



Department of Energy  
National Nuclear Security Administration  
Washington, DC 20585



February 1, 2017

The Honorable Sean Sullivan  
Chairman  
Defense Nuclear Facilities Safety Board  
625 Indiana Avenue NW, Suite 700  
Washington, D.C. 20004

Dear Chairman Sullivan:

Consistent with your letter, dated February 26, 2016, please find the attached fiscal year 2016 Annual Metrics Report on the nuclear criticality safety criteria. This metrics report includes a series of tables and satisfies the annual reporting requirement established for closure of DNFSB Recommendation 97-2, *Continuation of Criticality Safety at Defense Nuclear Facilities in the Department of Energy (DOE) Complex*.

If you have any specific questions regarding the report, please contact Kevin Hahn, National Nuclear Security Administration (NNSA), who has overall responsibility for the consolidated report, at (505) 845-4106. Robert Wilson, Office of Environmental Management (EM), (303) 236-3666, is responsible for the EM information; and Andrew DeLaPaz, Office of Science (SC), (301) 903-8225, is responsible for the SC information.

Sincerely,

James J. McConnell  
Associate Administrator  
for Safety, Infrastructure and Operations

J. Stephen Binkley  
Acting Director  
Office of Science

Matthew B. Moury  
Associate Under Secretary for  
Environment, Health, Safety and Security

James A. Hutton  
Deputy Assistant Secretary for  
Safety, Security, and Quality Assurance  
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cc:

Kevin Hahn, NNSA  
Sue Cange, EM-1 (Acting)  
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Patricia Lee, EM-3.111  
Robert Wilson, EM-3.111  
Andrew DeLaPaz, SC-3  
Joe Olencz, AU-1.1



**2016**  
**ANNUAL METRICS**  
**REPORT**

**To**  
**THE DEFENSE NUCLEAR**  
**FACILITIES SAFETY BOARD**

**January 2017**

**NUCLEAR CRITICALITY**  
**SAFETY PROGRAMS**



National Nuclear Security Administration  
United States Department of Energy  
Washington, DC 20585

## Purpose

A Defense Nuclear Facilities Safety Board (DNFSB) letter dated February 26, 2016, requested that the Department of Energy (DOE) provide an annual metrics table on the nuclear criticality safety criteria listed below in its Annual Report on Nuclear Criticality Safety (NCS) Programs. The Board's letter modified the annual reporting requirement established for closure of DNFSB Recommendation 97-2, *Continuation of Criticality Safety at Defense Nuclear Facilities in the Department of Energy (DOE) Complex*, which requires the Department of Energy to provide a report and briefing on the requested subject areas for its various nuclear criticality safety programs.

The points-of-contact for this report are Kevin Hahn, NNSA, 505-845-4106, Dr. Robert Wilson, EM, 303-236-3666, and Andrew DeLaPaz, SC, 301-903-8225.

The requested metrics include:

- The number of criticality safety infractions in each severity level, per site specific criteria;
- The number of identified non-compliances with DOE Order 420.1, *Facility Safety*, and the American National Standards Institute/American Nuclear Society-8 series of criticality safety standards. Include the number of contractor-identified non-compliances and the number identified by external parties;
- The number of contractor and federal criticality safety assessments completed including the total number of findings and opportunities for improvement from these assessments;
- Current contractor and federal criticality safety staffing levels, including the average years of experience in criticality safety, number of qualified staff, number in training, number of staff lost, and number of staff hired in the previous year;
- DOE's overall evaluation of the contractors' performance in the functional area of criticality safety, consistent with DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*.

The following tables represent the requested data for DOE sites for the fiscal year 2016.

Annual Report on DOE Nuclear Criticality Safety Programs

**Table 1. Criticality Safety Infractions and Program Non-Compliances**

Site/Major Project	Overall Grade <sup>1</sup>	Criticality Safety Infractions <sup>2</sup>					Program Non-Compliances <sup>3</sup>	
		Level 1	Level 2	Level 3	Level 4	Level 5	Contractor-identified	Externally identified
Livermore	Green	0	0	0	2	0	0	0
Nevada	Green	0	0	0	0	0	0	0
Los Alamos	Red*	0	0	1	6	17	21	3
Sandia	Green	0	0	0	0	0	0	0
Pantex	Green	0	0	0	0	0	0	0
Y-12		60**					0	0
Uranium Processing Facility		N/A	N/A	N/A	N/A	N/A	0	0
PNNL (Office of Science)	Yellow	0	0	0	0	0	0	0
Richland CHPRC	Green	0	0	0	0	0	3	0
Richland WCH	Green	0	0	0	0	0	0	0
River Protection WTP	Green	N/A	N/A	N/A	N/A	N/A	0	0
River Protection Tank Farms	Green	0	0	0	0	0	0	0
PPPO Paducah-FPDP	Yellow	0	1	2	7	N/A	0	1
PPPO Portsmouth-Fluor/B&W	Green	0	0	0	5	1	0	0
PPPO BWCS	Green	0	0	0	0	1	2	2
Idaho Flour Idaho LLC	Green	0	0	2	0	0	0	0
Idaho CH2M WG	Green	0	0	0	0	0	0	0
Idaho ITG/AMWTP	Green	0	0	2	3	0	0	0
Oak Ridge UCOR	Green	0	0	0	3	1	0	0
Oak Ridge Isotek	Green	0	0	0	0	3	0	0
Oak Ridge TWPC	Green	0	0	0	0	1	0	0
Savannah River SRNS	Green	0	0	0	0	2	0	0
Savannah River Parsons	Green	0	0	0	0	0	N/A	N/A
Savannah River SRR	Green	0	0	0	0	0	0	0

Footnotes:

- 1 

Green	Meets or exceeds expectations
Yellow	Adequate but needs improvement
Red	Does not meet expectations

- 2 Levels 1 through 5 consistent with site specific criteria  
 3 "N/A" for program non-compliances indicates no assessments were performed during FY16

\* The overall rating of red is a snapshot of the state of the program evaluated against requirements. The program remains noncompliant in several areas and compensatory measures remain in place to ensure safety in operations. It is important to note that the overall rating is yellow when comparing the program against program improvement goals (last year's approach to determining the rating). A program improvement plan is in place and progress is closely monitored by the Field Office.

\*\* 35 Minor Non-compliances, 20 Deficiencies, 5 Occurrences

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**Table 2. Contractor and Federal Assessments**

Site/Major Project	Contractor Assessments			Federal Assessments		
	Total Assessments <sup>1</sup>	Total Findings <sup>2</sup>	Total OFIs <sup>3</sup>	Total Assessments <sup>1</sup>	Total Findings <sup>2</sup>	Total OFIs <sup>3</sup>
Livermore	3	0	10	6	0	1
Nevada	1	3	11	2	4	4
Los Alamos	3	3	0	3	4	0
Sandia	7	0	13	5	1	5
Pantex	3	2	10	1	0	0
Y-12	7	1	9	7	1	0
Uranium Processing Facility	4	1	2	2	0	1
<b>PNNL (Office of Science)</b>	<b>13</b>	<b>1</b>	<b>10</b>	<b>1</b>	<b>0</b>	<b>2</b>
Richland CHPRC	3	0	3	14	0	4
Richland WCH	1	0	0	2	0	0
River Protection WTP	0	0	0	2	4	0
River Protection Tank Farms	1	1	1	1	0	2
PPPO Paducah-FPDP	2	0	12	1	9	17
PPPO Portsmouth-Fluor/B&W	3	0	3	0	0	0
PPPO BWCS	5	11	14	1	2	4
Idaho Flour Idaho LLC	14	16	21	1	0	0
Idaho CH2M WG	28	0	19	4	0	0
Idaho ITG/AMWTP	6	0	0	4	0	0
Oak Ridge UCOR	16	0	0	4	0	0
Oak Ridge Isotek	1	0	7	4	0	0
Oak Ridge TWPC	1	0	1	5	0	0
Savannah River SRNS	137	16	77	24	3	8
Savannah River Parsons	0	0	0	0	0	0
Savannah River SRR	15	0	7	8	1	4

Footnotes:

- 1 Total assessments focused on criticality safety including:  
**For Contractors:** management self-assessments, criticality safety committee reviews, operational readiness assessments, and biennial/triennial external reviews  
 \*does not include regularly scheduled operational reviews  
  
**For Federal:** DOE headquarters, site office, field office, and Office of Enterprise assessments; CSSG reviews, federal readiness assessments, and "For-cause" assessments  
 \*does not include day-to-day oversight conducted by facility representatives
- 2 Findings: Total number of assessment observations that generate a corrective action plan
- 3 OFIs (opportunities for improvement): Total number of all other assessment observations that were not findings

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**Table 3. Contractor Staffing**

Site/Major Project	Contractor Staffing					
	Qualified <sup>1</sup>	Target <sup>2</sup>	In Training	Staff Lost	Staff Hired	Experience <sup>3</sup>
Livermore	6	Yes	1	1	0	20
Nevada	2	Yes	1	1	0	8
Los Alamos	9	No	11	1	6	8.8
Sandia	6	Yes	4	0	1	17
Pantex	4	Yes	2	0	0	4
Y-12	22	No	15	3	3	15.5
Uranium Processing Facility	29	No	6	5	3	22.1
<b>PNNL (Office of Science)</b>						
PNNL (Office of Science)	4	Yes	1	0	0	17
<b>Richland</b>						
Richland CHPRC	8	Yes	0	0	0	20.6
Richland WCH	1	Yes	0	0	0	23
River Protection WTP	2	Yes	2	1	0	13
River Protection Tank Farms	3	Yes	0	0	0	25
PPPO Paducah-FPDP	6	No	5	2	6	17.6
PPPO Portsmouth-Fluor/B&W	13	Yes	0	0	1	16
PPPO BWCS	1	Yes	0	1	0	20
Idaho Flour Idaho LLC	4	Yes	1	0	0	15
Idaho CH2M WG	3	Yes	0	0	0	10
Idaho ITG/AMWTP	3	Yes	1	0	0	18
Oak Ridge UCOR	4	Yes	0	0	0	16
Oak Ridge Isotek	5	Yes	0	1	1	25+
Oak Ridge TWPC	4	Yes	0	0	0	28+
Savannah River SRNS	20	Yes	8	1	3	21
Savannah River Parsons	2	Yes	1	2	1	25
Savannah River SRR	2	Yes	0	0	0	29

Footnotes:

- 1 Qualified to independently perform criticality safety work consistent with site specific criteria
- 2 Does the number of qualified staff meet the programmatic need?
- 3 Average years of experience for all qualified staff

Annual Report on DOE Nuclear Criticality Safety Programs

**Table 4. Federal Staffing**

Site/Major Project	Federal Staffing					
	Qualified <sup>1</sup>	Target <sup>2</sup>	In Training	Staff Lost	Staff Hired	Experience <sup>3</sup>
Livermore	1	Yes	0	0	0	17
Nevada	1	Yes	1	0	0	10
Los Alamos	1	No	0	0	0	10
Sandia	1	Yes	0	0	0	21
Pantex	2	Yes	1	0	1	20
Y-12						
Uranium Processing Facility						
PNNL (Office of Science)	1	Yes	0	0	0	21
Richland CHPRC	1	Yes	0	0	0	4
Richland WCH						
River Protection WTP	5	Yes	2	0	0	7
River Protection Tank Farms						
PPPO Paducah-FPDP	4	Yes	0	0	0	26
PPPO Portsmouth-Fluor/B&W	5	Yes	0	0	0	25
PPPO BWCS	*	Yes	N/A	N/A	N/A	N/A
Idaho Flour Idaho LLC	3	Yes	0	2	0	7
Idaho CH2M WG						
Idaho ITG/AMWTP						
Oak Ridge UCOR	2	Yes	0	0	0	22
Oak Ridge Isotek						
Oak Ridge TWPC						
Savannah River SRNS	3	No	0	1	0	16
Savannah River Parsons						
Savannah River SRR						

Footnotes:

- 1 Qualified to independently perform criticality safety work consistent with site specific criteria
- 2 Does the number of qualified staff meet the programmatic need?
- 3 Average years of experience for all qualified staff
- \* No additional federal staff; those dedicated to FPDP and Flour/B&W also support BWCS as needed.