,188
Avg. Yrs Experience			
Total Experience	21.9	25.3	21.4
NCS Experience	14.6	16.1	14.5
Base	221	61	160

Salary adjustments have been increasing at a modest pace over the past three years for nuclear criticality professionals, both in the amount of percentage increases and in the proportion of individuals receiving an increase. 65.5% reported receiving an increase in 2013. This increased to 75.1% reporting an increase in 2015. The amount of increase for those receiving an adjustment rose from an average of 3.15% to 3.73% over this same time period:

Percentage Increase	2015	2014	2013
0	24.9%	32.4%	34.5%
0.5 - 1.5	10.5%	9.1%	6.4%
1.5 - 1.9	2.2%	2.3%	1.8%
2 - 2.5	16.0%	18.8%	22.8%
2.6 - 2.9	5.5%	1.1%	2.3%
3 - 3.5	14.9%	21.0%	18.7%
3.6 - 3.9	1.1%	1.1%	0.6%
4 - 4.9	5.5%	2.8%	5.3%
5 - 5.9	6.1%	3.4%	2.3%
6 - 6.9	4.4%	1.1%	1.8%
7 - 7.9	3.3%	1.7%	0.0%
8 - 8.9	0.6%	2.8%	0.6%
9 +	5.0%	2.3%	2.9%
Total	100.0%	100.0%	100.0%
Mean - Total	2.82%	2.21%	2.06%
Mean – among those with increase	3.73%	3.27%	3.15%
Base	181	176	171

Additionally, respondents report that two-thirds of their increase is based on merit or performance, with the remainder attributed to market adjustments and cost of living increases.

Increase Factors	Total
Merit/performance increase	67.1%
Cost of living increase	22.2%
Market adjustment	10.7%
Total	100.0%
Base	149

Overtime policies vary widely, equally distributed among being not available, being compensated with other time off or being paid at the regular straight pay rate:

Overtime	
Overtime pay is not available	32.5%
Overtime is compensated with time off or flexible schedule	32.0%
Overtime pay is equal to my regular hourly pay	30.7%
Overtime pay is time and a half over forty (40) hours	1.8%
Other	3.1%
Total	100.0%
Base	228.00

Overall, the majority of respondents feel that their compensation, salary and benefits, is in line with the market indicating general satisfaction:

Compensation in line with Market	
Yes	67.2%
No	32.8%
Total	100.0%
Base	201

Benefits

For this analysis, there is sufficient sample size in the government contractor sample to compare their responses to those of all other industries (there is insufficient sample size within each of the other sectors to make representative conclusions.)

Retirement Benefits

Consistent with the large portion of respondents working for an organization (versus being self-employed) we find that most are covered by some sort of retirement savings plan:

Retirement Savings Plan	Total	Gov't Contractor	All Other
Yes	93.5%	99.1%	87.7%
No	6.5%	0.9%	12.3%
Total	100.0%	100.0%	100.0%
Base	230	116	114

And, most employers make contributions to that employment plan:

Employer Contribute to Plan	Total	Gov't Contractor	All Other
Yes	93.0%	96.5%	88.9%
No	7.0%	3.5%	11.1%
Total	100.0%	100.0%	100.0%
Base	214	115	99

While there is a fairly broad range in the maximum amount that employers will match, most respondents have matching between 5 – 8% of total salary:

Employer Salary Match Max	Total	Gov't Contractor	All Other
3%	7.4%	2.9%	12.9%
4%	4.7%	1.9%	8.2%
5%	10.5%	5.7%	16.5%
6%	44.2%	50.5%	36.5%
7%	10.5%	12.4%	8.2%
8%	11.6%	17.1%	4.7%
Other	11.1%	9.5%	12.9%
Total	100.0%	100.0%	100.0%
Base	190	105	85
Mean	6.4%	6.7%	6.0%

The rates at which employers' match are most often 50% or 100% of the employees' contribution. (For example, if the employee contributes 6% of his/her salary, the employer will contribute 50% of the 6% or 3% of total salary.)

Employer Contribution	Total	Gov't Contractor	All Other
25%	2.1%	2.8%	1.2%
50%	45.6%	48.1%	42.4%
67%	4.1%	0.0%	9.4%
75%	2.6%	2.8%	2.4%
100%	31.1%	25.0%	38.8%
Other	14.5%	21.3%	5.9%
Total	100.0%	100.0%	100.0%
Base	193	108	85
Mean	69%	66%	73%

In addition to an employer provided retirement savings plan, we find a fair portion of respondents able to participate in an employer provided pension plan and to receive retiree health benefits. These benefits are most often found for those working for the government or government contractor:

Other Retiree Benefits (% Yes)	Total	Gov't Contractor	All Other
Pension	41.2%	43.6%	38.8%
Health Insurance	39.4%	54.6%	24.0%
Base	199	101	98

As has been seen for companies in general, younger/newer employees are less likely to enjoy pension benefits. For NCS professionals the benefit of a pension and, to a lesser degree, retiree health benefits are lower for those with fewer years' experience:

Retiree Benefits by Years' Experience	Pension	Health Insurance
0 to 2	9.1%	20.0%
3 to 5	33.3%	38.5%
6 to 10	23.5%	40.0%
11 to 20	54.5%	44.1%
21 to 30	47.8%	38.1%
31+	46.8%	40.7%
Base	198	192

Other Benefits

The majority of respondents have a full package of employer provided insurance products; with those in government indicating higher participation levels:

Employer Provided Insurance (%Yes)	Total	Gov't Contractor	All Other
Medical Insurance	92.2%	99.1%	85.3%
Dental Insurance	88.8%	99.1%	78.1%
Group Life Insurance	86.0%	88.9%	83.0%
Short Term Disability	86.3%	95.4%	76.7%
Long Term Disability	80.0%	89.5%	70.4%
Base	210	105	105

Likewise, government employees enjoy a significantly higher number of paid day's off than do those in other sectors:

Paid Days Off (Average)	Total	Gov't Contractor	All Other
Vacation	15.7	18.0	13.4
Holidays	8.4	10.7	6.1
Personal Illness	4.3	5.2	3.4
Personal Business	0.3	0.2	0.4
Other	0.2	0.1	0.3
Total Days Off	28.9	34.2	23.6
Base	210	105	105

Given the large portion of those in government, we find that few among the sample, 7.6%, participate in any sort of profit sharing plan.

Regardless of industry, salary is the most important factor in the choice of a particular job or employer. NCS professionals working for a government contractor are more likely to indicate benefits, management support and work place culture as important factors where those in other industries are more likely to see job responsibilities and flexible work hours as more important. Perhaps reflective of the higher positions and experience levels of the respondent base, opportunities for advancement fell fairly low in the rankings of importance factors:

Importance Factors (average on a 1 - 10 scale)	Total	Gov't Contractor	All Other
Salary	8.42	8.30	8.53
Benefits	7.56	7.90	7.24
Job responsibilities	7.40	7.20	7.59
Job location	7.14	7.07	7.21
Management support	6.95	7.35	6.58
Flexible work hours	6.90	6.55	7.23
Work place culture	6.75	7.29	6.25
Opportunities for advancement	6.40	6.62	6.19
Physical work environment	4.99	5.28	4.72
Amount of travel required	4.95	4.71	5.17
Base	203	98	105

In the appendix, attached, charts have been constructed that detail the reported salary and bonus figures and salary figures alone for each of the industries examined in this study for which there is sufficient sample:

- Total Sample – Appendix 1A & 1B
- Government Contractor – Appendix 2A & 2B
- Private Industry – Appendix 3A & 3B
- Subcontractor/Consultant – Appendix 4A & 4B

Please note that any responses that were deemed inaccurate were removed from the data sets.

Conclusions

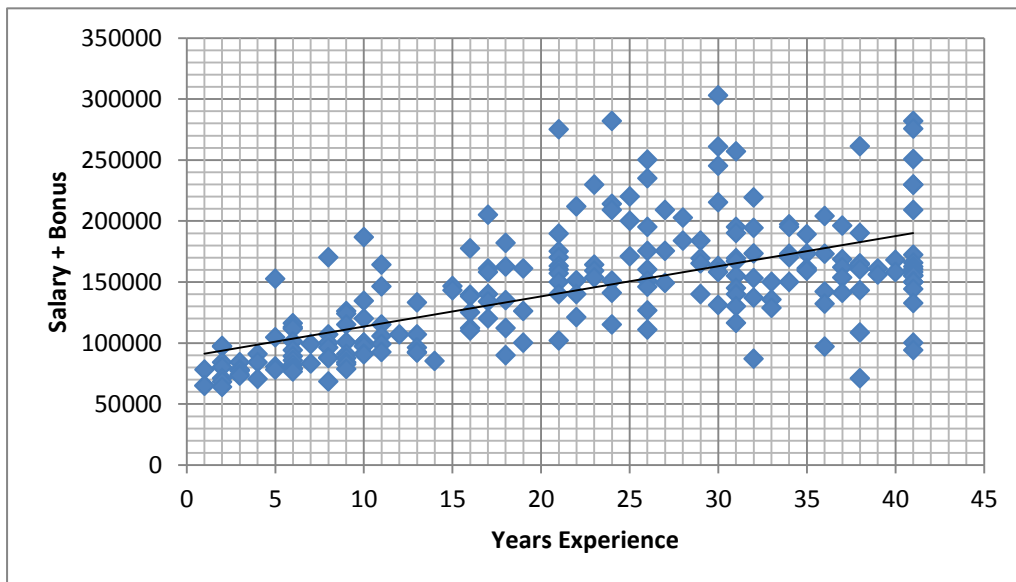
The highly educated and experienced NCS professionals examined in this study are commanding healthy salaries and an attractive array of benefits. Their salaries are higher than that of all engineers when adjusting for years of experience. And, it is years of experience which has the greatest positive relationship to salary. Additionally, there appears to be satisfaction in overall compensation in that the majority of respondents report that they feel their salary is in line with the market.

**Paid Compensation
Total Sample**

Paid Compensation: Salary and Bonus

All Employers Decile	Average Comp.	Years Avg. Experience	Years Avg NCS Experience	Percent NCS*
1	\$245,697	30.7	22.7	64%
2	\$188,629	28.0	21.6	68%
3	\$167,966	30.2	21.2	85%
4	\$159,328	31.1	19.7	68%
5	\$149,243	28.4	18.6	56%
6	\$135,958	25.9	13.2	55%
7	\$115,368	15.5	11.1	62%
8	\$98,405	13.6	7.7	55%
9	\$86,342	8.8	5.4	80%
10	\$70,029	5.1	3.7	59%
Mean	\$143,144	21.9	14.6	65%
Base	223			

*Percent of time working in NCS

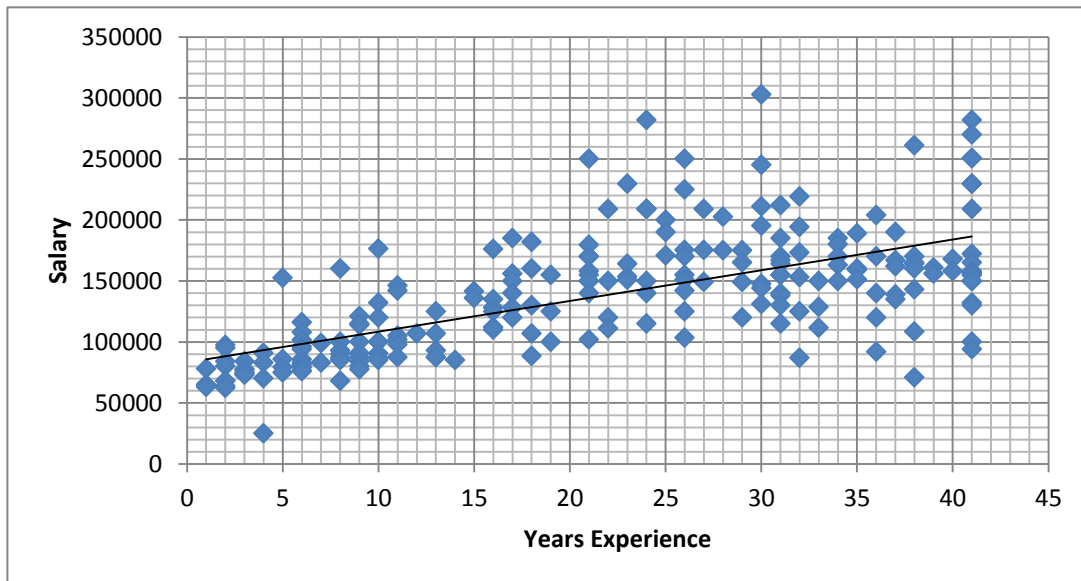


**Annual Salary
Total Sample**

Salary Only

All Employers Decile	Average Annual Salary	Years Avg. Experience	Years Avg NCS Experience	Percent NCS*
1	\$236,861	31.8	21.2	57%
2	\$183,080	27.3	23.7	77%
3	\$165,685	32.5	21.1	65%
4	\$156,636	29.4	19.6	74%
5	\$146,758	27.0	17.7	58%
6	\$130,845	24.2	13.2	55%
7	\$112,163	19.3	11.8	67%
8	\$96,257	12.6	7.0	61%
9	\$84,977	9.3	5.7	77%
10	\$69,884	5.1	3.8	57%
Mean	\$138,301	21.9	14.6	65%
Base	223			

*Percent of time working in NCS

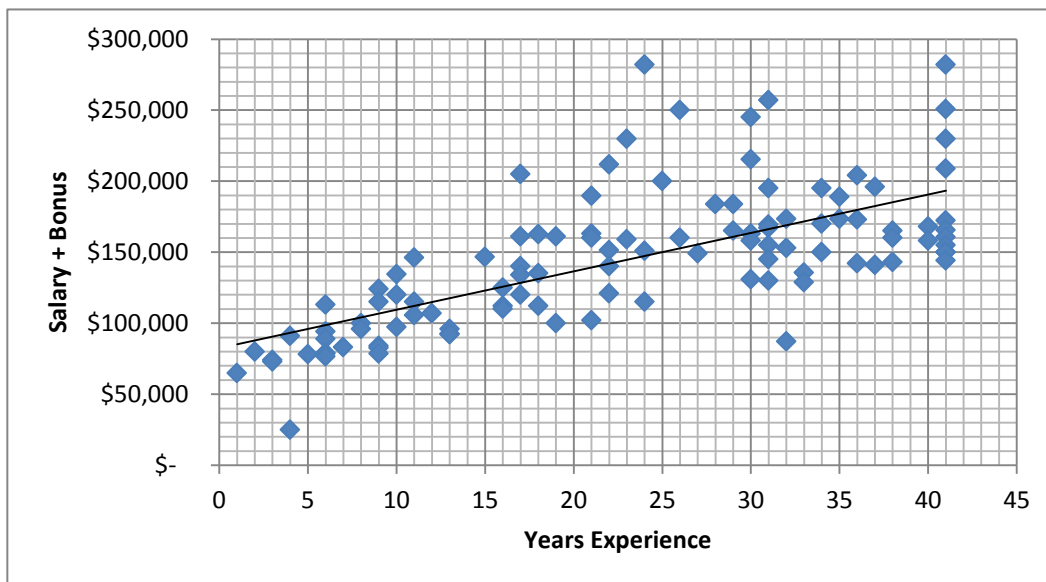


**Paid Compensation
Government Contractor**

Paid Compensation: Salary and Bonus

Gov't Contractor Decile	Average Comp.	Years Avg. Experience	Years Avg NCS Experience	Percent NCS*
1	\$241,955	31.8	22.5	73%
2	\$ 192,216	29.5	23.6	77%
3	\$168,322	35.1	21.4	90%
4	\$160,279	26.7	15.5	72%
5	\$150,964	31.7	22.8	54%
6	\$140,560	26.7	14.7	62%
7	\$123,970	18.6	10.3	74%
8	\$106,700	14.6	11.4	48%
9	\$ 89,727	10.9	7.5	74%
10	\$ 70,730	4.5	3.5	58%
Mean	\$145,219	23.2	15.4	69%
Base	108			

*Percent of time working in NCS

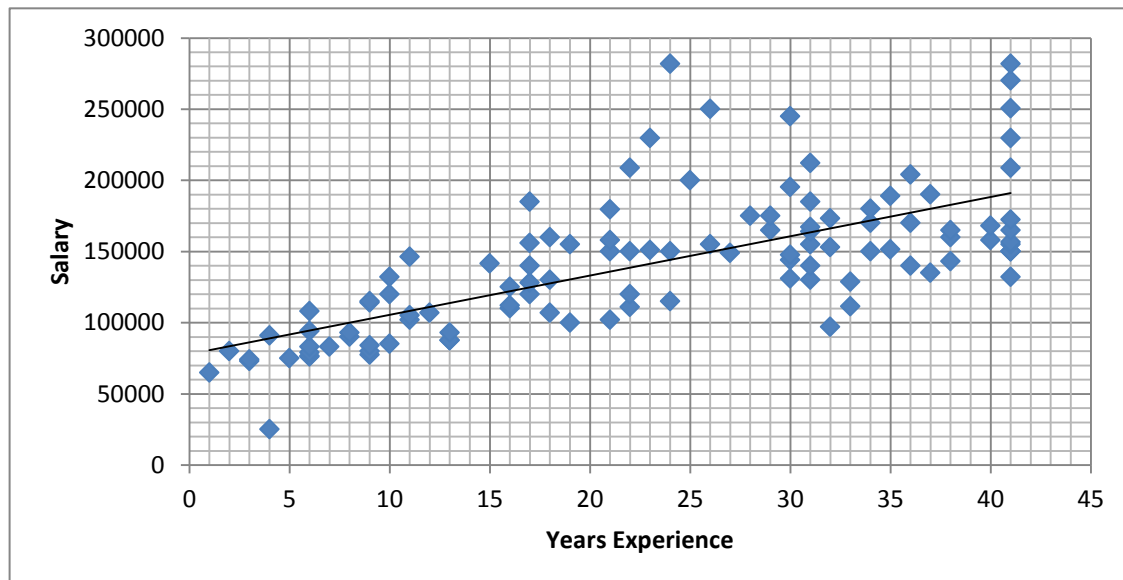


**Annual Salary
Government Contractor**

Salary Only

Gov't Contractor Decile	Average Annual Salary	Years Avg. Experience	Years Avg NCS Experience	Percent NCS*
1	\$238,640	32.8	21.2	74%
2	\$187,072	29.4	24.0	76%
3	\$167,240	33.7	19.6	82%
4	\$155,709	31.0	21.4	76%
5	\$149,424	28.6	19.9	55%
6	\$137,134	27.5	14.5	65%
7	\$120,706	18.5	12.4	68%
8	\$105,227	15.9	9.5	69%
9	\$88,563	11.2	7.5	58%
10	\$70,080	4.9	4.0	61%
Mean	\$141,139	23.2	15.4	69%
Base	108			

*Percent of time working in NCS

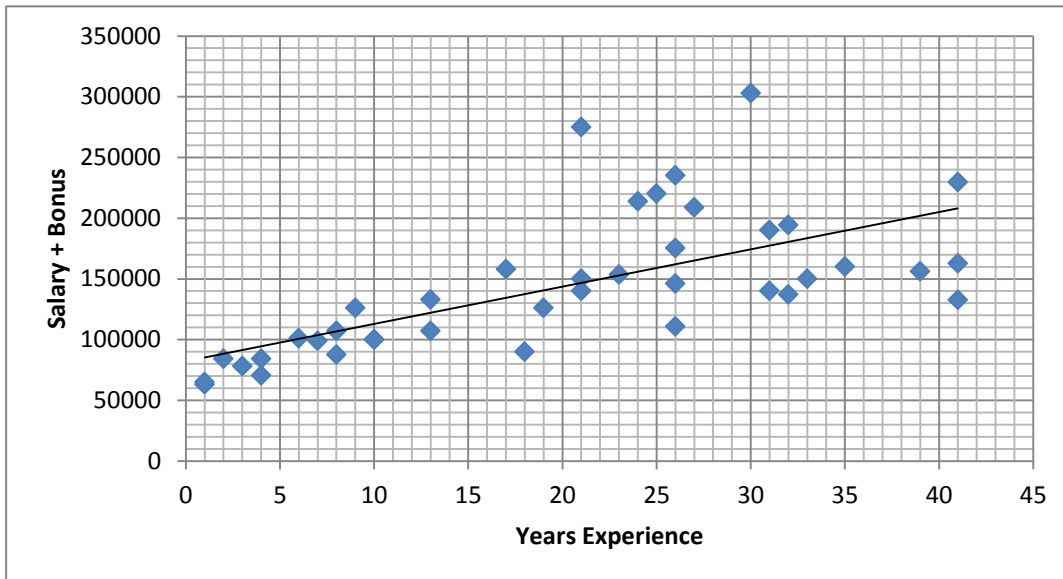


**Paid Compensation
Private Industry**

Paid Compensation: Salary and Bonus

Private Industry Quartile	Average Comp.	Years Avg. Experience	Years Avg NCS Experience	Percent NCS*
1	\$224,462	28.3	22.0	53%
2	\$151,597	28.7	21.2	54%
3	\$118,020	17.7	9.3	54%
4	\$82,069	5.8	3.2	52%
Mean	\$144,037	20.1	13.9	54%
Base	40			

*Percent of time working in NCS

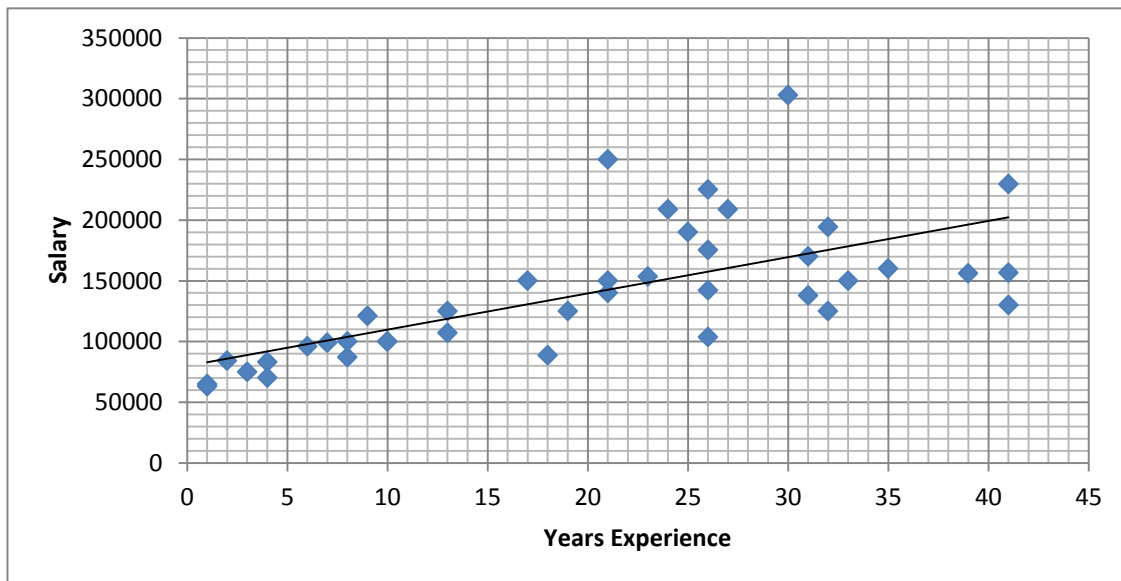


**Annual Salary
Private Industry**

Salary Only

Private Industry Quartile	Average Annual Salary	Years Avg. Experience	Years Avg NCS Experience	Percent NCS*
1	\$215,462	28.3	22.0	53%
2	\$149,607	28.7	21.2	54%
3	\$113,650	18.1	9.4	47%
4	\$81,069	5.4	3.1	59%
Mean	\$139,947	20.1	13.9	54%
Base	40			

*Percent of time working in NCS

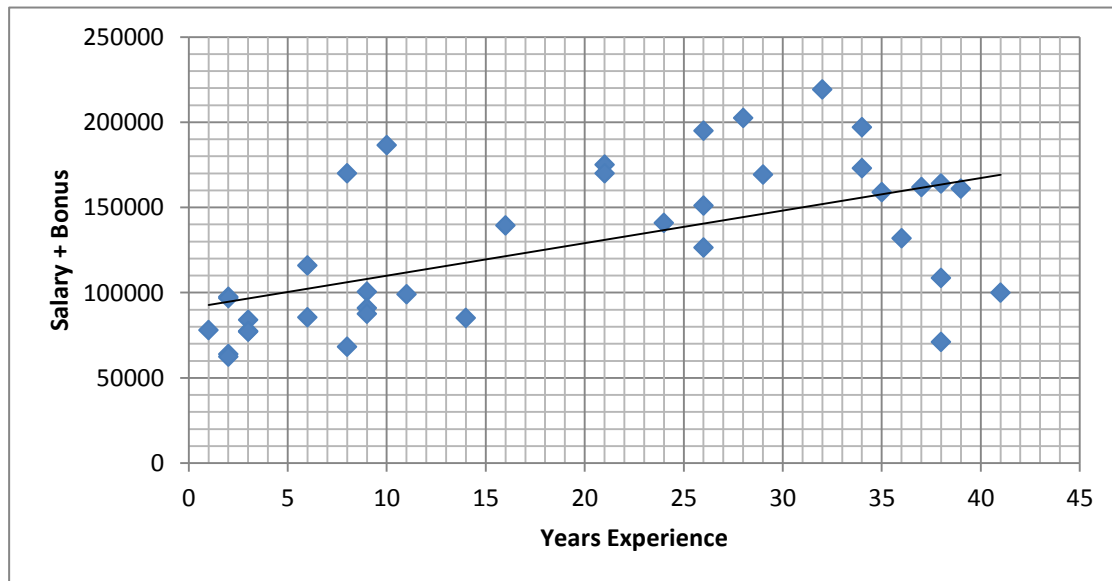


**Paid Compensation
Subcontractor/Consultant**

Paid Compensation: Salary and Bonus

Subcontractor Quartile	Average Comp.	Years Avg. Experience	Years Avg NCS Experience	Percent NCS*
1	\$ 187,586	23.8	17.0	52%
2	\$ 150,510	30.6	19.7	58%
3	\$ 98,258	13.3	6.5	86%
4	\$ 74,150	8.2	5.3	73%
Mean	\$127,456	19.1	12.2	67%
Base	38			

*Percent of time working in NCS



**Annual Salary
Subcontractor/Consultant**

Salary Only

Subcontractor Quartile	Average Annual Salary	Years Avg. Experience	Years Avg NCS Experience	Percent NCS*
1	\$180,031	27.1	20.4	52%
2	\$146,220	27.6	16.6	58%
3	\$97,928	13.3	6.5	86%
4	\$74,133	8.2	5.3	73%
Mean	\$124,446	19.1	12.2	67%
Base	38			

*Percent of time working in NCS

