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Department of Energy
Washington, DC 20585

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DNF SAFETY BOARD

JAN 24 2002

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

Dear Mr. Chairman:

Consistent with the Department of Energy's (DOE) Implementation Plan for the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 2000-2, *Configuration Management, Vital Safety Systems*, I am forwarding a report documenting completion of Commitments 17 and 18.

Commitment 17, originally to be completed in March 2001, called for DOE to identify needed Federal expertise, and survey the staffing necessary to ensure effective oversight of contractor safety systems at Defense Nuclear Facilities. Commitment 18, originally to be completed in April 2001, called for DOE to compile a report identifying DOE needs for Federal technical personnel and the means of addressing critical technical skill gaps. The enclosed report provides the information called for in these two commitments.

An extensive effort was undertaken to compile data associated with the Federal staff that performs technical oversight of safety systems, to determine if critical technical skill gaps exist, and to provide a means to address these gaps. Through this analysis almost 31 additional Full Time Equivalents (FTEs) have been determined to be needed to provide the necessary and sufficient oversight of contractor safety systems.

The majority of the technical skill gaps are in mechanical engineering, fire protection, electrical engineering, instrumentation and control, and criticality. Two-thirds of the skill gaps reside within four Field and Area Offices: Office of River Protection, Los Alamos Area Office, Oakland Area Office, and Y-12 Area Office. These gaps can be partially addressed in the near-term using technical expertise available at Headquarters and Albuquerque, using DOE support service contractors, and using the Authorization Basis (AB) and Facility Representative (FR) staff at the sites. Other long-term actions may be warranted. These include: 1) accelerating hiring actions to close technical gaps, 2) cross training and qualifying existing Technical Qualification Program (TQP) qualified personnel to develop them into safety system experts, or 3) transferring (at an appropriate time) existing safety system experts from closure sites to sites that have technical skill gaps. The Federal Technical Capabilities Panel plans to continue to monitor this area.

Based upon the enclosed report, I believe that Commitments 17 and 18 are completed and propose that they be closed.

If you have any questions, please contact me at (803) 952-2486 or have your staff contact Mr. Patrick W. McGuire at (803) 952-4016.

Sincerely,

Roy J. Schepens
Chairman
Federal Technical Capability Panel

NMED:PWM:mag

UD-02-023

Enclosure

cc w/enclosure:
S. Cary (EH-1), HQ
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Analysis of Safety System Federal Staff Expertise and Availability

Federal Technical Capabilities Panel
U.S. Department of Energy
January 2002

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List of Acronyms

AAO – Amarillo Area Office
AB – Authorization Basis
AL – Albuquerque Operations Office
C/SE NPH – Civil, Structural Engineering and Natural Phenomena
CB – Carlsbad Area Office
ChE/PrE – Chemical Engineering/Process Engineering
CRIT – Criticality Safety Specialist
DNFSB – Defense Nuclear Facility Safety Board
DOE – Department of Energy
EE – Electrical Engineering
EH – Office of Environment, Safety and Health
EM – Office of Environmental Management
EP – Emergency Preparedness
ES&H – Environment, Safety and Health
FP – Fire Protection
FR – Facility Representative
FTCP – Federal Technical Capabilities Panel
FTE or FT – Full Time Equivalent
I/C – Instrumentation and Control
ID – Idaho Operations Office
KAO – Kirtland Area Office
LAAO – Los Alamos Area Office
LLNL – Lawrence Livermore National Laboratory
ME – Mechanical Engineering
N/A – Not Applicable
NE – Nuclear Engineering
NNSA – National Nuclear Security Administration
NV – Nevada Operations Office
OAK – Oakland Operations Office
OH-F – Ohio Field Office – Fernald
OH-M – Ohio Field Office – Mound
ORO – Oak Ridge Operations Office (EM or NNSA)
OS/IH – Occupational safety/Industrial Health
P – Primary
RF – Rocky Flats Field Office
RL – Richland Operations Office
RP – Office of River Protection, Radiation Protection
S – Support
SRS – Savannah River Operations Office
TQP – Technical Qualification Program
Y12 – Y-12 Area Office

Analysis of Safety Systems Federal Staff Expertise and Availability

Executive Summary:

As part of the Department of Energy's (DOE) Implementation Plan for Defense Nuclear Facility Safety Board (DNFSB) Recommendation 2000-2, *Configuration Management, Vital Safety Systems*, an extensive effort was undertaken to compile data associated with the Federal staff that performs technical oversight of safety systems, to determine if gaps exist in critical technical expertise, and to provide a means to address these gaps. Through this almost 31 additional Full Time Equivalents (FTEs) have been determined to be needed to provide the necessary and sufficient oversight of contractor safety systems.

The majority of the technical skill gaps are in mechanical engineering (11.45 FTEs), fire protection (6 FTEs), electrical engineering (5.2 FTEs), instrumentation and control (3.6 FTEs), and criticality (3 FTEs). Two-thirds of the skill gaps reside within four Field and Area Offices: Office of River Protection (7 FTEs), Los Alamos Area Office (6.5 FTEs), Oakland Area Office (4.25 FTEs), and Y-12 Area Office (4 FTEs). These gaps can be partially addressed in the near-term using technical expertise available at Headquarters and Albuquerque, using DOE support service contractors, and using the Authorization Basis (AB) and Facility Representative (FR) staff at the sites. Other long-term may be warranted. These include: 1) Accelerating hiring actions to close technical gaps, 2) Cross training and qualifying existing Technical Qualification Program (TQP) qualified personnel to develop them into safety system experts, or 3) Transferring (at an appropriate time) existing safety system experts from closure sites to sites that have technical skill gaps.

Additional research is also needed to fully determine the staff requirements for effective contractor safety system oversight. Consideration will be given to developing Facility Oversight Charts and Safety System Assignment Charts for each facility and System/Program Expert Oversight Charts for each system/program expert (shown in Attachment B) to provide an improved framework for identifying the system expertise needed at the Federal level. These actions may identify larger (or smaller) technical skill gaps, identify the need for additional (or fewer) system experts, and identify where critical technical skill gaps exist.

Tables 3 and 4 (and the corresponding Field and Area Office Tables in Attachment A) define the system expertise needed and available to ensure effective oversight of safety systems. Tables 7 and 8 identify the additional safety system expertise the Department needs to effectively review safety systems and programs essential to system operability. This report presents several means the Department has available to address the identified critical technical skill gaps. As a result of the data and analysis provided in this report, Commitments 17 and 18 in the DOE Implementation Plan for DNFSB Recommendation 2000-2 are complete.

Introduction:

In Recommendation 2000-2, the DNFSB recommended that the DOE scrutinize safety system status, as well as supporting programs, as a regular part of line management assessments. DOE P 450.5, *Line Environment, Safety and Health Oversight,* sets forth the expectations for Environment, Safety and Health (ES&H) oversight, including key elements of a program for DOE-ES&H line organizations. The oversight role of the Federal workforce requires familiarity with safety systems. As such, there is a need to ensure that Federal technical personnel knowledgeable of those Vital Safety Systems are available to ensure effective oversight of these systems, particularly when significant system problems arise.

Objective:

The objective of this report is to provide information called for in Commitments 17 and 18 in the DOE Implementation Plan for DNFSB Recommendation 2000-2. Specifically, Commitment 17 states:

> *"As a supplement to the annual workforce analysis, the FTCP will identify system expertise needed at the Federal level and survey the availability and sufficiency of personnel required to ensure effective oversight of contractor safety systems."*

Commitment 18 states:

> *"A report will be compiled identifying the Department's needs for Federal technical personnel capable of reviewing safety systems and programs essential to system operability and the means of addressing critical technical skill gaps."*

To accomplish this objective, this report identifies:
- The system expertise needed to ensure effective oversight of safety systems,
- The system expertise available to ensure effective oversight of safety systems,
- The resulting technical skill gaps, and
- The means of addressing critical skill gaps.

This report begins with identifying at each Field and Area Office the safety systems the are Safety Class, Safety Significant, or perform and important defense-in-depth function. Then estimates are provided for the number and type of Federal technical experts needed at each site to perform effective oversight of the systems. Input from the affected Field and Area Offices are presented which identifies the number and type of technical experts who are available and capable of overseeing safety systems and programs essential to safety system operability. Skill gaps are identified by comparing the number and types of technical experts needed to the number and type of experts available. This report concludes with identifying means of addressing these skill gaps.

Commitment #17 - Identification of System Experts Needed and Available

To effectively determine the expertise needed and available to ensure effective oversight of contractor safety systems, it was necessary to establish the number and type of safety systems. The actions taken to identify the types of safety systems were completed as part of closing Commitment 2 in the DOE Implementation Plan for DNFSB Recommendation 2000-2. The safety system types/categories are based on guidance provided by the DOE Executive Team responsible for completing the DOE Implementation Plan for Recommendation 2000-2. Tables 1 and 2 identify the number and type of safety systems for each Field and Area Office.

After the safety systems were identified and categorized, each Field and Area Office then estimated the number of Full Time Equivalent (FTE) system experts that were needed to provide effective oversight of all the contractor safety systems. The number of system experts needed for each safety system category (e.g., confinement ventilation, fire protection, electrical, etc.) and for each technical discipline (e.g., Nuclear Engineering, Mechanical Engineering, Electrical Engineering, etc.) are shown in Tables 3 and 4. These tables also identify the number of available system experts. The top (shaded) number is the number of available experts and the bottom (non-shaded) number is the number of experts needed.

Table 1 – Number of Safety Systems (NNSA)

System Category	Field and Area Offices								
	LAAO	KAO	AAO	NV[1,2]	OAK[1]	SR	ORO	YAO	Totals[1]
Confinement Ventilation	12	2	0	3	13	9	4	5	48
Fire Protection	16	0	13	6	11	3	2	10	61
Electrical	5	1	14	1	2	1	0	0	24
Radiation Monitoring	16	1	15	1	2	1	1	15	52
Hoist & Crane	1	0	12	0	0	0	2	0	15
Process	20	23	4	4	0	0	0	0	51
Commun-ication	4	0	0	0	0	0	0	0	4
Gas & Air	6	0	0	1	2	0	0	1	10
Other	6	1	9	0	0	1	0	0	17
Totals	86	28	67	16	30	15	9	31	282

Footnotes: (1) The total for NV and OAK includes both NNSA and EM systems. At NV there are 4 NNSA and 12 EM systems and at OAK there are 23 NNSA and 7 EM systems for a total number of NNSA systems of 266; (2) At NV number of systems expected to increase by about 6 within one year.

Table 2 – Number of Safety Systems (EM)										
System Category	Field and Area Offices									
	RF	ID	SR	RL	RP	OH-F	OH-M	CB	OR	Totals
Confinement Ventilation	9	3	24	31	9	0	2	2	0	80
Fire Protection	10	2	7	27	7	1	2	1	0	57
Electrical	5	1	105	5	1	0	0	0	0	117
Radiation Monitoring	11	6	31	14	12	1	5	1	3	84
Hoist & Crane	0	3	3	1	0	0	0	2	0	9
Process	4	5	39	16	4	0	0	0	0	68
Commun-ication	6	0	0	2	0	0	0	1	0	9
Gas & Air	3	0	16	5	2	0	3	0	0	29
Other	0	2	4	1	0	4	4	1	0	16
Totals	48	22	229	102	35	6	16	8	3	469

The data presented in Tables 3 and 4 were evaluated to determine if it were reasonable and acceptable (method described below). Specifically, the evaluation concentrated on determining a factor for the reasonableness of the number of "needed" system experts provided by the NNSA Field and Area Offices. Based upon the factor determined from evaluating the NNSA data, a correlation could be developed to judge the adequacy of the EM data.

The number of system experts needed to maintain cognizance over safety systems was based on the traditional concept of "span of control". Engineering managers can effectively oversee the work of about 5 to 10 engineers, according to most management textbooks. Federal system experts are actually communicating with contractor system engineers, rather than working on the systems themselves. Since Federal system experts do not fulfill the full range of supervisory functions used in the previously stated assumption, it seemed reasonable to adopt a range to 7 to 12 systems per full time equivalent depending on system complexity, for Federal oversight work.

For example, for systems such as confinement ventilation, which is typically a distributed collection of differing components, the overall number of systems per engineer was adjusted downwards. In contrast, a larger number of systems per system expert were assumed for simpler systems, such as cranes and hoists, and for "static" systems such as structures. When a type of system also involved a secondary type of expertise, such as instrumentation and control for process systems, it was assumed one system expert per about 15 to 20 such systems.

Table 3 – Summary of NNSA Technical Staffing													
System Category		Technical Discipline Areas (consistent with TQP)											
	# of VSS	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	48	0	3.9	0	0	0	0	0	2.2	0.2	0	0	6.3
		0	6.3	0	0.5	0	0	0	2.2	0.2	0	0	9.2
Fire Protection	61	0	0	0	0	0	0	4	0	0	0	0	4
		0	0.6	0	0.5	0	0	8	0	0	0	0	9.1
Electrical	24	0	0	1	0	0	0	0	1	0	0	0	2
		0	0.1	2.5	0	0	0	0	1	0	0	0	3.6
Radiation Monitoring	52	0	0	1	0	3	0	0	0	1	0	0	5
		0	0.2	1.5	0.1	5	0	0	0	2	0	0	8.8
Hoist & Cranes	15	0	1	0	0	0	0	0	0	0	0	0	1
		0	1.8	0	0	0	0	0	0	0	0	0	1.8
Process	51	0	0	0	0	0	0	0	0	0	0	0	0
		0	1.1	0.9	0.5	1	0	0	0	0	0	0	3.5
Communication	4	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Gas & Air	10	0	0.1	0	0	0	0	0	0	0	0	0	0.1
		0	0.9	0	0	0	0	0	0	0	0	0	0.9
Other	17	0	0.25	0	0	0	0	0	0	0	0.75	0	1
		0	1.4	1	0	0	0	0	0	0	1.25	0	3.65
Total	282	0	5.25	2	0	3	0	4	3.2	1.2	0.75	0	19.4
		0	12.4	5.9	1.6	6	0	8	3.2	2.2	1.25	0	40.55

Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed. See Tables A1 through A9 for Field and Area Office Data.

Table 4 – Summary of EM Technical Staffing													
System Category		Technical Discipline Areas (consistent with TQP)											
	# of VSS	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	80	1.2	3.4	0.6	0.1	0	0	0	0	0.6	0	0	5.9
		1.2	5.9	0.6	0.1	0	0	0	0	0.6	0	0	8.4
Fire Protection	57	0.6	0.05	0.05	0	0	0	3.8	0	0.3	0	0	4.8
		0.6	0.05	0.05	0	0	0	5.8	0	0.3	0	0	6.8
Electrical	117	1.2	0	1.4	0.1	0	0	0	0	0	0	0	2.7
		1.2	0	2.7	0.1	0	0	0	0	0	0	0	4.0
Radiation Monitoring	84	0.81	0	0.1	0.2	1.86	0	0	0	1.93	0	0	4.9
		0.81	0	0.1	2.2	1.86	0	0	0	1.93	0	0	6.9
Hoist & Cranes	9	0.1	0.5	0.1	0	0.1	0	0	0	0	0	0	0.8
		0.1	0.5	0.1	0	0.1	0	0	0	0	0	0	0.8
Process	68	3.9	2.3	0.2	0.3	1.5	2.1	0	0	0.1	0	0	11.4
		3.9	3.45	0.2	0.3	1.5	2.1	0	0	0.1	0	0	12.55
Communication	9	0	0	0.2	0	0	0	0	0	0	0	0.1	0.3
		0	0	0.2	0	0	0	0	0	0	0	0.1	0.3
Gas & Air	29	1.1	1	0	0.1	0	0.6	0	0	0	0	0	2.8
		1.1	1.65	0	0.1	0	0.6	0	0	0	0	0	3.45
Other	16	0.9	0.3	0	1	0	0	0	1	0.5	1	0	4.7
		0.9	0.3	0	1	0	0	0	1	0.5	1	0	4.7
Total	469	9.81	7.55	2.65	2.8	3.46	2.7	3.8	1	3.43	1	0.1	38.3
		9.81	11.85	3.95	4.8	3.46	2.7	5.8	1	3.43	1	0.1	47.9

Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed. See Tables A10 through A19 for Field and Area Office Data.

Table 5 provides theoretical estimates of system expert needs based upon the "span of control" concept. Table 5 starts by listing those technical discipline areas considered to be primary and secondary for each of the System Categories, and provides an estimate for the number of experts needed. The number of experts needed is based on the total number of systems and the "judgments" related to system complexity as discussed above. The overall count for either primary or secondary numbers is found by summing across a given row (i.e., a given System Category). It is noted that these estimates did not consider those crosscutting topics, such as Authorization Basis Review and Facility Representative oversight, and when comparing the numbers from Table 5 to those in Tables 3 and 4, such differences may be important.

Table 5 – Theoretical Estimate of System Expert Needs

System Category	Technical Discipline Areas (consistent with TQP)											
	# of VSSs	NE	ME	EE	I/C	CRIT	ChE Pr E	FP	OS IH	RP	C/SE NPH	Total FTEs
Confinement Ventilation	48	S 0.5	P 5	S 0.5	S 0.5	N/A	N/A	S 0.5	N/A	P 1.5	N/A	8.5
Fire Protection	61	N/A	S 1.5	S 0.5	S 1	N/A	N/A	P 6	S 0.5	N/A	N/A	9.5
Electrical	24	N/A	S 0.5	P 2	S 1	N/A	N/A	N/A	S 0.5	N/A	N/A	4
Radiation Monitoring	52	S 1	N/A	N/A	S 1	P 4	N/A	N/A	N/A	S 1.5	N/A	7.5
Hoist & Crane	15	N/A	P 1	S 0.5		N/A	N/A	N/A	N/A	N/A	N/A	1.5
Process	51	P 1	S 0.5	N/A	S 1	P 2	S 1	N/A	S 0.5	S 0.5	N/A	6.5
Communi-cation	4	N/A	N/A	N/A	S 0.5	N/A	N/A	N/A	N/A	N/A	N/A	0.5
Gas & Air	10	N/A	P 1	N/A	S 0.5	N/A	N/A	N/A	N/A	N/A	N/A	1.5
Other Systems*	17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	P 5	5
Total	282	2.5	9	3.3	5.5	6	1	6.5	1.5	3.5	5	44.5

P=Primary: P based on 1 FTE per 5 to 10 systems depending on complexity; S=Support: S based on 1 FTE per ~20 VSSs depending on complixity; Footnote *: In the Other Systems category the number of Civil/Structural Engineers (+NPH) is based on 71 Cat. II/III Facilities.

The data provided by the EM and NNSA Field and Area Offices (Tables 3 and 4) are compared to the theoretical data from Table 5 to determine if the field data are over- or under-conservative. To perform this evaluation, the data in Tables 3, 4 and 5 are normalized by dividing the number of systems in each category by the number of system experts needed to perform oversight. The theoretical, NNSA and EM normalized data are listed in Table 6. This normalized data can be used as a gauge to determine if the data provided by the Field and Area Offices are reasonable and adequate.

Table 6 – Number of Systems that One FTE Can Oversee			
System Category	Table 5 Theoretical Needs	Table 3 NNSA System Experts Needed	Table 4 EM System Experts Needed
Confinement Ventilation	6	5	10
Fire Protection	6	7	8
Electrical	6	7	29
Radiation Monitoring	7	6	12
Hoist & Crane	10	8	11
Process	8	15	5
Commun-ication	8	0	30
Gas & Air	7	5	8
Other	3	5	3
Average	6	7	10
Footnotes: The data are rounded up to the next whole number			

While there may be some concerns when evaluating the data in Table 6, the data provided by the field are generally reasonable and adequate, and is consistent with the traditional concept of "span of control' accepted in commercial industry. Both EM and NNSA Field and Area Offices may have underestimated the number of system experts needed to effectively oversee various safety system categories. For example, the Amarillo Area Office indicated that only 0.1 FTE was needed to oversee 14 Electrical Power systems (or 140 systems per FTE); the Savannah River Site indicated that only 0.7 FTE was needed to oversee 31 Radiation Monitoring systems (or 44 systems per FTE); and Rocky Flats indicated that only 0.1 FTE was needed to oversee 6 Communication systems (or 60 systems per FTE). While these differences may appear to be significant, the complexity of each of these systems must be considered to determine if the differences are truly significant. Additionally, too much emphasis should not be placed on interpreting what these numbers mean as the numbers alone do not ensure that effective oversight will be accomplished. The Field and Area Offices should use this data as a starting point to identify where technical skill gaps exist. (These gaps and means to address the gaps are discussed later in this report.) The Offices should use the numbers presented in these tables cautiously as they continue to ensure that sufficient resources are available to provide effective oversight and not rely on numbers alone.

One method available to improve the estimates of the number of systems experts needed is to develop Facility Oversight Charts for each facility that contains safety systems. An example Facility Oversight Chart is shown in Attachment B, Figure B1. This Chart shows each System Category, technical discipline and safety management program essential for ensuring system operability, as well as the system/program expert responsible for conducting the oversight. Each system within the facility is then assigned to a system/program expert as shown in Attachment B, Table B1. After this process is completed for all facilities and all systems are assigned, a table is developed for each system/program expert that clearly identifies all the safety systems for which he/she is responsible (similar to Attachment B, Table B2). Using this process, it should be very clear if a particular system/program expert is overloaded, if additional (or fewer) system experts are needed, and where critical technical skill gaps exist. As with previous data, the Field and Area Offices should use the information developed in these charts and tables cautiously. The need for additional system/program experts should be based on the long-term need for projected workload requirements, supplemented by additional temporary resources for peak workload needs. The workload tasks in a given period and for a given safety system should then be distributed based on the particular skills and strengths of the system/program expert and their availability.

As discussed in their December 2001 meeting, the majority of the Federal Technical Capabilities Panel (FTCP) Agents concurred that developing charts and tables similar to those shown in Attachment B would be beneficial. The FTCP will consider including action items in their 2002 Annual Plan for each Field and Area Office to develop Facility Oversight Charts (Figure B1) and Safety System Assignment Charts (Table B1) for each facility, and System/Program Expert Oversight Charts (Table B2) for each system/program expert. The FTCP will also consider adding an action item to evaluate the data from this alternate process and make recommendations to the Field and Area Office Managers. These actions will provide the necessary framework for the FTCP to continue to improve the identification of system expertise needed at the Federal level and the identification of personnel available to ensure effective oversight of contractor safety systems.

Efforts will continue to enhance the Department's understanding of staff needs for effective oversight of contractor safety systems. In the interim, the data in Tables 3 and 4 (and the corresponding Field and Area Office Tables in Attachment A) provide reasonable and acceptable data for both the system expertise needed and available to ensure effective oversight of Vital Safety Systems. This satisfies Commitment 17 in the DOE Implementation Plan for DNFSB Recommendation 2000-2.

Commitment #18 - Field Office Technical Expertise Data and Gap Analysis:

Each of the Field and Area Offices submitted estimates of the number of system experts needed to perform Federal Oversight of Vital Safety Systems. The roll-up of technical capability by Office and by System Category is shown in Tables 3 and 4; whereas, the individual inputs from each of the Offices is listed in Attachment A. (Note: 1) The NNSA Savannah River Area Office numbers are included in the EM Savannah River Operations Office data, and 2) The EM Oakland Operations Office and Nevada Operations Office numbers are included in the NNSA data for these facilities.) From this data, Tables 7 and 8 were prepared displaying the current technical gaps by System Category and by technical discipline.

Between NNSA and EM, almost 31 additional FTEs are needed to provide the necessary and sufficient oversight of contractor safety systems (see Table 9). The most significant technical expertise gaps are mechanical engineering (11.45 FTEs), fire protection (6 FTEs), electrical engineering (5.2 FTEs), instrumentation and control (3.6 FTEs), and criticality (3 FTEs). Most of these gaps are spread across several system categories. Approximately two-thirds of the technical gaps reside within four Field and Area Offices: Office of River Protection (7 FTEs – Table A15), Los Alamos Area Office (6.5 FTEs – Table A4), Oakland Area Office (4.25 FTEs – Table A6), and Y-12 Area Office (4 FTEs – Table A9). All other Offices have technical gaps that are comprised of fewer than 3 FTEs per site. Several Offices identified no technical skill gaps: Oak Ridge Operations Office (EM and NNSA), Idaho Operations Office, Savannah River Operations Office, Ohio Field Office (Fernald and Mound) and Carlsbad Area Office. Although a number of reports previously identified significant technical skill gaps in criticality safety, this analysis does not indicate that this is the case, with the exception of the Y-12 Area Office and the Los Alamos Area Office. Two criticality experts are needed at the Y-12 (Table A9) while one criticality expert is needed at Los Alamos (Table A4).

There are near and long term options available to address these technical gaps. In the near term, existing staff within the NNSA Headquarters' Office of Environment, Safety and Health Operations Support, and existing staff within the Albuquerque Operations Office are available to provide technical expertise. The expertise within these offices is summarized in Table 9 as well as the total NNSA and EM technical gaps from Tables 7 and 8. As Table 9 shows, several of the technical gaps can be reduced using the existing additional technical support; however, the number and expertise of NNSA Headquarters and Albuquerque qualified personnel are not sufficient to close all the skill gaps. Although not shown in Table 9, other technically qualified personnel may be available within Headquarters (EM and Office of Environment, Safety and Health (EH)) to further reduce the skill gaps. Additionally, support service contractors have been and will continue to be a valuable resource to DOE, and are fully capable of providing technical support to reduce the critical technical skill gaps. Not withstanding, more than 20 FTEs are still needed to ensure effective oversight of contractor safety systems, the majority in the mechanical engineering field.

Table 7 – Technical Skill Gaps (NNSA)												
System Category	Technical Discipline Areas (consistent with TQP)											
	NE	ME	EE	I/C	CRIT	ChE Pr E	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	0	2.4	0	0.5	0	0	0	0	0	0	0	2.9
Fire Protection	0	0.6	0	0.5	0	0	4	0	0	0	0	5.1
Electrical	0	0.1	1.5	0	0	0	0	0	0	0	0	1.6
Radiation Monitoring	0	0.2	0.5	0.1	2	0	0	0	1	0	0	3.8
Hoist & Crane	0	0.8	0	0	0	0	0	0	0	0	0	0.8
Process	0	1.1	0.9	0.5	1	0	0	0	0	0	0	3.5
Commun-ication	0	0	0	0	0	0	0	0	0	0	0	0
Gas & Air	0	0.8	0	0	0	0	0	0	0	0	0	0.8
Other	0	1.15	1	0	0	0	0	0	0	0.5	0	2.65
Total	0	7.15	3.9	1.6	3	0	4	0	1	0.5	0	21.15

Table 8 – Technical Skill Gaps (EM)												
System Category	Technical Discipline Areas (consistent with TQP)											
	NE	ME	EE	I/C	CRIT	ChE Pr E	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	0	2.5	0	0	0	0	0	0	0	0	0	2.5
Fire Protection	0	0	0	0	0	0	2	0	0	0	0	2
Electrical	0	0	1.3	0	0	0	0	0	0	0	0	1.3
Radiation Monitoring	0	0	0	2	0	0	0	0	0	0	0	2
Hoist & Crane	0	0	0	0	0	0	0	0	0	0	0	0
Process	0	1.15	0	0	0	0	0	0	0	0	0	1.15
Commun-ication	0	0	0	0	0	0	0	0	0	0	0	0
Gas & Air	0	0.65	0	0	0	0	0	0	0	0	0	0.65
Other	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	4.3	1.3	2	0	0	2	0	0	0	0	9.6

Table 9 – Resources Available to Address Technical Gaps												
Category	Technical Discipline Areas (consistent with TQP)											
	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
Technical Gaps NNSA & EM	0	11.45	5.2	3.6	3	0	6	0	1	0.5	0	30.75
ES&H (NNSA)	6	1	1	1	0	1	1	2	1	3	0	17
AL	0.5	0	1.5	1	1	0.5	1	3	2.5	0	2	13
Total Needed	0	10.45	2.7	1.6	2	0	4	0	0	0	0	20.75

Two groups of highly trained and qualified personnel that have not yet been discussed are the Authorization Basis (AB) staff and Facility Representative (FR) staff at each of the Field and Area Offices. Most of these personnel have engineering backgrounds and are available to perform safety system oversight as needed. Additionally, most Field and Area Office sites are organized such that the AB and FR staffs perform a level of oversight consistent with the number and type of facilities at each site. Therefore, the AB and FR staffs are available to supplement and enhance the oversight performed by personnel whose function is specifically related to a given technical discipline (such as Mechanical Engineer). This overall framework is important when developing judgments to address the critical technical gaps.

Table 10 summarizes the number of AB and FR staff available, the Safety System Expert staff available, the number of safety systems at each site, and the number of Category II and III Nuclear Facilities at each site. As Table 10 shows, there are a substantial number of technical personnel assigned to AB and FR positions who are capable of providing effective oversight and available to assist the safety system experts. These additional, existing resources also can be combined with the other measures discussed above to reduce the technical skill gaps.

Another option available to close the technical skill gaps is to obtain assistance from the personnel qualified in the Technical Qualification Program at each site. Numerous personnel are TQP qualified or are in the process of completing their qualifications; however, they do not posses the necessary knowledge, skills or abilities to be considered safety system experts. After receiving additional training involving facility safety systems, these TQP qualified personnel would be available to oversee safety systems thereby reducing the technical skill gaps.

Table 10 – Federal Oversight Staff Available

DOE Office and Number of Category II/III Nuclear Facilities	Number of Safety Systems	Safety System Expert Staff	Federal Oversight Authorization Basis Staff[4]	Federal Oversight Facility Representative Staff	Total Federal Oversight Staff
LAAO: 17	86	0	11[1]	18	29
AAO: 19	67	1	7	10	18
KAO: 4	28	0	2	9	11
AL[3]:0	0	13	4	0	17
OAK[2]: 8	30	2.4	4	10	16.4
YAO: 13	31	3	2	7	12
SR (NNSA): 8	See Note 5	See Note 5	5	3	8[5]
NV[2]: 3	16	7	3	8	18
ORO (NNSA Support): 1	9	6	0.2	1	7.2
RF: 16	48	1.4	4	15	20.4
ID: 23	22	2.3	7	18	27.3
SR (EM): 17	229	22	18	36	76
RL: 29	102	5	7	20	32
RP: 5	35	0	4	6	10
OH-F: 2	6	2	1.3[6]	6	9.3[6]
OH-M: 5	16	4.2	17[6]	4	25.2[6]
CB: 2	8	1.3	1	1	3.3
ORO (EM): 32	3	0.1	2	17	19.1
Totals: 204[2]	736	70.7	99.5	189	359.2

Footnotes: (1) Numbers include 3 contractor FTE's; (2) For OAK list includes 5 EM facilities, for NVO list includes 2 EM facilities, and total number of facilities is 67 for NNSA; (3) AL provides support to LAAO, AAO, and KAO; (4) Some Offices may have included AB staff into their safety system expert staff data; (5) The NNSA Savannah River Area Office safety system expert numbers are included in the Savannah River (SR) Operations Office data; (6) The AB staff data from the Ohio Offices may not be up to date.

The Field and Area Offices have Agents reporting to the Federal Technical Capability Panel. These Agents reviewed ongoing hiring actions to determine if technical skill gaps identified in this report are being addressed as urgent needs. It was found that ongoing hiring actions are not focused on these areas of expertise. The Field and Area Office Managers should consider the expertise that resides at designated closure sites when developing hiring plans. Rather than hiring new personnel, strong consideration should be given to transferring existing safety systems experts from closure sites to sites that have critical technical skill gaps. Timing will play a major role in this human capital initiative, as it must be known when the personnel will become available. This option will not resolve the near term technical skill gaps, but should provide long term benefits if properly managed.

The FTCP 2002 Annual Plan will contain an action item to transmit this report to each of the Field and Area Office Managers. For those Offices that are in need of additional safety system expertise, this report can be used by Managers to locate other sites where experts (safety system, AB and FR) are available to provide them assistance. This report may also be used to assist Managers by focusing ongoing hiring actions in technical disciplines needed in their Office to ensure critical technical skill gaps are reduced.

Tables 7 and 8 identify additional safety system expertise the Department needs to effectively review safety systems and programs essential to system operability. This report also identified several means the Department has available to address critical technical skill gaps. This satisfies Commitment 18 in the DOE Implementation Plan for DNFSB Recommendation 2000-2.

Conclusions:

An extensive effort has been undertaken to compile data associated with the Federal staff that performs technical oversight of safety systems, to determine if gaps exist in critical technical expertise, and to provide a means to address these gaps. This analysis has identified gaps in mechanical engineering, fire protection, electrical engineering, instrumentation, control, and criticality. Two-thirds of the skill gaps reside within four Field and Area Offices: Office of River Protection, Los Alamos Area Office, Oakland Area Office, and Y-12 Area Office. These gaps can be partially addressed in the near-term using technical expertise available at Headquarters and Albuquerque, using DOE support service contractors, and using the AB and FR staff at the sites. Other long-term actions may be warranted. These include: 1) Accelerating hiring actions to close technical gaps, 2) Cross training and qualifying existing TQP qualified personnel to develop them into safety system experts, or 3) Transferring (at an appropriate time) existing safety systems experts from closure sites to sites that have technical skill gaps.

Additional research is also needed to fully determine the staff requirements for effective contractor safety system oversight. Consideration will be given to developing Facility Oversight Charts and Safety System Assignment Charts for each facility, and System/Program Expert Oversight Charts for each system/program expert to provide an improved framework for identifying the system expertise needed at the Federal level. These actions may identify larger (or smaller) technical skill gaps, identify the need for additional (or fewer) system experts are needed, and identify where critical technical skill gaps exist.

This report documents completion of Commitments 17 and 18 in the DOE Implementation Plan for DNFSB Recommendation 2000-2. The data in Tables 3 and 4 (and the corresponding Field and Area Office Tables in Attachment A) provide reasonable and acceptable data for both the system expertise needed and available to ensure effective oversight of safety systems. Tables 7 and 8 identify the additional safety system expertise the Department needs to effectively review safety systems and programs essential to system operability. This report also identifies several means the Department has available to address critical technical skill gaps.

Attachment A

Table A1 – NNSA Technical Capability by Site and System Category

Site	System Category																											Total FTE Needs		
	Confinement Ventilation			Fire Protection			Electrical Power			Radiation Monitoring			Hoist & Crane			Process			Comuni-cations			Gas & Air			Other					
	# of Sys.	# FT Av.	# FT Nd.	# of Sys.	# FT Av.	# FT Nd	# of Sys.	# FT Av.	# FT Nd	# of Sys.	# FT Av.	# FT Nd	# of Sys.	# FT Av.	# FT Nd	# of Sys.	# FT Av.	# FT Nd	# of Sys.	# FT Av.	# FT Nd	# of Sys.	# FT Av.	# FT Nd	# of Sys.	# FT Av.	# FT Nd	# of Sys.	# FT Av.	# FT Nd
LAAO	12	0	1	16	0	1	5	0	1	16	0	1	1	0	0.5	20	0	1.5	4	0	0	6	0	0.5	6	0	0	86	0	6.5
AAO	0	0	0	13	1	1.6	14	0	0.1	15	0	0.2	12	0	0.1	4	0	0.3	0	0	0	0	0	0	9	0	1.4	67	1	3.7
KAO	2	0	0.5	0	0	0	1	0	0	1	0	0.1	1	0	0.2	23	0	1.2	0	0	0	0	0	0	0	0	0	28	0	2
AL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0
NV	3	2	3.5	6	1	1.5	1	2	2	1	2	2	0	0	0	4	0	0.5	0	0	0	1	0	0.2	0	0	0	16	7	9.7
OAK	13	0.4	1.3	11	0	1.5	2	0	0.5	2	1	1	0	0	0	0	0	0	0	0	0	2	0	0.1	0	1	2.25	30	2.4	6.65
ORO	4	3	2	2	1	1	0	0	0	1	1	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	9	6	5
YAO	5	0.9	0.9	10	1	2.5	0	0	0	15	1	3.5	0	0	0	0	0	0	0	0	0	1	0.1	0.1	0	0	0	31	3	7

# of Sys. = number of Safety Systems, # FT Av. = number of available FTEs, # FT Nd. = number of needed FTEs. The NNSA Savannah River site office federal numbers are included in the data compiled by EM (Table A13).

Table A2 – Summary of Needs: NNSA-AAO													
System Category	Technical Oversight (Consistent with TQP)												
	# of Sys.	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Fire Protection	13	0	0	0	0	0	0	1	0	0	0	0	1
		0	0.6	0	0	0	0	1	0	0	0	0	1.6
Electrical	14	0	0	0	0	0	0	0	0	0	0	0	0
		0	0.1	0	0	0	0	0	0	0	0	0	0.1
Radiation Monitoring	15	0	0	0	0	0	0	0	0	0	0	0	0
		0	0.2	0	0	0	0	0	0	0	0	0	0.2
Hoist & Cranes	12	0	0	0	0	0	0	0	0	0	0	0	0
		0	0.1	0	0	0	0	0	0	0	0	0	0.1
Process	4	0	0	0	0	0	0	0	0	0	0	0	0
		0	0.3	0	0	0	0	0	0	0	0	0	0.3
Communi-cation	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Gas & Air	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other	9	0	0	0	0	0	0	0	0	0	0	0	0
		0	0.4	1	0	0	0	0	0	0	0	0	1.4
Total	67	0	0	0	0	0	0	1	0	0	0	0	1
		0	1.7	1	0	0	0	1	0	0	0	0	3.7
Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed.													

Table A3 – Summary of Needs: NNSA-KAO													
System Category	Technical Oversight (Consistent with TQP)												
	# of Sys.	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	2	0	0	0	0	0	0	0	0	0	0	0	0
		0	0.5	0	0	0	0	0	0	0	0	0	0.5
Fire Protection	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Electrical	1	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Radiation Monitoring	1	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0.1	0	0	0	0	0	0	0	0.1
Hoist & Cranes	1	0	0	0	0	0	0	0	0	0	0	0	0
		0	0.2	0	0	0	0	0	0	0	0	0	0.2
Process	23	0	0	0	0	0	0	0	0	0	0	0	0
		0	0.3	0.9	0	0	0	0	0	0	0	0	1.2
Communi-cation	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Gas & Air	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Total	28	0	0	0	0	0	0	0	0	0	0	0	0
		0	1	0.9	0.1	0	0	0	0	0	0	0	2
Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed.													

Table A4 – Summary of Needs: NNSA-LAAO													
System Category	Technical Oversight (Consistent with TQP)												
	# of Sys.	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	12	0	0	0	0	0	0	0	0	0	0	0	0
		0	0.5	0	0.5	0	0	0	0	0	0	0	1
Fire Protection	16	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	1	0	0	0	0	1
Electrical	5	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	1	0	0	0	0	0	0	0	0	1
Radiation Monitoring	16	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	1	0	0	1
Hoist & Cranes	1	0	0	0	0	0	0	0	0	0	0	0	0
		0	0.5	0	0	0	0	0	0	0	0	0	0.5
Process	20	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0.5	1	0	0	0	0	0	0	1.5
Communi-cation	4	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Gas & Air	6	0	0	0	0	0	0	0	0	0	0	0	0
		0	0.5	0	0	0	0	0	0	0	0	0	0.5
Other	6	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Total	86	0	0	0	0	0	0	0	0	0	0	0	0
		0	1.5	1	1	1	0	1	0	1	0	0	6.5
Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed.													

Table A5 – Summary of Needs: NNSA-AL													
System Category	Technical Oversight (Consistent with TQP)												
	# of Sys.	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Fire Protection	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Electrical	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Radiation Monitoring	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Hoist & Cranes	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Communi-cation	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Gas & Air	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0.5	0	1.5	1	1	0.5	1	3	2.5	0	2	13
		0	0	0	0	0	0	0	0	0	0	0	0
Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed.													

Table A6 – Summary of Needs: NNSA-OAK

System Category	Technical Oversight (Consistent with TQP)												
	# of Sys.	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	13	0	0	0	0	0	0	0	0.2	0.2	0	0	0.4
		0	0.9	0	0	0	0	0	0.2	0.2	0	0	1.3
Fire Protection	11	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	1.5	0	0	0	0	1.5
Electrical	2	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0.5	0	0	0	0	0	0	0	0	0.5
Radiation Monitoring	2	0	0	0	0	1	0	0	0	0	0	0	1
		0	0	0	0	1	0	0	0	0	0	0	1
Hoist & Cranes	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Communi-cation	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Gas & Air	2	0	0	0	0	0	0	0	0	0	0	0	0
		0	0.1	0	0	0	0	0	0	0	0	0	0.1
Other	0	0	0.25	0	0	0	0	0	0	0	0.75	0	1
		0	1	0	0	0	0	0	0	0	1.25	0	2.25
Total	30	0	0.25	0	0	1	0	0	0.2	0.2	0.75	0	2.4
		0	2	0.5	0	1	0	1.5	0.2	0.2	1.25	0	6.65

Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed.

Table A7 – Summary of Needs: NNSA-NV

System Category	Technical Oversight (Consistent with TQP)												
	# of Sys.	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	3	0	0	0	0	0	0	0	2	0	0	0	2
		0	1.5	0	0	0	0	0	2	0	0	0	3.5
Fire Protection	6	0	0	0	0	0	0	1	0	0	0	0	1
		0	0	0	0	0	0	1.5	0	0	0	0	1.5
Electrical	1	0	0	1	0	0	0	0	1	0	0	0	2
		0	0	1	0	0	0	0	1	0	0	0	2
Radiation Monitoring	1	0	0	0	0	1	0	0	0	1	0	0	2
		0	0	0	0	1	0	0	0	1	0	0	2
Hoist & Cranes	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Process	4	0	0	0	0	0	0	0	0	0	0	0	0
		0	0.5	0	0	0	0	0	0	0	0	0	0.5
Communi-cation	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Gas & Air	1	0	0	0	0	0	0	0	0	0	0	0	0
		0	0.2	0	0	0	0	0	0	0	0	0	0.2
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Total	16	0	0	1	0	1	0	1	3	1	0	0	7
		0	2.2	1	0	1	0	1.5	3	1	0	0	9.7

Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed.

Table A8 – Summary of Needs: NNSA-ORO (Support)

System Category	Technical Oversight (Consistent with TQP)												
	# of Sys.	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	4	0	3	0	0	0	0	0	0	0	0	0	3
		0	2	0	0	0	0	0	0	0	0	0	2
Fire Protection	2	0	0	0	0	0	0	1	0	0	0	0	1
		0	0	0	0	0	0	1	0	0	0	0	1
Electrical	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Radiation Monitoring	1	0	0	1	0	0	0	0	0	0	0	0	1
		0	0	1	0	0	0	0	0	0	0	0	1
Hoist & Cranes	2	0	1	0	0	0	0	0	0	0	0	0	1
		0	1	0	0	0	0	0	0	0	0	0	1
Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Communi-cation	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Gas & Air	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Total	9	0	4	1	0	0	0	1	0	0	0	0	6
		0	3	1	0	0	0	1	0	0	0	0	5

Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed.

Table A9 – Summary of Needs: NNSA-YA0

System Category	Technical Oversight (Consistent with TQP)												
	# of Sys.	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	5	0	0.9	0	0	0	0	0	0	0	0	0	0.9
		0	0.9	0	0	0	0	0	0	0	0	0	0.9
Fire Protection	10	0	0	0	0	0	0	1	0	0	0	0	1
		0	0	0	0.5	0	0	2	0	0	0	0	2.5
Electrical	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Radiation Monitoring	15	0	0	0	0	1	0	0	0	0	0	0	1
		0	0	0.5	0	3	0	0	0	0	0	0	3.5
Hoist & Cranes	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Communi-cation	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Gas & Air	1	0	0.1	0	0	0	0	0	0	0	0	0	0.1
		0	0.1	0	0	0	0	0	0	0	0	0	0.1
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Total	31	0	1	0	0	1	0	1	0	0	0	0	3
		0	1	0.5	0.5	3	0	2	0	0	0	0	7

Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed.

Table A10 – EM Technical Capability by Site and Safety System Category

Site	System Category																													Total FTE Needs		
	Confinement Ventilation			Fire Protection			Electrical Power			Radiation Monitoring			Hoist & Crane			Process			Communi-cations			Gas & Air			Other					
	# of Sys.	# FT Av.	# FT Nd.	# of Sys.	# FT Av.	# FT Nd	# of Sys.	# FT Av.	# FT Nd	# of Sys.	# FT Av.	# FT Nd	# of Sys.	# FT Av.	# FT Nd	# of Sys.	# FT Av.	# FT Nd	# of Sys.	# FT Av.	# FT Nd	# of Sys.	# FT Av.	# FT Nd	# of Sys.	# FT Av.	# FT Nd	# of Sys.	# FT Av.	# FT Nd
RF	9	0	.3	10	.3	.3	5	.3	.3	11	.5	.5	0	0	0	4	.1	.1	6	.1	.1	3	.1	.1	0	0	0	48	1.4	1.7
ID	3	.3	.3	2	.2	.2	1	.1	.1	6	.6	.6	3	.3	.3	5	.5	.5	0	0	0	0	0	0	2	.3	.3	22	2.3	2.3
SR	24	2.6	2.6	7	1.6	1.6	105	2.2	2.2	31	.7	.7	3	.1	.1	39	10.4	10.4	0	0	0	16	1.6	1.6	4	2.8	2.8	229	22	22
RL	31	1.2	1.4	27	1	2	5	.1	.4	14	2	2	1	.2	.2	16	.4	.8	2	0	0	5	.1	.5	1	0	0	102	5	7.3
RP	9	0	2	7	0	1	1	0	1	12	0	2	0	0	0	4	0	.75	0	0	0	2	0	.25	0	0	0	35	0	7
OH-F	0	0	0	1	1.3	1.3	0	0	0	1	.2	.2	0	0	0	0	0	0	0	0	0	0	0	0	4	.5	.5	6	2	2
OH-M	2	1.5	1.5	2	.2	.2	0	0	0	5	.5	.5	0	0	0	0	0	0	0	0	0	3	1	1	4	1	1	16	4.2	4.2
CB	2	.3	.3	1	.2	.2	0	0	0	1	.3	.3	2	.2	.2	0	0	0	1	.2	.2	0	0	0	1	.1	.1	8	1.3	1.3
ORO	0	0	0	0	0	0	0	0	0	3	.1	.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	.1	.1
Total	80	6.9	9.4	57	5.8	6.8	117	2.7	4	84	6.9	8.9	9	.8	.8	68	11.4	12.95	9	1.3	1.3	29	2.8	3.45	16	4.7	4.7	469	38.3	47.9

# of Sys. = Number of Safety Systems, # FT Av. = Number of available FTEs, # FT Nd. = Number of needed FTEs. The NNSA Savannah River site office federal numbers are included in the data compiled by EM (Table A13).

Table A11 – Summary of Needs: EM-RF													
System Category	Technical Oversight (Consistent with TQP)												
	# of Sys.	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	9	0	0	0	0	0	0	0	0	0	0	0	0
		0	0.3	0	0	0	0	0	0	0	0	0	0.3
Fire Protection	10	0	0	0	0	0	0	0.3	0	0	0	0	0.3
		0	0	0	0	0	0	0.3	0	0	0	0	0.3
Electrical	5	0	0	0.3	0	0	0	0	0	0	0	0	0.3
		0	0	0.3	0	0	0	0	0	0	0	0	0.3
Radiation Monitoring	11	0	0	0	0	0.3	0	0	0	0.2	0	0	0.5
		0	0	0	0	0.3	0	0	0	0.2	0	0	0.5
Hoist & Cranes	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Process	4	0	0	0	0	0	0.1	0	0	0	0	0	0.1
		0	0	0	0	0	0.1	0	0	0	0	0	0.1
Communi-cation	6	0	0	0.1	0	0	0	0	0	0	0	0	0.1
		0	0	0.1	0	0	0	0	0	0	0	0	0.1
Gas & Air	3	0	0	0	0	0	0.1	0	0	0	0	0	0.1
		0	0	0	0	0	0.1	0	0	0	0	0	0.1
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Total	48	0	0	0.4	0	0.3	0.2	0.3	0	0.2	0	0	1.4
		0	0.3	0.4	0	0.3	0.2	0.3	0	0.2	0	0	1.7

Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed.

Table A12 – Summary of Needs: EM-ID													
System Category	Technical Oversight (Consistent with TQP)												
	# of Sys.	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	3	0.1	0.2	0	0	0	0	0	0	0	0	0	0.3
		0.1	0.2	0	0	0	0	0	0	0	0	0	0.3
Fire Protection	2	0	0	0	0	0	0	0.2	0	0	0	0	0.2
		0	0	0	0	0	0	0.2	0	0	0	0	0.2
Electrical	1	0	0	0.1	0	0	0	0	0	0	0	0	0.1
		0	0	0.1	0	0	0	0	0	0	0	0	0.1
Radiation Monitoring	6	0	0	0	0	0	0	0	0	0.6	0	0	0.6
		0	0	0	0	0	0	0	0	0.6	0	0	0.6
Hoist & Cranes	3	0	0.2	0	0	0.1	0	0	0	0	0	0	0.3
		0	0.2	0	0	0.1	0	0	0	0	0	0	0.3
Process	5	0	0.3	0.2	0	0	0	0	0	0	0	0	0.5
		0	0.3	0.2	0	0	0	0	0	0	0	0	0.5
Communi-cation	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Gas & Air	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other	2	0.1	0.2	0	0	0	0	0	0	0	0	0	0.3
		0.1	0.2	0	0	0	0	0	0	0	0	0	0.3
Total	22	0.2	0.9	0.3	0	0.1	0	0.2	0	0.6	0	0	2.3
		0.2	0.9	0.3	0	0.1	0	0.2	0	0.6	0	0	2.3

Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed.

Table A13 – Summary of Needs: EM-SR													
System Category	Technical Oversight (Consistent with TQP)												
	# of Sys.	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	24	1.1	1.5	0	0	0	0	0	0	0	0	0	2.6
		1.1	1.5	0	0	0	0	0	0	0	0	0	2.6
Fire Protection	7	0.6	0	0	0	0	0	1	0	0	0	0	1.6
		0.6	0	0	0	0	0	1	0	0	0	0	1.6
Electrical	105	1.2	0	1	0	0	0	0	0	0	0	0	2.2
		1.2	0	1	0	0	0	0	0	0	0	0	2.2
Radiation Monitoring	31	0.7	0	0	0	0	0	0	0	0	0	0	0.7
		0.7	0	0	0	0	0	0	0	0	0	0	0.7
Hoist & Cranes	3	0.1	0	0	0	0	0	0	0	0	0	0	0.1
		0.1	0	0	0	0	0	0	0	0	0	0	0.1
Process	39	3.9	2	0	1	1.5	2	0	0	0	0	0	10.4
		3.9	2	0	1	1.5	2	0	0	0	0	0	10.4
Communi-cation	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Gas & Air	16	1.1	0.5	0	0	0	0	0	0	0	0	0	1.6
		1.1	0.5	0	0	0	0	0	0	0	0	0	1.6
Other	4	0.8	0	0	1	0	0	0	0	0	1	0	2.8
		0.8	0	0	1	0	0	0	0	0	1	0	2.8
Total	229	9.5	4	1	2	1.5	2	1	0	0	1	0	22
		9.5	4	1	2	1.5	2	1	0	0	1	0	22
Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed.													

Table A14 – Summary of Needs: EM-RL													
System Category	Technical Oversight (Consistent with TQP)												
	# of Sys.	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	31	0	1	0	0.1	0	0	0	0	0.1	0	0	1.2
		0	1.2	0	0.1	0	0	0	0	0.1	0	0	1.4
Fire Protection	27	0	0	0	0	0	0	1	0	0	0	0	1
		0	0	0	0	0	0	2	0	0	0	0	2
Electrical	5	0	0	0	0.1	0	0	0	0	0	0	0	0.1
		0	0	0.3	0.1	0	0	0	0	0	0	0	0.4
Radiation Monitoring	14	0	0	0	0.2	1.5	0	0	0	0.3	0	0	2
		0	0	0	0.2	1.5	0	0	0	0.3	0	0	2
Hoist & Cranes	1	0	0.2	0	0	0	0	0	0	0	0	0	0.2
		0	0.2	0	0	0	0	0	0	0	0	0	0.2
Process	16	0	0	0	0.3	0	0	0	0	0.1	0	0	0.4
		0	0	0	0.3	0	0	0	0	0.1	0	0	0.8
Communi-cation	2	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Gas & Air	5	0	0	0	0.1	0	0	0	0	0	0	0	0.1
		0	0.4	0	0.1	0	0	0	0	0	0	0	0.5
Other	1	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Total	102	0	1.2	0	0.8	1.5	0	1	0	0.5	0	0	5
		0	2.2	0.3	0.8	1.5	0	2	0	0.5	0	0	7.3
Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed.													

Table A15 – Summary of Needs: EM-RP

System Category	# of Sys.	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
		Technical Oversight (Consistent with TQP)											
Confinement Ventilation	9	0	0	0	0	0	0	0	0	0	0	0	0
		0	2	0	0	0	0	0	0	0	0	0	2
Fire Protection	7	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	1	0	0	0	0	1
Electrical	1	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	1	0	0	0	0	0	0	0	0	1
Radiation Monitoring	12	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	2	0	0	0	0	0	0	0	2
Hoist & Cranes	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Process	4	0	0	0	0	0	0	0	0	0	0	0	0
		0	0.75	0	0	0	0	0	0	0	0	0	0.75
Communi-cation	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Gas & Air	2	0	0	0	0	0	0	0	0	0	0	0	0
		0	0.25	0	0	0	0	0	0	0	0	0	0.25
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Total	35	0	0	0	0	0	0	0	0	0	0	0	0
		0	3	1	2	0	0	1	0	0	0	0	7

Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed.

Table A16 – Summary of Needs: EM-OH(F)

System Category	# of Sys.	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
		Technical Oversight (Consistent with TQP)											
Confinement Ventilation	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Fire Protection	1	0	0	0	0	0	0	1	0	0.3	0	0	1.3
		0	0	0	0	0	0	1	0	0.3	0	0	1.3
Electrical	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Radiation Monitoring	1	0	0	0	0	0	0	0	0	0.2	0	0	0.2
		0	0	0	0	0	0	0	0	0.2	0	0	0.2
Hoist & Cranes	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Communi-cation	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Gas & Air	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other	4	0	0	0	0	0	0	0	0	0.5	0	0	0.5
		0	0	0	0	0	0	0	0	0.5	0	0	0.5
Total	6	0	0	0	0	0	0	1	0	1	0	0	2
		0	0	0	0	0	0	1	0	1	0	0	2

Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed.

Table A17 – Summary of Needs: EM-OH(M)													
System Category	Technical Oversight (Consistent with TQP)												
	# of Sys.	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	2	0	0.5	0.5	0	0	0	0	0	0.5	0	0	1.5
		0	0	0.5	0	0	0	0	0	0.5	0	0	1.5
Fire Protection	2	0	0	0	0	0	0	0.2	0	0	0	0	0.2
		0	0	0	0	0	0	0.2	0	0	0	0	0.2
Electrical	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Radiation Monitoring	5	0	0	0	0	0	0	0	0	0.5	0	0	0.5
		0	0	0	0	0	0	0	0	0.5	0	0	0.5
Hoist & Cranes	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Communi-cation	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Gas & Air	3	0	0.5	0	0	0	0.5	0	0	0	0	0	1
		0	0.5	0	0	0	0.5	0	0	0	0	0	1
Other	4	0	0	0	0	0	0	0	1	0	0	0	1
		0	0	0	0	0	0	0	1	0	0	0	1
Total	16	0	1	0.5	0	0	0.5	0.2	1	1	0	0	4.2
		0	1	0.5	0	0	0.5	0.2	1	1	0	0	4.2
Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed.													

Table A18 – Summary of Needs: EM-CB													
System Category	Technical Oversight (Consistent with TQP)												
	# of Sys.	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	2	0	0	0.1	0	0	0	0	0	0	0	0	0.3
		0	0	0.1	0	0	0	0	0	0	0	0	0.3
Fire Protection	1	0	0.05	0.05	0	0	0	0.1	0	0	0	0	0.2
		0	0.05	0.05	0	0	0	0.1	0	0	0	0	0.2
Electrical	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Radiation Monitoring	1	0.1	0	0.1	0	0	0	0	0	0.1	0	0	0.3
		0.1	0	0.1	0	0	0	0	0	0.1	0	0	0.3
Hoist & Cranes	2	0	0.1	0.1	0	0	0	0	0	0	0	0	0.2
		0	0.1	0.1	0	0	0	0	0	0	0	0	0.2
Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Communi-cation	1	0	0	0.1	0	0	0	0	0	0	0	0.1	0.2
		0	0	0.1	0	0	0	0	0	0	0	0.1	0.2
Gas & Air	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other	1	0	0.1	0	0	0	0	0	0	0	0	0	0.1
		0	0.1	0	0	0	0	0	0	0	0	0	0.1
Total	8	0.1	0.45	0.45	0	0	0	0.1	0	0.1	0	0.1	1.3
		0.1	0.45	0.45	0	0	0	0.1	0	0.1	0	0.1	1.3
Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed.													

Table A19 – Summary of Needs: EM-ORO													
System Category	Technical Oversight (Consistent with TQP)												
	# of Sys.	NE	ME	EE	I/C	CRIT	ChE PrE	FP	OS IH	RP	C/SE NPH	EP	Total
Confinement Ventilation	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Fire Protection	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Electrical	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Radiation Monitoring	3	0.01	0	0	0	0.06	0	0	0	0.03	0	0	0.1
		0.01	0	0	0	0.06	0	0	0	0.03	0	0	0.1
Hoist & Cranes	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Communi-cation	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Gas & Air	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Total	3	0.01	0	0	0	0.06	0	0	0	0.03	0	0	0.1
		0.01	0	0	0	0.06	0	0	0	0.03	0	0	0.1

Note: The top (shaded) number is the number of available staff and the bottom (non-shaded) number is the number of staff needed.

Attachment B

Figure B1
Facility Oversight
(H-Canyon Example)

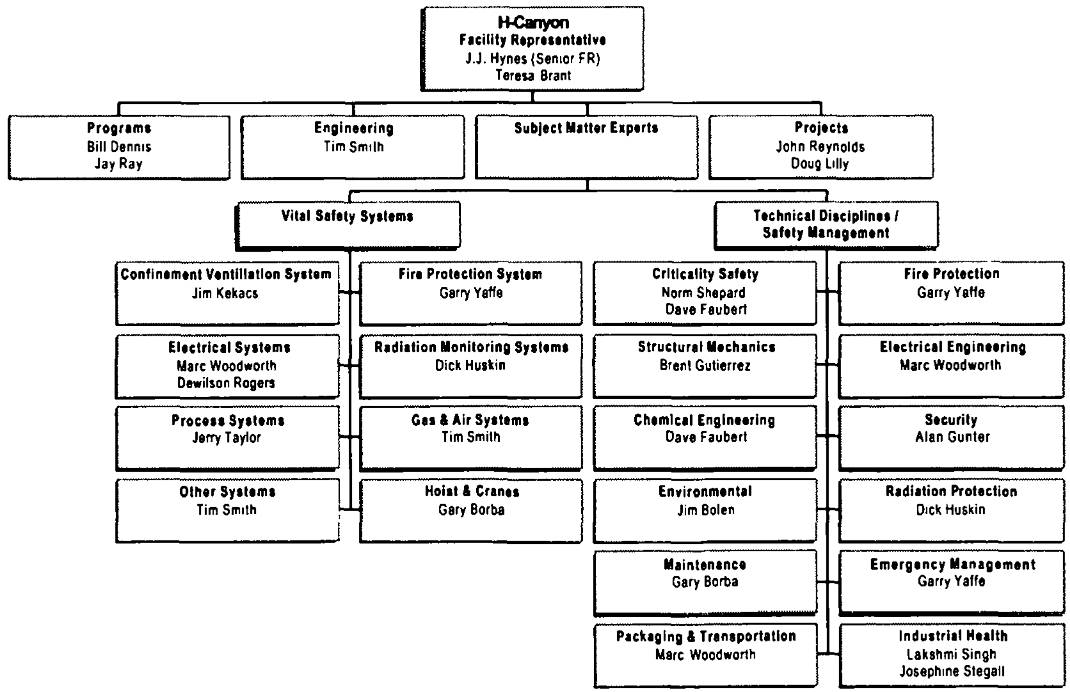

Table B1 – Safety System Assignment Chart

(EXAMPLE – H-Canyon)

Safety System	System Category	System Expert
Canyon Exhaust Fans A and C	Confinement Ventilation	James D. Kekacs
AAA Canyon Supply Fan Interlock for Low Can Exh Air Tunnel Vac	Confinement Ventilation / Electrical	DeWilson Rodgers
BBB Diesel Generator System	Electrical	Marc R. Woodworth
CCC Circulated Cooling Water Monitor and Alarms and Auto Timers	Process / Electrical	DeWilson Rodgers
DDD Circulated Cooling Water Diversion Valves and Motor Operators	Process	Jerald L. Taylor
EEE Segregated Cooling Water Delaying Basin Outlet Valves	Process	Jerald L. Taylor
High Temp Interlock and Alarms for Evap A, B, C, D, E, F	Process / Electrical	DeWilson Rodgers
Organic Tank Level and High Level Alarm on Decanters AA and BB	Process / Electrical	DeWilson Rodgers
Tank XXX High Level Alarm in Control Room	Process / Electrical	DeWilson Rodgers
ZZZ Segregated Cooling Water Activity Monitors and Alarms	Process / Electrical	DeWilson Rodgers
YYY Segregated Cooling Water Diversion Valves and Motor Operators	Process	Jerald L. Taylor
Mixer-Settler Neutron Monitor Interlocks	Process / Electrical	DeWilson Rodgers
Nuclear Incident Monitoring System	RP / Electrical	Richard L. Huskin
Head End Evaporator (AA.BB) Low Level Steam Cutoff Interlock	Process / Electrical	DeWilson Rodgers
Head End Strike Tank C.DD Low Level Steam Cutoff Interlock	Process / Electrical	DeWilson Rodgers
Head End Strike Tank XXX High Temperature Interlock	Process / Electrical	DeWilson Rodgers
1CU Evaporator (YYYY) Low Level Interlock	Process / Electrical	DeWilson Rodgers
Head End Evaporator XX.ZZ High Specific Gravity Interlock	Process / Electrical	DeWilson Rodgers
Evaporator YYYY Low Liquid Level Interlock	Process / Electrical	DeWilson Rodgers
Dissolvers A.B & C.D Condenser Cooling Water Interlock	Process / Electrical	DeWilson Rodgers
XXX Feed Tank YYY High Temperature Interlock	Process / Electrical	DeWilson Rodgers
AAA and BBB Uranium Analyzer Interlocks	Process / Electrical	DeWilson Rodgers
Mixer-Settler High Feed Temperature Interlocks	Process / Electrical	DeWilson Rodgers
Railroad Tunnel and Hot Crane Maintenance Shield Dr Perm Switch	Process / Electrical	DeWilson Rodgers
High Temperature Alarms on Tanks XXX, YYY and ZZZ	Process / Electrical	DeWilson Rodgers
Dissolvers XXX & YYY Air Purge Sys and Low Air Purge Steam Interlock	Process / Electrical	DeWilson Rodgers
PVV System to Include Filter Inlet Low Vacuum Alarms	Process	James D. Kekacs
Instrument Air Rot to Diss W & X and Evap Y& Z (Rot &Alrms)	Process / Electrical	DeWilson Rodgers
High Steam Pressure Interlock for Evap A, B, C, D, E, F, G, H, I	Process / Electrical	DeWilson Rodgers
High Temperature Interlocks and Alarms on Evaporators X, Y and Z	Process / Electrical	DeWilson Rodgers
ARU High Temperature Interlocks	Process / Electrical	DeWilson Rodgers
Low Liquid Level Pump Cutoff Interlock or ARU Feed Tank	Process / Electrical	DeWilson Rodgers
Flow Alarms for First Cycle Feed Streams AAA and ZZZ	Process / Electrical	DeWilson Rodgers
XXX Conductivity Meter and Interlock	Process / Electrical	DeWilson Rodgers
H-Canyon Section AAA Sump High Liquid Level Alarm	Process / Electrical	DeWilson Rodgers
Temperature Alarms for First Cycle Feed Streams XXX, YYY, and ZZZ	Process / Electrical	DeWilson Rodgers
The Coil Air Pressure System and Low Coil and Pressure Alarm	Process / Electrical	DeWilson Rodgers
Stack Monitors	RP / Electrical	Richard L. Huskin

Table B2 – System/Program Expert Oversight Charts

EXAMPLES

System/Program Expert Oversight Chart (James D. Kekacs)		
Facility	Safety System	System Category
235-F	235-F Facility Exhaust System	Confinement Ventilation
FB-Line	Room Exhaust System	Confinement Ventilation
FB-Line	Cabinet Exhaust System	Confinement Ventilation
FB-Line	Third Level Exhaust System	Confinement Ventilation
FB-Line	Hydrogen Dilution Vessel Vent Purge System	Process
FB-Line	Hydrogen Dilution Vessel Pneumatic Purge System	Process
F-Canyon	Canyon Exhaust Fans	Confinement Ventilation
F-Canyon	Process Vessel Ventilation System (PVV)	Process
HB-Line	Tornado Dampers	Confinement Ventilation
HB-Line	Glovebox Exhaust System	Confinement Ventilation
H-Canyon	Canyon Exhaust Fans A and C	Confinement Ventilation
H-Canyon	PVV System to Include Filter Inlet Low Vacuum Alarms	Process

System/Program Expert Oversight Chart (Marc R. Woodworth)		
Facility	Safety System	System Category
235-F	XXX-XX Standby Diesel Generator	Electrical
FB-Line	FB-Line Diesel Generator	Electrical
FB-Line	Electronic Balance for Cabinets A - B	Other
F-Canyon	XXX-X Electrical Distribution System	Electrical
F-Canyon	Coil Pr Control Sys (CASH Air System) for Vessel on Segregated Cooling Water Return Sys	Process / Electrical
HB-Line	Backup Power System	Electrical
H-Canyon	BBB Diesel Generator System	Electrical

DOE F 1325.8

United States Government Department of Energy (DOE)

memorandum

DATE: JAN 24 2002

REPLY TO ATTN OF: AMMFS (Schepens, 803/952-2486)

SUBJECT: Analysis of Safety System Federal Staff Expertise and Availability

TO: Francis S. Blake, Deputy Secretary of Energy (DS), HQ

Attached is the report, *Analysis of Safety System Federal Staff Expertise and Availability*. This report is provided to you consistent with Commitment 18 of the Department's Implementation Plan for the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 2000-2, *Configuration Management, Vital Safety Systems.*

An extensive effort was undertaken to compile data associated with the Federal staff that performs technical oversight of safety systems, to determine if critical technical skill gaps exist, and to provide a means to address these gaps. Through this analysis almost 31 additional Full Time Equivalents (FTEs) have been determined to be needed to provide the necessary and sufficient oversight of contractor safety systems.

The majority of the technical skill gaps are in mechanical engineering, fire protection, electrical engineering, instrumentation and control, and criticality. Two-thirds of the skill gaps reside within four Field and Area Offices: Office of River Protection, Los Alamos Area Office, Oakland Area Office, and Y-12 Area Office. These gaps can be partially addressed in the near-term using technical expertise available at Headquarters and Albuquerque, using DOE support service contractors, and using the Authorization Basis (AB) and Facility Representative (FR) staff at the sites. Other long-term actions may be warranted. These include: 1) accelerating hiring actions to close technical gaps, 2) cross training and qualifying existing Technical Qualification Program (TQP) qualified personnel to develop them into safety system experts, or 3) transferring (at an appropriate time) existing safety system experts from closure sites to sites that have technical skill gaps.

I will continue to work with the Federal Technical Capabilities Panel (FTCP) Agents to monitor this area to ensure critical technical skill gaps are reduced in their respective Offices. I will also encourage the Field and Area Office Managers to use the data contained in the attached report to locate other sites where experts are available to provide them technical assistance as warranted.

If there are any questions related to this correspondence, please contact me at (803) 952-2486.

Roy J. Schepens
Chairman
Federal Technical Capability Panel

NMED:PWM:mag

UD-02-024

Attachment:
Report

cc w/ attachment:
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M. Whitaker (S-3.1), HQ
R. Card (US), HQ
J. Gordon (NA-1), HQ
J. Roberson (EM-01), HQ
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FTCP Agents (electronically)

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