
SSO Staffing Analysis

An Alternate Method

Presented to the Federal Technical Capability Panel
March 29, 2011

Requirement

- DOE O 426.1 – “Senior managers must conduct annual workforce analyses of their organizations and develop staffing plans that identify critical technical capabilities and positions that ensure safe operations of defense nuclear facilities.”
- The FTCP Chair sends out a call for the Workforce Analysis and includes a template for determining the number of SSO personnel required at each site.

Annual Workforce Analysis Memo

- Site summaries are the basis for the FTCP report to the Secretary of Energy summarizing actions taken or necessary to maintain technical capabilities for safety assurance.
- “Workforce analysis guidance should assist you in determining your technical staffing needs. Use of equivalent technical staffing methods is acceptable.”

FTCP Action

- The FTCP Calendar Year 2008 Annual Report, issued May 2009, contains the following action:

“Provide additional SSO staffing guidance to identify the number of SSO personnel needed at DOE sites, particularly in light of the various methods used for implementing this responsibility”

Current FTCP Suggested Method

- Derived from the FR staffing analysis method
- Based on facility hazards and risks to the public, worker, environment
- Considers system size, operations complexity, system activity level
- Determination of staffing need based on prioritization and management judgment
- Consideration given to other duties and administrative activities
- Complex process & not task based

Alternate Staffing Analysis Method

- Based on specific tasks assigned SSOs to be completed in the year analyzed - flowdown from FRAM and technical requirements
- Prioritization of oversight is completed separately – such as risk evaluation completed through assessment planning processes
- Consideration given to other duties and administrative activities – including qualification

Advantages of Alternate Method

- Much simpler to complete
- Represents actual work to be completed
- Results are easier to defend
- Tailored to Site SSO roles and responsibilities
- Facilitates out year projections
- Can clearly demonstrate flow down from the FRAM and linkage to performance plans
- Allows for quantification of what won't get done if under staffed

Discussion of Analysis Method

- Two Categories of Work –Task Based & Individual Based
- Task Based are the activities that have to be performed to support the SSO function – assessments, design reviews
- Individual Based are activities that affect a person's availability to perform the tasks – training, leave, collateral duties – things each person has to do

**Los Alamos Site Office Safety System Oversight Staffing Plan
December 2010**

ACTIVITIES	Days for Activity in each Fiscal Year						Notes
	FY10	FY11	FY12	FY13	FY14	FY15	
Task Based							
3 SC System Assessments	64	66	66	66	66	66	Integrated Assessment Schedule items, SET lead, 15 days per assessment for team leader, based on 8 hour days, 7 days for team member (30 SC, 82 SS systems).
10 SS System Assessments	220	220	220	198	198	176	Formal assessments can be reduced as CAS matures & Shadow assessments increased. (NA-1 SD 226.1A)
4 Shadow Assessments	48	20	20	20	20	20	5 days per normal shadow assessment (NA-1 SD 226.1A)
Program Assessment (Safety Management Programs)	45	45	45	45	45	45	3 assessments per year CSE, CM, other 420.1B (NA-1 SD 226.1A)
3 Support Assessments	32	24	24	24	24	24	Readiness Reviews, Team members on other office assessments, 5 days field, 2 days prep, 1 day factual accuracy review and prestart closure per assessment
2 Readiness Reviews	16	16	16	16	16	16	
PBI Management	100	80	60	60	60	60	Development 4 days, PEPRS 1 day per month, Product reviews and response 1 day per product, product numbers decline each year, end of year eval 3 days per PBI
3 Safety Basis Reviews - new	15	10	10	5	5	10	new AB @ 40 hrs, annual update @ 8 hrs, new reviews decrease with time and update reviews increase
4 Safety Basis Reviews - annual update	4	6	8	8	6	6	
3 Project Reviews & IPTs	24	24	24	24	24	24	hours per project step - (DOE Std-1189)
Support for External Assessment of LASO	13	13	13	13	13	13	HSS, CDNS, reviews - assume schedule rebaselined and only one occurs each year, 1 week self-assessment, 3 document prep & interviews, 3 days CAP prep
Corrective Action oversight	36	36	36	36	36	36	1 day per assessment
Corrective Action implementation	8	8	8	8	8	8	Implement actions as a result of oversight of LASO by external groups and self-assessment
LASO Business Process Maintenance & Implementation	21	21	21	21	21	21	Procedure Development/Maintenance, Assessment Schedules, new initiative support, CAP development & management, 1 day per month just for CAPs, Management briefings
Program Oversight	24	24	24	24	24	24	COE Program - 1 days per month, Conduct of Engineering & Procedure reviews, 1 day per month
DNFSB, IG, GAO Support	12	12	12	12	12	12	Document Requests, Briefings, Letter Responses,
Total Task Days	772	625	607	580	578	561	Number of days required for activities that need to be completed regardless of number

Calculation of FTEs needed

(alternate staffing method)

Individual Based							
Qualification Training	39	46	16	5	16	46	25% time for 18 months, new qual each 5 years averaged across 5 FTEs at different stages of qual
Continuing Training	5	10	10	15	10	10	Continuing training is greater when initial qualification is completed
Operations Awareness/Emergent Issues	13	20	20	20	20	20	Event response, Field Oversight, 3/4 day per week,
External Support	5	5	5	5	5	5	SSO Standard Development, 2008-1 Committee, HQ Assessment Teams, product teams
Collateral Duties	5	5	5	5	5	5	Electical Safety, HEPA filter testing, CoE implementation, etc.
Administrative	37	37	37	37	37	37	E-mail management 1 hour per day, IDPs 1/2 day, DOE training 4 @ 2hrs, surveys 4hrs, Financial disclosure 2 hrs, All-hands 10 hrs, support hiring actions 6 hrs, rules/procedure reviews, etc.
Leave, Holidays	36	36	36	36	36	36	
Total Individual Days	140	159	129	123	129	159	Number of days required for activities that need to be completed by each individual
percent of individual time available for task based activities	0.46	0.39	0.50	0.53	0.50	0.39	$[1-(\text{total individual based days})/(260 \text{ days per year})]$
FTEs required	6.4	6.2	4.6	4.2	4.4	5.6	$(\text{Total task days})/[(\% \text{ time available for tasks}) * (260 \text{ days per year})]$
Average FTE need over 5 years (FY11 - FY14)	5.0						

Discussion of Analysis Method

- List all activities expected of SSO staff
- Decide which bin they belong in (task or individual)
- Assign the amount of time per task in consistent units – hours, days, weeks
- Predict current year and future year needs
- Add up the time required in each bin

Discussion of Analysis Method

- Determine the percent of time available to support Task Based activities after Individual Based activities have been completed

$$1 - \frac{\text{total individual based days}}{260 \text{ work days per year}} = \% \text{ time}$$

$$1 - (159 / 260) = 0.39$$

Discussion of Analysis Method

- Calculate FTEs required to staff SSO such that all tasks are completed

$$\text{FTE} = \frac{\text{Total Task Days}}{\% \text{ time available} * 260 \text{ days per year}}$$

$$\text{FTE} = \frac{625}{0.39 * 260} = 6.2 \text{ FTEs}$$

Completion of Analysis

- Instructions for completing the analysis have been developed for use with a template spreadsheet.
- The analysis method can be easily adapted for other organizations. LASO also uses it to determine Nuclear Safety Specialist staffing needs.

Backup Slides

- Current SSO Analysis Method

Facility Hazard Ranking

(based on currently suggested method)

Table 1 - Facility Hazard Ranking Worksheet														December 2005																							
	Radiation Exposure			Criticality			Biological			Hazardous Chemicals			Vapors			Electricity			Cryogenics			High Pressure			Hoisting & Rigging			Construction or D&D			Explosives			Fire			Facility Hazard Value
Nuclear Facility	public	worker	environment	public	worker	environment	public	worker	environment	public	worker	environment	public	worker	environment	public	worker	environment	public	worker	environment	public	worker	environment	public	worker	environment	public	worker	environment	public	worker	environment	public	worker	environment	
<i>TA-55</i>	3	3	2	1	2	1	0	0	0	1	3	1	0	1	0	0	2	0	0	2	1	0	2	0	0	2	0	0	2	2	0	1	0	1	1	1	35
<i>CMR</i>	2	2	2	0	1	0	0	0	0	1	3	1	0	0	0	0	3	0	0	2	0	0	2	0	0	2	0	0	2	1	0	0	0	1	1	1	27
<i>WETF</i>	1	2	1	0	0	0	0	0	0	0	1	1	0	0	0	0	2	0	0	2	0	0	2	0	0	1	0	0	0	0	0	1	0	1	1	1	17
<i>TA-50 WCRRF</i>	1	3	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	1	1	1	13
<i>TA-54 Area G</i>	3	3	3	0	2	0	0	0	0	1	1	1	0	0	0	0	2	0	0	1	1	0	1	0	0	2	0	0	2	0	0	0	0	1	1	1	26
<i>TA-54 RANT</i>	1	2	2	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	2	0	0	2	0	0	1	0	0	0	0	1	1	1	16
																																					0
																																					0

Considering additional factors

(based on currently suggested method)

Table 2 - Facility Coverage Ranking Factor

Facility or Groups of Facilities	Facility Hazard Value (from Table 1)	Facility Size	Material Condition	Operations Complexity	Programmatic Importance	Operational Rigor	Facility Hazard Ranking Factor
a	b	c	d	e	f	g	$h=b*c*d*e*f*g$
TA-55	35	1.25	1.25	1.00	1.25	1.25	85
CMR	27	1.25	1.25	1.00	1.25	1.25	66
WETF	17	1.00	0.75	1.00	1.25	1.25	20
TA-50 WCRRF	13	0.75	1.25	1.00	1.00	1.25	15
TA-54 Area G	41	1.25	1.25	1.00	1.25	1.25	100
TA-54 RANT	16	0.75	1.25	1.00	1.00	1.00	15

System Adjustment Factors

(based on currently suggested method)

Table 3 - Safety System Adjustment Factor						
Facility / Nuclear Safety Systems	System Type	System Size	System Complexity	System Condition	Contractor System Engineer Program Implementation	Safety System Adjustment Factor
a	b	c	d	e	f	$g=c*d*e*f$
Electrical Power System	Electrical	1.25	1.25	1.25	1.25	2.4
WETF						
Ventilation System	Ventilation	1.25	1.25	1	1.25	2.0
Fire Protection System	Fire Protection	1.25	1.25	1	1.25	2.0
Tritium Gas Handling System	Mechanical	1	1	0.75	1.25	0.9
Tritium Gas Containment System	Mechanical	1	0.75	0.75	1.25	0.7
Tritium Monitoring System	Instrumentation	1	1	0.75	1.25	0.9
Tritium Waste Treatment System	Mechanical	1	1	0.75	1.25	0.9
Uninterruptible Power Supply (UPS)	Electrical	1	1	0.75	1.25	0.9
TA-50 WCRRF						
TA-50-69 Fire Suppression System	Mechanical	0.75	0.75	1	1.25	0.7
TA-50-69 HVAC	Mechanical	1	0.75	1	1.25	0.9
Characterization Glove Box/Fixture	Mechanical	0.75	0.75	1	1.25	0.7
Continuous Air Monitors	Radiological	0.75	0.75	1	1.25	0.7
Electrical Distribution System	Electrical	1	0.75	1	1.25	0.9
TA-50-69 UPS	Electrical	0.75	0.75	0.75	1.25	0.5
TA-54 Area G						
Low-Level Waste Compactor Ventilation	Ventilation	0.75	0.75	0.75	1.25	0.5
Interlocks for Radiography Machines	Electrical	0.75	0.75	0.75	1.25	0.5
Personnel Contamination Monitors	Radiological	0.75	0.75	0.75	1.25	0.5
Continuous Air Monitors	Radiological	0.75	0.75	0.75	1.25	0.5
TA-54 RANT						
Fire Suppression System	Fire Protection	0.75	0.75	0.75	1.25	0.5
Bridge Crane and Rigging	Mechanical	0.75	0.75	0.75	0.75	0.3
NOTE: This table only includes active systems - There are many passives that are not entered.						

SSO Time Commitments

(based on currently suggested method)

Table 4 - SSO Base Time Commitment									
SSO Programmatic and Collateral Activities for a Simple Safety Significant System in a low hazard facility									
	Activity	Hrs/day	Hrs/week	Hrs/month	Hrs/quarter	Hrs/year	Total Hours	FTE	
System-Dependent	Monitor Contractor SE Program		2	0	2		112	0.054	
	Inspection/Condition Monitoring								
	System Walkdowns/CAP Inspections	2		4			568	0.273	
	Other (Specify)						0	0	
	System-Dependent Time Subtotal							1114	0.536
Total BASE SSO Technical Time							2171	1.04	
Administrative Time	Other Technical Assignments - Non-SSO								
	Operational Readiness Reviews					40	40	0.02	
	Special Assignments					40	40	0.02	
	Collateral Assignments		3		20		236	0.11	
	Non-SSO Assessments (e.g., ISM, etc.)				12		48	0.02	
	Technical Support to Other Federal Staff			2			24	0.01	
	Administrative Duties & Activities								
	Time keeping		0.25					13	0.01
	Training Registration				1			12	0.01
	Travel						80	80	0.04
	Personnel Activities						8	8	0.00
	Medical Qualifications/Exams						3	3	0.00
	Document Reviews					24		96	0.05
	Mail & E-Mail Management	1						260	0.13
	Staff Meetings			1	1			64	0.03
	Annual Leave			4				208	0.10
	Sick Leave						40	40	0.02
	Military Leave							0	0.00
	Training, GET						3	3	0.00
	Training, Rad Worker II						8	8	0.00
	Training, Hazwoper Refresher						8	8	0.00
	Training, Facility Access						12	12	0.01
	Training, Admin (EEO, Ethics, etc.)						12	12	0.01
	Other, Specify							0	0.00
	Overtime (0%)						0	0	0.00
SSO Administrative Time							1215	0.58	

System Coverage Factors

(based on currently suggested method)

Table 5 - System-Specific Adjusted Base SSO Hours

Facility or Groups of Facilities (a)	Functional Area Assignment	System Type (b)	Safety System Adjustment Factor (c)	SSO System Dependent Base Hours (d)	Adjusted System Dependent (e)=(c)*(d)	Oversight Complexity Factor* (f)	Adjusted System Dependent (g)=(e)*(f)
TA-55							
Ventilation System	1	Ventilation	2.4	1114	2720	0.5	1360
Fire Suppression System	2	Fire Protection	2.0	1114	2176	0.5	1088
Criticality Alarm System	SME	Instrumentation	0.9	1114	1044	0.25	261
Paging System	3	Instrumentation	0.9	1114	1044	0.25	261
Gloveboxes	4	Mechanical	1.6	1114	1741	0.25	435
Flammable Gas Control System	3	Instrumentation	0.9	1114	1044	0.25	261
Uninterruptible Power Supply (UPS)	3	Electrical	0.7	1114	783	0.25	196
Continuous Air Monitors	SME	Radiological	0.7	1114	783	0.25	196
CMR							
Fire Suppression System	2	Fire Protection	2.4	1114	2720	0.5	1360
Ventilation System	1	Ventilation	2.4	1114	2720	0.5	1360
Fire Alarm System	3	Instrumentation	2.4	1114	2720	0.25	680
Radiation Monitoring System	SME	Radiological	1.3	1114	1393	0.25	348
Electrical Power System	3	Electrical	2.4	1114	2720	0.25	680
WETF							
Ventilation System	1	Ventilation	2.0	1114	2176	0.5	1088
Fire Protection System	2	Fire Protection	2.0	1114	2176	0.25	544
Tritium Gas Handling System	4	Mechanical	0.9	1114	1044	0.5	522
Tritium Gas Containment System	4	Mechanical	0.7	1114	783	0.5	392
Tritium Monitoring System	3	Instrumentation	0.9	1114	1044	0.25	261
Tritium Waste Treatment System	4	Mechanical	0.9	1114	1044	0.25	261
Uninterruptible Power Supply (UPS)	3	Electrical	0.9	1114	1044	0.25	261
TA-50 WCRRF							
TA-50-69 Fire Suppression System	2	Mechanical	0.7	1114	783	0.5	392
TA-50-69 HVAC	4	Mechanical	0.9	1114	1044	0.25	261
Characterization Glove Box/Fixture	4	Mechanical	0.7	1114	783	0.25	196
Continuous Air Monitors	SME	Radiological	0.7	1114	783	0.25	196
Electrical Distribution System	3	Electrical	0.9	1114	1044	0.25	261
TA-50-69 UPS	3	Electrical	0.5	1114	587	0.25	147
TA-54 Area G							
Low-Level Waste Compactor Ventilation	1	Ventilation	0.5	1114	587	0.25	147
Interlocks for Radiography Machines	4	Electrical	0.5	1114	587	0.25	147
Personnel Contamination Monitors	SME	Radiological	0.5	1114	587	0.25	147
Continuous Air Monitors	SME	Radiological	0.5	1114	587	0.25	147
TA-54 RANT							
Fire Suppression System	2	Fire Protection	0.5	1114	587	0.5	294
Bridge Crane and Rigging	4	Mechanical	0.3	1114	352	0.5	176

FTEs needed by expertise

(based on currently suggested method)

System Type	Facility	System	Adjusted System Dependent SSO Hours/Year	Fixed-Time Technical Hours/Year	Total SSO Technical Hours/Year (Note 1)	Total SSO Technical FTE
(a)	(b)	(c)	(d)	(f)	(g)	
Ventilation/Mech	TA-55	Ventilation System	1360	1057	3714	1.79
	CMR	Ventilation System	1360			
	WETF	Ventilation System	1088			
	TA-54	LLW Compactor Ventilation	147			
Piping/Fluid/Mech	CMR	Fire Supression	1360	1057	3576	1.72
	TA-55	Fire Supression	1088			
	WETF	Fire Supression	544			
	TA-54	RANT Fire Suppression	392			
	TA-50-69	Fire Supression	294			
Electrical/Instrumentation	CMR	Electrical Power Distribution	680	1057	2901	1.39
	CMR	Fire Alarm System	680			
	TA-55	Flammable Gas Control System	261			
	TA-55	Uninterruptible Power Supply (UPS)	196			
	TA-55	Paging System	261			
	WETF	Tritium Monitoring System	261			
	WETF	UPS	261			
	TA-50 WCRR	EDS	261			
	TA-50-69	UPS	147			
Electro-Mechanical	WETF	Tritium Gas Handling System	522	1057	2513	1.21
	TA-55	Gloveboxes	435			
	WETF	Tritium Gas Containment System	392			
	WETF	Tritium Waste Treatment System	261			
	TA-50 WCRR	HVAC	261			
	TA-50 WCRR	Char. Glovebox Fixture	196			
	TA-54 RANT	Bridge Crane and Rigging	176			
	TA-54 Area G	Radiography Interlocks	147			