Resident Inspector Demographics

Scope and Objectives

This enclosure is the annual update on demographic data for inspectors assigned to the resident inspector (RI) program. It was originally requested by the Commission in its Staff Requirements Memorandum (SRM) for COMGJD-98-001/COMEXM-98-002, "Discussion of Resident Inspector Demographics and the Balance between Expertise and Objectivity," dated April 8, 1998 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML003753515). The scope and breadth of this annual update have evolved over the years to address requests from the Commission in subsequent SRMs, recommendations from the Davis-Besse Lessons Learned Task Force (DBLLTF), and other enhancements to provide a more focused review.

The RI program demographic analyses examine three primary functional areas: (1) inspector experience, (2) inspector turnover, and (3) site staffing. The results are discussed in Sections I, II, and III below and illustrated in Figures 1a through 7. Several of the analyses separately examine data from the RI and senior resident inspector (SRI) groups, while other analyses combine data from these groups into region-based or national analyses and trends. Section IV provides conclusions.

I. Inspector Experience

Under Appendix A to Inspection Manual Chapter (IMC) 0307, "Reactor Oversight Process Self-Assessment Program," dated March 23, 2009, experience analysis consists of the following four data sets:

(1) "NRC time" is the total number of years the individual has accumulated as a U.S. Nuclear Regulatory Commission (NRC) employee from hire date through November of the reported year.

(2) "Total resident time" is the total number of years the individual has accumulated as an RI or SRI through November of the reported year.

(3) "Current site time" is the total number of years spent as an RI or SRI at the current site through November of the reported year.

(4) "Relevant non-NRC experience" is nuclear power experience acquired outside of the NRC. Examples of relevant non-NRC experience include operation, engineering, maintenance, or construction experience with commercial nuclear power plants, naval shipyards, U.S. Department of Energy facilities, or the U.S. Navy's nuclear power program.

Median and average statistical descriptors of the above data sets are plotted for both resident and SRI groups in Figures 1a, 1b, 2a, 2b, 3a, 3b, 4a, and 4b. Figures 1a, 1b, 3a, and 3b plot national trend data from 2007 through 2012 while Figures 2a, 2b, 4a, and 4b plot 2012 data by region and nationally. Plotted data is presented in fractional years. Analysis of the plots describes (a) percent change over time in national trend analyses or (b) percent plus or minus regional variance from national data in regional comparison analysis. This provides the reader

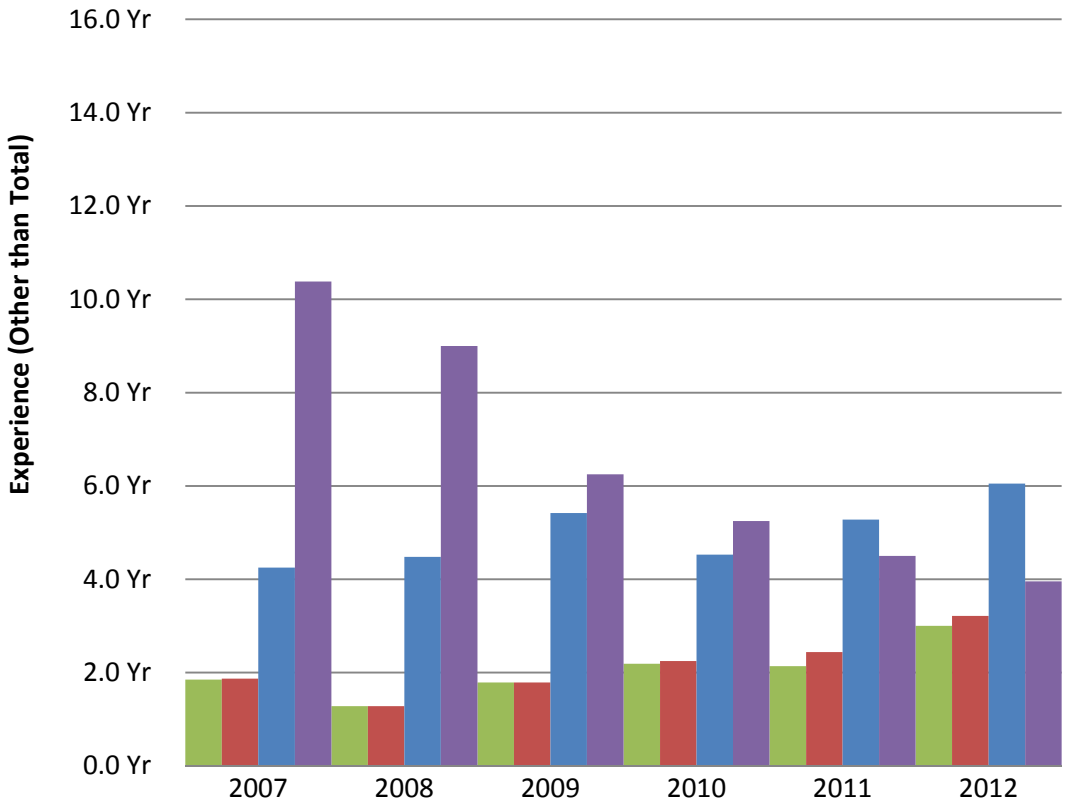
with a more intuitive and objective sense of the magnitude of the respective trend or region variation.

Resident Inspector Experience Analysis

The following analysis supports IMC 0307 Metric O-13 "Analysis of Resident Inspector Demographics and Experience," a trend-only metric. The following analysis is intended primarily for tracking and trending RI experience. The results of this analysis are used to make any necessary modifications to the RI program to attract and retain highly qualified inspectors to the program. Conclusions are discussed in Section IV.

Analysis of Figure 1a, below, reveals moderately increasing trends in *median* RI total resident time, current site time, and NRC time. However, it also reveals a more dominant declining trend in relevant non-NRC experience - down 62 percent from 10.4 to 4.0 years.

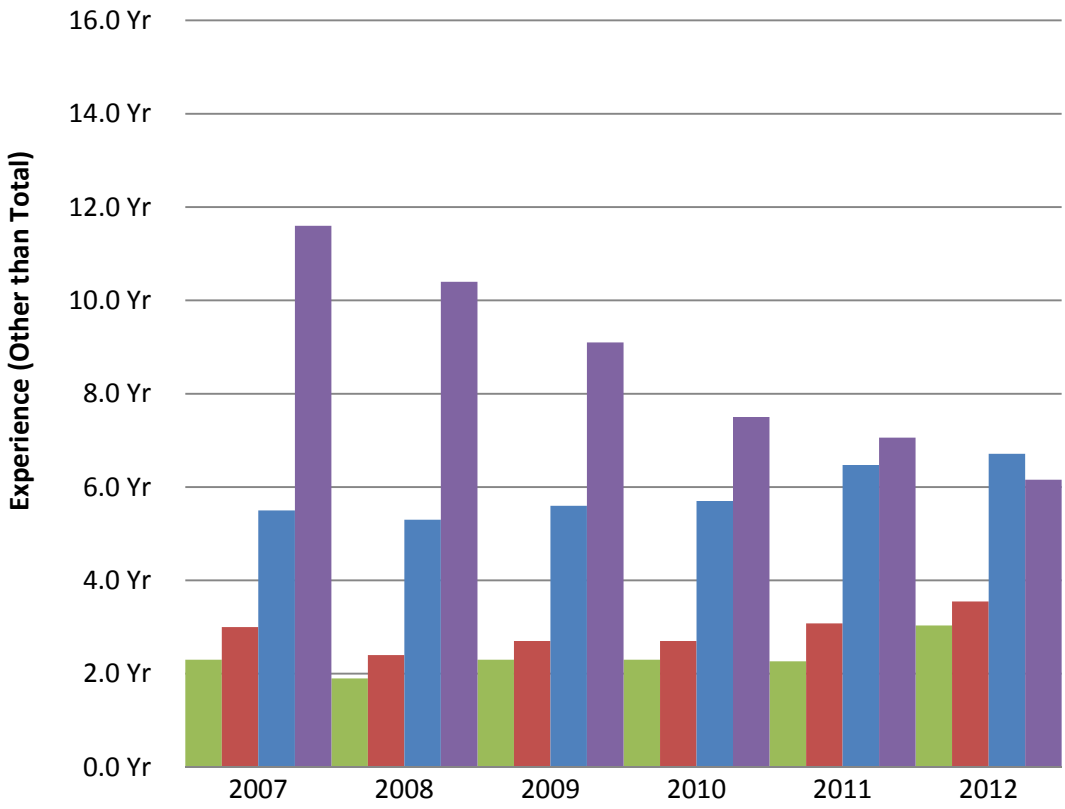
Figure 1a Median Resident Inspector Experience Trend (Metric O-13)



	2007	2008	2009	2010	2011	2012
Current Site Time	1.9 Yr	1.3 Yr	1.8 Yr	2.2 Yr	2.1 Yr	3.0 Yr
Total Resident Time	1.9 Yr	1.3 Yr	1.8 Yr	2.3 Yr	2.4 Yr	3.2 Yr
NRC Time	4.3 Yr	4.5 Yr	5.4 Yr	4.5 Yr	5.3 Yr	6.1 Yr
Relevant Non-NRC Experience	10.4 Yr	9.0 Yr	6.3 Yr	5.3 Yr	4.5 Yr	4.0 Yr

Analysis of Figure 1b, below, similar to Figure 1a, reveals increasing trends in *average* RI current site time, NRC time, and total resident time. However, it also reveals a more dominant declining trend in relevant non-NRC experience – down 47 percent from 11.6 to 6.2 years.

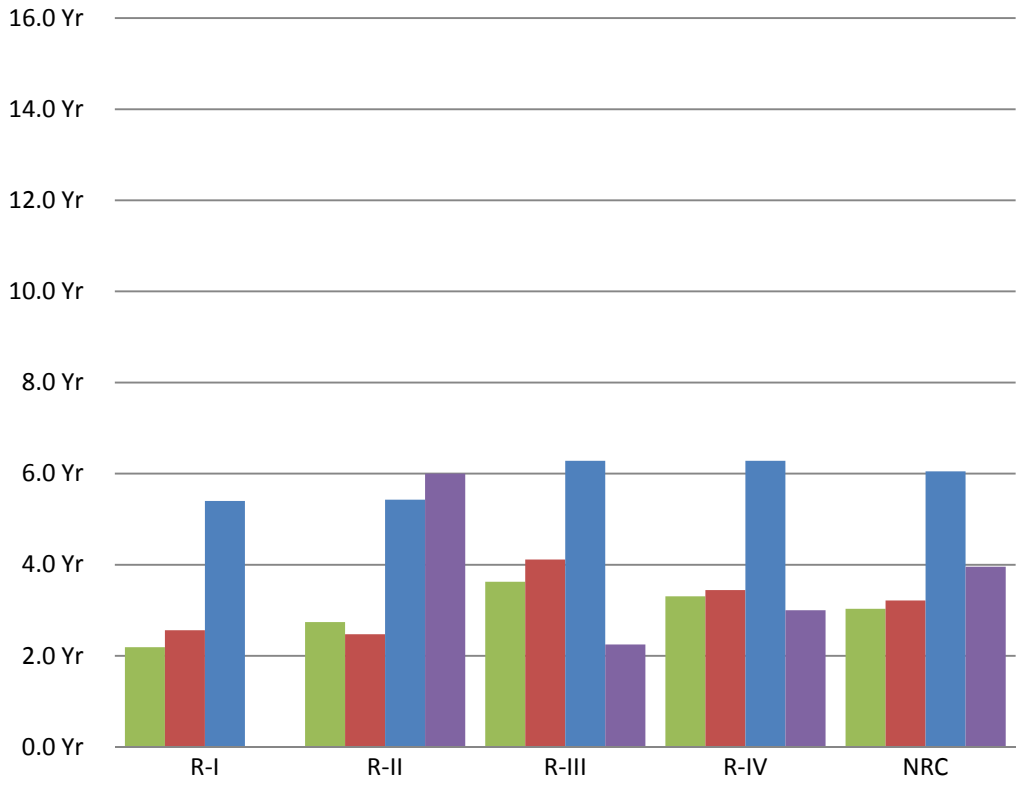
Figure 1b Average Resident Inspector Experience Trend (Metric O-13)



	2007	2008	2009	2010	2011	2012
Current Site Time	2.3 Yr	1.9 Yr	2.3 Yr	2.3 Yr	2.3 Yr	3.0 Yr
Total Resident Time	3.0 Yr	2.4 Yr	2.7 Yr	2.7 Yr	3.1 Yr	3.5 Yr
NRC Time	5.5 Yr	5.3 Yr	5.6 Yr	5.7 Yr	6.5 Yr	6.7 Yr
Relevant Non-NRC Experience	11.6 Yr	10.4 Yr	9.1 Yr	7.5 Yr	7.1 Yr	6.2 Yr

Analysis of Figure 2a, below, explores the variation between 2012 *median* regional RI experience. The analysis reveals the least regional variation in NRC time from 5.4 to 6.3 years compared with the NRC median of 6.1 years, a variance of minus 7 percent to plus 9 percent. The greatest regional variation was in relevant non-NRC experience from 0.0 to 6.0 years compared with the NRC median of 4.0 years, a minus 100 percent to plus 41 percent variance. Regional variations for total resident time and current site time fell between the above extremes.

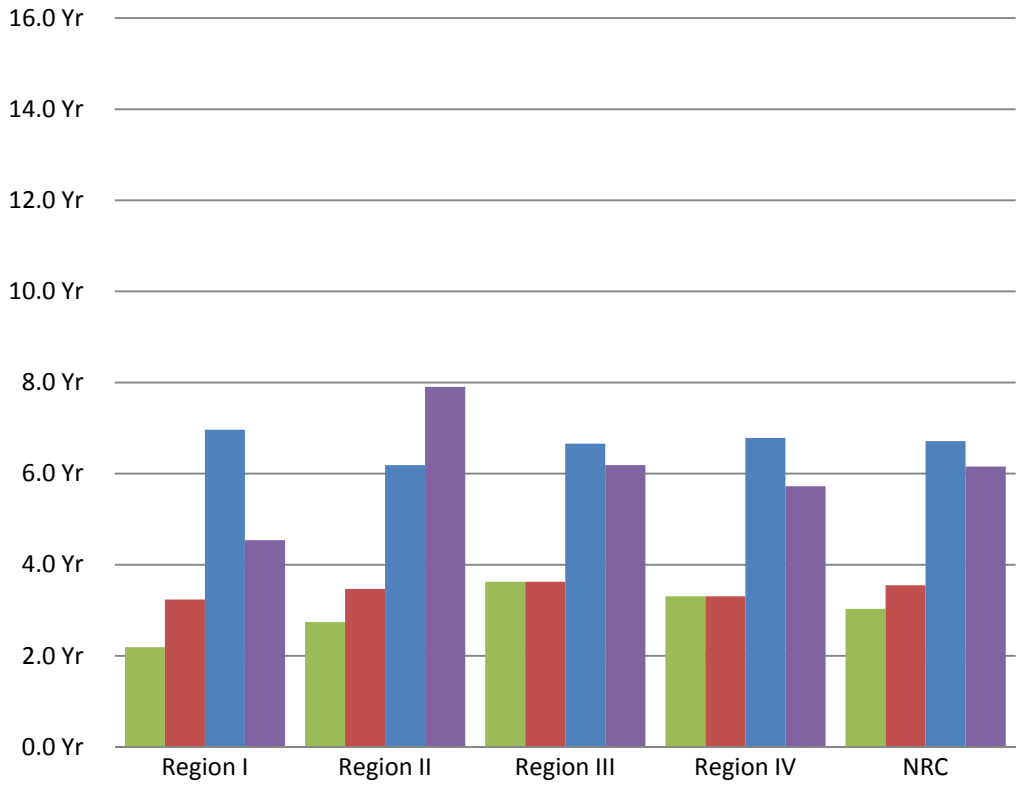
Figure 2a 2012 Median Resident Inspector Experience by Region (Metric O-13)



	R-I	R-II	R-III	R-IV	NRC
Current Site Time	2.2 Yr	2.7 Yr	3.6 Yr	3.3 Yr	3.0 Yr
Total Resident Time	2.6 Yr	2.5 Yr	4.1 Yr	3.4 Yr	3.2 Yr
NRC Time	5.4 Yr	5.4 Yr	6.3 Yr	6.3 Yr	6.1 Yr
Relevant Non-NRC Experience	0.0 Yr	6.0 Yr	2.3 Yr	3.0 Yr	4.0 Yr

Analysis of Figure 2b, below, explores the variation between 2012 *average* regional RI experience. The analysis reveals the least regional variation in total resident time from 3.2 to 3.6 years compared with the NRC average of 3.5 years, a variance of minus 5 percent to plus 6 percent. The greatest regional variation was in relevant non-NRC experience from 4.5 to 7.9 years compared with the NRC average of 6.2 years, a minus 29 percent to plus 24 percent variance.

Figure 2b 2012 Average Resident Inspector Experience by Region (Metric O-13)



	Region I	Region II	Region III	Region IV	NRC
Current Site Time	2.2 Yr	2.7 Yr	3.6 Yr	3.3 Yr	3.0 Yr
Total Resident Time	3.2 Yr	3.5 Yr	3.6 Yr	3.3 Yr	3.5 Yr
NRC Time	7.0 Yr	6.2 Yr	6.7 Yr	6.8 Yr	6.7 Yr
Relevant Non-NRC Experience	4.5 Yr	7.9 Yr	6.2 Yr	5.7 Yr	6.2 Yr

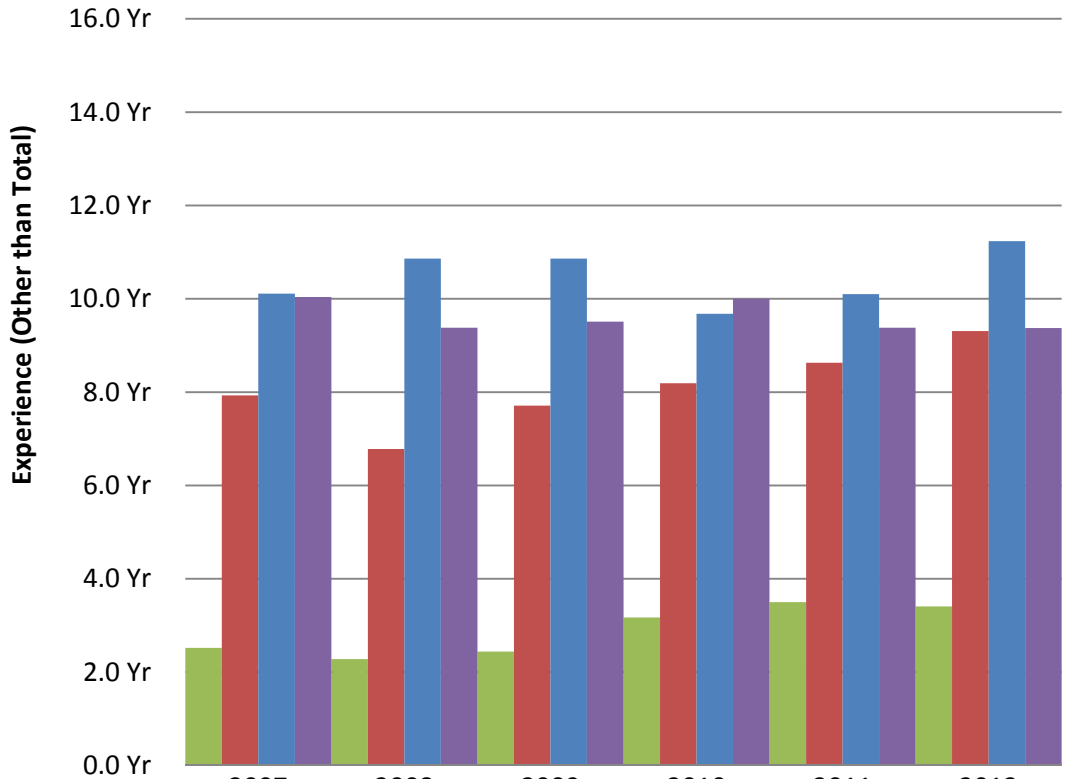
Overall, the RI experience analysis reveals an increasing 2007 to 2012 trend in NRC time, current site time, and total resident time but a declining trend in relevant non-NRC experience. Likewise, the 2012 regional comparison analysis revealed the highest regional variations in relevant non-NRC experience.

Senior Resident Experience Analysis

The following analysis supports IMC 0307 Metric O-13 "Analysis of Resident Inspector Demographics and Experience," a trend-only metric. The following analysis is intended primarily for tracking and trending SRI experience. The results of this analysis are used to make any necessary modifications to the SRI program in order to attract and retain highly qualified inspectors to the program. Conclusions are discussed in Section IV.

Analysis of Figure 3a, below, reveals no notable trends in ***median*** SRI experience. Unlike analysis of Figure 2a, the declining trend in median relevant non-NRC experience has not fully emerged but can be expected to do so in the future as RI's promote to SRI positions.

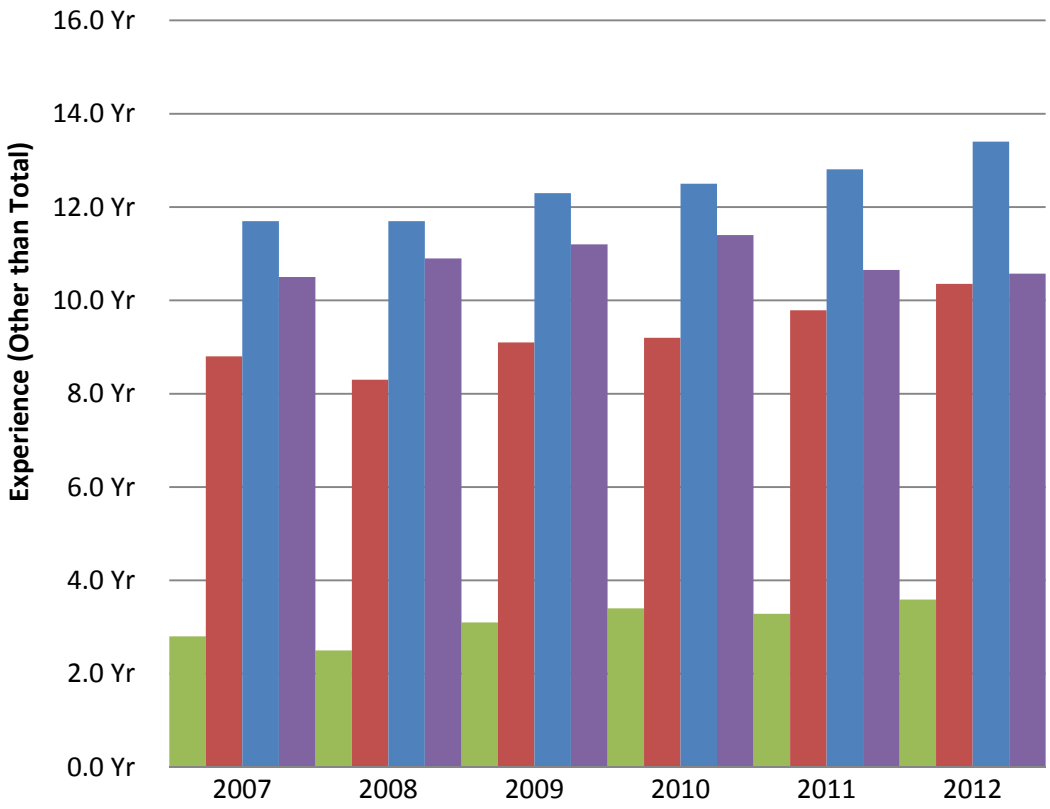
Figure 3a Median Senior Resident Experience Trend (Metric O-13)



	2007	2008	2009	2010	2011	2012
Current Site Time	2.5 Yr	2.3 Yr	2.4 Yr	3.2 Yr	3.5 Yr	3.4 Yr
Total Resident Time	7.9 Yr	6.8 Yr	7.7 Yr	8.2 Yr	8.6 Yr	9.3 Yr
NRC Time	10.1 Yr	10.9 Yr	10.9 Yr	9.7 Yr	10.1 Yr	11.2 Yr
Relevant Non-NRC Experience	10.0 Yr	9.4 Yr	9.5 Yr	10.0 Yr	9.4 Yr	9.4 Yr

Analysis of Figure 3b, below, reveals no notable trends in *average* SRI experience. Unlike analysis of Figure 2b, the declining trend in average relevant non-NRC experience has not emerged but can be expected to do so in the future as RI's promote to SRI positions.

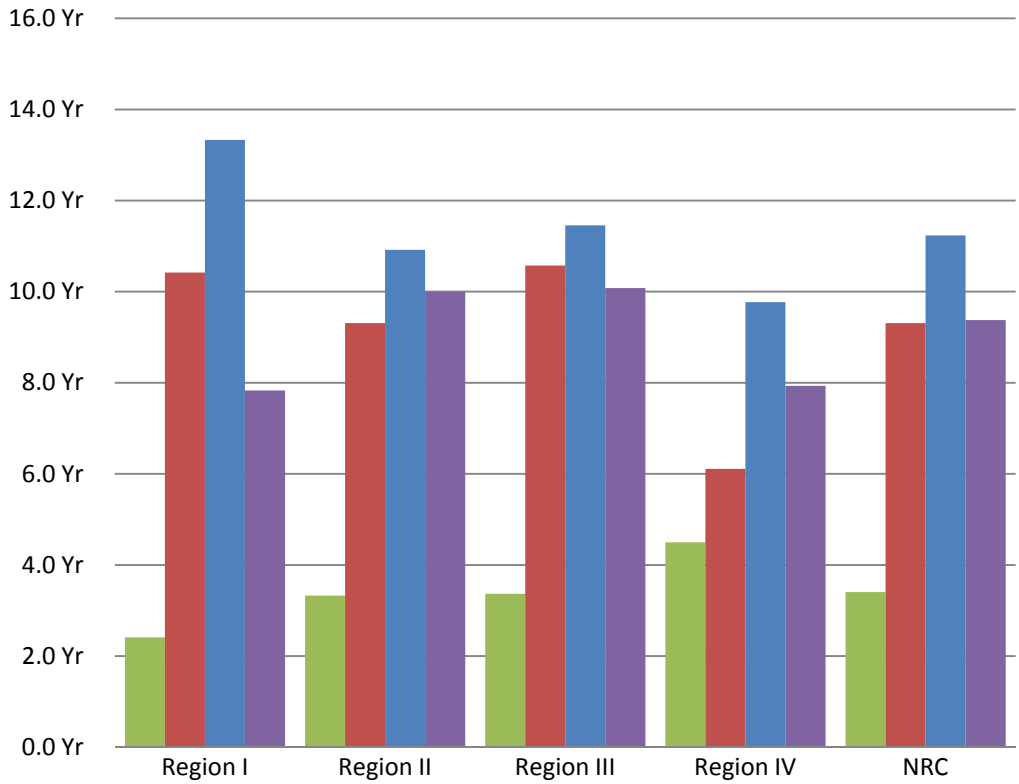
Figure 3b Average Senior Resident Experience Trend (Metric O-13)



	2007	2008	2009	2010	2011	2012
Current Site Time	2.8 Yr	2.5 Yr	3.1 Yr	3.4 Yr	3.3 Yr	3.6 Yr
Total Resident Time	8.8 Yr	8.3 Yr	9.1 Yr	9.2 Yr	9.8 Yr	10.4 Yr
NRC Time	11.7 Yr	11.7 Yr	12.3 Yr	12.5 Yr	12.8 Yr	13.4 Yr
Relevant Non-NRC Experience	10.5 Yr	10.9 Yr	11.2 Yr	11.4 Yr	10.7 Yr	10.6 Yr

Analysis of Figure 4a, below, explores the variation between 2012 *median* regional SRI experience. The analysis reveals the least regional variation in NRC relevant non-NRC experience from 7.8 to 10.1 years, a variance of minus 16 percent to plus 8 percent. The greatest regional variation was in current site time from 2.4 to 4.5 years, a minus 28 percent to plus 34 percent variance.

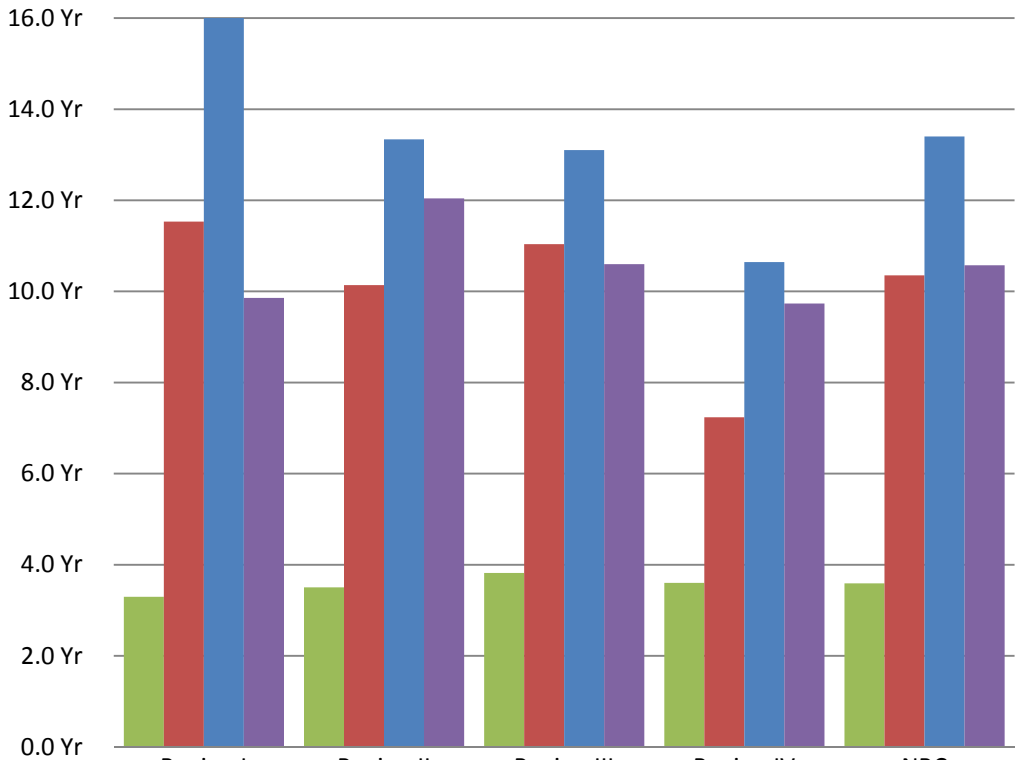
Figure 4a 2012 Median Senior Resident Experience by Region (Metric O-13)



	Region I	Region II	Region III	Region IV	NRC
Current Site Time	2.4 Yr	3.3 Yr	3.4 Yr	4.5 Yr	3.4 Yr
Total Resident Time	10.4 Yr	9.3 Yr	10.6 Yr	6.1 Yr	9.3 Yr
NRC Time	13.3 Yr	10.9 Yr	11.5 Yr	9.8 Yr	11.2 Yr
Relevant Non-NRC Experience	7.8 Yr	10.0 Yr	10.1 Yr	7.9 Yr	9.4 Yr

Analysis of Figure 4b, below, explores the variation between 2012 *average* regional SRI experience. The analysis reveals the least regional variation in relevant non-NRC experience from 9.7 to 12.0 years compared with the NRC average of 10.6 years, a variance of minus 8 percent to plus 14 percent. The greatest regional variation was in total resident time from 7.2 to 11.5 years compared with the NRC average of 10.4 years, a minus 28 percent to plus 14 percent variance.

Figure 4b 2012 Average Senior Resident Experience by Region (Metric O-12)



	Region I	Region II	Region III	Region IV	NRC
Current Site Time	3.3 Yr	3.5 Yr	3.8 Yr	3.6 Yr	3.6 Yr
Total Resident Time	11.5 Yr	10.1 Yr	11.0 Yr	7.2 Yr	10.4 Yr
NRC Time	16.1 Yr	13.3 Yr	13.1 Yr	10.6 Yr	13.4 Yr
Relevant Non-NRC Experience	9.9 Yr	12.0 Yr	10.6 Yr	9.7 Yr	10.6 Yr

Overall, the SRI experience analysis reveals a 2007 to 2012 trend of increasing average and median experience in all areas except relevant non-NRC experience which remained relatively constant.

II. Inspector Turnover

Inspector turnover analysis supports the identification and evaluation of agency actions to manage turnover rates. Seventy-seven RI and 72 SRI positions were examined in the 2012 turnover analysis.

The rate and destinations of RI and SRI turnovers in the resident program are evaluated and trended based on calendar year data. Figures 5 and 6 trend the number and nature of Resident and SRI turnovers, respectively, to each of four departing inspector destinations over the period from 2007 through 2012. Additionally, these plots show the total turnover rate each year as a percentage of the number of RIs or SRIs in the national pool each year.

Outgoing RI destinations include: (1) Resigned, (2) Retired, (3) Moved to non-RI, and (4) Promoted to SRI. Similarly, outgoing SRI destinations include (1) Resigned, (2) Retired, (3) Moved to non-SRI, and (4) Promoted to non-SRI. Inspector turnover analysis is reported at the national level. Departures to destinations not specifically listed in the tables, such as RI and SRI site-to-site transfers, are not reflected as turnovers.

RI-to-RI and SRI-to-SRI site-to-site transfers are not considered to be inspector turnovers because they do not result in a loss to the resident program – only a relocation of assets within the program.

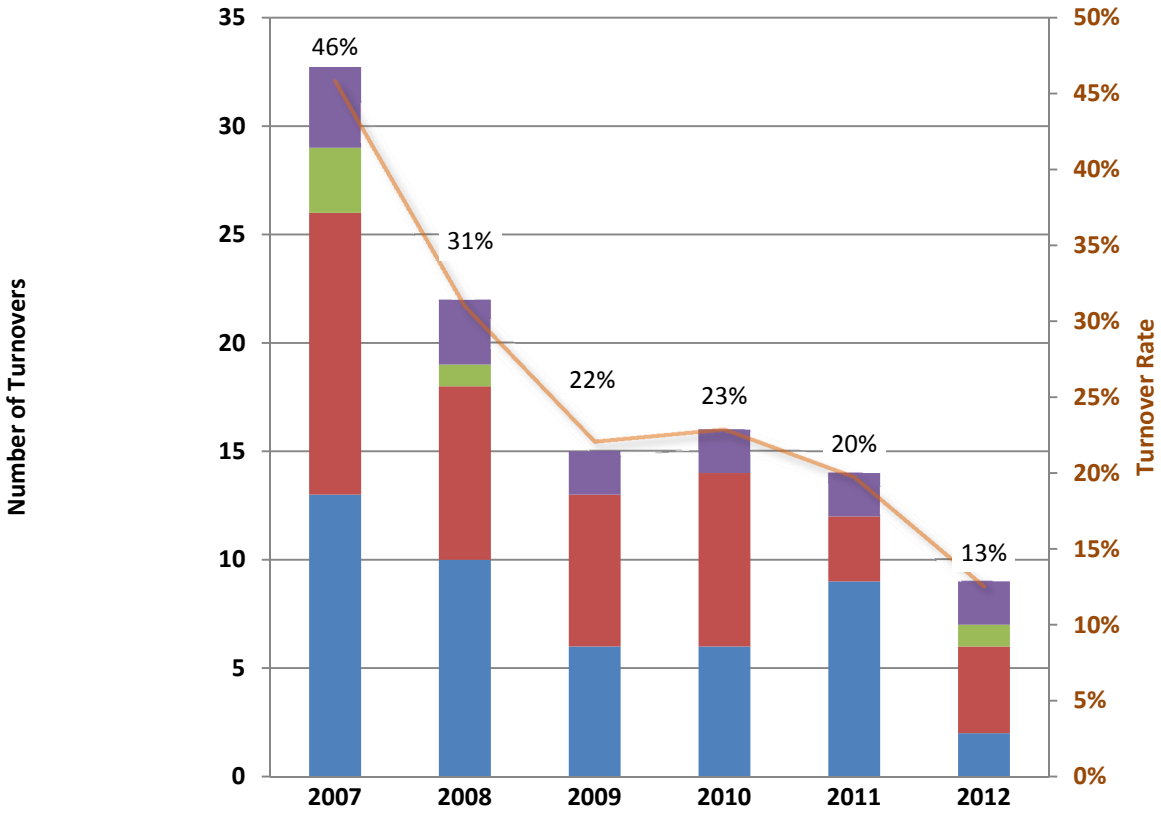
RI Group Turnover Trend

Analysis of Figure 5, below, reveals a declining trend in RI turnover rate from a high of 46 percent in 2007 to a low of 13 percent in 2012 (down from 20 percent in 2011). The turnover rate decline is attributed both to changes in external economic conditions and to NRC initiatives aimed at reducing and stabilizing the turnover rate.

Examination of the RI turnover destination data reveals resignations holding steady at 2, retirements at 1, and movement to non-SRI positions at 4.

The above in connection with a review of the trending and distribution of RI demographic data reflecting current site time, total resident time, and NRC time, shown in Figures 1a, 1b, 2a, and 2b, suggests that RI turnover will continue to stabilize at an acceptable level to support the resident inspector program.

Figure 5 - Resident Inspector Turnover Trend



	2007	2008	2009	2010	2011	2012
Resigned	4	3	2	2	2	2
Retired	3	1	0	0	0	1
Moved to non-RI	13	8	7	8	3	4
Promoted to SRI	13	10	6	6	9	2
Turnover Rate	46%	31%	22%	23%	20%	13%

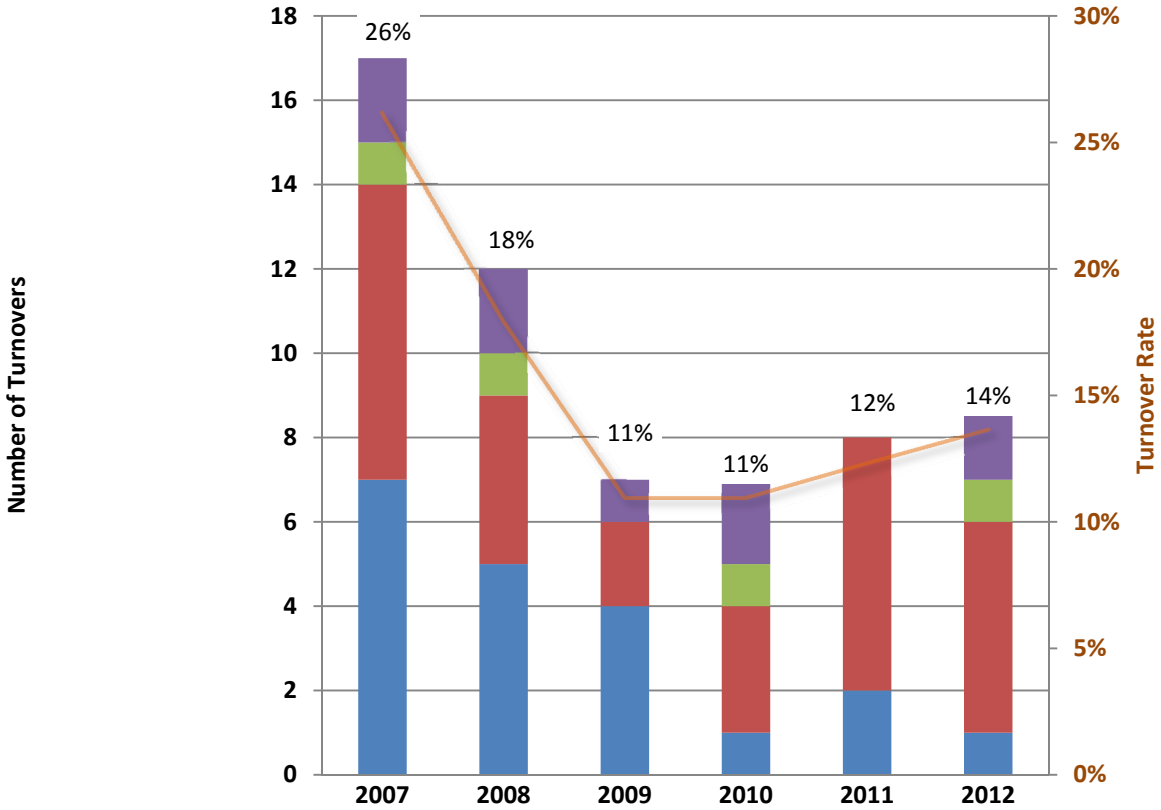
SRI Group Turnover Trend

Analysis of Figure 6, below, reveals both (a) a dominant decline in SRI turnover rate from 26 percent in 2007 to 11 percent in 2009 followed by (b) a relatively gradual 3-year trend of increasing SRI turnover rate, from 11 percent in 2010 to 14 percent in 2012.

Examination of the SRI turnover destination data reveals resignations at 2, retirements at 1, movement to non-SRI positions at 5, and promotion to non-SRI at 1.

The more gradual trend from 2010 through 2012 in connection with a review of the trending and distribution of SRI demographic data reflecting current site time, total resident time, and NRC time, shown in Figures 3a, 3b, 4a, and 4b, suggest that SRI turnover will continue to stabilize at an acceptable level to support the resident inspector program.

Figure 6 - Senior Resident Turnover Trend



	2007	2008	2009	2010	2011	2012
Resigned	2	2	1	2	0	2
Retired	1	1	0	1	0	1
Moved to non-SRI	7	4	2	3	6	5
Promoted to non-SRI	7	5	4	1	2	1
Turnover Rate	26%	18%	11%	11%	12%	14%

Over the period from 2007 to 2012, both the RI and SRI turnover rates have been significantly reduced and have begun to stabilize. These turnover rate reductions and improved stability are attributed both to changes in external economic conditions and to NRC initiatives aimed at

reducing and stabilizing resident inspector program turnover rates. This, combined with review of the trending and distribution of demographic experience data reflecting current RI and SRI site time, total resident time, and NRC time, suggests that turnover rates will continue to stabilize at an acceptable level to support the resident inspector program.

III. Permanent Site Staffing

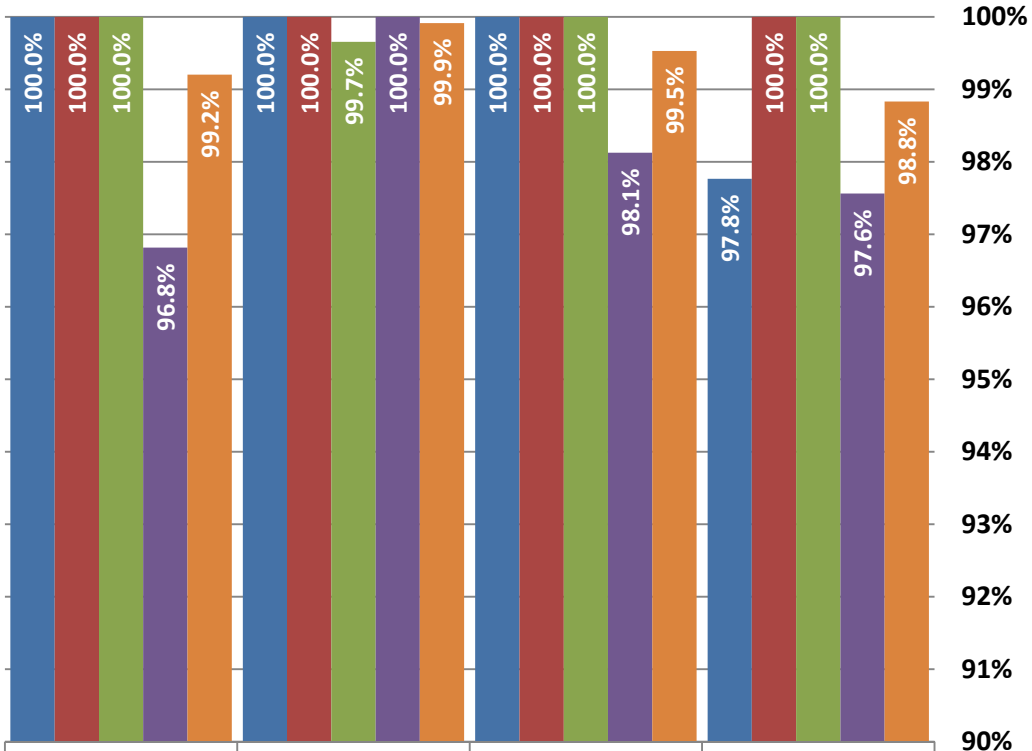
Permanent[1] site staffing analysis supports IMC 0307 Metric O-14 "Analysis of Site Staffing," to measure the permanent inspector staffing levels at each of the reactor sites for both RIs and SRIs in order to evaluate the agency's ability to provide continuity of regulatory oversight in response to DBLLTF recommendation 3.3.5.3 that staff establish a measurement for RI / SRI staffing, including program expectations to satisfy minimum staffing levels.

Permanent inspector staffing levels at each reactor site were analyzed for both RIs and SRIs. Only those inspectors who have attained at least a basic inspector certification status, as defined in Appendix A, "Basic-Level Training and Qualification Journal," to IMC 1245, "Qualification Program for Operating Reactor Programs," dated December 19, 2012, are counted. The data reflect the number of days a qualified RI and SRI were permanently assigned to the site divided by the number of days in the period. In accordance with the metric criterion in Appendix A to IMC 0307, any site that falls below 90 percent is individually evaluated. Reasons for any meaningful increase or decrease in the inspector staffing level are provided. IMC 0307 provides further details on the site staffing goal.

[1] Permanent in this context refers to inspectors assigned to the site permanently or through a rotation with a minimum duration of 6 weeks. Sites where permanently assigned RIs or SRIs are away from the site for a continuous period longer than 6 weeks will be considered gapped unless the positions are filled through a rotation with a minimum duration of 6 weeks. Away periods for training, meetings, team inspections, leave, or other temporary duties are not counted against the goal unless the absence exceeds 6 continuous weeks.

Analysis of the data summarized in Figure 7, below, confirms that all regions exceeded the 90 percent criteria with a national annual average of 99.4 percent for 2012. This reflects an improvement over 2011 in which the national annual average was 98.5 percent. In 2012, national quarterly averages ranged from 98.8 to 99.9 percent while regional quarterly averages ranged from 96.8 percent to 100 percent.

Figure 7 - 2012 Resident Program Permanent Site Staffing Levels



	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Region I	100.0%	100.0%	100.0%	97.8%
Region II	100.0%	100.0%	100.0%	100.0%
Region III	100.0%	99.7%	100.0%	100.0%
Region IV	96.8%	100.0%	98.1%	97.6%
National	99.2%	99.9%	99.5%	98.8%

Analysis of the data summarized in Table 1, below, reveals that, in 2012, for the first time in the trending period, all sites exceeded the 90 percent permanent annual site staffing metric criteria.

Table 1 Individual Permanent Site Staffing Performance Trend

Instances of Annual Site-Specific Staffing < 90 percent	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*
Number of Sites with < 90 percent site staffing	9	5	5	3	3	0

IV. Conclusions and Recommendations

Section I – Inspector Experience Conclusions

- During the period from 2007 through 2012, 3 of 4 inspector experience trends were stable or improving.
    - RI total resident time, current site time, and NRC time all trended moderately upward in both median and average whereas relevant non-NRC experience trended downward. It should be noted that the 2012 average NRC time of 6.7 years and total resident time of 3.5 years represent significant regulatory and inspection experience and provide assurance that the declining relevant non-NRC experience is not a significant concern.
    - SRI experience trending and regional variances were not noteworthy.
    - The dominant declining trend and high degree of regional variance observed in relevant non-NRC RI experience have not yet emerged in the SRI demographic data but can be expected to do so in the future as RI's promote to SRI positions.
- In 2012, regional variations in 3 of 4 inspector experience metrics were minimal.
    - Regional variations in both median and average RI total resident time, current site time, and NRC time were relatively low.
    - Regional variations in *average* RI relevant non-NRC experience, in contrast to the variations above, were relatively high.
    - Regional variations in *median* RI relevant non-NRC experience were strikingly high, ranging from 0.0 to 6.0 years. This reflects that at least half of one region's RI's possessed no relevant non-NRC experience.
    - Regional variations in SRI experience were relatively low in both median and average across all four experience parameters.
    - Regional variations in SRI relevant non-NRC experience had not yet begun to reflect higher variations observed in RI non-NRC experience but are expected to trend upward in the future as RI's promote to SRI positions.

The downward trend in RI relevant non-NRC experience is attributed to a focus on the hiring, training, and assignment of inspectors directly from college with no relevant non-NRC experience. As these inspectors enter and remain in the resident program, it is not unexpected that a declining trend in the non-NRC experience will occur.

Based on the evaluation of ROP performance, the declining trend and high regional variability in RI relevant non-NRC experience have not adversely impacted ROP effectiveness.

Section II – Inspector Turnover Conclusions

- Over the period from 2007 to 2012, both the RI and SRI turnover rates have been significantly reduced and have begun to stabilize.

- Turnover rate reductions and improved stability are attributed both to changes in external economic conditions and to NRC initiatives aimed at reducing and stabilizing resident inspector program turnover rates.

- The above, combined with review of the trending and distribution of demographic experience data reflecting current RI and SRI site time, total resident time, and NRC time, suggests that turnover rates will continue to stabilize at an acceptable level to support the resident inspector program.

Sections III – Permanent Site Staffing Conclusions

- During the period from 2007 through 2012, inspector permanent site staffing trends were stable or improving.

    - Permanent Site Staffing remains stable and well above the 90 percent staffing goal.

    - In 2012, no individual site documented annual permanent site staffing levels below 90 percent - the first time this has occurred during the 2007-2012 trending period.

Recommendations

Staff recommends not making any further changes to the RI program at this time. However, NRR and the regions will continue to monitor inspector experience, inspector turnover, and permanent site staffing demographics in 2013.