

July 28, 1998

FOR: The Commissioners  
 FROM: L. Joseph Callan /s/ Executive Director for Operations  
 SUBJECT: SUBMITTAL AND ANALYSIS OF REVISED RESIDENT INSPECTOR DEMOGRAPHIC DATA

PURPOSE:

This paper presents the revised resident inspector (RI) demographic data and analysis as requested by the Commission in a staff requirements memorandum (SRM) dated April 8, 1998.

BACKGROUND:

SECY-97-285, "Discussion of Resident Inspector Demographics and the Balance Between Expertise and Objectivity," was submitted to the Commission on December 10, 1997, in response to an SRM dated March 25, 1997. The staff found that a comparison of the demographic data from April 1994 and November 1997 indicated that the average experience level for the RI staff was less in 1997 than it had been in 1994. In addition, the attrition rates from the RI Program had increased in each of the previous 4 years. The staff indicated its intention to undertake a comprehensive management review of the RI Program and to develop a Commission paper that would address issues and recommendations associated with the RI Program.

SRM COMGJD-98-001/COMEXM-98-002, dated April 8, 1998, directed the staff to take several actions with respect to RI demographics. These actions included (1) revise and resubmit the demographic data (to include both the median and average values for resident time, site time, NRC experience, qualified resident time, and relevant non-NRC experience, sorted by each region and all regions combined) and provide a trend analysis of relevant new-hire experience covering the last 5 years; (2) provide recommendations to address the high attrition rate of inspectors from the RI Program on an expedited basis (by June 30, 1998), track the reasons inspectors are leaving the RI Program, and consider the significant process changes expected following completion of the Integrated Review of the NRC Assessment Processes, the Regional Division of Reactor Projects Job Task Analysis, and the results of the Office of the Inspector General's Safety Culture and Climate Survey; and (3) provide annual updates of the demographics data and any recommendations warranted by the updated data.

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SECY-98-152, "Summary of Issues and Recommended Improvements to the Resident Inspector Program," was submitted to the Commission on June 29, 1998. SECY-98-152 presented the staff's approach to addressing recommended improvements to the RI Program as committed to in SECY-97-285 and as specifically requested by the Commission in paragraph two of the April 8 SRM. This paper presents the revised resident demographic data as requested by paragraph one of the April 8 SRM. As noted in SECY-98-152, the first of the annual updates will be provided to the Commission in a separate paper by November 30, 1999. The first annual update will include demographic data through the end of Fiscal Year (FY) 1999, as well as any recommendations warranted by the updated data.

DISCUSSION:

**Revised Resident Demographic Data**

The staff reformatted the RI demographic data as requested by the April 8 SRM to include both the median and average values for NRC time, resident time, site time, qualified resident time, and relevant non-NRC experience, sorted by each region and all regions combined (see Attachment 1). The raw data on which the statistical analysis is based are also included with this paper as requested by the April 8 SRM (see Attachment 2). The data are further sorted by RI and Senior Resident Inspector (SRI). The two time periods used for this statistical comparison are April 1994 and November 1997, consistent with the resident experience level comparison in SECY-97-285. The revised data are summarized in Table 1 below.

Table 1 - Summary of RI Experience Levels (in Years)

			April 1994	November 1997	Percent change
RIs -	NRC time	- average	5.55	5.08	- 8.5%
		- median	4.79	6.01	+ 25.5%
	Total resident time	- average	3.29	2.66	- 19.2%
		- median	2.64	1.51	- 42.8%
	Current site time	- average	1.86	1.35	- 27.4%
		- median	1.57	1.01	- 35.7%
	Qualified resident time	- average	2.38	1.76	- 26.1%

		- median	1.68	0.61	- 63.7%
	Relevant non-NRC experience	- average	5.83	6.60	+ 13.2%
		- median	5.33	6.17	+ 15.8%
SRI's -	NRC time	- average	10.46	9.93	- 5.1%
		- median	9.78	9.80	+ 0.2%
	Total resident time	- average	7.59	6.93	- 8.7%
		- median	7.81	6.22	- 20.4%
	Current site time	- average	2.38	2.11	- 11.3%
		- median	2.18	1.97	- 9.6%
	Qualified resident time	- average	5.62	6.03	+ 7.3%
		- median	5.43	5.45	+ 0.4%
	Relevant non-NRC experience	- average	6.87	5.30	- 22.9%
		- median	5.92	4.17	- 29.6%

Consistent with SECY-97-285, "NRC time" refers to total years as an NRC employee, "total resident time" refers to total years in the RI program, and "current site time" refers to total years as a resident at the current site. The values for these experience measures, however, are slightly different from those presented in SECY-97-285. The differences are due to the inclusion of individuals on temporary assignments to the RI Program in the SECY-97-285 study which have been removed from the data set for this study, which is more appropriately characteristic of the demographics of the RI staff. "Qualified resident time" and "relevant non-NRC experience" are new experience measures as defined in their respective discussion sections below. The values for these two new measures are based on data available for current NRC employees only; "not available" is noted in the raw data in Attachment 2 for those ex-residents who have left the agency and whose personnel and training records are not readily available. Those individuals whose data were "not available" were not included in the average and median value calculations for those experience measures. The Office of Human Resources began tracking these two new experience measures at the start of FY 1998, so future annual reports to the Commission on the demographics and status of the RI Program should include a complete set of data.

#### Comparison of Median Versus Average Values

The "average" (or "mean") value is the sum of the individual values divided by the total number of data points in the distribution. The "median" value is the middle value in the distribution, above and below which lie an equal number of values. As expected, determining the median for each of the experience measures provided different values from those obtained when calculating the average. The median values for the RIs indicated a greater variation when compared to the average values and when compared to the percent change between the April 1994 and the November 1997 data, while the median values for the SRI's were more comparable to the average values. Since the RI position is the normal entry point into the RI Program, its corresponding median values showed the largest fluctuation, particularly for total resident time and qualified resident time for November 1997 data as discussed below.

#### Comparison of Qualified Resident Time Versus Total Resident and Current Site Time

"Qualified resident time" is a subset of resident time, including only the time spent in the RI Program after completing the resident/operations inspector qualification requirements of NRC Inspection Manual Chapter (IMC) 1245, "Inspector Qualification Program for the Office of Nuclear Reactor Regulation Inspection Program." This calculation assumes that the RI staff members remain "qualified" continuously after their initial IMC 1245 qualification. This calculation does not include "interim qualification," which new RIs typically receive to conduct independent inspections in specified areas before all requirements in the qualification journal have been completed.

The percentage of total resident time consisting of qualified time for SRI's was 87 percent in November 1997, compared to 74 percent in April 1994. For RIs, however, the percentage of qualified time was less in November 1997 (66 percent) than it had been in April 1994 (73 percent). This drop in percentage of qualified time for RIs can be attributed to the fact that the demand to fill RI vacancies exceeded the ability to provide a supply of candidates fully qualified in accordance with IMC 1245 due to the increased resident attrition in recent years. As a result, more candidates have been selected for RI positions before they complete the IMC 1245 program certification process, and they must then complete their inspector qualification while serving as an RI. The staff expects the percentage of qualified time to rise as these recent new hires complete their IMC 1245 qualification requirements.

#### Regional Comparison

As requested by the April 8 SRM, the data in the attachments are presented by each region and all regions combined. Although the statistical distribution varied between regions, the average values for each of the experience measures were fairly consistent. Some outliers include the higher NRC time of Region II RIs in April 1994, the lower total resident time of Region IV RIs in April 1994, and the greater relevant non-NRC experience of Region III RIs in April 1994, although the November 1997 data indicate that these values are more similar to the rest of the regions. In fact, the variance between regions for each of the experience measures is smaller in November 1997 than it had been in April 1994.

#### Trend Analysis of Relevant New-Hire Experience

"Relevant non-NRC experience" is defined as experience acquired before joining the NRC that is considered relevant to the production of nuclear power. Typical examples of relevant non-NRC experience would include operations, engineering, maintenance, or construction experience with commercial nuclear power plants, the Naval shipyards, Department of Energy facilities, and/or the Navy nuclear program. Although the data in Table 1 indicate that the relevant non-NRC experience for SRIs is less in November 1997 than it had been in April 1994, it is important to note that SRI positions are not typically filled with new hires. On the contrary, SRI positions are typically filled with IMC 1245 qualified inspectors with significant NRC inspection experience, who have often previously served as RIs. More importantly, Table 1 indicates that RIs have more non-NRC experience relevant to the production of nuclear power in November 1997 than they had in April 1994.

Attachment 3 presents the relevant non-NRC experience of new hires entering the RI Program in each of the last 5 years. These data indicate that the individuals hired to fill the larger number of vacancies over the past few years have significant nuclear experience. In fact, the average relevant non-NRC experience of new hires has increased significantly over the past several years, from 3.31 years in FY 1994 to 11.92 years in FY 1998. The majority of the relevant experience of new hires has been gained directly from the commercial nuclear industry. Although the recent new hires have often been assigned to sites before completing their formal IMC 1245 inspector qualification and with little or no NRC experience, the staff believes that these individuals bring a great deal of valuable non-NRC experience, as well as a fresh perspective, to the NRC RI Program.

## **Conclusions**

The revised demographic data presented in this paper are consistent with the findings of SECY-97-285 in that the experience level for RI staff is less than it had been in the past. Although the qualified resident time for RIs showed a large drop between 1994 and 1997, the relevant non-NRC experience showed a significant increase. The staff believes that the data presented in this paper further support the recommended RI Program improvements presented to the Commission in SECY-98-152. The staff has no additional recommendations at this time as a result of the revised demographic data. The staff will continue to monitor RI demographics and will provide the first annual update of the demographic data and any recommendations warranted by the updated data to the Commission by November 30, 1999.

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Attachments: As stated