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FOIA/PA REQUEST

Case No.: 2012-0307  
Date Rec'd: 8/22/12  
Specialist: Kilgore  
Related Case: 2012-0162

**August 21, 2012**

**FREEDOM OF INFORMATION ACT (FOIA) REQUEST**

NRC Freedom of Information Act and Privacy Act (FOIA/PA) Officer  
U.S. Nuclear Regulatory Commission  
Mail Stop T-5 F09  
Washington, DC 20555-0001

[emailed to [FOIA.resource@nrc.gov](mailto:FOIA.resource@nrc.gov) on August 21, 2012]

To Whom It May Concern:

This is a follow-up to a previous FOIA [FOIA/PA-2012-00162] submitted to the NRC on March 5, 2012. This request was only partially fulfilled, as the data returned in response to that FOIA was only broken down by career length (Appendix A), and not by year as clearly requested in the March FOIA (Appendix B).

Therefore, in this new request, we ask that the data compiled in the table in Appendix A<sup>1</sup> be presented **by calendar year from 1977 through 2009**. This would result in a total of **33 tables** identical to the table in Appendix A, for each year from 1977 to 2009. This is in line with what was discussed in a conference call with REIRS representatives and NRC officials on March 14, 2012. During that call, the REIRS officials (who presumably compiled the data in Appendix A) clearly stated that the data would also be presented by calendar year, yet failed to do so as evidenced by Appendix A.

As it has now been almost eight months since we first attempted to obtain these data, we look forward to a prompt response to this final request.

Thank you,

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<sup>1</sup> 1- Distribution of whole body lifetime radiation doses, broken down by career length, 2- Average Career Length for Individuals with Measurable Career Exposure, 3- Average Career Dose for Individuals with Measurable Dose, 4- Average Career Length for Individuals with Measurable Career Exposure and Career Lengths of at Least One Year, and 5- Average Career Dose for Individuals with Measurable Dose with career lengths of at least one year.

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# Appendix A: Data made public in response to FOIA/PA-2012-00162

**Table 5.7**  
**Career External Dose (DDE) Distribution By Dose and Career Length At Reactor Facilities**  
**1977 - 2009**

Career Length	Number of Persons in Dose Range (rems)														Grand Total	
	No Meas.	.001 - .1	.1 - .5	.5 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 50		>50
<=30 days	154,598	27,605	9,447	2,747	3,187	1,104	63	7	3	-	-	-	-	1	-	198,76
31 days - 6 mos	71,360	41,202	25,839	8,815	7,029	2,488	1,183	304	48	3	2	-	-	-	-	158,27
6 mos - 1 yr	31,985	17,494	10,214	3,278	2,590	1,246	678	306	249	4	-	-	-	-	-	68,04
1 - 2 yrs	25,478	16,890	11,492	4,604	3,810	1,722	984	594	730	29	2	1	-	-	-	66,33
2 - 3 yrs	14,338	10,865	8,164	3,479	3,137	1,585	849	559	934	100	8	1	-	-	-	44,01
3 - 4 yrs	9,022	7,843	6,248	3,036	2,778	1,359	766	476	896	173	32	3	1	-	-	32,61
4 - 5 yrs	8,346	5,909	4,909	2,495	2,399	1,285	764	470	916	194	37	14	3	-	-	25,74
5 - 10 yrs	16,126	17,919	15,195	8,016	8,555	4,841	3,027	2,051	4,449	1,209	398	131	48	23	2	81,98
10 - 15 yrs	6,580	9,309	8,499	4,560	5,227	3,220	2,195	1,606	3,914	1,317	541	241	108	88	8	47,41
15 - 20 yrs	3,004	5,311	5,218	2,823	3,257	2,124	1,536	1,149	3,237	1,304	533	311	174	166	7	30,15
20 - 25 yrs	1,319	2,972	3,179	1,752	2,050	1,405	993	792	2,317	1,154	546	323	192	230	35	19,25
25 - 30 yrs	399	1,151	1,548	872	1,024	732	613	449	1,421	728	441	243	137	197	32	9,98
30 - 35 yrs	114	308	452	284	368	254	180	168	495	277	181	112	81	116	20	3,41
> 35 yrs	19	34	58	42	47	33	22	18	71	51	28	25	10	29	8	49
<b>Grand Total</b>	<b>340,668</b>	<b>164,812</b>	<b>110,452</b>	<b>46,802</b>	<b>45,457</b>	<b>23,398</b>	<b>13,853</b>	<b>8,949</b>	<b>19,680</b>	<b>6,543</b>	<b>2,749</b>	<b>1,405</b>	<b>754</b>	<b>850</b>	<b>110</b>	<b>786,48</b>

Average Career Length for Individuals with Measurable Career Exposure: 5.75 yrs  
 Average Career Dose for Individuals with Measurable Dose (631,178 rem / 445,814 persons): 1.42 rem

Average Career Length for Individuals with Measurable Career Exposure and Careers Lengths of at Least One Year: 9.1 yrs  
 Average Career Dose for Individuals with Measurable Dose with career length of at least one year (565,671 rem / 278,679 persons): 2.03 rem

\_\_\_\_\_ Roughly the values where individuals averaged 5 rem/yr during their career  
 \_\_\_\_\_ Roughly the values where individuals averaged 2 rem/yr during their career

Only individuals that ended monitoring after 1977 but before 2010 are included in this analysis.

**Appendix B: FOIA/PA-2012-00162 submitted March 5, 2012** [Note incorrect previous FOIA referenced below in the first sentence that reads: "This is a clarification of a previous FOIA [2012-0101]..." The sentence should read: "This is a clarification of a previous FOIA [2012-0102]..."



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[emailed to [FOIA.resource@nrc.gov](mailto:FOIA.resource@nrc.gov) on March 5, 2012]

To Whom It May Concern:

This is a clarification of a previous FOIA [2012-0101] submitted to the NRC on Dec. 29, 2011. In your initial response dated Jan. 25, 2012, you returned a list of annual NRC reports going back to 1985. Note that we are asking for lifetime exposure data, not annual exposure data that is already available in the annual reports. The only annual data we are requesting (category "c" below) is for pregnant workers not already in the annual reports.

In 1994, the Nuclear Regulatory Commission (NRC) removed the requirement that nuclear power plants under its jurisdiction submit "termination reports" that documented an employee's lifetime radiation exposure for entry into the NRC REIRS database:

"Under the previous requirements of 10 CFR Part 20.1 through 20.602, seven classes of licensees were required to submit termination reports containing occupational radiation exposure data for the entire period of work or employment to the NRC when individuals terminated employment or a work assignment at their facilities. Thus, at the end of a worker's employment, the individual's entire exposure record would be part of NRC's exposure database. In addition, these licensees were required to submit a statistical summary of the exposures of all individuals occupationally exposed at their facilities.

Under the new requirements of 10 CFR 20.1001 through 20.2402, which became mandatory on January 1, 1994, these licensees are now required to annually submit occupational radiation exposure data to the NRC for all persons occupationally exposed at their facilities, during that year, for whom monitoring is required. **Termination reports are no longer required (emphasis added).**"<sup>1</sup>

In addition, in 2007, the NRC revoked its requirement that nuclear power plants attempt to obtain lifetime occupational radiation exposure histories on most of their workers (Federal Register, Vol 72, No. 232):

<sup>1</sup> Nuclear Regulatory Commission, NRC Generic Letter 94-04: Voluntary reporting of additional occupational radiation exposure data, September 2, 1994. Accessed December 29, 2011 <http://www.nrc.gov/reading-rm/doc-collections/gen-comm/gen-letters/1994/g194004.html>

“...this rule removes the requirement that licensees attempt to obtain cumulative exposure records for workers unless these individuals are being authorized to receive a planned special exposure.”<sup>2</sup>

As a result, no NRC annual report going back to 1995 (the earliest publicly available report on the NRC website) presents lifetime exposure data for power plant employees.

The harmful health effects, mainly cancer, from low-dose radiation exposure are incurred over a lifetime in a dose-response fashion. It is extremely concerning, therefore, that the NRC does not collect, or even require employers to collect, data on lifetime radiation exposure to ensure that no, or as few as possible, workers are being exposed to excessive health risks over their working life. The NRC acknowledged the importance of such lifetime exposure data in a notice<sup>3</sup> related to the 1994 rule change that began requiring annual exposure reporting, instead of (not in addition to) lifetime reports.

We, therefore, submit this FOIA request for aggregate data on lifetime occupational ionizing radiation exposure for workers at nuclear power plants under the NRC's jurisdiction that were sent to the NRC before 1994 in the form of “termination reports” (required under 10 CFR Part 20.1 through 20.602), and after 1994 through analyses of existing Form 4 records in the REIRS database.

Specifically, we request, by calendar year and individual nuclear facility, and for both terminated and current nuclear power plant employees:

- a) mean and median individual lifetime doses of whole body, and organ-specific, radiation (in rems);
- b) a distribution of individual lifetime radiation doses (whole body and organ-specific), with the number of workers exposed in each radiation dose category, similar to that provided in the NRC annual reports for annual exposures (see as an example Table 4.4 in the 2009 report below)<sup>4</sup>; and
- c) the distribution of individual annual and lifetime radiation doses (whole body and organ-specific) for pregnant workers.

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<sup>2</sup> Nuclear Regulatory Commission 10 CFR Parts 19, 20, and 50 RIN 3150-AH40. Occupational Dose Records, Labeling Containers, and the Total Effective Dose Equivalent. Action: Final rule.

<sup>3</sup> Nuclear Regulatory Commission. NRC Generic Letter 94-04: Voluntary reporting of additional occupational radiation exposure data. September 2, 1994. The notice states that incomplete lifetime exposure records would have the following consequences: “First, NRC would not be able to continue to provide complete exposure histories to individuals to facilitate the movement of transient workers from one licensee to another. Second, actual lifetime exposures could not be determined for the occupationally exposed workers in the seven categories of licensees. Without this information, NRC may have difficulty in evaluating whether further limitations on occupational doses are needed to achieve dose levels recommended by the ICRP.” Accessed December 29, 2011. <http://www.nrc.gov/reading-mv/doc-collections/gen-comm/gen-letters/1994/g194004.html>

<sup>4</sup> NRC. Occupational Radiation Exposure at Commercial Nuclear Power Reactors and Other Facilities 2009. Table 4.4. Accessed on October 5, 2011. <http://www.reirs.com/nureg2009/nureg2009.pdf>

**TABLE 4-4**  
Summary Distribution of Annual Whole Body Doses at Commercial Light Water Reactors  
(1984-2009)

Year	No. Mean Annual Employees	Minimum Number of REIRs	Number of Employees with Whole Body Doses at the Following Levels																	Total Number of Employees	Annual Mean Whole Body Exposure	Cumulative Mean Whole Body Exposure
			0.10-0.25	0.25-0.50	0.50-1.00	1.00-1.50	1.50-2.00	2.00-2.50	2.50-3.00	3.00-4.00	4.00-5.00	5.00-6.00	6.00-7.00	7.00-8.00	8.00-9.00	9.00-10.00	10.00-12.00	12.00-15.00				
1984	38,196	36,529	28,673	34,296	3,600	3,600	3,273	276	6									366,298	23,152	27,924,928		
1985	41,192	39,171	26,746	31,379	3,891	3,938	3,272	175	5									389,528	21,176	27,674,908		
1986	38,197	36,828	18,965	14,201	4,978	2,884	2,282	58										362,006	24,448	28,824,026		
1987	39,763	41,150	19,663	13,358	3,384	2,145	1,871	15	1									388,916	24,473	27,124,026		
1988	37,090	37,073	17,189	10,467	3,920	1,860	1,129	26										340,493	23,881	23,129,988		
1989	34,827	35,666	18,063	12,964	3,954	1,920	1,187	24	2									352,287	25,420	23,664,271		
1990	33,793	33,381	17,868	10,150	3,828	1,975	978	23										342,861	22,308	22,467,882		
1991	33,226	37,881	18,008	9,751	3,800	1,650	1,171	23										349,726	23,570	23,008,616		
1992	36,287	37,368	18,752	10,826	3,121	1,345	1,000	106	2									348,642	23,242	22,128,596		
1993	37,896	42,769	17,231	9,589	3,139	1,385	866	17										352,762	24,122	23,856,876		
1994	40,473	41,988	15,426	10,285	2,723	976	648	116										362,823	23,888	23,967,892		
1995	42,874	46,444	17,214	9,151	2,954	1,704	583	17										366,701	24,423	24,122,022		
1996	44,858	48,437	18,260	9,812	2,676	954	532	2										368,823	23,288	23,025,886		
1997	44,457	49,958	17,672	9,291	2,329	921	420	11										369,081	24,630	23,120,216		
1998	46,824	51,801	17,347	2,928	3,003	383	268	16										369,824	23,490	23,195,848		
1999	48,823	52,670	17,473	6,812	2,100	140	412											376,421	23,758	23,024,824		

Source: NRC, "Occupational Radiation Exposure at Commercial Light Water Reactors (1984-2009)," (NRC) (http://www.nrc.gov/docs/2010/01/2010-01-001.pdf). The data were compiled from the REIRS database. The REIRS database is a summary of the radiation dose information for each worker at each of the reactors. The REIRS database is a summary of the radiation dose information for each worker at each of the reactors. The REIRS database is a summary of the radiation dose information for each worker at each of the reactors.

Most, if not all, of these data are already electronically available (internally, not publicly) in the REIRS database,<sup>5</sup> and each worker has a unique REIRS identifying number<sup>6</sup> that would permit such analyses to be conducted quickly. We therefore look forward to a prompt response to our request.

Thank you,

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<sup>5</sup> NRC, REIRS Automated Dose History Request Form. Accessed on December 29, 2011. <https://www.reirs.com/dosehist.cfm>

<sup>6</sup> NRC, Occupational Radiation Exposure at Commercial Nuclear Power Reactors and Other Facilities 2009. Page 5-3. "The REIRS database stores the radiation dose information for an individual by his/her unique identification number and identification type." Accessed on October 5, 2011. <http://www.reirs.com/nureg2009/nureg2009.pdf>